Phase 1 Corrib Causeway Dyke Road Development

Outline Construction & Environmental Management Plan

Galway City Council

Project number: 60710277
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Quality information

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Revision	Revision date	Details	Authorized	Name	Position
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1. Introduction

AECOM Ireland Limited (AECOM) has prepared an Outline Construction & Environmental Management Plan (OCEMP) for the development of Phase 1 lands at Dyke Road, Terryland, Galway City. The Dyke Road site is located on the edge of Galway City Centre, Galway.

This Outline Construction & Environmental Management Plan (OCEMP) has been prepared to accompany the planning application for a new residential development on the site.

Figure 1-1: Project Phasing, Stage 1 Development Framework, MOLA Architecture 2023

The Dyke Road site forms part of a strategic brownfield landbank located on the edge of Galway City Centre which has been identified for comprehensive redevelopment by the Galway Development Plan 2023-2029. The proposed development of the site will be subdivided into three distinct phases:

- Phase 1 lands (c. 1.144ha) are designated for residential development.
- Phase 2 is anticipated to comprise of commercial / office / civic development.
- Phase 3 would subsequently comprise the relocation of the Black Box Theatre and development of this final portion of the site for residential use.

1.1 Background

This Outline CEMP sets out the procedures, standards, work practices and management responsibilities to address potential environmental effects that may arise from the construction and demolition works proposed as part of the residential development at Dyke Road, Galway (hereafter referred to as the 'Project'). The primary aim is to reduce any adverse effects from construction on the environment.

This Outline CEMP will form part of the Contract Documents for the construction stage. The Outline CEMP remains at all times a live document, subject to amendment including the revision and addition of content throughout the works. In this context, the values and information presented herein is subject to change and refinement through the selection of the contractor and the delivery of the Project.

The Outline CEMP will be updated into a Contractors CEMP by the appointed Contractor (hereafter referred to as the Contractor). The Contractors CEMP will be prepared by the Contractor, approved by the Client, and agreed with Galway City Council prior to the commencement of works.

The Contractors CEMP will be treated as a live document throughout the lifecycle of the project, requiring regular review and update, as necessary.

At the end of the construction phase, the Contractor will prepare a Handover Environmental Management Plan (HEMP) that will contain essential environmental information needed by the bodies responsible for the future maintenance and operation of the Proposed Development.

1.2 Objectives

The objectives of a CEMP are to:

- Act as a continuous link and reference document for environmental issues between the design, construction, testing and commissioning stages of the project.
- Demonstrate how construction activities and supporting design will properly integrate the requirements of environmental legislation, planning consent conditions, policy, good practice, and those of the environmental regulatory authorities and third parties.
- Record environmental risks and identify how they will be managed during the construction period.
- Record the objectives, commitments, and mitigation measures to be implemented together with programme and date of achievement.
- Identify key staff structures and responsibilities associated with the delivery of the Project, and environmental control and communication and training requirements, as necessary.
- Describe the Contractor's proposals for ensuring that the requirements of the environmental design are achieved, or are in the process of being achieved, during the Contract Period.
- Act as a vehicle for transferring key environmental information at handover to the body responsible for operational management. This will include details of the asset, short and long-term management requirements, and any monitoring or other environmental commitments.

Provide a review, monitoring, and audit mechanism to determine effectiveness of, and compliance with, environmental control measures and how any necessary corrective action will take place.

2. Project Description

2.1 Location

The site, as shown in **Figure 2-1**, is located at Dyke Road Car Park on the edge of Galway City Centre, Galway Phase 1 lands are currently being used as a public car park. The existing site covers an area of approximately 1.144 ha. The total site area is outlined in Figure 2-2, where the phase 1 area is highlighted in yellow.

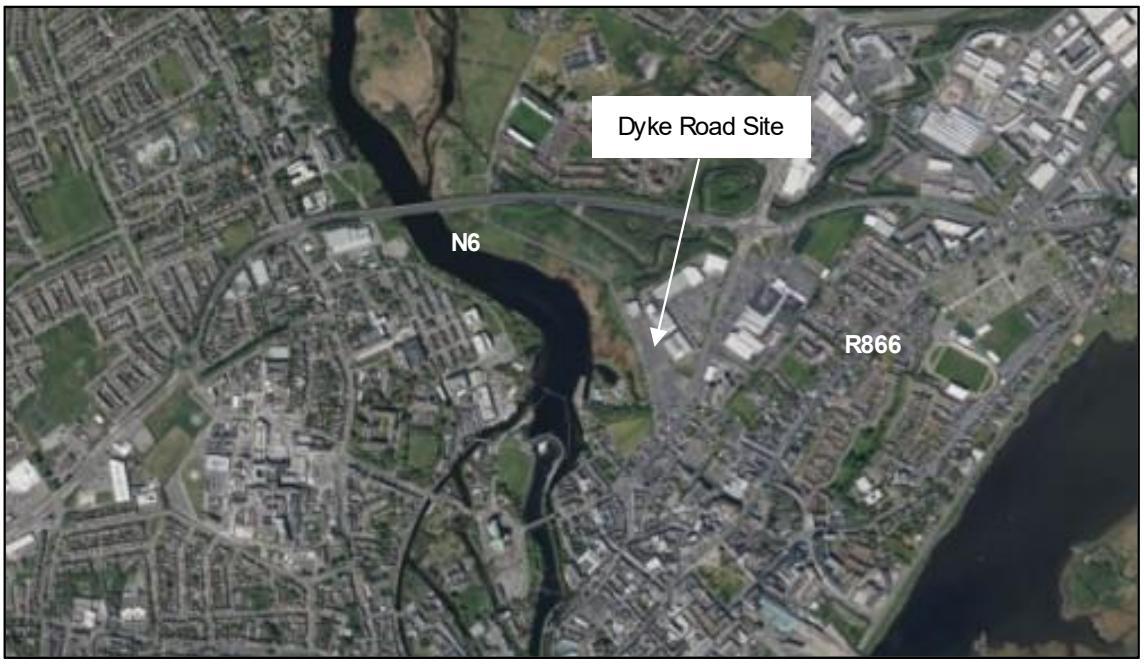

Figure 2-1: Site Location

Figure 2-2: Site Location – Phase 1, Tóchar na Coiribe Vision, LDA & MOLA Architecture 2023

2.2 Development Description

The proposed development will consist of the construction of a new residential development of 219 no. apartment units and a childcare facility (approx. 241 sq m) in the form of 1 no. new residential block (5 - 9 storeys over lower ground floor level) with associated car parking, bicycle parking, public and communal open spaces, and all ancillary works on a site area of 1.144 ha.

The proposed development will provide for:

a) 219 no. residential apartment units (109 no. 1-bedroom units, 100 no. 2-bedroom units and 10 no. 3-bedroom units) each with an associated private open space area in the form of a balcony/terrace.

b) A raised pedestrian boardwalk along the western elevation of the proposed building.

c) Open Space (approx. 2,778 sq m) is proposed in the form of (a) public open space (approx. 1,183 sq m) to the west of the proposed building fronting on to Dyke Road accommodating outdoor seating, planting, a sunken garden and pedestrian pathways and connections; and (b) communal open space (approx. 1,605 sq m) to the east of the proposed building in the form of a courtyard including outdoor seating, planting, a children's play area and outdoor sports equipment.

d) A childcare facility (approx. 241 sq m) at ground floor level with dedicated external play area (approx. 61 sqm) at surface level.

e) A total of 33 no. new car parking spaces at surface level to serve the proposed residential development (including 2 no. accessible spaces). In addition, 2 no. set down / drop off spaces are proposed to serve the childcare facility.

f) A total of 465 no. bicycle parking spaces to include 330 no. standard residential spaces, 100 no. visitor spaces, 25 no. cargo bicycle spaces and 10 no. bicycle parking spaces dedicated for the childcare facility staff, all at surface / lower ground floor level.

