



Appendix 6

Appendices

Appendix 6.1 Construction Environmental Management Plan

Appendix 6.2 Preliminary Design Drawings - Selection

Appendix 6.3 Preliminary Design Report

Appendix 6.1 Construction Environmental Management Plan



Construction Environmental Management Plan

Glounthaune - Midleton Twin Track Project

October 2022

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1 Introduction

1.1 Overview of the Proposed Development

The proposed development is the Glounthaune to Midleton Twin Track project. This development will provide twin tracking of the existing single track rail line between Glounthaune and Midleton train stations, County Cork. It is proposed to construct a new and directly adjacent additional railway track which will make the route a twin track between Glounthaune and Midleton to facilitate the passage of two trains along the railway line. The railway line is ca. 10km in length. Twin tracking of the single-track sections between Glounthaune and Midleton totalling a distance of approximately 10km.

1.2 Purpose of the CEMP

The purpose of this Construction Environmental Management Plan (CEMP) is to document and describe the main activities that will be undertaken to facilitate the proposed development and to provide a framework of environmental protection measures that will be implemented prior to commencement of, and throughout the duration of, the proposed works. This document will be further developed by the appointed Contractor, within the parameters assessed in the application particulars, taking into account any conditions of the statutory Approval (which, it is anticipated, will include a requirement for agreement of the content of this CEMP with the relevant planning authority – Cork County Council), the results of confirmatory surveys and any additional measures identified during detailed design. This CEMP will remain a ‘live’ document which will be reviewed regularly and revised as necessary and appropriate.

The works will be undertaken by Contractors engaged by Iarnród Éireann. This CEMP will be provided to the appointed Contractor prior to the commencement of works and will be further developed by the appointed Contractor. The appointed Contractor will be required to obtain approval of any updated CEMP by Iarnród Éireann prior to commencement of any works, irrespective of any Condition of Statutory Approval that might be imposed by An Bord Pleanála for agreement of the content of the CEMP with Cork County Council.

The Contractor’s CEMP will set out the approach and methodology which the Contractor will follow in scheduling and undertaking the work and will incorporate the control (mitigation) measures detailed in this CEMP in addition to specified conditions that may be prescribed in any grant of development consent for the proposed development, the measures provided in the Natura Impact Statement (NIS) and the Environmental Impact Assessment Report (EIAR) and any commitments given by Iarnród Éireann in relation to environmental protection associated with the activities described in this CEMP.

The primary objective of the CEMP is to safeguard the environment, site personnel and nearby sensitive receptors from site activity which may cause harm or nuisance. As such, the CEMP sets out a project framework to ensure that key mitigation measures and conditions set out as part of the planning consent process are translated into measurable actions and are appropriately implemented during the construction phase of the proposed development. As part of this framework, transparent and effective monitoring of the receiving environment during construction will be used to inform and manage on-going activities on site and to demonstrate effectiveness of the measures outlined therein.

A contractual obligation will be included within the tendering processes and implemented on appointment of the Contractor to ensure that the proposed works are developed in compliance with the requirements of the CEMP, EIAR, NIS and planning conditions which will take precedence over this current version of the CEMP in the event of conflicting information.

Iarnród Éireann will monitor the contractor(s) performance on a regular basis and will undertake the following compliance checks throughout the duration of the construction period:

- Review contractor documents against the requirements of the CEMP;
- Undertake regular audits;
- Continuously check records;
- Set up a contractor reporting structure; and
- Conduct regular meetings (at least fortnightly) where Environmental Health and Safety is an agenda item.

As will be specified under Roles and Responsibilities, the Contractor's Environmental Clerk of Works (EnCoW) will also coordinate regularly with the corresponding staff delivering the elements of the Glounthaune – Midleton Twin Track Project.

1.3 Structure of the CEMP

The structure of this CEMP is set out below.

- Chapter 1 describes the purpose of this CEMP
- Chapter 2 describes the roles and responsibilities of the construction phase team
- Chapter 3 describes the proposed construction activities
- Chapter 4 describes the control measures that will be implemented
- Chapter 5 includes an Environmental Incident Management Plan
- Chapter 6 describes the training and auditing protocols that will be implemented
- Chapter 7 describes the communications and procedure for complaints

A Waste Management Plan is provided in Appendix A and a Traffic Management Plan is provided in Appendix B.

2 Roles and Responsibilities

2.1 Introduction

This initial issue of the CEMP identifies the key roles for the construction works. The contractor will update the CEMP and will set out detailed roles and responsibilities (including named individuals) and an organogram of the team structure.

2.2 Employer

Iarnród Éireann is the Employer and has the following responsibilities:

- The Railway Order application as set out in the Transport (Railway Infrastructure) Act 2001 as amended by the Strategic Infrastructure Act 2006, including decision-making on the nature and extent of the proposed development, and setting out of environmental mitigation measures, included in this CEMP. The CEMP forms part of the documents supporting the RO Application;
- Post-consent manages the process towards construction including liaison with key environmental agencies and stakeholders;
- Undertakes a Client Engineering function, including inspections to ensure that detailed designs, plant, materials and works including scheduling meet the requirements of its Development Plan, its functional specifications, its outline designs and its generic standards; and
- Continued liaison with landowners and local residents, as required.

2.3 Employers Representative

The Employer will employ an independent Environmental Clerk of Works (EnCoW) within the Employer's Representative Team to assess the construction of the Proposed Development and advise the Contractor and Contractor's EnCoW on the implementation of the agreed Contractors CEMP.

2.4 Contractor

Contractors for the Signalling and Communications Upgrade and for the Glounthaune to Middleton Twin track will be appointed following a tendering process and Iarnród Éireann will be responsible for the track works. All parties will be responsible for the Health and Safety of site workers, for the implementation of all mitigation as set out in Table 4.1 and the completion of the works to the satisfaction of the Employer.

2.5 Site Manager

The Site Manager will be responsible for the day to day running of the site and will direct and oversee the activities of a range of contractors and subcontractors throughout the works. The Site Manager will be responsible for programming of the works, will consult regularly with the Employer and will maintain site safety.

2.6 Contractors' Environmental Clerk of Works

The Contractors' EnCoW will have suitable environmental qualifications and the necessary experience and knowledge appropriate to the role. The Contractors' EnCoW will be delegated sufficient powers under the construction contract so that she / he will be able to instruct the Contractors to stop works and to direct the carrying out of emergency mitigation / clean-up

operations. The Contractors' EnCoW will also manage consultation with environmental bodies including the NPWS and IFI. The Contractors' EnCoW will be responsible for carrying out regular monitoring of the Contractors' CEMP and will report monitoring findings as required by the planning consent. The Contractors' EnCoW will also report monitoring findings in writing to the independent EnCoW within the Employer's Representative Team on a regular basis (at least weekly, but immediately in the case of incidents or accidents).

2.7 Contractor's Ecological Clerk of Works (ECOW)

An Ecological Clerk of Works (ECoW) will be employed by the Contractors to oversee implementation of ecological mitigation and support the Contractors' Environmental Clerk of Works (Contractor's EnCoW) responsible for wider environmental mitigation. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented. The Contractor's EcOW will also ensure any disturbance licenses for protected species are arranged for in the event that confirmatory pre-construction surveys identify breeding or resting sites within the Zol.

The Contractors' ECOW will advise on ecological mitigation measures which require to be implemented and scheduled as part of the works and will be included in regular liaison meetings between project teams.

The independent EnCoW, employed on behalf of the Employers Representative team, will review and comment on the reports generated by the Contractor's EnCoW/ECOW; namely pre-construction survey reports, and the specific monitoring and compliance reports referenced under the mitigation measures in this CEMP.

3 Proposed Activities

3.1 Project Overview

The proposed development is the Glounthaune to Midleton Twin Track project. This development will provide twin tracking of the existing single track rail line between Glounthaune and Midleton train stations, County Cork.

It is proposed to construct an adjacent railway track between Glounthaune and Midleton to facilitate the passage of two trains along the railway line. The railway line is ca. 10km in length.

The proposed development comprises:

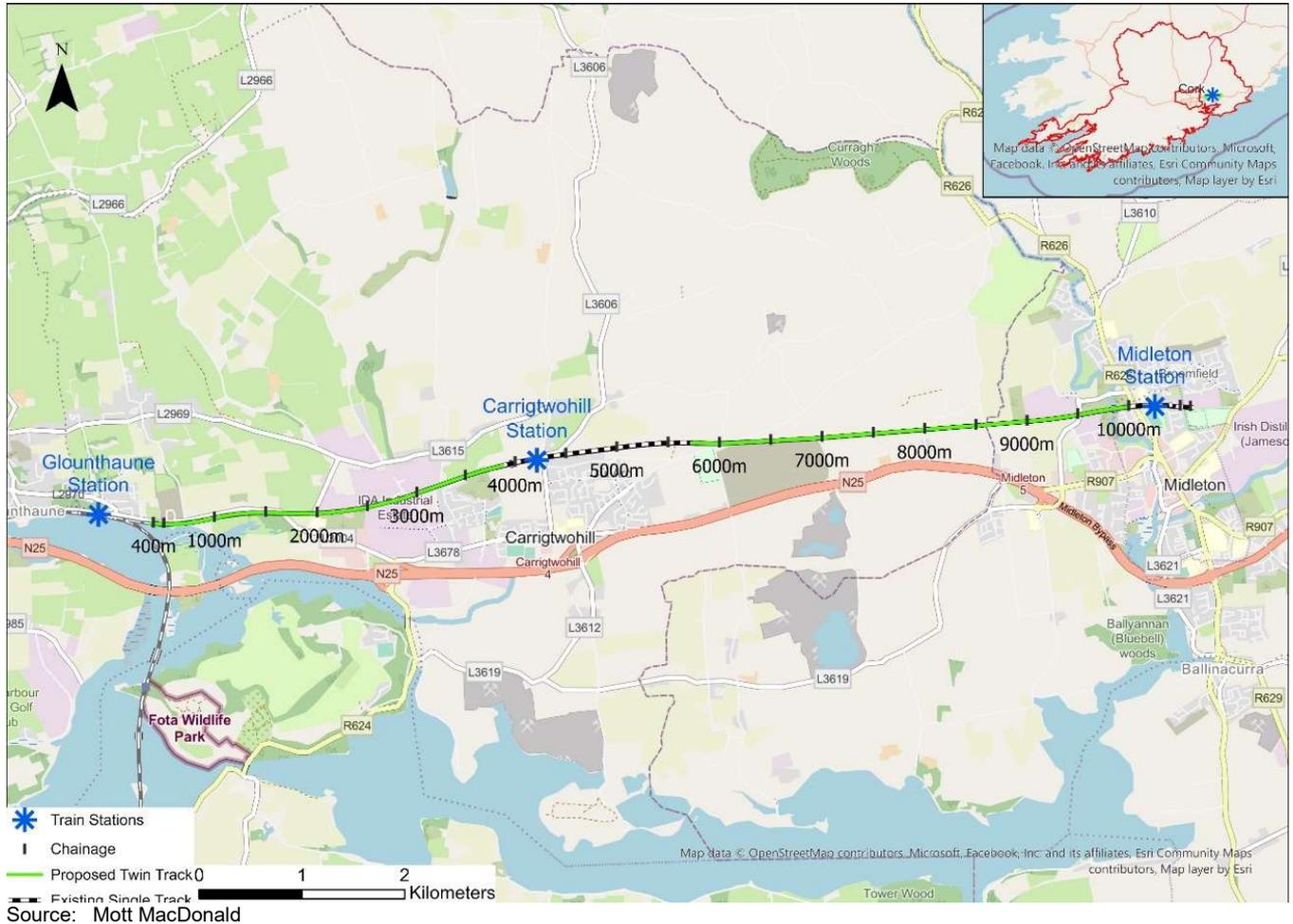
- Twin tracking of the single-track sections between Glounthaune and Midleton totalling a distance of approximately 10km;
- Reconfiguration of the operational track layouts;
- Removal of 1No. bridge (OBY08, Ballyadam House overbridge) and widening of bridge deck crossing the Ownenacurra River (UBY11);
- Extinguishment of one level crossing (Ford CCTV XY010) and widening of one level crossing (Water Rock CCTV XY009);
- Provision of sidings/turn back facility at Midleton Station;
- Provision of new cable containment routes from Glounthaune to Midleton to facilitate signalling upgrades and alterations;
- Associated signalling upgrades and alterations; and
- All associated works (e.g. temporary construction compounds; drainage, retaining walls, boundary treatments).

3.2 Site Location

The proposed development is located between Glounthaune and Midleton in Co. Cork within the functional area of Cork County Council. Figure 6.1 illustrates the geographical context of the proposed development. Over the length of the route, twin tracking is currently in place over approximately 35% of the route. The new track will be required between these areas.

The proposed development is located between Glounthaune and Midleton in Co. Cork. Figure 3.1 illustrates the location of the railway line.

Figure 3.1: Site Location



3.3 Construction Phase Activities

3.3.1 Bridges

There are two existing bridges which will require works as part of the proposed development. These are detailed in Table 3.1 and the requirement for works is also detailed.

Table 3.1: Bridge Structures along the Glounthaune – Midleton Railway Line

Structure		Chainage	Function	Works required
Name	Denotation			
Ballyadam House Overbridge	OBY8	6+500m	Carries local access road on Ballyadam House property over the rail line	To be removed
Owenacurra River Bridge	UBY11	9+870m	Carries the rail line over the Owenacurra River	Deck to be widened using existing river piers.

3.3.1 Ballyadam House Overbridge (OBY8)

It is proposed to remove bridge OBY8 at Ballyadam House as part of the works. This bridge is an overpass built for agricultural purposes, to allow livestock and equipment access the farmyard at the rear of Ballyadam House. The bridge is constructed of limestone, with coursed rock-faced rusticated walls. The structure will be required to be dismantled. This bridge is not in use and would present an unjustifiable safety risk if it were retained.

The dismantling of OBY8 will comprise the following:.

- Erect perimeter fencing around demolition works area.
- Undertake a photographic record of the bridge.
- Obtain railway line possession for duration of demolition works.
- Install crash mat under the span on the existing tracks.
- Remove any existing services on the deck.
- Temporarily remove existing trackside services.
- Remove stone parapets.
- Remove stone spandrel walls and retaining walls.
- Dismantle brick arch barrel and infill.
- Remove stone abutments.
- Remove approach embankments.
- Regrade embankments and remove crash mat.
- Reinstate trackside services.
- Check and adjust track and ballast levels as necessary.
- Sort demolition spoil for re-use on this and other projects including cut stone and brick.

3.3.2 Owenacurra River Bridge (UBY11)

All bridge structures (with the exception of the un-used bridge OBY8) are to be retained, however works will be required at Owenacurra River Bridge (UBY11) to widen the deck of the bridge on the existing piers to allow for a double track and the abutments are to be widened – see Figure 6.2 below. The bridge crosses the Owenacurra River. The span lengths from west to east are ca. 11m, 7m and 11m. The widening structure span arrangement, structural form and articulation will match the existing bridge. The widening deck consists of precast prestressed concrete beams with an in situ infill concrete deck which will be stitched to the existing deck. The bankseat (base of the bridge) widenings are supported on continuous flight auger piles. The existing pier capping beams will be widened to accommodate the proposed deck. The existing north walkway will be removed and reinstated on the widened deck. The existing reinforced concrete northern wingwalls will be dismantled and rebuilt to accommodate the widened deck.

The widening of the Owenacurra River Bridge will comprise the following:

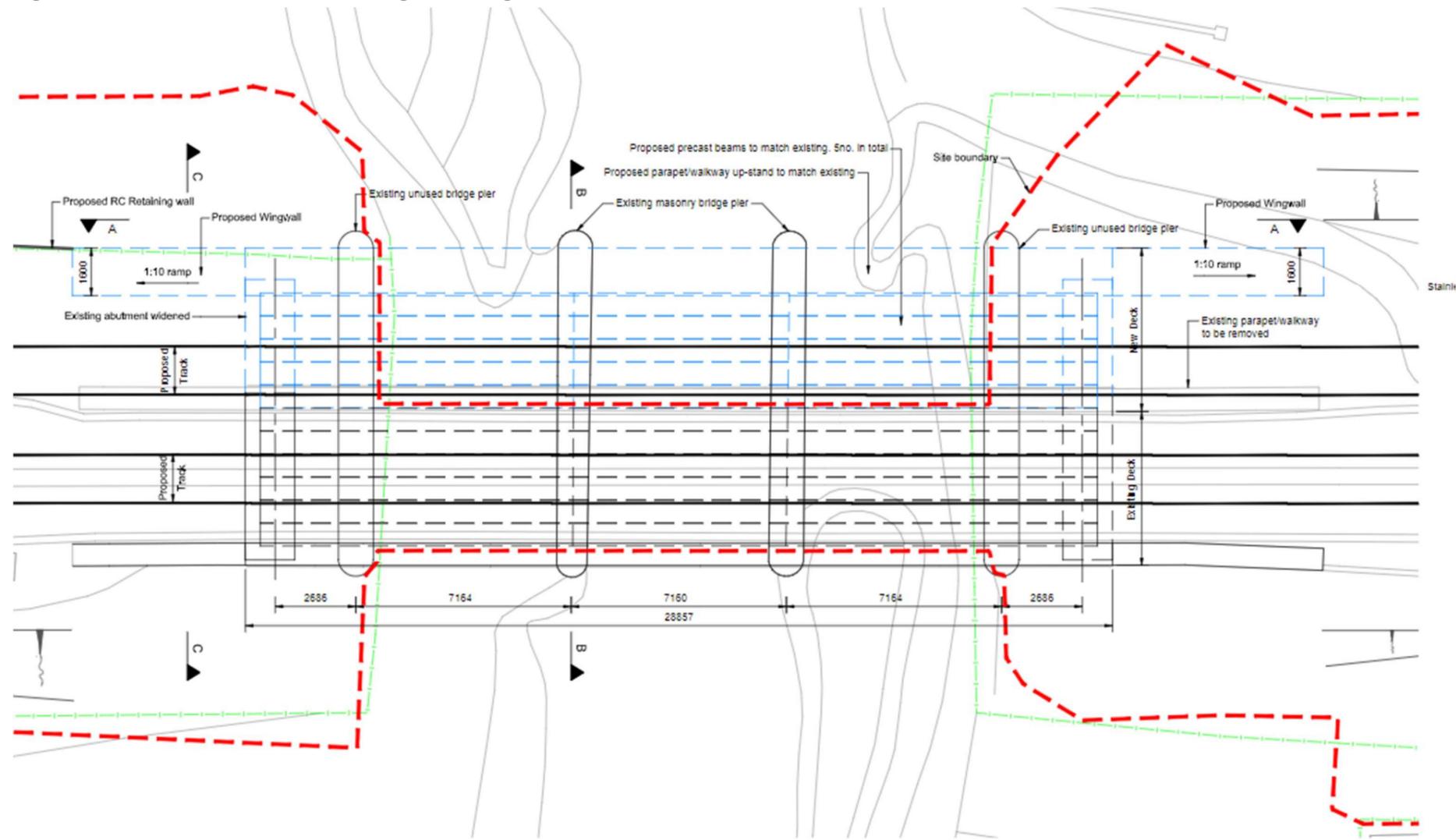
- Erect perimeter fencing around construction works area.
- Construct a temporary access track to the bridge from both east and west approaches.
- Provide storage and set-down area for the precast beams.
- Install environmental protection measures which include silt fences and water management.
- Remove rail track, ballast and granular fill on the bridge and on the approaches to the bridge.
- Excavate the existing wingwall backfill at both north-east and north-west wingwalls and remove the existing wingwalls.
- Remove / break-out the existing north concrete bridge walkway.

- Place and compact fill at both east and west abutment extension locations.
- Construct piling rig platform at both east and west abutments.
- Install piles.
- Construct in situ concrete abutment extensions.
- Install precast capping beam extension on top of two number of existing bridge piers located within the river.
- Construct temporary crane platform.
- Install precast prestressed bridge beams.
- Install precast concrete north parapet/walkway upstand.
- Install tubular metal handrail.
- Pour in situ concrete deck infill.
- Spray apply waterproof deck.
- Install granular fill on both east and west bridge approaches.
- Install precast concrete north-east and north-west wingwalls.
- Backfill wingwalls and abutments.
- Install track ballast
- Remove water management measures.
- Remove silt fences.

A scaffold will be required within the Owenacurra River as part of the works. As the works in-stream are restricted to July-September, water levels will likely be low. In this situation scaffolding is erected in the wet, founding the scaffold legs on steel plates to spread the load over the riverbed material. The piers at this location are approximately 1-2m high so the scaffolding will be a single level just above water level which will allow staff to work on the piers in the dry and also to catch any pier material from entering the river. In the unlikely event that water levels are high the scaffolding will be supported from the piers rather than the riverbed.

The works at the Owenacurra River bridge are expected to last eight weeks for preparation works and an additional one week for deck works.

Figure 3.2: Plan of Owenacurra River Bridge Widening



Source: Mott MacDonald

3.4 Culverts

There are works proposed at four culverts along the route – these are illustrated on Figure 3.3.

3.4.1 IDA Open Culvert

The existing open culvert is ca. 900m in length. The culvert consists of a u-shaped cross-section. The wall heights vary throughout the culvert length between ca. 1.4m and 2.56m. The channel width of the culvert is 1.45m.

A portion of the existing culvert is to be re-aligned by skewing to the north over a length of approximately 200m. It is proposed to re-use the existing culvert units.

An in-situ connection will be required at the interface where the repositioning begins and at the interface with the existing IDA attenuation outfall. The re-aligned culvert will tie into UBY2A which is also being lengthened with the construction of new wing walls.

A sheet pile wall will be installed just north of the works area to retain the existing embankment during construction. Refer to drawing C745-WP3_03-XX-XX-XXX-DR-MMD-SE-0240 in Appendix 6.2.

3.4.2 Culvert UBY2A

UBY2A culverts the Killacloyne. The existing culvert is ca. 12m long twin cell structure. The widths are ca. 2.4m and 2.1m and the culvert internal height is ca. 1.2m. Reinforced concrete wingwalls are provided at both the inlet and outlet.

The culvert will be lengthened by ca. 2m to the north and ca. 2m to the south. The cross-section dimensions of the lengthened sections will be similar to the existing cross section. The existing north and south wingwalls will be dismantled and rebuilt to accommodate the lengthened structure. Refer to drawings C745-WP3_03-XX-XX-XXX-RP-MMD-SE-0003 UBY2A_AIP in Appendix 6.2.

3.4.3 Culvert UBY1B

UBY1B culverts an unnamed watercourse. The existing culvert is ca. 14m long single barrel structure. The width is ca. 1.5m and the culvert internal height is ca. 1m. Reinforced concrete wingwalls will be provided at both the inlet and outlet.

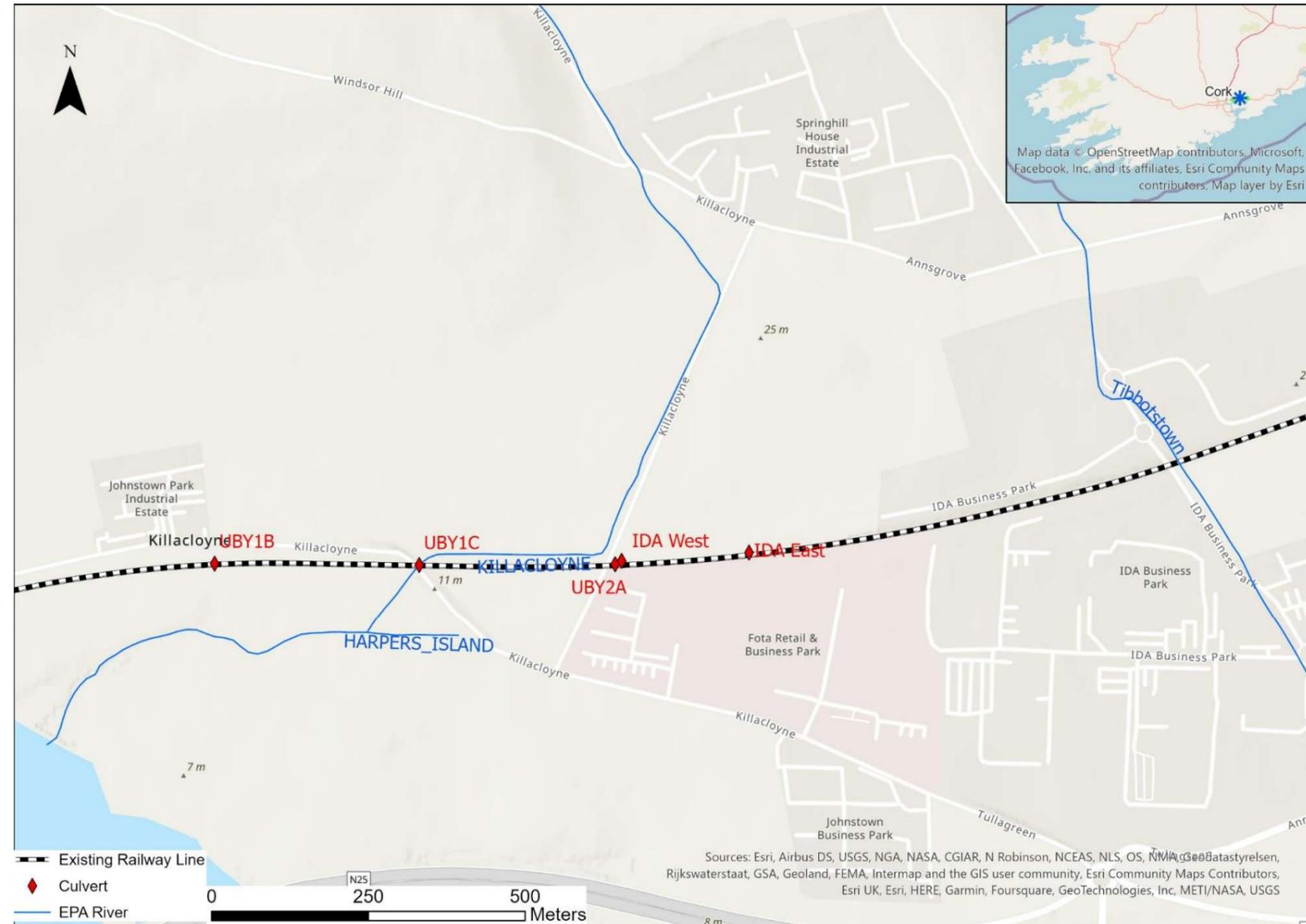
The culvert is to be lengthened by ca. 1m to the north. The cross-section dimensions of the lengthened sections will be similar to the existing cross section. The existing north wingwalls are to be dismantled and rebuilt to accommodate the lengthened structure. Refer to drawing C745-WP3_03-XX-XX-XXX-RP-MMD-SE-0007 UBY1B in Appendix 6.2.

3.4.4 Culvert UBY1C

UBY1C culverts the Killacloyne Stream. The existing culvert is a ca. 10m long single barrel structure. The width is ca. 2.1m and the culvert internal height is ca. 1m. Reinforced concrete wingwalls are provided at both the inlet and outlet.

The culvert is to be lengthened by ca. 1m to the north. The cross-section dimensions of the lengthened sections will match the existing cross section. The existing north wingwalls are to be dismantled and rebuilt to accommodate the lengthened structure. Refer to drawing C745-WP3_03-XX-XX-XXX-RP-MMD-SE-0008 UBY1C in Appendix 6.2.

Figure 3.3: Culvert Locations



Source: <Insert Notes or Source>

3.5 Level Crossings

There are three of level crossings along the route, and these are tabulated in Table 3.2.

Table 3.2: Existing Level Crossings

Level Crossing Code/Name	Location	Crossing Control Operation Type	Works	Chainage
Water Rock CCTV XY009	Castle Rock Avenue L-3618	Remotely controlled	Widen	8600
Ford CCTV XY010	un-named road	Remotely controlled	To be closed/extinguished, road not currently used.	9000
Mill Road R626 CCTV XY012	R626, Mill Road, west of Midleton Station	Remotely controlled	None	10050

It is proposed to close the Ford CCTV XY010 level crossing. The level crossing decking system will be removed together with the associated operational equipment and signage and the railway boundary secured using a 2.4m high blockwork wall in accordance with Transport Infrastructure Ireland standard construction detail CC-SCD-02401.

Water Rock level crossing (CCTV XY009) is to be widened to accommodate the twin tracks. Refer to drawings C745-WP3_03-XX-XX-XXX-DR-MMD-PR-2301 and C745-WP3_03-XX-XX-XXX-DR-MMD-PR-2302 in Appendix 6.2 for details.

