

Dún Laoghaire Rathdown County
Council

Coliemore Harbour Permanent Remedial Works

Construction Environmental
Management Plan

Issue | 29 April 2022

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It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.



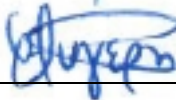
Job number 277645-00

Ove Arup & Partners Ireland Ltd

Arup
One Albert Quay
Cork
T12 X8N6
Ireland
www.arup.com

ARUP

Document verification

Job title		Coliemore Harbour Permanent Remedial Works		Job number	
				277645-00	
Document title		Construction Environmental Management Plan		File reference	
Document ref					
Revision	Date	Filename	Coliemore Harbour CEMP Issue.docx		
Issue	29 Apr 2022	Description	Issue for Planning		
			Prepared by	Checked by	Approved by
		Name	Elsie O'Gorman	Daniel Garvey	Ioannis Aygeris
		Signature			
		Filename			
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1 Introduction

1.1 Introduction

This Construction Environmental Management Plan (CEMP) has been prepared by Arup to support the Dún Laoghaire Rathdown County Council (DLRCC) application for consent for the proposed Coliemore Harbour permanent remedial works, hereinafter referred to as the ‘proposed development’.

The proposed development will comprise:

- Mobilisation and site set-up, including access to viewing platform and obstruction removal (bollards etc);
- Removal of temporary walkway to allow access for grouting;
- Pointing works to the harbour wall followed by compensation grouting behind the rock face to improve stability;
- Installation of up to 16 rock anchors from the suspended platform via a crane located on the viewing platform;
- Grouting of the rock anchors;
- Headplate installation, with grey olive metal rings welded to the top of the bars; and
- Resurfacing and reinstatement of the existing walkway.

DLRCC, as the developer, has appointed PJ Edwards & Co. Ltd. as the competent party (the ‘Contractor’) to oversee all aspects of the construction phase of the proposed development.

An outline design for the permanent remedial works has been carried out by Arup. The works will be carried out on a design and build basis. The PJ Edwards & Co. Ltd. proposal will largely follow the Arup scheme. PJ Edwards & Co. Ltd will subcontract the pre-condition survey and permanent designs to Byrne Looby Partners.

1.2 Overview of CEMP

This CEMP summarises the overall environmental management strategy that will be implemented during the construction of the proposed development.

Construction is considered to include all site preparation, enabling works, materials delivery, materials and waste removal, construction activities and associated engineering works.

This CEMP sets out the duties and responsibilities in relation to the environmental management of the project which will be imposed on the contractor in the construction contract.

DLRCC will ensure compliance with the mitigation measures set out in the Environmental Impact Assessment (EIA) Screening Report and Natura Impact Statement (NIS), prepared to support the application for approval of the proposed development, and will be responsible for ensuring that the contractor complies with all requirements of this CEMP.

This CEMP must be read in conjunction with the details of the proposed development and the mitigation measures described in the EIA Screening Report and NIS.

1.2.1 Purpose of the CEMP

The purpose of this CEMP is to provide a framework that describes how the mitigation measures described in the EIA Screening and NIS will be implemented in order to minimise the negative environmental effects of the construction of the proposed development. This CEMP has been produced, as part of the application for approval, to ensure compliance with the mitigation measures specified in the EIA Screening and NIS.

This CEMP identifies the minimum requirements with regard to the appropriate mitigation, monitoring, inspection and reporting mechanisms that need to be implemented throughout the construction phase. Compliance with this CEMP will not absolve DLRCC, and the Contractor (PJ Edwards & Co. Ltd.) from compliance with all legislation and bylaws relating to the construction activities.

1.2.2 Preparation of the CEMP

The CEMP has been prepared having regard to industry best practice guidance including:

- National Roads Authority; *Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan*; and
- CIRIA C741 *Environmental Good Practice on Site Guide* (4th Edition, 2015).

The CEMP has been prepared in conjunction with the EIA Screening Report and NIS.

1.2.3 Updating the CEMP

The CEMP is a working document. Prior to commencing the works on site, the CEMP will be further developed by the Contractor as follows:

- **Section 4**, which addresses Roles and Responsibilities, will be adjusted to reflect the contractor's construction team structure and will be populated with the names of the personnel filling the roles.
- The contractor's detailed method statements will be appended.
- If planning approval is granted for the proposed development, the planning decision, and the conditions attached to the decision, will be included.

- The Contractor's Environmental Management System (EMS) for the proposed scheme, which will align with ISO 14001:2015 – Environmental Management Systems, will be appended.

The CEMP will be complemented by the contractor's general procedures, work procedures and operations instructions. These documents will be in place in the site administration offices and at appropriate site locations during the works.

The CEMP is a dynamic document and the contractor will ensure that it remains up to date for the duration of the construction period. The CEMP will be updated during the construction period to include such matters as monitoring results, legislative changes and outcomes of third-party consultations. All of the requirements of the CEMP will be delivered in full by the contractor. The updating of the CEMP by the contractor will not affect the robustness and adequacy of the information presented here and relied upon in the NIS.

The contract documents will require the Contractor to submit the updated CEMP to DLRCC no more than 28 days after receiving notice of the Commencement of Works and at defined intervals thereafter.

1.3 Structure of the CEMP

This CEMP has been structured as follows:

- **Section 1** introduces the proposed development and explains the purpose of the CEMP;
- **Section 2** describes the proposed development;
- **Section 3** lists reference documents used in the preparation of the CEMP
- **Section 4** sets out the roles and responsibilities of the personnel tasked with managing the environmental requirements;
- **Section 5** outlines the procedures to be employed during construction to manage environmental aspects;
- **Section 6** describes the emergency response measures to be implemented to minimise likely significant negative effects, as far as practicable, during the construction of the proposed development.
- **Section 7** presents the community liaison plan
- **Section 8** presents the spill management measures
- **Section 9** describes the general environmental management measures on the construction site
- **Section 10** presents the mitigation measures for each environmental factor.

2 Description of the Proposed Development and Construction Activities

2.1 Overview

The proposed development will comprise the permanent remedial works for Coliemore Harbour, with a design aim for minimum intrusion. This includes the grouting and infill works, rock anchoring dentition of the voids utilising up to 16 rock anchors and reinstatement of the walkway and parapet as per original. An overview of the proposed development is shown in **Figure 2.1**.

It is recognised that Coliemore Harbour is of major historic importance as it is a Protected Structure. There is also a number of recorded monuments in close proximity to the harbour. Dalkey where the harbour is situated is considered an Architectural Conservation Area (ACA), therefore, it is considered a sensitive landscape which must be accounted for prior to any works in the harbour. The proposed development will provide a permanent solution to safeguard the integrity of the wall while ensuring minimum intrusion of the protected structure.

The proposed development will provide:

- Grouting and rock anchoring dentition of the voids by installing rock anchors from suspended platform via crane located on viewing platform, to ensure the integrity of the structure;
- The resurfacing and reinstatement of the existing walkway to its original condition, for safe use.

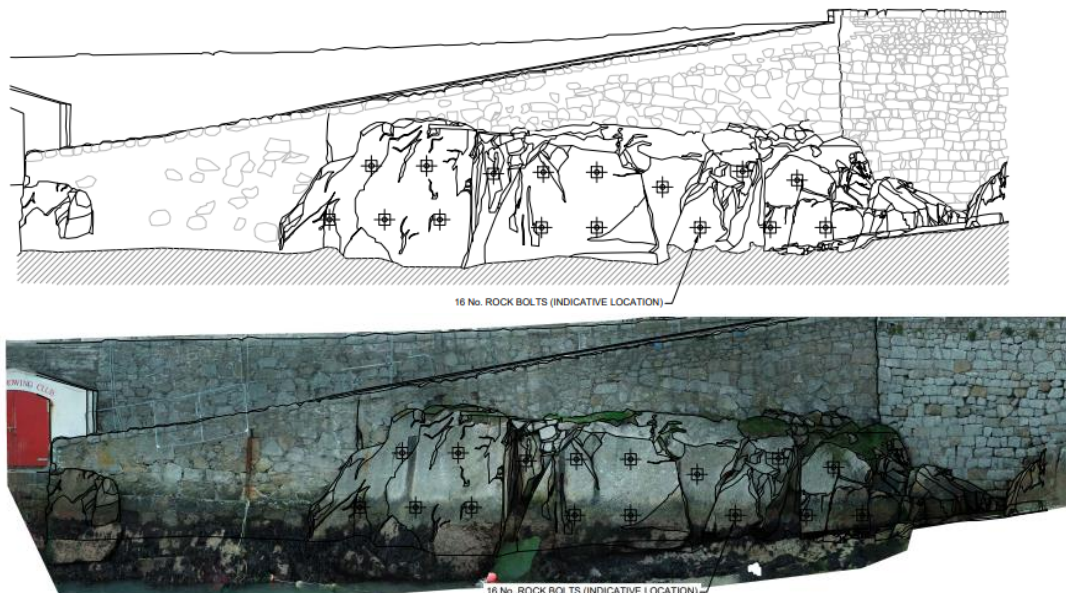


Figure 2.1: Overview of the Proposed Development | not to scale

2.2 Construction Activities

The construction program will be carried out over a period of 8 weeks, with specific construction activities outlined below.

2.2.1 Site Preparation

The temporary walkway will be removed, prior to works commencing. Two granite bollards will be removed from the viewing platform for accessibility. A single land traffic closure will be required for approximately four hours during this period. The laydown and works area will be secured.

2.2.2 Pointing

This initial step seals the stone masonry wall as much as possible, with the aim of limiting grout or water leaking from the masonry wall during the compensation grouting. A crane will be setup in a lifting position as shown below in **Figure 2.2**.

The crane will be set up on the adjacent platform and will lift the man basket into position above the rock face, directed by a banksman via 2-way radio communication. After cleaning, the operative will apply lime mortar to the small joints in the masonry wall using a trowel.