g) Vehicular access to serve the development is proposed via Dyke Road at 2 no. new locations along the western site boundary (to the north west and south west of the main development site). Pedestrian and Cyclist access is also proposed throughout the site via Dyke Road and a new pedestrian crossing is also delivered at Dyke Road. The proposed development will extinguish the existing pedestrian connection between Galway Retail Park and the subject site as part of wider proposals for local improvements to permeability.

h) The removal of 389 no. existing car parking spaces (311 no. from Car Park 1 and 78 no. from Car Park 2) is proposed to provide for the new development. An overall total of 165 no. existing car parking spaces will be maintained in Car Park 2.

i) The extinguishment of the main existing vehicular entrance serving Car Park 1 and Car Park 2 at Dyke Road with provision made for a new vehicular access point (to the south of the main development site) to facilitate continued access to existing Car Park 2 and the remaining car parking spaces (165 no.).

j) The removal of existing bring bank facilities including 2 no. clothing banks and 8 no. bottle banks from Dyke Road.

k) 2 no. telecommunications lattice towers (overall height 6.45 m and 7.67 m) affixed to the rooftop supporting 9 no. 2m 2G/3G/4G antennas; 9 no. 0.8m 5G antennas; 6 no. 0.3m microwave transmission links; together with all associated telecommunications equipment and cabinets. The proposed overall building height including the telecommunications towers is approx. 38.18 m (+43.18 AOD).

The development will also provide for all associated site development works, infrastructure, excavation and clearance works including decommissioning the existing Black Box Theatre waste water pumping station, provision for a new pumping station complete with below ground emergency storage, all boundary treatment/retaining walls, public lighting, internal roads and pathways, ESB substations, switch rooms, water tank rooms, cleaner store and WC, meter

rooms, facilities management office, parcel store, comms rooms, plant room, generator room / associated plant space, bin storage, bicycle stores, hard and soft landscaping, play equipment, below ground attenuation tanks, nature based SUDs features, green roofs, roof plant, new and replacement site services and connections for foul drainage, surface water drainage and water supply.

This planning application is accompanied by an Environmental Impact Assessment Report and Natura Impact Statement.

2.3 Construction Programme

It is anticipated that Construction of the Proposed Development will commence in Q1 of 2027, and finish Q1 2028. The construction period will take approximately 2 years.

3. Survey and Monitoring Requirements

It will be the Contractor's responsibility to ensure a hierarchy of environmental impact avoidance, reduction and mitigation is applied and adhered to onsite throughout the construction phase.

3.1 Surveys

The Contractor will ensure all required pre-construction surveys are carried out prior to commencement of works and that the Contractors CEMP is updated with any mitigation or monitoring measure identified within the survey report. The list of surveys will be agreed with the project Ecological Clerk of Works (ECoW) and GCC.

Should mitigation measures be required (subject to survey results) the site ECoW and the Contractor will prepare a methodology for inclusion within the appendices of the Contractors CEMP outlining all mitigation measures required and how they will be implemented and monitored on site. It would be the responsibility of the ECoW and the Contractor to ensure all licences required have been obtained prior to the commencement of works (for example any licences required from the NPWS related to protected species etc.).

It should be noted that all Irish bats are protected under national and EU legislation and bats and their roosts are legally protected. It is an offence to disturb or interfere with bats or their roosts without a licence.

The nesting and breeding season for birds is from 1 March to 31 August. It is illegal to disturb nesting birds and to cause harm to or disturb eggs and/or nests during this period.

3.2 Monitoring

It will be the responsibility of the Contractor and the ECoW to provide and implement a monitoring schedule for dust, noise and vibration, and water quality monitoring throughout the construction phase. The results of which will be available upon request and will be reported to the client on a monthly basis. Any exceedances will be reported to the client upon occurrence along with details of what caused the exceedance and how it was rectified. The Contractor will also provide a location plan of monitoring points for dust, noise and vibration, and water quality and will include a monitoring methodology as an appendix to the Contractors CEMP.

The frequency of monitoring and the monitoring parameters (such as noise limits) will be in line with best practice and guidance and will be agreed with Galway City Council prior to the commencements of works.

4. Site Logistics

The Main Contractor will be responsible for the overall site management during the proposed works. The Main Contractor will be required to submit a site layout plan that will indicate the site perimeter, the proposed details of site hoarding, site security and gate system along with the proposed location of the site compound, storage areas, etc.

This section sets out a number of areas which the Main Contractor will be required to address during the works.

This section is to be updated by the Contractor prior to the commencement of works to include further information such as information on the temporary water and electricity supply (if applicable).

4.1 Site Security and Hoarding

This section is to be updated by the Contractor prior to the commencement of works. The Main Contractor will be responsible for site security and will ensure that the site and site compound are adequately secured at all times.

All personnel will be required to sign-in and sign-out at the Main Contractor's site office. It will be the responsibility of the Main Contractor to ensure that a full, intact, and impenetrable site cordon is maintained at all times, and that all people entering and exiting the site do so with expressed and recorded granted permission.

The main contractor will be required to apply adequate security measures on this Project to exclude unauthorised persons from the site, including members of the public.

Site hoarding and barriers will prevent unauthorised access to each works area. A minimum 2.4 m high plywood painted timber hoarding is to be provided around working areas. Heras type fencing will be used on short term site boundaries where appropriate to suit the works.

The site compounds will each be fenced to deter unauthorised access. The contractor must regularly inspect and maintain the condition of the hoarding throughout the duration of the contract.

Controlled access points to the site, in the form of gates or doors/turnstiles, will be kept locked at any time that these areas are not monitored (e.g., outside working hours). During working hours, a gateman will control traffic movements and deliveries at any active site access to ensure safe access and egress to & from site onto the public roads. All personnel working on site must have a valid Safe Pass card and be inducted by the Main Contractor with regard to site specific information.

The external hoarding and walkways must be maintained in good condition during the construction period. The external hoardings and walkways must not obstruct any drainage, surface water channels or traffic signals, signs, or lights.

4.2 Signage

The Main Contractor will be responsible for the erection of all appropriate site, safety, road & traffic signage including:

- General warnings, keep out & safety signage to be displayed externally on-site boundary,
- General site warnings & safety signage to be displayed within the site boundary,
- Identification of vehicle & pedestrian access points,
- Location & direction of site parking, site offices, first aid boxes & equipment, and
- Construction site & traffic warning signage on public roads approaching the site entrance.

All signage used will meet the requirements of the Safety, Health & Welfare at Work (General Applications) Regulations 2007 and Chapter 8 Traffic Signs Manual.

4.3 Site Safety

This section is to be updated by the Contractor prior to the commencement of works.

The main contractor will be required to apply safety measures and provide safety awareness training to ensure the safe construction, access, and egress of the site. All construction works will be carried out under appropriate supervision. Works will be carried out by experienced contractors using appropriate and established safe methods of construction. All requirements arising from statutory obligations including the Safety, Health and Welfare at Work Act 2005 (as amended) and associated regulations will be met in full.

The Contractor will ensure the health, safety and welfare of all personnel and members of the public is protected and adequate safety measures are in place.

4.4 Site Lighting

During the winter months, site lighting may be necessary so that construction works can be carried out in a safe manner. Any use of site lighting will be designed to prevent any nuisance to neighbouring residents or road traffic and be used primarily for reasons of health and safety or security.

The Main Contractor will ensure that:

- Nearby resident’s welfare is not adversely affected by light pollution from the site,

- An energy efficient lighting approach is adopted,
- Lighting does not pose a hazard, and
- Plant which is not in use is switched off and that lighting is used only when necessary (such as through the use of timers).

Site lighting will be located and aligned so as not to intrude into neighbouring or residential properties, on sensitive areas, or constitute a road hazard.

4.5 Site Set-up

A construction site compound will be utilised throughout the duration of the proposed works. The Main Contractor will be required to submit a site layout plan which will detail the proposed location of the site compound.

