Mungret Residential Development

Construction Environmental Management Plan

Proposed Development at Dromdarrig, Mungret, Co. Limerick

January 2021

Application prepared with

HRA | PLANNING
chartered town planning consultants

eml architects

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Limerick City & County Council

Mungret Residential Development

Construction Environmental Management Plan

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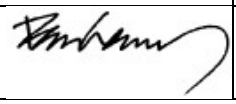
		Signature			
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Contents

1 Introduction

This Construction Environmental Management Plan (CEMP) has been prepared by Arup to support Limerick City & County Council's proposed development of new residential units and associated infrastructure in Mungret, County Limerick, hereafter referred to as "*the proposed development*".

The purpose of the CEMP is to demonstrate how the proposed construction works can be delivered in a logical, sensible and safe sequence with the incorporation of specific environmental control measures relevant to construction works of this nature. The CEMP sets out the mechanism by which environmental protection is to be achieved during the construction phase of the proposed development. Implementation of the CEMP will ensure disruption and nuisance are kept to a minimum.

The CEMP has been prepared in accordance with industry best practice guidance including:

- TII's Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan;
- CIRIA in the UK, Environmental Good Practice on Site Guide, (4th Edition) (2015).

The CEMP has been prepared in conjunction with the Screening Determination for Environmental Impact Assessment (EIA) having regard to the surveys undertaken by specialists and environmental consultants. The environmental controls described in this CEMP are good construction practices. The potential for adverse effects on Natura 2000 sites has been assessed and is documented in a separate report for screening for Appropriate Assessment, which considers this potential in the absence of mitigation.

This CEMP is structured as follows:

- **Section 1** introduces the proposed development and outlines the purpose of the CEMP;
- **Section 2** describes in detail the proposed development;
- **Section 3** sets outs the framework and mechanisms through which environmental requirements will be managed;
- **Section 4** outlines the procedures to be employed during construction to manage environmental aspects;
- **Sections 5** and **6** describe the general requirements and environmental measures to be implemented to minimise likely significant negative effects, as far as practicable, during the construction of the proposed development; and
- **Section 7** provides a concluding statement.

It is intended that this CEMP will be expanded and further developed prior to the commencement of any construction activities on site.

The CEMP is a dynamic document and will remain up to date for the duration of the construction period. The CEMP may need to be altered during the different phases of the construction period to take account of monitoring results, legislative changes, outcomes of third-party consultations etc.

Following appointment, the Contractor will be required to develop more specific Method Statements that are cognisant of the proposed construction activities, equipment and plant usage and environmental monitoring plan for the proposed development. This CEMP should not be considered a detailed Construction Method Statement as it will be the responsibility of the Contractor, appointed to undertake the individual works, in association with Limerick City & County Council, to implement appropriate procedures and progress this documentation prior to commencement of construction.

2 Proposed Development

The site area for the proposed development is 7.2 hectares and will be comprised of 253 residential units (plots A1- A4), creche, community facility, local shops, associated roads, carparking, public open spaces, public toilet, local services and ancillary utilities infrastructure. The proposed development is located adjacent to Mungret College, Co. Limerick.

The development includes two distinct elements; a standard housing development, plots A1 to A3, which comprises of 186 housing units and an Independent Living for Older Persons development, plot A4, which includes 55 apartments for Independent Living and a further 12 apartments which will be standard units open to any occupancy.

In addition to the Creche, Community Facility and local shops a number of Public Open Spaces (POS) will be included in the proposed development, including a public square (S1). Refer to **Figure 1.**

The proposed development consists of the following:

- 253 residential units located in plots as follows
  - A1 (2.2 ha)
  - A2 (0.96ha)
  - A3 (2.1ha)
  - A4 (0.91ha)
- Public Open Spaces;
  - POS - A1 and A3 (approximately 0.2ha)
  - POS - A2 (approximately 0.2ha)
- Public Square - S1 (approximately 0.2ha);
- Community Facility including a café - (gross area of approximately 341m^2);
- Creche - (gross area of approximately 476m^2); and
- Local shops which include a beauty salon and corner shop - (gross area of approximately 200m^2).

Figure 1: Site Layout | Not to scale | Based on information provided by: EML Architects

2.1 Residential Units

As previously mentioned, the 253 residential units are divided into a standard housing development, plots A1 to A3, and an Independent Living for Older Persons development, plot A4. The heights of each building will range from 2- 3 storeys.

A total of 372 car parking spaces will be provided as part of the proposed development. The parking strategy for the housing and apartment units in plots A1, A2 and A3 will differ to that for the Independent Living for Older Person Units in plot A4.

For plot A1, 127 car parking space will be provided, plot A2, will have a total of 43 car parking spaces and for plot A3 104 spaces will be provided. A total of 98 on-street car parking spaces will be provided to serve plot A4 including the Independent Living for Older Person Residential units, the local shop, creche and the community facility. The creche and corner shop will be provided with full car parking in accordance with development plan standards.

Of the total number of car parking spaces included in the proposed development 36 spaces will be designated charging points for electric vehicles.

2.2 Community Facility

A Community Facility, which a gross area of approximately 341m^2 will be constructed to the north of the public square (S1) and plot A4. This building will have three community rooms and an auxiliary café area.

2.3 Creche

A proposed creche, with a gross area of approximately 476m^2, will be constructed on a hardstanding area north of the community facility. The creche will provide approximately 70 child places for ages up to 6 years and a small after-school club. An outdoor play area will be located on the south side of the creche for use by the creche. Parking will be provided at the public square S1.

2.4 Local Shop(s)

A corner shop is proposed for the south west corner of the building within plot A4; this will be a convenience shop with a gross area of approximately 100m^2. Located next to the corner shop is a proposed beauty salon/ hairdressers that will be linked to the A4 apartment blocks and will have a gross area of approximately 100m^2. Parking for these units will be provided at the public square S1.

2.5 Construction Compounds

The construction programme for the proposed development is planned over a five-year period and will be constructed in three phases: Phase 1, Phase 2 and Phase 3.

Each phase will be served by a local construction compound located in the green /open area of the relevant phase. The ground within the construction compound will be levelled and hardcored with hoarding/ fencing erected to secure the area. Towards the end of each construction phase the compounds will be removed and depending on location, replanting and landscaping will be undertaken. The construction compounds will be opened and closed in line with the construction programme. Locations of the construction compounds are shown in **Figure 2**.

Each of the construction compounds will be safely secured and a Construction Traffic Management Plan (CTMP) will be further developed by the Contractor to ensure safe access during the construction phase.

All construction compounds will provide the following:

- Space for materials lay down;
- Wheel wash;
- Construction waste storage;
- Site Offices;
- Electricity supplied by mains and /or an onsite generator;
- IT/telecommunication connection;
- Water supplied from the public watermain; and
- Mobile welfare facilities – either mobile welfare vans, towed units or self-contained units will be provided for construction personnel and will be fully bunded with foul sewage disposed of by removal off-site.

A designated bunded refuelling area on an impermeable surface will be provided at all construction compounds. Refuelling of vehicles will be restricted to these designated areas.

The Surface Water Management Plan (SWMP), refer to **Section 6.7**, will be further developed by the Contractor and will specify the environmental controls to be put in place. Site drainage will be provided at each of the construction compounds to collect surface water runoff, which will be directed into the existing local drainage network. Surface water or contaminants within the site compounds will not be released from the site to any waters or the bed and banks of any waters (including ground water).

N

LEGEND:

PHASE 1: 18 Months
PHASE 1 - 55 Units (Older Person) 0.80ha
54 Units (Residential) 1.55ha

PHASE 2: 18 Months
PHASE 2 - 56 Units (Residential) 1.84ha
12 Units (Residential), Creche, Community Facility 0.78ha

