Planning and Environmental Consultants

Construction and Environmental Management Plan

Proposed Social Housing & Traveller Appropriate Accommodation Development- Lands at Keeraun, Knocknacarra, Galway

DOCUMENT DETAILS

Client:	**Galway City Council**
Project Title:	**Proposed Social Housing & Traveller Appropriate Accommodation Development- Lands at Keeraun, Knocknacarra, Galway**
Project Number:	**210406**
Document Title:	**Construction and Environmental Management Plan**
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Prepared By:	**MKO** **Tuam Road** **Galway** **Ireland** **H91 VW84**

Planning and Environmental Consultants

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01	Draft	26/07/2021	LB	OC
02	Draft	03/08/2021	LB	OC
03	Draft	13/08/2021	LB	OC
04	Final	31/08/2021	LB	OC

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1. INTRODUCTION

This Construction & Environmental Management Plan (CEMP) has been prepared by MKO on behalf of Galway City Council for the construction of a residential development 71 no. dwellings in total 63 no. social housing units and 8 no. Traveller appropriate houses and associated site development infrastructure in Knocknacarra, Galway City. The CEMP provides the environmental management framework to be adhered to during the pre-commencement, construction and operational phases of the development and it incorporates the mitigating principles to ensure that the work is carried out in a way that minimises the potential for any environmental impacts to occur. The CEMP has been informed by and takes account of the findings of a Natura Impact Statement (NIS) and accompanying documents of the proposed development.

This CEMP provides an outline methodology for the proposed construction phase of the project. It incorporates the mitigating principles to ensure that the proposed works are carried out in a way that minimises the potential for any environmental impacts as a result of the proposed works.

This CEMP identifies for the incoming contractor, the key planning and environmental management considerations that must be adhered to during construction works. This report is intended as a single, amalgamated document that can be used during any potential phases of the project, as a single consolidated point of reference relating to all wastes management requirements for the Planning Authority, developer and contractors alike.

1.1 Background to the Development

The proposed development involves the construction by Galway City Council, of a social housing scheme comprising a mix of standard residential units and culturally appropriate Traveller-specific accommodation. The completed project will deliver high quality residential accommodation with positive engagement with the existing sub-urban/rural context in a highly sustainable, efficient and cost-effective design with low maintenance requirements. The project also takes into account the N6 Galway City Ring Road which will pass along the south-eastern boundary when it is completed.

All site services will form part of the development including connection to an existing foul water treatment plant, connection to existing water mains, and connection to surface water drainage systems in proximity to the site.

The proposed layout has been heavily influenced by the requirements of the Traveller Community Liaison Officer, who conveyed the requirements of the Traveller Community, resulting in many design iterations and the final design conclusion presented in this report. The final layout essentially comprises 2 sections (see Figure 1-2):

1) The standard social housing scheme of 63no. dwellings; &

2) The Traveller Appropriate Accommodation (TAA) scheme in the northwest quadrant of the site, comprising 8no. TAA dwellings.
The Proposed Development consists of the following:

Unit Breakdown

- 1 bed units – 4no. (16%)
- 2 bed units – 34no. (48%)
- 3 bed units – 22no. (31%)
- 4 bed units – 3no. (4%)
- 4 bed TAA units – 8no. (11%)

Car Parking

A total of 116no. car parking spaces are proposed, in line with Development Plan Standards for Social Housing, Duplex Apartments, and TAA Housing.

1.2 Scope of the Construction Management Plan

This report is presented as a guidance document for the management of construction activities and waste materials generated during the works and following completion. It outlines clearly the mitigation measures that are required to be adhered to in order to manage activities and waste materials in an appropriate manner. The report is divided into seven sections, as outlined below.

- Section 1 provides a brief introduction as to the scope of the report detailing the targets and objectives of this plan.
- Section 2 outlines the site and project details and an overview of construction methodologies that will be adopted throughout the proposed project.
- Section 3 sets out details of the environmental controls on site which looks at noise and dust controls. site drainage principles and a waste management plan are also included in this section.
- Section 4 sets out a fully detailed implementation plan for the environmental management of the proposed project outlining the roles and responsibilities of the project team.
- Section 5 outlines the Emergency Response Procedure to be adopted in the event of an emergency in terms and environmental protection.
- Section 6 consists of a summary table of all mitigation proposals to be adhered to during the implementation of the project.
- Section 7 sets out a programme for the timing of the works.
- Section 8 outlines the proposals for reviewing compliance with the provisions of this report.

Map Legend

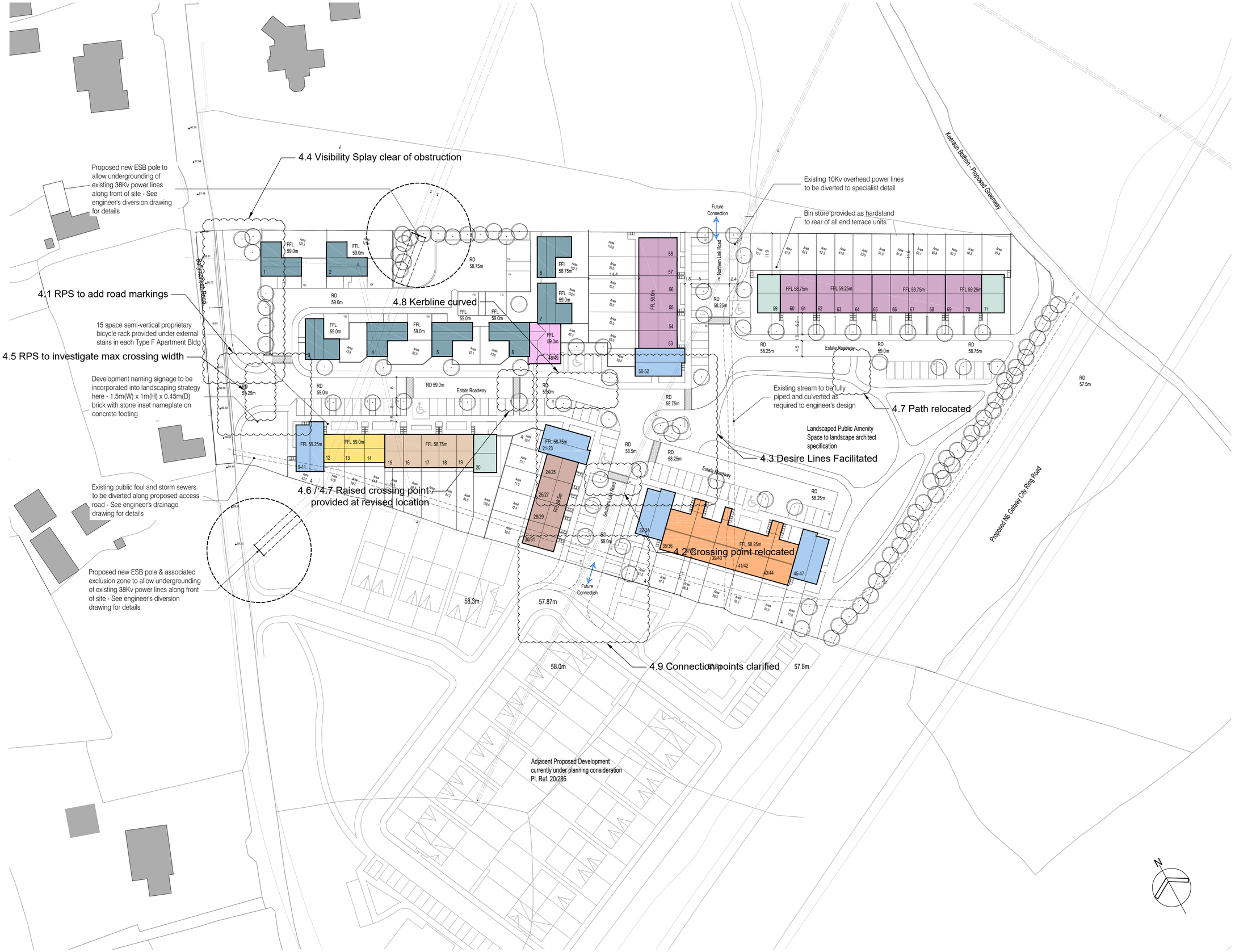
Site Boundary

Drawing Title: Site Location

Project Title: 210406

Drawn By	Checked By
LB	OC
Project No. 210406	Drawing No. Figure 1-1
Scale 1:15298	Date 2021.08.31

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie



1 Site Layout

Scale: 1:500

Notes:

Do not scale from this drawing.
Use figured dimensions only.
All errors and omissions to be reported to the Architect.
This drawing to be read in conjunction with relevant consultant's drawings.
All dimensions are in millimetres and all levels are in meters to match Datum unless otherwise noted.