The compound will consist of:

- Site office / Cabins / Main Contractor personnel & welfare facilities,
- Car parking,
- Toilets,
- Canteen area, and
- Laydown & contractor storage / stockpile / plant & fuel depot area.

4.6 Working Hours

For the duration of the proposed infrastructure works, the maximum working hours will be 07:00 to 19:00 Monday to Friday (excluding bank holidays) and 08:00 to 13:00 Saturdays, subject to the restrictions imposed by the local authority.

Works will not be permitted on Sundays and Public Holidays.

Subject to the agreement of the local authority, out of hours working may be required for water main connections, foul drainage connections and utility connections. Where this is necessary, prior approval of Galway City Council will be sought.

In order to mitigate any impact of construction activities, the following measures are proposed:

- Coordination of deliveries to site within working hours,
- Scheduling of noisier activities early in the working day,
- Noise and vibration mitigation measures as per Section 6.8 of this plan,
- The delivery of materials to the site during the construction phase will be organised so that deliveries are minimised and do not cause traffic hazard, and
- Deliveries will not be permitted at peak times of traffic as follows;
  - 08:00 to 09:00,
  - 15:00 to 16:00,
  - 16:00 to 17:00.

Any works proposed outside of these periods will be strictly by agreement with the Local Authority in advance.

4.7 Health and Safety

All construction works will be carried out under appropriate supervision. Works will be carried out by experienced contractors using appropriate and established safe methods of construction. All requirements arising from statutory obligations including the Safety, Health and Welfare at Work Act and associated regulations will be met in full.

All site works to be completed as per the Safety, Health, and Welfare at Work (Construction) Regulations 2013 (as amended).

5. Traffic Management

The Contractor is to inform and educate all regular suppliers and all sub-contractors and delivery drivers of the basic protocols. All deliveries will be controlled at the identified compound location. The designated storage area will be identified prior to taking delivery of the materials and the driver will be directed to the compound. Site access, and the delivery of construction materials, will be carefully planned and managed throughout the construction works. A Traffic Management Plan (TMP) will be produced by the Contractor prior to construction to minimise congestion.

5.1 Outline Construction Traffic Management Plan

An Outline Construction Traffic Management Plan has been prepared to accompany this document and is included in Chapter 13 of the Traffic Impact Assessment prepared by PUNCH Consulting Engineers.

6. Waste Management

A Resource and Waste Management Plan has been prepared as a standalone document, document reference 60710277-ACM-XX-XX-RP-CE-00-0006 and submitted alongside this Outline CEMP.

7. Environmental Management

The Contractor will be required to be accredited with ISO14001 Environmental Management Systems. The Contractor will be required to mitigate the impact of the construction works on the environment.

7.1 Overview

The CEMP will be prepared by the Contractor and submitted to Galway City Council for approval prior to commencing construction works. It will be prepared in sufficient detail to describe the framework of the Contractor's proposed management, control, and mitigation strategy for each environmental aspect with the consideration of relevant adjacent developments. The CEMP will include, where required, specific Method Statements for specific works (e.g., working in or near watercourses) and these will be included in Appendix B.

The CEMP will be developed/updated as necessary during the course of the design and construction phases and will be reviewed with the Client every 6 months as a minimum. It is the Contractors responsibility to ensure all the relevant legislation and guidance is adhered to during construction.

7.2 Environmental Aspects and Impacts

The Contractor will prepare a project specific Project Environmental Risk Assessment (ERA), which will be included in Appendix C. The Contractor will also include the following:

- Environmental guidelines on how to prepare an ERA;
- The guidelines and procedure on how to prepare/undertake an ERA and to assist in the identification of environmental aspects of the project activities, products, and services;
- Monitoring and checklists will be implemented to manage the environment; and
- Environmentally sensitive area(s) and control measures to be implemented on site which will be included as an appendix to the CEMP.

7.3 Roles & Responsibilities

The Contractor will employ a suitably experienced and qualified Construction Environmental Management Plan Co-ordinator (CEMPC) to undertake co-ordination of monitoring of the works' impacts and implementation of the Contractor's proposals, in respect of all environmental requirements.

A CEMPC will be present on-site for the duration of the project. The CEMPC will be the point of contact for dealing with environmental issues for the Contractor's employees, Subcontractors, relevant authorities/environmental bodies, and members of the public. The CEMPC will also be responsible for controlling the construction impacts arising from the activities of the Contractor and Subcontractors in accordance with the CEMP.

The CEMPC will prepare, implement, manage, review, and revise the CEMP with the sole purpose of ensuring that the environment is safeguarded at all times from anticipated or unexpected adverse impacts during construction.

Within the Contractor's team, the CEMPC will have the authority to ensure that the CEMP is effectively implemented. The CEMPC must notify Galway City Council of any transgressions in respect of the CEMP so that necessary sanctions can be imposed.

In general, the duties of the CEMPC will include the following:

- Implementation of the CEMP procedures;
- Routine environmental monitoring, recording, and reporting;
- Maintaining and auditing the CEMP and documents that underpin it;
- Environmental training including daily toolbox talks to site staff and design staff;
- Liaison with statutory authorities as required;
- Assist in liaison with the relevant authorities/environmental bodies and local community; and
- Any other activities that may be necessary in order to protect wildlife and the environment during the works.

In addition, other environmental specialists as listed in **Table 7-1** must be available to provide advice on the CEMP during construction. The CEMP will typically place environmental responsibilities on the key roles within the project as set out below.

Table 7-1: Indicative Key Contractor Team Roles and Responsibilities (to be updated by the Contractor)

Role	Responsibilities
Contractor's Project Director	• Assign specific environmental duties to competent members of the Contractor's Team. • Identify the environmental training needs of personnel under their control and arrange appropriate training programmes and ensure records are being maintained. • Ensure that significant environmental aspects identified for the Project are managed. • Promote the continual improvement of environmental performance.

Role	Responsibilities
CEMP Coordinator/Environment Manager	• Develop, maintain, and audit the CEMP (and supporting documents/plans) to ensure all aspects, impacts and statutory requirements etc. are reflected in the CEMP. • Develop and implement a programme of regular project environmental inspections, monitoring, recording, and reporting in accordance with procedures set out in the CEMP. • Ensure that the works are constructed in line with the CEMP. • Liaise with statutory authorities. • Attend regular construction meetings to ensure environmental issues are discussed and addressed by the Contractor's Team. • Liaise with relevant authorities/environmental bodies and the local community as required. • Comply with duties under relevant legislation and company procedures in relation to environmental incident investigation and reporting. • Provide support and training to the workforce with regard to understanding environmental aspects, impacts, regulatory requirements, best practice, constraints, and methods of working. • Appoint environmental specialists as required. • Ensure identified environmental specialists are in attendance on-site as required by the CEMP. • Review environmental non-conformance reports to identify any underlying issues or patterns to identify suitable ameliorative measures.
Contractor's Project Manager	• Ensure that the CEMP is produced, maintained, implemented, and distributed to all relevant parties. • Provide an on-call 24hr resource as a first point of contact for environmental issues/incidents. • Monitor the completion of corrective actions by the Site Manager and act as required to expedite completion. • Provide regular reports to the Client and Galway City Council (where required) and any other relevant statutory bodies on environmental performance, including details of any identified incidents or non-conformances and corrective actions. • Ensure that all personnel for whom they are responsible are aware of the CEMP and implement the relevant requirements. • Evaluate the competence of all subcontractors and suppliers and ensure that they are made aware of and comply with the CEMP and associated procedures. • Establish a consultation and communication system with all relevant stakeholders and interested parties associated with the Project, including employees, partners, sub-contractors, designers and third parties, etc., where relevant.
Site Manager	• Ensure that all personnel undergo suitable and sufficient environmental induction before starting work on the project, and periodic refresher environmental awareness training throughout the construction phase. • Ensure staff attend the appropriate environmental courses that are organised by the CEMPC. Ensure the CEMPC is maintaining records of training delivered to site staff. • Monitor the performance of personnel and activities under their control and ensure arrangements are in place so that all personnel can work in a manner which minimises risks to them and to the environment. • Undertake a programme of regular environmental inspections in liaison with the CEMPC. • Complete any corrective actions identified by the CEMPC) and provide status reports as required to the Client and Galway City Council and any other relevant statutory bodies. • Assist and support the CEMPC and statutory bodies in the investigation of any incidents. • Notify the CEMPC of all environmental issues or incidents arising over the course of operations.