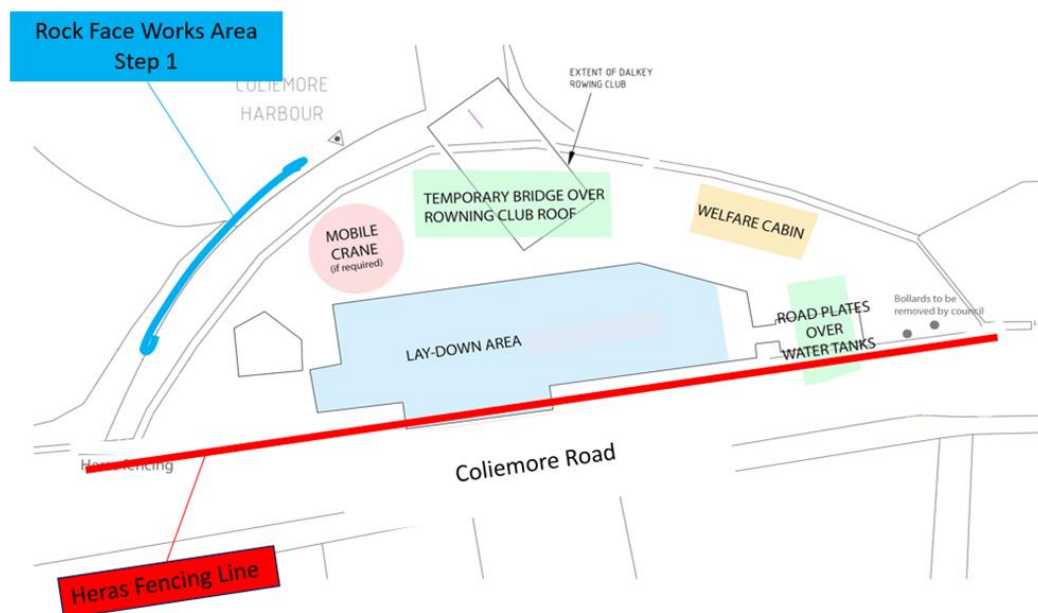


Figure 2.2: Site Set-up

2.2.3 Compensation Grouting

This secondary step fills the voids behind the rock face prior to rock anchor installation.

Grout injection will be carried out from the existing tarmac walkway via vertical holes drilled using a mini piling rig (Technodrill TD 308).

Grouting will be carried out in a bottom-up sequence as follows:

- Stage 1 grouting will be carried out in two rows along the walkway at 2m centres on either side of the walkway and to depth not exceeding 2m.
- Stage 2 grouting will be carried out in similar fashion but a 1 m centres and to depth not exceeding 6m.

Where larger voids are found sand filler will be used within the grout and the drill string will be removed and replaced with a 35mm grout lance. Measures will be taken to ensure that grout losses will be curtailed as far as possible to ensure minimal grout can enter the harbour.

2.2.4 Boring to Depth

The drilling rig is set up over the pin position by positioning the drilling head directly above setup position.

The required depth is achieved by means of rotary percussive driving of the drilling head fitted with rock bit (approximately 85 - 110mm). The “returns” are flushed out from the hole via swivel through the drilling head. This process uses air flushing to target depth to avoid spoil contaminating the surrounding environment / harbour water.

The pre-prepared hollow stem rods of the correct length and size are inserted into the bore holes. The additional lengths will be added in sections. The final depth will be checked by means of checking rod lengths.

2.2.5 Grouting of Pile

Grout is pumped through a hollow stem rod when drilling is completed, injecting grout at the bottom of the hole to displace any water and to ensure that the tendon is completely encased with grout. The grout is mixed in a Putzmeister SP11 mixer and pumped by the pumping operative. The grout pump will be bunded with heavy duty polythene to maintain onsite housekeeping.

The volume of injected grout per borehole will be recorded and noted on the daily report sheet.

If grout is detected to be rising to the top of the borehole, the drill rig operator will immediately direct the grout pump operator to stop pumping, to minimise liquid grout discharged to the surrounding area.

The bottom of walkway will be bunded to catch any flowing grout which escapes the top of the bores. Any escaped grout will be scraped up once it sets at the bund and will be disposed of offsite.

During compensation grouting, the operative will be in a man basket at the rock face, monitoring the rock joints for escaping grout. If grout leakage is detected, the operative will signal for the pumping to cease immediately, and the joint will be re-sealed.

Rods will be withdrawn from position at each location. On completion of all positions, the rock anchor installation can commence.

2.2.6 Installation of Rock Anchors

The purpose of this step is to install tie-back anchors which keep the rock mass in place for the design life duration. The access arrangements to the rock face will be via crane and man basket as outlined in **Section 2.2.1**.

The contractor will core a hole within the granite rock face to enable the headplate and rock anchor to be recessed flush to the rock face.

A cradle-mounted drill will be used to install the inclined anchors. The objective is to bore to depth by means of a rotary percussive drilling head using a compressed air as a flush for the bored materials and then to fill the resultant hole with grout and reinforcement.

The pile diameter is envisaged to be 85-110mm nominal diameter R51N DYWI type hollow stem pile founded with embedment into existing rock.

Boring to depth will be carried out as per **Section 2.2.3**, except the drill rod will be driven by a cradle-mounted unit rather than drill rig.

Grouting of rock anchors will be via standard procedure using natural hydraulic lime mortar mix or a 'prompt' mix which is a fast-setting mix to ensure the works set before high waters. Alternatively, a dry grout/resin capsule bored in with drill rod which is activated during drilling, will be used. It is likely the standard procedure will be used and is considered the worst-case option in terms of potential for grout leak/spill.

Once the headplate is installed, a grey olive metal ring will be welded to the top of the bar.

An indicative sketch of the proposed solution is presented on **Figure 2.3**.

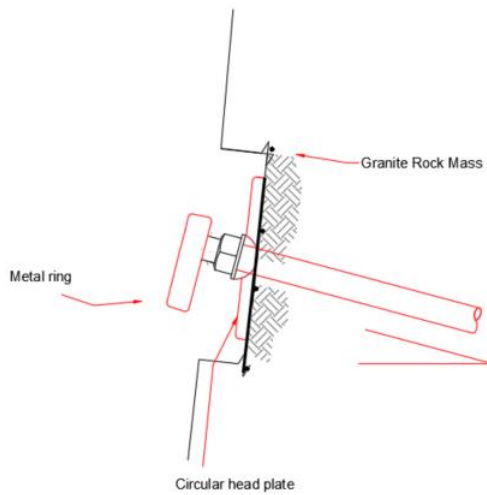


Figure 2.3: Indicative rock anchor sketch | not to scale

2.2.7 Reinstatement

The existing walkway will be resurfaced and reinstated to its original condition, for safe use, post completion of the works.

3 Reference Documents

This section provides a list of the reference documents which are relevant to the environmental management of the construction of the proposed scheme. The documents are divided into two categories, project specific reference documents and general reference and guidance documents.

3.1 Project Specific Reference Documents

The project specific reference documents are:

- Coliemore Harbour Permanent Remedial Works Natura Impact Statement, Scott Cawley (2022)
- Coliemore Harbour Permanent Remedial Works, Environmental Impact Screening (EIA) Screening Report, Arup (2022)

Other project specific reference documents will be included in this section when the contractor further develops the CEMP prior to the commencement of construction. These will include the construction contract documents, grant of planning permission and the conditions attached, the Health and Safety Plan, the Quality Plan and any other relevant project specific reference documentation.

3.2 General Reference and Guidance Documents

The general reference and guidance documents, listed below, indicate the best practice approach to addressing potential significant environmental impacts during construction. The list is non-exhaustive and will be updated by the contractor as some of the standards and documents may be revised or new guidance published prior to or during construction.

- British Standard Institute BS 5228 – 1: 2009 +A1 2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Noise.UK Environment Agency PPGs including PPG1, PPG2, PPG5, PPG6 and PPG21 (2009, 2014)
- British Standard Institute BS5837:2012, Trees in relation to design, demolition and construction. Recommendations.
- British Standards Institution PAS 2080:2016 Carbon Management in Infrastructure (2016)
- British Standard Institute BS 4428:1989 Code of practice for general landscape operations (1989)
- Construction Industry, Task Force B4 Report - Recycling of Construction and Demolition Waste (2001)
- CIRIA SP156 Control of water pollution from construction sites – guide to good practice (2002)
- CIRIA C532 Control of Water Pollution from Construction Sites. Guidance for consultants and Contractors (2001)

- CIRIA C584: Coastal and Marine Environmental Site Guide (2003)
- CIRIA C624 Development and Flood Risk – guidance for the construction industry (2004);
- CIRIA C648 Control of Water Pollution from Linear Construction Projects - Site Guide (2006)
- CIRIA C649 Control of water pollution from linear construction projects - Technical guidance (2006)
- CIRIA C741 Environmental good practice on site guide (4th edition) (2015)
- CIRIA C744 Coastal and marine environmental site guide (2nd edition) (2015)
- CIRIA C750 Groundwater control – design and practice (2016)
- CIRIA C762 Environmental Good Practice on Site pocket book (fourth edition) (2015)
- CIRIA X263 Brownfield development sites: ground-related risks for buildings (2002)
- Department of the Environment Heritage and Local Government Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects (2006)
- Department of Transport, Tourism and Sport Guidelines for Managing Openings in Public Roads (April 2017).
- Department of Transport, Tourism and Sport Traffic Signs Manual – Chapter 8 Temporary Traffic Measures and Signs for Roadworks (August 2019)
- EPA Guidance on Soil and Stone By-products in the context of article 27 of the European Communities (Waste Directive) Regulations 2011 (Version 3; June 2019).
- Inland Fisheries Ireland Guidance on Protection of Fisheries during Construction Works in and adjacent to waters (2016)
- ISO 14001:2015 Environmental management systems -- Requirements with guidance for use (2015)
- Kelleher, C. & Marnell, F Bat Mitigation Guidelines for Ireland: Irish Wildlife Manuals, No. 2' (2006).
- Local Government Management Services Board and Department of Transport Guidance for the Control and Management of Traffic at Roadworks – Second Edition (2010)
- National Roads Authority Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (2008)
- National Roads Authority Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Road Schemes, Revision 1 (2010)
- National Roads Authority Guidelines on the Management of Waste from National Road Construction Projects, Revision 1 (2014)

- National Roads Authority Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (2005)
- National Roads Authority Guidelines for the Treatment of Badgers Prior to the Construction of a National Road Schemes (2006a)
- National Roads Authority Guidelines for the Treatment of Bats during to the Construction of National Road Schemes (2008)
- National Roads Authority Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (2006b)
- Transport Infrastructure Ireland CC-SPW-00600 Specification for Road Works Series 600 -Earthworks (including Erratum No 1, dated June 2013) (2013)
- Transport Infrastructure Ireland GE-ENV-01104 The Management of Invasive Alien Plant Species on National Roads - Standard (2020)
- Transport Infrastructure Ireland GE-ENV-01105 The Management of Invasive Alien Plant Species on National Roads - Technical Guidance (2020)

4 Environmental Management Roles and Responsibilities

4.1 Overview

PJ Edwards & Co. Ltd will include a requirement for the contractor to comply with relevant documents including the NIS and EIA Screening Report, the conditions of the planning permission and other statutory consents, this CEMP and any updates to the CEMP.