Contractor Design responsibility
It is noted that there are many elements within the works that require contractor design, and will be subject to certification as part of BCAR - see Preliminary Inspection Plan for clarity on certification required.

Legend - Housetype

- Extent of Planning Application Outlined Red
- Housetype A — 2B-4P
- Housetype A1 — 2B-4P Single Aspect
- Housetype B & B variation — 3B-5P
- Housetype C — 4B-6P
- Housetype D (TAA House) — 4B-7P
- Housetype E — 2B-4P Duplex over 1B 2P Apartment
- Housetype F — 2no. 2B-4P Apartment + 1no. 2B-3P Apartment
- Housetype G — 3B-5P Duplex over 2B 4P Apartment
- Housetype H — 2B 4P Apartment over 2B Accessible Apartment

Legend - Surface Finish

- Public Amenity Space — Mown grass / seeding on min 150mm topsoil to landscape architect specification
- General Shrub & Groundcover — Planting mix on min 450mm topsoil to landscape architect specification TBC
- Permeable PC Concrete Paving — "Bracken" coloured PC block paving
- Private Amenity Space — Mown grass / seeding on min 150mm topsoil to landscape architect specification
- Private Amenity Space TAA Houses — Concrete hardstanding with brushed finish laid in bays with expansion joints to engineer's specification
- Macadam finish to roads & Cycle Path — Build up to engineer's specification
- In-Situ Concrete Footpath — 1800mm wide with brush finish
- Compacted gravel - Hoggin Path — 1200mm wide throughout with compacted gravel and sand mix
- Indicative play area location — Hardwood play grade chip/wetpour coloured play safety surfacing
- Raised road crossing to engineer's detail
- Feature Tree Planting — In minimumum 1.2m3 topsoil Min 25-30cmp — Refer to planting schedule and typical planting details

Revisions:

Rev	Description	Date	By
P-04	Layout revised per draft RSA	19-07-2021	JPH
P-03	Layout revised per pre-planning comments	03-03-2021	JPH
P-02	Bin Stores Added, Curtilage Revised	01-03-2021	JPH
P-01	Issued for Costing	22-02-2021	JPH

Project: Keeraun Social Housing

Client: Galway City Council

Title: Proposed Site Plan

Drawing / Document Name:
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Scale @ A1	Drawn:	Checked:	Date:
1:500	James Hanlon	John Hennigan	22-02-2021

COADY ARCHITECTS
Mt Pleasant Business Ctr., Ranelagh, Dublin 6 D06X7P8
4 Carleycon House, Main St, Oranmore, Co. Galway, H91 T026

1.3 Targets and Objectives

The key site targets are as follows;

- Adopt a sustainable approach to construction and, ensure sustainable sources for materials supply where possible;
- Keeping all watercourses free from obstruction and debris;
- Avoidance of any pollution incident or near miss as a result of working around or close to existing watercourses and having emergency measures in place;
- Correct fuel storage and refuelling procedures to be followed;
- Air and noise pollution prevention to be implemented;
- Construction Methods and designs will be altered where it is found there is an adverse effect on the environment;
- Good waste management and house-keeping to be implemented;
- Using recycled materials if possible, e.g. excavated stone, soil and subsoil material;
- Avoidance of vandalism;
- Monitoring of the works and any adverse effects that it may have on the environment and,
- Provide adequate environmental training and awareness for all project personnel.

The key site objectives are as follows;

- Keep impact of construction to a minimum on the local environment and wildlife;
- Comply with all relevant water quality legislation;
- Ensure construction works and activities are completed in accordance with mitigation and best practice approach presented in the Natura Impact Statement (NIS) and associated planning documentation;
- Ensure construction works and activities are completed in accordance with any planning conditions for the development;
- Ensure construction works and activities have minimal impact/disturbance to local landowners and the local community;
- Ensure construction works and activities have minimal impact on the Natural Environment;

2. SITE AND PROJECT DETAILS

2.1 Site location

The subject site is a greenfield and measures approximately 2.08ha in area. The site is located in the northwest of Galway City, due north of Knocknacarra. Specifically, the site is located on the eastern side of Ballymoneen Road, approximately 4.3km from the City Centre, and 1km from Knocknacarra Neighbourhood Centre (see Figure 1-1). The site is bounded to the north by agricultural lands, to the east and south-east by agricultural lands, along which the future N6 Galway City Ring Road is planned, to the south by agricultural lands and to the west by Ballymoneen Road.

2.2 Construction Methodologies Overview

2.2.1 Introduction

The appointed contractors for the construction of the proposed development will be required to comply with this CEMP and any revisions made to this document throughout the construction phase. An overview of the anticipated Construction Methodologies is provided below.

- Temporary Site Compound
- Site Establishment
- Perimeter Hoarding
- Site Excavation
- Site Roads
- House Construction
- Service and Utilities
- Existing Underground Services
- Hours of Working
- Health and Safety Management
- Landscaping Works
- Construction Works Sequence

2.2.2 Temporary Site Compound

A temporary construction compound is proposed for the construction phase of the proposed development, located inside the development footprint on the proposed hardstanding area. The proposed temporary compound area incorporates temporary site offices and staff facilities.

A dedicated waste management area will be located within the compound, with waste to be sorted and collected from site by permitted collectors.

Temporary toilets located at the site offices and welfare facilities will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. Power will be supplied by a diesel generator, located within the compound or via a temporary power supply if available. The construction compound will be used for temporary storage of some construction materials, prior to their delivery to the required area of the site.

2.2.3 Site Establishment

Construction stage access will be taken via the road frontage on Ballymoneen Road. Prior to the commencement of any construction, this site entrance will need to be fully established with security gates. A parking area for construction worker's vehicles will be provided within the confines of the site.

There will be no parking permitted for any vehicles associated with the project on the public road during the construction phase of the development.

2.2.4 Perimeter Hoarding

Perimeter hoarding will be provided around the site to provide a barrier against unauthorised access from the public areas. A controlled access point in the form of a gated main site entrance will be kept locked outside of normal working hours.

The hoarding will be well maintained and painted or covered with graphics portraying project information. Due to the nature of the works and the construction traffic using the site entrance, appropriate signage will be provided along the footpath and site entrance to alert pedestrians to the traffic exiting/entering the site. Likewise, appropriate signage will be installed within and outside the site to alert drivers of the pedestrians crossing ahead. The contractor will be required to undertake the following;

- Operate a Site Induction Process for all site staff,
- Ensure all site staff shall have current 'Safe Pass' cards'
- Maintain Site Security staff at all times,
- Install access security in the form of turn-styles and gates for staff,
- Separate public pedestrian access from construction vehicular access,
- Ensure restricted access is maintained to the works.

2.2.5 Site Excavation

Soil stripping and temporary stockpiling of soils and subsoils will be required around the site as the proposed development progresses. Where these works occur, the following will apply.

- The area where excavations are planned will be surveyed and all existing services will be identified;
- All relevant bodies i.e. ESB, Gas Networks Ireland, Eir, Galway City Council etc. will be contacted and all drawings for all existing services sought;
- All plant operators and general operatives will be inducted and informed as to the location of any services;
- All plant operators and general operatives will be inducted and informed as to the identification of invasive species;
- A tracked 360-degree excavator will be used to strip the topsoil, and a dumper will be used to move the excavated materials to the temporary stockpile location;
- All excavated material will be reused for future landscaping works or for backfill of excavations;
- All stockpiles will be covered in a sheet of polythene, as required, which will prevent the creation of nuisance dust, and will also prevent sediment runoff in times of heavy precipitation;
- A silt filtration system will be used as appropriate to prevent contamination of any watercourse.

2.2.6 Culvert Installation

There is an existing stream which transverses through the proposed development site in the south to north direction. The stream enters the site from the south via an existing concrete pipe. This pipe was installed to allow construction access to the east of the site. The concrete pipe outfalls into an open stream which falls to the north. There is an existing culvert at the northern boundary of the site. The stream passes through this culvert and enters the neighbouring site to the north. Due to the layout of the housing development, the existing stream must be diverted. The stream will also be piped along its full

length. The following measures will be put in place to prevent the transportation of silt laden water or pollutants from entering any of the watercourses on site or any of the wider environments including downstream watercourses.