PHASE 3: 24 Months
PHASE 3 - 76 Units (Residential) 1.56ha

Construction Compounds

Construction Access

Temporary Storage of Materials

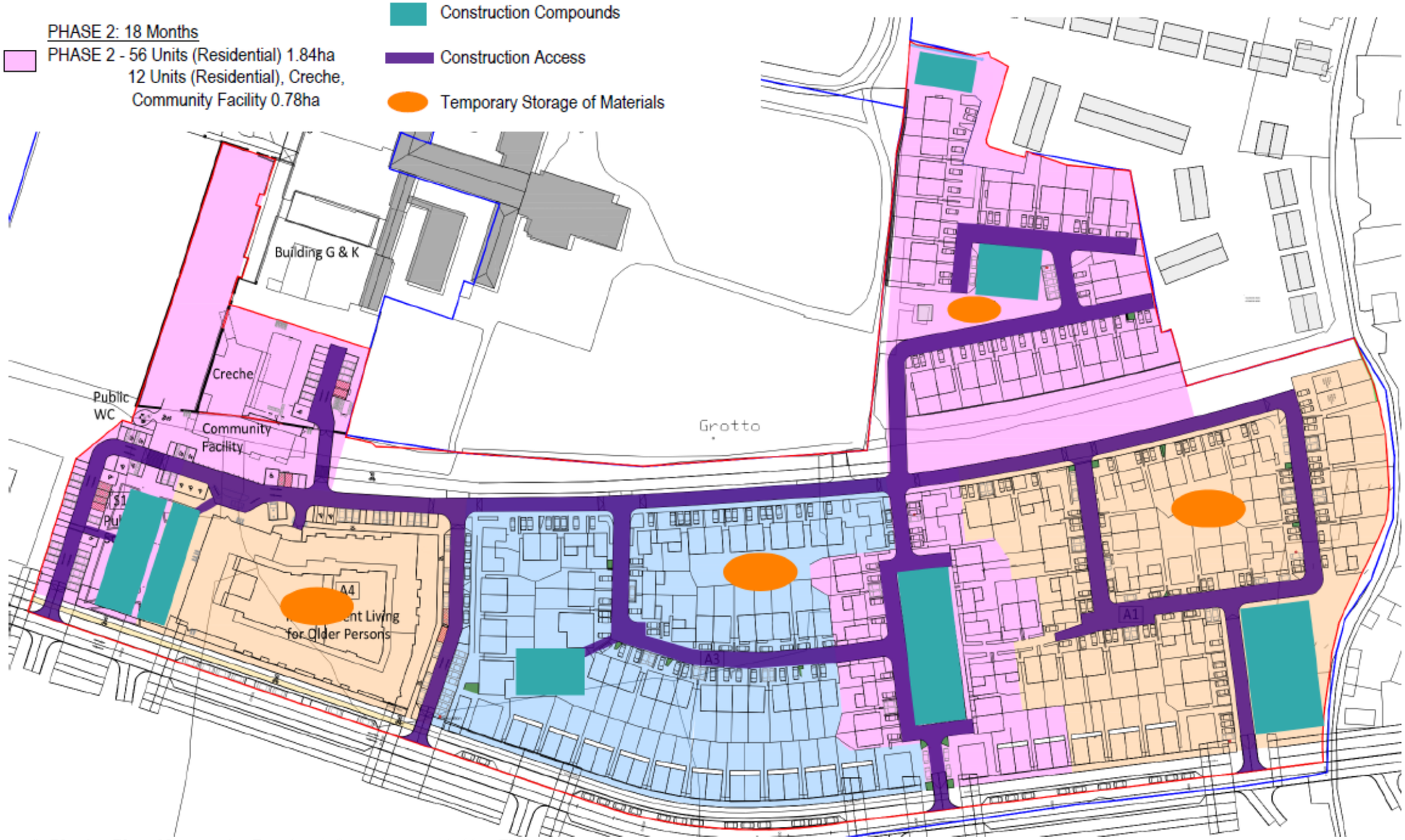

Figure 2: Phasing Plan | Not to scale | Based on information provided by: EML Architects

2.6 Construction Timeline and Phasing

Construction of the proposed development is likely to be completed over approximately five years and will be carried out in three phases. Activities within or across the phases may be carried out simultaneously depending on how the contractor choses to construct the scheme. The three construction phases are identified as Phase 1, Phase 2 and Phase 3. These phases are illustrated in **Figure 2.**

Phase 1 will commence with the construction of 55 Independent Living for Older Persons units in the western part of the site and the construction of approximately 54 residential units in the eastern part of the site. Approximately 700m^2 of the Public Square (S1) will be construction during Phase 1 along with the public open space (POS A1&A3) located to the south east of the site. It is estimated that construction of Phase 1 will take approximately 18 months to complete.

Phase 2 will consist of the construction of 56 residential units (to the west of the 54 units planned as part of Phase 1) and construction works to the proposed Creche, Community Facility and 12 residential units (located to the north of the Independent Living for Older Persons units) respectively. During Phase 2 the remaining area of the Public Square (S1) will be construction in addition to the public open spaces (POS A1& A3 and POS A2). Phase 2 will take approximately 18 months to complete.

Phase 3 will consist of the construction of 76 residential units and will complete the works on the site. It is estimated that Phase 3 will be completed in the 24 months following completion of the previous phases.

3 Environmental Management Framework

3.1 Overview

The contract(s) awarded for the proposed development will include a requirement for the Contractor to comply with relevant documentation including all conditions of any statutory approvals received and this CEMP.

As part of the environmental management framework contractors will need to comply with all relevant environmental legislation and take account of published standards, accepted industry practice, national guidelines and codes of practice appropriate to the proposed development. Due regard should be given to the guidance and advice given by ISO 14001 standard[1] and CIRIA guidance[2,3,4].

The appointed Contractor will be required to develop and implement an Environmental Management System (EMS) that follows the principles of ISO 14001. Further, the appointed contractor's EMS should include an environmental policy, operational, monitoring and auditing procedures to ensure compliance with all environmental requirements and to monitor compliance with environmental legislation and the environmental management provisions outlined in the relevant documentation.

3.2 Responsibilities

3.2.1 Employer

Limerick City & County Council will be the employer responsible for ensuring that competent parties are appointed to undertake construction and that sufficient resources are made available to facilitate the appropriate management of risks to the environment.

Limerick City & County Council will also ensure that the engineer setting out the works is fully aware of the ecological constraints and construction management requirements associated with the proposed development.

3.2.2 Employers Representative

Limerick City & County Council and/or the Employers Representative (ER) appointed by Limerick City & County Council will be responsible for monitoring compliance with the CEMP. The ER may be required to appoint temporary or permanent specialists with appropriate skills and experience as required to implement on site procedures and monitor construction on behalf of the employer, i.e. competent experts in biodiversity, noise, vibration, dust, waste, soils, contamination and/or water.

[1] ISO (2015) ISO 14001:2015 Environmental management systems -- Requirements with guidance for use
[2] CIRIA (2015) Environmental Good Practice on Site guide (fourth edition) (C741)
[3] CIRIA (2015) Coastal and marine environmental site guide (second edition) (C744)
[4] CIRIA (2002) Brownfield development sites: ground-related risks for buildings (X263)

3.2.3 The Contractor

The Contractor(s) appointed will be responsible for the organisation, direction and execution of environmental related activities during the detailed design and construction of the proposed development. The Contractor is required to undertake all activities in accordance with the relevant environmental requirements including the consent documentation and other regulatory and contractual requirements.

3.2.4 Site Manager

A Site Manager will be appointed by the Contractor to oversee the day-to-day management of working areas within the site and ensure that effective, safe, planned construction activities are delivered on an ongoing basis to the highest standards. The Site Manager will be a suitably qualified, competent and experienced professional that will oversee site logistics, communicate regularly with construction staff, accommodate project-specific inductions for staff on site and ensure that all work is compliant with the relevant design standards and health and safety legislation.

3.2.5 Environmental Manager

An Environmental Manager will be appointed by the Contractor to ensure that the CEMP is effectively implemented. The Environmental Manager will be a suitably qualified, competent and experienced professional that will perform the necessary tasks, review environmental procedures and consult with the members of the construction team and stakeholders as requited. The Environmental Manager will be responsible for:

- Developing, maintaining and implementing the CEMP;
- Establishing, implementing, and maintaining the EMS in line with ISO 14001;
- Conducting regular environmental inspections and audits as specified in the contract and checking adherence to the CEMP;
- Ensuring that construction occurs in accordance with the relevant environmental requirements and that such compliance is adequately recorded and documented;
- Completing a site inspection and compiling an environmental compliance record as agreed and specified in the CEMP;
- Consulting with relevant stakeholders on an on-going basis;
- Attending site and stakeholder meetings as required;
- Keeping up to date with relevant environmental best practice and legislative changes;
- Liaising with the relevant staff to prepare Method Statements and relevant plans for all activities where there is a risk of environmental damage;

- Having a detailed level of knowledge on all aspects of environmental information associated with the proposed development;
- Ensuring all personnel have undertaken adequate environmental inductions, awareness briefings and training (including subcontractors);
- Dealing with environmental complaints; and
- Managing and responding to environmental incidents and ensuring that all incidents are recorded and reported in an appropriate manner.

3.2.6 Community Liaison Manager

A Community Liaison Manager will be appointed and will be responsible for managing such tasks as the following:

- Briefing neighbours on progress and issues as necessary;
- Liaison with stakeholders and emergency services as appropriate;
- Liaison with local Gardaí, particularly in relation to traffic movements and permits where necessary.

Contact details for the liaison manager will be posted on all construction site notice boards and on any other information or correspondence, which may be distributed from time to time.

3.2.7 Environmental Specialists engaged by the Contractor

To fulfil its obligations under the CEMP and to support its Environmental Manager, the Contractor will be responsible for engaging suitably qualified and experienced professionals including where necessary the following (i.e. depending on the scope of the contract) competent experts:

- Project archaeologist;
- Project ecologist;
- Noise and vibration specialist;
- Air quality and dust specialist;
- Land, soils and contamination specialist(s); and
- Water specialist.

3.3 Communication Procedures

3.3.1 Community and Stakeholder Engagement

The Community Liaison Manager and Contractor will take all reasonable steps to engage with stakeholders in the local community, focusing on those who may be affected by the construction works including residents, businesses, community resources and specific vulnerable groups.

Communication with the local community and other relevant stakeholders will be undertaken at an appropriate level and frequency throughout construction.

Where communications are related to environmental issues the Environmental Manager will be informed and engaged with, as appropriate.

3.3.1.1 Community Liaison

Limerick City & County Council recognises the importance of effective community liaison in order to reduce nuisance to residents, to ensure public safety and welfare and to help ensure the smooth running of construction activities. As mentioned in **Section 3.2.6**, Limerick City & County Council will appoint a Community Liaison Manager for the proposed development.

Important issues in ensuring good relations are:

- Providing information for the public during the construction phases, (particularly nearby sensitive receptors);
- Providing the correct points of contact and being responsive; and
- Ensuring good housekeeping in all aspects of the operations.

A 'good neighbour' policy will be implemented, as far as possible. Key aspects of this policy include:

- Early implementation of the policy i.e. from the commencement of construction;
- Reduction of nuisance factors;
- Maintaining access to neighbouring premises;
- Clear and concise information; and
- Undertaking timely liaison with stakeholders.

