Bonneagar Iompair Éireann
Transport Infrastructure Ireland

NTA
Údarás Náisiúnta Iompair
National Transport Authority

Luas Finglas

Environmental Impact Assessment Report 2024

Appendix A6.1: Construction Environmental Management Plan

BARRY TRANSPORTATION
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Project Ireland 2040
Building Ireland's Future

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SECTION 1: CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

1.1 Introduction

This document is the Construction Environmental Management Plan (CEMP) for the Luas Finglas Scheme, hereafter referred to as the proposed Scheme.

The CEMP will be updated by the Transport Infrastructure Ireland (TII) (the Employer for the construction works) prior to the commencement of the Construction Phase, so as to ensure any additional measures required pursuant to conditions attached to any decision to grant approval are included in the plan. The TII shall set out the Employer's Requirements in the construction contract, including all applicable mitigation measures identified in this EIAR, as well as additional measures required pursuant to conditions attached to any decision to grant approval.

The CEMP comprises the construction mitigation measures, which are set out in the Environmental Impact Assessment Report (EIAR) and the Natura Impact Statement (NIS), and which will be updated to include any additional measures required pursuant to conditions attached to An Bord Pleanála's decision.

The CEMP will need to be altered during the lifecycle of the Construction Phase to take account of monitoring results, permits, legislative changes, outcomes of third-party consultations etc. The appointed contractors will ensure that the CEMP remains up to date for the duration of the Construction Phase.

Following appointment of the contractors for the Main Works and Enabling Works contracts they will be required to develop more specific Method Statements and submit an updated CEMP that is cognisant of the proposed construction activities, equipment and plant usage and environmental monitoring plan for the proposed Scheme. The appointed contractors may only propose modifications to the CEMP which will not give rise to any impacts which are more significant than those already identified and assessed in the EIAR or NIS.

All of the measures set out in this CEMP will be implemented in full by the appointed contractors and its finalisation will not affect the robustness and adequacy of the information presented and relied upon in the EIAR and NIS.

1.1.1 Purpose

The purpose of the CEMP is to set out the management framework for the delivery of the proposed construction works and to illustrate how the proposed Scheme could be delivered in a logical, sensible, and safe sequence with the incorporation of specific environmental commitments, as set out in Section 1.9.

The CEMP will be used by the appointed contractors and their personnel as a guidance document for the Construction Phase of the proposed Scheme outlining procedures for the delivery of environmental mitigation measures and for addressing general day-to-day environmental issues that could arise during the Construction Phase of the proposed Scheme.

1.1.2 Reference Documents

The CEMP has been prepared as part of the EIAR and the NIS, and should be read in conjunction with the following proposed Scheme specific documents:

- The EIAR, with particular reference to Chapter 6 (Construction Activities);
- The NIS;
- The construction contract; and
- Copies of An Bord Pleanála's Order, Inspector's Report and associated documentation.

The appointed contractors will need to comply with all relevant environmental legislation and take into account published standards, accepted industry practices, national guidelines, and codes of best practice appropriate to the proposed Scheme. The CEMP has been prepared in accordance with the following industry best practice guidance:

- TII's Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan (TII 2007), hereafter referred to as the TII Guidelines; and
- Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 4th Edition (CIRIA 2015).

1.1.3 Scope

This CEMP defines the approach to environmental management implementation. Compliance with the CEMP, the procedures, work practices and controls will be adhered to by all personnel employed during the Construction Phase of the proposed Scheme.

Table A6 1-1 provides the contents of the CEMP, and where details can be found in this document.

Table A6 1-1: CEMP Contents

Content	Section of CEMP
Introduction	1.1
Proposed Scheme Details	1.2
Planning Consent	1.3
Contact Sheets	1.4
Roles and Responsibilities	1.5
Communications	1.6
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Environmental Management	1.8

1.2 Proposed Scheme Details

1.2.1 Proposed Scheme Overview

The proposed Scheme is 3.9 km long and entails the new northern extension of the Luas Green Line from its current terminus in Broombridge to a new terminus in Charlestown, near the N2-M50 interchange, with four new stops, two major bridges, one new Park & Ride (P&R), an extension of the Broombridge Stabling Site and associated works. The route of the proposed Scheme is as indicated in Figure A1 1-1.

The proposed Scheme will comprise a number of key features as outlined in Table A6 1-2. A full description of the proposed Scheme is provided in Chapter 5 (Description of the proposed Scheme).

Table A6 1-2: Overview of the Key Features of the proposed Scheme

Scheme Key Features	Outline Description
Permanent Scheme Elements	
Light Rail track	3.9 km extension to the Luas Green Line track from Broombridge to Finglas (2.8km of grass track, 700m of embedded track and 360m of structure track)
Depot Stabling facility	A new stabling facility (with stabling for 8 additional LRVs) will be located just south of the existing Broombridge terminus, as an extension of the Hamilton depot area.

Scheme Key Features	Outline Description
Luas Stops	Four Stops located at: St Helena's, Finglas Village; St Margaret's Road and Charlestown to maximise access from the catchment area including the recently re-zoned Jamestown Industrial Estate.
Main structures	Two new LRT bridges will be constructed as part of the proposed Scheme: a bridge over the River Tolka within the Tolka Valley Park and a bridge over the Royal Canal and the Iarnród Éireann (IÉ) railway line at Broombridge. A number of existing non-residential buildings shall be demolished to facilitate the scheme. In addition, the existing overbridge at Mellowes Park will be demolished.
At grade signalised junctions	10 at grade signalised junctions will be created at: Lagan Road, Ballyboggin Road, Tolka Valley Road, St. Helena's Road, Wellmount Road, Cappagh Road, Mellowes Road, North Road (N2), McKee Avenue, Jamestown Business Park entrance. Note: The junction at Charlestown will be reconfigured but does not have a LRT crossing.
Uncontrolled crossings	13 at grade uncontrolled crossings (11 pedestrian / cycle crossings and 2 local accesses located at: Tolka Valley Park, St Helena's, Farnham pitches, Patrickswell Place, Cardiff Castle Road, Mellowes Park, St Margarets Road, and ESB Networks.
Cycle facilities	Approximately 4.4km of segregated cycle lanes and 0.3km non-segregated cycle lanes along the route. Covered cycle storage facilities will be provided at Broombridge Terminus, Finglas Stop and St. Margaret's Stop and within the Park & Ride structure. "Sheffield" type cycle stands will be provided at all stop locations.
Power substations	Two new traction power substations for the proposed Scheme will be located near Finglas Village Stop behind the existing Fire Station and near the N2 junction before St Margaret's Road Stop where the current spiral access ramp to the pedestrian overbridge is located. A third substation is required for the Park & Ride facility.
Park & Ride facility	A new Park & Ride facility, with e-charging substation, located just off the M50 at St Margaret's Stop will be provided with provision for 350 parking spaces and secure cycle storage. The building will feature photovoltaic (PV) panel roofing and is the location for an additional radio antenna. This strategic Park & Ride connecting the N2/M50 to the city centre will increase the catchment area of the proposed Scheme.
Temporary Scheme Elements	
Construction compounds	There will be three principal construction compounds, two located West of Broombridge Road and One located at the Northern extents of Mellowes Park. In addition, there are other secondary site compound locations for small works/storage. Details can be found in Chapter 6 (Construction Activities) of this EIAR.

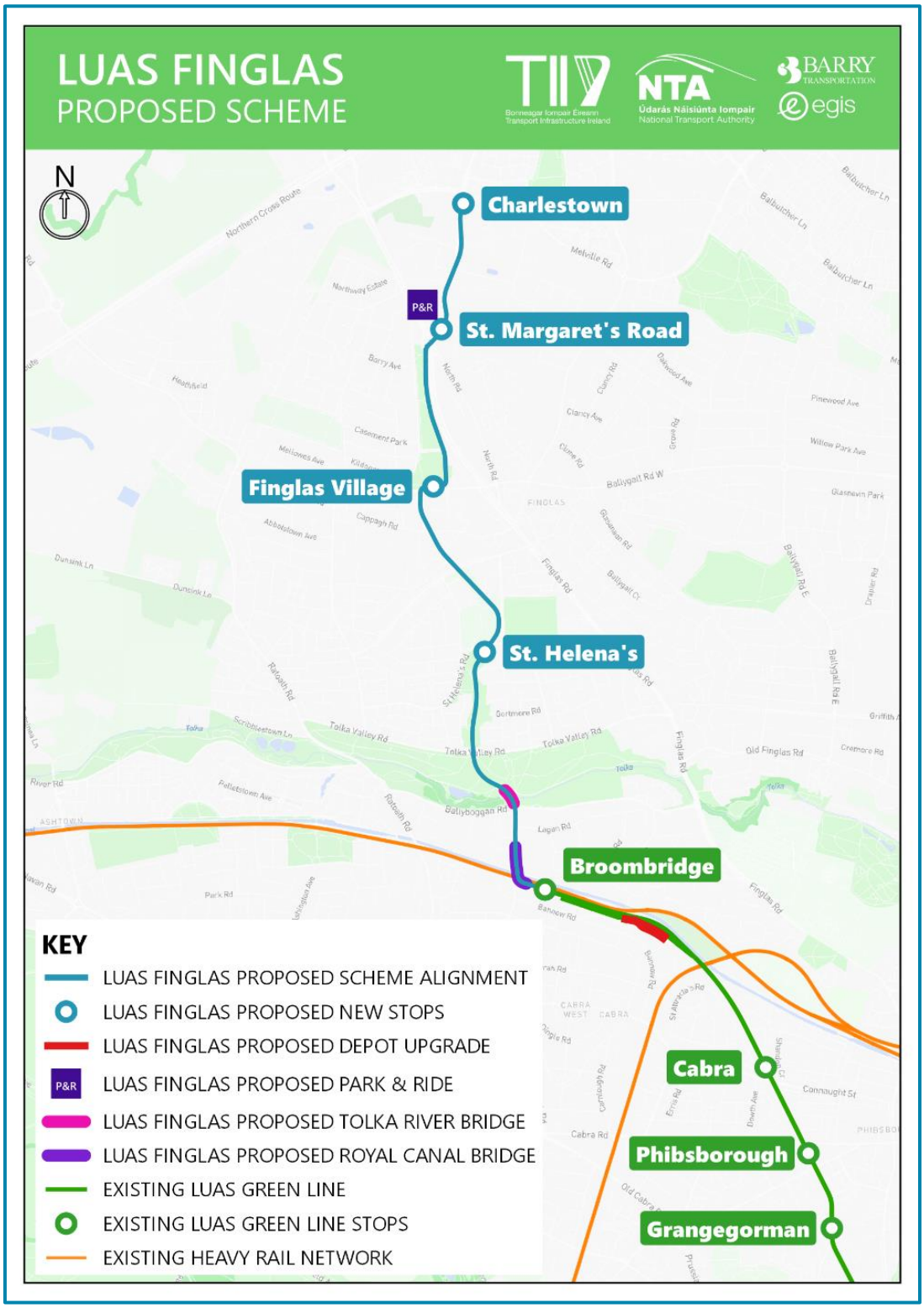

Figure A1 1-1: Proposed Luas Finglas Alignment Map

See Chapter 6 (Construction Activities) Volume 2 of this EIAR for a full description of the construction activities of the proposed Scheme.

1.2.2 Construction Programme and Phasing

The programme for the construction of the proposed Scheme will allow for the shortest Construction Phase practicable in order to minimise the duration of potential environmental impacts, while ensuring that the areas surrounding the works sites remain operational and functional.

An indicative programme showing the duration and phasing for construction of the proposed Scheme is included in Chapter 6 of this EIAR. The expected construction programme for the Main Works including testing and commissioning is approximately 3.5 years. The achievement of the programme is based on some core assumptions which are as follows:

- Key Enabling Works contracts can be advanced prior to two Main Works contracts;
- Multiple work fronts will be progressed concurrently during the Main Works in order to achieve this overall programme; and
- A Main Works: Power and Systems contract can be advanced in tandem with the latter part of the Main Works Contract.

1.3 Planning Consent

The entire contents of the planning consent of Planning permission granted for the proposed Scheme will be inserted at this location by Transport Infrastructure Ireland (TII) (the Employer for the construction works) prior to the commencement of the Construction Phase, so as to ensure all measures required pursuant to conditions attached to any decision to grant approval are included.

1.4 Contact Sheets

A project Contacts Sheet will provide a list of relevant Employer and contractor contacts (refer to examples provided in Table A6 1-3 and Table A6 1-4. A similar Contact Sheet for all relevant third-party contact details shall also be developed. The contractors will update these sheets and keep them current for the duration of the Contract.

Contact details of relevant personnel are required to ensure the efficient reporting of environmental incidents. It is essential that these contact details be frequently reviewed to ensure they are up to date. Contact details will include the organisation, position title, name, mobile phone number and email address of relevant personnel.

Table A6 1-3: Employer Contact Sheet (Example)

Position	Name	Tel / Mobile No.	Email Address
TII's Project Manager			
Employers Representative			
Other, as appropriate			

Table A6 1-4: Contractor Contacts Sheet (Example)

Position	Name	Tel / Mobile No.	Email Address
Contractor's Representative			
Construction Manager			
Environmental Manager			
Project Ecologist			
Community Liaison Officer			
Safety Officer			

Position	Name	Tel / Mobile No.	Email Address
Site Agents			
Forepersons			
Other, as appropriate			

[TII / appointed contractors shall insert contact details for the relevant personnel].

1.5 Roles and Responsibilities

1.5.1 Employer

TII will be the Employer for the Construction Works and will be responsible for ensuring that the appointed contractors is(are) competent to carry out the works, including the effective implementation of the mitigation measures.

1.5.2 Employer's Representative

TII will employ an Employer's Representative team with appropriate competence to administer and monitor each construction contract for compliance with the Employer's Requirements.