3.6 Track, Retaining Structures and Ancillary Works

3.6.1 Track Works

It is proposed to construct new track alongside the existing single-track sections so that the line will have full twin tracks to facilitate an increase in train trips – this will facilitate up to a ten minute service operating at up to 100km/hr. It is necessary to realign the existing track slightly due to space constraints along the railway line. It is also proposed to construct additional sidings / turn back facilities are proposed at Midleton station.

There is existing twin track at Glounthaune and at the approaches to Carrigtwohill station and Midleton station. Over the length of the route, twin tracking is in place over approximately 35% of the ca. 10km route. The new track will be required between these sections. In some cases, the original alignment of the single track will remain in place. However, due to the existing track layout it will be required to adjust the track position to allow for the twin tracks within Iarnród Éireann’s ownership boundary.

The new twin track along the railway line will require the site to be cleared of vegetation (outside of the bird breeding season which is between 01 March and 31 August, as per the Wildlife Act 1976, as amended) and soil and at some locations the embankments will need to be re-profiled to allow for the new track. In areas of cut, new sections of embankment will need to be installed. Retaining walls are also required in areas where space is restricted. The cut/fill and retaining structures in addition to the new track alignment are illustrated on C745-WP3_03-XX-XX-XXX-DR-MMD-PR-0001 to C745-WP3_03-XX-XX-XXX-DR-MMD-PR-0028-.

Drainage will also be constructed as part of the main works, as described in Section 6.9.3. Subgrade drainage will be installed to prevent the line from water logging.

The new track formation will be graded and compacted then a capping material laid on top prior to the installation of the bottom ballast. Following laying, grading and compaction of the bottom ballast the railway sleepers put in place. The steel tracks can then be installed and connected to the railway sleepers by the rail fastening system. A top layer of ballast is then distributed following which the track is brought to design position and mechanically consolidated.

For vegetation clearance the machinery will vary depending on the location, but the following will be required:

- Chainsaws, axes, and hatchets will be used to fell and remove trees.
- Stumps for trees that are removed will be ground down with stump grinders. Mulchers will be used to clear underbrush, small trees and leftover fencing (the contractor can either use a tracked or wheeled mulching machine or there are also mulching machines that can be used with equipment such as tractors or excavators which can be road-rail for use on the railway).
- Bulldozers will be used for clearing large areas where leftover structures, boulders, standing trees and debris remain.
- Tractors with frontend loaders will be used to clear rocks, smaller trees, branches etc. and for levelling/grading the land.
- Backhoes and excavators will be used in small-scale land-clearing.
- A woodchipper will be required to turn trees into woodchips for easy disposal

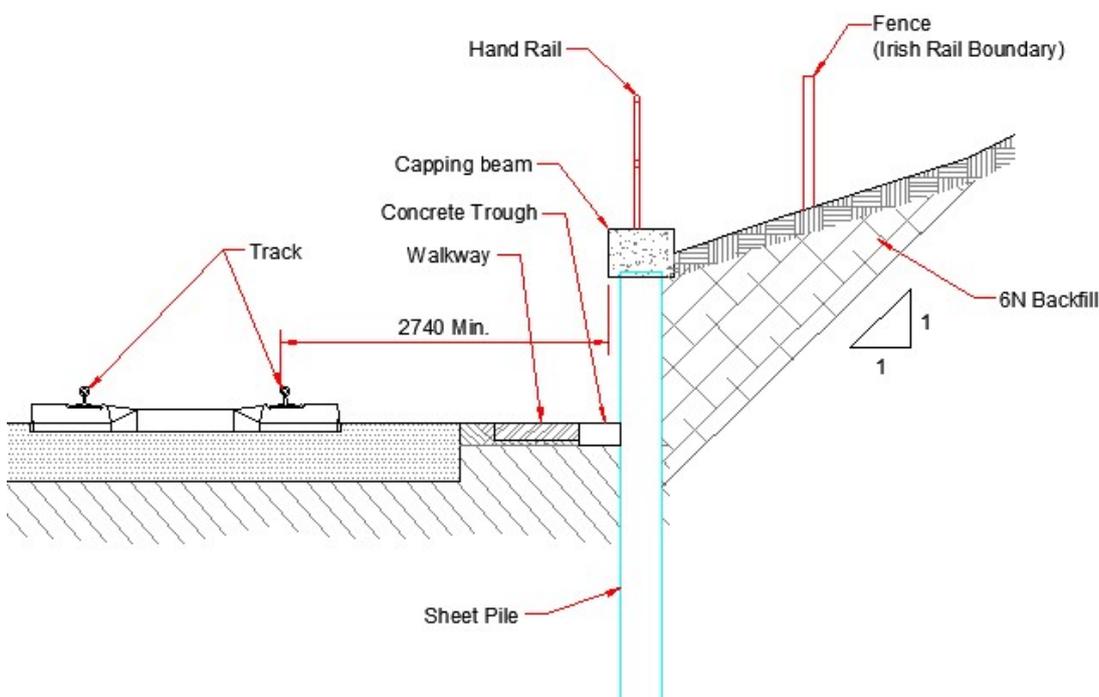
Ballast track construction works, as part of the horizontal alignment modifications, will involve the following typical sequence of activities.

- Enabling works, such as: installation of facilities and storage areas; bringing machinery and materials on site; utilities diversions; railway operation safely cut etc.
- Rail cutting of the existing track (separate track panels of 18m length) using a rail cutting machine (if required).
- Removal of old track panels using road-rail vehicles (vehicles capable of running on both road and rails), excavators, crane on truck and other necessary engineering equipment
- Removal of degraded ballast by means of road-rail vehicles, excavators and other engineering equipment that will load the materials into an articulated dump truck (if required).
- Preparation of the track formation until required level, using road-rail vehicle excavators.
- Extension and compaction on the subgrade, using a compactor.
- Extension of the geotextile.
- Placement of the longitudinal drainage, using trucks, mini diggers and plate compactors.
- Extension and compaction of the sub-ballast layer, using wheel loader, trucks and compactors.
- Extension of first ballast layer, levelling and compaction using wheel loader, trucks and compactors.
- Laying of the sleepers with the fastening systems, using crane on trucks and excavators.
- Laying of the rails and clamping the joints, using crane on trucks and excavators.
- Extension of second ballast layer, tamping and dynamic stabilisation, using crane on trucks, excavators and a ballast tamper.
- Welding of joints and second stabilisation.
- Rail destressing.

3.6.2 Retaining Structures

Retaining walls have been identified as required to minimise impact on adjacent lands due to environmental constraints, or to maintain the railway corridor within the existing railway corridor. The retaining walls are sheet piled structures due to the reduction in temporary and permanent land take required in comparison to a reinforced concrete gravity retaining wall structures and its increased retention height ability in comparison to gabion basket gravity structures. A typical sheet pile detail is shown in Figure 3.4. The walls will be sheet piles with a reinforced concrete capping beam and steel handrail. The piles will be driven by either a drop hammer or vibration hammer depending on ground conditions. In certain circumstances where obstacles are present in the ground pre-auguring may be required to prepare the ground for the sheet pile installation.

Figure 3.4: Typical Sheet Pile Detail



Source: Mott MacDonald

3.6.3 Drainage

Drainage is included in drawings C745-WP3_03-XX-XX-XXX-DR-MMD-DE-0001 to C745-WP3_03-XX-XX-XXX-DR-MMD-DE-0028 in Appendix 6.2. Where significant alteration to the existing track or where new track is proposed the existing drainage will be removed and new drainage will be installed.

The proposed drainage will consist of filter drains, carrier drains, open V-ditches and subsurface drains:

- Filter drains are open jointed, porous or perforated pipes laid in trenches which will be backfilled with a porous media and run longitudinally along the track both collecting water along its length and conveying water.
- Carrier drains are closed jointed and non-perforated and are used to convey water at a depth greater than the depth of filter drains.

- Open V-ditches are open channels which will intercept any overland runoff from adjacent land which slopes towards the track. These ditches will also be used to convey water to a discharge point.
- The ballast and sub-ballast provided as part of the permanent way normally consists of granular material with excellent drainage properties. The ballast and sub-ballast will be designed and graded to act as a drainage blanket in order to protect the formation and ensure the adequate performance and durability of the ballast layer and minimise maintenance requirements. All subsurface drainage will be designed on this basis in combination with the use of filter drains, geo-membranes and geo-textiles to provide adequate sub-surface drainage and control the build-up of fines and sediment which could affect the long term performance of the ballast and sub-surface drainage facilities.

All existing outfalls will be retained and no new outfalls will be required.

The drainage design will be in accordance with 'E25. I-PWY-1136 Requirements for Design Installation and Maintenance of Lineside Drainage' and the rainfall intensities will be factored by 20% to account for the future effects of climate change.

3.6.4 Fencing and Environmental Barriers

There is an existing property boundary fence in place along the length of the line. Additional lands are required along sections of the line and these will be fenced following the compulsory purchase order of the lands. Existing fencing will be relocated and repositioned where appropriate and where there is a change in the track location similar type fence will be relocated at a minimum. Where the track is not being moved the boundary fence will remain in place. The fence types to be used or reused are:

- Concrete post and wire;
- Timber post and wire or other timber structures;
- Steel palisade fence (security fencing);
- Acoustic timber / concrete block wall

Fencing is illustrated on drawings C745-WP3_03-XX-XX-XXX-DR-MMD-PW001-0001 to C745-WP3_03-XX-XX-XXX-DR-MMD-PW028 in Appendix 6.2.

Temporary noise barriers will be required at construction compounds to minimise noise effects.

3.6.5 Crossings of services

Service providers were contacted in relation to services within the proposed works areas and no third-party services have been identified.

3.6.6 Signage

New signage will be required along the railway line and will be developed at detailed design stage and will include speed limit signs, mileposts, gradient signs and warning signs.

3.6.7 Cable containment routes

There are currently cable routes parallel to and on either side of the existing rail track carrying operational railway communications, signalling and power cables. The cables are contained in precast concrete lidded troughs set flush with the ballast surface. To accommodate the construction of the second track ca.8500m of existing route will require to be relocated to either side of the new twin track layout. It is proposed to reuse the existing material where possible on the relocated sections of route.

3.6.8 Associated signalling upgrades and alterations

As part of a larger recontrol scheme and to enable the operation of the reconfigured railway a new signalling system is to be installed. The installation of this new system and the recovery of redundant equipment will take place in parallel with the twin tracking works with commissioning taking place during the line closure.

3.6.9 Lighting

During construction, a large proportion of the works will take place at night. The minimum light level required is 50lux and a maximum of 100lux. Illuminances provided need to be consistent, to avoid excessive contrast in illuminance, luminaires should not be spaced too far apart. Glare is determined by the light distribution of fittings, their mounting height and, for floodlights, the direction of aiming.

With large areas, the lighting design chosen depends upon:

- the degree of obstruction;
- whether illuminance is required primarily on horizontal or vertical planes

The lighting will be predominantly downward lighting to minimise light spill.

For the operational phase, additional lighting will be provided at Water Rock level crossing. The lighting will be directional. Existing lighting will be maintained at the level crossing and additional lighting will be similar to existing lighting. In line with Railway Safety Commission Guidance 'lighting should not cause glare to either road users or train drivers, interfere with the visibility of railway signals nor cause avoidable annoyance to local householders.

Walkway lighting will be provided in the new sidings in Midleton.

3.6.10 Lifting Operations

Cranes will be required at the Owenacurra River Bridge to lift the beams into place. This will be temporary. Track panels will also require lifting.

3.7 Iarnród Éireann Construction Methodology

3.7.1 Sustainable Construction Principles

Iarnród Éireann is committed to contributing to the achievement of the United Nations Sustainable Development Goals (SDGs) and together with the CIÉ Group of Companies has developed a Sustainability Strategy that coordinates actions that assist in addressing national economic, social and environmental challenges. The key themes used as a focus while designing the project include:

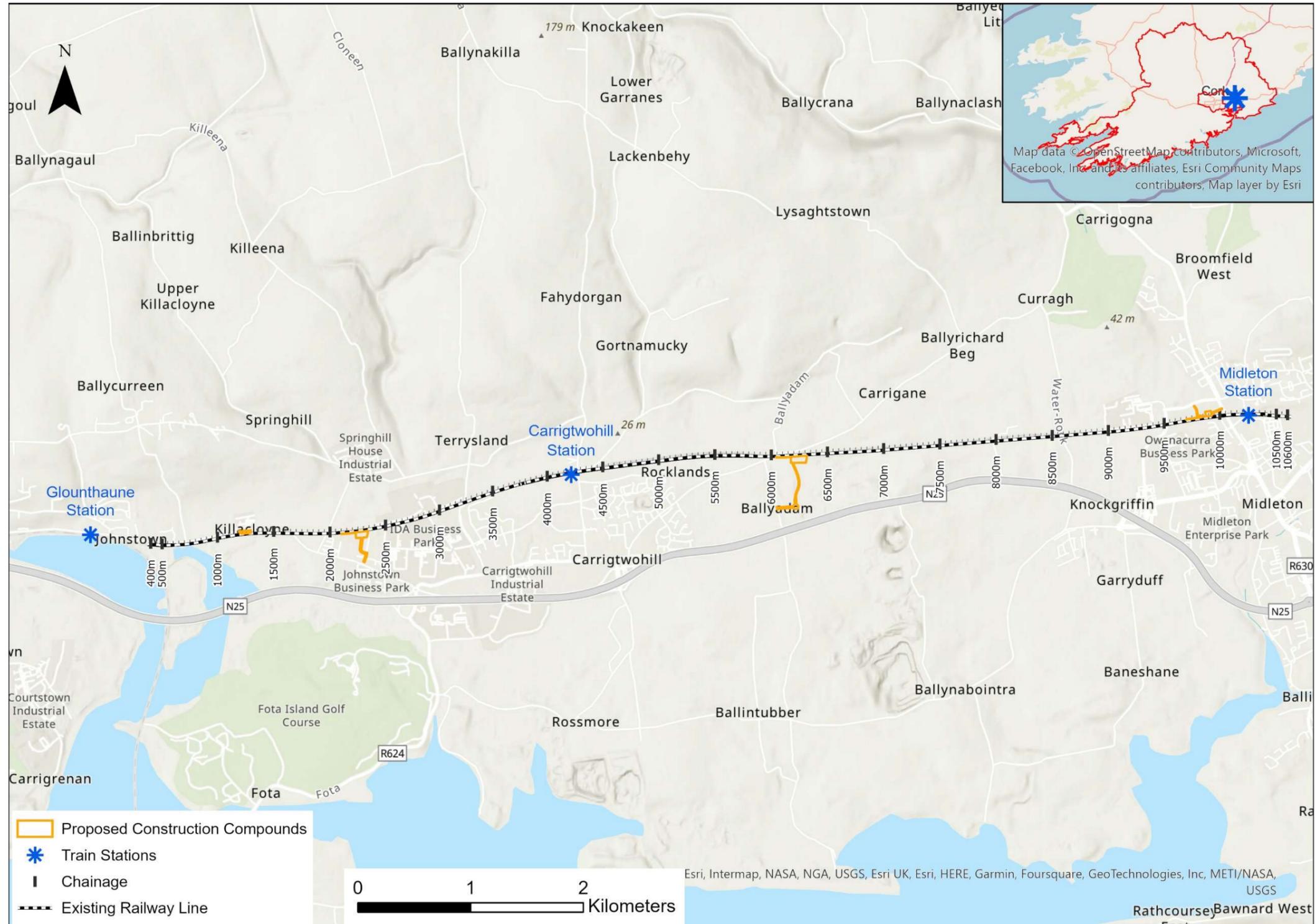
- Avoid, mitigate and if not possible reduce the adverse effects on communities during the construction of the project.
- Reduce the carbon footprint of the project during the design, construction, and operation and encourage more sustainable transport modes.
- Support for cleaner energy and lower emissions through implementation of an electrically powered fleet.
- Facilitating population and sustainable development growth, and a low carbon climate resilient economy.
- Designing for resilience against future demand changes and climate needs.
- Minimising waste during construction of the project, while focusing on using sustainable and reusable materials and construction methods.

3.7.2 Construction Compounds

During the construction phase five temporary construction compounds will be required. Please refer to Figure 3.2 for locations and the Appendix 6.2 within Chapter 6 – Description of the Proposed Development for drawings of the construction compounds. The construction compounds will contain portacabins for offices and welfare facilities, parking for construction staff and material stockpiles. Welfare facilities will be provided at these locations and any discharges will be connected to a sealed holding tank to be emptied and disposed of off-site by a licenced contractor to an approved licenced facility. Water will be tankered onto site as required.

There are also two construction compounds proposed on the west side and east side of the Owenacurra River. The westerly compound is only to be used for access to the bridge abutments and there will be no portacabin or storage in this area. The easterly compound will be used for storage of materials. Both compounds will be set back from the riverbank by a minimum of 15m.

Figure 3.5: Location of Construction Compounds



3.7.3 Construction Hours and Programme

The proposed works comprise civil engineering, permanent way and signalling works to enable the installation of a second running line along the length of the existing railway between Glounthaune Junction and Middleton to allow the introduction of a significantly increased frequency of train operation.

To minimise disruption to the current railway operations, it is proposed to undertake the construction works over an extended period of time utilising both day and night time working. Night time working is required to deliver works on or affecting the operational railway in a safe manner with regards to both the safety of the railway and the safety of those delivering the works. A disruptive blockade will be utilised to undertake the operational tie ins between the new and existing works and to test and commission the new signalling control systems.

The proposed development will take place in a long narrow corridor, 10km in length and of varying width (generally 15 to 30m).

Subject to the grant of statutory approvals, it is anticipated that proposed works will commence in Q4 2023 and will take approximately 36 months to complete. Indicative durations for the proposed works are detailed in Table 3.1.

Table 3.3: Indicative Construction Schedule

Phase	Revised timeline
1. Pre-construction works	Q4 2023
2. Enabling works	Q1 2024
3. Earthworks, drainage and track sub-base	Q2 2024 – Q3 2025
4. Track realignment and construction	Q2 2025 – Q1 2026
5. Signalling works	Q4 2024 – Q2 2026
6. Commissioning	Q2 2026 – Q3 2026

In general, it is anticipated that construction will take place between 07.00 and 19.00 Monday to Sunday when outside the operational railway footprint. Works within the operational railway footprint will be undertaken between 1900 and 0700 daily (in order to ensure the safety of the railway operations and construction staff). During the period of the railway closure, works will be undertaken around the clock. It is anticipated that the closure will be up to four months and buses will be provided to transfer passengers.

Table 3.2 outlines the proposed construction activities and the timelines.

Table 3.4: Construction Activities and Timelines

Construction Activity	Description of works
Earthworks	Predominantly night-time works, with rate of progress about 150m per week on average along the track
Formation treatment	Predominantly night-time works, with rate of progress about 350m per week on average along the track
Ballasting	Predominantly night-time works, with rate of progress about 350m per week on average along the track
Track installation	Daytime and night-time works, with rate of progress about 350m per week on average along the track.
Tamping	Daytime and night-time works, with rate of progress about 1km per week on average along the track.

Construction Activity	Description of works
Stressing and welding works	Daytime and night-time works, with rate of progress about 1km per week on average along the track.
Material stockpile and haulage at site compounds	Daytime and night-time works, locomotive trains haul materials and equipment to 5 site compound locations, depending on the current location of work.

The number of construction workers required during the construction phase is expected to peak at approximately 125 persons. Staff will travel to site via a combination of public transport, cycling, carpooling, minibuss and private passenger vehicles.

3.7.4 Pre-construction and Enabling Works

The pre-construction phase of development includes preparatory works and consultation with statutory bodies [Health and Safety Authority (HSA), EPA etc] and the general public as required. Following pre-construction, site clearance activities will commence.

Typical enabling works activities will include preparation of the construction working area, laydown areas and site clearance as required. Temporary and permanent boundary fencing will also be installed where required.

3.7.5 Other Consents

Section 50 consents from the OPW will be required for the realignment of the IDA culvert (UBY2A or CV3) and consent will also be required for works at the Owenacurra River bridge. Following consultation with IFI, if electrofishing is required, a licence will be required from IFI.

3.7.6 Rail Closures

It is likely that the railway line will be closed for a period of up to four months between months 29 to 32. Bus services will be used to accommodate passengers and will be run on a regular service between Cork and Middleton to minimise disruption. There will also be weekend closures for a period of eight months between 11pm on Fridays to 5.30am on Mondays.

3.7.7 Road Closures

It will be necessary to close Castle Rock Avenue to through traffic in order to facilitate level crossing upgrading works to Water Rock CCTV XY009. It is expected that the closure will last for 16 weeks with diversions via Ballyrichard More, the R626 and N25. Details of traffic diversion and road closures are presented in Chapter 15 of this EIAR. Alternative routes are available and will be sign posted. Any road closure requirements will be adhered to and will be in accordance with local authority procedures including notification to emergency services.

3.7.8 Earthworks

Reprofiling of existing embankments will be required and existing embankments will be extended. In areas of cut, embankment slopes will be reprofiled to allow for the twin track gauge and may incorporate toe retention to reduce the quantity of spoil generated. In areas where space is restricted, retaining structures will be installed. The walls will be sheet piles with a reinforced concrete capping beam and steel handrail. The piles will be driven by either a drop hammer or vibration hammer depending on ground conditions. In certain circumstances where obstacles are present in the ground pre-auguring may be required to prepare the ground for the sheet pile installation. Ca. 40,000m³ of cutting/excavation is required and ca. 38,000m³ of fill is required for the works, along with ca. 14,000 m³ of ballast.

3.7.9 Construction Traffic and Routes

The majority of construction traffic will be generated during phase three and phase four, the earthworks phase (Q2 2024 – Q3 2025) and the track construction phase (Q2 2025 – Q1 2026). As part of the earthworks phase there will be a requirement to bring engineering fill onto the site.

Where surplus spoil is unsuitable for reuse on site it will be taken to the compound areas for sorting. Spoil that cannot be re-used will be disposed of to a licenced waste disposal facility.

On completion of the earthworks phase, the track construction phase will commence. The track construction phase will see the delivery of construction material such as concrete sleepers, steel rails and ballast.

For the earthworks and track construction it is estimated that up to 5500 Heavy Good Vehicles (HGVs) loads to or from the site (11000 HGV movements) will be required (maximum of 30 loads per day) to deliver and remove material over the period of works which is expected to extend over an initial period of 11 months, with a further 4 months of ballast deliveries in the finishing stages of the works.

It is planned that sleepers and rails will be brought to site using rail haulage.

Chapter 15 of this EIAR describes the construction traffic and roads to be used as part of the works.

3.7.10 Land Acquisition

Ca. 1.4ha of land is to be compulsorily acquired for the proposed development and is comprised predominantly of hedgerows at the boundary between the railway and agricultural lands. Replacement hedgerows will be planted along the new fence line, comprising of native species. The permanent land take includes land necessary to construct, operate and maintain the proposed development and associated infrastructure and to undertake essential environmental mitigation measures as outlined in this EIAR.

Temporary landtake is required, including for the five compounds, over an area of ca. 7ha and these lands will be reinstated following completion of the construction phase.

4 Control Measures

4.1 Introduction

The following sections detail the minimum control (mitigation) measures that will be implemented prior to commencement and throughout the duration of the proposed works.

As detailed in Section 1.2 *Purpose of this CEMP*, the Contractor's CEMP to be prepared by the appointed Contractor will incorporate the control measures detailed in this CEMP in addition to specified conditions that may be prescribed in any grant of consent, measures outlined in the NIS and the EIAR and any commitments given by Iarnród Éireann in relation to environmental protection associated with the activities outlined in this CEMP.

All mitigation measures will be implemented under the supervision of an Environmental Clerk of Works (EnCoW) whom will be appointed by the Contractor (the Contractor's EnCoW).

4.2 General Site Environmental Rules

- The proposed works area will be demarcated, and pollution prevention measures will be implemented prior to commencement of construction works.
- All pollution control measures will be designed, installed, and maintained in accordance with CIRIA guidance for '*Environmental Good Practice on Site*' (C741) and '*Control of water pollution from linear construction projects. Technical guidance*' (C648) and under the supervision of an Environmental Clerk of Works (EnCoW).
- All mitigation will be implemented under the supervision of the Contractor's EnCoW.
- The EnCoW will carry out daily inspection of works areas for evidence of pollution, and areas where corrective action is required

4.3 Construction Environmental Management – Measures to be Implemented

The mitigation and monitoring measures detailed in the EIAR are detailed in Table 4.1, each under the separate headings as per the EIAR. Also detailed in Section 4.3 are the mitigation measures and monitoring specified in the Natura Impact Statement (NIS).

Table 4.1: Mitigation and Monitoring Measures

	Phase	Mitigation and Monitoring
Chapter 7 Population and Human Health		
7.1	Construction	This CEMP will be implemented by the contractor during the construction phase to safeguard the environment, site personnel, and nearby sensitive receptors, i.e. occupiers of residential and commercial properties, from site activities that may cause harm or nuisance.
7.2		The appointed contractor (in collaboration with Iamród Éireann) will be required to maintain close liaison with local community representatives, landowners and statutory consultees throughout the construction period .
7.3		The appointed Contractor will also implement the Traffic Management Plan included as Appendix 6.1 of this EIAR, which will be finally agreed upon with Cork County Council to mitigate any potential construction traffic impacts on the public road network. All construction activities, including construction traffic, will be managed through this site CEMP.
7.4		There are no specific mitigation measures required to ameliorate potential impacts on population and human health in addition to the measures specified in other chapters of this EIAR. Specific measures to mitigate likely significant impacts on human health during the construction phase (i.e. Noise and Vibration, Air Quality and Climate, Water, Traffic and Major Accidents and/or Disasters) are dealt with separately in the relevant chapters in this EIAR.
Chapter 8 Air Quality		
8.1	Construction	Construction dust emissions
8.2		Mitigation measures included in this CEMP are set out below and have been adapted from best practice guidance from the IAQM, based on the dust risk identified in Section 8.6 and considering the duration of the construction period.
8.3		Different mitigation measures have been recommended for different areas, based on construction activities and level of risk. With the implementation of these measures, fugitive emissions of dust from the proposed development will be negligible and therefore not significant.
8.4		The CEMP will facilitate stakeholder communications and community engagement prior to the commencement of construction.
8.5	Construction	All areas All areas are predicted to have at least 'low risk' in terms of dust soiling and PM ₁₀ effects due to earthworks activities, with no mitigation in place. Best practice mitigation measures which will be implemented for these activities are presented below:
8.6		Communication: Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary
8.7		Display the head or regional office contact information.
8.8		Site Management: Record all dust and air quality complaints, identify causes and take appropriate measures to reduce emissions in a timely manner and record the measures taken;
8.9		Make the complaints log available to the local authority when asked; and

Phase	Mitigation and Monitoring
8.1	Record any exceptional incidents that cause dust and or air emissions, either on or off site, and the action taken to resolve the situation in the log book.
	Monitoring:
8.11	Carry out regular site inspections to monitor compliance with this CEMP and record inspection results, and make an inspection log available to the local authority when asked; and
8.12	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Preparing and maintaining the site
8.13	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
8.14	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
8.15	Avoid site runoff of water or mud.
	Operating vehicles/ machinery and sustainable travel:
8.16	Ensure all vehicles switch off engines when stationary – no idling vehicles; and,
8.17	Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
	Operations:
8.18	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction;
8.19	Ensure an adequate water supply on the site for effective dust / particulate matter suppression / mitigation using non-potable water where possible and appropriate;
8.2	Use enclosed chutes and conveyors and covered skips; and
8.21	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
8.22	Waste management:
8.23	Avoid bonfires and burning of waste materials.
	Area 4 ('Low' risk from demolition activities)
8.24	In addition to all measures specified in (All areas):
	Measures specific to demolition:
8.25	Ensure effective water suppression is used during demolition operations;
8.26	Avoid explosive blasting, using appropriate manual or mechanical alternatives; and

Phase		Mitigation and Monitoring
8.27		Bag and remove any biological debris or damp down such material before demolition.
		Areas 1, 3, 4 and 5 ('Medium' risk from earthworks activities)
8.28		In addition to all measures specified in Section 8.5 (All areas):
		Communication:
8.29		Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
		Monitoring:
8.3		Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary.
	Construction	Preparing and maintaining the site
8.31		Keep site fencing, barriers and scaffolding clean using wet methods;
8.32		Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below; and
8.33		Cover, seed or fence stockpiles to prevent wind whipping.
8.34		Operating vehicles/ machinery and sustainable travel:
8.35		Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
		Operations:
8.36		Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Chapter 9 Climate		
9.1		Ireland's Climate Action and Low Carbon Development (Amendment) Bill 2021 commits to net-zero carbon emissions by 2050. To support this, the development shall seek to reduce GHG emissions as far as practicable in all cases to contribute to a net reduction in carbon emissions. It is recommended that emissions reduction measures are put in place as part of the proposed development at design stage.
9.2	Construction	In the different stages of the development lifetime, several best practice mitigation measures will be implemented as detailed through this Construction Environmental Management Plan (CEMP):
9.3		Ensuring all vehicles are switched off when stationary;
9.4		Increasing the use of biofuel blends in petrol and diesel;

Phase	Mitigation and Monitoring
9.5	Avoid using diesel- or petrol-powered generators, using battery or powered or mains electricity where practicable;
9.6	Regular maintenance of construction plant to limit GHG emission intensity;
9.7	No bonfires or burning of waste materials;
9.8	Construction works should be carried out in accordance with the best practicable means, to reduce fumes or emissions which may result in additional GHG emissions. Plant equipment and vehicles to be used on the proposed project should be selected based on their relative environmental performance.
9.9	A Construction Transport Management Plan (Appendix B) will include measures to minimise congestion during construction, and to coordinate efficient delivery to minimise the number of vehicle movements.
9.1	A Construction Resource Waste Management Plan (Appendix A) has also been developed, detailing additional measures that will further help mitigate the impact of the project. This includes:
9.11	Reduce the use of virgin resources, e.g. concrete reuse/recovery target of 85%;
9.12	Keeping materials in the economy as long as possible;
9.13	Where suitable source materials locally and use more sustainable / lower carbon intensity materials;
9.14	Maintain the intrinsic value/quality of materials as high as possible.
9.15	During operation the following measures will be taken:
9.16	Regular maintenance of train engines to limit GHG emission intensity;
9.17	Electrical switchgear which contains SF6 is compliant with European F-Gas Regulations to reduce leakage rates. Where possible non-SF6 equipment is preferred from a GHG emissions perspective.
Chapter 10 Land, Soils and Hydrogeology	
Construction	Land and Land-Use
10.1	No impact on land or land use is predicted. As such no mitigation, beyond the embedded mitigation, is proposed.
	Soils and Geology
10.2	Ground investigation will be carried out to establish the potential presence of any made ground or contamination along the route. This will target areas of soils identified as having a high risk of contamination.
10.3	The CEMP will include protocols to deal with unexpected contamination including:
10.4	An appropriately qualified person will be present on site during construction to identify visual and olfactory evidence of contamination during excavation; and
10.5	Any contaminated ground will be characterised according to Waste Acceptance Criteria and dealt with as soon as possible via a bespoke remediation strategy or a materials management plan. Any waste arising will be managed in accordance with the Waste Management Act 1996 (as amended) and associated Regulations.