3.3.2 Advance Notice of Works

The Community Liaison Manager and Contractor will ensure that local residents, businesses, occupiers, general users of the area and stakeholders are informed in advance of construction activities that may affect them. Relevant obligations and procedures in relation to advance notice of works will be identified in the CEMP(s) as they are further developed by the Contractor(s) and in the Communications Management Plan.

All notifications will detail the nature, estimated duration and working hours. All notifications will include a project-specific contact number to which any enquires can be directed. The Community Liaison Manager and Contractor will be responsible for preparing and issuing the notifications subject to the relevant approval and consents.

Limerick City & County Council and the Community Liaison Manager in consultation with statutory stakeholders will decide whether to arrange any further targeted consultation with the public or relevant stakeholders in advance of specific construction activities on a local basis.

3.3.3 Emergency Contacts

An emergency contact list will be established and made available to all construction staff employed. The contact list will be displayed prominently on site as well as at suitable locations where construction activity is being carried out around working areas. The contact list will include key environmental representatives that may need to be contacted in the event of an incident.

3.3.4 Enquiries and Complaints

The Contractor will establish a process for handling all enquires including complaints. All enquires will be recorded and a log will be maintained to include details of the response and action taken. This will be available upon request for inspection. All enquiries, whether a query or a complaint, will be dealt with in a timely manner.

The Environmental Manager will be immediately informed of any environmental-related issues that have been raised. Where appropriate, the Environmental Manager will be responsible for informing relevant stakeholders and statutory bodies.

4 Environmental Management Procedures

4.1 Training, Awareness and Competence

The Contractor (and its subcontractors) will be selected with due consideration of relevant qualifications and experience. The Contractor will be required to employ construction staff with appropriate skills, qualifications and experience appropriate to the needs of the works to be carried out during construction.

A site induction will be provided to all construction staff before they commence work on site. Where appropriate, the Contractor will identify specific training needs for the construction workforce and will ensure that appropriate training requirements are fulfilled. Two-way communication will be encouraged to promote a culture of environmental protection.

The Contractor will establish an Environmental Training and Awareness Programme and ensure that all personnel receive adequate training prior to the commencement of construction activities. A baseline level of environmental awareness will be established through the site induction programme. Key environmental considerations and objectives will be incorporated into this induction. Specifically, site inductions will cover the following as a minimum:

- Introduction to the Environmental Manager;
- Description of the CEMP and consequences of non-compliance;
- The requirements of due diligence and duty of care;
- Overview of conditions of consents, permits and licences;
- Requirements associated with community engagement and stakeholder consultation;
- Identification of environmental constraints and notable features within the site; and
- Procedures associated with incident notification and reporting including procedures for dealing with damage to the environment.

Nobody will work on site without first receiving environmental induction. This induction will relate to works being carried out adjacent to sensitive receptors and to re-emphasise the precautions that are required as well as the construction management measures to be implemented. Signed records of environmental training will be established, maintained and made available to the Employers Representative.

Site briefings and talks will be carried out on a regular basis to ensure that construction staff have an adequate level of knowledge on environmental topics and community relations and can effectively follow environmental control procedures throughout construction.

4.2 Meetings

Limerick City & County Council and/or the Employer's Representative will arrange regular meetings to discuss environmental matters and ensure effective coordination to be attended by:

- Limerick City & County Council;
- The Employer's Representative;
- Contractor (including Site Manager);
- Community Liaison Manager;
- Environmental Manager; and
- Environmental Specialists – engaged by either Limerick City & County Council and/or the Contractor.

The Environmental Manager will be responsible for arranging and holding monthly meetings and site walk overs with the Employer's Representative. The Environmental Manager will develop and distribute minutes of the monthly meetings and distribute them accordingly.

4.3 Monitoring, Inspections and Audits

For the duration of the contract(s), the environmental performance of the Contractor will be monitored through site inspections and audits. The programme for monitoring, inspections and audits will be specified in the contract and it is likely to be a combination of internal inspections and audits that may be either random or routine.

Records of all inspections carried out will be recorded on standard forms and all actions are to be closed out in a reasonable time. The CEMP as it is further developed by the Contractor will include additional details of inspection procedures.

4.3.1 Monitoring

Monitoring will be carried out in accordance with the requirements described in this CEMP and the EIA Screening Report so that construction activities are undertaken in a manner that does not give rise to significant negative effects. Suitable monitoring programmes will need to be developed, implemented, documented, and assessed.

The results of all environmental monitoring activities will be reviewed by the Environmental Manager on an ongoing basis to enable trends or exceedance of criteria to be identified and corrective actions to be implemented as necessary. The Contractor will be required to inform the Employer's Representative of any continuous exceedances of criteria.

4.3.2 Inspections

Inspections of construction activities will be carried out by the Environmental Manager daily to ensure all necessary environmental measures relevant to the construction activities are being effectively implemented by construction staff, ensuring legal and contractual conformity.

More detailed inspections will be undertaken by the Environmental Manager on a weekly basis.

The weekly inspections will be appropriately documented by the Environmental Manager and copies of these records and any action required to be undertaken will be made available to the Employer's Representative.

Each month one of the weekly inspections will include a review of environmental documentation and records. The monthly inspection will be recorded on a standard form and reported to the Employer's Representative within five days of the inspection taking place. This standard form will address the following as a minimum:

- Summary of compliance/non-compliance with the CEMP;
- Results and interpretation of the monitoring programme;
- Key issues noted in inspections and/or audits;
- Summary record of non-conformities, incidents and corrective actions;
- Summary of environmental complaints and queries received in relation to environmental matters; and
- Summary record of environmental training undertaken by staff.

4.3.3 Audits

The Environmental Manager will carry out audits during the construction phase and will advise on compliance with applicable environmental regulatory requirements, the efficacy of the environmental management approaches used, and recommendations for reducing identified environmental risks (if considered appropriate).

Further, regulatory and statutory bodies may undertake site visits to monitor compliance with legislative and regulatory requirements. These site visits may occur randomly throughout the construction period. The Contractor will facilitate these visits and the Environmental Manager will be available to provide information as required and deal with any issues that may arise during, or as a result of, these visits.

Planned and documented audits aimed at evaluating the conformance of the EMS will also be carried out by the Environmental Manager. The Environmental Manager will establish a schedule for internal audits and this inspection calendar will be made available to the Employer's Representative. These environmental audits will be scheduled at least once every three months.

Standard forms for reporting and audit items will be prepared and will include but not be limited to the following activities:

- Review of environmental documentation to establish if relevant requirements are being achieved and if continual improvement is occurring;
- Site inspection and interviews with onsite personnel; and
- Reporting with recommendations.

For any environmental non-conformities found, a Corrective Actions Report (refer to **Section 4.4.1**) will be prepared and will describe and record the findings of the non-conformance. The verification of previous Corrective Actions Reports will also be recorded.

Upon completion of an audit, the Environmental Manager will review all Corrective Actions Reports and prepare an Audit Report to summarise:

- Corrective action requests raised;
- Previous corrective action requests closed; and
- Observations made during the audit.

Once complete the Environmental Manager will issue the Audit Report to the Employer's Representative and a copy is provided to the Contractor within five working days of the audit. The Audit Report will detail the findings from the auditor, specify non-conformances identified and outline the proposed corrective actions.

4.4 Incident Response

4.4.1 Corrective Actions

4.4.1.1 Overview

Corrective actions are measures to be implemented to rectify any non-conformances (i.e. exceedance of criteria or targets) identified during monitoring, inspections and/or audits.

In the first instance, an investigation will be undertaken by the Environmental Manager to identify the cause of any non-conformances. Appropriate remedial measures will be identified and implemented as soon as practicable to prevent further exceedances. If necessary, the appropriate statutory authority and stakeholders will be notified.

Where new or amended measures are proposed, the relevant CEMP will be updated accordingly by the Environmental Manager and the Employer's Representative will be informed at the earliest opportunity.

4.4.1.2 Corrective Action Reports

As previously mentioned, a Corrective Actions Report is prepared on foot of any non-conformances identified during environmental monitoring, inspections and/or audits on site. The Corrective Actions Report will describe in detail the cause and effect of a non-conformance on site and describe the recommended corrective action that is required to remedy it.

An appropriate timeline for closing out the corrective actions will be identified by the Contractor as well as arrangements for the Environmental Manager verifying the Corrective Actions Report and informing appropriate authorities and stakeholders in a timely manner.

4.4.2 Emergency Incidents

4.4.2.1 Overview

Emergency incidents are those occurrences that give rise to significant negative environmental effects including but not limited to the following:

- Any malfunction of any control measures and/or environmental protection system;
- Any emission that does not comply with the requirements of the contract and relevant licences;
- Any circumstance with the potential for environmental pollution;
- Any emergency that may give rise to environmental effects: e.g. release or spill of hazardous substance such as fuel, oil, concrete or a flooding event caused by extreme rainfall.

As discussed in **Section 3.3.3** an emergency contact list will be established and made available to all construction staff employed. The contact list will be displayed prominently on site as well as at suitable locations where construction activity is being carried out around working areas. The contact list will include key environmental representatives that may need to be contacted in the event of an incident.

4.4.2.2 Spill Control Measures

Every effort will be made to prevent pollution incidents associated with spills during the construction of the proposed development. The risk of oil/fuel spillages will exist on the site and any such incidents will require an emergency response procedure.