1.5.3 The Contractor

The appointed contractors will be required to plan and construct the proposed Scheme construction works in accordance with the Employer's Requirements and planning consents.

The appointed Contractor's CEMP will define the roles and responsibilities of its project team. The contractor is responsible for ensuring that all members of the project team, including Subcontractors comply with the procedures set out in the CEMP. The contractor will ensure that all persons working on site are provided with sufficient training, supervision and instruction to fulfil this requirement.

Key staff will be notified of their appointment and confirm that their responsibilities are clearly understood. The principal environmental responsibilities for key staff can be identified in the following sections.

Information on the appointed contractor's organisational structure / duties and responsibilities will be provided in this section of the CEMP. The assignment and communication of duties and responsibilities to individually-named members will help ensure the successful implementation of the CEMP.

The TII Guidelines outline a typical organisational structure / roles that may be adopted. It is recognised that the actual titles used by the appointed contractors may vary. However, they should assign relevant duties and responsibilities to the appropriate equivalent person.

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

- Project Ecologist;
- Project Archaeologist (in consultation with TII's Project Archaeologist);
- Noise and Vibration Specialist;
- Air Quality and Dust Specialist;
- Land, Soils and Contamination Specialist(s); and
- Water Specialist.

The specialists' roles and responsibilities will be included in the CEMP as per the EIAR.

1.5.4 Environmental Manager

One of the roles identified in the TII Guidelines is that of an Environmental Manager (EM). The EM, or equivalent, will be suitably qualified, with sufficient training, experience and knowledge appropriate to the nature of the task to be undertaken. The EM will be responsible for co-ordinating the day-to-day management of environmental impacts during the Construction Phase and for assisting and advising the appointed contractors when programming construction activities and devising methodologies, taking cognisance of the Environmental Commitments. The EM will be responsible for performing inspections as deemed necessary. In addition, the EM will deal with licencing and permit issues, keep up to date with relevant environmental best practices and legislative changes, engage in personnel training, manage responses to environmental incidents and engage environmental contractors as and when required.

[The TII / appointed contractors shall insert the appointed contractors' organisational structure / duties and responsibilities].

1.6 Communications

The procedures adopted for internal and external communication of information regarding the specific elements of the proposed Scheme will be agreed between the TII and the appointed contractors prior to construction as set out in each construction contract.

1.6.1 External Communication with the Public and Key Stakeholders

The appointed contractors will put in place a Communications Plan in accordance with the Employer's Requirements and the Employer's Stakeholder Management Plan. The Plan will provide a mechanism for members of the public to communicate with the TII and the appointed contractors, and for the TII and the appointed contractors to communicate important information on various aspects of the proposed Scheme to the public. The Plan will include procedures to inform members of the community directly affected by the Construction Phase on schedules for any activity of a particularly disruptive nature which is likely to impinge on their property such as boundary works, road closures and diversions, and any mitigating actions that are being taken to minimise such disruption.

1.6.2 Internal Communications

The site management meeting(s) and weekly site safety meetings will include environmental issues (such as monitoring, complaints, incidents) on the agenda. The Environmental Manager will report on environmental issues to the site management meetings and attend weekly meetings. On-site communications, such as daily shift and activity briefings, will be used to advise the site workforce of health, safety, environmental and community matters. This will include information obtained from liaising with the community regarding matters, such as noise generation and access issues, together with constraints detailed in the contracts (e.g. working hours) and other documents, such as the CEMP, regulating the proposed Scheme. This communication will be addressed to all relevant members of the workforce, including new starters and Subcontractors, before they commence work. Further information can be found in the project's health and safety documentation. Toolbox talks will be used as a means to disseminate information to the workforce on a routine basis.

1.7 Environmental Management Procedures

1.7.1 Environmental Awareness Training

Copies of the CEMP will be made available to all personnel. All appointed contractors' personnel will receive relevant and appropriate training to ensure that they have the appropriate knowledge to successfully implement the CEMP.

Where a specific management plan has been devised for a works activity (e.g., working in an area where invasive species are present), all the appointed contractors' personnel involved in that activity will be given a toolbox talk outlining the relevant Environmental Commitments.

1.7.2 Compliance and Review

The EM, or equivalent, will carry out environmental inspections at appropriate intervals throughout the Construction Phase. The environmental inspections will ensure that the works are undertaken in compliance with the CEMP and all other planning application documents. Where appropriate and if required, the EM may arrange to be accompanied on these environmental inspections by suitably qualified professionals (e.g., arborist, ecologist, archaeologist). The CEMP will be developed further by the appointed contractors to include additional details of inspection procedures.

The inspections will address the following questions:

- Have all site personnel been inducted?;
- Are site personal adhering to the relevant Environmental Control Measures outlined in the CEMP and performing all work activities with the relevant site-specific Method Statements?;
- Are hazardous substances being stored appropriately?; and
- Is waste being disposed of appropriately?

The results of the inspections will be discussed at the weekly site safety and environmental meetings.

1.7.3 Monitoring

Mitigation and monitoring will be carried out in accordance with the requirements of the EIAR and NIS so that construction activities are undertaken in a manner that does not give rise to significant negative effects. Suitable monitoring programmes will need to be developed, implemented, documented and assessed in accordance with the specification outline in the detailed CEMP for each Main and Enabling Works contract.

The results of all environmental monitoring activities will be reviewed by the EM on an ongoing basis to enable trends or exceedance of criteria to be identified and corrective actions to be implemented as necessary. The contractors will be required to inform the TII of any continuous exceedances of criteria.

1.7.4 Audits

The construction contract documents will require the appointed contractors to further develop the CEMP within 28 days after receiving notice of Commencement of Works from the TII. The EM, and the TII will carry out audits of the CEMP at designated intervals, to determine whether the CEMP is effective in ensuring that the appointed contractors meets all the Environmental Commitments. All changes to the CEMP will be made by the EM and approved by the TII.

The EM, in conjunction with the Construction Manager, will carry out an annual audit of the CEMP to determine whether the CEMP is effective in ensuring that the contractors are meeting all Environmental Commitments/requirements or legislation changes. Where required as a result of such audits, the Environmental Manager will make all necessary changes to the plan, with the approval of the ER, and bring them to the attention of all contractors.

1.8 Environmental Management

1.8.1 Environmental Commitments

The Schedule of Environmental Commitments will comprise the following:

- The Construction Phase mitigation and monitoring measures as outlined in Chapter 7 (Human Health) to Chapter 22 (Risk of Major Accidents and / or Disasters) of this EIAR, summarised in Chapter 25 (Summary of Mitigation & Monitoring Measures) of this EIAR, and in Table A6 1-5 below;
- The Construction Phase mitigation and monitoring measures as outlined in the NIS, summarised in Table A6 1-6 which identifies the relevant section of the NIS;
- Any commitments arising during the statutory planning process up to and including the Oral Hearing;
- Any conditions and / or modifications imposed by An Bord Pleanála, should they grant approval for the proposed Scheme; and

- Any commitments set out in the construction contract documents.

The finalised CEMP will include the Schedule of Environmental Commitments together with the relative specification, evidence, and responsibilities of how each commitment will be met where necessary. The appointed contractors will be required to comply with all Environmental Commitments, and all applicable legislation, including relevant standards, codes of best practice and guidelines.

1.8.1.1 Mitigation and Monitoring Schedule

Table A6 1-5 summarises the Construction Phase mitigation (i.e., which the appointed will implement), outlined in the relevant EIAR technical assessment chapters. Table A6 1-5- should be read in conjunction with the relevant technical assessment chapter. Where appropriate, the specific location to which the mitigation relates to is to be identified and where the mitigation measure may be applicable along the extent of the proposed Scheme, the location is given as 'Throughout (as required)'. Note that in certain instances, a mitigation measure may be relevant to more than one environmental aspect.

Table A6.1-5 provides the Construction Phase mitigation and monitoring measures as outlined in the Natura Impact Statement. The table describes the avoidance and mitigation measures required to prevent or reduce impacts generated during the construction and operation of the proposed Scheme on the following Natura 2000 sites, and their respective Qualifying Interests (QIs):

- North Dublin Bay SAC;
- South Dublin Bay SAC;
- Rockabill to Dalkey Island SAC;
- North Bull Island SPA;
- South Dublin Bay and River Tolka Estuary SPA; and
- North-west Irish Sea SPA.

The stages of implementation are shown as "PC" for pre-construction, "C" for the Construction Phase and "O" for the Operational Phase.

Table A6 1-5: Mitigation and Monitoring Measures (Construction Phase)

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
GM-1	EIAR Appendix A6.1 Construction Environmental Management Plan section 1.1	Throughout (as required)	General Impacts	A Construction Environmental Management Plan (CEMP) has been prepared and will be updated by Transport Infrastructure Ireland (TII) (the Employer for the construction works) prior to the commencement of the Construction Phase, so as to ensure any additional measures required pursuant to conditions attached to any decision to grant approval are included in the plan. The CEMP comprises the construction mitigation measures, which are set out in the Environmental Impact Assessment Report (EIAR) and the Natura Impact Statement (NIS), and which will be updated to include any additional measures required pursuant to conditions attached to An Bord Pleanála's decision. Following appointment of the Contractors for the Main Works and Enabling Works contracts they will be required to develop more specific Method Statements and submit an updated CEMP that is cognisant of the proposed construction activities, equipment and plant usage and environmental monitoring plan for the proposed Scheme. Copies of the CEMP will be made available to all personnel. All appointed Contractors' personnel will receive relevant and appropriate training to ensure that they have the appropriate knowledge to successfully implement the CEMP. Environmental inspections will be carried out throughout the construction phase by the Environmental Manager appointed by the Contractor to ensure that the works are undertaken in compliance with the CEMP and all other planning application documents. The CEMP will be developed further by the appointed Contractor to include additional details of inspection procedures. Mitigation and monitoring will be carried out in accordance with the requirements of the EIAR and NIS so that construction activities are undertaken in a manner that does not give rise to significant negative effects. Suitable monitoring programmes will need to be developed, implemented, documented and assessed in accordance with the specification outline in the detailed CEMP for each Main and Enabling Works contract.	PC / C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
GM-2	EIAR Appendix A6.6 Environmental Incident Response Plan	Throughout (as required)	General Impacts	The Environmental Incident Response Plan (EIRP) has been prepared as part of EIAR to ensure that in the unlikely event of an incident (environmental, or non-environmental), response efforts are prompt, efficient, and suitable for the particular circumstances. The EIRP details the procedures to be undertaken in the event of a significant release of sediment into a watercourse, or a significant spillage of chemical, fuel or other hazardous substances (e.g., concrete), non-compliance incident with any permit or license, or other such risks that could lead to a pollution incident, including flood risks. It will be a condition of the Employers Requirements that the successful Contractor, immediately following appointment must detail in the EIRP, the manner in which it is intended to effectively implement all the applicable mitigation measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.	PC
GM-3	Natura Impact Statement section 7.1.2	Throughout (as required)	General Impacts	The appointed Contractor will be required to ensure good environmental management within the site compounds set up along the length of the proposed Scheme. The below list of measures will be incorporated into site compound environmental management: ▪ Site compounds will not be set up within Flood Zone A or B lands in accordance with the Office of Public Works (OPW) 'Planning System and Flood Risk Management Guidelines' (2009); ▪ Site compounds will not be located within core foraging areas utilised by protected wintering bird species; ▪ Only plant and materials necessary for the construction of the works will be permitted to be stored at the compound location; ▪ All sub-Contractors will be given induction toolbox talk so that they are aware of material storage arrangements; ▪ Construction materials within the compound will be stored in a designated area in an organised manner so as to protect them from accidental damage and deterioration as a result of exposure;	PC / C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ Bunded storage of fuels and refuelling area. Bunds shall be 110% capacity of the largest vessel contained within the bunded area; ▪ A separate container will be located in the Contractors compound to store absorbents used to contain spillages of hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste Contractor at a licenced site. Records will be maintained of material taken off site for disposal; ▪ Suitable precautions will be taken to prevent spillages from equipment containing small quantities of hazardous substances (for example, chainsaws and jerry cans) including: – Each container or piece of equipment will be stored in its own drip tray made of a material suitable for the substance being handled; – Spill kits and drip trays will be provided for all equipment and at locations where any liquids are stored and dispensed, and staff will be trained on the procedures to be followed; and – Containers and equipment will be stored on a firm, level surface; ▪ A maintenance programme for the bunded areas will be managed by the site environmental manager. The removal of rainwater from the bunded areas will be their responsibility. Records will be maintained of materials taken off site for disposal; ▪ The site environmental manger will be responsible for maintaining all training records and weekly environmental inspections; ▪ Drainage collection system for washing area will be provided to prevent run-off into surface water system; ▪ Stockpiling of spoil and spoil-like materials will be appropriately located within the compounds to minimise exposure to prevailing winds; and ▪ All refuelling of vehicles will be carried out at the fuel stores within the main site compound and only alternative dispute	