Phase	Mitigation and Monitoring
10.6	To reduce the risk of contamination, stockpiling of contaminated material is prohibited.
10.7	If it is not possible to immediately remove contaminated material then it will be stored on, and covered by, polythene sheeting to prevent rain water infiltrating through the material.
10.8	In-situ remediation of contaminated soils will be used in preference to offsite disposal where practicable.
10.9	A pre-construction survey will be completed to confirm the presence of identified areas of landslip hazard, and identify further areas of risk absent from this desk-study. Additionally, a Geotechnical Risk Register will be created to ensure any landslide and slope stability risks are systematically captured. This register will quantify the risk of failure and propose location-specific mitigation. The location of any identified areas of hazard will be incorporated into construction site management plans. Excavation, the use of heavy machinery, and site traffic routes will be planned to avoid these areas.
10.10	A pre-construction survey of karstic features will be carried out to confirm the presence of listed features and identify features absent from this desk-study assessment. The design of drainage, and temporary construction features (e.g. site compounds and access tracks) will be as such to avoid discharge of surface run-off to any identified karst feature or area of karst bedrock. This will include the use of lined ditches or impermeable pipes to direct collected water away from such features.
10.11	If excavation exposes limestone bedrock, an impervious liner will be used to mitigate against the risks of surface water directly entering into the karstified rock. Karst features will be assessed by a suitably qualified professional to determine their extent across the proposed development. Any Karst features will be filled with an appropriate granular material (to preserve hydraulic connectivity) and sealed before the liner is used.
10.12	Extensive GI will be carried out at the location of the limestone cutting at Water Rock to confirm the location of subsurface karst features including caves. The cutting at Water Rock will use an experienced contractor who will avoid caves and karst features. A geotechnical expert will be appointed by the contractor to closely monitor vibrations during cutting. Vibrations will be kept to within T11 specifications[1] which will ensure no disturbance to wider karst features including caves. In the unlikely event that vibration limits are exceeded, cutting will cease on site until the reason for the increased vibration is determined.
10.13	If GI or site work identifies potentially contaminated land at piling locations, an alternative (non-piling) method of embankment retention will be used. Where this is not possible, a Piling Risk Assessment will be carried out to select an appropriate piling method and identify any specific mitigation and monitoring measures required.
10.14	Where GI identifies that bedrock is likely to be encountered at proposed piling locations an alternative to drive piling will be required. This is likely to be either:
10.15	An alternative embankment retention method (reinforced concrete or gabion baskets). These alternatives may require additional excavation and land take; or
10.16	An alternative to drive piling (e.g. concrete sockets into bedrock). Socket piling will not be used in areas where GI has identified contaminated land due to the risk of mobilising contamination to the sensitive limestone bedrock. If socket piling is proposed into limestone:
10.17	A detailed karst stability assessment will be carried out. The objective will be to assess the ground stability and the need for reinforcement;
10.18	Impermeable liners will be used during socket piling to prevent loss of concrete to the limestone.

Phase	Mitigation and Monitoring
10.19	As a basis for a worst-case assessment, the quantities of material to be excavated and imported during construction have been assessed. This assessment assumes that no material can be reused. To the greatest extent possible, excavated material will be appropriately stored and reused on site to minimise the volume required for offsite disposal. The Contractor will ensure acceptability of the material for re-use within the proposed development. GI will be carried out to assess the properties of the material to be excavated. A construction earthworks programme will be implemented as part of the CEMP, which will categorise the source of material for each fill section and ensure it is appropriate.
10.20	Where non-granular fill material is used for embankment construction (e.g. reuse of local material) measures (e.g. the use of geotextile separator) will be taken to minimise washout of fines and/or sediment runoff from the embankment.
10.21	Where offsite disposal of excavated material is required, it will be managed in accordance with the Waste Management Act 1996 (as amended) and associated Regulations.
Hydrogeology	
10.22	A pre-construction verification survey of the identified boreholes / wells within 150m of the new track or construction compounds will be carried out to confirm whether they remain in use, and the nature of use.
10.23	If they are used for drinking water purposes, water quality testing of the boreholes (for standard drinking water parameters including turbidity) will be carried out. Water quality testing will be carried out monthly for 12 months before construction, monthly during construction and for at least 12 months after construction to ensure no degradation of water quality as a result of the construction activities.
10.24	A pre-construction survey of karstic features will be carried out to confirm the presence of listed features and identify features absent from this desk-study assessment. Due to the sensitivity and connectivity of the karstic environment, including the risk of potential connections between karst features and sensitive receptors outside of the study area, additional mitigation measures to reduce the risk of impact will be used. These include that:
10.25	A buffer area (at least 20 m) will be provided surrounding each identified karst feature, whereby no construction activity, including storage of materials will occur.
10.26	Storage of materials (including excavated materials and fill and ballast) will avoid areas at risk of surface water or groundwater flooding or areas of convergence of flow ; and
10.27	The use of additional pollution prevention measures, such as double silt fencing, will be used where excavation occurs adjacent to an identified feature.
10.28	It is anticipated that all existing drainage outfalls will be retained and that no new outfalls will be required. Where new drainage will be installed (in areas where significant alterations are proposed to the track), the design of the drainage will avoid discharge of surface run-off to any identified karst feature or area of karst bedrock. This will include the use of lined ditches or impermeable pipes to direct collected water away from such features.
10.29	Regular inspection and maintenance of trains (and other machinery) operating on the proposed development will occur. This will reduce the risk of accidental spillage of fuels, lubricants and chemicals, and subsequent pollution of run-off.
Chapter 11 Water and Flood Risk	
General	
11.1	Construction
The following mitigation measures will be implemented prior to commencement and throughout the duration of the proposed works.	
11.2	A full-time on-site Environmental Clerk of Works (EnCoW) will be appointed prior to commencement of works.

Phase	Mitigation and Monitoring
11.3	Confirmatory pre-construction surveys will be carried out and seasonal constraints will be confirmed in agreement with IFI and National Parks and Wildlife Service (NPWS) and Cork County Council, as appropriate.
11.4	Works will be carried out in accordance with the guidelines set out by IFI in 'Guidelines on Protecting Fisheries During Construction Works in and Adjacent to Waters' (IFI, 2016).
11.5	The IFI Biosecurity Protocol for Field Survey Works will be complied with.
Surface Water Quality Protection Measures	
11.6	The following water quality mitigation measures will be implemented prior to commencement and throughout the duration of the works:
11.7	Water quality monitoring will be conducted upstream and downstream of the works prior to works commencing and at regular intervals during the works.
11.8	Activities will be planned in advance and machinery will be managed to ensure that the number of trips is limited to the minimum required at each location i.e. the more times a piece of ground is tracked, the more likely it is that vegetative cover will be removed and ruts will be created that will act as miniature rivers where dirty water will flow.
11.9	Tracking beside streams and tracks will be avoided to avoid damage to the bankside.
11.10	Geotextile or timber matting will be used on soft ground, and in all protected areas
11.11	A buffer zone of 10m will be maintained between storage and working areas and watercourses, taking account of the minimum working area required to facilitate the works.
11.12	The time period over which areas of clearance are left open will be reduced insofar as is reasonably practicable.
11.13	Construction Re-instatement method statements will be subject to approval by the EnCoW.
11.14	Concrete will be brought to site by covered truck. Wet concrete operations adjacent to watercourses will be avoided where possible.
11.15	The Contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where possible and remote from watercourses.
11.16	In order to reduce the risk of contamination arising as a result of spills or leakages, measures including, but not limited to, the following will be employed:
11.17	· All collected waste will be managed in accordance with the Waste Management Act 1996, and associated Regulations:
11.18	· Fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces;
11.19	· Refuelling of plant, equipment and vehicles will be carried out on impermeable surfaces;
11.2	· All tanks and drums will be bunded in accordance with established best practice guidelines; and
11.21	· Spill kits will be provided at all compound locations and carried by all crews during underground cable installation works.
11.22	Works will not be carried out during extreme rainfall or high flow events. An early flood warning system will be set up to allow the removal of plant and material from construction compounds located in Flood Zones A and B in the events of flood warning.

Phase	Mitigation and Monitoring
11.23	Silt fences (to Hy-Tex Premium specification or similar) and silt traps will be installed prior to commencement of works and will be inspected daily to inform adaptive management as required. The locations of same will be determined by the EnCoW.
11.24	Site restoration post works will be carried out, in agreement with IFI with regard to the IDA culvert and works at the Owenacurra River Bridge. These works may include riverbank stabilization, gravel replacements etc. In all cases, the site will be restored post installation.
11.25	There are also two construction compounds proposed on the west side and east side of the Owenacurra River. The westerly compound is only for access to the bridge abutments and there will be no portacabin or storage in this area. The easterly compound will be used for storage of materials. Both compounds will be set back from the riverbank by a minimum of 15m.
11.26	The works to extend/reconfigure culverts will be conducted during the period July – September to avoid effects on fisheries.
11.27	Catch netting will be installed on the underside of the Owenacurra River Bridge to prevent any material from entering the watercourse.
11.28	Silt Control Measures
11.28	Silt control measures will be used to control silt generated from activities on site and prevent it gaining access to surface drainage which could convey silt to larger streams and watercourses.
11.29	Construction
11.29	Silt control measures include silt traps which can be located in small drains where flow is small and silt fences where runoff from large areas needs to be controlled.
11.30	Silt fences must be installed in the working areas and not at the watercourse.
11.31	Access routes will be delineated such that an appropriate set back distance from watercourses is maintained. Where works are to be undertaken adjacent to watercourses the setback distance will be delineated by the EnCoW on site.
11.32	Where distances between the works and watercourse allow, a minimum setback distance of 30m from the watercourse will be maintained.
11.33	Where the site is constrained, the best available set back distance will be employed taking account of the minimum working area required to facilitate the works.
11.34	Silt Fences
11.34	Silt fences will be installed downslope of the area where silt is being generated on disturbed ground.
11.35	To be effective the silt curtain must contain the area where silt is generated and must terminate on high ground (i.e. an elevated area not in the watercourse).
11.36	Silt fences will be constructed using a permeable filter fabric (e.g. Hy Tex Terrastop Premium silt fence or similar) and not a mesh.
11.37	The base of the silt fence will be bedded at least 15-30 cm into the ground at 2 metre intervals.
11.38	Once installed the silt fence will be inspected regularly, daily during the proposed works, weekly on completion of the works for at least one month, but particularly after heavy rains.
11.39	The integrity of the silt fencing will be checked daily by the EnCoW and after poor weather conditions (rain or wind) and any failures rectified immediately.
11.40	Two lines of silt curtain / fence will be installed, where considered necessary, by the EnCoW.

Phase	Mitigation and Monitoring
11.41	Any build-up of sediment along the fence boundary will be removed daily.
11.42	Silt fences will be maintained until vegetation on the disturbed ground has re-established. Re-instatement method statements will be subject to approval by the EnCoW.
11.43	The silt fencing must be left in place until the works are completed (which includes removal of any temporary ground treatment).
11.44	Silt fences will not be removed during heavy rainfall.
11.45	The silt fence will not be pulled from the ground but cutaway at ground level and posts removed.
11.46	A record of when it was installed, inspected and removed will be maintained by the EnCoW.
Construction	Silt Traps
11.52	The purpose of the trap is to reduce the level of solids in the slowly flowing water. The silt trap works by allowing a build-up of water behind it slowing flow and allowing solids to settle out. The following requirements will apply:
11.53	Silt traps will only be placed in drains downstream of working areas where the volume of water flow is expected to be low.
11.54	Silt traps will be made of terram or similar material, not mesh.
11.55	The trap will be staked into the banks of the drain / watercourse such that no water can flow around the sides.
11.56	The material will be bedded into the drain bed/watercourse to prevent water flowing beneath it.
11.57	The height of the trap will be lower than the bank heights. The upper edge will be fixed to a timber cross piece. This will allow water to overtop the silt trap and not burst through or around it.
11.58	Inspections will be carried out daily; during the proposed works, weekly on completion of the works for at least one month, and after heavy rains, and monthly thereafter until bare areas have developed new growth.
11.59	Any build-up of solids will be carefully removed without removing any vegetation growing on the bottom.
11.6	In sensitive areas a series of silt traps will be placed in the drain.
11.61	The silt trap will not be pulled from the ground but cutaway at ground level and posts removed.
11.62	A record of when it was installed, inspected and removed will be maintained by the EnCoW.
	Karst Measures
11.64	Due to the sensitivity and connectivity of the karstic environment, including the risk of potential connections between karst features and sensitive receptors outside of the study area, additional mitigation measures to reduce the risk of impact will be used. These include that:
11.65	A buffer area (at least 20 m) will be provided surrounding each identified karst feature, whereby no construction activity, including storage of materials will occur.
11.66	Storage of materials (including excavated materials and fill and ballast) will avoid areas at risk of surface water or groundwater flooding or areas of convergence of flow ; and

Phase	Mitigation and Monitoring
11.67	The use of additional pollution prevention measures, such as double silt fencing, will be used where excavation occurs adjacent to an identified karst feature.
11.68	Construction
	The design of drainage will be as such to avoid discharge of surface run-off to any identified karst feature or area of karst bedrock. This will include the use of lined ditches or impermeable pipes to direct collected water away from such features.
	Flood Risk Protection Measures
11.7	Any construction activities inside the watercourse or impeding flow area of the existing watercourse or inside the existing floodplain should be consulted with a Flood Risk Specialist. The Flood Risk Specialist will determine if a further assessment or mitigation measures are required. The mitigation measures may include the creation of a flood plan and putting an early flood warning system in place.
11.71	Appendix 11.3 (FRA Stage 3) of Chapter 11 Surface Water and Flood Risk, identified the potential risks and mitigation in relation to the construction works on culverts and the Ownennacurra Bridge. Should the construction method change, a new assessment will be required by the Flood Risk Specialist.
Chapter 12 Biodiversity	
Construction	Mitigation and Monitoring Measures
	Construction Phase Mitigation Measures
12.1	Mitigation measures were designed having regard to the Mitigation Hierarchy. This is a sequential order of mitigation actions whereby the preference for mitigation measures are as outlined below:
12.2	Avoidance: Steps to avoid harm to biodiversity.
12.3	Minimisation: Where adverse impacts cannot be avoided, action is taken to minimise these impacts.
12.4	Compensation: Only considered after all possibilities for avoidance and minimisation of impacts have been implemented.
12.5	Care has been taken throughout the design process to avoid impacts to sensitive ecological receptors. Additional mitigation measures to ameliorate the impacts as described in this chapter are outlined hereunder. These are incorporated into this CEMP for the proposed development.
	Ecological Clerk of Works
12.6	An ECoW will be employed by the Contractor to oversee implementation of mitigation. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented. The Contractor's ECoW will also ensure any disturbance licenses are arranged based on relevant details outlined in this EIAR and any significant findings of further confirmatory pre-construction surveys outlined above. The Contractor's ECoW will advise on mitigation measures implementation including the scheduling of works and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated and impacts are minimised. An independent Environmental Clerk of Works (EnCoW) will be employed on behalf of the Employers Representative team, who will review and comment on the monitoring and compliance reports generated by the Contractor's ECoW.

Phase	Mitigation and Monitoring
12.7	Key sensitive habitats, where works areas are adjacent, including saltmarsh and tidal mud will be monitored by the site EcoW on a full-time basis to ensure impacts to these sensitive adjacent habitats are avoided. Prior to enabling and construction works the site EcoW will review and confirm proposed access routes, demarcate sensitive habitats and confirm works areas in these locations.
12.8	<p data-bbox="616 403 1108 424">Mitigation to Prevent Spread of Invasive Species</p> <p data-bbox="616 448 1736 520">It is an offence under Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) to plant, disperse, allow, or cause to disperse, spread or otherwise cause to grow any plant species specified in the Third Schedule of the Regulations.</p>
12.9	Japanese knotweed, three cornered leek, Spanish bluebell, and Himalayan balsam (all listed under the above legislation) have been recorded within the footprint of the proposed development.
12.10	<p data-bbox="616 579 696 600">General</p> <p data-bbox="616 624 1736 719">It is noted that Japanese Knotweed is being actively treated along most of the proposed work's area currently (2022). Prior to works commencing a full preconstruction confirmatory invasive species survey will be carried out. The confirmatory survey will be carried out within the works areas, including compound locations, and along proposed access routes to identify the presence of all invasive species within and adjacent to works areas.</p>
12.11	The invasive species confirmatory survey will be carried out during the appropriate growing season (May–October). The findings of this confirmatory survey will be incorporated into an updated Invasive Species Management Plan by the Contractor's ECoW.
12.12	Any stands of invasive species recorded within the proposed development boundary, including within compounds and along access tracks, will be clearly marked out as restricted areas. This exclusion zone will incorporate a buffer surrounding stands of Japanese knotweed such that below ground growth is accounted for (7m in diameter and 3m depth and inclusive of both treated and untreated material at a worst-case scenario). No works will be carried out within the exclusion zones unless approved by the Contractor's ECoW.
12.13	'Biosecure zone' signage will be erected at each potentially contaminated site. This is to alert staff that invasive species have been recorded and to avoid accidental entering or interfering with these sites. Likewise, any stockpiles of soil that are or could be contaminated with any of the aforementioned invasive species will be clearly marked. Marked haulage routes protected by root barrier membranes will be established within the proposed development footprint to allow transport to bunds.
12.14	Designated and clearly marked cleaning stations will be strategically placed within the work site for use by staff, vehicles, and machinery. Where it is necessary to work in contaminated areas, every effort will be made not to use vehicles with caterpillar tracks.
12.15	The Contractor's ECoW will carry out a toolbox talk for all construction personnel which will provide information on how to identify and manage invasive species. The toolbox talk will take place prior to works commencing in any areas where Invasive Species have been recorded.
12.16	All vehicles and equipment that have been used in these control operations will be steam-cleaned in a designated wash-down area each time they leave the contaminated area, and once work in that area has been completed. This also includes footwear, personal protective equipment (PPE), tools, and other light equipment. This is essential to remove soil that may contain plant fragments (vector material), which otherwise could be transported along the proposed development as works are being undertaken. Any water required for this will be brought to site in a bowser.

Phase	Mitigation and Monitoring
12.17	Vehicles leaving contaminated area(s) will either be confined to marked haulage routes protected by root barrier membranes or be steam cleaned as outlined above before leaving the area. Only vehicles that are deemed to be Biosecure (i.e. sealed so that no soil can escape) will be used to transport contaminated soil and all must be thoroughly steam cleaned in the designated wash-down area before exiting the designated area.
	Chemical Control
12.18	Three cornered leek, Spanish bluebell and Himalayan balsam can all be controlled effectively using herbicide application. Applications will take place in Spring . Follow up monitoring of treatment sites will be undertaken annually, to ensure that regrowth of new plants does not take place.
12.19	The stands of Japanese knotweed identified within the proposed development footprint have been subject to a chemical treatment regime. In order to control established stands of Japanese knotweed, repeated treatments over successive years is necessary . Treatment will be carried out annually by Irish Rail.
12.20	TII (2020) outline that a site may be considered remediated after two consecutive growing seasons with no sign of regrowth from all of the previously identified stands. It is of note, however, there is always the possibility of further regrowth occurring, this happens most commonly through the reactivation of dormant rhizomes due to disturbance of soils but may also occur through re-infestation of the site from off-site.
12.21	Treatment of established stands of knotweed will be continued in order to prevent the spread of existing stands within the proposed development footprint.
	Physical Control
12.22	Pulling and digging of Himalayan balsam plants (before seed is mature), three cornered leek, and Spanish bluebell has been found to be an effective methodology to control and remove stands. This treatment will only be carried out under supervision of the EcoW or by an appropriately experienced knotweed contractor. All waste material associated with these stands will be treated in accordance with legislative requirements on disposal.
12.23	Physical control methods (cutting, digging, excavating etc) of Japanese knotweed will be avoided wherever possible as interference with stands may result in a resurgence of growth in dormant stands, and increase potential for spread of vector material should biosecurity measures not be adhered to.
12.24	Where excavation of Japanese knotweed material is required, it may be subject to burial at a suitable location agreed with the site EcoW, as follows:
12.25	Stands of Japanese knotweed identified for removal will be treated with a non-persistent herbicide prior to excavation.
12.26	Material with potential to contain Japanese knotweed, or vector material, will only be excavated under strict supervision and placed within a vehicle for transportation.
12.27	Only vehicles that are deemed to be Biosecure (i.e. sealed so that no soil can escape) will be used to transport contaminated soil and all must be thoroughly steam cleaned in the designated wash-down area before exiting the contaminated area.
12.28	Burial of material may be undertaken as follows:
12.29	Where deep burial of a minimum depth of 5m is feasible, the waste will be covered with a proprietary root barrier membrane. Any joins in the membrane will be overlapped and secured. No material will be placed over the membrane until it has been inspected by the EcoW. A layer of pea gravel will be placed on top of the barrier membrane to reduce the potential for perforation of the barrier membrane. The waste will then be infilled with a minimum 5m depth of uncontaminated soil.

Phase	Mitigation and Monitoring
12.30	Where a burial of 5m is not feasible, the waste will be completely encapsulated in a proprietary root barrier membrane cell. The lower surface of membrane will be covered in a layer of pea gravel to reduce the potential for perforation of the barrier membrane. Any joins in the barrier membranes will be overlapped and suitably sealed. The upper surface of the cell will be covered in a layer of pea gravel and buried to a minimum depth of 2m. No material will be placed over the membrane (both internally and over the upper surface until it has been inspected by the EcoW.
12.31	Where burial is not feasible due to site constraints, the material may be transported off-site (under license). It is a requirement to dispose of this material in a fully licenced wasted facility, capable of accepting such contaminated material. This disposal requirement applies to all Japanese knotweed contaminated material including untreated and treated plant material.
	Monitoring
12.32	As outlined previously, a single herbicide treatment is unlikely to control an established stand of Japanese knotweed. Any re-growth of treated Japanese knotweed will be accurately mapped.
12.33	Monitoring will be conducted post treatment to determine the level of control success that the treatments of all species have achieved. All stands identified within the proposed development, and any areas where burial or storage has taken place will be monitored. This will continue at a minimum until such time that after two consecutive growing seasons there is no sign of regrowth from all the previously identified stands within the proposed development site.
12.34	Following control of large areas Japanese knotweed, a subsequent disturbance of the soil may give rise to revitalised rhizome growth. To avoid this, bare soil will be mulched (covered with a natural or synthetic barrier, such as wood chip, straw, geo-textile, or other appropriate material) and planted at the earliest opportunity with appropriate native replacement vegetation to stabilize the soil and deter subsequent re-invasion.
	Reinstatement
12.35	Unless otherwise agreed with the Employer's Representative, the Contractor will re-instate hedgerows, and treelines, to a species-rich condition (i.e. five woody species per 30 m), comprising only native species suited to the locality.
12.36	The Contractor will seed all grassland verges with a native wildflower mix (to specification of EC12 Wild Flora for Earth Banks, Bunds and Ditches [1]).
12.37	All other sites will be returned as close as possible to their pre-existing condition, using the same woody species removed, or similar verge seed mixes, under the supervision and direction of the ECoW. Plant species of native provenance will be used in all replanting of semi natural habitats.
12.38	The Contractor will commit to a five year after-care plan for hedging, grassland, and agricultural reinstatement, or as otherwise agreed with the local authority.
12.39	The Contractor's agronomist will inspect, photograph and report in writing to the Employer's Representative on the establishment-phase of all vegetation.
12.40	The Contractor's agronomist will review, and advise on any corrective measures required to ensure good condition, immediately after reinstatement, and at least twice yearly thereafter for a five year period.
	Mitigation Against Impact to Rare and Protected Plant Species
12.41	As outlined previously, historical records of little robin, round leaved crane's bill and wood small reed were identified during the desktop study. These species were not recorded during site walkovers and are considered unlikely to occur. However, given their habitat associations, the following mitigation measures will be incorporated at a minimum:
12.42	Prior to works commencing a confirmatory survey for the species within suitable habitat, where direct impacts will arise, will be carried out by an experienced botanist during the appropriate flowering season.

Phase	Mitigation and Monitoring
12.43	The botanist, to be appointed by the Contractor, will coordinate with the Contractors ECoW and, report findings to the ENCoW within the Client's Representative Team. The botanist will be contracted for a period lasting at least one year following the cessation of potentially damaging construction works at the plant location(s).
12.44	In the event where one or more plants are identified at risk of impact, an assessment of risk of impact will be carried out by the appointed botanist, in consultation with NPWS where relevant. The assessment will be specific to the species which identify any additional measures required to protect the species by either avoiding and protecting the plant species in situ, or (only as a last resort) through the translocation of the plant species to new receptor locations nearby, under licence from the NPWS where appropriate. Any additional measures as outlined under the terms of the license will also be included.
Mitigation Against Impact to Breeding Birds	
12.45	Woody vegetation clearance will take place outside the main bird breeding season (March – August inclusive). Where tree clearance is proposed during the bird breeding season an experienced ecologist will conduct a pre-construction confirmatory survey to confirm no bird breeding sites will be disturbed. This will be monitored by the site EcOW.
12.46	Habitat reinstatement (Section 12.7.3) will ensure replanting of suitable woody vegetation breeding habitat for birds post works.
Mitigation Against Impact to Amphibians	
12.47	A pre-construction confirmatory survey for frog will be undertaken prior to works commencing during the breeding season (February and March) at potential suitable breeding habitat (ditches, drains, and standing water impacted).
12.48	When surveying for the species biosecurity measures will be followed to ensure that there is no incidental spread of vector borne diseases between waterbodies. This includes the cleaning, disinfection and drying of all equipment and will have regard to guidelines from IFI .
12.49	Should frog be recorded, translocation of the species to areas outside of the proposed development footprint will be undertaken, in consultation with the NPWS. Any translocation of these species will be under license by the NPWS.
12.50	Any spawn or adult frogs recorded will be captured and removed from affected habitat by hand net and translocated to the nearest area of available suitable habitat.
Mitigation for the Protection of Otter	
12.51	The Contractor will ensure an initial confirmatory otter survey is undertaken in advance of the commencement of any works within 150m of the works areas as per Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes. This will allow for the identification of any additional holts which have been established prior to commencement of works and the confirmation of the activity status of the identified holt.
12.52	The confirmatory pre-construction survey will be conducted no more than 10-12 months prior to construction commencing.
12.53	The existing holt is located approximately 115m from the existing track. This is within the Zol of noise effects associated with the proposed development. Should the holt be confirmed to be active during preconstruction confirmatory surveys, prior to works commencing between Ch 800 and Ch 925 sound reducing hoarding will be placed adjacent to works areas on the southern boundary of the site. This will reduce further the noise impacts associated with the construction phase of the works.
12.54	In addition, all plant used during the construction phase will be the quietest of its type practical for achieving the works.
12.55	All plant will be operated and maintained in accordance with the manufacturer's recommendations including the use and maintenance of any specific noise reduction measures.