The following steps provide the procedure to be followed in the event of an oil/fuel spill occurring on site:

- Identify and stop the source of the spill and alert people working in the vicinity;

- Notify the Environmental Manager immediately giving information on the location, type and extent of the spill so that they can take appropriate action;
- 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, 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;
- The Environmental Manager will inspect the site as soon as practicable and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring; and
- The Environmental Manager will notify the appropriate stakeholders such as Limerick City & County Council, National Parks and Wildlife Service, Department of Communications, Climate Action and Environment and Department of Housing, Planning and Local Government and/or the EPA.

Environmental incidents are not limited to just fuel spillages. Therefore, any environmental incident must be reported, recorded and investigated.

4.4.2.3 Emergency Incident Response Plan

A set of standardised emergency response procedures will govern the management of emergency incidents. The Contractor will be required to detail emergency incident response procedures and to develop an Emergency Incident Response Plan.

The Emergency Incident Response Plan will contain emergency phone numbers and the method of notifying local authorities, statutory authorities and stakeholders. Contact numbers for key personnel will also be included therein. Contractors will be required to adhere to and implement these procedures and ensure that all staff and personnel on site are familiar with the emergency arrangements.

In the case of work required in an emergency, or which if not completed would be unsafe or harmful to workers, the public or local environment, Limerick City & County Council will be informed as soon as reasonably practicable of the reasons and likely duration. Examples may include where the ground needs stabilising if unexpected ground conditions are encountered, concrete pouring taking longer than anticipated due to delayed deliveries or equipment failure.

In the event of an emergency incident occurring, the Contractor will be required to investigate and provide a report including the following, as a minimum:

- A description of the incident, including location, the type and quantity of contaminant and the likely receptor(s);
- Contributory causes;

- Negative effects;
- Measures implemented to minimise adverse effects; and
- Any recommendations to reduce the risk of similar incidents occurring.

The Contractor will consult with the relevant statutory authorities, stakeholders and relevant parties such as the Health and Safety Authority, the Fire Authority, the Ambulance Service, the EPA and utilities companies when preparing and developing response measures. Further, if any sensitive receptor is impacted, the appropriate environmental specialists will be informed and consulted with accordingly.

Any response measures will be incorporated into an updated Emergency Incident Response Plan that will be disseminated accordingly to construction staff, Limerick City & County Council and the Employer's Representative.

4.4.2.4 Emergency Access

The Contractor will be required to maintain emergency access routes throughout construction and identify site access points for each working area.

This will be developed in partnership with the emergency services and documented as part of the Emergency Incident Response Plan.

4.4.3 Extreme Weather Events

The Contractor will consider the effects of extreme weather events and related conditions during construction. The Contractor will use a short to medium range weather forecasting service from Met Eireann or other approved meteorological data and weather forecast provider to inform environmental control measures.

All measures deemed necessary and appropriate to manage extreme weather events will be considered and will specifically cover training of personnel and prevention and monitoring arrangements for staff. As appropriate, method statements will also consider extreme weather events where risks have been identified, e.g. construction works adjacent to public roads and business premises.

4.4.4 Unexpected Discoveries

Appropriate procedures will be put in place in the event of encountering unexpected archaeological or cultural heritage assets or subsurface contamination during intrusive ground works. However, archaeological test trenching, which was carried out by Aegis in October 2019, did not identify any features of archaeological interest. The *Archaeological Test Trenching & Impact Assessment Report* is included with the Part 8 documentation.

Control measures as described in **Section 6.5** will be implemented and the Environmental Manager will ensure that specialists (e.g. archaeologist) are facilitated to ensure management in accordance with industry best practice and effective compliance with the relevant legislation. All unexpected discoveries will

be reported to the appropriate authorities and documented in an appropriate manner.

4.5 Reporting

4.5.1 Environmental Compliance Report

The Contractor will be required to submit a monthly report to the Employer's Representative for review and approval. The report will include the items outlined in **Section 4.3.2**.

4.5.2 Incident Investigation Reports

The Contractor will inform the Employer's Representative of all emergency incidents immediately and prepare an initial report within 24 hours setting out the details of the incident and cause(s) if known. The Contractor will be required to complete the Environmental Incident Report and any further documentation requested by the Employer's Representative in relation to the incident within 7 days of the incident occurring. The Contractor will respond to all comments made by the ER on any incident.

The Environmental Incident Report will contain details of the incident including the location, known and suspected causes and weather conditions. It will define the scale and effects (short, medium, long term, temporary/permanent) as well as required corrective actions and control/ remediation/compensation measures (as appropriate).

4.6 Environmental Records

Records of all environmental documentation will be maintained including monitoring, test results, method statements and plans. All records will be kept up to date and be made available for audits, inspections and periodical reporting. The Contractor will maintain the following environmental records (as a minimum) that will be made available for inspection to the Employer's Representative and the relevant authorities, if required:

- Management Plans;
- Records of environmental incidents;
- Monthly environmental reports;
- Records of environmental training;
- Register of environmental complaints;
- Corrective Action Reports;
- Environmental inspection and audit reports;
- All monitoring data;
- Waste and chemical inventories; and

- Health and Safety records.

5 General Requirements

5.1 Good Housekeeping

A "good housekeeping" policy will be employed at all times. This will include, but not necessarily be limited to, the following requirements:

- General maintenance of working areas and cleanliness of welfare facilities and storage areas;
- Provision of site layout map showing key areas such as first aid posts, material storage, spill kits, material and waste storage, welfare facilities etc;
- Maintain all plant, material and equipment required to complete the construction work in good order, clean, and tidy;
- Keep construction compounds, access routes and designated parking areas free and clear of excess dirt, rubbish piles, scrap wood, etc. at all times;
- Details of site managers, contact numbers (including out of hours) and public information signs (including warning signs) will be provided at the boundaries of the working areas;
- Provision of adequate welfare facilities for site personnel;
- Installation of appropriate security, lighting, fencing and hoarding at each working area;
- Effective prevention of oil, grease or other objectionable matter being discharged from any working area;
- Provision of appropriate waste management at each working area and regular collections to be arranged;
- Excavated material generated during construction will be reused on site as far as practicable and surplus materials/soil, should it be deemed a by-product, will be recovered or if considered to be waste material, disposed of to a suitably authorised waste facility site;
- Effective prevention of infestation from pests or vermin including arrangements for regular disposal of food and material attractive to pests will be implemented. If infestation occurs appropriate action will be taken to eliminate and prevent further occurrence;
- Maintenance of wheel washing facilities at each of the construction compounds and other contaminant measures as required;
- No discharge of site runoff or water without agreement of the relevant authorities and an appropriate discharge licence, if relevant;
- Open fires will be prohibited at all times;
- The use of less intrusive noise alarms which meet the safety requirements, such as broadband reversing warnings, or proximity sensors to reduce the requirement for traditional reversing alarms;

- Maintenance of public rights of way, diversions and entry/exit areas around working areas for pedestrians and cyclists where practicable and to achieve inclusive access; and
- Material handling and/or stockpiling of materials, where permitted, will be appropriately located to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.

5.2 Working Hours

The timing of construction activities, core working hours and the rate of progress of construction works are a balance between efficiency of construction and minimising nuisance and significant effects.

The core construction working hours for the proposed development will be:

- 7am – 7pm: Monday to Friday; and
- 8am – 2pm: Saturday.

The hours above correspond to the current construction programme.

All rock breaking activities will be undertaken during daytime hours. The removal of waste material off site by road and regular deliveries to site will be generally confined to daytime hours but outside of peak traffic hours (i.e. 10am to 4pm).

It may be necessary in exceptional circumstances to undertake certain activities outside of the core construction working hours. Any construction outside of the core construction working hours will be agreed in advance with Limerick City & Council Council and scheduling of such works will have regard to nearby sensitive receptors.

5.3 Security

Adequate security will be provided to prevent unauthorised entry to or exit from any working areas. The following measures may be used to prevent unauthorised access:

- Install CCTV and alarm systems where required;
- CCTV and security systems will be sited and directed so that they do not intrude into occupied residential properties;
- Provide adequate security guards and patrols;
- Consult with neighbouring properties and local crime prevention officers including Limerick City & Council Council and An Garda Síochána on site security matters as required; and
- Prevent access to restricted areas and neighbouring properties by securing equipment on site such as scaffolding and ladders.

5.4 Hoarding and Fencing

A site boundary hoarding will be established around each of the construction compounds and associated working areas before any significant construction activity commences.

The hoarding, which will be 2.4m high and have a density of at least 7kg/m^2, will provide a secure boundary to what can be a hazardous environment for those that have not received the proper training and are unfamiliar with construction operations.

Site hoarding will also perform an important function in relation to minimising nuisance and effects including:

- Noise emissions (by providing a buffer);
- Visual impact (by screening the working areas, plant and equipment); and
- Dust minimisation (by providing a buffer).

The erection of hoarding will be of a similar nature to that provided on most construction sites. Mounting posts will be erected by using a mini-digger and the posts will be set in concrete. The hoarding will be positioned appropriately within the works area to minimise the noise transmitted to nearby receptors from plant, equipment and vehicles entering or leaving the working area.

Where practicable, hoarding and fencing will be retained and re-configured and re-used between working areas as the construction activities progress.

Mammal gates, which will be designed in accordance with TII standards[5], will be incorporated into the hoarding. These will be located wherever external hedgerows intersect the site hoarding and will facilitate the continued movement of mammals across the construction site.