Role	Responsibilities
Environmental Specialists (i.e. Ecological Clerk of Works (ECoW) and CEMPC))	• Attend site as required to monitor the protection of asset in accordance with the requirements of relevant legislation, planning conditions, the construction contract, and the CEMP – ECoW and CEMPC. • Identify potential risks to wildlife and develop suitable control measures – CEMPC. • Provide status reports and updates to the CEMPC in the completion of their activities– ECoW. • Provide advice about ecological and environmental and issues during the construction of a development including advice on protected species, pollution, surface water management, material management, air quality and noise – ECoW and CEMPC. • The ECoW and CEMPC roles can be carried out by the same person once they are adequately qualified.

7.4 Environmental Training

Personnel and sub-contractors working on environmentally sensitive sites will be provided with environmental training to achieve a level of awareness and competence appropriate to their assigned activities. Targeted environmental awareness training may be provided to individuals or groups of workers with a specific authority or responsibility for environmental management or those undertaking an activity with a high risk of environmental impact. Environmental Training will be recorded, and the records will be available for inspection upon request. **Table 7-2** summarises the environmental training that will likely be required to be undertaken as a minimum as part of the Project.

Table 7-2: Summary of Training Requirements

Training	Target	Frequency	Record
Site Induction	All Site Personnel	Prior to working on-site	Induction record form
Daily Pre-working Briefings	All Site Personnel	Prior to commencing daily works	Daily report
Toolbox Talk	Personnel relevant to the topic	As required	Toolbox Record Form
Project Management meeting	Project Managers, Engineers and Site Supervisor	Monthly	Meeting Minutes Record
Environmental Training	Personnel relevant to the activity	Quarterly or more frequently as required	Training Attendance Form
Environmental Bulletin	All company and project personnel	As required	Environmental Bulletin Form

7.4.1 Site Inductions

A site induction will be attended by all personnel working on the project. Such personnel attending will also complete a site induction record acknowledging attendance and confirming that they understand and agree to comply with the requirements of the site. Furthermore, certificates of competency, licences and other qualifications as deemed necessary by the Contractor will be copied and documented. The environmental induction will run concurrently with the site induction and safety awareness training.

The induction will include the following information as a minimum:

- Overview of the goals and objectives of the environmental policy and CEMP,
- Awareness in relation to the environmental risk associated with the project and methods of avoiding environmental risks as identified within the CEMP, the planning conditions, and any other relevant plans, documents, or reports,
- Awareness of roles and individual responsibilities and environmental constraints to specific jobs,
- Location of any sensitive receptors on or adjacent to the Site,
- Location of habitats and species to be protected during construction, how activities may affect them and methods necessary to avoid impacts, controls to minimise noise and the importance of pollution prevention measures to protect any nearby sensitive receptors,
- Environmental Emergency Response Procedures, the storage locations of items such as spill kits on site and key contact persons for environmental incident reporting.

7.4.2 Daily Pre-Work Briefings, Toolbox Talks and Training

Daily briefings are required to be carried out at the commencement of each shift by all supervisors to ensure environmental issues specific to the work being performed are being addressed. All personnel involved with site works must be briefed and signed onto the daily briefing form prior to commencing activities.

Toolbox talks may be conducted prior to the start of specific work elements where there is a substantial environmental risk or when required to reinforce ongoing environmental issues. Any toolbox talk training conducted will ensure that relevant information is communicated to the workforce and that feedback can be provided on issues of interest or concern.

7.5 Environmental Emergency Response Procedures

This section is to be updated by the Contractor to include a site-specific environmental emergency response procedure/emergency and preparedness plan for potential environmental issues that may occur on site.

This will cover topics such as pollution prevention, environmental incident actions and procedures, reporting requirements, key contact persons, site evacuation procedures, types of response equipment (e.g., spill kits) and their correct use and disposal.

7.6 Consents and Licences

All statutory consents and licences required to commence on-site construction activities will be obtained ahead of works commencing, allowing for the appropriate notice period. It will be the responsibility of the Contractor to ensure all consents and licences required are in place prior to the start of construction.

These will include, but are not limited to:

- Site notices;

- Construction commencement notices;
- Licence to connect to existing utilities (inc. water) and mains sewers, where required;
- Abstraction and/or discharge licenses; and
- Road opening/closure licences.

These may also include licences from the NPWS such as Disturbance/Derogation Licences if required.

7.7 Monitoring and Inspections

Environmental focused monitoring and inspection activities will be carried out throughout the lifetime of the project. The frequency of these monitoring and inspection activities will be agreed in advance of construction with the Client and would be in line with planning conditions. Additional monitoring and inspection will take place outside of the agreed frequency where an incident occurs or where activities that can have a significant environmental impact are occurring.

Regular site inspections will be undertaken by the Contractor's CEMPC to monitor compliance with the CEMP and record inspection results. It is anticipated that a daily visual check and a detailed weekly check will be carried out and these records will be available to Client upon request.

During the construction phase the following monitoring measures will be considered:

- Regular inspection of surface water run-off and sediments controls;
- Regular inspection of construction/mitigation measures will be undertaken e.g., concrete pouring, refuelling etc.;
- Dust Monitoring and monitoring of dust control measures;
- Noise and vibration monitoring and monitoring of noise and vibration control measures;
- Surface water monitoring (if required); and
- Daily monitoring of general housekeeping on Site.

7.8 Environmental Auditing

Planned and documented audits (including waste and environmental audits) aimed at evaluating the conformance of the project will be carried out throughout the construction phase of the project. The frequency of the audits will be agreed in advance with the Client. As a minimum this would include;

- Weekly site walkover with results presented at the Contractors' regular meetings with the Client,
- Dedicated waste audits will be carried out at a frequency agreed in advance with the Client and Galway City Council. All waste types and records would be available for review upon request. (Also see the standalone outline resource and waste management plan produced for the project), and

- The CEMP will be reviewed and audited every 6 months at a minimum and updated in line with current guidance and legislation.

7.9 Site Housekeeping

Good housekeeping is an important part of good environmental practice and helps to maintain a more efficient and safer site. The site should be tidy, secure, and have clear access routes that are well signposted. The appearance of a tidy, well-managed site can reduce the likelihood of theft, vandalism, complaints and/or specific hazards that could affect the safe operation of the other businesses in the area, such as bird hazards and wind-blown litter.

As outlined in the fourth edition of CIRIA's 'Environmental good practice on site guide' (C741), when considering good housekeeping, the following steps can be implemented:

- Adequately plan the site with designated areas for materials and waste storage,
- Segregate and label different types of waste as it is produced and arrange frequent removal, in line with the requirements of the Resource and Waste Management Plan,
- Keep the site tidy and clean,
- Ensure that no wind-blown litter or debris leaves the site, use covered skips to prevent wind-blown litter,
- Keep hoarding tidy – repair and repaint when necessary, removing any fly posting or graffiti,
- Frequently brush-clean wheel washing facilities (where applicable) and keep haul routes clean from site derived materials,
- Keep roads free from mud by using a road sweeper, and
- Ensure the Site is secure.

7.10 Complaints

A Complaints Register for internal communication and for receiving, documenting, and responding to environmental complaints from external parties will be established and will be maintained.