Phase	Mitigation and Monitoring
12.56	At a minimum the following will be incorporated to reduce the impact further:
12.57	The use of mufflers on pneumatic tools.
12.58	Effective exhaust silencers.
12.59	Machines in intermittent use will be shut down during periods where they are not required.
12.60	Should any additional holts be identified within 150m of the proposed development the following will, at a minimum, be employed, unless otherwise agreed with the NPWS:
12.61	No works will be undertaken within 150m of holts where breeding females or cubs are present. Presence of breeding females will be assumed until confirmed otherwise.
12.62	Works within 150m of such a holt can only take place following consultation and in agreement with the NPWS
12.63	No wheeled or tracked vehicles of any kind will be used within 20m of active but non breeding holts
12.64	No light work such as digging by hand or scrub will take place within 15m of such holts except under license from NPWS
12.65	The identified exclusion zones will be fenced and clearly marked on site prior to any invasive works.
12.66	All contractors on site will be made fully aware of the procedures in relation to the holts by the EcoW
Mitigation for the Protection of Badger	
12.67	Prior to any works commencing a preconstruction confirmatory badger survey will be carried out. Surveys will be conducted having regard to Surveying Badgers (Harris et al.1989) and record signs of badgers including tracks, hair, latrines and setts. The extent of the confirmatory survey area will be defined with regard to Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (NRA, 2006) as 150m beyond all works areas within suitable habitat.
12.68	Prior to works commencing, sett activity at all identified setts (including sett identified as inactive during initial walkovers) within 150m will be confirmed. This may be confirmed through the use of camera monitoring, setting of footprint traps, soft blocking of the sett entrance or similar. Any risk of disturbance to badger will be subject to disturbance license requirements.
12.69	A description of the setts i.e. main sett, annex sett, or outlier sett will be provided by the EcoW along with the level of activity at the sett. This will allow for an understanding of the importance of the setts in the wider context of the local population.
12.70	As per the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (NRA, 2006), where setts have been confirmed, no heavy machinery will be used within 30m of badger setts (unless carried out under licence from the NPWS). Lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance will not take place within 10m of sett entrances.
12.71	Unless otherwise agreed, and under license from the NPWS, during the breeding season (December to June inclusive), none of the above works will be undertaken within 50m of active setts nor blasting or pile driving within 150m of active setts. An assumption that the sett is active will apply unless proven otherwise during the course of investigation.
12.72	The three setts already identified are located in close proximity to the proposed works areas, with two requiring removals, and the third potentially directly impacted by works depending on the direction of underground chambers.

Phase	Mitigation and Monitoring
12.73	Sett Evacuation and Destruction
12.74	Any exclusion and/or destruction of setts will be undertaken in consultation with, and under license by the NPWS.
12.75	Prior to works commencing all three of the setts, and any additional setts identified during pre-construction confirmatory surveys will be clearly marked and the extent of bounds of exclusion zones clearly marked by fencing and signage. The location and restrictions surrounding these setts will be clearly communicated to personnel on site.
12.76	No exclusion or destruction procedures will take place during the badger breeding season due to risk of young being trapped within the sett.
Inactive Setts	
12.77	All entrances will be lightly blocked with vegetation and soil. The sett will be left undisturbed for approximately five days. If all entrances remain undisturbed for the time period the sett will be destroyed immediately using a mechanical digger, under the supervision of the licensee.
12.78	Should there be a delay all entrances will be hard blocked. Immediately prior to destruction the licensee will inspect the sett to ensure there are no signs of activity. The sett may then be destroyed as outlined above.
Active Sett	
12.79	Sett exclusions of active setts will include setts within the footprint of the works, but also setts where the proximity of the feature is such that there is potential for impact to outer chambers.
12.80	All entrances will have one-way gates installed to allow badgers to exit but not to return. The gates will be tied open for three days prior to the exclusion procedure taking place. During the exclusion procedure, gates will be left installed, with regular inspections, over a period of a minimum of 21 days before the sett is deemed to be inactive.
12.81	Inspections will include areas between sett entrances to identify any areas where badgers may have attempted to dig around the gates, or created new entrances and tunnels into the sett. Provided the gates are effective, and no activity is observed for 21 days, the sett may be considered inactive.
12.82	In the case of setts identified within the footprint of the works, destruction of the sett will be required. Once the sett is considered inactive destruction may take place.
Sett Destruction	
12.83	Destruction of setts will be avoided wherever possible.
12.84	Destruction of inactive and evacuated setts may only be conducted under license from NPWS and supervision of qualified and experienced personnel. Preparation must be made, and equipment on hand, to deal with any badgers which may be trapped within the sett, or injured during destruction.
12.85	Destruction may be undertaken with a tracked digger, over the time period of no more than one day. The digger will commence at approximately 25m from the outer sett entrances and work towards the centre of the sett cutting small 0.5m sections in a trench to a depth of 2m. Any tunnels which are exposed may be checked for recent badger activity. The sett will be destroyed from several directions until only the centre core remains. Once it is ensured that no badgers are present, the core may be removed and the area backfilled and made safe.
Artificial Setts	
12.86	As the two setts identified for destruction are noted as being outliers, there are alternative natural setts present in the wider area to accommodate any displaced badgers. Should setts be identified for destruction where no suitable natural setts are present, i.e. a breeding sett, an artificial sett will be constructed to replace the sett.

Phase	Mitigation and Monitoring
12.87	Any artificial sett will be constructed months in advance of the closure of the breeding sett. Closure and destruction of the existing sett will not take place until it is ensured that the affected badgers are utilising the artificial sett.
12.88	The sett will be constructed as close as possible to the existing sett, outside of the development footprint at a location that avoids significant residual impacts to habitats of ecological value.
12.89	The artificial sett will be located in well drained soils, landscaped, and planted, such that the sett is well covered to ensure lack of disturbance.
Mitigation for the Protection of Bats	
12.90	The Design and Construction of bat mitigation measures will be site specific, and comply with licensing requirements, having regard for relevant guidance including the NRA's "Guidelines for the Treatment of Bats During the Construction of National Road Schemes"[2], and the NPWS Bat Mitigation Guidelines for Ireland[3].
12.91	The following measures will, at a minimum, be undertaken:
12.92	Trees with suitability for roosting bats will not be felled in advance of surveying for bats, unless in agreement with the ECoW, and NPWS as relevant. This includes trees identified during baseline walkover surveys, and any additional trees with roosting features that may develop prior to works commencing.
12.93	Prior to felling of any trees, an initial bat survey of trees to be felled will be undertaken, by a licensed qualified specialist, to assess the suitability of the tree to contain bat roosts as per Bat Surveys for Professional Ecologists: Good Practice Guidelines.
12.94	Trees identified with potential roost features will be thoroughly examined, under licence from the NPWS, to ascertain the presence or absence of roosting bats. This will be conducted by an experienced bat expert. The trees will be examined for the presence or absence of bats / bat roosts immediately prior to felling. NPWS (2022) guidance notes that emergence/re-entry surveys of trees are limited in terms of effectiveness. As such, inspections via endoscope will be carried out, including of features at height.
12.95	Where felling does not occur within one day of the examination, the trees will be re-assessed.
12.96	Where evidence of a roost, or roosting bats has been determined, a license for destruction of a roost and/or exclusion of bats will be required from the NPWS. The procedures for the exclusion of bats and destruction of roost as detailed in the license document will be obeyed, at all times, by the Contractor.
12.97	Where bat exclusions are required, they will be undertaken in accordance with the requirements of the bat specialist, and any conditions under license. They will not be carried out during the breeding season, between the months of June to August inclusive, or during hibernation in the months of November to March inclusive, unless under license from the NPWS. Where the felling of trees found to be suitable as bat roosts cannot be avoided, appropriate mitigation will be agreed with the NPWS and put in place at least one month in advance of any felling or disturbance.
12.98	If any bat roost sites are removed by the Works, appropriate replacement bat roost sites will be provided following consultation with the NPWS, and in consultation with the local authority.
12.99	The Design and Construction of bat mitigation measures will be site specific, and comply with the requirements of the bat specialist, the Standards, the TII's "Guidelines for the Treatment of Bats During the Construction of National Road Schemes", the National Parks and Wildlife Services Bat Mitigation Guidelines for Ireland, the National Parks and Wildlife Service Circular 2/07 Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997.
Mitigation for the Protection of Wintering Birds	

Phase	Mitigation and Monitoring
12.100	Prior to the commencement of the works, a sound reducing hoarding will be placed along works area from Ch 600 to 800. Sound hoarding will reduce the noise impacts associated with the construction phase of the works. It will also reduce visibility of workers.
12.101	The barrier material will have a mass per unit area exceeding 7kg/m ² in accordance with the recommendations of BS 5228 Part 1:2009+A1:2014 Part B.4.
12.102	Any temporary lighting used to facilitate the works will be cowed and angled away from the SPA and watercourses.
12.103	The EnCoW will undertake daily monitoring of the barrier to ensure installed correctly, and identify any defects for the contractor to remedy.
12.104	All plant will be operated and maintained in accordance with the manufacturer's recommendations including the use and maintenance of the specific noise reduction measures in the next bullet.
12.105	The following may be incorporated to reduce the impact further:
12.106	The use of mufflers on pneumatic tools
12.107	Effective exhaust silencers
12.108	Sound reducing enclosures
12.109	Machines in intermittent use will be shut down during periods where they are not required.
Mitigation for the Protection of Breeding Birds	
12.110	Retention and compensation for areas of habitat which may be used by Breeding Birds (i.e. scrub, hedgerows, and grassland habitats is outlined previously in Section xx.
12.111	As outlined in the description of the development the clearance of all vegetation (except for improved grassland, recognising bare ground, or other vegetation with no nesting potential as determined by the ECoW), will take place outside of the breeding season for birds where possible or as determined by risk of disturbance to a nest site.
12.112	Should clearance within the breeding season be required, a suitably qualified ecologist / EcOW will conduct pre-construction confirmatory surveys to assess risk of disturbance to nesting birds to inform vegetation clearance activity. In the event where pre-construction surveys confirm or presume nesting birds are present, an exclusion zone will be established around the nesting bird (to include the risk of abandonment due to indirect disturbance), and no vegetation clearance may proceed until young are presumed to have fledged, or nesting has failed. Repeat surveys will be required if vegetation has not been cleared within 72hours of the initial survey. This will prevent direct impact to nesting birds within the footprint of the works.
12.113	Pre-construction confirmatory surveys will be carried out for kingfisher and other riparian breeding bird species. These will incorporate a survey area of approximately 100m upstream and downstream of the works at all river crossings.
12.114	Features likely to be of note to kingfisher and other breeding riparian bird species will be recorded and watches of suitable nest areas undertaken. If actual nest sites (i.e. confirmed or presumed) are present at or within close proximity to works areas at water crossings, the NPWS will be consulted regarding the potential requirement to stop works. The loss of any potentially suitable nesting sites will be compensated through the addition of artificial nesting sites or suitable nest features within the reinstated riverbank. The provision of any new nesting sites (if required) for kingfisher or other riparian bird species will be undertaken in line with NPWS and IFI consultation.
Mitigation for the Protection of Watercourses	

Phase	Mitigation and Monitoring
12.115	Mitigation for the protection of water quality in watercourses has been outlined previously in Chapter 11. Additional mitigation for the protection of aquatic species is outlined hereunder. General
12.116	Works will be carried out in accordance with the guidelines set out by IFI in 'Guidelines on Protecting Fisheries During Construction Works in and Adjacent to Waters' (IFI, 2016).
12.117	The IFI biosecurity protocol for works will be complied with for all instream works.
12.118	The open season (July-September) restriction for instream works will apply for all instream works.
12.119	Works method statements will be agreed with IFI for all instream works at watercourse crossings prior to works commencing. These method statements will be site and river specific.
12.120	The works method statement will include details on the works to take place, along with clear instructions relating to placement and monitoring of aquatic mitigation measures.
12.121	Works will not continue during adverse weather events, including during Met Eireann (Red, Orange, Yellow) warnings, and periods of high flow. High temperature will also be considered during instream works as this has the potential to cause increased stress on aquatic species. Instream Works
21.123	Instream works will be required to facilitate certain works. In the case of the Owenacurra River, the instream works will be restricted to the installation of scaffolding to support the addition of capping beams to the existing piers .
12.124	All instream works, including silt control measures, biosecurity measures, and fish salvage operations will be monitored by an appropriately experienced ECoW.
12.125	These instream works will be carried out between July and September, which is outside of the salmonid spawning season.
12.126	Instream works will take place within an isolated works area. Any isolated area will be kept to the minimum size required to facilitate the works. Works will take place span by span to ensure that there is no loss of flow during the works.
12.127	The riverbed will be isolated using either an aquadam, or sandbags, dependant on the water levels present when the works take place. Any sandbags used will be filled with clean, sediment free material to ensure that there is no downstream mobilisation of silt.
12.128	Prior to drying out of the works area, de-fishing will be undertaken under license. This will include for the translocation of fish out of the works footprint, should they be found within the isolated works area. The base of the realigned concrete channel will be lined with a layer of closely packed natural rock slabs. The rock slabs will be of approximate dimension 600mm(l) x 600mm(w) x 200mm(d).
12.129	Any pump used to dewater the works area will be fitted with a screen to prevent aquatic species from being sucked into the pump.
12.130	No dewatering will take place directly into the river itself. Any water pumped out of the works area will be treated to prevent downstream mobilisation of pollutants and sediment. Water will be discharged back to the river in such a way that scour is prevented.
Chapter 14 Archaeology, Architectural & Cultural Heritage	

Phase	Mitigation and Monitoring
14.1 Construction Phase	The mitigation strategies outlined in this section detail the techniques to be adopted in order to ameliorate the impacts that the proposed development may have on features of archaeological, architectural and / or cultural heritage within the study area during both the construction and operation phases of the scheme. The residual impacts that will remain once these mitigation measures have been implemented are set out in Section 14.1.8.
14.2	The following proposed mitigation measures are subject to approval by An Bord Pleanála and the National Monuments Service of DHLGH:
14.3	All sub-surface groundworks associated with the proposed development works at the Glounthaune Estuary AAP (Johnstown/Killahora; CH030) shall be subject to a programme of archaeological monitoring:
14.4	This should be carried out by a suitably qualified archaeologist under license and in accordance with the provisions of the National Monuments Acts 1930-2004.
14.5	If significant archaeological material is encountered during the course of archaeological monitoring, then resolution of any such significant material will be determined in consultation with the National Monuments Service (DHLGH).
14.6	Where possible, every reasonable effort should be made to preserve in situ or reduce the impact on any identified archaeological material. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of full archaeological excavation should be implemented to ensure the preservation by record of the portion of the site that will be directly impacted upon. This work should be carried out by a suitably qualified archaeologist under license and in accordance with the provisions of the National Monuments Acts 1930-2004.
14.7	A written report will be prepared detailing the results of all archaeological work undertaken.
14.8	It is recommended that architectural heritage structures along the railway line are monitored for signs of stress/cracking during the construction phase. Recommendations for a 5-year maintenance inspections on architectural heritage structures have also been identified in Chapter 14 Appendix 14.2
14.9	In relation to the dismantling of OBY 8, Ballyadam House Bridge conservation by record will be carried out, including lazer-scanning; careful dismantling and storage for repair of similar structures; and consideration of off-setting the effect by restoring Carrigtwohill Station building to compensate for loss of fabric at agricultural overpass.
14.1	When construction works are being carried out to widen the bridge deck of the Owenacurra river bridge (UBY 11), the historic buttresses that carry the bridge need to be protected during the works and assessed to ensure they can carry the structure without damaging them, during the operational phase.
14.11	Piling for a retaining wall to realign culvert UBY 2 in close proximity to Haly's Bridge (OBY2) should use CFA piles and the bridge should be monitored frequently by conservation engineer to assess it for signs of stress. It is considered to be a neutral, manageable effect of brief duration.
14.12	The extension of UBY 2 by 2m north and south will also necessitate the demolition and re-building of the NE wing-wall of Haly's Bridge (OBY 2), listed on the NIAH. The proposal to record, demolish and re-build using lime mortar and the original stone is considered to be a slight, localised and brief effect.
14.13	The proposed construction compounds at Glounthaune, Killacloyne, Ballyadam Knockgriffen and Townparks are not considered to have an effect from an architectural/ built heritage perspective and they are not in close proximity to any designated or undesignated architectural heritage structures and therefore no mitigation is required.
14.14	Haly's Bridge (OBY 2) piling in close proximity: Piling for retaining wall to realign culvert should use CFA piles and OBY 2 monitored frequently by conservation engineer to monitor signs of stress

Phase	Mitigation and Monitoring
14.15	Haly's Bridge (OBY 2) demolition & rebuilding of c. 1m ² section of NE wing wall to allow for extension of culvert UBY 2: Obtain permission from Cork County Council; Photographic survey of NE wing wall to record arrangement of courses, pinning stones/ snecks etc. Inspection and photographic record by heritage consultant during demolition, to agree specification for re-building post culvert extension. Inspection of sample panel of re-building 0.5m ² prior to complete re-building in original location and using original stone to match other wing-wall. Ensure soft joint between OBY2 and UBY2
14.16	Ballyadam House Bridge/ OBY 8 Agricultural Overpass: Conservation by record, including lazer-scanning; careful dismantling and storage for repair of similar structures; consideration of off-setting the effect by restoring Carrigtwohill Station building to compensate for loss of fabric at agricultural overpass
14.17	River Bridge (Knockgriffen) buttresses (UBY 11) new bridge structure on historic buttresses: Protect the historic buttresses that carry the bridge during the works and assess to ensure they can carry the structure without damaging them, during the operational phase.
Chapter 15 Road and Traffic	
15.1 Construction	The temporary effects of construction (none of which have been assessed as 'significant') or otherwise) will be mitigated through adoption of a regulated and approved CTMP.
15.2	The assessment of post-mitigation effects has been undertaken on the assumption that key measures set out in the CTMP will be developed as appropriate by the appointed contractor and be implemented during the proposed development construction phase.
15.3	The appointed contractor will agree temporary traffic management measures then adopt and monitor an appropriate way of working in consultation with Cork County Council, the appointed contractor, TII and/or their Agents and An Garda Síochána as appropriate. Construction activity generated vehicles (with the exception of site personnel in cars and vans) will travel on pre-defined routes to and from the relevant sites to reduce effects on existing local traffic.
15.4	The CTMP has been developed for the purposes of this assessment and will be further developed as necessary in consultation with Cork County Council and the Gardai prior to construction commencing. The CTMP will document measures to promote the efficient transportation of components and materials to site, whilst reducing congestion and disruption which might impact negatively on local communities or general traffic and in particular the emergency services. The CTMP will be considered a 'live' document and will be developed accordingly, within the parameters assessed in this EIAR.
15.5	Signed diversion routes will be provided to mitigate journey disruption. Where practically achievable, diversion routes will not apply outside of the worksite hours of operation.
15.6	During the construction phase, signage will be installed to warn road and recreational route users to the presence of the works access and the associated likely presence of large or slow-moving construction traffic.
15.7	To minimise inconvenience to the local community in terms of obstructive parking, adequate car parking for permanent site personnel, visitors and deliveries would be provided within the four worksite compounds. Adequate vehicle parking space will be provided on-site and car parking will not be permitted on any public road network adjacent to the site, so that sight lines will be maintained and to minimise potential for obstruction and delay for other road users.
15.8	Furthermore, only vehicles essentially required to facilitate construction will be allowed to attend worksites. Car sharing will be promoted to construction personnel by the contractor during the induction process.
15.9	In order to reduce the potential for mud and other debris being deposited onto the local road network in the vicinity of worksite accesses, the appointed contractor will ensure that all concrete truck wash watering / cleaning is undertaken onsite where practical and remote from watercourses, in accordance with Chapter 12 (Biodiversity). This will minimise the amount of deleterious material deposited on the road surface and the appointed contractor will ensure that the

Phase	Mitigation and Monitoring
	nearest public road (between the worksite and the N25) will be kept clear of debris by monitoring and then utilising a road sweeper where necessary
15.1	The appointed contractor could employ a number of sub-contractors and all will fall under the umbrella of the CTMP and will have an obligation to adhere to the Plan; this obligation will form part of the procurement process and will be written into any contract of employment.
15.11	Compliance will be monitored by the Project Manager, on behalf of the appointed contractor, via spot checks to ensure that vehicles follow the measures set out in the CTMP and recording of any complaints. The appointed contractor will be required to stipulate that all contractors disseminate these rules to their sub-contractors.
15.12	In liaison with Iarnród Éireann the appointed contractors will be required to maintain close liaison with local community representatives, landowners and statutory consultees throughout the construction period. This will include circulation of information about ongoing activities; particularly those that could potentially cause disturbance, including due to traffic.
15.13	The appointed contractor will nominate a person to be responsible for the co-ordination of all elements of Traffic and Transport during the construction process (Liaison Officer). This person will liaise with the local community so that the community has a direct point of contact within the developer organisation who they could contact for information purposes or to discuss matters pertaining to traffic management or site operation.
15.14	If the construction phase of any notably sized development(s) appears likely to overlap with the proposed development, the appointed contractor will seek to liaise with the appropriate developer organisation regarding the scheduling of deliveries to identify potential means of reducing the effects of combined construction.
	Construction Access Arrangements
15.15	Transportation, including deliveries to and from the construction areas will be taken from the existing public road network and in some cases the rail network (it is planned that sleepers and rails will be brought to site using rail haulage).
15.16	The local area road network is shown on Chapter 15 Roads and Figure 15-1 Given the nature of construction of the railway, there will be multiple work sites along the route throughout the construction programme.
15.17	The construction methodology, including construction access arrangements are provided within Chapter 6. The proposed programme of worksite locations will be confirmed by the appointed contractor as an integral part of their adopted CTMP provided in Appendix 6.1. All construction vehicle drivers will be instructed to access their destination worksite via an approved route; this is to be determined by the approved contractor in conjunction with the administering local authority.
Chapter 16 Noise & Vibration	
16.1 Construction	A CEMP including noise and vibration mitigation will be implemented during the construction phase in consultation with Cork County Council.
16.2	The contractor is obliged to comply with Local Authority controls on noise and vibration during construction. This will include (but is not limited to) the setting of limits for the control of noise and vibration from construction activities, the provision of mitigation measures required whilst adopting best practicable means, and any noise or vibration monitoring where significant adverse effects are required to be monitored. A comprehensive noise and vibration monitoring protocol will also be implemented.
16.3	As part of the CEMP, the Contractor will also develop and implement a stakeholder communications plan which will facilitate community engagement prior to the commencement of construction.

Phase	Mitigation and Monitoring
	Mitigation applicable to HGV deliveries
16.4	The number of vehicle movements and levels of noise are expected to be relatively low but have the potential to cause disturbance as being unusual, noise-emitting activity in a quiet, rural area. Measures will be implemented to control vehicle movements:
16.5	To avoid the need to perform reverse manoeuvres and therefore use of audible reverse alarms. However, in the interest of safety, the use of adjustable or directional audible vehicle-reversing alarms or use of alternative warning systems, e.g. white noise alarms rather than tonal alarms will be adopted.
16.6	To avoid the need to queue or wait to gain access to the site
16.7	To ensure vehicle engines are switched off when not in use
16.8	To ensure unloading activities are undertaken during the daytime
16.9	Further to the mitigation measures set out within the CEMP, the Contractor will:
16.10	Manage the timing of activities so that noise-emitting works are conducted in the daytime only
16.11	Where it is required that noise-emitting activities are undertaken in the evening or at night, provide prior notification to the occupiers of nearby dwellings
	Mitigation applicable to construction works
16.12	Typical means by which noise and vibration may be minimised include the following:
16.13	Selecting quiet equipment;
16.14	Ensuring equipment is maintained, in good working order, and is used in accordance with the manufacturer's instructions
16.15	Members of the construction team should be trained and advised during toolbox briefings on quiet working methods
16.16	Equipment shall not be left running unnecessarily
16.17	Equipment shall be fitted with silencers or mufflers where possible
16.18	Use plant enclosures whenever feasible
16.19	Materials shall be lowered instead of dropped from height
16.20	Manage deliveries to prevent queuing of site traffic at access points
13.21	Construction Use of adjustable or directional audible vehicle-reversing alarms and/or alternative warning systems (i.e. white noise alarms)
13.22	Utilising low vibration working methods
16.23	Provision of noise insulation measures and/or temporary rehousing of residents during periods of particularly intense noise construction work

Phase	Mitigation and Monitoring
16.24	<p>Good public relations are invaluable in securing public acceptance of construction noise. People are more tolerant of noise if they understand the reason behind it, the likely duration, start and completion dates, and mitigation measures used to minimise noise levels. Letter box drops explaining these shall be considered. A dedicated site contact will be nominated to liaise with residents and establish good rapport. A complaint handling procedure shall also be put in place.</p>
	<p>Mitigation applicable to site compound works</p>
	<p>Typical means by which noise impacts may be minimised include the following:</p>
16.25	<p>Selecting quiet equipment</p>
16.26	<p>Ensure equipment is maintained, in good working order, and is used in accordance with the manufacturer's instructions.</p>
16.27	<p>Trains will be at the opposite end of the site compounds when idling during material deliveries to ensure greater distances to the NSLs.</p>
16.28	<p>The provision of noise barriers or site hoarding is needed at site compounds 1, 3, 4 and 5 due to their close proximity to residential receptors. In accordance with BS 5228, as an approximation, a noise barrier that can partially block the line of sight between the noise source and receiver could achieve 5 dB attenuation. Where line of sight is completely broken a reduction of 10 dB may be achieved. Such screening will reduce the adverse noise impacts on the affected NSLs.</p>
Chapter 17 Material Assets	Construction
	Utilities
17.1	<p>All reasonable measures will be taken to avoid unplanned disruptions to any services during the proposed works.</p>
	Structures to be modified
17.2	<p>Mitigation during the construction phase for the alteration to the culverts and the Owenacurra Rive Bridge is detailed in Chapters 10, 11 and 12 of the EIAR.</p>
	Waste Management
17.3	<p>A Construction Waste Management Plan (as part of this CEMP) is appended. The plan provides for the segregation of all construction wastes to facilitate optimum levels of re-use, recovery, and recycling operations.</p>
17.4	<p>All operations will be managed and programmed in such a manner as to prevent / minimise waste production and maximise upper tier waste management (i.e. re-use, recycle, and recovery) in line with the Waste Hierarchy where technically and economically feasible.</p>
17.5	<p>Waste arisings will be handled, stored, managed and re-used or recycled as close as practicable to the point of origin.</p>
17.6	<p>Wastes sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the proposed development site to an authorised site of recovery / disposal in accordance with the Waste Management Act 1996 and associated amendments and regulations and in a manner which will not adversely affect the environment. All employees will be made aware of their obligations under the CEMP.</p>
17.7	<p>The CEMP will be available for inspection at all reasonable times for examination by the Local Authority.</p>

4.4 Appropriate Assessment Screening and Natura Impact Statement Mitigation

Additional mitigation measures, where not included above, are proposed with the Appropriate Assessment Screening and Natura Impact Statement and are included as follows:

Table 4.2: Mitigation and Monitoring Measures

Table 4.3: Mitigation Against Surface Water Pollution - General

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
<p>At a minimum, all pollution control measures will be designed, installed, and maintained in accordance with measures outlined below and under the supervision of the Contractor's Environmental Clerk of Works (EnCoW).</p> <p>Concrete</p> <p>The pouring of concrete will be required during the construction phase. To prevent the runoff of concrete into nearby watercourses and drains, the following will be implemented.</p> <p>No on-site batching will be permitted at the proposed works areas. Concrete will instead be transported to the site within a concrete truck.</p> <p>Quick setting concrete mixes will be used to reduce the risk of contaminated run-off to the nearby watercourses.</p> <p>Concrete trucks will be washed down in a sealed mortar bin / skip which has been examined in advance for any defects. This requirement will be communicated to each concrete truck driver prior to entering into the works area.</p> <p>Where concrete pours are to take place instream they will only take place within an isolated, dry, works area.</p> <p>Where concrete pours are required within a watercourse, the Contractor's EnCoW will regularly monitor the pH of the watercourse during concrete works. Should any change in pH +/-0.5 be detected concrete works shall immediately be ceased. The entry point to the watercourse will then be identified and implement appropriate measures to prevent further escape to the environment.</p>	<p>Measures will prevent the uncontrolled releases of pollutants into the environment.</p>	<p>Measures prescribed as standard best practice and are aligned with CIRIA Guidelines C532</p>	<p>Pollution prevention measures will need to be in place before the enabling and construction works commence at each location.</p>	<p>The Contractor's EnCoW will carry out ongoing monitoring of all pollution control measures.</p>	<p>Measures will prevent and/or remedy the uncontrolled releases of pollutants into the environment.</p>

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
<p>The Contractor's EnCoW will ensure that covers are available for freshly poured concrete to avoid wash off in the event of rain.</p> <p>Waste concrete slurry will be allowed to dry and taken to a licensed waste depot for disposal.</p> <p>The Contractor will schedule concrete works during dry weather conditions to reduce the elevated risk of runoff.</p> <p>The Contractor's EnCoW will notify the Independent EnCoW employed within the Employer's Representative Team. the NPWS and IFI immediately of any concrete spills into watercourses.</p>					
<p><u>Hydrocarbons</u></p> <p>Where mobile equipment is required e.g. generators, these will be housed in a suitably sized bund / plant nappy such that any leaks / spills are intercepted. All mobile equipment used will be stored within a plant nappy. Operators will regularly inspect the plant nappy, at a minimum on a daily basis, and replace it where it has become contaminated.</p> <p>Fuelling and lubrication of plant and equipment will be restricted to the construction compound sites, or laydown areas.</p> <p>All waste fuels, oils, and other hazardous wastes will be disposed of in accordance with the requirements of waste legislation.</p> <p>Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained during induction to site by the Contractor's EnCoW in the use of this equipment.</p> <p>Should use of a spill-kit be required it shall be immediately re-stocked by the Contractor.</p> <p>All spill-kits shall be inspected on a weekly basis by the SHEQ officer to ensure they are maintained as fit for</p>					

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
<p>purpose. Records relating to these inspections shall be kept.</p> <p>Welfare / hygiene facilities will be located within the construction compounds.</p> <p>All water from wheel washes will be removed from site and disposed of in line with Waste Legislation. No wheel wash water will be discharged into any watercourses or drainage ditches.</p> <p><u>Water crossings</u></p> <p>As outlined previously, alterations to existing culverts at water crossings is required.</p> <p>In-stream works will have regard to the potential for tidal ingress into the works area.</p> <p>The clearance of any riparian vegetation will be kept to the minimum required for the facilitation of the works such that no unnecessary exposure of riverbanks occurs.</p> <p>Works to clear vegetation shall take place from the bank with vegetation pulled back towards the land. The vegetation removed shall be transported off site and disposed of appropriately.</p> <p>Following the vegetation clearance, a dry works area shall be established. The measures required to achieve this will be appropriate for the size and flow associated with each watercourse. This may be achieved by:</p> <p>Isolating the entire watercourse and over pumping the flow. The outflow of any over pumped river shall be placed such that there is no scouring of the riverbed. This will be monitored on an on-going basis by the Contractor's EnCoW. Should scouring be identified, the Contractor's EnCoW will oversee the moving of the outflow such that scouring does not occur.</p> <p>Isolating half of the watercourse through the use of measures such as sandbags (double-bagged, containing only washed</p>					

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
<p>sand, from a licensed quarry) or aqua dams and diverting the flow around the works area.</p> <p>Following pollution control measure setup, but prior to instream works commencing, the isolated area shall be inspected by the Contractor's EnCoW to ensure that the watercourse is sufficiently protected. The contractor's EnCow shall monitor turbidity within the watercourses using a handheld turbidity meter.</p> <p>The Contractor's EnCoW shall direct the Contractor to take corrective actions required. The Contractor's will record all works authorisations, report these to the independent EnCoW within the Employers Representative Team and maintain on file for inspection as required.</p> <p>Should pumping out of the isolated area be required to maintain the dry works area, it shall be ensured that any discharge is treated appropriately prior to entering the watercourse. This may be achieved by discharging to a treatment system such as a silt buster or similar, discharge to a silt bag, or discharging to an area of the watercourse that is protected by a silt boom. These measures shall be used in combination in cases where ground conditions are such that just one measure is not achieving sufficient protection. The success of these measures shall be monitored regularly by the Contractor's EnCoW as works proceed at the watercourse crossings.</p> <p>Where the implementation of these measures fail, or are inadequate, the Contractor will implement adapted measures (for example replacement sediment treatment system) in agreement with the Contractor's EnCoW and the Employers Representative Team.</p> <p>Any diversion or over pumping of watercourses shall be sized such that they will accommodate a 1% AEP flood event over</p>					

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
the period in question, so as to prevent the overtopping of work areas.					

Table 4.4: Mitigation Against Disturbance to Wintering Waterfowl

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
<p>All works along the coastal section (0 – 850m chainage) are proposed during the summer.</p> <p>If works are proposed between September and March then prior to the commencement of the works, a sound reducing hoarding shall be placed along works area within Ch 0 – 800m Sound hoarding will help to reduce the noise impacts associated with the construction phase of the works. It will also reduce visibility of workers.</p> <p>The barrier material shall have a mass per unit area exceeding 7kg/m² in accordance with the recommendations of BS 5228 Part 1:2009+A1:2014 Part B.4.</p> <p>Any temporary lighting used to facilitate the works will be cowed and angled away from the SPA and watercourses.</p> <p>The EnCoW will undertake daily monitoring of the barrier to ensure installed correctly and identify any defects for the contractor to remedy.</p> <p>All plant used during the construction phase shall be the quietest of its type practical for achieving the works, as demonstrated in writing by the Contractor to the local authority, with reference to other noisier models.</p> <p>All plant shall be operated and maintained in accordance with the manufacturer's recommendations including the use and</p>	<p>Measures prescribed as standard best practice and are proven technologies / methods (sound reduction measures are used generally to reduce noise impacts on projects).</p>	<p>Hoarding will need to be in place before the construction works commence</p> <p>Implementation of plant specific noise reduction to take place on an ongoing basis.</p>	<p>The Contractor's EnCoW will carry out daily monitoring of noise and visual reduction measures</p>	<p>Measures will ensure any adverse effects associated with noise and visual disturbance are avoided.</p>

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
maintenance of the specific noise reduction measures in the next bullet. The following may be incorporated to reduce the impact further: The use of mufflers on pneumatic tools Effective exhaust silencers Sound reducing enclosures Machines in intermittent use shall be shut down during periods where they are not required				

Table 4.5: Mitigation Against Spread of Invasive Species

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
<p>General</p> <p>Prior to works commencing a full invasive species survey will be carried out. The pre-construction invasive species survey will be carried out within the works areas, including compound locations, and along proposed access routes to identify the presence of all invasive species within and adjacent to works areas.</p> <p>The invasive species survey will be carried out during the appropriate growing season (May–October). The findings of this invasive species survey will be incorporated into an updated Invasive Species Management Plan by the Contractor’s ECoW.</p> <p>Any stands of invasive species recorded within the Proposed Development boundary, including within compounds and along access tracks, will be clearly marked out as restricted areas. This exclusion zone will incorporate a buffer surrounding stands of Japanese knotweed such that below ground growth is accounted for (7m in diameter and 3m depth and inclusive of both treated and untreated material at a worst-case scenario). No works will be carried out within the exclusion zones unless approved by the Contractor’s ECoW.</p> <p>‘Biosecure zone’ signage shall be erected at each potentially contaminated site. This is to alert staff that invasive species have been recorded and to avoid accidental entering or interfering with these sites. Likewise, any stockpiles of soil that are or could be contaminated with any of the aforementioned invasive species shall be clearly marked. Marked haulage routes protected by root barrier membranes may be established within the</p>	<p>Measures prescribed as best practice and are proven technologies / methods.</p>	<p>Biosecurity measures will be implemented throughout the duration of the construction works.</p>	<p>The ECoW will inspect and monitor all biosecurity measures to ensure they are undertaken correctly.</p>	<p>Biosecurity measures will ensure any adverse effects associated invasive species spread are avoided.</p>

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
<p>Proposed Development footprint to allow transport to bunds.</p> <p>Designated and clearly marked cleaning stations shall be strategically placed within the work site for use by staff, vehicles, and machinery. Where it is necessary to work in contaminated areas, every effort shall be made not to use vehicles with caterpillar tracks.</p> <p>The Contractor's ECoW will carry out a toolbox talk for all construction personnel which will provide information on how to identify and manage invasive species. The toolbox talk will take place prior to works commencing in any areas where Invasive Species have been recorded.</p> <p>All vehicles and equipment that have been used in these control operations shall be steam-cleaned in a designated wash-down area each time they leave the works site, and once work in that area has been completed. This also includes footwear, personal protective equipment (PPE), tools, and other light equipment. This is essential to remove soil that may contain plant fragments (vector material), which otherwise could be transported along the Proposed Development as works are being undertaken.</p> <p>Vehicles leaving contaminated area(s) shall either be confined to marked haulage routes protected by root barrier membranes or be pressure-washed before leaving the area. Only vehicles that are deemed to be Biosecure (i.e. sealed so that no soil can escape) shall be used to transport contaminated soil and all must be thoroughly steam cleaned in the designated wash-down area before exiting the designated area.</p>				
<p><u>Chemical Control</u></p>				
<p>Three cornered leek, Spanish bluebell and Himalayan balsam can all be controlled effectively</p>				

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
<p>using herbicide application. Applications should take place in spring. Follow up monitoring of treatment sites will be required, however, to ensure that regrowth of new plants does not take place.</p> <p>The stands of knotweed identified within the proposed development footprint have been subject to a chemical treatment regime. In order to control established stands of Japanese knotweed, repeated treatments over successive years is necessary.</p> <p>Per TII guidelines (2020) the site will only be considered remediated after two consecutive growing seasons with no sign of regrowth from all of the previously identified stands. It is of note, however, there is always the possibility of further regrowth occurring, this happens most commonly through the reactivation of dormant rhizomes due to disturbance of soils but may also occur through re-infestation of the site from off-site. Subsequent surveys will be cognisant of this potential</p> <p>Treatment of established stands of knotweed shall be continued in order to prevent the spread of existing stands within the Proposed Development footprint.</p>				
<p><u>Physical Control</u></p>				
<p>Pulling and digging of Himalayan balsam plants (before seed is mature), three cornered leek, and Spanish bluebell has been shall be used to control and remove stands. This treatment shall only be carried out under supervision of the EcoW. All waste material associated with these stands shall be treated in accordance with legislative requirements on disposal.</p> <p>Physical control methods (cutting, digging, excavating etc) of Japanese knotweed shall be avoided wherever possible as interference with stands may result in a resurgence of growth in</p>				

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
<p>dormant stands, and increase potential for spread of vector material should biosecurity measures not be adhered to.</p> <p>Where excavation of Japanese knotweed material is required, it may be subject to burial as follows:</p> <p>Stands of Japanese knotweed identified for removal shall be treated with a non-persistent herbicide prior to excavation.</p> <p>Material with potential to contain Japanese knotweed, or vector material, shall only be excavated under strict supervision and placed within a vehicle for transportation. Only vehicles that are deemed to be Biosecure (i.e. sealed so that no soil can escape) shall be used to transport contaminated soil and all must be thoroughly steam cleaned in the designated wash-down area before exiting the contaminated area.</p> <p>Burial of material may be undertaken as follows:</p> <p>Where deep burial of a minimum depth of 5m is feasible, the waste shall be covered with a proprietary root barrier membrane. Any joins in the membrane will be overlapped and secured. No material shall be placed over the membrane until it has been inspected by the EcoW. A layer of pea gravel shall be placed on top of the barrier membrane to reduce the potential for perforation of the barrier membrane. The waste shall then be infilled with a minimum 5m depth of uncontaminated soil.</p> <p>Where a burial of 5m is not feasible, the waste shall be completely encapsulated in a proprietary root barrier membrane cell. The lower surface of membrane shall be covered in a layer of pea gravel to reduce the potential for perforation of the barrier membrane. Any joins in the barrier membranes shall be overlapped and suitably sealed. The upper surface of the cell shall be covered in a layer of pea gravel and buried to a minimum depth of 2m. No material shall be placed over the membrane</p>				

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
<p>(both internally and over the upper surface until it has been inspected by the EcoW.</p> <p>Where burial is not feasible due to site constraints, the material may be transported off-site (under license). It is a requirement to dispose of this material in a fully licenced wasted facility, capable of accepting such contaminated material. This disposal requirement applies to all Japanese knotweed contaminated material including untreated and treated plant material.</p>				
<p>Monitoring</p> <p>As outlined previously, a single herbicide treatment is unlikely to control an established stand of Japanese knotweed. Any re-growth of treated Japanese knotweed shall be accurately mapped.</p> <p>Monitoring shall be conducted post treatment to determine the level of control success that the treatments of all species have achieved. All stands identified within the Proposed Development, and any areas where burial or storage has taken place shall be monitored. This shall continue at a minimum until such time that after two consecutive growing seasons there is no sign of regrowth from all the previously identified stands within the Proposed Development site.</p> <p>Following control of large areas Japanese knotweed, a subsequent disturbance of the soil may give rise to revitalised rhizome growth. To avoid this, bare soil shall be mulched (covered with a natural or synthetic barrier, such as wood chip, straw, geotextile, or other appropriate material) and planted at the earliest opportunity with appropriate native replacement vegetation to stabilize the soil and deter subsequent re-invasion.</p>				

5 Environmental Incident Response Plan

5.1 Introduction

In the unlikely event of an incident, the Environmental Incident Response Plan will ensure that any incident is dealt with effectively, and that the response is timely and appropriate. This plan will be further developed by the appointed Contractor, in line with the mitigation measures detailed in the EIAR and NIS for the proposed development, to describe the procedures, lines of authority and processes that will be followed to ensure that all incident response efforts are prompt, efficient and appropriate to the particular incident.

5.2 Plan Objectives

The objectives of the plan are:

- To ensure the health and safety of all workers on site
- To minimise environmental effects
- To devise response procedures
- To establish procedures for an effective response to the incident which minimises effects on the environment and the health and wellbeing of personnel.

5.3 Implementation of the Plan

Risks and appropriate responses for incidents will be reviewed and updated regularly to ensure that all risks and response mechanisms are included within the plan. It will identify the risks associated with health and safety and the environment and will evolve throughout the project lifecycle, with inputs from the contractor/PSCS and sub-contractors.

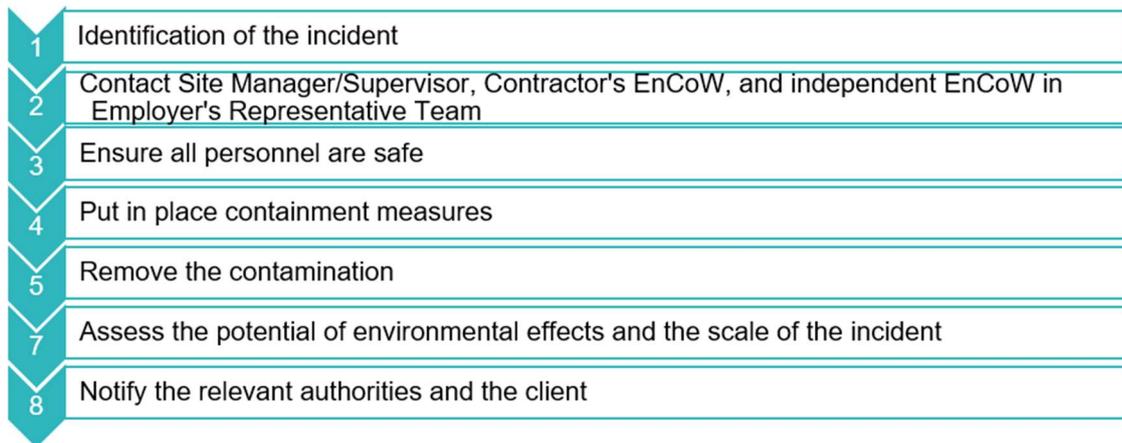
5.4 Environmental Emergency Response Procedures

The mitigation measures specified in the EIAR and NIS will minimise / avoid environmental pollution. However, procedures must be in place in the unlikely event of an incident. The following are required to ensure that the project / site / activity risks are known to all personnel on site:

- Identify all activities related to the project which have the potential to cause an incident;
- Conduct a risk assessment for each activity;
- Ensure effective planning of the works and the required equipment to deliver EIAR mitigation requirements;
- Contact details for those contacts detailed in section 5.5 to be distributed to personnel and displayed on site; and
- Training of staff/personnel in relation to response procedures, including drills.

In the unlikely event of an incident, the response will follow the following steps:

Figure 5.1: Incident Response Procedure



Source: <Insert Notes or Source>

An example of emergency response actions required, in the event of a spillage is as follows:

If safe, stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.

If safe, contain the spill using the absorbent spills material provided. Do not spread or flush away the spill.

Cover or bund off any vulnerable areas where appropriate.

If possible, clean up as much as possible using the absorbent spills materials.

Do not hose the spillage down or use any detergents.

Contain any used absorbent material in weather tight containers bins/bags so that further contamination is limited.

Notify the Site Manager so that used absorbent material can be disposed of using a licensed Waste Contractor, and

An accident investigation should be performed in accordance with procedures and the report sent to the Site Manager.

All works in the vicinity of the incident must be ceased until such a time as the Site Manager notifies personnel that it is safe to proceed with the works. The Contractor's EnCoW will be responsible for formulating any corrective actions that are required (e.g. repairs silt fencing in the event of damage from extreme weather) in consultation with the Contractor and relevant stakeholders.

For each incident, the following will be reported:

- Location of the incident;
- Time and Date;
- Scale of the incident;
- Nature of the incident and source-pathway and receptor;
- Remediation measures undertaken;
- Name of the personnel who reported the incident; and
- Any other relevant details.

The Site Manager will keep a log of all environmental incidents on file, and these will be made available to the Local Authority, the independent EnCoW within the Employer's Representative

Team and other agencies, as required, such as the Inland Fisheries Ireland or the Environmental Protection Agency.

5.5 Emergency Contact List

An emergency contact list will be displayed at prominent and suitable locations at construction sites during the proposed works. An example is provided in Table 5.1, and this will be further developed to include contact details for key personnel with environmental responsibilities, as detailed in Chapter 2 of this CEMP.

Table 5.1: Emergency Services and Authorities Contact Details

Emergency Services	Contact Telephone Number
Ambulance	999 or 112
Cork County Council Fire Services	999 or 112
Cork County Council Fire and Building Control Department (Ballincollig)	021 4304077
Cork County Council Environment Department	021 42768941/ Out of hours (021 4800048)
Cork County Council, East Cork Municipal District, Road Operations (Midleton Office)	022 211123
Inland Fisheries Ireland (Macroom office)	026 41222
National Parks and Wildlife Services	1890 383 000/ (01) 888 3200
Environmental Protection Agency	1890 33 55 99 / 053 9160600
National Monuments Services	01 888 2178
ESB Emergency	1850 372 999
Bord Gais Emergency	1850 20 50 50
Irish Water Emergency	1850 278 278
Irish Rail	01 8555454
Health and Safety Authority	1890 289 389

6 Training and Auditing

6.1 Environmental Induction and Awareness Training

All site personnel will receive environmental induction and awareness training in conjunction with site safety training. The environmental training and awareness training will ensure that staff are familiar with the principles of the CEMP, the environmental aspects and potential impacts associated with their activities, the controls in place to mitigate said impacts. Prior to working in areas of particular sensitivity, the Contractors' EnCoW will give a toolbox talk to site personnel. All site personnel will be trained in relation to incident response procedures and drills will be undertaken to ensure timely and effective responses to incidences.

All signed training records will be held on site for future inspection.

6.2 CEMP Reviews and Auditing

Internal and external auditing will facilitate the assessment of the effectiveness of the CEMP and compliance against regulatory and legislative requirements. Audit reports will be produced identifying examples of good practice, opportunities for improvement, non-conformances, and corrective actions taken, as appropriate. Recommendations for follow-up audits will also be provided. The findings of the audits will be reported to the Site Manager, the Contractors and the independent EnCoW within the Employer's Representative Team.

Internally, the Contractors' EnCoW will bring any changes required to the CEMP to the attention of the Contractor. A report on each change to the CEMP will be appended to the CEMP. The Contractors' EnCoW will monitor and track any changes in environmental legislation and any changes required will be brought to the attention of the Site Manager and Contractor. Changes to the CEMP may also arise due to changes in activities and measures contained in the CEMP may need to be updated / altered to take account of this.

Externally, the independent EnCoW within the Employer's Representative Team will carry out regular reviews of the CEMP to ensure that the Contractors are conducting the works in compliance with the EIAR, NIS and any conditions imposed by the Consenting Authorities.

The CEMP, environmental inspection reports and audit records will be maintained in hard copy and electronic formats for inspection.

7 Communications and Complaints

7.1 Communication and Engagement

Communication with the public and other stakeholders will be a two-way mechanism, to ensure awareness of the project and to share information. The Contractor will share important information with the public and other stakeholders.

The communication strategy will include:

- List of environmental stakeholders
- Road users – the Contractor will ensure that traffic disruption is minimised during construction.
- Local population – the Contractor will provide the local population and other stakeholders with advance notice of works in the area,
- Method and frequency of communication – this can include personal contact, letter drops, emails, telephone, meetings/presentations
- Details of key contacts – Employer, Site Manager, Contractors' EnCoW
- Details of the consultation register – a record will be maintained of all third-party communication and consultation. This includes consultation with statutory and non-statutory organisations, and members of the public.

The Contractors' Community Liaison Team will be expected to interface with the Employer's Community Liaison Team to ensure the successful delivery of the project in so far as communities are concerned.

7.2 Environmental Complaints

A formal complaints procedure will be developed and implemented by the Contractor.

Signage will be provided at site entrances or on perimeter hoarding locations showing details of whom to contact in the event of a complaint.

The Contractor will:

- Assess what corrective and preventive action is required.
- Carry out further investigation if necessary.
- Provide a response within a reasonable timescale.
- Notify the relevant stakeholder of the proposed corrective and preventive actions to be adopted.
- On completion of the corrective action and following agreement that the complaint has been adequately addressed; the Site Manager will close the case and record the date of closure. The complaints register will include details of the preventative measures undertaken to avoid a reoccurrence and will be agreed with the Contractor's EnCoW.

The Contractor will additionally communicate the specifics of any environmental complaint to Iarnród Éireann.

Appendices

A. Construction Resource Waste Management Plan



Construction Resource Waste Management Plan

Glounthaune-Midleton Twin Track Project

September 2022

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1 Introduction

1.1 Purpose of this CRWMP

This Construction Resource Waste Management Plan (CRWMP) has been prepared for the construction of an adjacent railway track between Glounthaune and Midleton, as detailed in Chapter 6 Description of the Development, in accordance with waste management guidance and principles as outlined in *Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects* (EPA, 2021)¹.

The 2021 EPA guidelines replace the *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (DoEHLG), June 2006.

This CRWMP will evolve in agreement with the planning authority, in the context of matters such as Conditions of the Statutory Approval, and as detailed design of the development emerges, to ensure that optimum levels of waste prevention, reduction, re-use, recycling, and recovery are achieved throughout the duration of the proposed development. Litter management will also be included. Because at this point – the commencement of the statutory consenting process, exact quantities and volumes of waste material cannot be determined, particularly in the absence of any Conditions of the Consent Approval.

The requirement to develop, maintain and operate this CRWMP will form part of the contract documents for the project and will be updated by the appointed Contractor in advance of the commencement of construction activities on site. Waste sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the proposed development site to an authorised site of recovery/disposal in a manner which will not adversely affect the environment. All employees will be required to comply with the obligations under this CRWMP.

On commencement of the project, the Contractor appointed to undertake the works will be responsible for the further development of this CRWMP and the implementation of all necessary protocols and measures to ensure regulatory compliance, including the provision of data to Cork County Council to enable fulfilment of reporting obligations. The CRWMP will be developed and agreed in line with the process presented in Figure 1.2 *Process Lifecycle of Resource Waste Management Plan*.

The Contractor will be required to regularly revisit this CRWMP throughout the lifecycle of the project so that opportunities to maximise waste reduction / efficiencies are exploited throughout, and to ensure that that data is collected on an ongoing basis so that it is as accurate as possible.

The Contractor will be required to:

- Reduce the use of virgin resources;
- Keeping materials in the economy as long as possible;
- Maintain their intrinsic value/quality as high as possible;
- Reduce fumes or emissions which may result in additional GHG emissions. Plant equipment and vehicles to be used on the proposed project should be selected based on their relative environmental performance; and
- Reduce hazardous substances in products and waste.

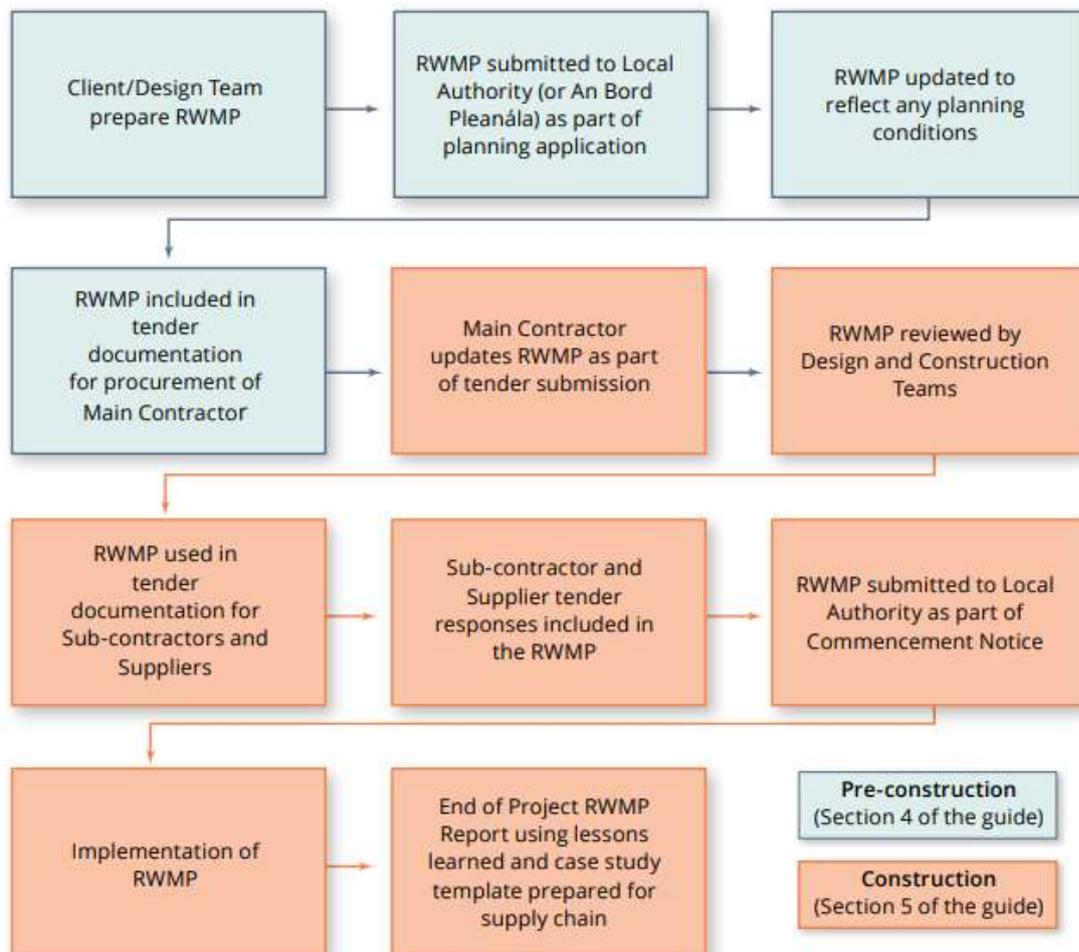
¹ [CDWasteGuidelines.pdf \(epa.ie\)](#)

This CRWMP has been prepared for the proposed development as there is potential for the project to exceed the specified Tier 2 construction waste threshold limits set out in the above referenced guidelines, namely Demolition projects generating in total less than 100m³ in volume of C&D waste.