The following measures will be applied in relation to hoarding and fencing:

- Maintenance of adequate fencing and hoardings to an acceptable condition to prevent unwanted access to working areas and provide noise attenuation, screening, and site security where required;
- Appropriate sight lines/visibility splays will be maintained around working areas to ensure safety of both vehicles and pedestrians is preserved;
- Use of different types of fencing and hoarding (e.g. mesh fence of solid hoarding including hoardings used for noise control);
- Temporary fences may be used in certain areas, such as for short term occupation of working areas;
- Display information boards with out of hours contact details, telephone helpline number (for comments/complaints) and information on the works;

[5] TII Publications (2009) *Specification for Road Works Series 300 - Fencing and Environmental Barriers*

- Erect notices on site boundaries to warn of hazards on site such as deep excavations, construction access, etc.;
- Ensure suitable measures for tree protection are implemented as required;
- Keep hoarding and fencing free of graffiti or posters;
- Retain existing walls, fences, hedges and earth banks as far as reasonably practicable; and
- Appropriate positioning of the fencing or hoarding to minimise the noise transmitted to nearby receptors or from plant, equipment and vehicles entering or leaving the working area.

5.5 Services and Lighting

5.5.1 Services and Utilities

Site services will be installed as part of the enabling works in parallel with the rearrangement and diversion of existing utilities. Working areas will be powered by mains supplies or diesel generators where an electrical supply is not available.

5.5.2 Lighting

Site lighting will typically be provided by tower mounted 1000W metal halide floodlights. The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting:

- Lighting will be provided with the minimum luminosity sufficient for safety and security purposes. Where practicable, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas;
- Motion sensor lighting and low energy consumption fittings will be installed to reduce usage and energy consumption; and
- Lighting will be positioned and directed as not to unnecessarily intrude on adjacent buildings and land uses, ecological receptors and structures, nor to cause distraction or confusion to passing motorists.

5.6 Welfare Facilities

Welfare facilities will be provided for construction staff and personnel such as toilets, lockers, showers etc. The construction compounds, located at the proposed public open spaces, will be used as the primary location for worker welfare facilities, however where required mobile welfare facilities will also be provided.

5.7 Reinstatement of Working Areas on Completion

All working areas and construction compounds will be closed and reinstated in line with the construction programme.

All plant, equipment, materials, temporary infrastructure and vehicles will be removed at the earliest opportunity and the surface of the ground restored as near as practicable to its original condition.

5.8 Health and Safety

All health and safety, fire safety and security requirements will be provided for in co-ordination with Limerick City & County Council. The Construction Traffic Management Plan (**Section 6.1)** will protect the public in the vicinity of the working areas during the construction phase of the works and will include all suitable temporary signage, barriers and hoarding as necessary.

All construction staff and operatives will be inducted into the security, health and safety and logistic requirements on site prior to commencing work.

All contractors will be required to progress their works with reasonable skill, care and diligence and to proactively manage the works in a manner most likely to ensure the safety, health and welfare of those carrying out construction works, all other persons in the vicinity of the working areas and interacting stakeholders.

All aspects of works and project facilities will comply with legislation, good industry practice and all necessary consents.

The requirements of the Safety, Health and Welfare at Work Act 2005 (Government of Ireland, 2005), the Safety, Health and Welfare at Work (Construction) Regulations, 2013 (Government of Ireland, 2013), as amended, (the "Regulations") and other relevant Irish and EU safety legislation will be complied with at all times.

As required by the Regulations, a Health and Safety Plan will be formulated which will address health and safety issues from the design stages through to completion of the construction and maintenance phases. This plan will be reviewed and updated as required, as the development progresses.

In accordance with the Regulations, a 'Project Supervisor Design Process' has been appointed and a 'Project Supervisor Construction Stage' will be appointed as appropriate.

The Project Supervisor Construction Stage will assemble the Safety File as the project progresses. In response to Covid-19, the Contractor will follow the latest public health advice and identify and implement suitable control measures to minimise the risk of Covid-19 infection in the workplace. Such measures are to be communicated to all relevant employees and others at the place of work.

5.9 Cranage

The construction works will require the use of mobile cranes on site. The cranes will be required for the moving of building materials on site such as concrete pipes, reinforcement, precast concrete, steelwork, plant and general building materials.

Heavy machinery transport on the road network to and from the working areas will be restricted to outside of peak hours.

6 Environmental Management

This section describes the specific environmental requirements identified as part of the design and EIA Screening Report that will be adhered to during the construction phase.

It should be noted that the measures in this CEMP provide a summary of minimum requirements that will be developed as the project progresses. It is intended that the measures set out herein will be discussed in more detail with relevant stakeholders as required to support the identification of any additional measures to be taken account of during construction.

6.1 Construction Traffic Management Strategy

The Construction Traffic Management Strategy (CTMS) outlines the measures to be implemented in relation to traffic and transportation during construction. Prior to commencement of works the appointed Contractor will prepare a detailed Construction Traffic Management Plan (CTMP) to ensure that construction traffic will be managed and monitored safely and efficiently throughout the construction phase.

The CTMP will take cognisance of the measures identified below and any conditions of statutory approvals, attached to the proposed development. Given the proposed development will be constructed over a five-year period the Contractor will prepare a specific CTMP for each of the construction phases taking into consideration the continual development of the project such as the opening and closing of construction compounds, occupancy of residential units etc.

To access the site construction traffic will use Mungret Link Streets Project which is expected to be complete or close to completion prior to the commencement of construction of the proposed development.

Light vehicles, such as cars and vans, will be used by site operatives travelling to and from the site. Heavy Construction Vehicles (HCV) will be required to deliver general construction materials, such as concrete, to the site.

6.1.1 Site Access and Egress

Advanced warning signs, in accordance with *Traffic Signs Manual Chapter 8: Temporary Traffic Measures and Signs for Roadworks (August 2019)*, will be displayed on the approach to the site access locations a minimum of one week prior to construction works commencing. Signage will clearly indicate site access and the locations of the different compounds for site staff and deliveries.

All site access and egress points will be provided with adequate sight lines. Construction operatives will use the Mungret Link Streets Project, which is expected to be completed prior to works starting on site, thereby allowing access from both the east and west access points. If the Mungret Link Streets Project is not complete it is expected to be in the final phases which will not prevent site

access and impact the commencement of works on site. Completion of any remaining activities on the Mungret Link Streets Project (such as landscaping, signage, road markings etc.) will have no significant effect on the proposed development. All and any site access will be agreed with the Mungret Link Streets Project contractor in advance if required. The Mungret Link Streets Project will connect to the R510 and R859 respectively and will be fully complete prior to the occupation of the residential units.

Construction access for Phase 1 will be via the entrances provided as part of the Mungret Link Streets Project which is expected to be completed or close to completion prior to works starting on site. Access will be permitted from both the east and west access points.

For Phase 2 most of the construction traffic will enter and leave the site via the Mungret Link Streets Project, again by entrances provided in advance.

Finally Phase 3, which consists of the final 76 residential units will also be accessed via the entrances provided on the Mungret Link Streets Project. All construction traffic will be limited to the entrances provided to them for each Phase, and no construction traffic will enter or leave a completed Phase of the development.

A site boundary in the form of hoarding or fencing will be established around each of the construction compounds. The hoarding/fencing will be c. 2.4m high to segregate members of the public from the construction site.

6.1.2 Deliveries to Site

Deliveries of materials will be planned and programmed to ensure that the materials are delivered only as they are required at the working areas. Works requiring multiple vehicle deliveries, such as concrete pours, will be planned so as to ensure there will no queuing on the public roadways. Deliveries will be limited to outside of peak hours.

To avoid disruption to residents, local businesses and road users, the transport of abnormal loads to site will be done outside of peak traffic hours. Should any road closures be necessary on sections of the route to facilitate transport of abnormal loads, applications for these road closures will be advertised and will be carried out in accordance with the requirements determined by the Roads Department of Limerick City & County Council. Service providers will also be contacted to be advised that abnormal loads will be traveling along the nominated route and any overhead services (ESB and telecoms) will be temporarily diverted if necessary.

All necessary permits for transport of abnormal loads will be sought from the local authority, Transport Infrastructure Ireland (TII), and An Garda Síochána as appropriate. The contract haulage firm nominated for the transportation of the abnormal loads will undertake the preparation and lodging of these permit applications under the guidance of the Contractor. Any conditions attached to these permits will be fulfilled prior to transport to ensure safe and timely delivery of the items.

Transportation of the large prefabricated elements will be limited to off-peak hours to limit effects on traffic within the city. Routes and times will be agreed and coordinated with Limerick City & County Council and An Garda Síochána in advance.

6.1.3 Construction Traffic

The following measures will be implemented in relation to traffic and transportation during construction:

- Construction access to the site will be from the Mungret Link Streets Project, which will connect the R510 and R859;
- Deliveries of materials will be planned and programmed to ensure that the materials are delivered only as they are required at the working areas and will avoid peak hours for set-up and removal of equipment;
- Works requiring multiple vehicle deliveries, such as concrete pours, will be planned so as to ensure there will no queuing on the public roadways around the working areas;
- Deliveries of materials will be limited to outside of peak hours on the existing road network and/or likely commuter movement times;
- All trucks entering and exiting the working areas which are carrying materials which could become windborne will be covered with tarpaulin;
- Trucks will not be allowed to park on public roads either outside the working areas or on any of the approach roads leading to the working areas;
- All trucks entering the working areas will be restricted to suitable speed limits and will be directed to the relevant area by the Site Manager. Adherence to posted / legal speed limits will be emphasised to all staff / suppliers and contractors during induction training. Drivers of construction vehicles / HGVs will be advised that vehicular movements in sensitive locations, will be restricted to 60km/h or 30km/h, depending on sensitivities. Such recommended speed limits will only apply to construction traffic and will not apply to general traffic. It is not proposed to signpost such speed limits in the interest of clarity for local road users.
- Trucks required to wait at the working areas will switch off engines to avoid unnecessary fuel usage and noise;
- All trucks exiting the construction compounds will be required to pass through a wheel wash. All water from the wheel wash will be collected, treated to remove silt or other contaminants, and removed from site;
- Roads immediately adjacent to the construction compounds will be visually inspected on a daily basis and power swept and washed as and when required. Roads will be returned to their original condition or better following the works.