As part of the environmental management framework in the construction contract, the contractor will have 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 will be given to the guidance and advice given by ISO14001 and Construction Industry Research and Information Association (CIRIA) guidance, listed in **Section 3** above.

PJ Edwards & Co. Ltd will be required to develop and implement an Environmental Management System (EMS) that follows the principles of ISO14001. The EMS will include an environmental policy, and operational, and monitoring procedures to ensure compliance with all environmental requirements and to monitor compliance with environmental legislation and the environmental management provisions outlined in the relevant documents.

4.2 Responsibilities

The environmental management responsibilities assigned to the key roles in the construction phase are described below. It should be noted that these roles will have other responsibilities on the construction project in relation to, for example, health and safety and compliance with quality standards. The Contractor's personnel will include other staff with specific roles such as the site safety officer.

4.2.1 Employer

DLRCC will ensure that competent parties are appointed to undertake construction and that sufficient resources are made available to facilitate the appropriate management of the risks to the environment.

4.2.2 Employer's Representative

Arup are the Employer's Representative (ER) for the project and have the following responsibilities:

- Monitoring compliance with the CEMP;
- Review and approve any updates to the CEMP proposed by the Contractor;

- Inspect the CEMP implementation measures put in place during the weekly site visits to ensure that construction impacts and nuisance on the environment are minimised.
- Supervise the construction of the scheme including monitoring the contractors' performance;
- Oversee the Contractor's liaison with key environmental agencies, the project stakeholders and the public during construction;
- Ensure that the construction is delivered as per the planning drawings and the Contractor's Detailed Design drawings (to be approved) and that the delivery of the proposed development meets the required design and H&S standards, and
- Undertake a final inspection of all reinstated areas at the end of the works following completion of reinstatement.

4.2.3 The Contractor

PJ Edwards & Co. Ltd. (the 'Contractor') will be responsible for the organisation, direction and execution of the construction activities during the construction of the proposed development. The Contractor will be required to undertake all activities in accordance with the relevant environmental requirements including the consent application documents and other regulatory and contractual obligations. The roles and responsibilities of the Contractor's staff in implementing the CEMP are summarised below.

4.2.3.1 Site Manager

A site manager will be appointed by the Contractor to oversee the day-to-day management of the working areas on site and ensure that construction activities are effective, safe, planned and delivered to the highest standards. The site manager will be a suitably qualified, competent and experienced professional who 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.

4.2.3.2 Environmental Manager

An environmental manager will be appointed by the Contractor to ensure that the CEMP is implemented effectively. The environmental manager will be a suitably qualified, competent and experienced professional who will perform the necessary tasks, review environmental procedures and consult with the members of the construction team and stakeholders as required. The environmental manager will be required to have a detailed level of knowledge on all aspects of environmental information associated with the proposed development. The environmental manager will be responsible for:

- Reviewing, updating, maintaining and implementing the CEMP;

- Establishing, implementing, and maintaining the EMS in line with ISO 14001 requirements;
- Ensuring that construction is undertaken 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 report on a monthly 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;
- Delivering general environmental awareness training and toolbox talks and provide specific environmental briefings prior to all activities
- Ensuring all personnel have undertaken adequate environmental inductions, and 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.

4.2.3.3 Contractor's Employees

The contractor's employees will have the following responsibilities with regard to environmental management on site:

- Complying with the relevant provisions of the CEMP;
- Complying with the directions and requirements given in the site induction;
- Proactively approaching environmental issues whilst on site;
- Reporting any environmental incidents/near misses immediately to the environmental manager;
- Carrying out all activities in line with the environmental procedures and requirements detailed in the CEMP.

4.2.3.4 General Subcontractors

The general sub-contractors will have the following responsibilities with regard to environmental management on site:

- Complying with the relevant provisions of the CEMP;
- Complying with the directions and requirements given in the site induction;
- Following control procedures as instructed;

- Carrying out all activities in line with the environmental procedures and requirements detailed in the CEMP;
- Reporting any environmental incidents/near misses immediately to the environmental manager.

4.2.3.5 Environmental Specialists Engaged by the Contractor

To fulfil its obligations under the CEMP and to support the environmental manager, the contractor will be required to engage suitably qualified and experienced professionals including the following competent experts:

- Archaeology and architectural heritage specialist; and
- Ecologist.

These specialist subcontractors will have the following responsibilities with regard to environmental management on site:

- Complying with the relevant provisions of the CEMP;
- Complying with the directions and requirements given in the site induction;
- Carrying out all activities in line with the environmental procedures and requirements detailed in the CEMP;
- Reporting any environmental incidents/near misses immediately to the environmental manager.

4.3 Contact Details

When the roles listed above have been assigned, contact details for the relevant personnel will be included in the CEMP. The contact details are required primarily in order to ensure a rapid response to, and the efficient reporting of, environmental incidents. The contact details will be maintained up to date. There will be three categories of contact details, (i) contractor's personnel, (ii) DLRCC contacts and (iii) statutory and third-party contacts. The contact details will include the organisation, job title, name, mobile phone number and email address of the relevant person.

5 Environmental Management Procedures

5.1 Training, Awareness and Competence

PJ Edwards & Co. Ltd. construction staff and their subcontractors are required to hold the relevant qualifications and experience to construct the project. The Contractor will be required to employ construction staff with the skills, qualifications and experience appropriate to the needs of the works to be carried out.

The Contractor will be required to provide a site induction to all construction staff before they commence work on site. The Contractor will identify specific training needs for the construction workforce and will ensure that appropriate training requirements are fulfilled.

The Contractor will be required to 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 requirements and consequences of non-compliance;
- The requirement of due diligence and duty of care;
- Overview of the conditions attached to the consents, permits and licences;
- Requirements associated with community engagement and stakeholder liaison;
- 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 the environmental induction. Signed records of environmental training received will be established, maintained and made available to the employer's representative.

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

5.2 Meetings

The environmental manager will be responsible for arranging and holding meetings and site walkovers. The environmental manager will prepare minutes of the meetings and distribute them appropriately.

5.3 Monitoring

5.3.1 Monitoring

Mitigation and monitoring will be carried out in accordance with the requirements of the NIS and EIA Screening so that construction activities are undertaken in a manner that does not give rise to significant negative effects. Prior to construction monitoring proposed in the NIS and EIA Screening and in **Section 9** below will be modified as required to incorporate conditions attached to the planning permission and will be documented in the CEMP.

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.

5.3.2 Corrective Actions

5.3.2.1 Overview

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

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 CEMP will be updated accordingly by the environmental manager and the employer's representative will be informed at the earliest opportunity.

5.3.2.2 Corrective Actions' Reports

A corrective actions' report will be prepared on foot of any non-conformances identified during environmental monitoring. 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 in the updated CEMP, as well as arrangements for the environmental manager to verify the corrective actions' report and, if appropriate, inform the appropriate authorities and stakeholders in a timely manner.

5.4 Environmental Compliance Report

The Contractor will be required to submit a monthly environmental compliance report to the employer's representative for review and approval. The report shall address the following as a minimum:

- Summary of compliance with the CEMP including identification of any non-conformances;
- Interpretation of the results of ongoing monitoring;
- Detailed description of any issues and/or non-conformances identified during inspections;
- Record of incidents and corrective actions, including corrective actions reports as appropriate;
- Synopsis of environmental complaints received / queries raised by stakeholders; and
- Records of environmental training undertaken as appropriate.

5.5 Environmental Records

The Contractor will maintain records of all environmental documents including monitoring, test results, method statements and plans. All records will be kept up to date and be made available for inspections and periodical reporting. The contractor will maintain the following environmental records, as a minimum, which 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 actions' reports;
- Environmental inspections;
- All monitoring data;
- Waste and chemical inventories; and
- Health and safety records.

6 Emergency Response Plan

6.1 Overview

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

- Any malfunction of a mitigation measure 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; or
- Any emergency that may give rise to environmental effects (e.g., significant spillages or fire outbreak).

Sections 6.2 and 6.6 below describes the mitigation measures which will be in place to minimise the risk of emergency incidents.

6.2 Emergency Response Plan

A set of standardised emergency response procedures will govern the management of emergency incidents. The contractor will be required to provide further detail of emergency response procedures in the updated CEMP, prior to construction, and to develop further this Emergency Response Plan.

The further detail, to be provided by the contractor, will include emergency phone numbers and the method of notifying local authorities, statutory authorities and stakeholders. Contact numbers for key site personnel will also be included. The contractor will be required to ensure that all 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 result in a situation which would be unsafe or harmful to workers, the public or the local environment, DLRCC will be informed as soon as reasonably practicable of the reasons and likely duration. Examples of such a situation include where the ground needs stabilising if unexpected ground conditions are encountered, or where the grouting activities take 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;
- Adverse effects;
- Measures implemented to mitigate the adverse effects; and

- Any recommendations to reduce the risk of similar incidents occurring.

The contractor will consult with the relevant statutory authorities and stakeholders such as the Health and Safety Authority, the DLRCC Fire Services, the HSE Ambulance Service, the EPA, and utility companies as required when preparing and developing response measures. If any sensitive environmental receptor is impacted, the appropriate environmental statutory authorities will be informed and consulted.

The response measures will be incorporated into the updated Emergency Response Plan that will be disseminated to construction staff and the employer's representative.

6.3 Emergency Access

The contractor will be required to maintain access routes for the emergency services in all work areas for the duration of the construction phase and to identify the emergency site access points to each work area.

These will be developed in consultation with the emergency services and documented by the contractor, as part of the updated CEMP prior to construction commencing, as well as being identified in the update Emergency Response Plan.

6.4 Extreme Weather Events and Flood Risk

The contractor will consider the impacts of extreme weather events, flood risk and related conditions during construction. The contractor will be required to use the short to medium range weather forecasting service from Met Eireann, or other approved meteorological data and weather forecast provider, to inform short to medium term scheduling of the works, environmental controls and mitigation measures.