The culverting methodology set forth as follows:

- The culvert will be installed avoiding the need for in channel works in so far as possible;
- The culvert route alignment and manhole locations shall be marked out on site by the Site Engineer with the excavation carried out using a tracked excavator. Material excavation shall be disposed of to an appropriate licenced facility or reused on site where the material is deemed suitable;
- The 900mm diameter culvert will comprise a pre cast concrete. The pipe bedding and surround shall be placed in accordance with the specifications provided by the Project Engineer; Precast concrete pipe shall be used to significantly minimise the need for use of in-situ concrete for this element of works. The Contractor shall also plan the works to ensure works are carried out during dry spells and monitor daily weather forecasts accordingly;
- Where water ingress in excavations is evident during the construction of the culverts, all dewatering flow will be passed through filtering dewatering bags to remove sediments;
- Once the culverts have been constructed and backfilled, the headwall to the open drains at the start (upstream) and end (downstream) of the diverted runs will be installed;
- The Contractor will adopt a water over pumping arrangement to manage the incoming water from upstream. The overpumped water shall pass through silt bags or other suitable measures before discharging to the previously constructed culverts at a downstream manhole;
- Once the overpumping arrangement is in place and the works area has been dried off, the installation of the headwalls will be completed. It is proposed that precast concrete concepts will be used to minimise the use of in-situ concrete in this element of works. The overpumping process will be repeated at the downstream headwall and on completion of both;
- The over pumping arrangement shall be discontinued which will allow the upstream open drain to connect to the newly constructed diverted culvert.

2.2.7 Site Roads

The construction methodology for the proposed access road is outlined as follows:

- Excavation will take place until a competent stratum is reached.
- The competent stratum will be overlain with up to 500mm of granular fill as determined by the Project Engineer;
- A layer of geogrid/geotextile may be required at the surface of the competent stratum.
- A final hard surface layer will be placed over the excavated road to provide a road profile to accommodate construction traffic;
- Prior to completion of the construction works on site, the finished tarmacadam road surface will be applied.

2.2.8 House Construction

The house will be constructed by the following methodology:

- The area where excavations are foundations are to be installed will be surveyed and all existing services will be identified if found onsite;
- The area of the building will be marked out using ranging rods or wooden posts and the soil and overburden stripped and removed to nearby storage area for later use in landscaping;
- All plant operators and general operatives will be inducted and informed as to the location of any services if found onsite;

- A tracked 360-degree excavator or similar will be used to excavate the area down to the level indicated by the designer and appropriately shuttered reinforced concrete will be laid over it;
- The block work walls will be built up from the foundation (including a DPC) and the floor slab constructed, having first located any ducts or trenches required by the follow on mechanical and electrical contractors;
- The block work will then be raised to wall plate level and the gables & internal partition walls formed. Scaffold will be erected around the outside of the building for this operation;
- Any concrete flooring slabs will be lifted into position using an adequately sized mobile crane;
- The timber roof trusses will then be lifted into position using a teleporter or mobile crane depending on site conditions. The roof trusses will then be felted, battened, tiled and sealed against the weather;
- Windows, electrics, plumbing and all other building components and services will be installed in as timely a manner as is possible;
- Each building will be inspected and certified by the project design engineer at the appropriate stages of construction.

2.2.9 Service and Utilities

The proposed development site has an existing foul water and stormwater network which will be redirected within the site in accordance with the proposed development. The foul water and storm water network shall connect the north of Ballymoneen road to the Galway city network as both pipes are directed toward the Clybaun road to the east. The site drainage details are included in the RPS Drainage and Watermain Design Report drawings MGC0716-RPS-00-XX-DR0001-01 and MGC0716-RPS-00-XX-C-DR0002-01.

The installation of services and connections to the residential units will be carried out as follows:

- The area where excavations are planned will be surveyed and all existing services will be identified;
- All relevant bodies i.e. ESB, Gas Networks Ireland, Eir, Galway City Council etc. will be contacted and all drawings for all existing services sought;
- A traffic management plan will be produced if required for connection works to the existing service network;
- A road opening licence will be obtained where required for connection to existing services;
- All plant operators and general operatives will be inducted and informed as to the location of any services;
- A tracked 360-degree excavator or similar will be used to excavate the trench to the required dimensions;
- All excavated material will be removed to an authorised waste recovery facility or, if suitable, stock piled and reused for backfilling and landscaping where appropriate;
- Once the trench has been excavated the ducting/pipework will then be placed in the trench as per specification;
- Once the service ducts/pipework has been installed couplers will be fitted as required and capped to prevent any dirt etc. entering the ducts/pipes;
- The as built location of the ducting/pipework will be surveyed using a total station/GPS;
- Backfill material will be carefully placed so as not to displace the ducting/pipework within the trench;
- The appropriate warning/marker tape will be installed above the ducts/pipes at the appropriate depths;

- The surface will be reinstated as per original specification or to the requirements of the site layout/Local Authority as appropriate.

2.2.10 Existing Underground Services

Any underground services encountered during the works will be surveyed for level and where possible will be left in place. If there is a requirement to move the service, then the appropriate body (ESB, Gas Networks Ireland, etc.) will be contacted, and the appropriate procedure put in place. Back fill around any utility services will be with dead sand/pea shingle where appropriate. All works will be in compliance with required specifications.

2.2.11 Hours of Working

It is expected that works will occur during normal working hours

- 08:00 – 18:00 Monday to Saturday
- Closed Sunday
- Public holidays will be observed unless otherwise agreed with the local planning authority. Deliveries will also be scheduled to avoid peak times, i.e. avoiding rush hours and school drop off/pick up times

2.2.12 Health and Safety Management

The Contractor shall be responsible for preparing a Health and Safety Plan for the project. The works will be carried out in accordance with all relevant health and safety legislation and Codes of Practice and site rules relating to the works will be observed.

2.2.13 Landscaping Works

Prior to completion of works on the development site, the landscaping works will be carried out. The finishes include areas of amenity grassland and tree planting. This work will be carried out before the completion of each phase in order to ensure that areas are reinstated in a timely manner. These works will involve the use of plant and machinery in order to carry out tasks such as earth moving. Materials which have been temporarily stockpiled for the task will be used as much as possible, and material will only be imported where it is required.

2.2.14 Construction Works Sequence

The sequencing of construction phase works is summarised in Table 2-1 below This provides a schedule of the expected sequence of operations for the works to be completed during the construction phase.

Table 2-1 Sequence of Operations for the Construction Phase

No.	Waste Materials Arising
1.	Foundations excavation and formation level establishment
2.	Foundations: formwork and steel reinforcement installation
3.	Masonry Blockwork: including insulation installation
4.	Carpentry 1st fix: timber roof structure and coverings

No.	Waste Materials Arising
5.	Window/Door installation
6.	Plastering (external)
8.	Painting (external)
9.	Internal services (electrical and plumbing)
10.	Plastering (internal)
11.	Floor: Sand and cement screed
12.	Services connection: electrical, sewage, telecoms.
13.	Painting (internal)
14.	Tiling: Floors, walls etc.
15.	Carpentry 2nd fix: doors, flooring etc.
16.	Landscaping
17.	Road finishes: Tarmacadam roads and parking areas

3. ENVIRONMENTAL MANAGEMENT

3.1 Protecting Water Quality

Prior to the commencement of any construction activities, the necessary mitigation measures will be put in place to ensure the protection of surface water during the works. This will involve confirming the location of all existing services and delineating between drainage systems. Surface waters will be managed to ensure the prevention of run off from areas where excavation occur does not result in silt laden water entering the existing storm water network. Stockpiled material will be located a minimum of 50m from watercourses and if deemed necessary will be surround by silt fencing where the is a risk of run-off during prolonged rainfall.

Waters will not be discharged directly to any exiting surface water sewer or drains. Particular emphasis will also be placed on hazardous materials entering the surface water management system as well as spills or leaks of fuel oils. Section 54 provides an Emergency Response Plan for dealing with spillages which may result in impacts on water quality.

3.2 Prevention Pollution Control Measures

The excavation phase of the development has the potential to encounter sub-surface and ground water during the works although it is not anticipated that this will be significant as the excavation does not include a basement. In the event of encountering groundwaters during excavation, the excavation will be de-watered using a pump equipped with a silt bag on the outlet to capture any silty material prior to subsequent natural percolation to ground. Alternatively, this water will be tankered off site if required.

There will be no release of suspended solids to any watercourse as a direct or indirect result of the proposed works. The following measures will be put in place to prevent the transportation of silt laden water or pollutants from entering any of the watercourses on site or any of the wider environments including downstream watercourses.

- Drainage ditches within the works footprint will be culverted. Any such instream works will be carried out in line with Inland Fisheries Ireland (2016) *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters;*
- Temporary instream crossings or temporary culverting will take place on the mapped watercourses on site before groundworks commence. Instream works will take place as per the method above;
- Any requirement for temporary fills or stockpiles will be damped down or covered with polyethylene sheeting as required to avoid sediment release associated with heavy rainfall;
- Prior to the commencement of groundworks silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present including along the existing that will be culverted. These will be embedded into the local soils to ensure all site water is captured and filtered;
- As construction advances there may be a requirement to collect and treat surface water within the site. Any water encountered during excavations will be pumped from the excavations through silt bags before discharging from the bags and percolating naturally into the ground. The perimeter of the silt bags discharge area will be surrounded with silt fencing.