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				resolution (ADR) trained personnel will be permitted to operate fuel bowsers.	
GM-4	EIAR Appendix A6.1 Construction Environmental Management Plan section 1.8.4	Throughout (as required)	General Impacts	A Dust Management Plan (DMP) within the CEMP (Volume 5 - Appendix A6.1) has been prepared as part of the EIAR, which includes measures to control emissions, which includes a strategy to be adopted in order to manage dust during construction. This will be incorporated by each contractor into their Plans and implemented as part of their works. The DMP will include plans for monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections. ▪ Record any exceptional incidents that cause dust and/or air emissions, either on or offsite, and the action taken to resolve the situation in the logbook.	PC / C
GM-5	EIAR Appendix A6.1 Construction Environmental Management Plan section 1.8.5	Throughout (as required)	General Impacts	A Noise and Vibration Management Plan within the CEMP (Volume 5 - Appendix A6.1) has been prepared as part of the EIAR which provides the strategy to be adopted in order to manage noise and vibration during construction. This will be incorporated by each contractor into their Plans and implemented as part of their works.	PC / C
PM-1	Chapter 8: Population section 8.5.2	Tolka Valley Park and Mellowes Park	Moderate physical and social severance where hoarding erected.	Secure hoarding will be needed during construction across Tolka Valley Park along with barriers to where the tracks enter or leave the park from Ballyboggan Road or Tolka Valley Road to prevent entry for vehicles or motorbike incursions into the park. ▪ There will need to be breaks in the hoarding, at least during daytime hours, to permit access across the works and avoid severance of the park. ▪ Signage should indicate to park users the reason for the works and the partial severance and the expected duration that will be in place.	C
PM-2	Chapter 8: Population section 8.5.2	Throughout (as required)	Accessibility for people with disabilities	The accessibility needs and safety of people with disabilities will need to be addressed, along with those of people with wheelchairs or buggies, at points where they will need to cross works.	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ Access signage will be needed (of appropriate height and size to meet all users' communication needs), smooth hard surfacing and lightly angled ramps where necessary.	
PM-3	Chapter 8: Population section 8.5.2	Royal Canal	Any temporary closure of the Royal Canal	If any temporary closure of the canal is required, this should be timed to between October and mid-March when the canal is habitually closed for boating.	C
PM-4	Chapter 8: Population section 8.5.2	Throughout (as required)	Any temporary closure of greenway and towpath. No simple route alternative.	Advance warning will be given of the time and duration of any temporary closure of the towpath and greenway.	C
PM-5	Chapter 8: Population section 8.5.2	St Helena's Resource Centre and St Malachy's National School	Potential impact on access by sensitive subsets. Noise impact	Provide clear and advance signage for new access arrangements for St Helena's Resource Centre and St Malachy's National School with managed space for school drop-offs that does not conflict with the access needs for both community facilities.	C
PM-6	Chapter 8: Population section 8.5.2	Farnham Crescent Park and pitches	Realignment of pitch	Local sports clubs will be supported in their search for alternative facilities during the realignment of the pitch at Farnham Crescent. Alternatively works will be undertaken outside of the football season.	C
PM-7	Chapter 8: Population section 8.5.2	Wellmount Road/Patrickswell Place	Slight severance of access and green space.	Provide for visible and safe access across works at Wellmount Road/Patrickswell Place, noting morning and afternoon use of the route by school children.	C
PM-8	Chapter 8: Population section 8.5.2	St Helena and Mellowes Road	Annoyance, severance and noise impact.	The Contractor will minimise the duration of works in neighbourhoods in the vicinity of St Helena's and Mellowes Road, acknowledging issues of localised sensitivity and higher than average deprivation. ▪ Works in close proximity to residential properties or at points where roads need to be crossed to access community facilities will be completed within as short a timeframe as possible and, along with barriers such as hoarding, must not be allowed to persist longer than is necessary.	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ In practice, noting the stated progression of works across the study area, in these specific areas the works must be completed with more urgency than at other locations.	
PM-9	Chapter 8: Population section 8.5.2	Raven's Court	Proximity to works, noise and annoyance. Loss of green space and garden space. Impacts on access on entrance.	Works at the entrance to Raven's Court will be undertaken as quickly as possible to avoid inconvenience for residents. Signalisation or a flag person will be provided for a short period of time. ▪ If necessary, an alternative temporary entrance will be provided. The boundary of the estate will be rebuilt with a comparable or enhanced façade compared with that at present.	C
PM-10	Chapter 8: Population section 8.5.2	Finglas Garda Station	Demolition of one building. Impact on functions and employees	Works at the Garda station will be undertaken as quickly as possible to avoid impacts on the amenity of people working in the building, security issues and any inconvenience for Gardai in accessing premises or vehicles. ▪ The same considerations apply to the Luas crossing of Mellowes Road given the roads use in times of emergency by either the Gardai or the nearby fire service.	C
PM-11	Chapter 8: Population section 8.5.2	Mellowes Road	General Impacts	Arrangements for emergency services will be provided to quickly bypass works and traffic queues on Mellowes Road. ▪ The appointed Contractor will ensure maximum safety of accessibility to community facilities on Mellowes Road during construction given their use by vulnerable population subsets.	C
PM-12	Chapter 8: Population section 8.5.2	Finglas Childcare / Mellow Spring Childcare Centre	Proximity to works. Loss of parking space	The appointed Contractor will provide temporary alternative, nearby and convenient temporary parking and appropriately timed parking for people with disabilities and parents delivering children to Finglas Childcare / Mellow Spring Childcare Centre to compensate for existing spaces lost during construction. ▪ Consideration will be given to the car parking needs of employees of the Finglas Resource Centre to avoid competition for remaining places.	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
PM-13	Chapter 8: Population section 8.5.2	Tolka Valley Park, Mellowes Park	Diversion of the path. Tracks follow eastern boundary	The appointed Contractor will provide hard surfaced temporary paths for diversions in Tolka Valley Park, Mellowes Park and other green spaces where there are existing paths which cross the line of the proposed Scheme. ▪ Maintain access between two halves of Tolka Valley Park. Maintain access to Mellowes Park from Mellowes Road, unless very temporary restrictions are needed. ▪ Allow for continuity and safety of the weekly park runs in both Tolka Valley Park and Mellowes Park.	C
PM-14	Chapter 8: Population section 8.5.2	R135 Finglas Road	Cyclist and pedestrian paths diversion could cause confusion	Construction of crossing facilities at the R135 Finglas Road will be ready for use prior to the demolition of the pedestrian overbridge. ▪ Pedestrian and cyclist crossings at the new crossing at Finglas Road are to be safe and well-signposted given that works, traffic volumes and changes to existing crossing habits could raise some confusion among pedestrians and cyclists, and particularly for people with disabilities.	C
PM-15	Chapter 8: Population section 8.5.2	St Margaret's Road	Effect of works on residential amenity, access and crossing of works Effect of works on attractiveness of shopping and on direct access to businesses	The appointed Contractor will implement the following mitigation measures: ▪ Provide temporary crossing facilities at St Margaret's Road in the vicinity of the proposed stop to permit access to bus stop and nearby supermarkets or places of employment; ▪ Facilitate, where possible, new vehicle parking or reconfiguration of parking for businesses where spaces have been lost on the east side of St Margaret's Road; ▪ Ensure continuity of electricity supply for businesses on the east side of St Margaret's Road or otherwise minimum interruptions flagged in advance; ▪ Ensure continuity of access for businesses on the east side of St Margaret's Road; and ▪ Provide alternative car parking, where possible, during construction and operation for residents of McKelvey estate located beside St Margaret's Road.	C
PM-16	Chapter 8: Population section 8.5.2	St Margaret's Court	Proximity to properties.	The appointed Contractor will ensure new uninterrupted access arrangements are in place for businesses and for residents of St	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			Severance prior to installation of new crossing. Minor works inside estate.	Margaret's Court where existing access will be directed impacted by construction of the proposed Scheme. ▪ They will provide highly visible signage to direct customers and suppliers to this new access.	
PM-17	Chapter 8: Population section 8.5.2	McKelvey Celtic AFC	Impact on primary access	The appointed Contractor will agree times of any temporary disruption to access with businesses on west side of St Margaret's Road and McKelvey AFC due to works on footpath and cycle lane.	C
PM-18	Chapter 8: Population section 8.5.3	Luas Stop	Parking restrictions	During Operational Phase, drop off space or limited timed car parking will be provided at Luas Stops where space allows combined with parking restrictions on roads in nearby residential estates.	O
PM-19	Chapter 8: Population section 8.5.3	Throughout (as required)	Safety during road crossings	Extend integration of the scheme with the bus network by facilitating access from LRT Stops to nearby bus stops with associated signalised crossing facilities or good lines of sight for road crossings.	O
PM-20	Chapter 8: Population section 8.5.3	St Malachys School	Changes to car parking. Improved public transport access. Slight severance as some children may need to cross tracks unaccompanied.	The proposed Scheme will provide sufficient drop-off and collection space for parents at St Malachys School to reduce the risk that access to the St Helena's Resource Centre will be blocked	C / O
PM-21	Chapter 8: Population section 8.5.3	St Helena's Stop	Access to parking	The proposed Scheme will provide disabled parking, timed and permitted parking spaces at St Helena's Stop to provide assurance and safety for vulnerable passengers	C / O
PM-22	Chapter 8: Population section 8.5.3	All four new stops	Safety of Stops	During Operational Phase TII will ensure that all stops, and nearby access routes to Stops, are open, brightly lit and monitored by CCTV, that emergency assistance buttons are provided at all Stops, and that details on how to promptly contact control centres are included on all LRVs.	O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
PM-23	Chapter 8: Population section 8.5.3	St Margaret's Road / St Margaret's Court	Proximity to properties. Adjacent signalised pedestrian crossing, but also physical presence of LRT	TII will ensure new access arrangements are in place for businesses on St Margaret's Road, and for residents of St Margaret's Court, consistent with the Jamestown Masterplan, where existing access will be directed impacted by the proposed Scheme. Provide highly visible signage to direct customers and suppliers to this new access	
PM-24	Chapter 8: Population section 8.5.3	Throughout (as required)	Safety of pedestrian and cyclist crossing the road	Signalised pedestrian and cycle crossing facilities will be provided where the proposed Scheme interacts with local roads. ▪ These will introduce minor delays and inconvenience when a LRV is approaching but will also often provide net relief from severance in comparison with the current need to cross busy roads without the benefit of crossing facilities.	O
BD-1	Chapter 9: Biodiversity section 9.5.2.2	Throughout (as required)	Impacts on habitat due to site compounds establishment	The Contractor will be required to ensure good environmental management within the site compounds set up along the length of the proposed Scheme. A suitably qualified Ecological Clerk of Works (ECoW) will be required to regularly conduct site compound checks to ensure they are adhering to ecological safeguarding protocols. As some of the construction compounds are located on a greenfield site, the appointed Contractor will be required to provide a temporary geogrid mattress overlain in stone for trafficking within the construction compound. All surface water runoff will be intercepted and directed to appropriate treatment systems (settlement facilities and oil trap) for the removal of pollutants prior to discharge.	C
BD-2	Chapter 9: Biodiversity section 9.5.2.5	Throughout (as required)	Impacts on invasive species	An Invasive Species Management Plan (Volume 5 - Appendix A6.3) has been prepared and will be implemented on site. The ISMP will be updated by the appointed Contractor prior to the commencement of the Construction Phase, so as to ensure that any additional measures required pursuant to conditions attached to any decision to grant approval are included in the plan. The mitigation measures for invasive species will utilise the below best practice management guidance documents, where relevant;	PC