The following information must be taken as a minimum when a complaint is received (telephone calls and letters of complaint etc.):

- Date and time of the complaint;
- Name of complainant (if provided);
- Nature of complaint; and
- Details of any remediation actions taken.

All complaints received from external sources and incidents must be reported to the CEMP Coordinator/Environment Manager and the appropriate site personnel (e.g., Senior Management). Complaints must be dealt with in a timely manner and reported to the Client.

8. Environmental Considerations and Mitigation

8.1 Groundworks

This section will be updated by the Contractor once further information becomes available.

A ground investigation has been carried out for the project site and will be made available to the Contractor upon appointment. The ground investigation report is included in Appendix E of the Infrastructure Report which accompanies the planning application.

During the site preparation and construction phase, all excavations and exposed sub-soils in open cuts will be blinded and protected with clean broken stone as soon as possible after exposing the subsoil in order to prevent erosion.

The macadam layers & road buildup will be stripped from the entire site. The site will be then be profiled to formation level.

Once the site is at the required formation level, a ground improvement technique known as “rigid concrete inclusions” will be implemented to the site outside of the building footprint. Rigid concrete inclusion is a ground improvement method using high deformation modulus columns constructed through compressible soils to reduce settlement and increase bearing capacity. The precise design proposal will be confirmed by the Contractor.

Soil stripping, earthworks and stockpiling on site will be carried out during the works. Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated through the implementation of an appropriate earthworks handling protocol during construction. It is anticipated that any stockpiles will be formed within the boundary of the excavation and there will be no direct link or pathway from this area to any surface water body. It is anticipated that only local/low level of stockpiling will occur as the bulk of the material will be excavated either straight into trucks for transport off site or will be reused in other areas of the site as fill.

Excavated material to be disposed off-site will go to a licensed facility. Heavy goods vehicle movements will be kept to a minimum.

Once the ground improvement works are completed, the building foundations will be installed. The building foundations will include 640mm diameter ODEX piles with reinforced insitu concrete ground beams between pile caps and suspended slab.

8.2 Control of Concrete and Lime

Mitigation and monitoring measures related to the use of concrete and lime are as follows:

- Ready-mixed concrete will be brought to the site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated water (for example storm water) to the underlying subsoil and groundwater,
- The pouring of concrete will take place within a designated area protected (for example by a geosynthetic material) to prevent concrete runoff into the soil/groundwater media,

- Any use of concrete in proximity to drainage (or watercourses) will be carefully controlled to avoid spillage. No on-site batching will occur,
- Washout of concrete transporting vehicles will take place at an appropriate facility, offsite where possible such as the concrete manufactures premises. Where wash out of chutes takes place onsite, it will be carried out in a designated, carefully managed onsite wash out area in a designated contained impermeable area, and
- Wastewater from washing of concrete lorry chutes will be directed into a concrete washout container, lined with an impermeable membrane. The container should be of good condition, should not overflow or leak and should be easily accessible to vehicles.

  The containers must be checked and emptied at a frequency equivalent to the volume of concrete being used and no runoff should leave the washout location. The area will be clearly marked and be located away from storm drain inlets, open drainage facilities, water courses & ditches.

8.3 Air Quality and Climate

8.3.1 Potential Impacts

The main air quality impacts that may arise during construction activities are:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated PM10 concentrations, as a result of dust generating activities on site;
- An increase in concentration of airborne particles and NO2 due to exhaust emissions from diesel powered vehicles and equipment on site and vehicles accessing the Site; and
- Fugitive emissions of airborne particulate matter (including dust) are readily produced through the action of abrasive forces on materials and therefore a wide range of site preparation and construction activities can have the potential to generate this type of emission, including:
  - Demolition;
  - Earthworks;
  - Construction; and
  - Track out (the transportation of dust and dirt from the construction site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network).

8.3.2 Environmental Mitigation, Control Measures and Proposals

For each of the potential sources of an environmental impact on the existing environment, the Contractor will identify the control and protection measures to be implemented as part of the environmental risk assessment. The following mitigation and general control measures should be followed as a minimum to ensure no significant adverse direct and indirect effects on the environment arise from the project.

8.3.2.1 General Measures

The Contractor will be required to implement measures to minimise the amount of dust and emissions (including odour) produced during the project, including the production of a Dust Management Plan as part of the CEMP.

Standard industry best practice mitigation measures will be applied to the Site, for example that described in:

- 'Control of dust from construction and demolition activities' (Kukadia, V., Upton S., & Hall, D. (2003). Control of dust from construction and demolition activities, BRE);
- 'Best Practice Guidance: The control of dust and emissions from demolition and construction' (GLA. (2006);
- Best Practice Guidance: The control of dust and emissions from demolition and construction, Greater London Authority);
- Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management);
- Guidelines for the Treatment of Air Quality during Planning and Construction of National Roads (TII. (2011); and

General mitigation measures include:

- Works will be planned to consider the location of sensitive receptors, sensitive core activities associated with operation of other businesses, local topography, wind direction and any potential sources of pollution;
- Discussion with the planning authority will be undertaken at an early stage by the Contractor to determine any specific monitoring requirements and to agree to any proposed trigger/action levels;
- Community engagement will be undertaken before works commence onsite explaining the nature and duration of the works to local residents and businesses;
- Wind breaks and barriers;
- Frequent cleaning and watering of the construction site and associated access roads;
- Control of vehicle access;
- Vehicle speed restrictions;
- Covering of piles;
- Use of gravel at Site exit points to remove caked on dirt from tyres and tracks;
- Washing of equipment at the end of each workday;
- Prevention of onsite burning; and
- Where appropriate and practicable,
  - hard surface roads should be wet swept to remove any deposited materials;
  - un-surfaced roads should be restricted to essential Site traffic only; and
  - wheel-washing facilities should be located at all exits from the construction site.

There is a Duty of Care on the Contractor to ensure that dust-raising activities are located away from sensitive receptors, such as nesting birds and residential dwellings as much as feasibly possible and duration kept to a minimum when in proximity to a receptor.

Regular site inspections will be undertaken by the Contractor's CEMPC to monitor compliance with the CEMP and record inspection results. It is anticipated that a daily visual check will be carried out and these records will be available upon request.

8.3.2.2 Generation and Control of Dust

A number of mitigation measures can be adopted to reduce the production and/or dispersal of dust to lessen the harm to amenity and limit the human health impacts. Ideally dust should be controlled at the source as once airborne it is more difficult to suppress. Appropriate mitigation measures are provided in the IAQM 'Guidance on the assessment of dust from demolition and construction' (IAQM, 2014).

Table 8-1 lists the measures recommended by the IAQM as being highly recommended for the level of dust risk identified for the project.

Table 8-1: Potential Site Operations and Possible Methods of Controlling Dust

Activity	Possible Dust Control Methods
Communication	• Develop and implement a stakeholder communications plan that includes community engagement before work commences. • Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary; • Display the head or regional office contact information; and • Develop and implement a Dust Management Plan (DMP).
Site Management	• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken; • Make the complaints log available to the local authority when asked; and • Record any exceptional incidents that cause dust and/or air emissions, either on or offsite and the action taken to resolve the situation in the logbook.
Monitoring	• Undertake daily onsite and offsite inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results and make the log available to the local authority when asked; • Increase the frequency of site inspections by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions; and • Carry out regular site inspections by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Preparing and maintaining the site	• Plan site layout so that machinery and dust causing activities are located away from receptors as far as possible; • Erect solid screens or barriers around dusty activities that are at least as high as any stockpiles on-site; • Remove materials that have a potential to produce dust from Site as soon as possible unless being re-used on-site; • Cover, seed, or fence stockpiles to prevent wind whipping; • Avoid Site run-off of water or mud; and • Keep Site fencing, barriers and scaffolding clean using wet methods.
Operating vehicle/machinery and sustainable travel	• Ensure all vehicles switch off engines when stationary – no idling vehicles; • Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable; • Impose and signpost a maximum speed limit of 15 kmph on surfaced and 10 kmph on unsurfaced haul roads and work area.