3.3 Cement Based Products Control Measures

The complete washing out of concrete trucks will not be permitted at the site. Suppliers will be directed back to their own facility to complete the washout process. However, a washout area for chute cleaning will be provided at various locations in close proximity to the concrete pour locations.

The following mitigation measures are proposed to avoid release of cement leachate from the site:

- No batching of wet-cement products will occur on site;
- Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place. Where possible pre-cast elements for culverts and concrete works will be used;
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;
- Where concrete is delivered on site, only chute cleaning will be permitted, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed;
- Use weather forecasting to plan dry days for pouring concrete;
- Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event;

3.4 Refuelling, Fuel and Hazardous Materials Storage

The following measures are proposed to avoid release of hydrocarbons at the site:

- Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling should occur at a controlled fuelling station;
- On-site refuelling will take place by direct refuelling from the delivery truck or using a mobile double skinned fuel bowser;
- Vehicles will never be left unattended during refuelling. Only dedicated trained and competent personnel will carry out refuelling operations and plant refuelling procedures shall be detailed in the contractor's method statements;
- Fuels volumes stored on site should be minimised. Any fuel storage areas will be bunded appropriately for the volume of fuel stored. volume for the time period of the construction. The bunded area will be roofed to prevent the ingress of rainwater;
- Fuels, lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment;
- Harmful materials shall be stored on site for use in connection with the construction works only. These materials shall be stored in a controlled manner. Where on site fuelling facilities are used, there shall be a bunded filling area using a double bunded steel tank at a minimum;
- Any other diesel, fuel or hydraulic oils stored on site will be stored in bunded storage tanks- the bunded area will have a volume of at least 110% of the volume of the stored materials;
- The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off site and will be towed around the site as required. It will be parked on a level, impermeable area in the construction compound when not in use and will only be present on site when heavy plant and machinery are in operation;
- Only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations;

- It is not anticipated that there will be any other means of fuel storage on site during construction;
- The plant used should be regularly inspected for leaks and fitness for purpose; and,
- Spill kits will be available to deal with and accidental spillage in and outside the refuelling area. Spill control measures are outlined in the section that follows.

3.5 Spill Control Measures

It is not proposed to store any large volumes of oils/fuels for the purpose of refuelling on the site. A bunded fuel tank will be stored at the temporary construction compound which will be used for smaller plant and equipment i.e. site dumpers and teleporters. This will be stored on an impermeable surface and will be equipped with spill kit. Onsite plant (excavator) will be refuelled by an external contractor who will call to site as required. Road vehicles will not be refuelled at the site.

In the event of minor spills and leaks from road vehicles and the onsite excavator the following steps provide the procedure to be followed in the event of any significant spill or leak.

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers;
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident;
- Contain the spill using the spill control materials including track mats, drip trays or other material as required. Do not spread or flush away the spill;
- If possible, cover or bund off any vulnerable areas where appropriate such as drains or watercourses;
- If possible, clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited;
- Notify the applicant immediately giving information on the location, type and extent of the spill so that they can take appropriate action and further investigate the incident to ensure it has been contained adequately;
- External consultants will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring;
- The applicant will notify the appropriate regulatory body such as Galway City Council if deemed necessary.

3.6 Dust Control

Construction dust can be generated from many on-site activities such as excavation and backfilling. The extent of dust generation will depend on the type of activity undertaken, the location, the nature of the dust, i.e. soil, sand, etc and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or, periods of dry weather. Construction traffic movements also have the potential to generate dust as they travel along the haul route. The measures below will also prevent construction debris arising on the public road network.

Proposed measures to control dust include:

- Any site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions;
- The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by Site Management for cleanliness, and cleaned as necessary;
- Material handling systems and material storage areas will be designed and laid out to minimise exposure to wind;

- Water misting or bowsers will operate on-site as required to mitigate dust in dry weather conditions;
- The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary;
- All construction related traffic will have speed restrictions on un-surfaced roads to 15 kph;
- Daily inspection of construction sites to examine dust measures and their effectiveness.
- When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper.

3.7 Noise & Vibration Control

Noise levels shall be kept below those levels specified in the National Roads Authority – "Guidelines for the Treatment of Noise and Vibration in National Roads Schemes" or such further limits as imposed by Galway City Council. The operation of plant and machinery, including construction vehicles, is a source of potential noise impacts. During the works, any plant introduced to the site will not be excessively noisy. Exhaust and silencer systems on plant will be maintained in a satisfactory condition and operating correctly at all times. Defective silencers will be immediately replaced.

Proposed measures to control noise include:

- Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts;
- Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All construction plant and equipment to be used on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations;
- Plant with the potential of generating noise or vibration will be placed as far away from sensitive properties as permitted by site constraints.
- Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works;
- Compressors will be of the "sound reduced" models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Machines, which are used intermittently, will be shut down during those periods when they are not in use;
- Training will be provided by the Site Management to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation; and,
- Local areas of the haul route will be condition monitored and maintained if necessary.

3.8 Traffic Management Proposals

The proposed traffic management measures to be adopted during the construction works are summarised below. Please note that this is not an exhaustive list, and it will be updated accordingly by the appointed contractor in consultation with the local authority. A separate detailed traffic construction management plan will be produced before the commencement of works.

- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access locations;

- Construction and delivery vehicles will be instructed to use only the approved and agreed means of access; and movement of construction vehicles will be restricted to these designated routes;
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on HGVs carrying dust producing material;
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds;
- Parking of site vehicles will be managed and will not be permitted on public road, unless proposed within a designated area that is subject to traffic management measures and agreed with Galway City Council;
- A road sweeper will be employed to clean the public roads of any residual debris that may be deposited on the public roads leading away from the construction works;
- On site wheel washing will be undertaken for construction vehicles to remove any debris prior to leaving the site, to remove any potential debris on the local roads if it is deemed necessary;
- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. All scheduled maintenance will not be carried out on the public highway; and
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons;
- Access to the site will be from the existing Ballymoneen Road. The site will not be open to members of the public. When vehicles are entering the site, or leaving the site, these movements will be supervised by road marshals. The construction site gates will be kept closed when not in use and monitored by security. Traffic cones and set-back signage will be put in place to warn and safely direct cyclists around obstructions.

3.9 Invasive Species Management

A baseline invasive species survey was carried out at the site to identify the presence and location of any invasive species (listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) by a suitably qualified ecologist. As no invasive species were found, an invasive species management plan will not be required for the site. In the case of an invasive species being found on site during the construction phase an invasive species management plan will be prepared. The treatment and control of invasive alien species will follow guidelines issued by the National Roads Authority – The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (NRA 2010) and the Environment Agency (2013) – The Knotweed Code of Practice: Managing Japanese Knotweed on Development Sites (Version 3, amended in 2013). To prevent the introduction of any invasive species to the site best practice control methods are summarised in the following sections.

3.9.1 Site Management

Careful preparation of the site and planning of the works is crucial to successful prevention of introduction of invasive species. The following list of guidelines, which is not exhaustive, shall be followed by all on-site personnel. Only those who have been inducted into biosecurity measures on-site may enter the contaminated zones within the works areas.

3.9.2 Establishment of Good Hygiene

- A risk assessment and method statement must be provided by the Contractor prior to commencing works;
- Fences will be erected around areas of infestation, as confirmed by test pits, and warning signs shall be erected;
- A designated wash-down area will be created, where power-washed material from machinery can be contained, collected and disposed of with other contaminated material. This area will contain a washable membrane or hard surface;
- Stockpile areas will be chosen to minimise movement of contaminated soil;
- Stockpiles will be marked and isolated;
- Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery. Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore;
- The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material;
- Any material that is imported onto any site will be verified by a suitably qualified ecologist to be free from any invasive species listed on the 'Third Schedule' of Regulations 49 & 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I 477 of 2011). This will be carried out by searching for rhizomes and plant material;
- Any soils or subsoils contaminated with invasive species will be sent for disposal to an authorized waste facility;
- A suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species remedial works.

Plant and equipment which is operated within an area for the management of materials in contaminated areas will be decontaminated prior to relocating to a different works area. The decontamination procedures will take account of the following:

- Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it;
- Decontamination will only occur within designated wash-down areas;
- Vehicles will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain rhizomes e.g. wheel treads and arches;
- All run-off will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas.