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				and are to be reference within the project's Invasive Species Management Plan: ▪ The Management of Invasive Alien Plant Species on National Roads – Technical Guidance (TII, 2020a); ▪ The Management of Invasive Alien Plant Species on National Roads – Standard (TII, 2020b); ▪ Invasive Species Ireland (ISI) - Best Practice Management Guidelines for Japanese Knotweed (ISI, 2008a); ▪ Invasive Species Ireland Invasive Species Ireland - Best Practice Management Guidelines for Giant Hogweed (ISI, 2008c); and - Best Practice Management Guidelines for Himalayan Balsam (ISI, 2008b); ▪ Inland Fisheries Ireland - Biosecurity Protocol for Field Survey Work (IFI, 2010).	
BD-3	Chapter 9: Biodiversity section 9.5.2.5	Throughout (as required)	The spread/expand of non-native invasive species	The Contractor will appoint a suitably qualified specialist conducting Works to monitor any vegetation clearance, and treatment of non-native invasive species. ▪ Prior to construction, confirmatory invasive species surveys will be undertaken by the qualified specialist, arranged by the Contractor, to re-confirm the absence, presence and / or extent of all Third Schedule non-native invasive species within the footprint of the proposed Scheme. Where an infestation is confirmed / identified within the footprint of the proposed Scheme, this will require the implementation of the final ISMP.	PC
BD-4	Chapter 9: Biodiversity section 9.5.2.5	Throughout (as required)	Presence of non-native invasive species	Following appointment, the Contractor(s) will be required to develop more specific Method Statements and submit an updated ISMP (Volume 5 - Appendix A6.3) that is cognisant of the proposed construction activities, equipment and plant usage and environmental monitoring plan for the proposed Scheme. ▪ All of the measures set out in this ISMP will be implemented in full by the appointed Contractor(s) and its finalisation will not affect the robustness and adequacy of the information presented and relied upon in the EIAR and NIS.	PC / C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ The ISMP will be updated following the pre-construction invasive species survey to detail the exact measures for any non-native invasive species population present within the footprint of the proposed Scheme. Depending on the extent and nature of the works, a number of approaches / treatments may be approved, all following the measures in the ISMP. All control measures specified in the final ISMP shall be implemented by a suitably qualified and licenced specialist prior to the Construction Phase of the proposed Scheme to control the spread of any newly established INNS within the footprint of the proposed Scheme. Furthermore, the appointed Contractor will adhere to control measures specified within the final ISMP throughout the Construction Phase of the proposed Scheme. The Site will be monitored by the appointed Contractor after control measures have been implemented. Any re-growth will be subsequently treated by the Contractor. All measures that are prescribed in the final ISMP shall be equally applicable to advance works as to construction works.	
BD-5	Chapter 9: Biodiversity section 9.5.2.5	Throughout (as required)	Spread of INNS could pose public health and safety risks	The adherence to a set of biosecurity measures, including: ▪ the fencing off / demarcating of the individual invasive species; ▪ communicating the location, risk and hazards associated with invasive species to construction personnel (e.g., Giant hogweed); ▪ identifying dedicated access points into and out of fenced-off areas; ▪ the installation of designated decontamination facilities (where appropriate); ▪ protocols around the removal of contaminated soils; and ▪ seed and fragment checks on boot, tyres and tracks entering and leaving the work site. As required by law, licences for the disposal of contaminated materials will be obtained, as well as the utilisation of licensed facilities:	PC / C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ In regard to the importation of soil and other materials, the Contractor will only utilise traceable topsoil for landscaping that has been cleared of any invasive species material; ▪ Measures to be implemented during the application of herbicides – Commitment to the appointment of a suitably qualified / registered / licensed pesticides advisor for any works requiring the use of pesticides, and safety precautions for consideration in the use of pesticides near watercourses; and Areas which contained invasives species, where invasives were treated on-site or removed, prior to the enabling and construction works will require an on-going post-construction monitoring programme to ensure that there is no reestablishment of any invasive species within these areas.	
BD-6	Chapter 9: Biodiversity section 9.5.2.5	Tolka Valley Park Bridge	Spread of invasive species	Prior to commencement of the enabling works in this area, a series of biosecurity measures will have to be undertaken to prevent spread of invasive species, namely Japanese Knotweed, Himalayan Balsam and potentially Giant Hogweed as well. The following hygiene measures shall be undertaken for the proposed Scheme: ▪ Known or potentially infested areas within the working area of the proposed Scheme shall be clearly demarcated and fenced off in advance of works and access restricted until such time that treatment has commenced and / or construction works are monitored in accordance with the ISMP in the area. In relation to Japanese knotweed, the guidance recommends an exclusion buffer of 7m (metres) in all directions (within the works area and 3m vertically underground); ▪ The implementation of clear signage in accordance with TII IAPS standards will be erected at compounds, and at the boundary of the exclusion fencing. These signs will be briefed out at toolbox talks specific to each INNS to personnel on site and particular attention will be given to INNS that have the potential to cause injuries such as Giant hogweed;	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ Identify and create access points into exclusion areas for INNS. These are only to be used by specialist personnel for the removal of INNS and are not to be used by general site workers until such a time as all contaminated material has been removed from site and it is safe to enter; ▪ Where it is practicable, wheel wash and footwear washing facilities will be provided to ensure biosecurity measure are preventing the further potential spread of INNS. These locations are to be provided by the Contractor. Where a dedicated / bespoke wheel wash cannot be installed owing to space limitations, the appointed Contractor will ensure that no excavated loose material is allowed off site from within an exclusion zone; ▪ Where plant that is used to excavate soils, it shall be visually checked for loose soil before movement to another part of site (the movements of tracked machinery should be restricted within the non-native invasive species exclusion zone). Loose soil shall be scraped off and disposed of, and a solution of Virkon© (or similar approved disinfectant) applied to machinery to ensure that no obscured seed / root material remains viable. Vehicular movements within the exclusion area shall be minimised as far as is practical; ▪ Unless in the exceptional circumstance that direction is given from a suitably qualified ecologist, no storage of contaminated soil on site. Instead, being disposed of in a licenced soil waste facility; and Where small volumes (e.g. volumes capable of being double bagged in quarantine bags such as cut plants, bulbs or loose soil occur), it may be practical to bag the material and bring it to a clearly demarcated and dedicated quarantine area within the Construction Compounds until such time that the material is disposed of to an authorised facility, similar to the process of disposing of bulk excavated contaminated soil.	
BD-7	Chapter 9: Biodiversity section 9.5.2.5	Throughout (as required)	Impacts from soil excavation	The following mitigation measures will be implemented during excavation works:	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ No excavation or removal of soil within areas demarcated as having INNS present is to be permitted unless under strict supervision by a suitably qualified ecologist or INNS specialist. Buffer zones to be installed by the Contractor(s) will be advised by a suitably qualified ecologist or INNS specialist and strictly adhered to. Guidance regarding Japanese knotweed recommends a buffer of 7m from the plant due to its expansive rhizomes; ▪ Where mechanical means of removal are required to dispose of INNS (treated or un-treated by chemicals) a suitably qualified ecologist or INNS specialist will be present to supervise and provide support to the Contractor(s) for the duration of the operation; ▪ There should be no temporary storage on-site of bulk excavated contaminated material. Where the final ISMP calls for shallow / deep burial, this material shall be removed from the excavated area and transported immediately to approved receptor area on-site. Furthermore, the temporary storage of non contaminated material should not occur within a European or National designated site nor within 10m of any watercourse and any land within an identified flood zone; ▪ The installation of industry-rated non-native invasive species-proof membrane before infilling construction of road / paths surface may be required. All waste arising out of this process which has been in contact with the excavated ground shall be treated as contaminated waste and disposed of at a facility that is authorised to accept such waste; and Where the movement of any Third Schedule non-native invasive species is required off site, a licence will be required from NPWS in advance of any movement to a site / facility licensed to accept such waste, as per the Birds and Natural Habitats Regulation. This licence is separate to and does not negate the need for licences / permits / authorisations required under waste legislation.	

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
BD-8	Chapter 9: Biodiversity section 9.5.2.5	Throughout (as required)	Impacts from disposal of INNS material	Where any INNS related material is collected and is required to be disposed of, it is essential to dispose of said material in a manner that does not afford it the potential to spread further either within the proposed Scheme or in the nearby vicinity of Site; ▪ The movement of invasive plant material, off site, requires a licence from the NPWS, as per the Birds and Natural Habitats Regulations. Invasive species (particularly roots, flower heads or seeds) must be disposed of at licensed waste facilities or composting sites, appropriately buried, or incinerated having regard to relevant legislation (e.g. Waste Management Act, as amended, Section 4 of Number 6 of 1987 - Air Pollution Act, 1987, relevant local authority bylaws and any other relevant legislation). All disposals must be carried out in accordance with the relevant waste management legislation, as per guidance Guidelines for the Management of Waste from National Road Construction Projects (TII 2017); It should be noted that some invasive species plant material or soil (vector material) containing residual herbicides may be classified as either 'hazardous waste' or 'non-hazardous waste' under the terms of the Waste Management Act, as amended, and both categories may require special disposal procedures or permissions. Advice should be sought from a suitably qualified waste expert regarding the classification of waste and the suitability of different disposal measures.	C
BD-9	Chapter 9: Biodiversity section 9.5.2.5	Throughout (as required)	Risk of water contamination from application of Herbicides	Measures to be implemented during the application of Herbicides: ▪ If the application of herbicides is the expert advice given and then implemented during the lifespan of the proposed Scheme then a suitably qualified pesticides advisor, registered with the Department of Agriculture, Food and the Marine will be employed. ▪ It should be noted that where a chemical treatment is to be used, there is a risk of contaminating a watercourse.	C / O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				The choice of herbicide is typically limited to formulations of Glyphosate or 2,4-D amine that are approved for use near water. Full details of any chemical used, where required and as advised by a registered pesticides advisor, will be included in the final ISMP prepared in advance of construction of the proposed Scheme.	
BD-10	Chapter 9: Biodiversity section 9.5.2.5	Throughout (as required)	Presence of non-native invasive species during maintenance of the proposed Scheme	▪ Following the construction of the proposed Scheme, there may be ongoing treatment programmes which extend for a number of years into the Operational Phase. In the Operational Phase, the management of the infrastructure will be the responsibility of the Luas Operator and the control of invasive species will be as per their plans and procedures, and responsibilities under The Birds and Natural Habitats Regulations. ▪ The above measures are important for all Third Schedule non-native invasive species, and in particular Japanese knotweed, where it occurs, as maintenance works associated with landscaping, such as mowing and hedge cutting have the potential to spread this plant via the dispersal of very small amounts of shredded plant material. If invasive plants are found, then they will be treated as per the measures outlined in the ISMP and any species-specific guidelines.	O
BD-11	Chapter 9: Biodiversity section 9.5.2.6	Throughout (as required)	Impact on fauna	Scheme-wide fauna mitigation: ▪ All excavations will be covered to prevent accidental trapping, mammal ramps will be used in larger excavations to allow for escape, and exclusionary fencing will be used where appropriate to prevent mammals from entering any potentially dangerous areas; ▪ Cowling of lights should be used wherever possible to direct light towards target features and away from dark zones and corridors to retain commuting and foraging areas;	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ Trees should be retained wherever possible to ensure commuting and foraging routes remain intact. This should include the trees north-west of the Soccer field; and Work should be carried out in daylight hours wherever possible and lighting on site should be kept to a minimum.	
BD-12	Chapter 9: Biodiversity section 9.5.2.7	Tolka Valley Road to St Helena's Road	Disturbance to qualifying interest (QI) bird species	Seasonal construction constraints are required in order to mitigate for the risk of disturbance to qualifying interest (QI) bird species during the winter period within the amenity grasslands (West Farnham area - Western playing pitches and East Farnham area - Erin Isle GAA pitches), located within and adjacent to the proposed Scheme. ▪ Given that up to 64.59% of North Bull Island Special Protected Area's (SPA) Light-bellied Brent Goose population, as well as smaller flocks of other QI species (Black-headed Gull, Herring and Curlew), can be present within the Farnham area during the high frequency utilisation months (November to March inclusive) a minimum disturbance buffer of 400m from the identified core foraging areas will be in place throughout these months. This will mean that no enabling or construction works will be conducted within this 200m buffer for these months. This disturbance buffer (enabling construction work exclusion buffer) is reduced to minimum of 100m during the low frequency foraging months, namely October to November, and March to April. Works north of Wellmount Road can be conducted without any seasonal restrictions.	C
BD-13	Chapter 9: Biodiversity section 9.5.2.7	St Helena's Road to Cardiff Castle Road	Impacts on winter bird species	This area will also be required to follow the seasonal restrictions on enabling and construction works within the Farnham area. This will mean that no enabling or construction works will be conducted within this 400m buffer between the months of November to March inclusive. The standard guidance and plans listed in Chapter 9 (Biodiversity) will also be required in order to protect the health of	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				amenity grassland habitats utilised by protected wintering bird species.	
BD-14	Chapter 9: Biodiversity section 9.5.3.1	Throughout (as required	Bird collision	The new bridges over the railway line / Royal Canal and River Tolka have been designed without cables in order to reduce the risk of bird collision. Furthermore, to mitigate for the risk of collision with overhead lines, deflectors will be installed on wires parallel to the overhead lines at a number of strategic locations, including the Broombridge rail and pedestrian bridges over the Royal Canal; and Tolka Valley Park bridge; and along the tracks within the Tolka Valley Park and Farnham areas.	O
BD-15	Chapter 9: Biodiversity Table 9-34	River Tolka, Royal Canal	The degradation of overall water quality and the vegetation of Annex I habitats as a result of pollutants such as hydrocarbon. Air (dust) pollution generated during the construction phase could negatively impact habitats, adversely impacting photosynthesis and the biological functions of valued flora. The spread of invasive species such as Japanese Knotweed, from the construction site into this Natura 2000 site via the	Strict adherence to: ▪ Management plans and mitigation measures detailed in Biodiversity chapter, including Surface Water (Volume 5 - Appendix A6.4), Dust (Volume 5 - Appendix A6.1), Pollution Control (Volume 5 - Appendix A6.6) and Invasive Species Management Plans (Volume 5 - Appendix A6.3) . Relevant Area Specific Mitigation Measures outline in the Biodiversity chapter.	C / O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			River Tolka may have serious adverse impacts on present Annex habitats, displacing native species.		
W-1	Chapter 10: Water section 10.5.1.1	Throughout (as required)	Pollution of surface water	The appointed Contractor will be required to operate in compliance with the CEMP (Appendix A6.1) and to implement the Surface Water Management Plan (SWMP) (Volume 5 – Appendix A6.4). ▪ The Surface Water Management Plan (SWMP) has been prepared which details control and management measures for avoiding, preventing or reducing any significant adverse impacts on the surface water environment during the Construction Phase of the proposed Scheme. At a minimum, all the control and management measures set out in the CEMP and SWMP will be implemented. This includes measures relating to: ▪ A requirement for a Pollution Incident Response Plan; ▪ Construction compound management including the storage of fuels and materials; ▪ Control of sediment; ▪ Use of concrete; ▪ Management of vehicles and plant including refuelling and wheel wash facilities (if necessary); and Monitoring. The appointed Contractor shall carry out visual monitoring of surface water (settlement tanks, silt fences, fuel storage areas etc.) on a daily basis. In addition, weekly visual inspections of the Royal Canal and the River Tolka will be carried out.	PC / C
W-2	EIAR Appendix A6.6 Environmental Incident Response Plan	Throughout (as required)	Contamination of surface water	All construction staff will be suitably trained to respond to accidental discharge/ leaks and appropriate spill management kits will be in place to allow rapid response on site.	PC / C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ An Emergency Incident Response Plan has been prepared and will be in place detailing the procedures to be undertaken in the event of spillage of chemical, fuel or other hazardous substances or wastes, logging of non-compliance incidents and any such risks that could lead to a pollution incident at any point along the proposed Scheme. ▪ Spill kits containing absorbent pads, granules and booms will be stored in the site compound with easy access for delivery to site in the case of an emergency. A minimum stock of spill kits will be maintained at all times and site foremen's vehicles will carry large spill kits at all times. ▪ Absorbent material will be used with pumps and generators at all times and used material disposed of in accordance with the Waste Management Plan. ▪ All used spill materials e.g., absorbent pads, will be placed in a bunded container in the Contractor's compound. The material will be disposed of by a licenced waste Contractor at a licenced facility. Records will be maintained by the environmental site manager. Regular inspections and maintenance of plant and machinery checking for leaks, damage or vandalism will be made on all plant and equipment. In the event of a spill the appointed Contractor will ensure that the following procedure are in place: ▪ Emergency response awareness training for all personnel on-site works; ▪ Appropriate and sufficient spill control materials will be installed at strategic locations within the site. Spills kits for immediate use will be kept in the cab of mobile equipment; ▪ Spill kits must include suitable spill control materials to deal with the type of spillage that may occur and where it may occur. Typical contents of an on-site spill kit will include the following as a minimum: ▪ Absorbent granules; ▪ Absorbent mats/cushions; ▪ Absorbent booms; and ▪ Track-mats, geotextile material and drain covers.	