The updated CEMP will include appropriate contingency measures to manage extreme weather events. The measures will include training of personnel and prevention and monitoring arrangements.

6.5 Fire and Explosion Risk

Even though the fire and explosion risk during construction are very low, the updated CEMP will include appropriate contingency measures to manage such risks. The measures will include training of personnel in fire and explosion risk awareness, prevention and monitoring. Portable fire extinguishers will be available for use at each of the working areas. Potentially flammable or hazardous substances will be stored appropriately and quantities stored will be limited to the minimum volume required to meet the immediate requirements.

Appropriate site personnel will be trained as first aiders and fire marshals. Monitoring of site activities to minimise fire and explosion risk will be a key part of the duties of the site safety officer and fire marshals.

6.6 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 an environmental incident report and any further documentation requested by the employer's representative in relation to the incident within seven days of the incident occurring. The contractor will respond to all comments made by the employer's representative 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 mitigation/ remediation/compensation measures (as appropriate).

7 Community Liaison Plan

7.1 Community Liaison Plan

DLRCC recognises the importance of effective community liaison in order to ensure public safety and welfare during the works, to reduce nuisance to residents and the local community, and to help ensure the smooth running of construction activities. To this end, this Community Liaison Plan has been prepared. The purpose of this plan is to ensure good relations with the neighbouring community. Key aims of the Plan are to:

- Provide frequent and timely information to the public during the construction phase, (particularly to nearby residents and building occupants);
- Appointment of a Liaison Officer as a single point of contact to engage with the local community and respond to concerns;
- Keeping local residents and businesses informed of progress and timing of particular construction activities that may impact on them;
- Provide the correct points of contact and be responsive to queries and complaints; and
- Ensure good housekeeping in all aspects of the operations on site to minimise nuisance.

The 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 nearby 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. The Community Liaison Plan will be updated by the contractor prior to construction and will specify obligations in relation to community and stakeholder engagement that the contractor must adhere to. Where communications are related to environmental issues, the environmental manager will be involved, if appropriate.

A significant part of the plan is the ‘good neighbour’ policy. Key aspects of this policy include:

- Implementation of the policy from the commencement of construction;
- Providing a point of contact for queries and complaints;
- Minimising causes of nuisance;
- Maintaining access to neighbouring premises;
- Clear and concise information, distributed widely and updated frequently; and
- Undertaking timely liaison with stakeholders.

With regard to liaison, the contractor will be required to comply with the Plan and develop it further with additional information, which will include providing the details of how the local community, road users and affected residents will be notified in advance of the scheduling of the temporary traffic diversions and the progress of the construction works.

Details of the available communication channels/points of contact for members of the public to contact the project team during construction will be established in advance of the commencement of construction and displayed around working areas. The contractor's additional details will include the following:

- Contractor's community relations policy;
- Personnel nominated to manage community relations, including the Community Liaison Officer;
- A methodology for processing observations, queries and complaints from the general public, relevant authorities, the media and emergency services; and
- The strategy for project-wide liaison with all relevant parties.

7.1.1 Advance Notice of Works

The 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. The contractor's detailed procedures and the responsible personnel will be identified in the CEMP, when it is updated by the contractor prior to construction.

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

7.1.2 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. The log will be available for inspection if requested by DLRCC. All observations, queries and complaints will be dealt with in a timely manner.

The complaints log will include details of

- Name and address of complainant
- Time and date complaint was made
- Characteristics, such as noise rumble, clatters, intermittent, etc.
- Likely cause or source of nuisance
- Weather conditions, such as wind speed and direction

- Investigative and follow -up actions

The employer's representative and the environmental manager will be immediately informed of any environmental-related issues that have been raised.

8 Spill Management Plan

8.1 Grout Management

8.1.1 General

Grouting works will be undertaken from a suspended man basket via crane located on the viewing platform. This will facilitate operatives to manually carry out the works on the seaward side. The grouting works will be carefully planned to minimise spillage into the harbour.

As the bedrock and harbour wall is exposed during low waters this work can be programmed within suitable tide times. Grouting of rock anchors will be via standard procedure using natural hydraulic lime mortar mix or a ‘prompt’ mix which is a fast-setting mix to ensure the works set before high waters. It is likely the standard procedure will be used and is considered the worst-case option in terms of potential for grout leak/spill.

Alternatively, a dry grout/resin capsule bored in with drill rod which is activated during drilling, will be used. The capsule, if used, would further reduce the risk of liquid grout leaking or spilling to the seawater. It will be determined by detailed design if this option can be used.

The volume of injected grout per borehole will be recorded and noted on the daily report sheet. Immediately when grout is detected to be rising to top of borehole, the drill rig operator will direct the grout pump operator to stop pumping, to minimise the liquid grout discharged to the surrounding area. The bottom of the walkway will be banded to catch any flowing grout which escapes to the top of the bores. Any escaped grout will be scraped from the bund once it sets and will be disposed of offsite to a permitted facility by a licenced contractor.

8.1.2 Pointing

During this first step, as much work as possible will be carried out with manually applied lime mortar mix. This pointing will seal any open joints in the stone masonry wall above the rock.

A natural hydraulic lime mortar mix or a ‘prompt’ mix which is a fast-setting lime mortar mix to ensure the works set before high water. The mortar mix will be mixed on viewing platform and carried in a bucket into works man basket by operative. The mixing area will be banded with heavy duty polythene to maintain housekeeping. To further prevent accidental spill or leaks of lime mortar into the sea during pointing works, either a toe board connected to the front of the man basket or hessian cloth secured to the seaward face of the wall can be provided.

Prior to pointing, vegetation will be removed and the jointed raked out and cleaned. Missing stones in the wall face will be replaced where possible to limit the amount of lime mortar required.

8.1.3 Compensation Grouting

The grouting mix will be mixed on viewing platform. The mixing area will be bunded with heavy duty polythene to maintain housekeeping.

During compensation grouting, operative will be in a man basket monitoring for escaping grout. If grout leakage is detected, operative will direct pump to cease immediately and joint will be resealed locally.

Care will be taken to make sure grout egressing from top of the borehole locations is collected and not allowed to enter the harbour. This will be achieved by bunding the bottom of walkway to prevent escape of surface runoff grout into harbour. The bunded grout will be allowed to set, then scraped up once in solid form and disposed of offsite by a licenced contractor.

If grout is detected to be rising to the top of the borehole, the drill rig operator will immediately direct the grout pump operator to stop pumping, to minimise liquid grout discharged to the surrounding area.

8.1.4 Grouting of Installed Rock Anchors

During this step, the contractor will use a natural hydraulic lime mortar mix which will be fast-setting (or potentially grout/resin capsules) to minimise quantity and duration of liquid grouting and risk of escaped liquid. The specific grouting solution will be confirmed in detail design.

8.1.5 Ecological Designated Sites Protection

The proposed development does not overlap with any European sites. The nearest European site to the proposed development is Dalkey Islands Special Protection Area (SPA), c. 93m east. The next nearest European site to the proposed development is Rockabill to Dalkey Island Special Area of Conservation (SAC) located c. 183m east. The proposed development is also hydrologically connected to European sites in Dublin Bay, including South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle SPA and Ireland's Eye SPA. The proposed development site overlaps with Killiney Hill pNHA.

The potential impacts on these ecologically sensitive sites will be addressed during construction through the following procedures:

- Fast-setting grout or mortar will be used.
- Bunds will be installed where practical, at bottom of walkway site to contain surface runoff to the seawater.
- A licenced waste collector will remove the accumulated wastewater off site and this will be confirmed by the Contractor to DLRCC with appropriate documentation retained.
- Measures will be put in place on the site compound, such as drip trays, spillkits and lined wastewater skips.

8.2 Pollution Control and Spill Prevention

Fuel/oil spillages can only occur on viewing platform or walkway, based on envisaged logistics. The Contractor will ensure that the following procedures are in place to control and/or prevent spills:

- Emergency response awareness training for all personnel on-site works.
- Grout machine, pressure washer and any fuel/oils on viewing platform laydown area will be stored in drip trays.
- Appropriate and sufficient spill control materials will be installed at strategic locations within the site. Spills kits for immediate use will be kept in on viewing platform.
- Spill kits must include suitable spill control materials to deal with the type of spillage that may occur and where it may occur. Typical contents of an on-site spill kit will include the following as a minimum;
 - Absorbent granules;
 - Absorbent booms; and
 - Absorbent mats/cushions.
- Potentially contaminated run off from plant and machinery on walkway will be contained by bunded area at end of walkway catching surface runoff. This will be disposed of offsite.
- Damaged or leaking containers will be removed from use and replaced immediately.
- Wastewater will be generated from washing out of pumps each evening after grouting. This will be collected in lined skip onsite and disposed of offsite.

8.3 Incident management

Should an environmental incident occur on-site the Contractor will record the event on an Environmental Incident Record. These records will include the following:

- Any malfunction of any environmental protection system,
- Any occurrence with the potential for environmental pollution,
- Any emergency.

The Environmental Incident Record will include relevant details associated with the incident and recommend measures which will prevent a similar incident occurring in the future.

The effectiveness of the amendments to the procedures and plans will be verified by the environmental site manager. A list of contact details for relevant personnel e.g., DLRCC, the local fire station etc. will be maintained in the site office. Access to the emergency phone list will be made available to all members of staff. The Contractor's staff will be informed of the emergency phone list at the tool-box talks.

9 General Site Management Requirements

9.1 Overview

As detailed in **Section 1**, the CEMP will be updated by the Contractor, who will include any specific conditions attached to the planning approval and other more detailed information available at the time, based on the contract requirements and the contractor's works proposals.

It will be the responsibility of the Contractor to ensure compliance with the CEMP and to avoid and/or reduce significant adverse effects on the environment that have been identified, where practicable. Where the Contractor diverts from the methodology outlined in the NIS and/or defined in the planning approval and its associated conditions, it will be the responsibility of the Contractor to obtain the relevant licenses, permits and consents for such changes.