3.10 Environmental Management Implementation

The Site Supervisor/Construction Manager will have overall responsibility for the organisation and execution of the demolition and construction phases of the development in accordance with the provisions of this CEMP. A series of daily checks of all works and the implementation of the mitigation measures set out throughout this document will be maintained. The findings of these daily checks will be documented by the site manager and will inform the overall site audit and inspection procedure as set out in Section 5.

3.11 Waste Management Plan

This section of the CEMP provides a Waste Management Plan (WMP) which outlines the best practice procedures during the construction phase of the project. The WMP will outline the methods of waste

prevention and minimisation by recycling, recovery and reuse at each stage. Disposal of waste will be seen as a last resort.

3.11.1 Legislation

The Waste Management Act 1996 and its subsequent amendments provide for measures to improve performance in relation to waste management, recycling and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

The Act requires that any waste related activity has to have all necessary licenses and authorisations. It will be the duty of the Waste Manager on the site of the proposed development to ensure that all contractors hired to remove waste from the site have valid Waste Collection Permits. It will then be necessary to ensure that the waste is delivered to a licensed or permitted waste facility. The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits and authorisations.

The Department of the Environment provides a document entitled, 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects'. These guidelines were published by the Government in July 2006, however this document is in a newly drafted stage as replacement guidelines reflect current waste legislation and policy including 'A Waste Action Plan for a Circular Economy Ireland's National Waste Policy 2020-2025' published in September 2020.

3.11.2 Preliminary Plan

The Department of the Environment guidelines state that, at the design stage of the project, only a preliminary WMP is required,

"Formal production and presentation of the Plan may be at a later stage but a clear 'waste management philosophy' needs to be adopted...at the initial conceptual stage of the Project..."

This preliminary WMP has a number of key objectives as outlined below:

- To set out management prescriptions that adhere to a waste management hierarchy;
- To outline the roles and responsibilities of the Waste Manager;
- Prevention and minimisation of waste at the construction stage of the proposed development.

3.11.3 Waste Management Hierarchy

The waste management hierarchy sets out the most efficient way of managing waste in the following order:

Prevention and Minimisation:

The primary aim of the WMP will be to prevent and thereby reduce the amount of waste generated at each stage of the project. The prevention and minimisation of waste of this development will be developed by implementing effective on-site materials management in terms of both material acquisition and storage on site.

Reuse of Waste:

Reusing as much of the waste generated on site as possible will reduce the quantities of waste that will have to be transported off site to recovery facilities or landfill. Site management will be required to

encourage the appropriate reuse of materials where possible as well as identify re-use opportunities to achieve ultimate goal of waste reduction.

Recycling of Waste:

There are a number of established markets available for the beneficial use of construction waste such as using waste concrete as fill for new roads. A designated Waste Storage Area (WSA) will be maintained on site which will cater for segregation and recycling of various waste streams.

At all times during the implementation of the WMP, disposal of waste to landfill will be considered only as a last resort.

3.11.4 Excavation Waste Management Plan

The excavation phase of the proposed development will require the removal and management of the materials from the foundation excavations. It is anticipated that some of the material will be re-used on site for landscaping, backfilling and general restoration of excavated areas.

All excavated material which is not required for future landscaping works or for backfill of excavations will be removed to an authorised waste recovery facility. This will also apply to material which is not suitable for reuse on site.

The excavation phase will also include te removal of the existing foul and storm sewer network for which diversion is proposed. As this pipework forms part of an existing live sewer, it will considered and managed in the same manner as the waste sludges that may be contained in the network prior to decommissioning.

3.11.5 Construction Phase Waste Management

The first significant quantity of waste to be generated during the construction phase of the project will be the excavation for the associated foundations. This will generate a significant quantity of soil and subsoil material as a result of the excavation. Although a quantity of this material will be used for landscaping, backfilling and general restoration of excavated areas, it is anticipated that a quantity of this material will be exported off site by a licenced haulier to an authorised waste facility.

Waste generated post excavation on site will be managed in the WSA where the various waste components will be segregated into a number of waste categories in accordance with a general waste segregation policy and placed into individual skips located on the hardstand in the temporary construction compound. The categories for segregation will include, timber, metal, cardboard and plastics. This material will be removed by authorised waste collection contractors for recycling and recovery at various licensed facilities. The remaining volume of waste material which cannot be allocated to any of these four waste streams will be disposed of in a general waste skip. This waste material will be transferred to a Materials Recovery Facility by a fully licensed waste contractor where the waste will be further sorted into individual waste streams for recycling, recovery or disposal. This general waste will be subject to constant monitoring by site management to ensure that potential reusable and recyclable material is not being disposed of therein. The on-site canteen will include waste receptacles for dry recyclables and food waste which should eliminate the potential of any waste produced within the canteen being sent to landfill. The expected wastes arising from the works including the individual European Waste Catalogue (EWC) codes are outlined in Table 3-1.

Table 3-1 Expected waste types arising during the construction phase

Materials type	Example	EWC Code
Cables	Electrical wiring	17 04 11

Materials type	Example	EWC Code
Concrete	Surfacing, flooring material	17 01 01
Insulation	Cavity & Floor Insulation	17 06 04
Tiles and ceramics	Wall and floor tiles	17 02 03
Bituminous materials	Torch on felt roof coverings	17 03 01
Metals	Rebar, reinforced steel joists, lead	17 04 07
Mixture of inert material	Sand, stones, plaster, rock	17 01 07
Plastic	PVC frames, electrical fittings	17 02 03
Soil & Stones	Overburden, soil, subsoil	17 05 04
Gypsum materials	Roof tiles/slabs	17 08 02
Wood	Frames and doors,	17 02 01
Canteen Waste	Miscellaneous waste from site staff	20 01 08

Plant will not be serviced onsite and so the likelihood of generating hazardous wastes is low. Hazardous wastes that may occur on site during the construction phase of the proposed development may include oil, diesel fuel, chemicals, paints, preservatives etc. Any hazardous wastes will be stored in bunded containers before being collected by an authorised waste contractor and brought to an EPA licensed waste facility.

3.11.6 Waste Arisings and Proposals for Minimisation, Reuse and Recycling of Construction Waste

Construction waste will arise on the project mainly from excavation and unavoidable construction waste including material surpluses and damaged materials and packaging waste.

Appropriate measures should be taken to ensure excess waste is not generated during construction, including;

- Ordering of materials should be on an 'as needed' basis to prevent over supply to site. Co-ordination is required with suppliers enabling them to take/buy back surplus stock;
- Purchase of materials pre-cut to length to avoid excess scrap waste generated on site;
- Request that suppliers use least amount of packaging possible on materials delivered to the site;
- Ensuring correct storage and handling of goods to avoid unnecessary damage that would result in their disposal;
- Ensuring correct sequencing of operations;
- Use reclaimed materials in the construction works.

Hazardous waste will be kept separate from all other construction waste to prevent contamination and removed appropriately.

3.11.7 Reuse

Many construction materials can be reused a number of times before they have to be disposed of:

- Concrete can be reused as aggregate for roads cable trench backfilling material.
- Plastic packaging etc. can be used to cover materials on site or reused for the delivery of other materials.

3.11.8 Recycling

If a certain type of construction material cannot be reused on site then recycling is the most suitable option.

All waste that is produced during the construction phase including dry recyclables will be sent directly for subsequent segregation at a remote facility. The low volume of such material that is anticipated to be generated at the proposed development is the justification for adopting this method of waste management.

3.11.9 Wastewater

The removal and disposal of wastewater from site welfare facilities, will be carried out by a fully permitted waste collector holding valid Waste Collection Permits as issued under the Waste Management (Collection Permit) Regulations, 2007. Information on the appointed permitted contractor and evidence of a maintenance contract having been submitted to the Planning Authority prior to any construction works taking place.

3.11.10 Waste Management Plan Implementation

3.11.10.1 Roles and Responsibilities for Waste Management

Prior to the commencement of the proposed development a Waste Manager will be appointed by the project team. The role of Waste Manager is likely to be fulfilled by the Site Manager given the scale of the development and will be responsible for the implementation of the objectives of this plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the proposed development adheres to the management plan. The waste manager will also be required to conducted regular waste audits in the WSA and throughout the site to ensure that the waste management plan is operating effectively.

3.11.10.2 Training

It is important for the Waste Manager to communicate effectively with colleagues in relation to the aims and objectives of the WMP. All employees working on site during the construction phases of the project will be trained in materials management and thereby, should be able to:

- Distinguish reusable materials from those suitable for recycling;
- Ensure maximum segregation at source;
- Co-operate with site manager on the best locations for stockpiling reusable materials;
- Separate materials for recovery; and
- Identify and liaise with waste contractors and waste facility operators.