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ All potentially polluting substances such as oils and chemicals used during construction will be stored in containers clearly labelled and stored with suitable precautionary measures such as bunding within the site compound. ▪ All tank and drum storage areas on the site will, as a minimum, be bunded to a volume not less than the following: – 110% of the capacity of the largest tank or drum within the bunded area, or – 25% of the total volume of substances which could be stored within the bunded area. ▪ All hydrocarbons to be utilised during construction are to be appropriately handled, stored and disposed of in accordance with the Transport Infrastructure Ireland (TII) document 'Guidelines for the crossing of watercourses during the construction of National Road Schemes' (NRA, 2008); ▪ The site compound fuel storage areas and cleaning areas will be rendered impervious and will be constructed to ensure no discharges will cause pollution to surface or ground waters; ▪ Designated locations for refuelling are within site compound; ▪ Potentially contaminated run off from plant and machinery maintenance areas will be managed within the site compound surface water collection system; and Damaged or leaking containers will be removed from use and replaced immediately.	
W-3	Chapter 10: Water section 10.5.1.2	Finglaswood Stream	Increased sediment loading as a result of silty water runoff.	Surface water run-off collected in excavations will be diverted to settlement tanks / bags and will not be allowed to discharge directly to the existing drainage system.	C
W-4	Chapter 10: Water section 10.5.1.3	River Tolka	Disruption to the hydromorphology of the River Tolka.	The mitigation measures during the Construction of the Tolka Bridge will be as follows: ▪ During excavation of the abutments, pumped groundwater shall not discharge directly to the River Tolka; ▪ Excavation of the abutments shall only be carried out during the summer months (April to September);	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			River Tolka polluted by construction activities. Increase surface water runoff. Increased flood risk. Section of watercourse in shadow.	▪ Following the treatment and removal of the invasive species from this section of the works, this section will require the installation of silt fences and geotextile sandbag barriers to protect the Tolka Valley Park, the ICW and the River Tolka; ▪ The pile cap and abutment stem construction will utilize sheet pile protection with top of sheet piles set above the 1 in 5-Year Flood level; abutment construction will take approx. 8 – 10 weeks, a short enough period to lower the risk of flooding; ▪ For the construction of the Tolka Valley Park Bridge, there are no piers proposed within the river channel and both abutments are offset a minimum of 5m from the riverbank to minimise risk to waters during abutment construction; and The Contractor will maintain awareness of rainfall event and weather forecasts by Dublin City Council (DCC) and Met Éireann	
W-5	Chapter 10: Water section 10.5.1.4	Royal Canal Luas Bridge	Increased sediment loading as a result of silty water runoff. Increased flood risk. Section of watercourse in shadow.	The mitigation measures of the Royal Canal and Rail Overbridge will be as follows: ▪ An Ecological Clerks of Works (ECoW) will be present and surface water run-off control measures will be implemented throughout the enabling and construction works in this area given the sensitivity of the habitats at this location, and the Royal Canal's status as a surface water pathway connecting the site to the Natura 2000 sites downstream; ▪ This section will require the installation of geotextile sandbag barriers to protect the Royal Canal and its bankside vegetation; ▪ Topsoil stripping and storage of topsoil and other excavated material will be carefully managed and stored correctly, to ensure fines and debris are not washed into the Royal Canal; and ▪ Groundwater pumping will not be discharged directly to the Royal Canal.	C
W-6	Chapter 10: Water section 10.5.1.5	Bachelors Stream	Increased sediment in runoff.	The mitigation measures for Bachelors Stream will be as follows:	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			Increased surface water runoff.	▪ In addition to the measures in the SWMP, silt screens will be provided on the open sections of Bachelors Stream; and Fine screens or grilles to be placed across gullies to ensure that silt is caught before becoming washed into piped networks.	
W-7	Chapter 10: Water section 10.5.1.6	Integrated Constructed Wetland (ICW)	Loss of habitat and functionality of ICW due to bridge construction. Section of ICW in shadow. Increased surface water runoff. Increased sediment in runoff.	Mitigation works consist of expanding Cell 1, together with removing trees, silt and unsuitable plant species from the pond. These works will form part of an advance works contract which will be completed prior to the main works commencing on the proposed Scheme and will include: ▪ Location and repositioning of surface water connection between the Finglaswood Stream and the ICW; ▪ Overpumping of feed waters from ICW inlet. Waters to be pumped from inlet to open water section of pond which is downstream of ICW cell 2B; ▪ Expansion of Cell 1 to the North and South, with associated extension of clay liner; ▪ Removal of unsuitable plant species within the ICW and replanting with appropriate species; ▪ Removal of accumulated silt within three cells of ICW; ▪ Clearing of pipes connecting Cells 1 to 2A and 2A to 2B, and 2B to open water pond; ▪ Removal of trees and root networks within cell 2B, together with associated repair of clay liner; ▪ Reconstruction of embankment and pipe connection between Cell 2B and open water pond; ▪ Reinstatement of minimal flows to ensure vegetation success. The majority of the flows coming from the Finglaswood Stream will continue to be overpumped, meaning only a minimal flow will pass through the ICW; and ▪ Monitoring of ICW establishment. In addition, silt fences and geotextile sandbags will be established adjacent to the ICW: ▪ Silt screens to be provided adjacent to the section of the ICW which is to be impacted by the construction of the abutments;	PC

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ Sheet piling will be used during the construction of the abutments. This will limit the excavation extents, and hence impacts on the ICW; and ▪ Prior to works commencing on the ICW, the inlet pipe into the ICW is to be relocated away from the location of the abutment	
W-8	Chapter 10: Water section 10.5.1.7	Construction Compound	Contamination of surface water. Water quality.	Mitigation measures for the construction compounds will be as listed below: ▪ All chemical and fuel filling locations will be contained within signposted, designated bunded areas, a minimum of 10m from any surface water drain; ▪ At the construction compound, where the site is pervious, an area of hardstanding will be installed in a demarcated area for refuelling, and vehicle / plant cleaning and service areas. This area will be drained via a hydrocarbon interceptor trap to a soakaway if possible, or to local surface water drains, with the permission of the asset owner; ▪ Procedures and contingency plans will be in place at each work area to address cleaning up small spillages as well as dealing with an emergency incident. An Environmental Incident Response Plan (EIRP) has been prepared as part of EIAR is set out in Appendix A6.6; ▪ The storage of fuels, other hydrocarbons and other chemicals within the construction compound shall be in accordance with relevant legislation and with best practice; and ▪ Storage areas will be covered, wherever possible, to prevent rainwater filling the bunded areas.	C
W-9	Chapter 10: Water section 10.5.1.8	Haul Road	Re-exposure of historically settled contaminants within or near the waterbodies. Adjacent landscape will be impacted.	Mitigations for the haul roads include the following: ▪ Through grassed areas, shallow land drains will be provided adjacent to haulage roads. The land drains will be provided with check dams which will allow infiltration of the collected surface water to ground. These will not be provided in the vicinity of the historical landfill in Tolka Valley Park to avoid re-exposure of historically settled contaminants. Surface water runoff from haulage roads will be allowed to runoff onto	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				adjacent parklands. Overland flow, when properly managed, can reduce the likelihood of contaminants spreading beyond the immediate vicinity of the haul roads and containing the potential exposure. Overall, overland flow is a safer and more environmentally sound method for managing haul road drainage in contaminated areas; ▪ Silt screens will be provided running alongside the haulage roads through grassed areas to prevent silt and fines from impacting on the adjacent landscape; and ▪ Procedures and contingency plans will be in place at each work area to address cleaning up small spillages as well as dealing with an emergency incident. An Environmental Incident Response Plan is set out in Appendix A6.6.	
W-10	Chapter 10: Water section 10.5.1.9	Park & Ride	Surface water quality	Mitigation for the construction of the Park & Ride includes the following: During the Construction Phase of the Park & Ride, surface water will be collected and controlled on site. At no point during the Construction Phase treated water will be discharged to local surface water networks without the water quality meeting the statutory limits as set under the environmental quality standards referenced in the Surface Water Management Plan (SWMP) Appendix A6.4.	C
W-11	Chapter 10: Water section 10.5.1.10	Tolka Valley Park Historical Landfill	Contamination with leachate from the historical landfill	The appointed Contractor will be responsible for the compliant management of all waste generated by construction activities and will be responsible for implementing the mitigation measures outlined in CEMP, where modifications to the prepared CEMP will not give rise to any impacts more significant than those already identified and assessed in this EIAR or the NIS. ▪ The updated CEMP will identify construction methodologies for the proposed Scheme and standard operating procedures that will be implemented to minimise the impact. The appointed Contractor will implement in full all of the measures set out in the CEMP; and the Contractor will be responsible for regular testing of excavated soils to monitor the suitability of the soil for re-use.	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				Samples of ground suspected of contamination will be tested for contamination by the Contractor and ground excavated from these areas will be disposed of to a suitably licensed or permitted site, in accordance with the current Irish waste management legislation.	
W-12	EIAR Appendix A6.4 - Surface Water Management Plan	Throughout (as required)	Increased sediment in runoff	In order to safeguard the local surface water network, and in turn the local groundwater network, from surface water-based pollution events, the following will be strictly adhered to: ▪ The Contractor will ensure compliance with environmental quality standards specified in the relevant legislation, namely European Communities (Environmental Objectives (Surface Waters)) Regulations, 2009 (S.I. No. 272 of 2009 and amendments), and the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293 of 1988). ▪ Oil booms and oil soakage pads should be maintained on-site to enable a rapid and effective response to any accidental spillage or discharge. These shall be disposed of correctly and records will be maintained by the environmental manager of the used booms and pads taken off site for disposal. ▪ Management of silt-laden water on-site, including procedures for accidental leaks / spills to ground, as well as water quality monitoring to ensure compliance with environmental quality standards specified above. ▪ At no point during the construction phase will treated - water be discharged to local surface water network without the water quality meeting the statutory limits as set under the environmental quality standards specified above. ▪ Fail-safe site drainage and bunding through drip trays on plant and machinery will be provided to prevent discharge of chemical spillage from the sites to surface water. ▪ To prevent the spread of any accidental discharge into the surface water network, oil booms will be on hand when construction activities are located beside aquatic habitats in order to control and minimise the spread of the spill. ▪ Washout of concrete plant will occur at a designated impermeable area with waste control facilities.	C

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				▪ Wherever reasonably possible, pre-cast concrete bridge features should be utilised to minimise the risk of a concrete-based pollution event. ▪ Concrete delivery, concrete pours and related construction methodologies will be part of the procedure agreed with the Contractor to mitigate any possibility of spillage or contamination of the local environment. Particular attention will be paid during the pouring process in order to avoid leakages or spills of concrete. ▪ Temporary stockpiles will be monitored for leachate generation. These stockpiles will be placed within designated areas and not located within the vicinity of watercourses, wetlands or artificial surface water drainage features. ▪ Excavated contaminated soils (most likely present Tolka Valley Park) will be segregated and securely stored in a designated area where the possibility of runoff generation or infiltration to ground or surface water drainage has been eliminated through bunding and imperviable geotextile linings. The contaminated soils will then be classified as clean, inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC. Furthermore, the Contractor will ensure that no cross-contamination with clean soils happens elsewhere throughout the proposed Scheme site. ▪ Silt fencing will be installed prior to the commencement of any construction works in order to enhance the protection of identified water features (River Tolka, Tolka Valley Park wetlands and Royal Canal). Shallow interceptor trenches will be installed in front of these silt fences, as there are space and depth constraints within certain areas of Tolka Valley Park. An Ecological Clerks of Works (ECoW) will be present during the installation of these protective measures to ensure that they are installed to best practice standard and correctly located in their assigned areas.	