Activity	Possible Dust Control Methods
	• Vehicles will not be overloaded, and all loads entering and leaving the construction site and carrying waste and other dusty materials will be adequately sheeted to prevent the spillage of material during transport.
Operations	• Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays; • Ensure an adequate water supply on the Site for effective dust/particulate matter suppression/mitigation; • Use enclosed chutes and conveyors and covered skips; and • Minimise drop heights.
Waste Management	• Avoid bonfires and burning of waste materials.
Earthworks	• Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover the topsoil as soon as practicable; and • Only remove the cover in small areas during work and not all at once.
Construction	• Avoid scabbling, if possible; and • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out; and • For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	• Use water assisted dust sweeper(s) on the access and local roads, to remove, as necessary any material tracked out of the Site; • Avoid dry sweeping of large areas; • Ensure vehicles entering and leaving the Site are covered to prevent escape of materials during transport; and • Implement a wheel washing system.

As per industry standard for the construction phase, the TA Luft Regulations limit value of 350 mg/m^2/day (as accepted by the Irish EPA) will be adhered to by the Contractor.

8.3.2.3 Climate Mitigation Measures

The following GHG mitigation measures will be implemented during the construction stage of the project:

- An Outline Construction Traffic Management Plan has been prepared to accompany this document and is included in Chapter 13 of the Traffic Impact Assessment prepared by PUNCH Consulting Engineers. A Traffic Management Plan (TMP) will be produced by the Contractor prior to construction to minimise congestion and would include various measures to reduce GHG emissions including:
  - Specification of locally sourced materials with lower embodied carbon content where feasible, in line with circular economy principles;
  - Turning off machinery engines when not in use;
  - Ensuring regular maintenance of construction machinery; and
  - Handling materials efficiently on site to minimise the waiting time for loading and unloading, thereby reducing potential emissions.

8.4 Cultural Heritage

8.4.1 Potential Impacts

The footprint of the proposed development is located on already developed lands and has been significantly disturbed in the past therefore the potential for direct impacts on previously unrecorded archaeological material at this location was assessed as low.

8.4.2 Environmental Mitigation, Control Measures and Proposals

The Contractor will be responsible for compliance with any additional requirements of the Department for housing, Local Government and Heritage (DHLGH) or Galway City Council.

For each of the potential sources of an environmental impact on the existing environment, the Contractor will identify the control and protection measures to be implemented.

The following mitigation and general control measures should be followed as a minimum to ensure no significant adverse direct and indirect effects on the environment arise from the project.

8.4.2.1 General Measures

- The Contractor is to ensure that mitigating measures outlined in the Outline CEMP, planning consent, the Client's/ Galway City Council's requirements, and any updated or new supplementary environmental reports are included in the CEMP.
- The Contractor is to agree with the planning authority details regarding any further cultural heritage requirements (including if necessary further testing) prior to commencement of construction works and demolition on the Site.
- If any archaeology or features of archaeological potential are discovered during the course of the construction phase, works around it must be stopped and relevant authorities contacted to agree if further archaeological mitigation is required.

8.5 Biodiversity

8.5.1 Potential Impacts

Potential impacts during construction can include habitat disturbance (i.e., visual, vibration and noise, temporary barriers to connectivity, etc.) and the potential for the release of pollutants and contaminants (i.e., suspended solids, oils, fuels, paints, concrete, lime, etc.) to receiving watercourses.

A range of factors influence the potential significance of effects including vulnerability of individual receptors (e.g., condition of vegetation, or fitness of faunal populations), time of year and lifecycle stage of a species impacted, and the potential for unforeseen events such as extreme weather (including flooding of working areas), or introduction of invasive species to exacerbate predicted impacts.

8.5.2 Environmental Mitigation and Control Measures and Proposals

For each of the potential sources of an environmental impact on the existing environment, the Contractor will identify the control and protection measures to be implemented. The following general control and mitigation measures should be followed as a minimum.

8.5.2.1 Roles and Responsibilities

- Prior to commencement of construction, a suitably experienced Ecological Clerk of Works (ECoW), will be appointed by the contractor. The Ecologist will be a full member of a relevant professional institute such as the Chartered Institute of Ecology and Environmental Management (CIEEM), have relevant experience in the management of ecological constraints during construction, and hold or have held a protected species licence(s) in the Republic of Ireland. The Ecologist will be appointed sufficiently in advance of the project to arrange for any mitigation requirements to be incorporated into the Contractor's site-specific CEMP, Method Statements, and programme;
- The ECoW will be responsible for advice and provision of services in relation to implementation of any required ecological mitigation measures. The ECoW will be engaged and consulted on a regular basis by the Contractor and CEMPC;
- The Contractor, CEMPC and the ECoW will ensure that the ecological mitigation and control measures are satisfactorily implemented;
- The Contractor will liaise with the ECoW on all matters relating to ecology including mitigation (particularly protected species including bats and nesting birds); and
- The Contractor will engage and consult with the ECoW and a bat specialist prior to any demolition within the Site and if bats are unexpectedly encountered during any element of construction works.
- The Contractor will accommodate the ECoW, whose role will be to:
  - Oversee carrying out of pre-construction surveys to the appropriate specifications (see Section 4);
  - Communicate relevant matters to Galway City Council, and other stakeholders as relevant;
  - Attend site meetings and input to Contractor toolbox talks prior to commencement of the project (if required); and
  - Determine the potential requirement for licences and provide specialist input (if required).

8.5.2.2 General Mitigation Measures

The following are standard mitigation measures which will be implemented throughout construction phase of the project.

- All site personnel involved in the construction and operation of the project will be made aware of any ecological features present and the mitigation measures and working procedures which must be adopted (if ecological features present). This will be achieved as part of the site induction process through the delivery of a toolbox talk. In addition,

briefings will be provided to all site personnel in advance of any works considered to present an increased risk of impacting upon ecological features.

- Best practice guidance on pollution prevention will be followed at all times during the construction and operation of the project, including implementation of the following:
  - Controls and contingency measures will be provided to manage run-off from construction areas and to manage sediment;
  - Pollution prevention measures will be implemented for all construction works, but in particular should these take place within 30 m of any watercourses. These must prevent pollution (including siltation) of the watercourses;
  - There will be no direct discharge of water from any construction area into any watercourses;
  - All oils, fuels, lubricants, or other chemicals will be stored in an appropriate secure container in a suitable storage area, with spill kits provided at the storage location and at places across the Site;
  - In order to avoid potential pollution impacts to waterbodies, soils, or vegetation from machinery during construction, all refuelling and servicing of vehicles and plant will be carried out in a designated area which is bunded and has an impermeable base;
  - No on-site batching of concrete will occur (also see Section 23 Control of Concrete and Lime); and
  - Soil exposure during the construction works will be reduced and exposed soil will be reinstated as rapidly as possible.
- The Contractor will produce a Pollution Prevention Plan (or similar document). This will include procedures and diagrams for:
  - Dewatering of excavations to SuDS treatment area;
  - Temporary soil storage;
  - Fuel storage/refuelling;
  - Concrete wash-out area;
  - Controlling surface water entering site;
  - Preventing existing drainage features becoming pathways for construction run-off;
  - Reducing soil exposure and reinstating as rapidly as possible; and
  - Contingency measures.
- The Principal Contractor will not be permitted to use materials that could cause heavy metal, sulphide, or strong acid pollution of run-off, and must use aggregates free of excessive fines clays.
- Standard measures for protected species and wildlife in general will be implemented, including:
  - A pre-construction walkover survey for protected species, those surveys outlined within Section 4 and any other Biodiversity surveys deemed required will be undertaken by a suitably experienced ecologist;