3.11.10.3 Record Keeping

The WMP will provide systems that will enable all arisings, movements and treatments of construction waste to be recorded. This system will enable the contractor to measure and record the quantity of waste being generated. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The WMP can then be adapted with changes that are seen through record keeping.

The fully licensed waste contractor employed to remove waste from the site will be required to provide documented records for all waste dispatches leaving the site of the proposed development. Each record will contain the following:

- Consignment Reference Number
- Material Type(s) and EWC Code(s)
- Company Name and Address of Site of Origin
- Trade Name and Collection Permit Ref. of Waste Carrier
- Trade Name and Licence Ref. of Destination Facility
- Date and Time of Waste Dispatch
- Registration no. of Waste Carrier vehicle
- Weight of Material
- Signature of Confirmation of Dispatch detail
- Date and Time of Waste Arrival at Destination
- Weight of Material
- Site Address of Destination Facility

3.11.11 Construction Waste Management Plan Conclusion

The WMP will be properly adhered to by all staff involved in the project which will be outlined within the induction process for all site personnel. The waste hierarchy should always be employed when designing the plan to ensure that the least possible amount of waste is produced during the construction phase. Reuse of certain types of construction wastes will cut down on the cost and requirement of raw materials therefore further minimising waste levels.

This preliminary WMP has been prepared to outline the main objectives that are to be adhered to for the preparation of a more detailed WMP to be completed after the planning phase of the proposed development.

4. ENVIRONMENTAL MANAGEMENT AND IMPLEMENTATION

4.1 Construction Manager/Site Supervisor

The Construction Manager/Site Supervisor will have overall responsibility for the organisation and execution of all related environmental activities as appropriate, in accordance with regulatory and project environmental requirements. The duties and responsibilities of the Site Supervisor/Construction Manager will include:

- Ensure that all works are completed safely and with minimal environmental risk;
- Approve and implement the CEMP and supporting environmental documentation, and ensure that all environmental standards are achieved during the construction phase of the project;
- Take advice from the Site Environmental Manager on legislation, codes of practice, guidance notes and good environmental working practice relevant to their work;
- Ensure compliance through audits and management site visits;
- Ensure timely notification of environmental incidents; and,
- Ensure that all construction activities are planned and performed such that minimal risk to the environment is introduced.

4.2 Environmental Manager

The main contractor appointed to carry out the works on site will be required to provide a level of supervision on site in the form of an Environmental Manager who will also fulfil the role of Waste Manager. Due to the scale of activity proposed for the site, this role can be adopted by a Site Manager/Foreman as part of their duties. In general, this Environmental Manager will maintain responsibility for monitoring the works and Contractors/Sub-contractors from an environmental perspective. The Environmental Manager will act as the regulatory interface on environmental matters by reporting directly to the client and liaising with Galway City Council and other statutory bodies as required. The Site Environmental Manager will report to the Site Supervisor/Construction Manager. The duties of the appointed Environmental Manager are summarised as follows:

- Maintain and update as required the Construction Phase CEMP and supporting environmental documentation and review/approval of contractor method statements;
- Undertake inspections and reviews to ensure the works are carried out in compliance with the CEMP;
- Monitor the implementation of the CEMP, particularly all proposed/required Environmental Monitoring;
- Generate environmental reports as required to show environmental data trends and incidents and ensure environmental records are maintained throughout the construction period;
- Advise site management/contractor/sub-contractors on:
    - Prevention of environmental pollution and improvement to existing working methods;
    - Changes in legislation and legal requirements affecting the environment;
    - Suitability and use of plant, equipment and materials to prevent pollution;
    - Environmentally sound methods of working and systems to identify environmental hazards.
- Liaise with Project Team and present the findings of site audits/inspections that are completed;
- Ensure adequate arrangements are in place for site personnel to identify potential environmental incidents;

- Ensure that details of environmental incidents are communicated in a timely manner to the relevant regulatory authorities, initially by phone and followed up as soon as is practicable by email;
- Support the investigation of incidents of significant, potential or actual environmental damage, and ensure corrective actions are carried out, recommend means to prevent recurrence and communicate incident findings to relevant parties;
- Identify environmental training requirements and arrange relevant training for all levels of site-based staff/workers; and
- Fulfil the role of Waste Manager and implement the objectives of the Waste Management Plan as set out in Section 3 above;
- Coordinate the Emergency Response in terms of site health and safety and environmental protection as outlined in the section below.

5. EMERGENCY RESPONSE

The Emergency Response Plan (ERP) is presented in this section of the CEMP. It provides details of procedures to be adopted in the event of an emergency in terms of site health and safety and environmental protection. The site ERP includes details on the response required and the responsibilities of all personnel in the event of an emergency. The ERP will require updating and submissions from the contractor and suppliers as the proposed project progresses. Where sub-contractors that are contracted on site are governed by their own emergency response procedure a bridging arrangement will be adopted to allow for inclusion of the sub-contractor's ERP within this document.

This is a working document that requires updating throughout the various stages of the project.

5.1.1 Roles and Responsibilities

The chain of command during an emergency response sets out who is responsible for coordinating the response. The Site Manager will lead the emergency response which makes him responsible for activating and coordinating the emergency response procedure. The other site personnel who can be identified at this time who will be delegated responsibilities during the emergency response are presented in Figure 5-1. In a situation where the Site Manager is unavailable or incapable of coordinating the emergency response, the responsibility will be transferred to the next person in the chain of command outlined in Figure 5-1. This will be updated throughout the various stages of the project and considering the scale of the development, all roles may not be applicable during the construction phase.

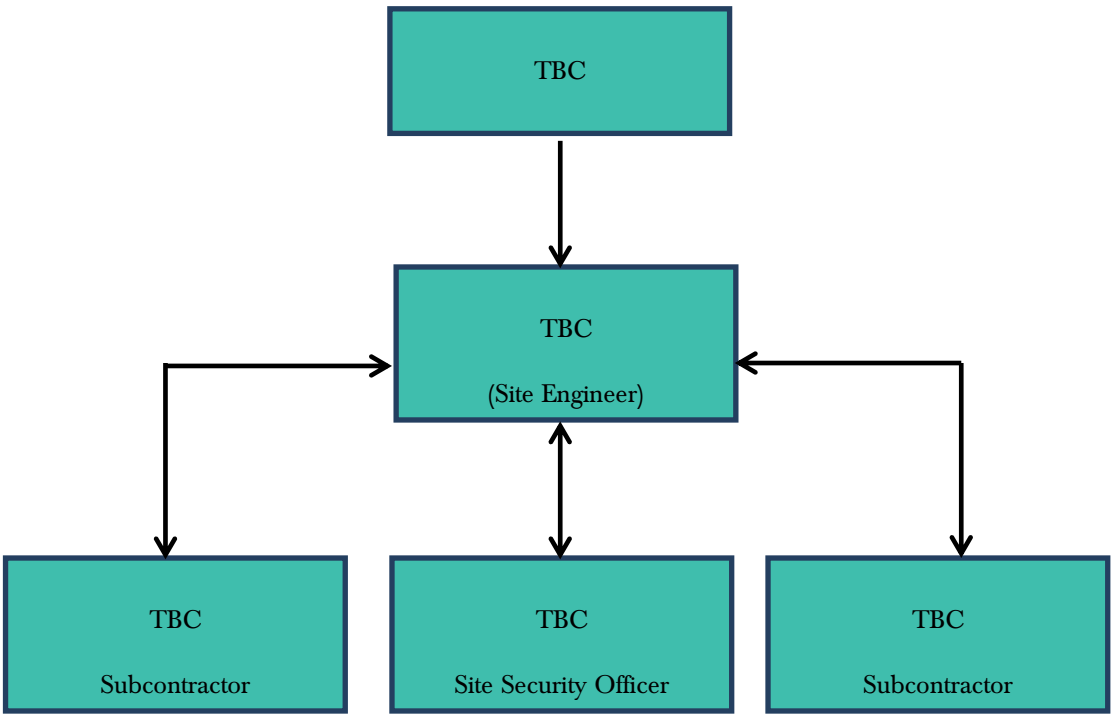

Figure 5-1 Emergency Response Procedure Chain of Command

5.1.2 Initial Steps

In order to establish the type and scale of potential emergencies that may occur, the following hazards have been identified as being potential situations that may require an emergency response in the event of an occurrence.