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				Silt fences will be repaired and/or replaced as necessary by the Contractor as part of the on-going environmental monitoring programme.	
W-13	Chapter 10: Water section 10.4.7.2	Throughout (as required)	Drainage system	The following measures are incorporated into design of the scheme. The following criteria are applicable to all sections of the drainage design along the scheme: ▪ Sealed Carrier pipes are designed so as not to generate surcharge out of the pipes during the 1 in 2-year Critical Storm Condition (This Critical Storm Condition will incorporate a 20% Climate Change Allowance); ▪ Filter Drains are designed so as not to generate surcharge out of the pipe during the 1 in 5-year Critical Storm condition; ▪ The new elements of the drainage systems have been assessed for the critical storm 1 in 100-year flood condition (the critical storm will incorporate a 20% margin for climate change). Whilst out-of-chamber flooding will be allowable during the critical 1 in 100-year condition (the critical storm will incorporate a 20% margin for climate change), the flood volume and how it will affect the adjacent infrastructure has informed provision of necessary mitigation measures; ▪ New attenuation storage units in the form of ponds, swales, tanks, pipes and similar methods will accommodate the critical 1 in 100-year storm (the critical storm will incorporate a 20% margin for climate change). Outfall rates from attenuation areas are based on greenfield and brownfield estimates; and Where roads are to be realigned, at the very least, a gully will be provided for every 200 square metres of pavement. This will be an improvement on the predevelopment condition and will provide additional silt trapping and containment measures on the scheme.	O
W-14	Chapter 10: Water section 10.4.7.2	Throughout (as required)	Increased run-off rates to waterbodies	Throughout the scheme hardstand areas have been replaced with SuDS features such as, Bio-Retention Areas and Rain Gardens. These will act as new attenuation for surface water falling on the scheme. The mitigation, which is by design, will	O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				result in subsurface attenuation volumes which will be utilised in the event of storm events. The SuDS features also act as traps for sediment, meaning there will be a smaller amount of sediment getting washed into downstream pipework, and potentially causing blockage.	
W-15	Chapter 10: Water section 10.4.7.2	Tolka/ICW	Change to water quality	To mitigate against the effect the scheme may have in causing polluted overland flow from the abandoned landfill reach the ICW and the Tolka at a faster rate, post development, an attenuation pond is to be provided on the ground to the North of the ICW. This pond will intercept overland flow and provide an additional level of treatment before outfalling into the ICW.	O
W-16	Chapter 10: Water section 10.4.7.2	Throughout (as required)	Surface water baseflow affected due to alteration of groundwater regime	The design has taken into consideration the future maintenance regime of the scheme. A number of elements have been incorporated into the design to make maintenance operations simpler: ▪ Infiltration trenches, bioretention areas and trees pits, all incorporate drainage pipes towards the base of the filter medium. These drainage pipes will help to encourage the migration of silt from between the filter medium, reducing the likelihood that the filter medium will become silted up during the lifespan of the infiltration trench, bioretention area or tree pit. ▪ Catchpit manholes which incorporate a 300mm deep sump have been provided on drainage lines. Gully pots and collection gullies for the track drainage systems also incorporate sumps. Silt and gravel will accumulate in these sumps, which can be cleaned out by maintenance crews. The sumps help to prevent the accumulation of silt within the drainage pipes, the removal of which requires more complex maintenance operations. ▪ Access chambers have been provided at all changes in direction of drainage pipe runs. Access has also been provided at all pipe junctions. These measures will make the clearance of any blockages within the pipes easier.	O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				SuDS features in the form of tree pits, bioretention areas, rain gardens, infiltration trenches and an attenuation pond have been incorporated into the design of the scheme. The grass and planting incorporated into these features will trap silts and gravels and prevent them becoming washed into the piped drainage infrastructure where they can cause siltation which will require clearance by maintenance operatives.	
W-17	Chapter 10: Water section 10.4.7.2	ICW	Decreased sediment in runoff. Surface or subsurface runoff from historical landfill flowing into the ICW.	Monitoring of ICW (Integrated Constructed Wetland) establishment during the Operational Phase.	O
W-18	Chapter 10: Water section 10.4.7.2	Tolka Bridge	Increase in flood risk	The following mitigation measures during Operational Phase will be implemented: ▪ For the River Tolka Bridge, the abutments have been set back 5 meters from the edge of the river to provide adequate space for flood flow. ▪ The proposed drainage system through Tolka Park incorporates bioretention areas, infiltration trenches, filter trenches and an attenuation pond. Whilst testing has revealed that the landfill material is inert, the design measures will provide a level of treatment to any surface or subsurface runoff from the landfill material. ▪ The Park & Ride will accommodate an attenuation storage tank so that surface water from the roof and parking area attached to the facility will be attenuated before discharging to the existing drainage network at greenfield runoff rates; and Where nature-based SuDS features are not considered adequate for attenuating surface water runoff from hardstanding areas, attenuation in the form of tanks or pipes has been provided, i.e. adjacent to the existing Broombridge Luas Stop and along Broombridge Road.	O

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W-19	Chapter 10: Water section 10.5.2	Throughout (as required)	Drainage systems	During the Operational Phase of the proposed Scheme, a number of different agencies will carry out maintenance of SuDS features in accordance with their respective management procedures. No additional mitigation measures are required. Pre-emptive mitigation measures are to be implemented for the sustained performance of the ICW in advance of the bridge construction. It is programmed that works on the ICW will be progressed as part of the proposed Scheme enabling works.	O
LSGH-1	EIAR Appendix A6.1 – Construction Environmental Management Plan	Throughout (as required)	General Management	Prior to and during construction localised confirmatory ground investigations/sampling will be undertaken to verify the results of the assessments, undertaken and reported in this EIAR.	PC / C
LSGH-2	Chapter 11: Land & Soils section 11.5.2.1	Throughout (as required)	Surplus soil arising from earthworks	Where unidentified contamination (such as potential asbestos containing material or free phase hydrocarbon product) is encountered, material shall be segregated and stockpiled on a low permeability surface with bunding and shall be covered to allow further testing of the impacted soils to enable specification of treatment and re-use, or disposal.	C
LSGH-3	Chapter 11: Land & Soils section 11.5.2.1	Throughout (as required)	Surplus soil arising from earthworks	Notwithstanding the results of geo-environmental testing and associated assessment data included in the GQRA (Volume 5 - Appendix A11.2), it remains the responsibility of the Construction Contractor(s) to ensure that material is appropriately managed during the Construction Phase. In particular, the Contractor(s) will be responsible for the appropriate segregation of excavated materials. The Contractor(s) will retain a competent person to manage and supervise soil excavation and removal from the site. This person will ensure correct procedures are followed and that waste soils are appropriately logged and tracked using appropriate docketing system.	C
LSGH-4	Chapter 11: Land & Soils section 11.5.2.1	Throughout (as required)	Surplus soil arising from earthworks	The appointed Construction Contractor(s) for future groundworks will be expected to retain the services of an experienced environmental engineer or scientist during bulk excavation works, primarily to identify any previously unidentified contamination.	C

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LSGH-5	Chapter 11: Land & Soils section 11.5.2.1	Throughout (as required)	Surplus soil arising from earthworks	In recognition of national policy and sustainability, where material cannot be re-used as part of the on-site works and requires transfer off site, consideration will be given to the transfer of this material as a by-product under Article 27 of the European Communities (Waste Directive) Regulations 2011.	C
LSGH-6	Chapter 11: Land & Soils section 11.5.2.1	Throughout (as required)	Surplus soil arising from earthworks	Material that is not suitable for re-use, will be removed off site for treatment, recycling or disposal at an authorised waste management facility. The Construction and Demolition Resource and Waste Management Plan (C&D RWMP) will address the analysis of waste arisings, methods proposed for the prevention, re-use and recycling of wastes, and material handling procedures.	C
LSGH-7	Chapter 11: Land & Soils section 11.5.2.2	Throughout (as required)	Potentially contaminated soil Posing risk to human health	The appointed Construction Contractor(s) will be responsible for the compliant management of all waste generated by construction activities and will be responsible for updating and implementing the CEMP, where modifications to the prepared CEMP will not give rise to any impacts more significant than those already identified and assessed in this EIAR or the Natura Impact Statement (NIS). The updated CEMP will identify construction methodologies for the proposed Scheme and standard operating procedures that will be implemented to minimise the impact. The appointed Contractor(s) will implement in full all of the measures set out in the CEMP.	C
LSGH -8	Chapter 11: Land & Soils section 11.5.2.2	Throughout (as required)	Potentially contaminated soil	The Contractor(s) will be responsible for regular testing of excavated soils to monitor the suitability of the soil for re-use. Samples of ground suspected of contamination will be tested for contamination by the Contractor(s) and ground excavated from these areas will be disposed of to a suitably licensed or permitted sites in accordance with the current Irish waste management legislation.	C
LSGH-9	Chapter 11: Land & Soils section 11.5.2.2	Throughout (as required)	Potentially contaminated soil	While the risk of asbestos containing materials is exceptionally low, construction workers will be briefed on the possible presence of localised asbestos. Dermal contact with soils (particularly	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				Made Ground) will be avoided wherever possible and appropriate training and Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE) will be provided to mitigate the risk of inhalation of asbestos	
LSGH-10	Chapter 11: Land & Soils section 11.5.2.3	Throughout (as required)	Importation of fill	In order to minimise the impacts of importation of construction materials, where possible, a proportion of site-won materials generated during the works will be re-used within the proposed Scheme. Where importation of fill is necessary, imported materials will be sourced from reputable quarries as listed on the registers maintained by Fingal County Council, Dún Laoghaire-Rathdown County Council, and South Dublin County Council	C
LSGH-11	Chapter 11: Land & Soils section 11.5.2.4	Throughout (as required)	Loss of soil cover, soil erosion	Subsoil removal is an unavoidable consequence of the construction works. The earthworks balance has been designed to minimise residual surplus soil.	C
LSGH-12	Chapter 11: Land & Soils section 11.5.2.4	Throughout (as required)	Loss of soil cover, soil erosion	Topsoil stripping and earthworks removal will not be carried out over large areas in advance, which will limit soil erosion by limiting the time during which these areas are exposed. Control measures will involve the immediate use of topsoil wherever practicable after its stripping.	C
LSGH-13	Chapter 11: Land & Soils section 11.5.2.4	Throughout (as required)	Loss of soil cover, soil erosion	The principal avoidance measures regarding compaction of topsoil include the following; topsoil and overburden shall not be unnecessarily trafficked either before stripping or when in a stockpile. When the construction cut level has been achieved, the underlying overburden shall not be left exposed for extended periods of time before construction and refilling of the excavations.	C
LSGH-14	Chapter 11: Land & Soils section 11.5.2.5	Throughout (as required)	Contamination of existing soil	Excavation in areas of historic waste will be carried out as per requirements outlined specified in the CEMP to minimise exposure to surface run-off and to have the appropriate temporary surface drainage in place to minimise the risk of uncontrolled discharge.	C
LSGH-15	Chapter 11: Land & Soils section 11.5.2.5	Throughout (as required)	Contamination of existing soil	In the event of accidental soil pollution, excavation / remediation of a small proportion of contamination may be required.	C

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				Mitigation measures proposed for soil pollution are consistent with the design mitigation measures for the protection of groundwater, as potential contaminants could travel through soil before entering the groundwater system. As such, measures to protect the groundwater from contamination will also protect the soils.	
LSGH-16	Chapter 11: Land & Soils section 11.5.2.5	Throughout (as required)	Contamination of groundwater	Topsoil stripping and earthworks removal will not be carried out over large areas in advance, which will limit the time for which groundwater vulnerability in these areas is increased during construction. During piling activities, an appropriate piling method will be selected that will reduce the risk of cross-contamination from made ground into the underlying groundwater. Construction activities will be undertaken in compliance with guidance set out in CIRIA's Control of water pollution from linear construction projects (CIRIA, 2006). All potentially harmful substances (e.g. oils, diesel, herbicides, pesticides, concrete etc.) will be stored in accordance with the manufacturer's guidelines regarding safe and secure buildings/compounds and hardstanding areas. Adequate means to absorb or contain any spillages of these chemicals shall be made available at all times.	C
LSGH-17	Chapter 11: Land & Soils section 11.5.2.6	Finglas East	Disruption to an existing well	In the unlikely event the identified well (Ref: 2923SEW003) is intercepted by the proposed Scheme, it will be duly recorded by an experienced Hydrogeologist and tested to confirm existing yield rates in advance of being decommissioned. If required, either a replacement supply well will be sited accordingly, designed, drilled, installed, and tested prior to follow-on commissioning or the supply will be replaced by a connection to public supply, subject to local constraints.	C
LSGH-18	Chapter 11: Land & Soils section 11.5.3	Throughout (as required)	Risk of accidental spillages	In the Operational Phase the infrastructure will be maintained by TII, or local authority, and will be subject to their management procedures to ensure that the correct measures are taken in the event of any accidental spillages.	O

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LT-1	Chapter 12: Land Take section 12.5.2	Throughout (as required)	Compensation for Compulsory Purchase	TII is authorised to serve a notice to treat pursuant to the provisions of the Housing Act, 1966 (as amended), including Section 79 thereof. The acquisition of the various specified rights and interests in land and property, is necessary in order to ensure the delivery of the proposed Scheme in its entirety. In the event that the RO is approved and TII exercises its powers of acquisition pursuant to the enforceable RO, the owners, lessees and occupiers of those acquired lands and interests in lands will be entitled to submit a claim for compensation which, in default of agreement, will be determined by a Property Arbitrator in accordance with the relevant statutory provisions.	C
LT-2	Chapter 12: Land Take section 12.5.2	Throughout (as required)	Acquisition of land and property interests	Some temporarily acquired lands, for example portions of grounds, yards and front gardens, will be handed back in a slightly different state with a changed gradient to a garden or driveway or a boundary wall/entrance.	C
LT-3	Chapter 12: Land Take section 12.4.2.2	Throughout (as required)	Temporary restriction to property access	The appointed Contractor will implement the following measures: ▪ Temporary traffic management and access controls will be put in place as required and all impacted owner/occupiers will be notified and consulted so as to minimise any temporary impacts and ensure maximum safety for the public and the construction team at all times. ▪ Alternative designated safe crossing points will be provided. ▪ Reinstatement of landscape areas. ▪ New landscaping and provision of new maintenance access to canal bank and footpaths. New access and Parking arrangements at resource centre and school will be provided.	C
LT-4	Chapter 12: Land Take Table 12-9	Tolka River	Air rights for bridge decks over Tolka river. Tree removal and modifications to integrated constructed wetlands.	Reinstatement of landscape area and replanting will be provided.	C

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LT-5	Chapter 12: Land Take sections 12.4.2.2 and 12.6.1	Throughout (as required)	Demolition of structures, including boundary walls/fences	There will be minor demolition requirements associated with utility structures and boundary walls and fencing along the alignment. Existing demolition materials will be recycled and reused, matching materials to existing or new sympathetic materials shall be used otherwise.	C
LT-6	Chapter 12: Land Take Table 12-8	Area 30	Reduction in residual land area. Impacting future development potential due to reduced area	Provision of new boundary treatment.	C
AQ-1	Chapter 13: Air Quality section 13.5.1.3	Throughout (as required)	Risk from asbestos-containing materials	A Demolition Survey of all buildings to be demolished will be required prior to commencement of any such demolition works. ▪ This will include an intrusive asbestos-containing materials survey, which will involve destructive inspection. Prior to commencement of the demolition works, all asbestos containing materials identified by the Management Asbestos Survey and Refurbishment and Demolition Survey, will be removed by a suitably trained and competent person. Asbestos-containing materials will only be removed from site by a suitably permitted/licensed waste Contractor and will be brought to a suitably licensed facility. The Health and Safety Authority will be contacted where needed in relation to the handling of asbestos and material will be dealt with in accordance with the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006, as amended and associated approved Codes of Practice.	PC
AQ-2	Chapter 13: Air Quality section 13.5.1.1 And EIAR Appendix A6.6 Construction Environmental	Throughout (as required)	Dust emission, increase level of PM10	Dust Management Plan contained within the CEMP (Volume 5 - Appendix A6.1) has been prepared as part of the EIAR and will be incorporated by the appointed Contractor in his plan. DMP will be implemented and updated by the Contractor. The DMP include monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections.	PC