- Adequate parking will be provided at the construction compounds to avoid queuing at the site entrances and prevent disruption to neighbouring businesses and residences;

6.1.4 Construction Phases and Occupancy

As mentioned, following the completion of each construction phase and the subsequent occupancy of the residential units, the Contractor will update the CTMP to ensure the segregation of pedestrians/ cyclists/ other road users from construction traffic is maintained at all times. Where required footpaths and additional temporary pedestrian crossing points will be provided within the site.

The movement of traffic within the site will be managed through the use of signage, portable traffic lights or stop/go personnel.

6.2 Air Quality and Climate

Emissions to air during excavation, rock breaking, movement of construction traffic around site and construction will occur. Construction activities are likely to generate dust emissions, particularly during the site clearance, rock breaking and excavation stages.

The extent of the effects from dust emissions will be determined by the prevailing weather, the nature of the works and the distance to sensitive receptors. The focus of the control procedures will therefore be to reduce the generation of airborne material.

Standard environmental control measures will be implemented, as per guidance presented in the TII document *Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes* (TII, 2011). These will include the following:

- During dry periods when dust generation is likely or during windy periods, working areas and vehicles delivering material with dust forming potential will also be sprayed with water, as appropriate;
- Wheel-wash facilities will be provided with rumble grids to remove excess mud from wheels. These facilities will be located at the exit from the construction compounds and away from sensitive receptors, where possible.
- Stockpiles will be covered and located as far from sensitive receptors as possible;
- Control of vehicle speeds, speed restrictions and vehicle access; and
- Surrounding roads used by trucks to access to and egress from the site will be cleaned regularly using an approved mechanical road sweeper. Site roads will be cleaned on a daily basis.

In addition, the following measures will be implemented. These measures are based on best practice as outlined in the British Research Establishment (BRE) document *Controlling particles, vapour and noise pollution from construction sites* (BRE, 2003) and the Institute of Air Quality Management (IAQM) document

Guidance on the assessment of dust from demolition and construction (IAQM, 2016).

- Exhaust emissions from vehicles operating within the working areas, including trucks, excavators, diesel generators or other plant equipment, will be controlled through regular servicing of machinery;
- Areas where materials will be handled and stockpiled will be designed to minimise their exposure to wind – all stockpiles will be kept to the minimum practicable height with gentle slopes;
- There will be no long-term stockpiling within the working areas and storage time will be minimised;
- Material drop heights from plant to plant or from plant to stockpile will be minimised;
- Hoarding c. 2.4m high will be provided around the works to minimise the dispersion of dust from working areas; and
- Truck loads will be covered when carrying material likely to generate dust.

Employee awareness is also an important way that dust may be controlled on any site. Staff training and the management of operations will ensure that all dust suppression methods are implemented and continuously inspected.

6.3 Noise and Vibration

Specific noise abatement measures will be taken, to comply with the recommendations of BS 5228-1 and 2:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites: Noise and vibration* (BSI, 2014) and the *European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001* (EC, 2001).

The following specific measures will be implemented during the construction phase to ensure noise and vibration effects are minimised:

- The duration of rock-breaking activities will be minimised, with works being concentrated in the early part of each of the three phases of construction. For Phase 1, the duration of this activity will be approximately a month, for Phase 2 it will be approximately three months, with the works in the northern part of the site restricted to a month's duration. It is intended to remove rock identified in the lands of Phase 3 in Phase 2 to complete all these works in a practical manner.
- Noisy works will be restricted to daytime hours;
- Site representatives will be appointed to be responsible for matters relating to noise and vibration;
- Equipment will be switched off when not required and unnecessary revving of machinery will be avoided;
- Rubber linings will be used in chutes and dumpers etc. to reduce noise;
- Drop heights of materials will be minimised;

- Site equipment will be located away from sensitive receivers and will be enclosed;
- Keep internal haul routes well maintained and avoid steep gradients;
- Careful selection of equipment, construction methods and programming with the objective of reducing noise and vibration where possible. Only equipment, including road vehicles, conforming to relevant national or international standards, directives and recommendations on noise and vibration emissions, will be used;
- Plant and vehicles will be started sequentially rather than all together;
- Fitting suitable anti-vibration mountings where practicable, to rotating and/or impacting equipment;
- Using noise-control equipment such as jackets, shrouds, hoods, and doors, and ensuring they are closed;
- Locating plant, as far as is reasonably practicable, away from receptors or as close as possible to noise barriers or hoardings where these are located between the source and receptor;
- Regular and effective maintenance by trained personnel will be carried out to reduce noise and/or vibration from plant and machinery;
- Ensuring that all plant is maintained regularly to comply with relevant national or international standards and operation of plant and equipment that minimises noise emissions;
- Ensuring that air lines are maintained and checked regularly to prevent leaks;
- Designing all audible warning systems and alarms to minimise noise. Non-audible warning systems can be used in preference, i.e. cab-mounted CCTV or the use of banksmen. If required, ensure that audible warning systems are switched to the minimum setting required by the Health and Safety Authority and where practicable use 'white noise' reversing alarms in place of the usual 'siren' style reversing alert
- A c. 2.4m hoarding of density of at least 7kg/m^2 will be provided around construction works;
- Handling all materials, particularly steelwork, in a manner that minimises noise. For example, storing materials as far as possible away from sensitive receptors and using resilient mats around steel handling areas;
- During construction, regular inspections will be undertaken to ensure that the noise and vibration minimising methods, plant and control measures identified in the specimen design stage are adopted on site and are working effectively. If applicable, it is proposed that construction method inspections be integrated into any health and safety or quality surveillance regime;
- Site representatives will be appointed to be responsible for matters relating to noise and vibration; and

- Monitoring typical levels of noise and vibration during critical periods and at sensitive locations for comparison with limits[6],[7] and background levels e.g. rock-breaking during Phase 2 which is adjacent to Mungret Woods.

From the Standard, applicable daytime noise limits at sensitive receptors are 65dB $L_{Aeq.}$ An exceedance of this limit by more than 10dB is considered to be a significant impact.

In relation to vibration, the Standard identifies that a vibration level of 1.0mm/s can be tolerated if prior warning and explanation is given to residents. Levels of 10mm/s or more is 'likely to be intolerable for any more than a very brief exposure to this level'.

In the absence of additional noise control measures, it is likely that noise levels at the closest sensitive receptors will exceed the 65dB limit for periods of time during the rock breaking activity. To ensure this is properly controlled, the following specific measures will be implemented.

- A programme of noise monitoring will be implemented for the duration of the rock-breaking activities, focussed on the sensitive receptors closest to the most intensive rock-breaking activity.
- The construction contractor will erect acoustic screening local to the rock breaking activity, which will be specified and sized to ensure that off-site noise effects are compliant with the 65dB L_{Aeq} criterion. At a minimum, this will be required for the duration of this activity in the north-eastern part of the site.
- If the noise monitoring records exceedances of the limits, the rock-breaking activity will be suspended until enhanced acoustic screening is installed.

Notwithstanding these measures, the nature of rock-breaking activities means that there is still the potential for negative noise and vibration effects at the closest sensitive receptors while those activities are ongoing.

6.4 Biodiversity

6.4.1 Habitats and Flora

To accommodate construction of the proposed development the removal of three trees is required and approximately 7,523m^2 of hedgerow. The Contractor will appoint a Project Arborist who will prepare a site-specific Tree Protection Plan. This plan will set out specific measures for the protection of the remaining trees and root protection zones to avoid effects of construction on trees. Environmental control measures to be implemented include:

Pre-Construction Works

[6] BS 7385-2:1993 *Evaluation and measurement for vibration in buildings. Guide to damage levels from ground borne vibration.*
[7] *BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites –Vibration.*

- Project Arborist will be appointed for the duration of the proposed development and will make regular site visits to ensure that the required protection measures are in place and adhered to.
- All construction personnel will be briefed on the tree and hedge protection measures in place. Environmental buffers and exclusion zones to be easily identifiable.
- Trees and hedgerows identified for removal, including methodologies, will be agreed with the Project Arborist.
- Works will be carried out by appropriately trained personnel taking into account the recommendations of BS 3998 (2012).
- Prior to any construction works on site all trees and hedgerows to be retained will be protected by the use of protective barriers or ground protection. In order for the retained trees and hedgerows to be adequately protected on the site a construction exclusion zone will be identified. Additionally, areas that are designated for new plantings will be similarly protected with barriers being fit for the purpose of excluding construction activity
- Protective fencing will be c. 2.4m high and constructed in accordance with BS 5837 (2012). Alignment of fencing will be agreed with the Project Arborist and once erected will remain in place for the duration of the construction phase of the proposed development and will only be removed when all works are complete and incorporated into the finished landscape.
- Signs will be attached to the protective fences warning people to 'keep out'.