Table 5-1 Hazards associated with potential emergency situations

Hazard	Emergency Situation
Site Evacuation / Fire Drill	Injury to operative through exposure to fire
Siltation of watercourses, Fuel Management and Spill Control	Run-off to a watercourse or groundwater infiltration causing pollution

In the event of an emergency situation associated with, but not restricted to, the hazards outlined in Table 5-1 the Site Manager will carry out the following:

- Establish the scale of the emergency situation and identify the number of personnel, if any, have been injured or are at risk of injury;
- Where necessary, sound the emergency siren/fog horn that activates an emergency evacuation on the site;
- Make safe the area if possible and ensure that there no identifiable risk exists with regard to dealing with the situation e.g. if a machine has turned over, ensure that it is in a safe position so as not to endanger others before assisting the injured.
- Contact the required emergency services or delegate the task to someone if he is unable to do so. If delegating the task, ensure that they follow the procedures for contacting the emergency services as set out in Section 5.2;
- Take any further steps that are deemed necessary to make safe or contain the emergency incident e.g. cordon off an area where an incident associated with electrical issues has occurred;
- Contact any regulatory body or service provider as required e.g. ESB Networks the numbers for which as provided in Section 5.2.2;
- Contact the next of kin of any injured personnel where appropriate. The procedure for this is outlined in Section 5.2.3.

5.1.3 Spill Control Measures

Every effort will be made to prevent an environmental incident during the construction and operational phase of the proposed project. Oil/Fuel spillages are one of the main environmental risks that will exist on the proposed site which will require an emergency response procedure. The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. The following steps provide the procedure to be followed in the event of such an incident.

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill.
- If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats.
- If possible, clean up as much as possible using the spill control materials.

- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the Environmental Manager immediately giving information on the location, type and extent of the spill so that they can take appropriate action.
- The Environmental Manager will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.
- The Environmental Manager will notify the appropriate regulatory body such as Galway City Council, The Department of Communications, Climate Action and Environment and the Department of Housing, Planning and Local Government , if deemed necessary.

Environmental incidents are not limited to just fuel spillages. Therefore, any environmental incident must be investigated in accordance with the following steps.

- The Environmental Manager must be immediately notified.
- If necessary, the Environmental Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.
- The details of the incident will be recorded on an Environmental Incident Form which will provide information such as the cause, extent, actions and remedial measures used to follow the incident. The form will also include any recommendations made to avoid reoccurrence of the incident.
- If the incident has impacted on an ecologically sensitive receptor, such as a sensitive habitat, protected species or designated conservation site (pSPA or cSAC), the Environmental Manager will liaise with a Project Ecologist.
- A record of all environmental incidents will be kept on file by the Environmental Manager and the Main Contractor. These records will be made available to the relevant authorities such as Galway City Council, DCCAE and DHPLG if required.

The Environmental Manager will be responsible for any corrective actions required as a result of the incident e.g. an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Main Contractor as appropriate.

5.2 Contacting the Emergency Services

5.2.1 Emergency Communications Procedure

In the event of requiring the assistance of the emergency services the following steps should be taken:

Stay calm. It's important to take a deep breath and not get excited. Any situation that requires 999/112 is, by definition, an emergency. The dispatcher or call-taker knows that and will try to move things along quickly, but under control.

Know the location of the emergency and the number you are calling from. This may be asked and answered a couple of times but don't get frustrated. Even though many emergency call centres have enhanced capabilities meaning they are able to see your location on the computer screen they are still required to confirm the information. If for some reason you are disconnected, at least emergency crews will know where to go and how to call you back.

If you reach a recording, listen to what it says. If the recording says your call cannot be completed, hang up and try again. If the recording says all call takers are busy, WAIT. When the next call-taker or dispatcher is available to take the call, it will transfer you.

Let the call-taker guide the conversation. He or she is typing the information into a computer and may seem to be taking forever. There's a good chance, however, that emergency services are already being sent while you are still on the line.

Follow all directions. In some cases, the call-taker will give you directions. Listen carefully, follow each step exactly, and ask for clarification if you don't understand.

Keep your eyes open. You may be asked to describe victims, suspects, vehicles, or other parts of the scene.

Do not hang up the call until directed to do so by the call taker.

5.2.2 Contact Details

A list of emergency contacts is presented in Table 5-2. A copy of these contacts will be included in the Site Safety Manual and in the site offices and the various site welfare facilities.

Table 5-2 Emergency Contacts

Contact	Telephone no.
Emergency Services – Ambulance, Fire, Gardaí	999/112
Doctor – Knocknacarra Medical Centre	091 862 220
Hospital – University Hospital Galway	091 524 222
ESB Emergency Services	1850 372 999
Gas Networks Ireland	1850 20 50 50
Gardaí – Galway Garda Station	091 538 000
Health and Safety Coordinator - Health & Safety Services	TBC
Health and Safety Authority	1890 289 389
Project Supervisor Construction Stage (PSCS): TBC	TBC
Client – Galway City Council	091 536 819

5.2.3 Procedure and Personal Tracking

All operatives on site without any exception will have to undergo a site induction where they will be required to provide personal contact details which will include contact information for the next of kin.

In the event of a site operative becoming involved in an emergency situation where serious injury has occurred, and hospitalisation has taken place, it will be the responsibility of the Site Manager or next in command if unavailable to contact the next of kin to inform them of the situation that exists.

5.2.4 Induction Checklist

Table 5-3 provides a list of items highlighted in this ERP which must be included or obtained during the mandatory site induction of all personnel that will work on the site. This will be updated throughout the various stages of the project.

Table 5-3 Emergency Response Plan Items Applicable to the Site Induction process

ERP Items to be included in Site Induction	Status
All personnel will be made aware of the evacuation procedure during site induction.	
Due to the location of the site it may be necessary to liaise with and assist the emergency services on the ground in terms of locating the site. This may involve providing an escort from a designated meeting point that may be located more easily by the emergency services. This should form part of the site induction to make new personnel and sub-contractors aware of any such arrangement or requirement if applicable.	
All operatives on site without any exception will have undergo a site induction where they will be required to provide personal contact details which will include contact information for the next of kin.	

6. MITIGATION PROPOSALS

The Mitigation Measures which will be implemented are presented in this section of the CEMP. The CEMP will be finalised subsequent to any permission granted by An Bord Pleanála and will be updated prior to construction to include, inter alia, any additional requirements pursuant to relevant planning conditions imposed.

By presenting the mitigation proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the future phases of the project.