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
	Management Plan section 1.8.4.1				
AQ-3	Chapter 13: Air Quality section 13.5.1.1	Throughout (as required)	Dust emission on site	The following measures will be implemented by the site Environmental Manager (EM) to avoid dust emission on site: ▪ Record any exceptional incidents that cause dust and/or air emissions, either on or offsite, and the action taken to resolve the situation in the logbook; ▪ Record any exceptional incidents that cause dust and/or air emissions, either on or offsite, and the action taken to resolve the situation in the logbook ▪ Make the complaints log available to the local authority when asked Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary if applicable, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.	C
AQ-4	Chapter 13: Air Quality section 13.5.1.1	Throughout (as required)	Dust emission	The appointed Contractor will: ▪ Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; ▪ Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site; ▪ Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period; ▪ Avoid site runoff of water or mud; ▪ Keep site fencing, barriers and scaffolding clean using wet methods; ▪ Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site; and ▪ Cover, seed or fence stockpiles to prevent wind whipping.	C

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AQ-5	Chapter 13: Air Quality section 13.5.1.1	Throughout (as required)	Traffic emissions	The appointed Contractor will: ▪ Ensure all vehicles switch off engines when stationary.. Minimise and prevent idling of construction vehicles and plant and equipment both on-site and in construction compounds; ▪ Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable; ▪ Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas; ▪ Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials; and ▪ Efficiently schedule deliveries undertaken to minimise emissions.	C
AQ-6	Chapter 13: Air Quality section 13.5.1.1	Throughout (as required)	Dust emissions from construction	The following mitigation measures will be implemented by the Contractor: ▪ Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems; ▪ Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water; ▪ Use enclosed chutes and conveyors and covered skips; ▪ Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; ▪ Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages after the event using wet cleaning methods; ▪ Avoid scabbling (roughening of concrete surfaces) if possible; ▪ Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required	C

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				for a particular process, in which case ensure that appropriate additional control measures are in place; ▪ Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and ▪ For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	
AQ-7	Chapter 13: Air Quality section 13.5.1.1	Throughout (as required)	Dus emission from demolition activity	The following mitigation measures will be implemented: ▪ Soft strip inside buildings before demolition of retaining walls and windows in the rest of the building to provide a screen against dust; ▪ Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground; ▪ Avoid explosive blasting, using appropriate manual or mechanical alternatives; and ▪ Bag and remove any biological debris or damp down such material before demolition.	C
AQ-8	Chapter 13: Air Quality section 13.5.1.1	Throughout (as required)	Dust emission from earthworks	The appointed Contractor will undertake the following works: ▪ Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces; ▪ Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil; and ▪ Only remove the cover in small areas during work and not all at once.	C
AQ-9	Chapter 13: Air Quality section 13.5.1.1	Throughout (as required)	Dust emission on trackout	The appointed Contractor will: ▪ Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use; ▪ Avoid dry sweeping of large areas;	C

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				▪ Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; ▪ Inspect on-site haul routes for integrity and instigate necessary repairs to the surface; ▪ Record all inspections of haul routes and any subsequent action in a site logbook; ▪ Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned; ▪ Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site); ▪ Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; and ▪ Access gates to be located at least 10m from receptors.	
AQ-10	Chapter 13: Air Quality section 13.5.1.2	Throughout (as required)	Potential for Aspergillus airborne during demolition and earthworks	Survey and prevention works with respect to *Aspergillus* will take place before construction commences by a competent Contractor in proximity to any sensitive buildings and hospitals or health clinics. ▪ If pre-construction surveys indicate that Aspergillus is a risk, the prevention works will include sealing the windows to the façades that are in close proximity to the hospital to prevent fugitive dust entering the hospital through windows. These works will form part of an Aspergillus Prevention Plan to be completed by a specialist and will ensure the prevention of Aspergillus spores spreading.	PC / C
AQ-11	Chapter 13: Air Quality section 13.5.1.1	Throughout (as required)	Dust soiling.	Monitoring measures that will be implemented by the EM include: ▪ 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 windowsills within 100m of site boundary, with cleaning to be provided if necessary;	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked; ▪ Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions; ▪ Monthly monitoring of dust deposition levels shall be undertaken for the duration of construction for comparison with the guideline of 350 mg/m2/day (for non-hazardous dusts). This monitoring shall be carried out at a minimum of three locations in proximity to each construction compound and further monitoring locations shall be designated at sensitive receptors along the proposed Scheme alignment. If dust levels are measured to be above the guideline of 350 mg/m2/day, the mitigation measures in the area shall be reviewed and improved to ensure that dust deposition is reduced to below 350 mg/m2/day. Should high dust levels continue to occur following these improvements, the Contractor shall provide alternative mitigation measures and/or will modify the construction works taking place.	
CM-1	Chapter 14: Climate section 14.5.1	Throughout (as required)	General Management	▪ Maintaining existing tree corridors to minimise tree clearance. Carbon storage associated with existing trees. ▪ Landscape design strategy to be implemented to address carbon and climate adaptation.	PC
CM-2	Chapter 14: Climate section 14.5.1	Throughout (as required)	Emission of GHG	The following mitigation measures will be put in place to minimise emissions: ▪ Construction machinery engines will be turned off when machinery is not in use; ▪ A regular maintenance schedule for all construction plant machinery shall be undertaken to maintain optimum machinery efficiency;	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ Minimise and prevent idling of construction vehicles and plant and equipment both on-site and in construction compounds; ▪ Efficiently schedule deliveries undertaken to minimise emissions; ▪ Ensure conformity of construction vehicles with the latest EU emissions standards and where reasonably practicable, their emissions should meet upcoming standards prior to the legal requirement date for the new standard; ▪ Sustainable timber post fencing will be specified over steel in boundary treatments; and ▪ The use of private vehicles by construction staff to access the site will be minimised through the encouragement of use of public transport, encouragement of car sharing, and maximising use of local labour to reduce transport emissions. To implement this, the Contractor shall prepare a Mobility Management Plan for site staff.	
CM-3	Chapter 14: Climate section 14.5.1	Throughout (as required)	Embodied Carbon	Elements that will mitigate construction carbon include: ▪ Incorporation of concrete with 25% or 50% ground granulated blast furnace slag (GGBS) to reduce the carbon footprint. Lower carbon footprint than other cements produced in Ireland; ▪ The design is based on the use of a grass track which reduces concrete requirements; ▪ Facilitating sustainable material use, such as Green Cement and recyclable material; ▪ Divert waste materials from landfill / incineration to re-use onsite or offsite or recycling material; ▪ The use of non-concrete assets shall be optimised in the design e.g. grass track, grassed drains etc. to minimise the need for concrete; ▪ Aggregates required for pavement materials shall be secondary aggregates. Virgin aggregates shall only be employed where it is demonstrated that secondary aggregates are unsuitable for structural reasons and/or they are unavailable;	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ Wherever available, the Contractor shall secure construction materials from local/regional sources or sources within the State to minimise material transport emissions and reduce life cycle carbon emissions associated with the construction materials; ▪ For electricity generation at the construction compounds, hydrogen generators or electrified plant shall be utilised over traditional diesel generators. This shall also apply to lower powered mobile plant, as appropriate; ▪ Implement a Waste Management Plan for Construction and Demolition Waste as part of the CEMP; ▪ Issue a notification under Article 27 of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011), as amended (Waste Directive Regulations (2011)) (referred to as Article 27) to the Environmental Protection Agency on behalf of TII to classify much of the construction phase generated inert waste material as a by-product and not a waste. This will allow the material to be re-used in the construction of the proposed Scheme; ▪ Reuse materials as much as possible within the extent of the sites. In addition, materials will be sourced locally to reduce the embodied carbon emissions associated with transport; and ▪ Require operations to achieve high recycling rates with an aspiration to achieve zero waste directly to landfill. This will also include audits prior to any demolition/excavation to review for material that can be reused on site.	
CM-4	Chapter 14: Climate section 14.5.1	Throughout (as required)	Climate change	▪ The appointed Contractor will undertake updated Climate Change Risk Assessments for all aspects of the proposed Scheme and implement measures to mitigate identified impacts during detailed design and prior to the commencement of operation. ▪ the appointed Contractor will implement a whole-life Carbon Management Plan aligned to PAS 2080:2023 Carbon management in buildings and infrastructure which has been used to inform the detailed design, build and operation of the proposed Scheme.	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ The construction Contractor will pay due consideration to the impacts of extreme weather events during the Construction Phase and will utilise available meteorological forecast data from Met Éireann to inform short to medium-term programme management, environmental control, and impact mitigation measures. A Severe Weather Management Plan (to be prepared by the Contractor having regard to the CEMP and the Water and Energy Management Plan) will be considered in order to ensure mechanisms are in place should this impact arise. The documents should contain plans and mitigation measures to prevent future impacts due to increasingly severe weather events. ▪ Integrate and maintain measures to manage construction and operational surface water and stormwater runoff. ▪ Achieve a reduction in mains water use during construction through the use of rainwater harvesting, water re-use and efficiency systems and devices at all work sites, stations, and buildings. ▪ Reuse rainwater and pumped water from excavations collected on site. This will account for at least 25% of the water required during the Construction Phase.	
CM-5	Chapter 14: Climate section 14.4.1.3	Throughout (as required)	GHG Climate change	The following additional Operational Phase mitigation measures will be implemented: ▪ Installation of a Solar PV panel array on the Park & Ride facility roof. The proposed Scheme includes a multi-storey car park and the roof is proposed to be a green or blue roof with PV panels. Approximately 350 car parking spaces will be provided. The facility is designed to facilitate 100% EV parking, with approximately 20% of EV spaces provided from opening year. The electricity generated by the operation of the Solar PV panel array on the park and ride facility will equate to a saving of approx. 96 tCO_{2eq} per annum or 5,760 tCO_{2eq} over the lifetime of the proposed Scheme; ▪ The power supply for the proposed Scheme will be delivered from electrical sub-stations via an Overhead Catenary System (OCS). Power will be supplied to the sub-stations from the national grid.	O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ The proposed design maximises the use of green track, for landscaping, infiltration, visual amenity and reducing of urban heat intensity. Extensive planting proposals aim to create connected green spaces along the route; ▪ Use SuDS systems for surface water collection and attenuation. A SuDS system offers environmental benefits, as it requires less maintenance over traditional closed surface water collection and attenuation systems. A reduced maintenance regime over the lifetime of the proposed Scheme will be one of the drainage design objectives. The proposed design maximises the use of green track, for landscaping, infiltration, visual amenity and reducing of urban heat intensity. Extensive planting proposals aim to create connected green spaces along the route. The carbon emission savings from this design approach is estimated at approx. 194 tCO2eq per annum or 11,640 tCO2eq over the 60-year lifetime of the proposed Scheme; ▪ Achieve Net Zero for operational energy by the design year through energy efficiency, innovation, green power purchases and offsetting residual emissions; and ▪ Provision for cyclists including routes and cycle parking to be maintained throughout quantifiable GHG mitigation measures such as the use of 80% - 100% renewable electricity, can be implemented and detailed. This carbon emission mitigation measure will be very significant in terms of GHG emission reductions due to the proposed Scheme.	
NV-1	Chapter 15: Noise & Vibration section 15.5.1.1	Throughout (as required	Impacts on stakeholders	The main principles and standards required for noise mitigation are outlined as follows: ▪ The Contractor undertaking the construction of the works will be required to take specific noise abatement measures to the extent required and comply with the recommendations of BS 5228–1; ▪ The Contractor will undertake a reassessment of noise levels once further information is available as part of the identification of mitigation measures. This will include details of all anticipated out of core hours work;	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ The selection of plant items will be required to comply and European Communities Noise Emissions by Equipment for Use Outdoors (Amendment) Regulations 2006; ▪ The Contractor will prepare a Noise and Vibration Management Plan (CNVMP) which will be formulated for the construction phase and used by all Contractors based on the mitigation measures outlined in this chapter, and the CEMP. The CNVMP will be a live document. ▪ As part of the CNVMP, a baseline noise study will be undertaken prior to the commencement of construction works in order to characterise the prevailing noise environment at impacted NSLs. This information will be used to inform the relevant CNTs. The key principles relating to noise mitigation will be applied across all construction activities for the proposed Scheme: ▪ Noise control at Source: Selection of quiet plant, site layout, attenuation at source, operational control (hours and periods); and ▪ Noise Control along Pathway: Localised screening to plant items on site, enclosures, site buildings, site hoarding and noise barriers.	
NV-2	Chapter 15: Noise & Vibration section 15.5.1.1	Throughout (as required)	Impacts on stakeholders	Selection of quiet plant: ▪ The Contractor(s) will evaluate the choice of piling, excavation, breaking or other working method considering various ground conditions and site constraints. Where alternative lower noise generating equipment that would economically achieve, in the given ground conditions, equivalent structural / excavation / breaking results, these will be selected to control noise emissions. The use of non-percussive piling methodologies will be used across the proposed Scheme to control noise and vibration impacts.	C
NV-3	Chapter 15: Noise & Vibration section 15.5.1.1	Throughout (as required)	Impacts on stakeholders	If replacing a noisy item of plant is not a viable or practical option, noise control “at source” will be followed: ▪ For static plant such as compressors, generators, motors and pumps within each construction compound, the units will	C