Construction Works

- During the course of the works special attention will be paid to ensure that the protective fences remain upright, rigid and complete at all times. The fences will be checked daily by the Contractor and any damage noted will be fixed immediately.
- Prior to the installation of any services, these are to be marked out on site for review by the Project Arborist and a detailed method statement is to be prepared by the installation contractor in conjunction with the Project Arborist on how these services are to be installed while providing protection to the vegetation being retained.
- If it becomes necessary to carry out works within the RPA of trees to be retained, such works will be discussed and agreed with the Project Arborist. All works will be carried out manually. Root pruning will be undertaken by an Arborist using proprietary cutting tools such as a secateurs or hand pruning saw. The ground within the RPA of these trees will be protected from damage as per the recommendations of BS 5837 (2012)[8]. The installation of ground protection in the form of a single thickness of scaffold boards on top of a compressible layer laid onto a geotextile may be acceptable.

[8] British Standard (BS 5837:2012) Trees in Relation to Design, Demolition and Construction-recommendations

- The existing ground level within the RPA of trees to be retained will be incorporated into the finished landscaped development. Where changes in levels occur, these will either be graded into the finished levels starting outside the RPA or alternatively, retaining wall structures will be used differentiating between the different levels.
- The following activities will not be permitted within the RPA, or the vicinity of the trees and hedgerows being retained.
    - Storage of plant/equipment, fuel, construction material, or the stockpiling of soil or rubble;
    - Burning of rubbish;
    - Washing of machinery;
    - Attaching notice boards, cables or other services to any part of the tree;
    - Using neighbouring trees as anchor points; and
    - Care will be taken when using machinery such as Tele-porters, cranes or other equipment close to trees so as not to damage the crown or any other parts.
- Following construction works, all retained trees and hedgerows will be re-examined by the Project Arborist and remedial works, where identified, completed.
- The Wildlife Amendment Act 2000 (S.46.1) provides that it is an offence to cut, grub, burn or destroy any vegetation on uncultivated land or such growing in any hedge or ditch from the 01 March to the 31 August. Exemptions include the clearance of vegetation in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided. Where possible, vegetation will be removed outside of the breeding season and in particular, removal during the peak-breeding season (April-June inclusive) will be avoided. This will also minimise the potential disturbance of breeding birds outside of the proposed development site boundary.

6.4.2 Fauna

There are no species-specific control measures included for the proposed works, however, to facilitate the continued movement of mammals across the construction site mammal gates will be located wherever external hedgerows intersect the site hoarding.

Potential indirect effects on faunal species could arise from water quality issues, environmental controls in relation to water quality are described in **Section 6.7**.

6.5 Archaeology, Architectural and Cultural Heritage

As part of the proposed development minor upgrade works to the observatory and existing site walls are to be carried out. Works to the observatory include the

installation of a new steel frame and vertical bar gate at the entrance and the construction of a sweeping path. Additionally, the fabric of the observatory is also intended for some repair and stabilisation works. Conservation and retention work to the existing site walls include the removal of vegetation, cleaning of joints and repointing.

The following specific measures will be implemented during the construction phase to ensure effects to the observatory and existing site walls are minimised:

- Protective fencing will be erected around the observatory and existing site walls to protect the structures from accidental damage. The fencing will remain in place for the duration of the construction phase and will only be removed when all works are complete and incorporated into the finished landscape.
- Prior to the commencement of works an assessment on the stability of the existing site walls will be carried out by a structural engineer. Based on the findings a comprehensive cleaning and conservation strategy will be prepared and undertaken by a specialist in this area. All vegetation will be removed, and care taken to the surrounding stone and mortar joints. Where mortar joints have deteriorated and decayed, a process for the repointing will be undertaken with regards to, raking out, washing, brushing, mortar mix and curing. The joints will be cleaned, and loose debris removed prior to repointing. A Natural Hydraulic Lime (NHL) mortar, to the appropriate specification, will be used for repointing, thereby adhering to good conservation practise of replacing like with like materials.
- All ground disturbances associated with the proposed development will be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works archaeological measures may be required, such as preservation in-situ or by record. The archaeologist will secure an excavation licence for monitoring in the event of an archaeological discovery. Any further measures will require approval from the National Monuments Service.
- Vibration monitoring will be implemented to ensure that the construction does not exceed the vibration limits[6, 7] for protected structures.
- Financial support and sufficient time within the construction programme will be provided at the outset of the proposed development to facilitate any excavation or recording of archaeological material that may be uncovered during the works. The construction programme will be developed and implemented to reflect this provision, to ensure the preservation of such archaeological material.

6.6 Land and Soils and Hydrogeology

The following standard best practice measures and construction techniques will be implemented to prevent soil contamination, sedimentation, run-off and pollutants from entering adjacent watercourses and contamination:

- Good housekeeping (daily site clean-ups, use of disposal bins, etc.) will be carried out on site during construction, and the proper use, storage and disposal of all substances and their containers will help prevent soil contamination. For all activities involving the use of potential pollutants or hazardous materials, there will be a requirement to ensure that the material such as concrete, fuels, lubricants and hydraulic fluids will be carefully handled and stored to avoid spillages. Potential pollutants will also be adequately secured against vandalism and will be provided with proper containment. Any spillages will be immediately contained, and contaminated soil removed from site and disposed of in a licenced waste facility.
- Chemicals will be stored in sealed containers and applied in such a way as to avoid any spillage or leakage
- Excavations in made ground will be monitored by an appropriately qualified person to ensure that any hotspots of contamination encountered are identified, segregated and disposed of appropriately. Care will be taken to ensure that the hotspot does not cross contaminate clean soils elsewhere throughout the sites.
- Best practice measures to prevent potential soil and water pollution incidents include adequate bunding for oil containers, wheel washers and dust suppression on site roads, and regular plant maintenance. A contingency plan for pollution emergencies will also be developed prior to the commencement of works and regularly updated, which will identify the actions to be taken in the event of a pollution incident. The CIRIA document recommends that a contingency plan for pollution emergencies will address the following:
    - Containment measures;
    - Emergency discharge routes;
    - List of appropriate equipment and clean-up materials;
    - Maintenance schedule for equipment;
    - Details of trained staff, location and provision for 24-hour cover;
    - Details of staff responsibilities;
    - Notification procedures to inform the relevant environmental protection authority;
    - Audit and review schedule;
    - Telephone numbers of statutory water undertakers and local water company; and
    - List of specialist pollution clean-up companies and their telephone numbers.
- Where at all possible, soil excavation will be completed during dry periods and undertaken with excavators and dump trucks. Topsoil and subsoil will not be mixed together. Monitoring of excavation during site clearance to ensure that the soils excavated for disposal are consistent with the relevant descriptions and classifications according to the relevant legislation.

- Ground settlement, horizontal movement and vibration monitoring will be implemented during the construction activities where required to ensure that the construction does not exceed the design limitations.
- Ground settlements will be controlled through the selection of a foundation type and method of construction which are suitable for the particular ground conditions.
- Earthwork operations will be carried out such that surfaces will be designed with adequate falls, profiling and drainage to promote safe run-off and prevent ponding which could lead to percolation to ground.

Section 6.7 provides further erosion and sediment control measures to be implemented.

6.7 Surface Water Management Plan

Best practice construction measures, which are in accordance with CIRIA (C532) – *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (2001)* will be implemented during construction of the proposed development.

6.7.1 Concrete Control Measures

Concrete will be used for foundations, wall forming structures and grouting of precast concrete. Wet concrete and cement are very alkaline and corrosive and can cause serious pollution to watercourses. The following measures will be implemented:

- Concreting works will be carried out in dry conditions where possible and concrete works will be strictly controlled and monitored;
- No concrete washout will be allowed to discharge to watercourses. Wash out of concrete trucks will not be permitted on site;
- Batch loads of concrete will be delivered, on an as needed basis, to pre-prepared hardstand areas to the roadside boundary of the site.
- A hardstand area of the site will be prepared as a temporary storage compound and construction preparation area.
- All concrete mixing and batching activities will be located in areas away from watercourses and drains;
- Small batch concrete loads will be delivered to specific construction locations by mini dumper or other enclosed contained system of transfer.
- Trucks that deliver concrete to site will be washed out at the supplier's facilities and not on site.
- A designated trained operator experienced in working with concrete will be employed during concrete pours.
- Disposal of raw or uncured waste concrete will be controlled to ensure no watercourses are impacted.

- Best practice in bulk-liquid concrete management addressing pouring and handling, secure shuttering / formwork, adequate curing times will be implemented.
- Wash water from cleaning ready mix concrete lorries and mixers may be contaminated with cement and is therefore highly alkaline, therefore, washing will not be permitted on site.