This CRWMP has been prepared with reference to, and taking account of, the following legislation, plans and waste management guidance documents:

- The Waste Management Act 1996 – 2008, Amendments & Associated Regulations;
- Construction Industry Research and Information Association (CIRIA) document 133 Waste Minimisation in Construction;
- Design Out Waste: A design team guide to waste reduction in construction and demolition projects (EPA, 2015) The Litter Pollution Act 1997;
- The Waste Management Plan for the Connacht-Ulster Waste Management Plan 2015-2021; and
- Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects (EPA, 2021).

Figure 1.1: Process Lifecycle of Resource Waste Management Plan



Source: Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects (EPA, 2021)

1.2 Structure of this CRWMP

Design Out Waste (EPA, 2015) notes that the preparation of a Waste Management Plan within the early design and feasibility phases provides a framework to carry out design reviews, and should be used as an implementation, benchmarking, monitoring and reporting tool throughout the overall construction process.

This CRWMP has been prepared in line with the recommendations of the *Best Practice Guidelines* (EPA, 2021) for Tier 2 projects and consequently addresses the following:

- Introduction
- Project description.
- Roles and Responsibilities
- Design Approach
- Key Materials, Quantities and Costs
 - Waste forecasting: Analysis of the waste arising / materials surpluses.
 - Specific waste management objectives for the project.
 - Proposed strategies and associated costs: Methods proposed for prevention, reuse and recycling of wastes.
 - Materials logistics.
- Site Management
 - Monitoring procedures: Auditing and record keeping; and
 - Proposals for education of workforce and plan dissemination programme.
- Site Infrastructure

1.3 Irish Waste Management Targets

The EU Waste Framework Directive (Directive 2008/98/EC) set the basic concepts and definitions related to waste management, such as definitions of waste, recycling and recovery. It also included definitions for when waste ceases to be waste and becomes a secondary raw material (end-of-waste criteria) and how to distinguish between waste and by-product. The Directive was enacted in Ireland under the Waste Directive Regulations 2011 (S.I. No. 126 of 2011).

The EU Waste Framework Directive (2008/98/EC) requires Member States to take the necessary measures to achieve the minimum recycling/recovery target of 70% by weight for non-hazardous construction and demolition (C&D) waste, excluding naturally occurring materials. The Directive specifies that such a target should be achieved by preparing for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other material.

Ireland is required to meet the waste re-use and recycling targets presented in Table 1.1.

Table 1.1: Targets

Target Specifics	Reference Year	Rate	Indicator
Preparing for re-use, recycling and other material recovery (incl. beneficial backfilling operations using waste as a substitute) of 70% by weight of C&D non-hazardous waste (excluding natural soils & stone)	2019	84%	On Track

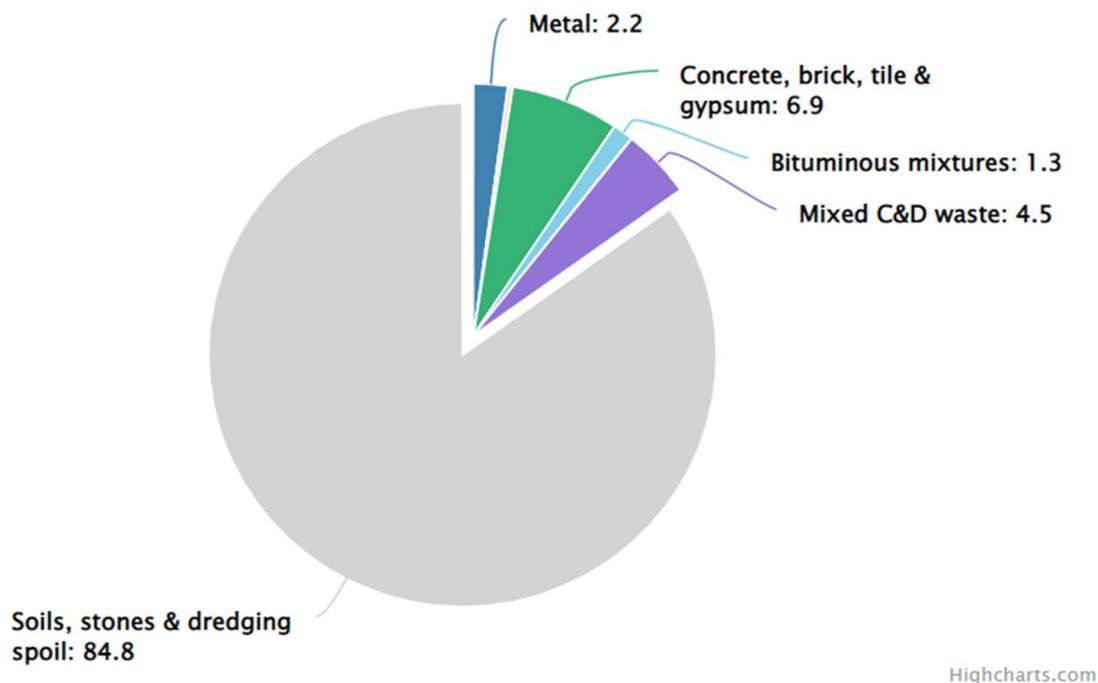
Source: <http://www.epa.ie/nationalwastestatistics/constructiondemolition/>, EPA Waste Data Release, 1 December 2021 (Accessed: 11/03/2022)

Ireland is currently on-track to meet the EU waste targets for C&D waste. It should be noted, however, that soil and stones waste are excluded from the calculation of the Waste Framework Directive targets.

The EPA² notes that just over 8.8 million tonnes C&D waste was generated in Ireland in 2019. This represents an increase of 2.6 million tonnes on the 6.2 million tonnes of C&D waste generated in 2018. This increase in C&D waste corresponded with an increase in construction activity nationally.

The composition of C&D waste in Ireland in 2019 is illustrated in Figure 1.3.

Figure 1.2: Composition of C&D waste material collected in Ireland, 2019



Source: www.epa.ie

The vast majority (96%) of C&D waste underwent final treatment in Ireland in 2019; only four per cent (359,812 tonnes) was exported abroad for final treatment. Soil and stones made up the large majority (85%) of C&D waste collected in 2019. The next largest C&D waste types in 2019 were concrete, brick, tile and gypsum waste (7%) and mixed C&D waste (4%).

Most of the C&D waste finally treated in Ireland (82%) was backfilled in 2019, while ten per cent went for disposal and only seven per cent of all C&D waste was recycled. The dominance of backfilling as a treatment operation reflects the large proportion of soil and stones in C&D waste. Recycling was the main treatment operation for the smaller fractions of metal, plastic, glass and wood.

The Contractor will be obliged to aim for an overall recycling rate of 70% of C&D material, in accordance with EU targets under Waste Framework Directive (2008/98/EC) as well as regional waste management targets.

² [Construction & Demolition | Environmental Protection Agency \(epa.ie\)](https://www.epa.ie)

1.4 Waste Management Regulatory and Policy Requirements

The Southern Region Waste Management Plan 2015 -2021³, which includes Cork County Council acting, states the following:

A clear strategy, policies and actions are required to manage our wastes in a safe and compliant manner. The Waste Management Plan for the Southern Region is the framework for the prevention and management of wastes in a safe and sustainable manner. The scope of the waste plan is broad and ultimately it needs to provide policy direction, setting out what we want to achieve and a roadmap of actions to get us there. The waste management plan is a statutory document prepared by the local authorities of the region. This waste plan covers the period from 2015 to 2021 and is required to be revised or replaced every six years. The waste plan contains a comprehensive list of policy actions which are scheduled to be implemented by the local authorities over the plan's period, including streaming and proximity principle, national targets and ensuring the best overall environmental outcome. The following waste management principles will be applied:

- Establish reuse, repair and preparing for reuse activities and networks to recirculate the lifespan of items.
- Optimise the value of recycled and residual waste resources in the system to turn these materials into reliable sources of secondary raw materials for reprocessing and recovery.

The Waste Framework Directive 2008/98/EC defines waste as “any substance or object that the holder discards or intends to or is required to discard”.

The Waste Hierarchy described in the framework prioritises prevention over re-use, recycling recovery and disposal, as illustrated in Figure 1.4.

Figure 1.3: Waste Hierarchy



Source: Waste Framework Directive (https://ec.europa.eu/environment/topics/waste-and-recycling/waste-framework-directive_en)

The primary legislative instruments that govern waste management in Ireland relevant to the proposed Temporary Emergency Generation Plant Project are as follows:

³ [Southern Waste Region](#)

- Waste Management Act 1996 (S.I. No. 10 of 1996), as amended. Sub-ordinate legislation to this Act includes:
 - European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended 2011 (S.I. No. 323 of 2011)
 - Waste Management (Collection Permit) Regulations S.I No. 820 of 2007 as amended 2008 (S.I No 87 of 2008)
 - Waste Management (Facility Permit and Registration) Regulations, S.I No. 821 of 2007 as amended 2008 (S.I No. 86 of 2008)
 - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended 2004 (S.I. No. 395 of 2004), 2010 and (S.I. No. 350 of 2010)
 - Waste Management (Packaging) Regulations 2003 (S.I. No. 61 of 2003) as amended 2004 (S.I. No. 871 of 2004), 2006 (S.I. No. 308 of 2006) and 2007 (S.I. No. 798 of 2007)
 - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
 - Waste Management (Landfill Levy) (Amendment) Regulations 2012 (S.I. No. 221 of 2012), as amended 2015 (S.I. No. 189 of 2015)
 - European Communities (Waste Electrical and Electronic Equipment) Regulations 2011
 - Waste Management (Registration of Brokers and Dealers) Regulations 2008 (S.I. 113 of 2008)
 - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009), as amended 2015 (S.I. 190 of 2015)
- Protection of the Environment Act 2003 (S.I. No. 413 of 2003) ·
- Litter Pollution Act 1997 (S.I. No. 12 of 1997)

1.5 Iarnród Eireann Group Environment and Waste Policies

The Iarnród Eireann (IÉ) Environmental Policy Statement⁴ states that they 'recognise our activities have an impact on the environment. It is our responsibility to manage these impacts and improve our efficiency to reduce our consumption of natural resources'. IÉ are committed to undertake activities in an environmentally responsible manner, with challenging targets, with reviews annually. The Sustainability policy⁵ ensures the commitment of IE to the future and advancing environmental sustainability by decarbonising transport, ensuring climate change resilience; reducing the impact on the natural environment, and proactively protecting and enhancing biodiversity.

⁴ [Environmental Policy \(irishrail.ie\)](https://www.irishrail.ie/Environmental-Policy)

⁵ [Sustainability \(irishrail.ie\)](https://www.irishrail.ie/Sustainability)

2 Roles and Responsibilities

2.1 Description and Role of the Client and Key Personnel

IE is the Employer with the following responsibilities:

- Manages the process towards construction including liaison with stakeholders.
- Undertakes a Client Engineering function, including inspections, to ensure that detailed designs, plant, materials and works including scheduling meet the requirements of outline designs and the proposal requirements.
- Ensures that the Contractor employs an independent Environmental Clerk of Works (EnCoW) to assess the construction of the Proposed Development, and advise the Contractor on the implementation of the agreed Contractor's CRWMP.

The Work Package 2 (WP2) Design and Build (D&B) Contractor will be Project Supervisor Construction Stage (PSCS) during the enabling works phase and the WP3 Contractor will take over as PSCS when they mobilise to site. IE will then take over as PSCS for the blockade when both contractors (WP2 & WP3) and IE are carrying out works on site. All three parties will be responsible for the Health and Safety of site workers, for the implementation of this CRWMP.

The following sections provide further detail on roles and responsibilities.

2.2 Description and Role of the Resource Manager

The Resource Manager will be appointed by the Contractor(s) who will ensure that the objectives and measures contained within this CRWMP are incorporated into the project specific CRWMP to achieve the associated target re-use / recycling rates.

The Resource Manager will be responsible for all aspects of waste management at the different stages of the proposed development, and overall implementation of this CRWMP and associated procedures.

The Resource Manager, as appointed by the Contractor, will be technically competent and appropriately trained.

The Resource Manager will facilitate effective communication of the waste management objectives with all operatives associated with the project (including site staff, external contractors and suppliers).

Another key objective of the Resource Manager will be the maintenance of accurate records on the quantities of waste / surplus materials generated and the real cost (including purchasing) associated with waste generation and management. The recording of summary information will further assist the implementation of the plan.

The Resource Manager will keep records of the quantities of waste / surplus materials generated and the costs associated with waste generation and management.

The Resource Manager will ensure that reporting and recording requirements are met, and all necessary resources are in place to support the implementation of the plan.

2.3 Description of the future role of the Contractor

The appointed Contractor(s) will be responsible for the Health and Safety of site workers and the completion of the works to the satisfaction of the Employer.

2.4 Description and role of other parties and key personnel

2.4.1 Project Supervisor Design Process (PSDP) / PSCS

- Mott MacDonald will be PSDP for the detailed design phase (WP3) of this project.
- It is likely that the PSCS on the project will change with the various stages. The WP2 D&B Contractor will be PSCS during the enabling works phase and the WP3 Contractor will take over as PSCS when they mobilise to site. IÉ will then take over as PSCS for the blockade when both contractors (WP2 & WP3) and IÉ are carrying out works on site.

2.4.2 Site Manager

The Site Manager will be responsible for the day to day running of the site and will direct and oversee the activities of the Contractor and subcontractors throughout the works. The Site Manager will be responsible for programming the works, will regularly consult with the Employer and will maintain site safety.

2.5 Contact Details

As detailed previously, the requirement to develop, maintain and operate this CRWMP will form part of the contract documents for the project and will be updated by the appointed Contractor in advance of the commencement of construction activities on site. At that time the specific roles and responsibilities will be confirmed with the Planning Authority as part of the next iteration of this CRWMP prior to construction.

Table 2.1: Contact details of site personnel and their roles

Organisation	Role	Name	Contact Number	Email
To be confirmed				
To be confirmed				
To be confirmed				

3 Design Approach

3.1 Proposals for Managing Waste Arisings

Waste arisings will be managed in accordance with the principles outlined in the Waste Management Hierarchy as illustrated in Figure 1.4.

In order of priority, the Waste Management Hierarchy sets out the most desirable approaches to waste management in the following order:

1. Prevention
2. Reduction/Minimisation
3. Re-use
4. Recycle
5. Other Recover (including energy recovery)
6. Disposal

3.1.1 Opportunity for Prevention and Reduction

Opportunities for the prevention of waste will be considered throughout all stages of the project. Contractors will plan the construction process to eliminate / reduce waste; specifically, careful planning will minimise the volume arising on-site, facilitate the use of reclaimed materials in the works, and influence wastage caused by poor materials handling.

Design Out Waste (EPA, 2015) notes that 33% of all on-site waste is due to a failure to implement waste reduction measures during the design stages. Materials logistics, specifically the avoidance of overstocking of materials, is a critical factor for material optimisation in preventing wasted material. A review assessment of this plan and detailed design plans will inform the appropriate quantities of materials required for the project thereby minimising, and potentially preventing, the generation of certain waste streams. In accordance with *Best Practice Guidelines* (EPA, 2021) and *Design Out Waste*, the following measures will be implemented at a minimum:

- Materials will be ordered on an 'as needed' basis to prevent over-supply to site;
- Materials required will be purchased in shape, dimensions, and form that minimise the creation of excessive scrap waste on-site;
- Storage and handling procedures and systems will be introduced to minimise generation of damaged materials / waste e.g. deliveries will remain unpacked until ready for use, sufficient space will be made available for manoeuvring of machinery etc.;
- The correct sequence of operations will be determined and implemented;
- Agreements will be made with suppliers, where possible, to ensure take back / buy back of surplus and sub-standard / rejected materials; and
- The primary Contractor will assign individual responsibility (through appropriate contractual arrangements) to sub-contractors for the purchase of raw materials and for the management of wastes arising from their activities.

Waste generated during the project will be re-used on-site, where practicable. Opportunities for recycling will be employed for any waste that cannot be re-used. Waste will only be sent for disposal if no other reasonable economically or technically feasible alternative can be found.

All wastes will be handled in a responsible manner with due regard to relevant legislation, codes and best practice guidelines.

Only authorised waste contractors with appropriate waste collection permits will be authorised to collect waste streams from the facility. Waste will only be transferred to facilities authorised to treat or dispose of the material in accordance with the requirements of the Waste Management Act 1996 (as amended) and associated Regulations.

Copies of all permits and licences will be retained with other waste-related documentation. Comprehensive waste descriptions will be provided on all documentation.

Appropriate and adequate waste segregation areas will be provided at secure locations on site. The number and size of containers and the number of uplifts required will be determined at a later stage in the project. The Contractor will ensure that containers are not filled beyond the maximum loading capacity of the collection vehicle. Effective inspection, containment and control measures will be implemented to ensure that no litter escapes from the construction site. Litter pickers will be employed within the construction site as required.

3.1.2 Opportunity for Re-use/Recycling

Material that is generated will be reused on site or salvaged for subsequent reuse to the greatest extent possible or recycled. Disposal will only be considered as a last resort. Initiatives will be put in place to maximise the efficient use/reuse of materials.

3.1.2.1 Concrete

The contractor will be encouraged to process concrete troughing to be reused.

3.1.2.2 Soil

All material will be tested and in the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material and disposed of appropriately. Soil will be reused where possible. Note, that soil infested with Japanese Knotweed cannot be reused.

3.1.2.3 Hazardous Waste Arisings

Waste fuel and oil and nominally empty containers will be appropriately contained and stored in designated areas on drip trays to prevent loss through drips and spills. Paints will be stored in appropriate containers in designated areas on drip trays, where practicable, non-hazardous paints will be used.

Hazardous wastes will be collected by appropriately authorised waste contractors for recovery or disposal as appropriate. Nominally empty containers will not be sent for disposal unless a determination can be made that the residual content does not exhibit any of the hazardous characteristics associated with hazardous waste.

3.1.2.4 Scrap Metal

Scrap metal will be sent to an appropriately authorised waste contractor for recycling.

3.1.2.5 Miscellaneous Waste Arisings

Small volumes of a variety of waste streams will be generated including packaging waste, plastic pipe and cable cut-offs, green, and mixed municipal type waste. The generation of surplus waste streams will be minimised through careful planning; however, it will not be possible to eliminate all surplus waste arisings.

- Cardboard will be flattened while paper and cardboard containers will be covered to prevent ingress of water.

- Plastic will be segregated at source and kept as clean as possible prior to placement in a covered container.
- Paper, cardboard and plastics will be recycled whereas mixed municipal waste arising will be sent for disposal.

3.1.3 Green Procurement

Tender specifications, selection and award criteria and contract conditions will require procurement of products and services that prevent and reduce waste.

4 Key Materials, Quantities and Cost

4.1 Analysis of Waste Arisings

The main waste stream arisings (including surplus materials) which are likely to be generated during the demolition and construction phase, are presented in Table 4.1 hereunder.

Table 4.1: Waste Types and Associated EWC codes

Waste Type	European Waste Classification (EWC) Code ⁶	Waste Classification
Concrete	17 01 01	Non-hazardous
Bricks	17 01 012	Non-hazardous
Tiles and ceramics	17 01 03	Non-hazardous
Soil and Stones	17 05 04	Non-hazardous
Track ballast containing hazardous substances	17 05 07*	Hazardous
Nominally Empty Containers containing residues of or contaminated by dangerous substances	15 01 10*	Hazardous
Waste Diesel and Oil	13 07 01*	Hazardous
Waste Fuels (Miscellaneous)	13 07 03*	Hazardous
Scrap Metal	17 04 07	Non-hazardous
Gypsum-based construction material	17 08 02	Non-hazardous
Mixed construction and demolition waste	17 09 04	Non-hazardous
Electrical and electronic components	20 01 35*	Hazardous
Electrical and electronic components	20 01 36	Non-hazardous
Batteries and accumulators	20 01 33*	Hazardous
Batteries and accumulators	20 01 34	Non-hazardous
Insulation materials and asbestos-containing construction materials*	17 06 04*	Hazardous
Plastic Pipe Cut-offs	17 02 03	Non-hazardous
Plastic Packaging	15 01 02	Non-hazardous
Paper and Cardboard Packaging	15 01 01	Non-hazardous

4.2 Waste Management Targets

The Contractor will be obliged to aim for an overall recycling rate of 70% of C&D material, in accordance with EU targets under Waste Framework Directive (2008/98/EC) as well as regional

⁶ The selected European Waste Classification (EWC) codes provided are provisional only. In a number of instances more than one EWC may be considered appropriate. Care should be taken to ensure that the waste collectors permit includes all EWC codes specified in the appropriate documentation. In addition, there will be a requirement for a technically competent person to assess waste as it arises and to make a determination as to the classification of the material in accordance with the Hazardous Waste List.

waste management targets. Waste management targets for anticipated waste arisings regarding reuse / recycling / recovery and disposal rates are presented in Table 4.2 below.

Table 4.2: Waste Management Targets

Waste Type	Reuse/Recovery %	Recycling %	Disposal %
Concrete treshing	85	-	15
Non-hazardous Soils	100	-	0
Nominally Empty Containers containing residues of or contaminated by dangerous substances	100	-	-
Waste Diesel and Oil	80	20	-
Waste Fuels (Miscellaneous)	80	20	-
Scrap Metal	85	10	5
Plastic Packaging	-	85	15
Paper and Cardboard Packaging	15	85	-

The volume of fill (stone) and ballast required for construction of the proposed development is estimated for worst-case assessment purposes at approximately 52,000m³. The volume of cut for disposal offsite is estimated at approximately 40,000m³. These volumes can be reduced if cut ground can be reused on site.

Iarnrod Eireann have an operating procedure in place for the management of spent ballast. This sets out the roles and responsibilities, classification of the ballast, disposal removal and best practice measures which include the following:

- The requirement for potential assessment of spent ballast and the waste classification process should be considered at the earliest stages of the process.
- Spent ballast should ideally be classified at source, however, due to the restrictive nature of the railway corridor, it is permissible to temporarily store spent ballast at compounds while awaiting classification.
- Spent ballast should be separated at source or at a designated IE compound from other material such as vegetation, soil and other building/construction materials before undergoing waste classification sampling.
- Spent ballast which is uncontaminated should never be mixed with spent ballast that is likely to be contaminated.
- Ideally, where spent ballast from cluster worksites is stored at a hub compound, the stockpile should be labelled with the line name and mileage point from which the spent ballast was excavated from in order to differentiate between plane line and stations/sidings material.

4.3 Waste Management Costs

4.3.1 Financial Cost Associated with Waste

The total cost of implementing the CRWMP will have to consider costs such as, handling, storage, transportation, revenue from rebates and disposal costs.

4.3.2 Re-use / Recovery

Reusing of materials on site will reduce disposal costs. Clean and inert soils, gravel, stones etc. which cannot be reused on site may be classified as a by-product (under Article 27 of the 2011 Waste Directive Regulations). This material may be used as capping material for landfill sites, or for the reinstatement of quarries etc. subject to approvals by the EPA. This material is often taken free of charge for such purposes, or when used as capping in landfills will not attract the landfill tax levy, thereby reducing final waste disposal costs.

4.3.3 Recycling

All metals are salvable and can earn a rebate which can offset collection and transportation costs. Clean, uncontaminated cardboard and certain hard plastics can be recycled. Waste contractors will charge considerably less to take segregated wastes such as recyclable waste from a site than mixed waste. Timber can be recycled as chipboard. If wastes are segregated, waste contractors will charge considerably less as sorting and processing of waste reduces.

4.3.4 Disposal Charge

The total cost of waste management associated with the proposed development will be calculated in regard to the purchase costs of materials, handling costs, storage costs, transportation costs, revenue from sales, disposal costs etc. Costs will be recorded for the range of C&D materials and waste arising. At this stage, it is difficult to determine indicative total waste management costs as the CRWMP is preliminary in nature. When exact quantities and volumes of waste material cannot be determined the full disposal costs can be calculated.

A template for the recording of costs is provided in Table 4.3. This record will be live and will be developed as the project progresses.

Table 4.3: Indicative Costs Breakdown for Waste Management

Waste Type	Estimated Quantity (Tonnes)	Estimated Cost (€)
Quantity of Material	To be confirmed	To be confirmed
Purchase Cost	To be confirmed	To be confirmed
Materials Handling Costs	To be confirmed	To be confirmed
Material Storage Costs	To be confirmed	To be confirmed
Material Transportation Costs	To be confirmed	To be confirmed
Material Treatment Costs	To be confirmed	To be confirmed
Total Waste Management Cost	To be confirmed	To be confirmed
Unit Waste Management Cost	To be confirmed	To be confirmed

5 Site Management

5.1 Resource Manager

The Resource Manager will take responsibility for all aspects of waste management at the different stages of the proposed development and overall implementation of the CRWMP and associated procedures.

The Resource Manager, as appointed by the Contractor, will be technically competent and appropriately trained, and will take responsibility to ensure that the objectives and measures contained within this CRWMP are transposed into the detailed CRWMP, and are subsequently implemented including associated target re-use / recycling rates. The Resource Manager will also facilitate effective communication of the waste management objectives with all operatives associated with the project (including site staff, external contractors and suppliers).

Another key objective of the Resource Manager will be the maintenance of accurate records on the quantities of waste / surplus materials generated and the real cost (including purchasing) associated with waste generation and management. The recording of summary information will further assist the implementation of the plan.

The Resource Manager will ensure that reporting and recording requirements are met, and all necessary resources are in place to support the implementation of the plan.

5.2 Site Personnel

All site personnel will be instructed about the objectives of the CRWMP and informed of the responsibilities to effectively implement the plan. Where waste prevention, source segregation, material reuse techniques, and best practice guidelines apply, each member of staff will be given instructions on how to comply with the CRWMP.

5.3 Training

Copies of the CRWMP will be made available to all relevant personnel on site. The Resource Manager will arrange for all site personnel to receive training on the objectives of the plan and materials management. The topics to be covered will include:

- Project programme and requirements;
- Project commitments and targets;
- Health and safety requirements;
- Materials to be segregated;
- Segregation systems and protocols;
- Arrangements for the storage and handling of reusable materials and recyclables;
- Instruction on hazardous wastes and the dangers of each hazardous waste; and
- Document control requirements.

Toolbox talks on resource management will be provided on a regular basis to ensure that site personnel are aware of the resource management practices associated with their work and the appropriate control measures that are required to carry out their work in compliance with this CRWMP.

5.4 Record Keeping and Communications

A system will be developed to ensure that all details of generation, movement and treatment of C&D waste is recorded. Where practicable, a computerised monitoring tool will be employed to assist in facilitating waste reduction via benchmarking. As such, this system will enable the Contractor to measure and record the quantity of waste generated and identify wastage more readily as well as identify successes or failures as measured against performance targets. An indicative template is provided in Appendix A *Tracking Template*.

Verifiable and validated tracking and authorisation documentation will be maintained for all wastes destined for re-use, recovery, recycling, other recovery (including energy recovery), or disposal. Justification will also be provided where a disposal option has been employed.

In addition, a record will be kept of all materials as they arrive on site detailing the assignment of specific uses within the works. This will enable the monitoring of the quantity and type of waste produced at various stages throughout the project.

All waste material will be managed in accordance with the Waste Management Act 1996 (as amended) and associated Regulations e.g. all hauliers will hold waste licences and/or Certificates of Registration (COR) for the specified EWC and the appropriate local authority at the final destination. Waste will only be sent to facilities authorised to accept, treat and / or dispose of the material. Copies of all waste accreditations relevant to the waste treatment / collection will be retained with other waste records.

5.5 Communications

The Resource Manager will be responsible for internal reporting of resource statistics to IÉ and the Contractor management. This will include performance relative to agreed targets and objectives which will be included as an agenda item at site meetings.

The Resource Manager will engage with Cork County Council and the EPA on any site inspection or enforcement audits undertaken at the site. All follow-up actions and corrective actions will be logged and reported to Cork County Council, as appropriate.

The Resource Manager will engage with other stakeholders (the public, etc.) as appropriate in relation to the resource management on site.

Upon completion of construction, the Resource Manager will prepare a final report summarising the outcomes of resource management processes adopted, the total reuse and recovery figures and the final destinations of all resources taken off-site. This report will be issued to IÉ, Contractor management and Cork County Council.

5.6 Waste Auditing

The effectiveness of the plan, and its implementation, will be subject to regular audits by the Resource Manager throughout the duration of the project. The purpose of the waste audit is to highlight the problems that waste can cause and the benefits of prevention and minimisation.