Table 6-1 Mitigation Measures

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
	Pre-Commencement Phase			
1	CEMP Section 2	All measures identified in this Construction Environmental Management Plan, which will be finalised subsequent to any permission granted and updated prior to construction will include all mitigation measures identified to be adhered to during the pre-commencement and construction phases of the proposed development.		
2	CEMP Section 4	Construction Manager engaged who will also fulfil the role of Environmental Manager (EM), and to monitor all site works and to ensure that methodologies and mitigation are followed throughout construction to avoid negatively impacting on the receiving environment.		
3	CEMP Section 2	› Hoarding will be erected around the boundaries of the development site. All works will be located within the confines of this fencing; › In terms of the construction traffic using the site entrance, appropriate signage will be provided along the footpath and site entrance to alert pedestrians to the traffic exiting/entering the site; › Access routes will be clearly marked / identified. Access during construction to any working areas will be restricted to land within the outlined works area.		
	Construction Phase			
		Construction Management		
4	CEMP Section 3	› No batching of wet-cement products will occur on site; › Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place. Where possible pre-cast elements for culverts and concrete works will be used;		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		› No washing out of any plant used in concrete transport or concreting operations will be allowed on-site; › Where concrete is delivered on site, only chute cleaning will be permitted, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed; › Use weather forecasting to plan dry days for pouring concrete; › Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.		
		Fuel and Oil Control		
5	CEMP Section 3	› Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling should occur at a controlled fuelling station; › On-site refuelling will take place by direct refuelling from the delivery truck or using a mobile double skinned fuel bowser. › Vehicles will never be left unattended during refuelling. Only dedicated trained and competent personnel will carry out refuelling operations and plant refuelling procedures shall be detailed in the contractor's method statements; › Fuels volumes stored on site should be minimised. Any fuel storage areas will be bunded appropriately for the volume of fuel stored. volume for the time period of the construction. The bunded area will be roofed to prevent the ingress of rainwater; › Fuels, lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment;		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		› Harmful materials shall be stored on site for use in connection with the construction works only. These materials shall be stored in a controlled manner. Where on site fuelling facilities are used, there shall be a bunded filling area using a double bunded steel tank at a minimum; › Any other diesel, fuel or hydraulic oils stored on site will be stored in bunded storage tanks- the bunded area will have a volume of at least 110% of the volume of the stored materials; › The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off site and will be towed around the site as required. It will be parked on a level, impermeable area in the construction compound when not in use and will only be present on site when heavy plant and machinery are in operation. › Only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations. › It is not anticipated that there will be any other means of fuel storage on site during construction; › The plant used should be regularly inspected for leaks and fitness for purpose; and, › Spill kits will be available to deal with and accidental spillage in and outside the refuelling area. Spill control measures are outlined in the section that follows.		
6	CEMP Section 3	› Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers; › If applicable, eliminate any sources of ignition in the immediate vicinity of the incident; › Contain the spill using the spill control materials including track mats, drip trays or other material as required. Do not spread or flush away the spill;		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		› If possible, cover or bund off any vulnerable areas where appropriate such as drains or watercourses; › If possible, clean up as much as possible using the spill control materials; › Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited; › Notify the applicant immediately giving information on the location, type and extent of the spill so that they can take appropriate action and further investigate the incident to ensure it has been contained adequately; › External consultants will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring; › The applicant will notify the appropriate regulatory body such as Galway City Council if deemed necessary.		
Surface Water Mitigation				
7	CEMP Section 3	› Drainage ditches within the works footprint will be culverted. Any such instream works will be carried out in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters; › Temporary instream crossings or temporary culverting will take place on the mapped watercourses on site before groundworks commence. Instream works will take place as per the method above; › Any requirement for temporary fills or stockpiles will be damped down or covered with polyethylene sheeting as required to avoid sediment release associated with heavy rainfall; › Prior to the commencement of groundworks silt fencing will be placed down-gradient of the construction areas where drains or drainage		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		pathways are present including along the existing that will be culverted. These will be embedded into the local soils to ensure all site water is captured and filtered; › As construction advances there may be a requirement to collect and treat surface water within the site. Any water encountered during excavations will be pumped from the excavations through silt bags before discharging from the bags and percolating naturally into the ground. The perimeter of the silt bags discharge area will be surrounded with silt fencing.		
8	NIS	› Run-off from the working site or any areas of exposed soil should be channelled and intercepted at regular intervals for discharge to silt-traps or lagoons with over-flows directed to land rather than to a watercourse; › Surface water run-off will be treated using silt trays/settlement ponds and temporary interceptors and traps will be installed until such time as permanent facilities are constructed. Straw bales or silt fences will be appropriately located near watercourses to help prevent untreated surface water run-off entering any watercourse. A buffer zone should remain between the silt trap and the watercourse with natural vegetation left intact.		
Air Quality and Dust Control				
9	CEMP Section 3	› Any site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions; › The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by Site Management for cleanliness, and cleaned as necessary; › Material handling systems and material storage areas will be designed and laid out to minimise exposure to wind; › Water misting or bowsers will operate on-site as required to mitigate dust in dry weather conditions;		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		› The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary; › All construction related traffic will have speed restrictions on un-surfaced roads to 15 kph; › Daily inspection of construction sites to examine dust measures and their effectiveness; › When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper.		
		Noise		
10	CEMP Section 3	› Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts; › Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All construction plant and equipment to be used on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations; › Plant with the potential of generating noise or vibration will be placed as far away from sensitive properties as permitted by site constraints. › Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers; › All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works; › Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers; › Machines, which are used intermittently, will be shut down during those periods when they are not in use; › Training will be provided by the Site Management to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation; and, › Local areas of the haul route will be condition monitored and maintained if necessary.		
		Traffic Management		
11	CEMP Section 3	› Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access locations; › Construction and delivery vehicles will be instructed to use only the approved and agreed means of access; and movement of construction vehicles will be restricted to these designated routes; › Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on HGVs carrying dust producing material; › Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds; › Parking of site vehicles will be managed and will not be permitted on public road, unless proposed within a designated area that is subject to traffic management measures and agreed with Galway City Council; › A road sweeper will be employed to clean the public roads of any residual debris that may be deposited on the public roads leading away from the construction works;		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		› On site wheel washing will be undertaken for construction vehicles to remove any debris prior to leaving the site, to remove any potential debris on the local roads if it is deemed necessary; › All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. All scheduled maintenance will not be carried out on the public highway; and › Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons; › Access to the site will be from the existing Ballymoneen Road. The site will not be open to members of the public. When vehicles are entering the site, or leaving the site, these movements will be supervised by road marshals. The construction site gates will be kept closed when not in use and monitored by security. Traffic cones and set-back signage will be put in place to warn and safely direct cyclists around obstructions. .		
Invasive Species Management				
12	CEMP Section 3	› An invasive species management plan will be prepared and the following measures adopted if an invasive species is encountered. Only those who have been inducted into biosecurity measures on-site may enter the contaminated zones within the works areas.		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
13	CEMP Section 3	› A risk assessment and method statement must be provided by the Contractor prior to commencing works; › Fences will be erected around areas of infestation, as confirmed by test pits, and warning signs shall be erected; › A designated wash-down area will be created, where power-washed material from machinery can be contained, collected and disposed of with other contaminated material. This area will contain a washable membrane or hard surface; › Stockpile areas will be chosen to minimise movement of contaminated soil; › Stockpiles will be marked and isolated. › Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery; Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore; › The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material; › Any material that is imported onto any site will be verified by a suitably qualified ecologist to be free from any invasive species listed on the 'Third Schedule' of Regulations 49 & 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I 477 of 2011). This will be carried out by searching for rhizomes and plant material; › Any soils or subsoils contaminated with invasive species will be sent for disposal to an authorized waste facility; › A suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species remedial works.		
14	CEMP Section 3	Plant and equipment which is operated within an area for the management of materials in contaminated areas will be decontaminated prior to relocating to a		

Mitigation Measure	Reference Location	Mitigation Measure	Audit Result	Action Required
		different works area. The decontamination procedures will take account of the following: › Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it; › Decontamination will only occur within designated wash-down areas; › Vehicles will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain rhizomes e.g. wheel treads and arches; › All run-off will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas.		
Waste Management				
15	CEMP Section 3	› All waste will be collected in skips and the site will be kept tidy and free of debris at all times; › Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling; › All construction waste materials will be stored within the confines of the site, prior to removal from the site to a licensed waste facility; › A self-contained port-a-loo with an integrated waste holding tank will be used at the site compounds, maintained by the providing contractor, and removed from site on completion of the construction works; › No wastewater will be discharged on-site during either the construction or operational phase.		

7. PROGRAMME OF WORKS

7.1 Construction Programme

Table 7-1 Phasing Scope of Works

Phase No.	Description	Scope of works
Phase 1	Site Setup	This occurs from months 1 to 3 and includes laying the matting or gravel for the temporary construction compound, the construction compound setup, laying the crushed gravel for the access tracks, and machinery mobilisation. Works will also include sewer construction and divesion of the existing
Phase 2	Foundations	This occurs from months 4 -5. It includes digging laying foundations and other preparatory works.
Phase 3	Building Structures	This occurs from months 6 to 8. It includes building the main structures within the site.
Phase 4	Internal Fit Out	This occurs from months 9 to 14. It includes the fitting out of the buildings and civils connections.
Phase 5	Close Out	This occurs in the last months of construction and includes laying tarmacadam road and landscaping followed by machinery demobilisation and construction compound reinstatement.

8. COMPLIANCE AND REVIEW

8.1 Site Inspections and Environmental Audits

Routine inspections of activities will be carried out on a daily and weekly basis by the Site Environmental Manager/Construction Manager as appointed by the applicant to ensure all controls to prevent environmental impact, relevant to the construction activities taking place at the time, are in place.

Environmental inspections will ensure that the works are undertaken in compliance with this CEMP. Environmental site inspections will be carried out by suitably trained staff.

8.2 Environmental Compliance

The following definitions shall apply in relation to the classification of Environmental Occurrences during the infilling works:

Environmental Near Miss: An occurrence which if not controlled or due to its nature could lead to an Environmental Incident.

Environmental Incident: Any occurrence which has potential, due to its scale and nature, to migrate from source and have an environmental impact beyond the site boundary.

Environmental Non-Compliance: Non-fulfilment of a requirement and includes any deviations from established procedures, programs and other arrangements related to the CEMP

8.3 Corrective Action Procedure

A corrective action is implemented to rectify an environmental issue on-site. Corrective actions will be implemented by the Construction Manager, as advised by the Site Environmental manager. Corrective actions may be required as a result of the following;

- Environmental Audits;
- Environmental Inspections and Reviews;
- Environmental Incidents; and,
- Environmental Complaints.

A Corrective Action Notice will be used to communicate the details of the action required to the main contractor. A Corrective Action Notice is a form that describes the cause and effect of an environmental problem on site and the recommended corrective action that is required. The Corrective Action Notice, when completed, will include details of close out and follow up actions.

If an environmental problem occurs on site that requires immediate attention direct communications between the Construction Manager and the Site Environmental manager will be conducted. This in turn will be passed down to the site staff involved. A Corrective Action Notice will be completed at a later date.