9.2 Good Housekeeping

The Contractor will ensure “good housekeeping” at all times. This will include, but not necessarily be limited to, the following:

- 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, spill kits, material and waste storage and welfare facilities;
- Maintaining all plant, material and equipment required to complete the construction work in good order, clean, and tidy;
- Keeping construction compounds, access routes and designated parking areas free and clear of excess dirt, rubbish piles, scrap wood, etc. at all times;
- Provision of signs giving details of site management contact numbers, including out of hours, and public information 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;
- Prevention of infestation from pests or vermin including arrangements for regular disposal of food and material attractive to pests. If infestation occurs the contractor will take appropriate action to eliminate and prevent further occurrence;

- Maintenance of wheel washing facilities and other contaminant measures as required in each working area;
- No discharge of site runoff or water discharge without agreement of the relevant authorities;
- Prohibition of open fires at all times;
- 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;
- All loading and unloading of vehicles will take place off the public highway wherever this is practicable; and
- Material handling will be appropriately located to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.
- Any empty cement bags will be disposed of in site skip and grout pump will be banded with heavy duty polythene to maintain onsite housekeeping.

9.3 Hours of Work

9.3.1 Core Working Hours

The construction program will take place over a period of 8 weeks. The proposed core construction working hours (subject to agreement as part of the Road Opening License Process) for the proposed development will be:

- 8am to 6pm , Monday to Friday;
- 8am to 2pm on Saturdays, and;
- No works on Sundays and Public holidays

Drilling works will be carried out within these periods as required, dependent on the suitability of the tides.

All rock breaking/fracturing activities and pile driving will be undertaken during daytime hours. The removal of waste material off site by road and regular deliveries to site will be confined to daytime hours, from 10am to 4pm outside of peak traffic hours, where feasible.

9.3.2 Start-up and Shut-down

The Contractor may require a period of up to one hour before and one hour after core working hours for start-up and shut down activities in working areas. Activities permitted may include deliveries and unloading of materials, movement of staff to their place of work, maintenance and general preparation works. Excepted as noted in **Section 9.3.3** below, the use of plant or machinery likely to cause disturbance, will not be permitted outside of the core working hours.

9.3.3 Additional Working Hours

It may be necessary, for example, due to weather constraints, specialist subcontractor availability or the nature of the activity, to undertake certain activities outside of the construction core working hours. Any construction outside of the construction core working hours will be agreed by the Contractor in advance with DLRCC and scheduling of such works will have regard to nearby sensitive receptors, who will be notified in advance.

In the case of work outside of the core working hours required in an emergency or which if not completed would result in an unsafe or harmful situation for workers, the public or local environment, DLRCC will be informed as soon as reasonably practicable of the reasons and likely duration and timing.

In the case of works outside of the core working hours, any night works involving high level of noise should be carried out between 7pm and 11pm.

9.4 Site Security

The security of the works areas will be the responsibility of the Contractor who will provide adequate security to prevent unauthorised entry to or exit from any working areas. The following measures may be used to prevent unauthorised access:

- Installation 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;
- When there is no activity on site, closed and lock site gates and appropriate site security provisions;
- Consultation with neighbouring properties and local crime prevention officers including DLRCC and An Garda Síochána on site security matters as required; and
- Prevention of access to restricted areas and neighbouring properties by securing equipment on site such as scaffolding and ladders.

9.5 Hoarding and Fencing

A site boundary in the form of Heras fencing will be established around the working area before any significant construction activity commences in that working area. The fencing will be a minimum of 2.4m high to provide a secure boundary.

The Heras fencing will be typical of that used on most construction sites.

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

- Adequate fencing will be installed to prevent unwanted access to working areas and screening, and site security where required;

- Appropriate sight lines/visibility splays will be maintained around accesses to working areas from the public road to ensure safety of both vehicles and pedestrians is preserved;
- Display information boards will be provided with out of hours contact details, a telephone helpline number for comments/complaints and information on the works;
- Notices to warn of hazards on site such as construction access will be installed on site boundaries; and
- Hoarding and fencing will be maintained free of graffiti or posters.

9.6 Services and Lighting

9.6.1 Services and Utilities

Site services will be installed as part of the enabling works. Working areas will be powered preferably by mains supplies and by diesel generators where an electrical supply is not available.

9.6.2 Lighting

Site lighting will typically be provided by tower mounted temporary portable construction 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 so that it does not to unnecessarily intrude on adjacent buildings and land uses, ecological receptors and structures used by protected species, nor cause distraction or confusion to motorists.

9.6.3 Welfare Facilities

Welfare facilities will be provided, as appropriate, for construction staff and site personnel. The welfare facilities will be located at the temporary works area.

Drinking Water

Potable water will be transported via tanker to site or via large bottles. Typically, one delivery each week will be required for the provision of potable water.

Grey Water

Grey water for non-drinking purposes (construction and toilets) will be sourced via rainfall collection or transported via tanker to site.

Wastewater

Sanitary wastewater will be collected and stored on site in holding tanks, which will be emptied on a regular basis (typically bi-weekly) by licensed contractors and disposed of appropriately.

9.6.4 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. Storage of material will be at the supplier premises or at the temporary working area, depending on the type of material.

Works requiring multiple vehicle deliveries, will be planned so as to ensure queuing on the public roads around the working areas will be avoided as far as is practical.

Deliveries will, where feasible, be limited to outside of peak traffic hours on the local road network.

9.7 Reinstatement of Working Area on Completion

The Contractor will reinstate the working area post construction. All plant, equipment, materials, temporary infrastructure and vehicles will be removed at the earliest opportunity and the area restored as near as practicable to its original condition.

9.8 Health and Safety

The Contractor will be required to ensure all relevant health and safety, fire safety and security requirements are in place prior to the commencement of construction and in accordance with relevant legislative requirements in addition to the specifications of DLRCC.

Relevant Irish and EU health and safety legislation will be complied with at all times by all construction personnel during construction.

9.9 General Environmental Control Measures

Steps will be taken to reduce the probability of an incident, such as an accidental release, occurring and to also reduce the magnitude of any incident. These measures will include a combination of good site environmental management procedures, including additional precautions when operating machinery close to the harbour, staff training, contingency equipment and emergency plans.

All operatives will be informed of the relevant measures prior to starting on site. The environmental impact of these works is very significant to DLRCC and the community. Considerable attention will be given to the containment of all deleterious materials entering the harbour or injuring the amenity. In addition to risk assessment, the below measures will be undertaken.

Key measures identified to reduce the risk of pollution, erosion and sedimentation into the harbour include:

- Potential pollutant or hazardous substances will be adequately secured against vandalism and stored in accordance with appropriate codes of best practice;
- Oil and chemical storage will be in bunded areas and quantities stored will be limited to the minimum volume required to serve immediate needs with specified delivery and refuelling areas. All bunded storage areas will be a minimum distance of 10m away from the harbour;
- A designated bunded refuelling area on an impermeable surface will be provided at all construction compounds, again at a minimum distance of 10m away from the harbour;
- No vehicles will be left unattended when refuelling;
- Emergency spill kits including an oil containment boom and absorbent pads will be retained onsite at sensitive locations all the time work is under way;
- Should an incident be identified, work will cease and measures to contain and/or remove the pollutant will be identified;
- Silt traps will be employed and maintained in appropriate locations;
- All concrete mixing and batching activities will be located in areas away from the harbour;
- Grouting works will be carried out at low tide where possible and will be strictly controlled and monitored;
- No grout material washout will be allowed to discharge to the harbour.
- Care will be taken when cleaning out ('blowing out') grout lines, ensuring nobody is near the end of the line when blowing out and when disconnecting lines, ensuring no pressure is present (the pressure is released through the compressor);
- The pumpman to wear gloves, face mask and glasses at all times to prevent skin, lung and eye irritation from dust;
- When working from the suspended platform over water the appropriate PPE will be worn and specific risk assessments will be adhered to; and
- The drill rig driver and crew to wear hearing protection during drilling, in addition to standard PPE.

9.9.1 Response to a Spill or Leak

Every effort will be made to prevent pollution incidents associated with spills and leaks 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. The following steps describe 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 she/he 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;
- Clean up as much as possible of the spilled substance using the spill control materials;
- Collect all used spill control material and dispose of it appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited;
- The site compound fuel storage areas and cleaning areas will be rendered impervious and will be constructed to ensure no discharges will cause pollution to surface, coastal or ground waters;
- Designated locations for refuelling are within the site compound.

The environmental manager will inspect the site as soon as practicable following a spill and will ensure that the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring. The environmental manager will notify the appropriate stakeholders such as DLRCC, Department of the Environment, Climate and Communications and Department of Housing, Local Government and Heritage and/or the EPA.

10 Environmental Commitments

10.1 Introduction

The mitigation measures to reduce the impacts on the environment to a practical minimum and mitigation measures which are specified in the CEMP, which are additional to those described in **Sections 5 to 9** above, are described below.

10.2 Biodiversity

The employment of good construction management practice, as described in **Sections 5 to Section 9** above and in this section, will minimise the risk of adverse impacts on the biodiversity during the construction phase.

10.2.1 General Mitigation for Biodiversity

Every effort will be made to ensure that any significant environmental effects will be avoided, prevented or reduced during the construction phase of the proposed development.

All personnel involved with the proposed development will receive an on-site induction relating to operations and the environmentally sensitive nature of European sites and to re-emphasise the precautions that are required as well as the precautionary measures to be implemented. The workforce, including all subcontractors, will be suitably trained in pollution risks and preventative measures, as described in **Section 8** above.

All staff and subcontractors will have the responsibility to:

- Work to agreed plans, methods and procedures to eliminate and minimise environmental impacts,
- Understand the importance of avoiding pollution on-site, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact;
- Respond in the event of an incident to avoid or limit environmental impact;
- Report all incidents immediately to the environmental manager;
- Monitor the workplace for potential environmental risks and alert the environmental manager if any are observed; and
- Co-operate as required, with site inspections.

10.2.2 Mitigation – Water Quality During Construction

The employment of good construction management practices will serve to minimise the risk of pollution of soils, groundwater or surface water during construction.

The Construction Industry Research and Information Association (CIRIA) in the UK has issued a guidance note on the control and management of water pollution from construction sites, *Control of water pollution from construction sites. Guidance for consultants and contractors (C532)*. CIRIA. H. Masters-Williams et al (2001) and *Control of water pollution from linear construction projects. Technical guidance (C648)*. CIRIA. E. Murnane, A. Heap and A. Swain. (2006)

A set of standardised emergency response procedures will govern the management of emergency incidents, as outlined in the Emergency Response Plan in **Section 6** above. A detailed spillage response procedure will be put in place which is described in **Section 8** above.