6.7.2 Fuel and Oil Management Plan

- A detailed spillage procedure will be put in place and all personnel will be trained with respect to the relevant procedures to be undertaken in the event of the release of any sediment, hydrocarbons into a watercourse. Spill kits will be maintained on site and relevant staff will be trained in their effective usage. All site personnel will be trained and aware of the appropriate action in the event of an emergency, such as the spillage of potentially polluting substances. In the event of spillage of any polluting substance and/or pollution of a watercourse, Limerick City & County Council and the NPWS will be notified.
- At the construction compounds, all fuels, oils and lubricants will be stored in a bunded area (110% capacity) protected from flood damage and inundation. In addition, a designated bunded refuelling area on an impermeable surface will be provided at the construction compounds.
- Containers will be properly secured to prevent unauthorised access and misuse. An effective spillage procedure will be put in place with all staff properly briefed. Any waste oils or hydraulic fluids will be collected, stored in appropriate containers and disposed of offsite in an appropriate manner.
- Refuelling of vehicles and mobile plant will take place at designated locations on an impermeable surface and from any drains or watercourses. A spill kit, including an oil containment boom and absorbent pads, will be on site at all time;
- Generators, diesel pumps and similar equipment will be placed in drip trays to collect minor spillages. These will be checked regularly, and accumulated oil removed;
- No vehicles will be left unattended when refuelling;
- Hoses and valves will be checked regularly for signs of wear and turned off when not in use;
- All vehicles will be regularly maintained, washed and checked for fuel and oil leaks;
- Leaking oil drums will be removed from site immediately and disposed of via a licensed waste disposal contractor;
- Any tanks or drums will be stored in a secure container or compound, which is to be kept locked when not in use. The contents of the tanks will be clearly marked on the tank, and a notice displayed requiring that valves and hoses to be locked when not in use.

- Oily water associated with construction activities will pass through an oil separator before discharging into the surface water drainage system.

6.7.3 Erosion and Sediment Control Measures

Construction works have the potential to generate sediment within the work area.

To prevent silt and sediment from entering the watercourses the following standard best practice measures and construction techniques will be implemented and monitored:

- All works undertaken will be fully consolidated to prevent run-off of silt;
- To minimise the potential for elevated silt levels in surface water run-off, the working area used during construction will be clearly outlined prior to the commencement of works and will be kept to the minimum area necessary to effectively complete the works.
- To reduce the risk of erosion vegetation will be retained where possible. Where deemed necessary, areas where vegetation has been removed, will be stabilised using hardstand materials (road base, bitumen seal, concrete, or similar).
- Sediment fences/silt traps will be provided at locations where surface water run-off may enter/leave the working areas. Where a sediment fence cannot be adequately installed due to presence of rock, alternative controls capable of ponding site runoff will be installed (e.g. sediment sock filled with sand).
- Excavations: Water will be prevented from entering local excavations by way of cut-off drains. Personnel and/or plant will not disturb water in a local excavation. If required, the means of dewatering excavations in the event there is ingress will include sediment filtration tanks, to ensure that any de-waterings do not increase background suspended solids levels in the environment.
- Dewatering, where required, will be passed through sediment filtration tanks. There will be no direct pumping of contaminated water from the works at any time;
- Spoil heaps: Small ($<100m^3$) topsoil/subsoil heaps will be located, protected and stabilised at the temporary construction compounds in a way that will avoid the risk of contamination of drainage systems and local watercourses. Stockpiles and adjacent drainage infrastructure will be monitored and maintained appropriately.
- Self-contained wheel wash facilities will be provided to protect watercourses from the carriage of silt on vehicles. Waste liquid will be contained and subsequently removed off-site for disposal at an appropriately permitted facility.

6.7.4 Foul Drainage

At the construction compounds, mobile welfare facilities such as vans, towed units or self-contained units will be provided for construction personnel with foul sewage disposed of by removal off-site to a licensed facility at regular intervals.

6.8 Construction Waste Management

The following measures will be implemented throughout the proposed development:

- Site clearance which includes the removal of trees and vegetation will be restricted to the winter months.
- Organic waste, such as trees and vegetation, will be removed from site by a waste collection permit holder and delivered to an authorised composting or organic waste facility.
- All spoil and excavated materials will be temporarily stored at designated areas.
- Possibilities for re-use of clean non-hazardous excavation material as fill on the site or in landscaping works will be considered following appropriate testing to ensure material is suitable for its proposed end use. Where excavation material cannot be re-used within the proposed works, every effort will be made to send material for re-use as a by-product, recovery or recycling so far as is reasonably practicable. Re-use as a by-product can be done under an Article 27 notification once the established EPA criteria for such re-use are met;
- Where excavation material may not be re-used within the proposed development or as a by-product the Contractor will endeavour to send material to a suitable waste permit facility or licensed soil recovery facility in accordance with relevant waste legislation.
- The Contractor will ensure that any off-site interim storage facilities for excavated material have the appropriate waste licences or waste facility permits in place.
- Waste disposal will be minimised so far as is reasonably practicable;
- Waste from the proposed development will be transported by authorised waste collectors in accordance with the relevant Irish waste legislation;
- Storage of materials which are vulnerable to damage by rain are covered and carefully handled to avoid undue damage;
- Waste from the proposed development will be delivered to authorised waste facilities in accordance with the relevant Irish waste legislation;
- Source segregation: Where possible, metal, timber, glass and other recyclable material will be segregated during construction works and removed off site to a permitted/licensed facility for recycling. Waste stream colour coding, and photographs of wastes to be placed in each container as required, will be used to facilitate segregation. Where waste generation cannot be avoided this will

maximise the quantity and quality of waste delivered for recycling and facilitate its movement up the waste hierarchy away from landfill disposal and reduce its environmental effect;

- Material management: 'Just-in-time' delivery will be used so far as is reasonably practicable to minimise material wastage;
- Supply chain partners: The Contractor will engage with the supply chain to supply products and materials that use minimal packaging, and segregate packaging for reuse;
- Waste Auditing: The quantity in tonnes and types of waste and materials leaving site will be recorded during the construction phase;
- Waste fuels/oils will be generated from equipment used on-site during construction and will be classified as hazardous waste. Such wastes will be stored in a secure, bunded area on-site prior to collection by a contractor who holds the appropriate waste collection permit;
- The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material, which is recovered, and which is disposed of.
- The site will be maintained to prevent litter and regular litter picking will take place throughout the site.
- The Contractor will record the quantity in tonnes and types of waste and materials leaving the site during the demolition works. The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material which is recovered and disposed of.
- Waste generated on site will be removed as soon as practicable following generation for delivery to an authorised waste facility.

6.8.1 Hazardous Waste

All hazardous waste such as paints, sealants and chemicals will be separately stored in a bunded location in an appropriate lockable container, prior to removal from site by an appropriate waste collection holder.

Even though the quantity of hazardous waste generated during the construction phase are expected to be small and not of significance, the following steps must be taken where hazardous waste is being transported from the proposed development to a hazardous waste recovery or disposal facility within the State:

- Waste transfer forms will be obtained by the waste producer from Limerick City & County Council's website and completed on-line before the waste is collected.
- A copy will be downloaded, printed and signed, accompanying the consignment of hazardous waste when it is in transit.

- On the load's arrival, the operator of the recipient disposal or recovery facility will log-in and complete the relevant details documenting the receipt of the waste.
- Export of hazardous waste from the proposed development outside of the State is subject to a Europe-wide control system founded on EU Regulation 1013/2006 on the Shipments of Waste (known as the Transfrontier Shipment Regulations), as amended. This legislation is supplemented by the Waste Management (Shipments of Waste) Regulations 2007, as amended, which makes Dublin City Council responsible for the enforcement of this regulatory system throughout Ireland. Export of hazardous waste from site outside the state should comply with the procedures set out in this legislation.

6.9 Population and Human Health

Measures which will be implemented to minimise effects on the general amenity of residents and businesses will include:

- The erection of directional and information signage where paths are temporarily closed;
- The provision of information to local residents and businesses during the construction phase;
- The provision of community liaison and nomination of personnel to manage community relations; and
- The preparation of an emergency response plan to cover foreseeable risks.

Industry-standard traffic management measures will be put in place to alleviate construction-related traffic disruptions. Refer to **Section 6.1** for further details.

Dust emissions will be controlled throughout the construction phase. Refer to **Section 6.2** for details of dust control measures.

Noise and vibration disturbance will also be minimised. Environmental controls are described in **Section 6.3** will be adhered to during the construction phase.

As required by regulation and legislation, a Health and Safety Plan will be prepared to address health and safety issues during the construction phase. This plan will be reviewed and updated as required, as the development progresses. The Project Supervisor Construction Stage will assemble the Safety File as the project progresses. Further details are provided in **Section 5.8.**

6.10 Material Assets

The Contractor will be responsible for putting measures in place to ensure that there are no interruptions to existing services and that all services and utilities are maintained unless this has been agreed in advance with the relevant service provider. All works near existing services and utilities will be carried out in ongoing consultation with the relevant utility company and will follow any requirements or guidelines they may have.

Further methods to be implemented by the Contractor to minimise the risk of damage to existing services will be as follows.

- Undertake their own surveys to establish full extent of underground services prior to the commencement of construction to support any surveys already undertaken as part of early design work and statutory consent applications
- The use of Ground Penetration Radar (GPR) and CAT (cable avoidance tool), to provide greater confirmation of the locations of existing assets;
- The use of trial holes, where required, again to provide greater knowledge on the exact location of existing assets;
- The implemented of environmental controls will minimise the risk of pollution of storm water run-off or groundwater. Refer to **Section 6.7** for further details.

7 Concluding Statement

It is intended that this CEMP will be expanded and further developed prior to the commencement of any construction activities on site. The CEMP is a dynamic document and will remain up to date for the duration of the construction period. The CEMP may need to be altered during the lifecycle of the construction period to take account of monitoring results, legislative changes, outcomes of third-party consultations etc.

Following appointment, the Contractor will be required to develop more specific Method Statements that are cognisant of the proposed construction activities, equipment and plant usage and environmental monitoring plan for the proposed development. This CEMP should not be considered a detailed Construction Method Statement as it will be the responsibility of the Contractor, appointed to undertake the individual works, in association with Limerick City & County Council, to implement appropriate procedures and progress this documentation prior to commencement of construction.