The audits will focus on material inputs to the project (assignment of materials to specific uses within the works) and the waste outputs for each operation, identifying additional opportunities for waste reduction, re-use and recycling. The audits will also investigate the operational factors and management policies that contribute to the generation of waste and identify appropriate corrective actions, where necessary.

The audit findings will reflect the success or failure of reaching performance targets and subsequent Action Plans will be developed to address any issues and highlight corrective actions that may be taken in relation to management policies or site practices in order to bring

about further waste reductions. Inspections of the waste storage areas will be undertaken on a weekly basis, issues relating to housekeeping, inappropriate storage and / or segregation will be actioned at the earliest practicable opportunity.

6 Site Infrastructure

This section relates to on-site signage, separation, and storage for handling and managing of waste and resources.

Prior to construction, the site layout will be reviewed by IÉ to ensure that the proposed Waste Storage Areas (WSAs) have adequate space for storage and handling.

WSAs include stockpiles, skips or secure containers for hazardous materials. All WSAs will be assessed as fit for purpose and suitably contained, or banded as required.

The WSA will be set out to reduce any potential impact on sensitive human or natural environments and a suitable buffer will be applied to mitigate any impact.

Labelling and signage will be used onsite to inform personnel of key WSA requirements and restrictions, with clear signage provided on all WSAs.

Signage will provide information to assist good resource practice across the site.

Appendices

A. Tracking Template



B. Traffic Management Plan



Glounthaune-Midleton Twin Track Project

Construction Traffic Management Plan

September 2022

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1 Introduction

The Construction Traffic Management Plan (CTMP) is targeted at minimising disruption and enhancing safety in traffic operations during the construction phase of the Glounthaune-Midleton Twin Track project (hereafter referred to as the proposed development). It incorporates measures which will specifically mitigate transport impacts identified in the Roads and Traffic chapter of the Environmental Impact Assessment Report (EIAR).

1.1 General

The CTMP has been developed in support of the proposed development. The CTMP provides details of proposed traffic management measures and associated interventions to be implemented during the construction phase of the proposed development to minimise disruption and enhance safety.

Mott MacDonald produced the EIAR Chapter 15: Traffic and Transport to support the Environmental Impact Assessment (EIA) process for the Project. It was identified through the EIA process that a CTMP would be required.

The CTMP will remain a 'live' document which will be updated in response to any relevant conditions of the Approval, and to reflect the detailed design of the Approved development – in collaboration and agreement with the relevant Roads Authorities, primarily Cork County Council. It will be reviewed regularly and revised as necessary to ensure that the measures implemented are effective.

1.2 Glounthaune-Midleton Twin Track Project

The CTMP considers anticipated development traffic movements on public roads directly within the proposed development study area along with other public roads likely to be used for construction access. These have been set out in Chapter 15 – Traffic and Transport of the EIAR, submitted with the application for Approval of the proposed development.

There are five construction compounds and the categorised compound locations (referenced by measured chainage distance of railway centreline from 50m east of the end of the station carpark. See Figure 1-1.) are:

- Compound at chainage 1200m;
- Compound at chainage 2340m;
- Compound at chainage 6600m;
- Compound at chainage 9800m; and
- Compound at chainage 9900m.

The compound at chainage 9800m is only for machinery access, with the main compound being the compound at 9900m.

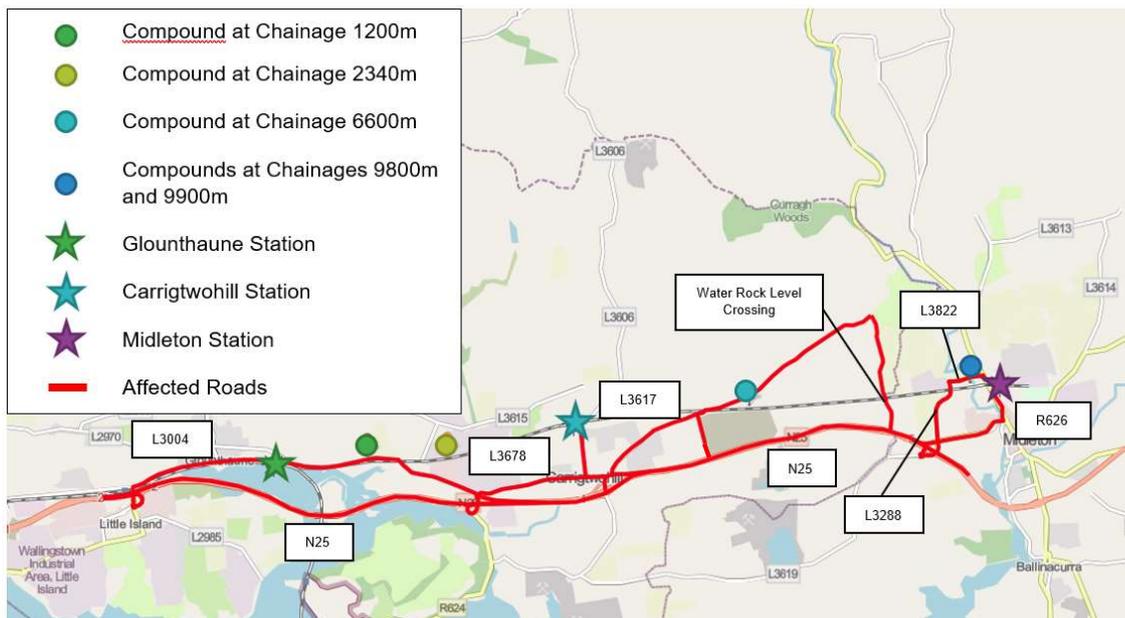
Figure 1-1: Railway Alignment



Source: Mott MacDonald

Figure 1-2 indicates the sites in a local context.

Figure 1-2: Site Context Plan



Source: Mott MacDonald/OpenStreetMap

1.3 Structure of this Report

The report is sub-divided into the following Sections:

- **Section 2** outlines the background context attributed to the project
- **Section 3** lists the proposed traffic management mitigation measures over the course of the construction phase of the project
- **Section 4** presents the measures to monitor and implement the CTMP
- **Section 5** provides a summary statement for the CTMP

2 Construction Traffic

2.1 Construction Programme

Construction is expected to commence in Q4 2023 with a scheduled duration of 36 months. The construction programme is presented in EIAR Chapter 6.

2.2 Construction Traffic

The wide geographic spread of the proposed development necessitates that construction related traffic will utilise several public roads in the Cork County Council area. The access routes utilised will depend upon the origination of the journey.

The construction traffic movements will comprise construction workers and Heavy Good Vehicles (HGV) carrying construction material / plant.

It is planned that sleepers and rails will be brought to site using rail haulage.

Subject to the grant of statutory approvals, it is anticipated that proposed works will commence in Q4 2023 and will take approximately 36 months to complete. Indicative durations for the proposed works are detailed in Table 2.1.

Table 2.1: Indicative Construction Schedule

Phase	Revised timeline
1. Pre-construction works	Q4 2023
2. Enabling works	Q1 2024
3. Earthworks, drainage and track sub-base	Q2 2024 – Q3 2025
4. Track realignment and construction	Q2 2025 – Q1 2026
5. Signalling works	Q4 2024 – Q2 2026
6. Commissioning	Q1 2026 – Q2 2026

It is estimated that the peak of construction activities will occur from Q2 2024 to Q1 2026 and will be associated with phase three and phase four; the earthworks phase and the track construction phase. The whole construction period runs from Phase 1 in Q4 2023 to Q2 2026.

Construction will occur between 0700 and 1900 Monday to Sunday, outside the operational railway footprint. Works within the operational railway footprint will be undertaken between 1900 and 0700 daily. Construction workers will generally arrive and depart outside the traditional peak hours associated with the surrounding road network. Most of these movements will be undertaken by car or van, termed as Light Goods Vehicle (LGV) movements, and will most likely include carpooling; generally, these movements will be undertaken outside of network peak periods and thus the impact of LGV traffic on the network is negligible.

The predicted number of HGV traffic movements (note: one trip = two movements; i.e., one delivery and one return journey) generated by construction activity are summarised in Table 2.2

Table 2.2: Vehicle Movements Summary

Site	Total HGV Movements	Peak Total HGV Movements per Day
Compound at chainage 1200m	7198	60
Compound at chainage 2340m	9575	60

Site	Total HGV Movements	Peak Total HGV Movements per Day
Compound at chainage 6600m	9609	40
Compound at chainage 9800m	1928	10
Compound at chainage 9900m	7010	39
Total	36,540	

Source: Mott MacDonald

As indicated in Table 2.2 the total HGV traffic generated by the proposed development is estimated to be 36,540 movements, spread over the approximate 36 months construction period whereby traffic will impact the roads. Peak HGV traffic activity will occur during phase three and four of the works.

It will be necessary to close Castle Rock Avenue to through traffic to facilitate upgrading works to the level crossing (Water Rock CCTV XY009). It is expected that the closure will last for 16 weeks with diversions via Ballyrichard More, the R626 and N25.

2.2.1 Abnormal Load Deliveries

No abnormal loads are anticipated to be required.

2.2.2 Construction Access and Public Road Impacts

2.2.2.1 Construction Compounds

HGV construction traffic and construction personnel (travelling by car mini-bus or small van) will access each of the four compounds via the N25 from either the east or west.

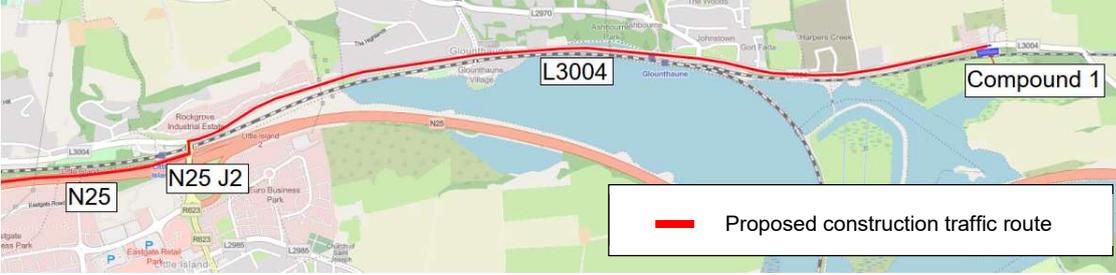
The number of construction personnel required during the construction phase is expected to peak at approximately 125 persons. It is assumed that staff will travel to site via a combination of public transport, cycle, minibus, and private passenger vehicles (in some cases accommodating more than one occupant). The construction compounds will contain portacabins for offices and welfare facilities, parking for construction staff and material stockpiles.

Space to accommodate large vehicle manoeuvring and laydown will be provided within the curtilage of the compounds. Accordingly, no construction-related vehicles associated with the proposed development at a compound will be required to park on local public roads. This will be advised to all construction personnel before the commencement of works and reinforced via 'toolbox talks'.

Apart from site signage, there are no works envisaged being required on the public road network to facilitate the work at each compound. Proposed construction routes to and from each compound are shown in Table 2-3.

Table 2-3: Construction Routes

Compound Reference and Route Description

<p>To Compound 1 at chainage 1200m from the west on the N25</p> <p>Route:</p> <ul style="list-style-type: none"> • N25 (J2) • L3004 (N25 (J2) to Compound 1) • Compound 1 opposite The Elm Tree
 <p>This map shows the proposed construction traffic route starting from the N25 (J2) junction, heading east along L3004 to reach Compound 1. A red line indicates the route, and a legend box contains the text 'Proposed construction traffic route'.</p>
<p>From Compound 1 at chainage 1200m towards the west on the N25</p> <p>Route:</p> <ul style="list-style-type: none"> • Compound 1 opposite The Elm Tree • L3004 (Compound 1 to N25 (J2)) • N25 (J2)
 <p>This map shows the proposed construction traffic route starting from Compound 1, heading west along L3004 to reach the N25 (J2) junction. A red line indicates the route, and a legend box contains the text 'Proposed construction traffic route'.</p>
<p>To Compound 1 at chainage 1200m from the east on the N25</p> <p>Route:</p> <ul style="list-style-type: none"> • N25 (J3) • L3004 (N25 (J3) to Compound 1) • Compound 1 opposite The Elm Tree
 <p>This map shows the proposed construction traffic route starting from the N25 (J3) junction, heading west along L3004 to reach Compound 1. A red line indicates the route, and a legend box contains the text 'Proposed construction traffic route'.</p>

Compound Reference and Route Description

From Compound 1 at chainage 1200m towards the east on the N25

Route:

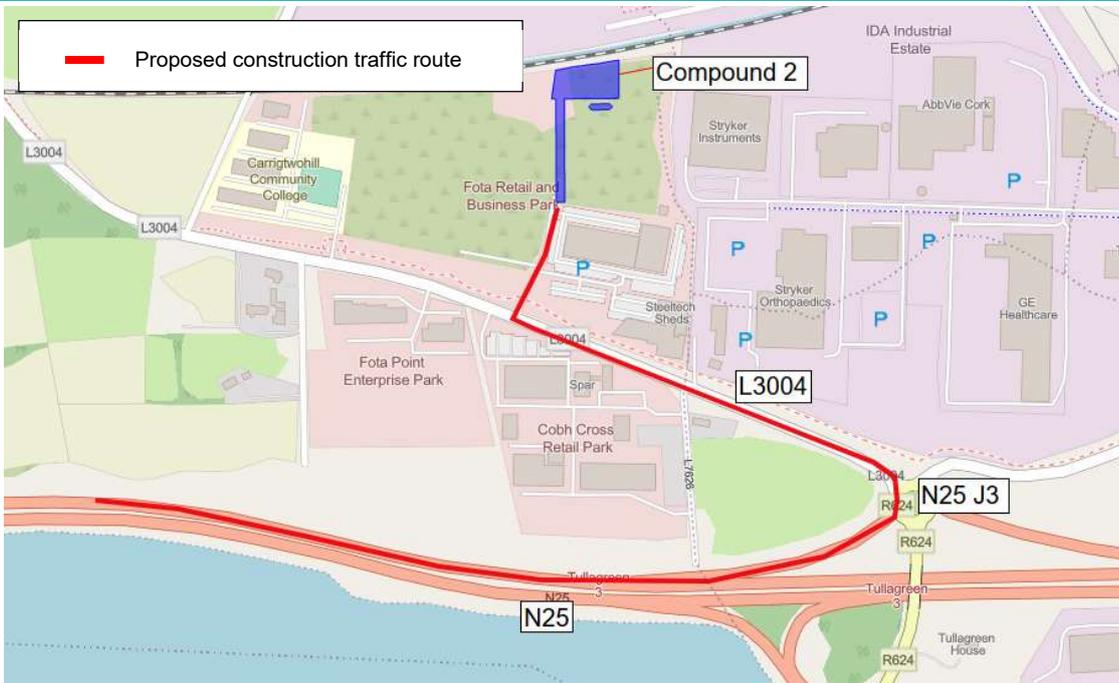
- Compound 1 opposite The Elm Tree
- L3004 (Compound 1 to N25 (J3))
- N25 (J3)



To Compound 2 at chainage 2340m from the west on the N25

Route:

- N25 (J3)
- L3004 (N25 (J3) to Fota Retail and Business Park)
- Compound 2 at Fota Retail and Business Park



Compound Reference and Route Description

From Compound 2 at chainage 2340m towards the west on the N25

Route:

- Compound 2 at Fota Retail and Business Park
- L3004 (Fota Retail and Business Park to N25 (J3))
- N25 (J3)



To Compound 2 at chainage 2340m from the east on the N25

Route:

- N25 (J3)
- L3004 (N25 (J3) to Fota Retail and Business Park)
- Compound 2 at Fota Retail and Business Park

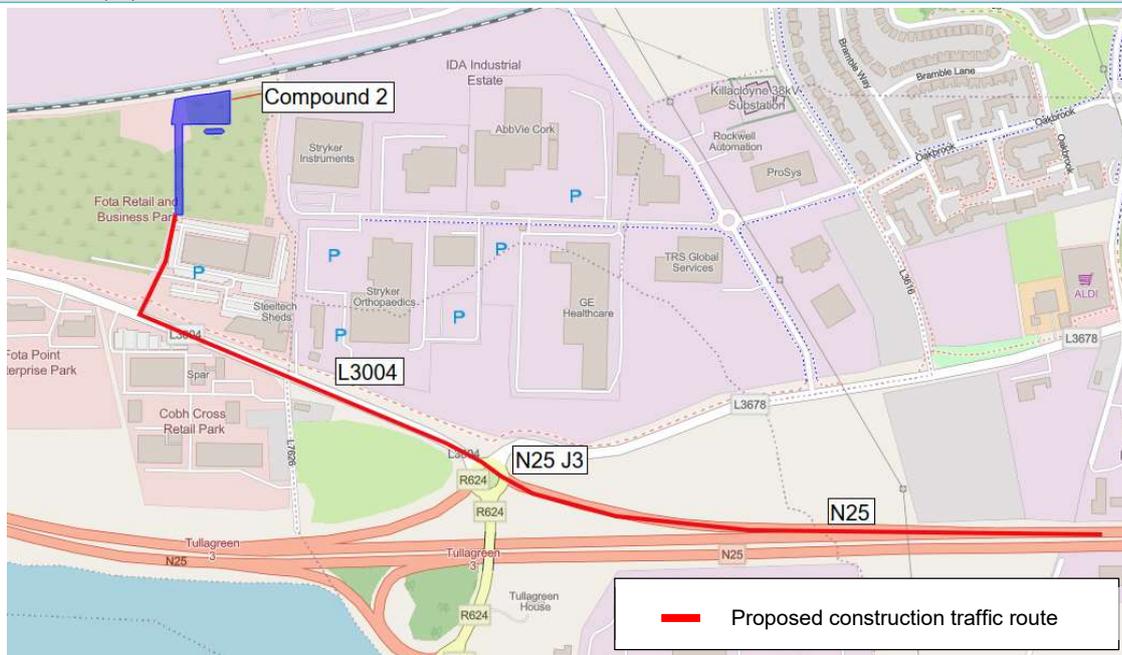


Compound Reference and Route Description

From Compound 2 at chainage 2340m towards the east on the N25

Route:

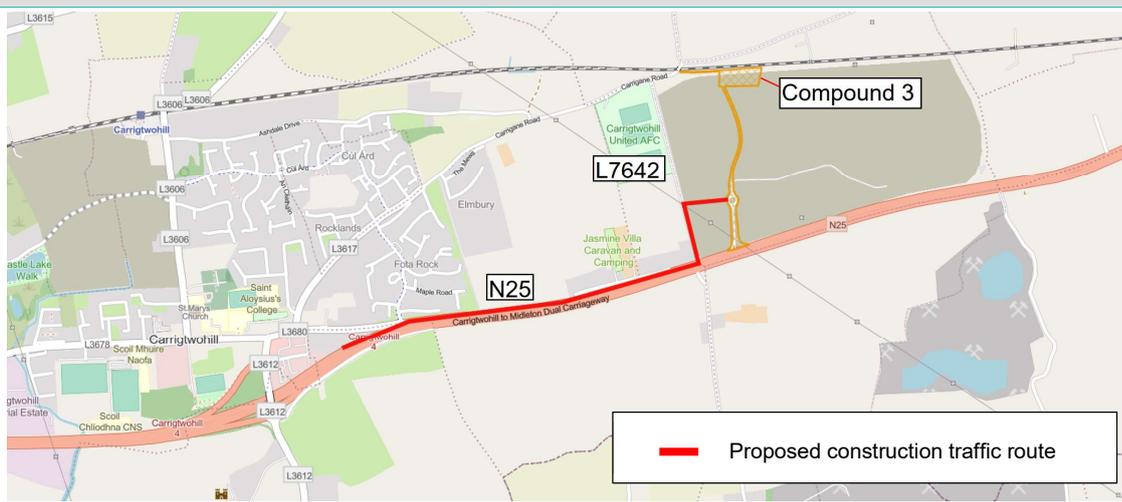
- Compound 2 at Fota Retail and Business Park
- L3004 (Fota Retail and Business Park to N25 (J3))
- N25 (J3)



To Compound 3 at chainage 6600m from the west on the N25

Route:

- N25
- L7642 Private Access (c. 200m north of N25 junction)

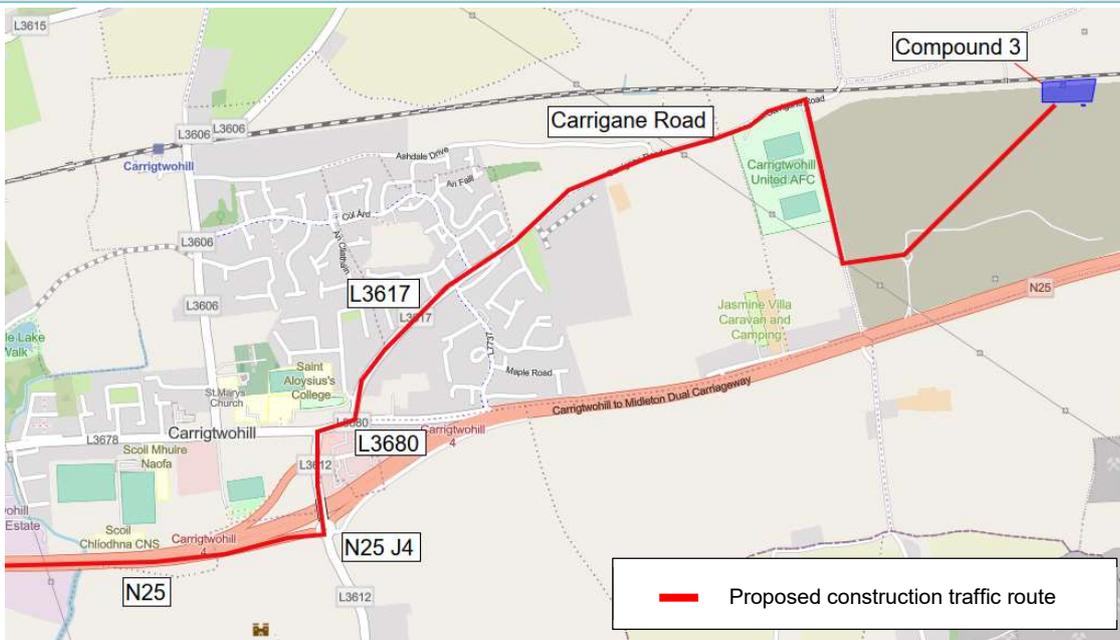


Compound Reference and Route Description

From Compound 3 at chainage 6600m towards the west on the N25

Route:

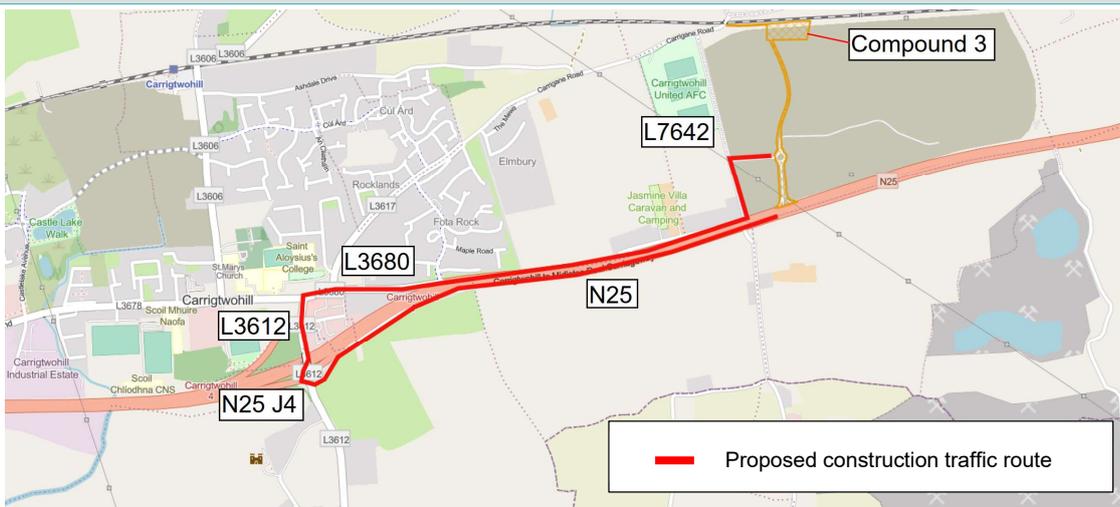
- Private Access Track from Compound 3
- L7642 (between Private Access and Carrigane Road)
- Carrigane Road/L3617 (between L7642 and L3680)
- L3680 (between L3680 and L3612)
- N25 (J4)



To Compound 3 at chainage 6600m from the east on the N25

Route:

- N25 (J4)
- L3612/L3680 ('U' turn via N25 (J4))
- L7642 Private Access (c. 200m north of N25 junction)

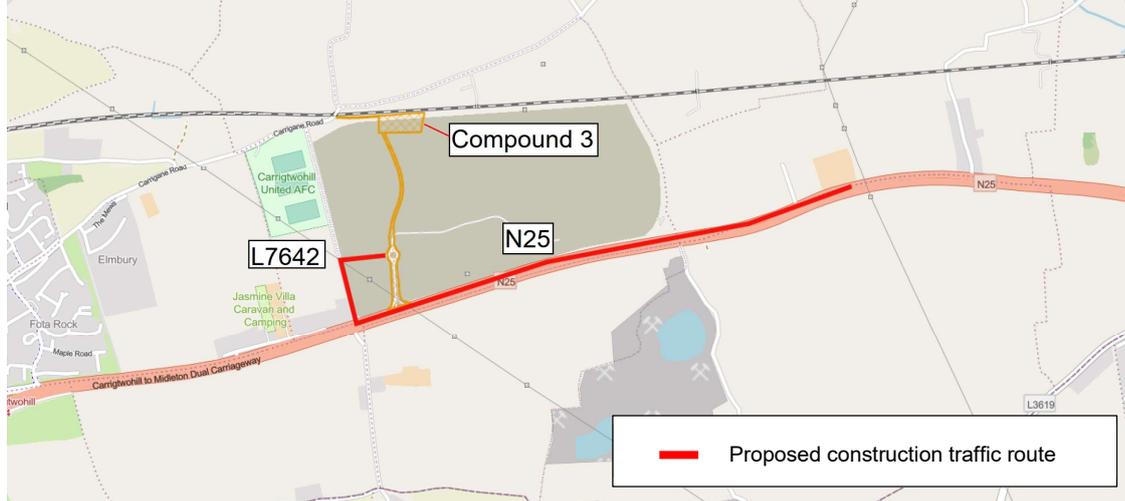


Compound Reference and Route Description

From Compound 3 at chainage 6600m towards the east on the N25

Route:

- Private Access Track from Compound 3
- L7642 Private Access (c. 200m north of N25 junction)



To Compound 4 at chainage 9800m from the west on the N25

Route:

- N25 (J5)
- R907 (between N25 (J5) and L3288)
- L3288/L3822 (to Compound 4 via private access)



Compound Reference and Route Description

From Compound 4 at chainage 9800m to the west on the N25

Route:

- L3288/L3822 (from Compound 4 via private access)
- R907 (between L3288 and N25 (J5))
- N25 (J5)

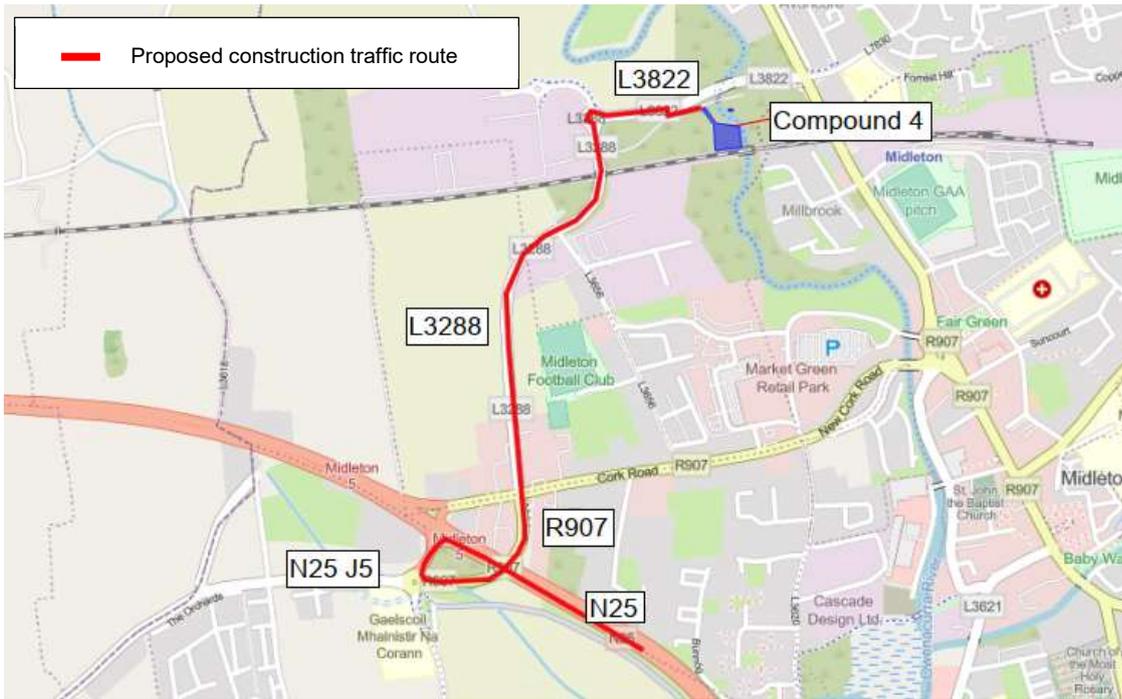


To Compound 4 at chainage 9800m from the east on the N25

Route:

- N25 (J5)
- R907 (between N25 (J5) and L3288)

L3288/L3822 (to Compound 4 via private access)



Compound Reference and Route Description

From Compound 4 at chainage 9800m towards the east on the N25

Route:

- L3288/L3822 (from Compound 4 via private access)
- R907 (between L3288 and N25 (J5))
- N25 (J5)



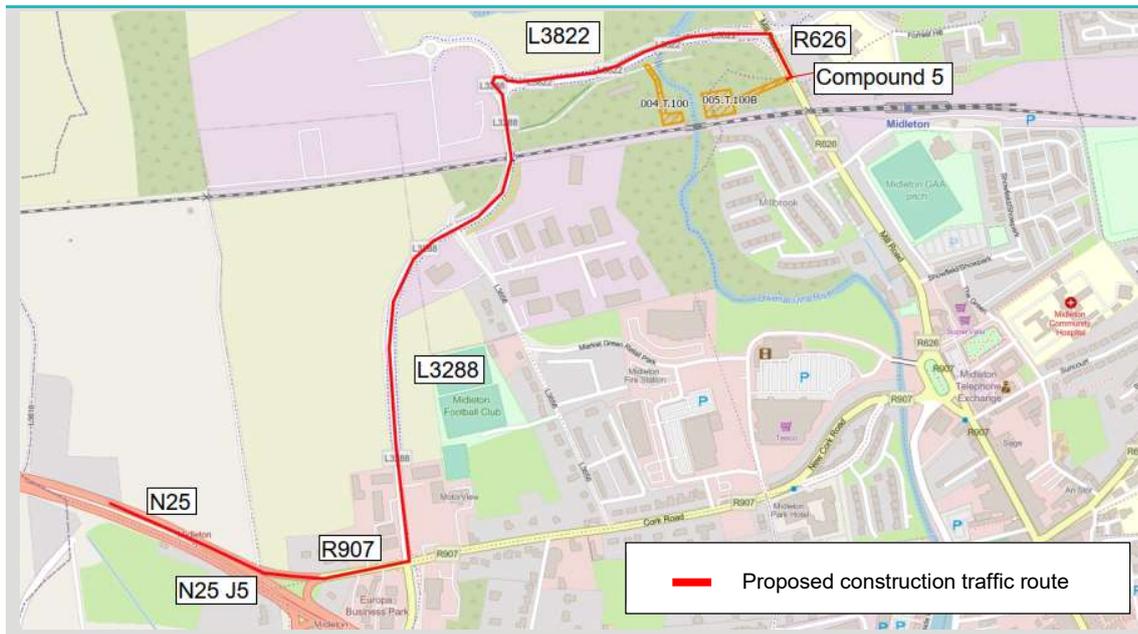
To Compound 5 at chainage 9900m from the west on the N25

Route:

- N25 (J5)
- R907 (between N25 (J5) and L3288)
- L3288



- L3822
- R626 (between L3822 and Compound 5)

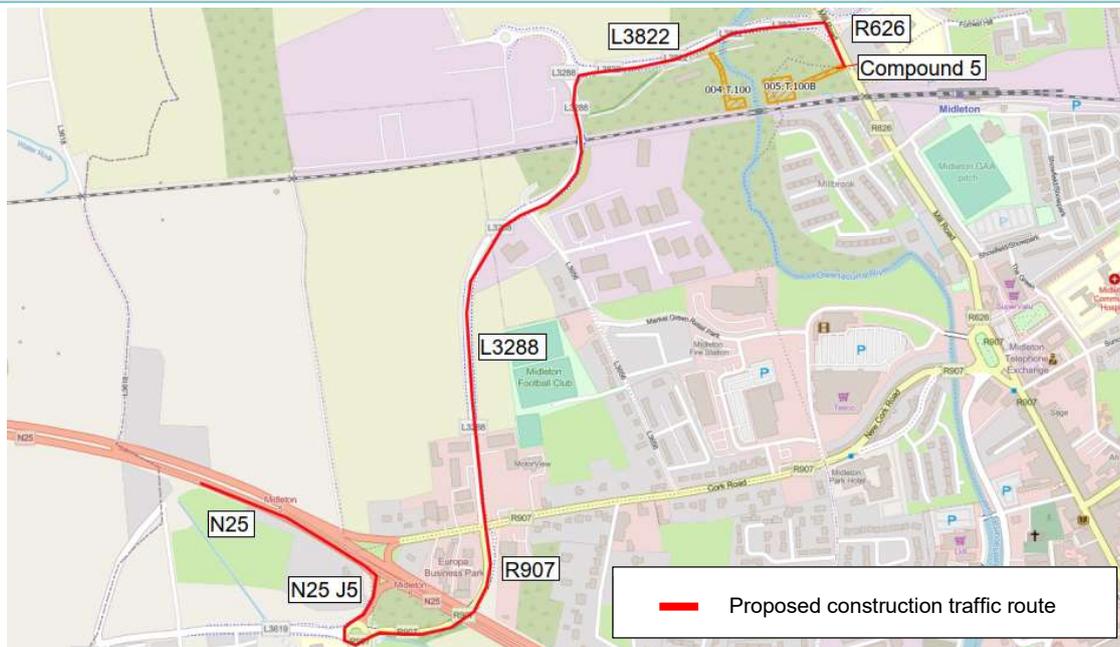


Compound Reference and Route Description

From Compound 5 at chainage 9900m to the west on the N25

Route:

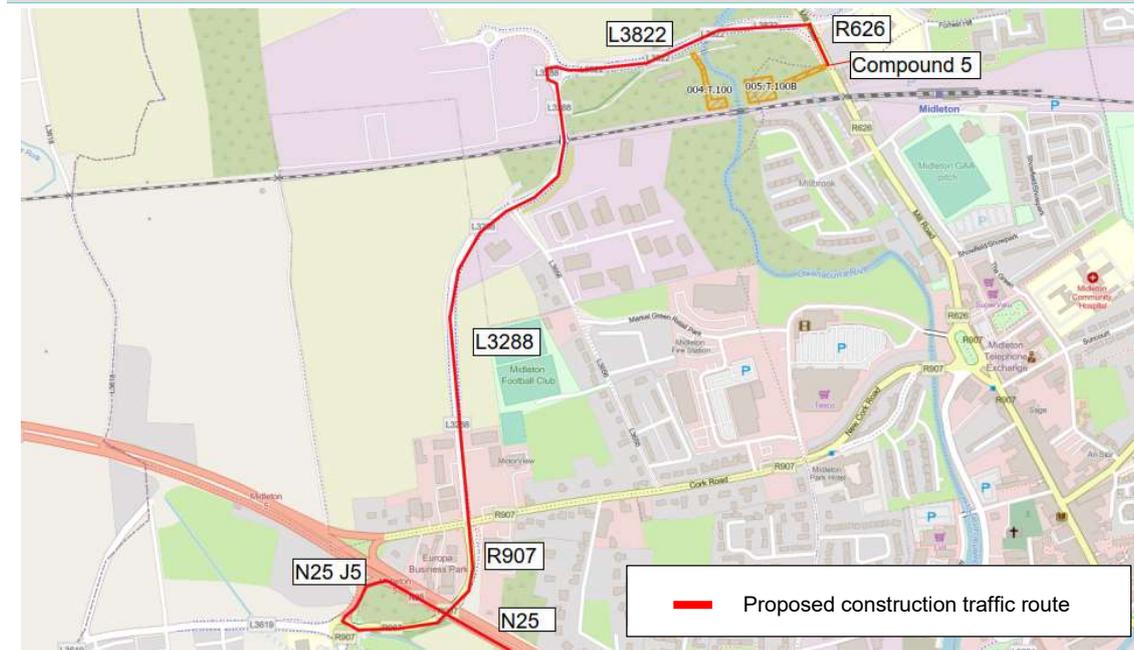
- R626 (between L3822 and Compound 5)
- L3822
- L3288
- R907 (between N25 (J5) and L3288)
- N25 (J5)



To Compound 5 at chainage 9900m from the east on the N25

Route:

- N25 (J5)
- R907 (between N25 (J5) and L3288)
- L3288
- L3822
- R626 (between L3822 and Compound 5)

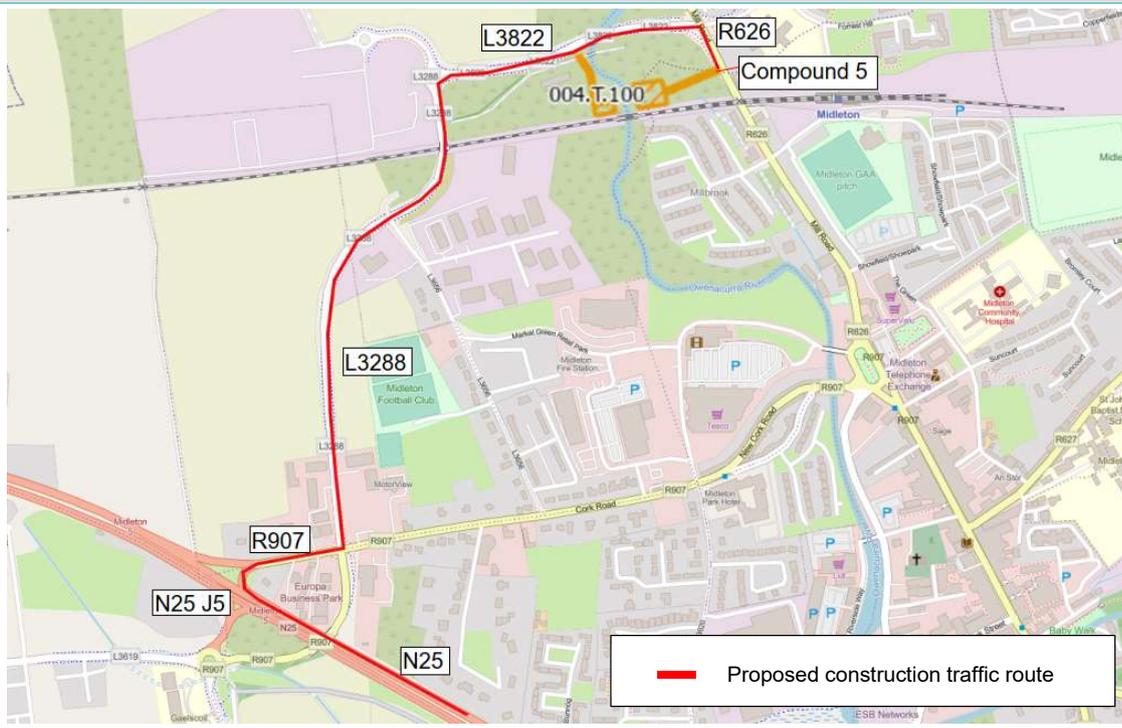


Compound Reference and Route Description

From Compound 5 at chainage 9900m to the east on the N25

Route:

- R626 (between L3822 and Compound 5)
- L3822
- L3288
- R907 (between N25 (J5) and L3288)
- N25 (J5)



Source: Mott MacDonald/OpenStreetMap

Specific traffic management requirements and localised arrangements will be developed by the appointed contractor(s) and will be agreed upon in advance of implementation with the appropriate reviewing authority.

2.2.2.2 Castle Rock Avenue

It will be necessary to close Castle Rock Avenue to through traffic to facilitate level crossing upgrading works to Water Rock CCTV XY009. It is expected that the closure will last for 16 weeks from December 2025 to March 2026. The additional length of the diversion route would be 6.7km and would typically add 6 minutes travel time onto journeys previously utilising Castle Rock Avenue (assuming the level crossing barriers were open).

Table 2-4 shows the planned diversion due to the temporary closure of the Water Rock level crossing on Castle Rock Avenue.

3 Measures Identified to Minimise and Mitigate Traffic Impacts

3.1 General

Local vehicle routes have been reviewed, with the principal aim being to minimise disruption to local communities and users of the N25 and local traffic routes.

There are several traffic management measures proposed to mitigate potentially disruptive impacts associated with construction traffic. These measures are hereafter described.

3.1.1 Time Control

It is anticipated that the proposed development will operate a 7-day working week with operations/deliveries typically being undertaken between 0700 and 1900 Monday to Sunday, outside the operational railway footprint. If works generating road traffic are to be undertaken outside these hours, then prior notification will be provided, and agreement sought from Cork County Council. Works within the operational railway footprint will be undertaken between 1900 and 0700 daily.

The appointed contractor will plan and manage deliveries and collections from each compound to minimise potential disruption on the surrounding road network to minimise the impact on the local community's day-to-day life within peak traffic hours.

The appointed contractor will liaise with Cork County Council upon finalisation of the construction programme to ensure (as far as is reasonably practicable) that no conflict with planned road works in the vicinity of each compound occurs so as not to impact motorists further.

Deliveries will be scheduled, as far as is reasonably practicable, to avoid network peak hours and passing by schools around typical drop-off and pick-up times. Where practically achievable, diversion routes will not apply outside of the compound's hours of operation.

Accordingly, the appointed contractor will discuss and agree with Cork County Council on times to be avoided at schools and other community receptors at peak periods of the construction programme to minimise disruption.

The appointed contractor will liaise with Cork County Council regarding local events dates and seek to avoid traversing affected route sections at agreed times.

3.1.2 Diversion Routes

At the location where local road diversions would be implemented (due to construction activity) all reasonable and practically achievable measures will be implemented to facilitate local access requirements for emergency services, residential and commercial purposes.

Once the construction programme, construction methodologies and associated compound layout requirements are firmly established, there will be a process of approvals for signage and information provision regarding essential traffic diversions. These will be discussed and agreed upon with Cork County Council and other authorities as required. When a road closure is required, the procedure set out in Section 75 of the Roads Act 1993 will be followed and the proposed diversion route will be approved by the relevant Road Authority.

When a closure is required, there will be a provision for a diversion route suitable to accommodate the types and volumes of traffic. Diversion route signage will be clear and consistent, guiding the traffic through each decision point until it re-joins the route from which it was diverted.

Diversion routes will be maintained in a satisfactory condition throughout the period of the diversion. Figure 3-1 below shows some examples of diversion signage and is not exhaustive.

Figure 3-1: Temporary Traffic Measures and Signs for Roadworks



Source: 'Temporary Traffic Measures and Signs for Roadworks'. Traffic Signs Manual Chapter 8 (August 2019). Department of Transport, Tourism and Sport.

An indication of the location of and potential implications of diversions are set out in **Table 2-4** of the CTMP. Confirmed diversion routes will be agreed before construction between the appointed contractor and relevant authorities.

3.1.3 Transportation Protocol

All contractors will adhere to the agreed CTMP and any agreed conditions imposed by Cork County Council.

All construction vehicles associated with the proposed development will:

- Display a unique identification number shown on a plate clearly visible.
- Be securely sealed.
- Record origin, destination, and route of the vehicle.
- Not leave in convoy.
- Ensure all vehicle identifications including registration plates on the vehicle are clearly visible.

On route to and from their destinations drivers of all construction vehicles will:

- Access their destination compound via an approved route; this is to be determined by the approved contractor in conjunction with the administering local authority.

- Strictly observe speed limits.
- Drive in a safe and courteous manner with due care and consideration for other road users both vehicular and pedestrian.
- Be aware and alert whilst driving through towns and villages particularly at school times.
- Strictly adhere to the hours of operation detailed by the TMP.
- Not deliberately wait or stack on any public road.

The appointed contractor will maintain a management system whereby the following records are kept and are available to Cork County Council:

- The number of vehicles arriving and leaving their destination.
- All complaints received regarding transport and resultant action taken.
- All instances where a protocol has been breached and resultant action taken.

The appointed contractor will supply the following information to Cork County Council, which will be treated in confidence:

- Action to be taken when a protocol is breached; and
- A log of vehicle movements.

3.1.4 Wheel Wash and Road Cleaning / Sweeping

To reduce the potential for mud and other debris being deposited onto the local road network, a wheel washing facility will be installed on-site, at each compound, during the construction period. This would minimise the amount of deleterious material deposited on the road surface and the appointed contractor will ensure that the nearest public road (between the compound and the N25) will be kept clear of debris by monitoring and then utilising a road sweeper where necessary.

3.1.5 Speed Restrictions

All construction personnel, including contractor managed HGV drivers, will be briefed on the absolute requirement to adhere to posted speed limits on public roads through induction sessions and through regular briefings (toolbox talks). Other parties responsible for site deliveries will also be instructed per the requirement for compliance with posted speed limits on all roads.

Speed limits posted within compounds will be considered mandatory and, therefore will be complied with.

3.1.6 Temporary Signage

During the construction phase, signage will be installed to warn road users to the presence of the works access and the associated likely presence of large or slow-moving construction traffic.

General information signage will be installed to inform road users and local communities of the nature and location of the works, including contact details should they require additional information.

Indicative signage for use on these routes is illustrated in **Figure 3-2**.

Figure 3-2: Indicative Warning Signs



Source: Mott MacDonald

Temporary signage will be formally agreed with Cork County Council prior to installation and commencement of construction. All signing will also be provided in accordance with Traffic Signs Manual.

3.1.7 Temporary Traffic Lane Closures

To safely accommodate works on sections of Castle Rock Avenue, the road will need to be closed and diversions required, see Section 2.2.2.2 for diversion routes.

The contractor will request permission from the relevant Authority prior to installation of any potential traffic management. All necessary signing will be provided in accordance with Traffic Signs Manual.

3.1.8 Public Transport

The appointed contractor will discuss with Cork County Council and local bus operators regarding matters that could affect the flow of buses and, will implement reasonable and practically achievable measures to mitigate any disruption to bus services and inconvenience to service users.

Public Transport services that may be affected by local traffic management are listed below in Table 3-1.

Table 3-1: Public Transport services that utilise road sections affected by construction activity

Service Number	Route Summary	Service Operator	Weekday Frequency (Mon-Fri) (Two-way)	Weekend Frequency (Two-way)	Railway or Road Closure	Diversion	Construction Access
40	Tralee – Rosslare Europort via Cork	Bus Éireann	Between 08:00 and 21:00 (between Cork and Waterford City): 26 services	Saturday: between 08:00 and 21:00 (between Cork and Waterford City): 26 services Sunday: between	-	-	✓

Service Number	Route Summary	Service Operator	Weekday Frequency (Mon-Fri) (Two-way)	Weekend Frequency (Two-way)	Railway or Road Closure	Diversion	Construction Access
				09:00 and 21:00 (between Cork and Waterford City): 22 services			
240	Cork Bus Station - Ballycotton	Bus Éireann	Between 06:00 and 17:45: four services	Saturday: between 08:50 and 15:30: three services	-	-	✓
241	Cork Bus Station - Trabolgan	Bus Éireann	Between 07:15 and 18:00: nine services	Saturday: between 11:00 and 18:40: three services	-	-	✓
260	Cork Bus Station - Ardmore	Bus Éireann	Between 07:00 and 23:00: seven services	Saturday: between 07:55 and 23:00: five services Sunday: between 10:30 and 23:00: four services	-	-	✓
261	Cork Bus Station - Ballinacurra	Bus Éireann	Between 07:20 and 22:50: 31 services	Saturday: between 08:25 and 22:50: 20 services Sunday: between 07:50 and 22:05: 16 services	-	-	✓
Rail Service	Midleton - Cork	Irish Rail	Between 05:45 and 22:45: 44 services.	Saturday: between 05:45 and 22:45: 36 services. Sunday: between 08:15 and 20:45: 17 services	✓	-	-

Source 1: <https://www.transportforireland.ie/getting-around/by-bus/route-maps/> , <https://www.buseireann.ie/>, <https://www.irishrail.ie/en-ie/train-timetables/timetables-by-route>

It is likely that the railway line will be closed for a period of four months commencing in Q1 2026. Rail replacement bus services will be used to accommodate passengers. Table 3-2 shows the assumed rail replacement bus route.

Table 3-2: Rail Replacement Bus Routes

Section Name and Route Description

<p>Bus service eastbound (Glounthaune Station to Carrigtwohill Station to Midleton Station)</p> <p>Route:</p> <ul style="list-style-type: none"> • L3004 (From Glounthaune Station) • L3678 • L3606 • L3680 • N25 (to J5) • R907 • R626
<p>Bus route westbound (Midleton Station to Carrigtwohill Station to Glounthaune Station)</p> <p>Route:</p> <ul style="list-style-type: none"> • R626 • R907 • N25 (J5 to J4) • L3612 • L3606 • L3678 • L3004 (To Glounthaune Station)

Source: Mott MacDonald/OpenStreetMap

3.1.9 Pedestrian, Cyclist or Equestrian Routes

Appropriate signage advising of dates and hours of working will be installed on the pedestrian, cyclist, and recreational routes, among others, in advance of road crossing points to warn users of construction traffic:

Table 3-3: Pedestrian, cyclist or equestrian routes that may be affected by local traffic management

Route Type	Description	Location	Existing/Proposed	Road Closure	Diversion	Construction Access
Cycling	Inter-Urban Route (IU-1): Glounthaune to Midleton. Construction between Glounthaune between Fitzpatrick's shop and the Elm Tree restaurant completed in July 2021. Public consultation opened for Carrigtwohill to Midleton Phase 1 in November 2021.	Glounthaune to Midleton	Proposed	-	-	✓
Cycling	CT-U8 along Western Distributor Road (Cork Road)/ Kilahora Road, connecting Old N28 to Fota Retail Park. Currently in public consultation.	Carrigtwohill	Proposed	-	-	✓
Cycling	CT-U6 along Main Street/ Western Distributor Road (Cork Road), from intersection with Maryville Estate to the IDA Business Park. Currently in public consultation.	Carrigtwohill	Proposed	-	-	✓
Cycling	CT-U9 along Main Street/Midleton Road, from the western end of Main Street to	Carrigtwohill	Proposed	-	-	✓

Route Type	Description	Location	Existing/Proposed	Road Closure	Diversion	Construction Access
	Fota Rocks Estate. Currently in public consultation.					
Cycling	CT-U14 along New Link, from Castlelake Road to Station Road.	Carrigtwohill	Existing	-	-	✓
Cycling	CT-U4 along Cul Ard, from Station Road to Carrigane Road	Carrigtwohill	Existing	-	-	✓
Cycling	CT-U3 along Fota Rock Estate from Midleton Road to Carrigane Road.	Carrigtwohill	Existing	-	-	✓
Cycling/Walking	M-U2 Northern Relief Road, between Cork Road to Mill Road	Midleton	Existing	-	-	✓
Cycling	M-GW3 along the Owenacurra River Greenway, between Water Rock Master Plan area to Gyratory. Currently in public consultation.	Midleton	Proposed	-	-	✓
Cycling	M-GW2 from Midleton to Youghal Greenway. Currently scheduled to be opened in 2023.	Midleton to Youghal	Existing (will be completed prior to construction of proposed development)	-	-	✓

Indicative signage for use at these locations is illustrated in **Figure 3-3**. The exact details and location of the signage would be agreed with Cork County Council.

Figure 3-3: Recreational Routes Warning Signage



Source: Mott MacDonald

3.1.10 Parking for Vehicles of Site Personnel, Operatives and Visitors

To minimise inconvenience to the local community in terms of obstructive parking, adequate car parking for permanent site personnel, visitors and deliveries will be provided within the site compounds. Adequate vehicle parking space will be provided on-site, and car parking will not be permitted on any public road network adjacent to the site so that sight lines would be maintained and to minimise the potential for obstruction and delay for other road users. The requirement for construction personnel not to park their private vehicles on public roads will be a mandated requirement and advised to all construction personnel prior to commencement of works and reinforced via 'toolbox talks'.

Vehicle sharing will be promoted to construction personnel by the contractor during the induction process.

4 CTMP Implementation and Monitoring

4.1 General

The implementation of the CTMP will be the responsibility of the appointed contractor who will also be responsible for monitoring the Plan. Further evolution of the CTMP will likely be required during the detailed proposed development planning stages and during the construction period itself.

The appointed contractor could employ several sub-contractors, and all in such cases sub-contractors' activities will fall under the requirements of the CTMP and therefore sub-contractor personnel and sub-contractor managed construction vehicle drivers will have an obligation to adhere to the CTMP. This obligation will form part of the procurement process and will be written into any relevant employment or commissioning contract.

Compliance will be monitored by the Project Manager, on behalf of the appointed contractor, via spot checks to ensure that vehicles follow the measures in the CTMP and record any complaints. The appointed contractor will stipulate that all contractors circulate these rules to their sub-contractors.

Non-compliance with the CTMP will constitute a breach of contract, and action will be taken against the contractor or supplier should repeated non-compliance continue. Details of the proposed monitoring and enforcement regime will be supplied to Cork County Council upon request.

4.2 Responsibilities

The appointed contractor will nominate a person responsible for the coordination of all elements of traffic and transport during the construction process, a nominated Liaison Officer. The Liaison Officer will be the direct point of contact for the developer organisation with the local community. Accordingly, local residents and business holders can contact the Liaison Officer for information purposes or discuss specific matters about traffic management or site operation.

Contact details for the Liaison Officer will be made available to relevant parties and more generally to the local community prior to commencement of works on-site.

The appointed contractor (or their appointed agent) will review the number of site personnel, traffic numbers, and the construction programme as the proposed development progresses. Any proposed or unplanned substantive changes will be discussed and agreed with Cork County Council as far as is reasonably practicable.

As necessary, meetings would be held with Cork Council and the appointed contractor to discuss the CTMP and to discuss any relevant issues raised by the local community.

4.3 Transport Co-ordination

The appointed contractor will be responsible for the co-ordination of all elements of HGV transport to and from the compounds. The appointed contractor (or their appointed agents) will be responsible for co-ordination and liaison with sub-contractors, Cork County Council, TII, emergency services and the local community.

The Liaison Officer will inform Cork County Council (or agents thereof) of any important matters that could affect traffic movement through reports issued at regular intervals or by day-to-day reports of any substantial, essential changes to transport plans necessitated by circumstances.

4.4 Communication and Consultation

As indicated above, the appointed contractor will nominate a Liaison Officer to act as a point of contact with the local community. The Liaison Officer would be responsible for keeping the local community informed of progress on the site and communicating upcoming activities which could give rise to increased construction vehicle movements.

The Liaison Officer will be able to attend Community Council meetings to provide a report and to be on hand to answer any questions that the local community may have. Contact details will be provided for the Liaison Officer (telephone number and email address) and will be made available locally so that members of the public have an opportunity to ask questions and provide feedback.

The appointed contractor will utilise local media channels to circulate information regarding traffic management.

Signs will be erected at access points to construction compounds to provide contact details of the appointed contractor's Project Manager. These contact details will also be provided directly to the emergency services.

4.5 Liaison with Other Construction Sites

It is recognised that the construction period associated with the proposed development could coincide with the construction of other proposed developments whereby construction related traffic will travel through the same area and use the same public roads.

If the construction phase of any notably sized development(s) appears likely to overlap with the proposed development, the appointed contractor will seek to liaise with the appropriate developer organisation regarding the scheduling of deliveries to identify potential means of reducing the effects of combined construction.

4.6 CTMP Review

The CTMP, as a 'live document' will be reviewed on a regular basis by the appointed (as needed, in tandem with the appointed contractor(s) prior to and during the project construction phase. The CTMP, during the project's evolution, will be subject to change to enable the most effective and suitable measures for implementation and where needed, approved by Cork County Council.

5 Summary Statement

5.1 Summary

The CTMP represents a commitment to satisfy reviewing Authority requirements and sets out proposed traffic management and contingency planning measures to enhance road safety and limit adverse effects of construction traffic on the existing road network and the communities it serves.

It is anticipated that once the contractors are appointed, further useful information would become available, including a finalised construction programme. Such details would be submitted to Cork County Council for information and/or agreement as appropriate.