Measures, as recommended in the guidance above, that will be implemented to minimise the risk of spills and contamination of soils and waters, include:

- All vehicles and plant will be regularly inspected for fuel, oil and hydraulic fluid leaks.
- Collection systems will be used to prevent any contaminated drainage entering surface water drains, watercourses or groundwater.
- The use of cleaning chemicals will be minimised.
- All staff will be trained and will follow vehicle cleaning procedures. Details of the procedures will be posted in the work area for easy reference.
- All the contractor's workforce will be trained with respect to the relevant procedures to be undertaken in the event of the release of any sediment or hydrocarbons into a watercourse.
- Works will be suspended during severe rainfall or flood events or when such events are forecast. This will make all activities and measures easier to implement and manage and will limit the potential for generation of sediment laden runoff.

Specific environmental control measures for construction run off and accidental spills to minimise the risk of the pollution of waters or the contamination of groundwater are described in **Section 8**.

10.2.3 Protection of Habitats

Works associated with the proposed development will not take place during the breeding bird season (March-August inclusive), to avoid any potential disturbance/displacement impacts on breeding tern species as a result of construction.

There will be a defined working area which will be fenced off to prevent inadvertent damage to adjoining habitats.

10.3 Surface Water Management Plan

10.3.1 Introduction

The employment of good construction management practice, as the mitigation measures will prevent impact on water quality described in in this section, will minimise the risk of adverse impacts on the hydrological regime, water quality and flood risk in the construction phase.

10.3.2 General Mitigation

Specific environmental control measures to minimise the effect on the hydrological regime, water quality and flooding, which will be implemented, include:

- Good housekeeping (site clean-ups, use of disposal bins, etc.) will be implemented on the site;
- No materials will be stored in areas which would impede flood flow paths;
- Weather warnings will be monitored during construction to ensure that there is no flood risk to construction workers. A risk assessment will be carried out in the case of a weather warning to determine what works can proceed, and what works need to be postponed;
- Road run-off will be channelled, to avoid potential ponding on roads during construction; and
- The temporary foul drainage at the construction compounds and works areas will comprise self-contained sanitary facilities, with wastewater stored and removed off-site to appropriately licensed treatment facilities.
- The required bore depth is achieved using air flushing to target depth to avoid spoil contaminating the surrounding environment / harbour water.

10.3.3 Monitoring of Construction Phase Mitigation Measures

Visual monitoring will be undertaken as part of the regular site inspections, during the construction of the proposed development to ensure existing surface water drainage runoff and natural infiltration to ground is not affected by the proposed development.

10.4 Land and Soils

The employment of good construction management practice, as described in **Section 5** to **Section 9** above and in this section, will minimise the risk of adverse impacts on the land and soils during the construction phase.

10.4.1 Runoff Control

Operations will be carried out such that surfaces will utilise adequate falls, profiling and drainage to promote safe runoff and prevent ponding and flooding.

Runoff will be controlled through control structures and spill control materials appropriate to minimise the water impacts. Care will be taken to ensure that surfaces are stable to minimise erosion. Measures to control runoff will comply with the requirements of **Section 8** above.

10.4.2 Surrounding Ground

Ground settlement, horizontal movement and vibration monitoring will be implemented during construction activities to ensure that the construction does not exceed the design limitations. Ground settlement will be controlled through the selection of construction methods which are suitable for the particular ground conditions.

10.4.3 Pollution of groundwater

Measures to be implemented to minimise the risk of spills and contamination of waters are described in **Sections 8** and **10.3** will also minimise the risk of pollution of groundwater.

10.4.4 Monitoring during construction

Movement monitoring shall be carried out during any activities which may result in ground movements or movements of the existing structure.

During grouting works, an operative will be in a man basket at the rock face, monitoring the rock joints for any escaping grout. If grout leakage is detected, the operative will signal for pumping to cease immediately, and the joint will be re-sealed.

10.5 Construction Waste Management Plan

10.5.1 Introduction

This Construction Waste Management Plan (CWMP) has been prepared having regard to the Department of Environment, Heritage & Local Government (2006) *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects*, EPA (2021) *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects - Draft for Public Consultation* and National Roads Authority (2014) *Guidelines on the Management of Waste from National Road Construction Projects, Revision 1*.

The contractor will further develop, implement and maintain the CWMP during the construction phase. The CWMP addresses:

- Waste management
- Waste minimisation
- Tracking and documentation procedures for off-site waste.

10.5.2 General Mitigation – Construction Waste

The key principles underlying the plan will be to minimise waste generation and to segregate waste at source. The measures to achieve these aims include:

- Where possible recyclable material will be segregated and removed off site to a permitted/licensed facility for recycling.
- Office and food waste arising on the construction compound will be source-separated at least into dry mixed recyclables, biodegradable and residual wastes.
- Waste bins, containers, skip containers and storage areas will be clearly labelled with the waste types which they should contain, including photographs as appropriate.
- The site will be maintained to prevent litter and regular litter picking will take place throughout the site.
- Material management ‘just in time’ delivery will be used so far as is reasonably practicable to minimise material wastage.
- The contractor will ensure that the material transported off site will go to an appropriately licensed/permitted facility.
- The contractor will record the quantity in tonnes and types of waste and materials leaving the site. 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.
- The recording of gate receipts for the licenced facility to which excavation and demolition wastes are brought is essential to ensure that waste materials removed from sites are properly disposed of and that site management is in compliance with statutory obligations under the Waste Management Acts 1996, as amended.
- All hazardous waste will be separately stored and labelled, in appropriate lockable containers, prior to removal from site by an appropriate waste collection holder.
- In the event that hazardous soil, or historically deposited hazardous waste is encountered during the work, the contractor must notify Dún Laoghaire Rathdown County Council, Environmental Enforcement Section, and provide a Hazardous/Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation or monitoring proposed, and destinations for authorised disposal/treatment, in addition to information on the authorised waste collector(s).
- Waste generated on site will be removed as soon as practicable following generation for delivery to an authorised waste facility.
- The contractor will minimise waste disposal so far as is reasonably practicable;

- Provision of a dedicated and secure compound, containing bins and skips into which all waste generated by construction site activities will be placed and designation of a single person with responsibility for provision of signage and verbal instruction to ensure proper housekeeping, maintenance of records and segregation of construction waste materials;
- Waste Auditing: The contractor will record the quantity in tonnes and types of waste and materials leaving site during the construction phase;
- Any empty cement bags generated as waste and will be disposed of in a separate skip which shall be disposed of offsite by licensed waste haulier;
- 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 haulier who holds the appropriate waste collection permit. The quantities of hazardous waste generated during the construction phase are expected to be small and not of significance.

10.6 Noise and Vibration

The employment of good construction management practice will minimise the risk of adverse impacts from the noise and vibration during the construction phase. There is potential for low levels of noise and vibration to be generated from certain construction activities.

Noisy activities associated with the construction of the proposed development include the use of equipment such as a grout mixer and pump, mobile telescopic crane, hand-held pneumatic rock drill, and hand-held pneumatic breaker. The following mitigation measures will be implemented for the construction phase of the proposed development as good practice.

10.6.1 General

This Noise and Vibration Management Plan will be updated by the contractor, prior to construction, to include any specific conditions attached to the approval and other specific construction information, but will at a minimum, include the measures described below.

Mitigation measures will be employed to ensure that potential noise and vibration impacts at nearby sensitive receptors due to construction activities are minimised. The preferred approach for controlling construction noise is to reduce source levels where possible, but with due regard to practicality.

The effect of noise and vibration on nearby human sensitive receptors will be minimised through an effective communication strategy, which is discussed in **Section 7**.

Noise and vibration will be reduced by limiting the daily time that equipment generating high levels of noise and/or vibration is operated.

However, it is acknowledged that sometimes a greater noise/vibration level may be acceptable if the duration of the construction activity, and therefore length of disruption, is reduced.

There is no potential for more than one of any of the noisiest pieces of equipment (namely the grout mixer and pump, mobile telescopic crane, hand-held pneumatic rock drill, and hand-held pneumatic breaker) to be in operation at the same time.

10.6.2 Good Industry Practice

Good industry standards, guidance and practice procedures (i.e., compliance with the Considerate Contractors Scheme) will be followed in order to minimise noise and vibration effects during construction. The measures implemented will ensure that potential impacts relating to noise nuisance, disturbance and vibrational impacts are effectively minimised, controlled and monitored to ensure that site construction activities do not have an adverse or unacceptable impact on local receptors, adjacent property, adjacent users and human health and on the wider receiving environment.

Noise and vibration will be minimised through the adoption of good industry practice as standard working practices across the working areas whenever practicable. The following measures will be adhered to where practicable throughout the construction programme:

- Rubber linings shall be used to reduce impact noise;
- Drop heights of materials will be minimised;
- The contractor will ensure that all plant complies with the relevant statutory requirements;
- Construction plant and activities to be employed on site will be reviewed, where feasible, to ensure that they are the quietest available for the required purpose;
- Vehicles and mechanical plant used for the purpose of the works will be fitted with effective exhaust silencers and will be started sequentially rather than all together;
- Plant will be maintained in good working order so that extraneous noise from mechanical vibration, creaking and squeaking is kept to a minimum;
- Machines in intermittent use will be shut down or throttled down to a minimum when not in use;
- Compressors will be fitted with properly lined and sealed acoustic covers which will be kept closed whenever in use.
- Pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers;
- Where possible, the use of impact tools will be avoided;
- Wherever possible, equipment powered by mains electricity will be used in preference to equipment powered by internal combustion engine or locally generated electricity;

- Generators will be enclosed and they and other static plant will be located away from sensitive receivers, where feasible;
- The construction activities including rock breaking activities will not take place outside of the standard working hours as outlined in **Section 9.3.1.**;
- No part of the works nor any maintenance of plant will be carried out in such a manner as to cause unnecessary noise except in the case of an emergency when the work is absolutely necessary for the saving of life or property or the safety of the works; and
- Noise emitting machinery which is required to run continuously will be housed in a suitable acoustically lined enclosure.