  - Should tree felling and vegetation removal works be required, which will directly impact upon areas of vegetation which could be used by nesting birds, this will wherever possible, be undertaken outside the breeding season (taken to be March to August, inclusive). Where this cannot be achieved, a pre-works check for active nests will be conducted by a suitably experienced ornithologist. Each new construction/felling area will be checked not more than 72 hours prior to commencement of works since nests can be quickly established. Where any active nests are identified, suitable exclusion zone(s) will be established and maintained until the ornithologist determines that the breeding attempt(s) have concluded;
  - Sightings of protected or notable species within the Site or immediate surrounds during the construction period will be recorded. If any evidence or sightings of protected or notable species occur within 30 m of works, then works in that area will stop immediately and the ECoW will be consulted;
  - Any excavations will be left with a method of escape for any animal that may enter overnight, and will be checked at the start of each working day to ensure no animals are trapped within them; and
  - Any pipes will be capped or otherwise blocked at the end of each working day, or if left for extended periods of time, to ensure no animals become trapped;
- There can be no storage of hydrocarbons or any polluting chemicals or refuelling of vehicles/equipment within 30m of the watercourse or any active/inactive drains connecting to the river.
- Any diesel or fuel oils stored on site must be bunded to 110% of the capacity of the storage tank. Design and installation of fuel tanks must be in accordance with best practice guidelines. Drip trays and spill kits must be kept available on site.
- All stationary plant must be placed on drip trays to prevent leaking oils reaching the river or entering groundwater.
- Machinery on site must have pollution control kits on hand in the event of an emergency
- Machinery will be kept in good order at all times and inspected for drips and leaks when kept onsite.
- The contractor will refer to the guidelines set out by CIRIA (2006) on the control of water pollution from linear construction projects and any other relevant legislation and guidance related to the control of water pollution on construction sites.

8.6 Land and Soils

8.6.1 Potential Impacts

The risk of potential negative impacts on the land and soils environment occurring during the construction phases of the project (in the absence of adequate management and mitigation measures) can arise from several activities; for example, weathering and erosion of the surface soils, increased silt levels or pollutants from the construction processes, accidental spills, and impacted runoff.

8.6.2 Environmental Mitigation and Control Measures and Proposals

For each of the potential sources of an environmental impact on the existing environment, the Contractor will identify the control and protection measures to be implemented. The following general control and mitigation measures should be followed as a minimum.

8.6.2.1 General

- Materials and equipment to implement the spill response and control plan will be available at various locations across Site (for example, spill kits, booms). These will be in clearly marked response points, which can be accessed by all staff. They will be checked on a daily basis to ensure that all required materials are in place. All staff on site will be aware of these items and be trained on procedures to implement in the case of a spill. Any used spill kits will be disposed of using a hazardous waste disposal contractor and in accordance with all relevant EU and Irish waste management legislation.
- Leaking or empty fuel drums will be removed from Site immediately and disposed of via an appropriately licensed waste disposal contractor.
- The Resource and Waste Management Plan will be consulted for mitigation measures related to stockpiling and waste management onsite.
- Contaminated or potentially contaminated soil will be stockpiled only on hard-standing or high-grade polythene sheeting to prevent cross-contamination;
- Mixing of unclassified stockpiles of different origin, or of stockpiles having different classification, will not be carried out. When a stockpile has been sampled for classification purposes, it will be considered to be complete, and no more soil will be added to that stockpile prior to disposal; and
- Stockpiles will not be positioned adjacent to ditches, watercourses or existing or future excavations.

8.6.2.2 Fuel and Chemical Handling

In order to prevent spillages of fuels to ground, and to prevent any consequent soil quality impacts, it will be necessary to adopt mitigation measures during the construction phase, which include:

- A designated bunded storage area will be located at the contractor's compound for all oils, solvents and chemicals used during construction. Oil and fuel storage tank design will be bunded to a volume of not less than the greater of 110% of the capacity of the largest tank or drum within the bunded area, or 25% of the total volume of the substance which could be stored within the bunded area, with impermeable bases within each contractor's storage area as required. Drainage from the bunded area will be diverted for collection and safe disposal. All containers within the storage area and on Site will be clearly labelled so that appropriate remedial action can be taken in the event of a spillage. When moving drums from the bunded storage area to locations within Site a suitably sized spill pallet will be used for containing any spillages during transit;
- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated areas which will be away from surface water gullies or drains. Spill kit facilities will be provided at the fuelling areas in order to provide for accidental releases or spillages in and around the area. Any used spill kit materials will be

disposed of using a licenced hazardous waste contractor in accordance with relevant legalisation;

- Should mobile fuel bowsers be used on the project, in the event of a machine requiring refuelling outside of the designated area, fuel will be transported in a mobile double skinned tank. Any flexible pipe tap, or valve will be fitted with a lock where it leaves the container and locked shut when not in use. Each bowser will carry a spill kit and each bowser operator will have spill response training; and
- The Contractor will develop procedures and contingency plans to deal with emergency accidental spills and leaks.

8.6.2.3 Depletion of Natural Resources

Mitigation and monitoring measures to limit potential impacts associated with the use of natural resources throughout the course of the project are as follows:

- The source of any backfill material (should it be required) will be vetted for environmental management status, regulatory and legal compliance status;
- Backfill material will be sourced from suppliers which comply with vetting requirements only;
- Periodic reviews of the backfill supplier's license will be undertaken;
- In the event recycled aggregate is used as backfill, chemical testing will be undertaken to confirm that it is 'clean'; and
- The resource and waste management plan will be implemented on Site and updated regularly.

8.7 Water

8.7.1 Potential Impacts

Development works by their nature have the potential to impact watercourses and groundwater by way of pollution. Appropriate control measures in accordance with the Contractor's CEMP and best management practices will be implemented on Site. Examples of potential sources of impacts include:

- Polluted discharges from Site;
  - discharge of vehicle wash-down water;
  - discharge of construction materials, e.g., uncured concrete;
  - uncontained spillage of wastewater effluent;
  - uncontrolled sediment erosion and contaminated silty runoff; and
  - refuelling facilities, chemical and waste storage, or handling areas.
- Changes to the existing drainage network including interception and redirection of natural and artificial watercourses (e.g., drainage channels); and
- Increased runoff from cleared and capped areas.

8.7.2 Environmental Mitigation and Control Measures and Proposals

For each of the potential sources of an environmental impact on the existing environment, the Contractor will identify the control and protection measures to be implemented.

8.7.2.1 General

The following mitigation and general control measures will be followed as a minimum on Site.

- The Contractor will develop an emergency response plan to be followed in the event of spills and leaks.
- Materials and equipment to implement the spill response and control plan must be available at various locations across Site (for example, spill kits, booms). These will be in clearly marked response points, which can be accessed by all staff. They must be checked on a daily basis to ensure that all required materials are in place. All staff on site must be aware of these items and be trained on procedures to implement in the case of a spill. Any used spill kits will be disposed of using a hazardous waste disposal contractor and in accordance with all relevant EU and Irish waste management legislation.
- Mobile bowsers, tanks and drums will be stored in secure, impermeable storage areas.
- Bunded storage will be provided for potentially hazardous materials (i.e., oils, hydraulic fluids, greases, solvents, chemicals, and paints) used during the works. Oil and fuel storage tank design will be bunded to a volume of not less than the greater of 110% of the capacity of the largest tank or drum within the bunded area, or 25% of the total volume of the substance which could be stored within the bunded area, with impermeable bases within each contractor's storage area as required.
- Hazardous materials will be stored in designated appropriately bunded areas, which will be located away from all watercourses with nearby drains to be protected as appropriate.
- A plant and machinery maintenance programme will be implemented to keep plant and machinery in good working condition.
- Plant will be refuelled in designated refuelling areas where possible.
- All water runoff from designated refuelling areas will be channelled to an oil interceptor or an alternative treatment system prior to discharge.
- Drip trays will be used during refuelling operations if performed outside of a contained area and spill kits will be carried in the fuel bowser vehicle. Any used spill kits will be disposed of using a hazardous waste disposal contractor and in accordance with all relevant EU and Irish waste management legislation.
- Leaking or empty fuel drums will be removed from Site immediately and disposed of via an appropriately licensed waste disposal contractor.