10.6.3 Communication Strategy

The nuisance effect of noise and vibration on nearby sensitive receptors can be minimised through a good communication strategy. Sometimes a greater noise level may be acceptable if the duration of the construction activity, and therefore length of disruption, is reduced. The Community Liaison Plan is described in **Section 7** above.

10.6.4 Noise and Vibration Monitoring

Maximum noise levels of 97dB_LA_{eq} are predicted to occur at a distance of 10m from the proposed works for relatively brief periods of time. This is a worst-case scenario, principally associated with the operation of a hand-held pneumatic breaker and a hand-held pneumatic rock drill at the same time. The Contractor will monitor noise levels during these peak periods of operating this equipment to ensure that these predicted noise levels are not exceeded.

- Prior to the commencement of the proposed site works noise monitors stations shall be installed and maintained by a suitable qualified specialist firm to provide continuous noise monitoring to measure and record the impact of site activities on local receptors.
- All noise monitoring data shall be compiled into a weekly technical report which will include a full assessment of the noise impacts arising from site construction activities.
- Trigger limits at which remedial action will be taken and maximum limits at which work will be suspended should be clearly set out.
- Should construction noise trigger limits be approached or exceeded appropriate measures shall be implemented to address the issues raised.

The contractor will adhere to any conditions imposed by the planning approval which impose a noise and vibration monitoring requirement. Monitoring data will be made available to DLRCC at an appropriate frequency.

10.7 Air Quality

10.7.1 Introduction

The employment of good construction management practice, as described in **Section 5 to Section 9** above and in this section, will minimise the risk of adverse impacts on the air quality during the construction phase.

All operations on-site shall be carried out in a manner such that air emissions do not result in significant impairment of, or significant interference with amenities or the environment beyond the site boundary.

A dust management plan will be implemented for the proposed development as outlined in **Section 10.7.3**.

10.7.2 Construction Phase Mitigation Measures

It is envisaged that no significant dust will be generated as a result of the proposed works. Any dust generated during the works would be an inert material. The following mitigation measures will be implemented for the construction phase of the proposed development as good practice.

10.7.2.1 Site Management

- All dust and air quality incidents and complaints will be recorded, the cause(s) will be identified, appropriate measures to reduce emissions will be taken in a timely manner, and the measures taken will be record.
- Site fencing, barriers and scaffolding will be maintained clean using wet methods.

10.7.2.2 Operating Vehicle/Machinery

- All vehicles will switch off engines when stationary - no vehicles will idle.
- Mains electricity or battery powered equipment will be used where practicable and the use of diesel-powered generators avoid, where practical.
- Adherence to posted / legal speed limits will be adhered to. Drivers of construction vehicles will be advised that vehicular speeds in sensitive locations, such as local community areas, will be restricted to appropriate levels.

10.7.3 Dust Management Plan

Dust arising from construction activities will be mitigated by implementation of the dust management plan.

Employee awareness is an important way that dust may be controlled on a construction site.

Staff training and the management of operations will ensure that the dust suppression methods, described below, are implemented and continuously inspected.

The following dust mitigation measures will be implemented by the contractor:

10.7.3.1 Preparing and maintaining the working areas

- The site layout at working area will be planned so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Site fencing, barriers and scaffolding will be maintained clean using wet methods.
- An adequate water supply for effective dust/particulate matter suppression/mitigation will be supplied on the working areas.

10.7.3.2 Site Operations

- Only cutting, grinding or sawing equipment, fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems, will be used.
- Enclosed chutes and conveyors and covered skips will be used.
- Drop heights from loading or handling equipment will be minimised and fine water sprays will be used on such equipment wherever appropriate.
- Sand and other aggregates will be stored in bunded areas and will not be allowed to dry out, unless this is required for a particular process, in which case appropriate additional control measures will be put in place.
- Materials, that have a potential to produce dust, will be removed from site as soon as possible, unless being re-used on site. If they are being re-used on-site, they will be covered as described below.
- A wheel washing system, with rumble grids to dislodge accumulated dust and mud, will be used prior to leaving the site where reasonably practicable.
- Water-assisted dust sweeper(s) will be use on the access and local roads, to remove, as necessary, any material tracked out of the site.
- Should dust occur during drilling, water sprays can be added to suppress this dust.

10.7.3.3 Monitoring

- A programme of air quality monitoring shall be put in place at the site boundaries for the duration the construction activities to ensure that the air quality standards as set out in the Air Quality Standards Regulations (2011) relating to dust deposition, specifically PM₁₀, are not exceeded.
- Measures to ensure that where levels exceed specified air quality limit values, dust generating activities cease and alternative working methods are identified and implemented.

- The selection of sampling point locations will be completed after consideration of the requirements of Standard Method VDI 2119 (Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Institute) including the consideration of the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures. The optimum locations will be determined by a suitably qualified air quality expert to ensure that dust gauge locations are positioned in order to best determine potential dust deposition in the vicinity of site boundaries and existing buildings.
- Technical monitoring reports detailing all measurement results shall be subsequently prepared and maintained on site.

10.8 Climate

The employment of good construction management practice, as described in **Section 5** to **Section 9** above and in this section, will minimise the risk of adverse impacts on the climate during the construction phase.

The following mitigation measures will be implemented for the construction phase of the proposed development:

- Low carbon construction materials will be used, where feasible;
- Site management and transport will be as energy efficient as is feasible;
- Resources will be managed efficiently to tackle inefficiencies across the supply chains, overuse of resources (e.g., materials, energy and water) and waste generation.

10.9 Material Assets

The employment of good construction management practice, as described in **Section 5** to **Section 9** above and in this section, will minimise the risk of adverse impacts on the material assets during the construction phase.

The contractor will put measures in place to ensure that there are no interruptions to existing services unless this has been agreed in advance with the relevant service provider. Further methods that will be used to mitigate the risk of damage to existing services will be as follows:

- All works near existing services and utilities will be carried out in consultation with the relevant utility company or local authority and will follow any requirements or guidelines they may have;
- The contractor will ensure that that all necessary site and service investigations have been carried out, utility drawings obtained, and utility enquiries complete prior to commencing works;

- The contractor will ensure that the existing infrastructure beneath the viewing platform (comprising an existing storm tank and pumping chamber, flowmeter and wash-water tanks, 160mm diameter rising main and 450mm diameter emergency overflow) will be protected throughout the works by ensuring that no HGV vehicles or crane tacks on or over the existing services infrastructure and the choice of crane entry point and operational position based on avoiding this infrastructure;
- The spreader mats and beams for load distribution across crown of rowing club arched roof will be used when the crane is tracking onto viewing platform to move into the operational position and when the crane is de-mobilising. The crane operation position is situated away from top of rowing club;
- The contractor will liaise with asset owners to agree clearances and where necessary.

10.10 Landscape and Visual

The employment of good construction management practice, as described in **Section 5 – Section 9** above and in this section, will minimise the risk of adverse impacts on the landscape and visual amenity during the construction phase.

Following completion of the works, all working areas will be returned to their original form, with only temporary visual effects to the appearance of the rock surface until natural weathering processes and recolonisation by maritime flora help to blend interventions into the surrounding rock face. The temporary barriers will be removed.

10.11 Archaeology, Architectural and Cultural Heritage

The appropriately-finished rings to be fixed to the rock anchors will have a minor effect on the overall visual amenity of the harbour; however, the nineteenth-century form and masonry finish will remain unchanged by the proposed works.

The proposed development will utilise the appropriate-coloured steel rings on the heads of rock anchors, as outlined above, which will be the only legible element of the works. The rings will allow for ongoing monitoring and adjustment of the rock anchors as well as ensuring durability while reducing visual impact in comparison to other potential measures.

The design of the proposed development incorporates measures for minimal intrusion. During the construction phase, all precautionary measures will be taken to ensure no damage to the existing structure during the construction operations, as outlined in **Section 5 to 9** and **Section 10.4**.

10.12 Construction Traffic Management Plan

10.12.1 Introduction

The Contractor shall undertake consultation with DLRCC's Roads Control section in order to obtain a Road Opening License to carry out the works which will require the CTMP with detailed of expected road closures. The license will be in place for the duration of the works.

Following consultation with An Garda Síochána and DLRCC's Roads Control section, the Construction Traffic Management (CTMP) will be further developed by the contractor, prior to the commencement of construction, to ensure that construction traffic will be managed and monitored safely and efficiently throughout the construction phase.

10.12.1.1 Purpose and Scope

This Construction Traffic Management Plan will be a key construction contract document, the implementation of which will reduce possible impacts which may occur during the construction of the proposed scheme.

The objectives of this CTMP are to:

- Outline minimum road safety measures to be implemented at the site access/egress locations and at the approaches to such access/egress locations, during the works;
- Demonstrate to the contractor and suppliers the need to adhere to the relevant guidance documentation for such works; and
- Provide the basis for the contractor to further develop the details of this CTMP.

The employer's representative will be responsible for ensuring that the contractor manages the construction activities in accordance with this CTMP.

Objectives and measures are also included for the management, design and construction of the project to control the traffic impacts of construction insofar as it may affect the environment, local residents and the public in the vicinity of the construction works.

In the event that the approval is granted for the proposed development, the CTMP will address the requirements of any relevant conditions, including any additional mitigation measures which are conditioned. The CTMP (updated by the contractor prior to construction to incorporate these conditions) will require approval from the DLRCC and An Garda Síochána.

The objective of this CTMP is to ensure that the residual impacts to the public road network during the construction phase of the proposed development are minimised and that transport related activities are carried out as safely as possible and with the minimum disruption to other road users. The CTMP has also been prepared for the purpose of identifying appropriate and safe methods of access for construction traffic to the proposed scheme.

This CTMP describes the traffic management for the transportation of construction materials, equipment and personnel along the public road network to facilitate the construction of the proposed development. Light vehicles, such as cars and vans, will be used by site operatives travelling to and from the site.

There will be a small number of Heavy Construction Vehicles (HCV) required to deliver general construction materials to the site and for the removal of material that is to be disposed of off-site.

This CTMP will remain a live document that will be reviewed by the contractor and updated, where necessary, throughout the construction phase.

10.12.1.2 Implementation

All site personnel will be charged with following good practice and will be encouraged to provide feedback and suggestions for improvements. Site personnel will also be required to ensure compliance with the requirements of the site's CTMP.

10.12.1.3 Document Revision

The CTMP will be subject to on-going review throughout the construction phase of the proposed scheme, and site inspections.

All of the information required to further develop the CTMP will be highlighted in the specification for the construction contract. The contractor will be required to include further details and/or confirmation, as described below.

10.12.2 Proposed Construction Traffic Generation

10.12.2.1 Overview

The potential temporary impacts of the scheme on the road network are as follows:

- Temporary impacts associated with the importing of construction materials to the works areas, and the relevant movements of delivery and construction vehicles and construction workforce;
- Single lane closure on Coliemore Road adjacent to the pier and viewing platform for approximately 4 hours to facilitate the removal of the temporary walkway;
- Construction staff commuting to and from the construction compound; and
- General service traffic associated with construction activities (i.e. plant deliveries, visitors, traffic between compounds and working areas, etc.)

10.12.2.2 Envisaged Construction Equipment

Construction equipment and vehicles required for each construction element/operation will be delivered to site by appropriate vehicles.

Specific equipment and vehicles which are deemed to be required for the proposed development by the principal contractor, suppliers and staff are to be confirmed and included in the CTMP. The contractor will keep his working space to a minimum and pedestrian access to adjacent properties will be maintained at all times.

10.12.3 Matters to be Addressed in More Detail

The contractor will be required to ensure that the contents of this CTMP are further developed prior to the commencement of works. The contractor will implement monitoring measures to confirm the effectiveness of the mitigation measures outlined in the CTMP. The updated CTMP will address the following issues:

- Site/works area access and egress;
- Traffic management signage;
- Timings of material deliveries to site;
- Traffic management speed limits;
- Road cleaning;
- Vehicle cleaning;
- Road condition;
- Road closures;
- Enforcement of traffic management plan;
- Emergency procedures during construction;
- Variable Message Signage at strategic locations is reflected to facilitate advance notice to key stakeholders.
- Workers parking;
- Damages to adjacent public roads arising from works and
- Communication.

These items are explained in detail in the remainder of this section of the plan.

10.12.3.1 Site Access and Egress

The proposed site access location will be identified and the contractor will provide advanced warning signs, in accordance with Department of Transport's 'Traffic Signs Manual, Chapter 8: *Temporary Traffic Measures and Signs for Roadworks* (August 2019), on the approaches to proposed site access locations, a minimum of one week prior to construction works commencing at that location.

In addition, Traffic Management Operatives will control access/egress of Heavy Construction vehicles HCV of the site during the works.

10.12.3.2 Road Network

Where possible higher order roads will be the preference for haul routes. This does not apply to construction personnel.

It is likely that the following local and regional roads will be utilised as haul routes during the construction period:

- R119
- R829
- Coliemore Road.

10.12.3.3 Traffic Management Signage

The Contractor will undertake consultation with the relevant authorities for the purpose of identifying and agreeing signage requirements. Such signage will be installed prior to works commencing on site.

Proposed signage will include warning signs to provide warning to road users of the works access/egress locations and the presence of construction traffic. All signage will be provided in accordance with the Department of Transport's 'Traffic Signs Manual, Chapter 8: *Temporary Traffic Measures and Signs for Roadworks* (August 2019).

In summary, the contractor will ensure that the following elements are implemented:

- Consultation with the relevant authorities for the purpose of identifying and agreeing signage requirements;
- Provision of temporary signage indicating site access route and locations for contractors and associated suppliers; and
- Provision of general information signage to inform road users and local communities of the nature and locations of the works, including project contact details.

10.12.3.4 Timings of Material Deliveries to Site

In order to reduce impacts on local communities and residents adjacent to the proposed sites:

- The contractor will liaise with the management of other construction projects in the area and the local authorities to co-ordinate deliveries;
- The contractor will schedule deliveries in such a way that construction activities and deliveries activities do not run concurrently, where practicable;
- The anticipated deliveries will be via pickup truck or van to minimise frequency of large vehicles/HGVs accessing site area;

- The contractor will schedule deliveries to and from any proposed compound such that traffic volumes on the surrounding road network are kept to a minimum;
- A construction phase programme of works will be developed by the contractor in liaison with the DLRCC, specifically taking into account potential road repair works that are included in the local authority's road works schedule;
- Deliveries will be suspended on the days of any major local events, etc. that have the potential to cause larger than normal traffic volumes in the overlap areas;
- The contractor will liaise with members of the local community to ensure that construction-related traffic will not conflict with sensitive events such as funerals;
- Specific construction moratoria (for example, certain busy periods) as indicated by DLRCC will be respected and incorporated into the construction phasing programme; and
- Construction activities will normally be undertaken during daylight hours for all construction stages.

10.12.3.5 Traffic Management Speed Limits

Adherence to posted / legal speed limits will be emphasised to all staff and suppliers and contractors during induction training. Drivers of construction vehicles will be advised that vehicular speeds in sensitive locations, such as local community areas, will be restricted to appropriate levels.

Special speed limits will be implemented for construction traffic in sensitive areas. Such recommended speed limits will only apply to construction traffic and not to general traffic.

10.12.3.6 Enforcement of Traffic Management Plan

All project staff and material suppliers will be required to adhere to the CTMP. The contractor will agree and implement monitoring measures to confirm the effectiveness of the CTMP and compliance will be monitored by the supervising employer's representative. Regular inspections / spot checks will also be carried out to ensure that all project staff, material suppliers and hauliers follow the measures specified in the CTMP.

10.12.3.7 Emergency Procedures During Construction

The contractor will ensure that unobstructed access is provided for all emergency vehicles along all routes and site accesses.

The contractor will provide to DLRCC and the emergency services, the contact details of the contractor's personnel responsible for construction traffic management.

The site must have in operation a radio-controlled system for emergencies in order that certain vehicles, i.e., ambulances, fire brigade, security envoys, state cars, etc., can travel through the site uninterrupted.

In the case of an emergency which occurs off site all construction traffic will be notified of the incident and location.

10.12.3.8 Communication

The contractor will ensure that close communication with DLRCC and the emergency services is maintained throughout the construction phase.

The contractor will also ensure that the local community is informed of proposed traffic management measures in advance of their implementation. Such information will contain the contractor's contact information for members of the public to obtain additional information and to provide additional knowledge such as local events, sports fixtures etc. which may conflict with proposed traffic management measures.

10.12.4 Conclusions

This CTMP will form part of the construction contract and is designed to reduce possible impacts which may occur during the construction of the proposed development.

The CTMP will be further developed by the contractor following consultation with An Garda Síochána and DLRCC.

The Employer representative will be responsible for ensuring that the contractor manages the construction activities in accordance with this CTMP and will ensure that any conditions of planning are incorporated into the site specific CTMP.

10.13 Population and Human Health

The implementation of this CEMP will minimise the effects of construction works on the local population, as outlined below.

- The environmental management procedures, described in **Section 5** and the general site management requirements, specified in **Section 9** above, will minimise the nuisance and inconvenience caused to the local population for the duration of the construction works.
- The Emergency Response Plan, **Section 6**, above, will address all foreseeable construction risks.

11 References

- British Standard Institute *BS 5228 – 1: 2009 +A1 2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Noise.UK Environment Agency PPGs including PPG1, PPG2, PPG5, PPG6 and PPG21* (2009, 2014)
- British Standard Institute *BS5837:2012, Trees in relation to design, demolition and construction. Recommendations.*
- British Standards Institution *PAS 2080:2016 Carbon Management in Infrastructure* (2016)
- British Standard Institute *BS 4428:1989 Code of practice for general landscape operations* (1989)
- Construction Industry, Task Force B4 Report - *Recycling of Construction and Demolition Waste* (2001)
- CIRIA SP156 *Control of water pollution from construction sites – guide to good practice* (2002)
- CIRIA C532 *Control of Water Pollution from Construction Sites. Guidance for consultants and Contractors* (2001)
- CIRIA C584: *Coastal and Marine Environmental Site Guide* (2003)
- CIRIA C624 *Development and Flood Risk – guidance for the construction industry* (2004);
- CIRIA C648 *Control of Water Pollution from Linear Construction Projects - Site Guide* (2006)
- CIRIA C649 *Control of water pollution from linear construction projects - Technical guidance* (2006)
- CIRIA C741 *Environmental good practice on site guide (4th edition)* (2015)
- CIRIA C744 *Coastal and marine environmental site guide (2nd edition)* (2015)
- CIRIA C750 *Groundwater control – design and practice* (2016)
- CIRIA C762 *Environmental Good Practice on Site pocket book (fourth edition)* (2015)
- CIRIA X263 *Brownfield development sites: ground-related risks for buildings* (2002)
- Department of the Environment Heritage and Local Government *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* (2006)
- Department of Transport, Tourism and Sport *Guidelines for Managing Openings in Public Roads* (April 2017).
- Department of Transport, Tourism and Sport *Traffic Signs Manual – Chapter 8 Temporary Traffic Measures and Signs for Roadworks* (August 2019)

EPA Guidance on Soil and Stone By-products in the context of article 27 of the European Communities (Waste Directive) Regulations 2011 (Version 3; June 2019).

Inland Fisheries Ireland Guidance on Protection of Fisheries during Construction Works in and adjacent to waters (2016)

ISO 14001:2015 Environmental management systems -- Requirements with guidance for use (2015)

Kelleher, C. & Marnell, F Bat Mitigation Guidelines for Ireland: Irish Wildlife Manuals, No. 2' (2006).

Local Government Management Services Board and Department of Transport Guidance for the Control and Management of Traffic at Roadworks – Second Edition (2010)

National Roads Authority Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan (2007)

National Roads Authority Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (2008)

National Roads Authority Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Road Schemes, Revision 1 (2010)

National Roads Authority Guidelines on the Management of Waste from National Road Construction Projects, Revision 1 (2014)

National Roads Authority Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (2005)

National Roads Authority Guidelines for the Treatment of Badgers Prior to the Construction of a National Road Schemes (2006a)

National Roads Authority Guidelines for the Treatment of Bats during to the Construction of National Road Schemes (2008)

National Roads Authority Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (2006b)

Transport Infrastructure Ireland CC-SPW-00600 Specification for Road Works Series 600 -Earthworks (including Erratum No 1, dated June 2013) (2013)

Transport Infrastructure Ireland GE-ENV-01104 The Management of Invasive Alien Plant Species on National Roads - Standard (2020)

Transport Infrastructure Ireland GE-ENV-01105 The Management of Invasive Alien Plant Species on National Roads - Technical Guidance (2020)