8.7.2.2 Managing Runoff and Silty Water

The following mitigation measures will be followed as a minimum.

- Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust.

- The Resource and Waste Management Plan will be consulted for mitigation measures related to stockpiling and waste management onsite.
- Stockpiles (should they occur on site) will be kept to a minimum, to control erosion areas of exposed ground, to reduce silty runoff. They will be located well away from watercourses, drains and dewatering points;
- Soil stockpiles will be covered with high-grade polythene sheeting to prevent run-off of rainwater and leaching of potential contaminants from the stockpiled material generation and/or the generation of dust;
- Contaminated or potentially contaminated soil will be stockpiled only on hard-standing or high-grade polythene sheeting to prevent cross-contamination;
- Drainage channels will be clearly identified on site and shown on method statements and site plans. Existing drainage channels will be protected during works.

8.8 Noise and Vibration

8.8.1 Potential Impacts

Noise and vibration impacts may arise from a wide variety of sources during construction and to varying degrees during the course of the works, depending upon the stage of construction (i.e., ground works, etc.). There is the potential for the generation of noise and vibration levels above those currently experienced in the surrounding environment during the construction phase.

8.8.1.1 Noise

A noise assessment as part of the planning application has been undertaken by Allegro Acoustics, report number DC2256-06. Noise sensitive locations have been identified in close proximity to the Site. These locations include residential dwellings surrounding the site and a school to the west of the site. The assessment proposes that the construction noise limits outlined by the National Roads Authority in “Guidelines for the Treatment of Noise and Vibration in National Road Schemes” are appropriate for this development, **Table 8-2.**

Table 8-2: Proposed Construction Noise Limits

Day & Times	dB $L_{aeq\ (1hr)}$	dB L^{Amax}
Monday – Friday (07:00 to 19:00)	70	80
Monday – Friday (19:00 to 22:00)	60	65
Saturday (08:00 to 16:30)	65	75
Sundays and Bank Holidays (08:00 to 16:30)	60	65

These limits will be enforced using continuous noise monitoring, with the monitoring station equipped with real time text/email alerts.

8.8.1.2 Vibration

The Contractor will carry out their works such that the effect of vibration on the surroundings is minimised and does not cause any damage.

In the case of this development, vibration levels used for the purposes of evaluating building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s. BS 5228 and BS 7385 define the thresholds, given in **Table 8-3**, for cosmetic damage to residential or light commercial buildings.

Table 8-3: Vibration Limits

Type of Building	Transient Vibration	Continuous Vibration
Reinforced or framed structures. Industrial and heavy commercial buildings	50 mm/s	25 mm/s
Unreinforced or light framed structures. Residential or light commercial-type buildings	15 mm/s	7.5 mm/s
Protected and Historic Buildings (Note 1)	6 mm/s - 15 mm/s	3 mm/s - 7 mm/s
Identified Potentially Vulnerable Structures and Buildings with Low Vibration Threshold	3 mm/s	3 mm/s

Note 1: The relevant threshold value to be determined on a case-by-case basis. Where sufficient structural information is unavailable at the time of assessment, the lower values within the range will be used, depending on the specific vibration frequency.

BS 5228-2 also provides guidance relating to the human response to vibration. Guidance is provided in terms of PPV in mm/s since this parameter is routinely measured when monitoring the structural effects of vibration. The potential human response at different vibration levels, as set out in BS 5228-2, is summarised in **Table 8-4**.

Table 8-4: Potential Human Response

Vibration Level (Notes 3, 4, 5)	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.

10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

Note 2: The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.

Note 3: A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.

Note 4: Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

8.8.2 Environmental Mitigation and Control Measures and Proposals

The Contractor will be responsible for compliance with any noise and vibration limits prescribed by Galway City Council. The Contractor will adhere to noise and vibration best practice and guidance such as BS 5228 and BS 6187. This will apply to all works carried out by the Contractor and any sub-contractors under its control. The requirement whether or not to undertake noise and vibration monitoring will be agreed with Galway City Council prior to the commencement of works.

For each of the potential sources of an environmental impact on the existing environment, the Contractor will identify the control and protection measures to be implemented. The following mitigation and general control measures will be followed on Site as a minimum.

8.8.2.1 General Measures

The following mitigation and general control measures will be followed as a minimum on Site.

- A CEMPC and designated noise liaison responsible for matters relating to noise and vibration will be appointed prior to construction on site. Any complaints will be logged, investigated, and followed up in a prompt fashion and, where required, measures taken to ameliorate the source of the noise complaint. In addition, prior to particularly noisy construction activity, e.g., excavation close to a property, etc., the site contact will inform the nearest noise sensitive locations of the time and expected duration of the works.

- The site CEMPC and designated noise liaison will also liaise with relevant authorities/environmental bodies and the local community as required with respect to noise and vibration impacts during the construction phase.

- The Contractor will highlight through method statements and/or risk assessment specific activities that will create significant noise and vibration levels. Contractors will demonstrate how they will mitigate/manage these emissions. The Contractor will implement mitigation measures where noise sources are located near sensitive receptors and where required on Site.

Best Practicable Means for the control of construction noise and vibration to be implemented on site include:

- Ensuring that modern plant is used, complying with the latest European noise emission requirements.
- Selection of inherently quiet or low vibration plant where possible.
- Use of lower noise and vibration piling techniques (such as vibratory, rotary bored or hydraulic jacking) rather than driven piling techniques where possible.
- Off-site pre-fabrication where practical.
- Noisier plant will be positioned to optimise screening by other plant.
- Where earth movers dump material into dumper trucks, the material fall height will be minimised as much as practical so that noise generation is minimised.
- Use temporary noise screens or site hoardings as noise barriers where possible.
- Where possible, carry out noisy works during less sensitive hours, e.g., daytimes rather than at night.
- All plant and equipment being used for the works to be properly maintained, silenced where appropriate, operated to prevent excessive noise and switched off when not in use.
- Ensuring contractors are made familiar and follow the guidance in:
  - BS 5228 Code of practice for noise and vibration control on construction and open sites: Part 1 Noise and Part 2 Vibration;
  - NR/L2/ENV/015 Environment and Social Minimum Requirements for Projects – Design and Construction; and
  - NR/L2/ENV/121 Managing environmental and social impact of noise and vibration.
- Loading and unloading of vehicles, dismantling of site equipment, or moving equipment or materials around the Site to be conducted in such a manner as to minimise noise generation.
- Communication with local residents as appropriate to advise of potential noisy works that are due to take place.
- Brief site staff on the most preventable causes of complaint: shouting, car radios, slamming doors etc.
- Monitoring of noise complaints and reporting to the contractor for immediate investigation.
- Machinery will be switched off when it is not in use instead of leaving it on idle.
- As far as reasonably practical, sources of significant noise will be enclosed. Acoustic screens will be used close to noisy operations where required.
- Temporary hoarding will be erected around items such as generators or high duty compressors where required.
- Noisy plant will be located as far away from noise sensitive facades as practical and as permitted by site constraints.
- Diesel engines will be substituted with electric motors where practical.

8.9 Landscape and Visual

8.9.1 Potential Impacts

Construction effects are most likely to be associated with the visibility of construction traffic and construction works within the Site including construction machinery. The majority of visual

receptors will be school staff, students, local residents and vehicle drivers who pass through the area.

8.9.2 Environmental Mitigation and Control Measures and Proposals

For each of the potential sources of an environmental impact on the existing environment, the Contractor will identify the control and protection measures to be implemented. The following mitigation and general control measures will be followed on Site as a minimum.

8.9.2.1 General Measures

Adherence to the CEMP will be a contract requirement and this will ensure good working practices are followed to minimise and manage any significant, negative environmental impacts arising from construction.