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				be surrounded by acoustic lagging or have acoustic enclosures providing air ventilation, as required, to ensure CNTs are not exceeded, particularly if required at night; ▪ Equipment powered by mains electricity shall be used in preference to equipment powered by internal combustion engines or locally generated electricity; ▪ For mobile plant items such as dump trucks, cranes, excavators and loaders, the installation of an acoustic exhaust, utilizing an acoustic canopy to replace the normal engine cover and/or maintaining enclosure panels closed during operation can be used to reduce noise levels by up to 10dB; ▪ Reverse alarms from mobile plant within construction compounds, will be broadband to reduce tonal elements from this source; ▪ For piling plant, noise reduction can be achieved by enclosing the driving system in an acoustic shroud. For steady continuous noise, such as that generated by diesel engines, it is possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy to replace the normal engine cover; ▪ Mobile and stationary plant will be switched off or throttled back to a minimum when not in use (engines, motors and generators). Lorries, trucks and concrete vehicles will not be permitted to queue outside site compounds with engines left idling; ▪ For percussive tools such as pneumatic concrete breakers and tools used for utility diversion works and surface level ground breaking for track construction, a number of noise control measures include fitting a muffler or sound reducing equipment to the breaker 'tool', and ensuring any leaks in the air lines are sealed; ▪ For all materials handling within compounds, the Contractor will ensure that best practice site noise control measures are implemented including ensuring that materials are not dropped from excessive heights and drop chutes/dump trucks are lined with resilient materials. This is an important	

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				consideration for site compounds where materials are loaded and unloaded; ▪ Resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can be controlled by fixing resilient materials in between the surfaces in contact; ▪ All items of plant will be subject to regular maintenance. All vehicles and mechanical plant will be maintained in good working order for the duration of the contract. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures; and ▪ The impact from works will be controlled using the best practicable means set out above and restricting significant noise and vibration generating activities to daytime hours.	
NV-4	Chapter 15: Noise & Vibration section 15.5.1.1	Throughout	Construction working hours	From a consideration of construction working hours, a number of mitigation measures will be implemented: ▪ The proposed construction working hours are mostly limited to daytime hours only from Monday to Friday and to Saturday morning periods. This approach assists with limiting the duration over which NSLs are exposed to construction noise impacts; ▪ It will be necessary to work overtime (including weekends) and night shifts at certain critical stages during the Construction Phase e.g. during works adjacent to live rail lines at Broombridge and some road works; ▪ Activities will be scheduled in a manner that reflects the location of the site and the nature of NSLs. Construction activities/plant items will be considered with respect to their potential to exceed CNTs at NSLs and will be scheduled according to their noise level, proximity to sensitive locations and possible options for noise control; and ▪ For work areas where night-time activities will be required, as far as practicable, activities with highest noise emissions will be scheduled during daytime periods and/or daytime shifts will set up the relevant sites for night-time periods to	C

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				avoid unnecessary use of mobile plant, cranes, and material handling to occur during night-time periods. Typically, screening is an effective method of reducing the noise level from construction work areas and can be used successfully as an additional measure to other forms of noise control. In practice screens constructed with materials with per units of surface rea greater than 10kg/m^2 will give adequate sound insulation performance.	
NV-5	Chapter 15: Noise & Vibration section 15.5.1	Throughout (as required)	Impacts on stakeholders	Consultation with stakeholders: ▪ The project team including Client, Contractor and Local Authorities will engage in regular meetings to discuss the approach to noise management; ▪ A particular emphasis should be placed on the risk of noise impacts during any out of hours work; ▪ The Contractor will provide proactive community relations and will notify the public and vibration sensitive premises before the commencement of any works forecast to generate appreciable levels of noise or vibration, explaining the nature and duration of the works; ▪ The Contractor will distribute information circulars informing people of the progress of works and any likely periods of significant noise and vibration; and ▪ A Public Liaison Officer will be appointed to site during construction works. All noise complaints will be logged and followed up in a prompt fashion by the liaison officer.	C
NV-6	Chapter 15: Noise & Vibration section 15.5.1	Throughout (as required)	Impacts on stakeholders	A full monitoring and auditing programme will form part of the CNVMP which will be agreed with the Local Authorities prior to the commencement of the Construction Phase. As a minimum the monitoring programme will include an alert system for threshold exceedances, remote access and a platform for sharing monitoring results between the Contractor, TII and DCC.	C
NV-7	Chapter 15: Noise & Vibration section 15.5.1.2	Throughout (as required)	Impacts on stakeholders	Construction traffic noise will be limited by restricting speed limits, maintaining road surfaces and ensuring that all vehicles are properly maintained. In addition, any coverings on construction	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				vehicles will be securely fastened before leaving site to avoid excessive 'rattling'	
NV-8	Chapter 15: Noise & Vibration section 15.5.1.3	Throughout (as required)	Construction Vibration impacts Human discomfort	It is understood that bored piling is to be used and this is a piling method which generates relatively low levels of vibration. Notwithstanding this, consideration should be given to the following methods to further mitigate the vibration levels: ▪ Minimise obstructions between the vibration source and the sensitive receiver, e.g. old basement floors, old foundations etc., which exacerbate the transmission of vibration; and ▪ Reduce the resistance to bored piles by "mudding in". This technique involves lubricating the borehole with a small amount of bentonite slurry. In the case of vibration levels giving rise to human discomfort, and in order to minimise such impacts, the following measures shall be implemented during the construction period: ▪ A clear communication programme will be established by TII to inform adjacent building occupants in advance of any potential intrusive works which may give rise to vibration levels likely to result in significant effects. The nature and duration of the works will be clearly set out in all communication circulars as necessary; ▪ Activities capable of generating significant vibration effects with respect to human response will be restricted to daytime hours only; and ▪ Appropriate vibration isolation shall be applied to plant (such as resilient mounts to pumps and generators), where required and where feasible.	C
NV-9	Chapter 15: Noise & Vibration section 15.5.2.1	St Helena's Childcare Centre	Increased airborne noise	A new solid boundary treatment is to be installed, with a minimum height of 2.25m and at the western edge of the St Helena's Childcare Centre. The boundary treatment will be constructed from a suitable dense material such as masonry or solid timber fencing, offering suitable sound attenuation.	O

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NV-10	Chapter 15: Noise & Vibration section 15.5.2.2	Throughout (as required)	Noise from rail corrugation and squeal	Grinding rail surfaces will be carried out to reduce rail generated noise from rail and wheel roughness. As part of the rail maintenance programme conduct rail lubrication at these locations to minimise the risk and magnitude of any squeal noise generated as provided by on-board lubrication systems aboard all LUAS fleet, both existing and proposed.	O
NV-11	Chapter 15: Noise & Vibration section 15.5.2.2	Finglas Village Stop	Higher levels of vibration	A floating slab track detail will be provided in the area approaching the Finglas Village Stop to mitigate the risk of higher levels of vibration being generated by the curvature of the track. The floating slab track reduces the transmission of vibration by incorporating a floating slab mat between the track slab and the surrounding structural slab.	O
NV-12	Chapter 15: Noise & Vibration section 15.5.2.3	Throughout (as required)	Impacts on stakeholders	Schedule rail maintenance activities over night-time periods along the proposed Scheme alignment, advance notice will be provided to affected residents providing notification of the dates and durations of the planned works.	O
ECI-3	Chapter 16: Electromagnetic Compatibility and Interference section 16.6.1	Throughout (as required)	Impact on LRT crossing under the ESB HV overhead lines	Carry out an assessment to determine the separation between the two systems and if there are any EMF risks to passengers or staff	O
ECI-4	Chapter 16: Electromagnetic Compatibility and Interference section 16.6.1	Throughout (as required)	Impacts on Garda and Fire station Rado systems radio systems	Review the radiated emission data for the LRVs to ensure emissions are low at the radio operating frequency. Review the OHL design to ensure it minimises arcing (e.g. no gaps) in the area near the Garda station Calculate the field strength from the radio systems at the LRV and wayside equipment. Review immunity levels for LRV and wayside equipment.	O
ECI-5	Chapter 16: Electromagnetic Compatibility and	Throughout (as required)	Impacts from interference of nearby emitters on	Ensure LRV equipment meets EN 50121-3-2 immunity levels. Ensure wayside equipment and LRV stop equipment meets appropriate immunity standard.	C / O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
	Interference section 16.6.1		wayside equipment, LRVs, etc	Ensure substation equipment meets immunity levels in EN 50121-5 or other appropriate immunity standard	
ECI-6	Chapter 16: Electromagnetic Compatibility and Interference section 16.6.1	Throughout (as required)	Impacts of stray current in structures and utilities	Liaise with utility companies to determine potential assets that may be affected. Produce stray current management strategy in line with EN 50122-2 and best practice and addresses any identified utilities assets. Review design to ensure it is aligned with strategy and minimises stray current. Inspect installation to ensure stray current mitigates are implemented.	PC / C
ECI-7	Chapter 16: Electromagnetic Compatibility and Interference section 16.6.1	Substations	Impacts on LRV line and associated power supply (substations) exceeding EMF limits	Ensure cable routing and substation design minimise EMF levels Ensure LRT meets the limits in the 'Low Action Levels' of the EMF Directive	C / O
ECI-8	Chapter 16: Electromagnetic Compatibility and Interference section 16.6.1	St Margarets Substation	Impacts on soil resistivity	The measure to be implemented is to not bury spoil or contaminate the ground during the removal of the pedestrian fly-over.	C
ECI-9	Chapter 16: Electromagnetic Compatibility and Interference section 16.6.1	Throughout (as required)	Impacts of EMC	The following plans/reports will be developed and Implemented throughout the lifecycle of the proposed Scheme: ▪ EMC Control Plan ▪ EMC Hazard Analysis & Risk Assessment ▪ Stray Current Strategy Management Plan ▪ EMC Simulation Studies EMC Test Plans	PC / C / O
MAM-1	Chapter 6: Construction Activities section 6.5.6	Throughout (as required)	Impacts on Stakeholders	Prior to beginning of any demolition or construction activities, the Contractor will identify the locations of all utilities within the proposed work area.	PC

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				All electrical relocations, isolations and de-energizations will be performed by a licensed electrical Subcontractor in advance of demolition.	
MAM-2	Chapter 17: Material Assets: Infrastructure and Utilities section 17.5.1.1	Throughout (as required)	Impacts on Stakeholders	Major utility infrastructure will be avoided. Where there are interfaces with existing utility infrastructure, and protection in place is not viable, diversion measures have been proposed to prevent long-term interruption to the provision of the affected services. The proposals will ensure that efforts are made during construction so as to ensure disruption to any utility service is minimised and where necessary, subject to service level agreement, will take alternative measures to ensure continuity of the service whilst diverted.	C
MAM-3	Chapter 17: Material Assets: Infrastructure and Utilities section 17.5.1.1	Throughout (as required)	Stakeholders (Utility companies)	Consultations have been undertaken with all major utility companies regarding project designs. Consultations will continue through the design development.	C
MAM-3	Chapter 17: Material Assets: Infrastructure and Utilities section 17.5.1.1	Throughout (as required)	Impacts on Stakeholders	Protection measures during construction will include warning signs and markings indicating the location of utility infrastructure, safe digging techniques in the vicinity of known utilities, and in certain circumstances isolation of the section of infrastructure during works in the immediate vicinity.	C
MAM-4	Chapter 17: Material Assets: Infrastructure and Utilities section 17.5.1.1	Throughout (as required)	Impacts on Stakeholders	Prior notification will be given to all impacted properties for service disruptions and disturbance around residential commercial and or community property	C
MAM-5	Chapter 17: Material Assets: Infrastructure and Utilities section 17.5.1.1	Throughout (as required)	Impacts on Stakeholders	Interruptions will be planned such that electrical works will be preferred during summer to avoid summer works involving water supply	C
MAM-6	Chapter 17: Material Assets: Infrastructure and Utilities section 17.5.2	Throughout (as required)	Impacts on Stakeholders	In accordance with service level agreements utility infrastructure modifications during Construction will ensure reliable provision of power (electricity/gas), water and other services are provided across the live LRT during maintenance works	O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
TT-1	Chapter 18: Material Assets: Traffic and Transport section 18.5.1	Throughout (as required)	Impacts on traffic	The appointed Contractor will implement and update measures In the CEMP prior to construction commencing (Appendix A6.1).	C
TT-2	Chapter 18: Material Assets: Traffic and Transport section 18.5.1	Throughout (as required)	Impacts on traffic	All temporary traffic measures required during the Construction Phase are outlined in the PTMP (Appendix A6.2) which will be developed by the Contractor into a Construction Stage Traffic Management Plan. All content provided in the CTMP will be implemented in full by the appointed Contractor and its finalisation will not affect the robustness and adequacy of the information presented and relied upon in this EIAR. In preparing the CTMP for the proposed works, the appointed Contractor will be required to give consideration where practicable to facilitate and identify opportunities for the maximum movement of people during the construction period through implementing the following hierarchy of transport mode users: ▪ Pedestrians and Cyclists; ▪ Public Transport; ▪ General Traffic; and ▪ Parking and Access	C
TT-3	Chapter 18: Material Assets: Traffic and Transport section 18.5.1	Throughout (as required)	Impacts on traffic	Phasing will be considered as a requirement of the proposed Scheme to ensure safe construction and minimise the impact on traffic on NMUs along the route of the proposed Scheme and maintaining flow of all modes of transport wherever practicable.	C
WR-1	Chapter 19: Material Assets: Resource & Waste Management section 19.5.1	Throughout (as required)	Designing for circular economy	The proposed Scheme will use circular economy principles in construction to minimize the use of materials, energy and other resources These include ▪ Minimise resource consumption and waste generation ▪ Design for re-use and recovery ▪ Design for materials optimisation: simplifying layout and form to minimise material use ▪ Design for off-site construction	PC

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				Design for the future (deconstruction and flexibility): identifying how materials can be designed to be more easily adapted over an asset lifetime	
WR-2	Chapter 19: Material Assets: Resource & Waste Management section 19.5.2	Throughout (as required)	Impacts on the environment	Standard sizes for most items will be used to avoid cutting on-site and prevent wastage	C
WR-3	Chapter 19: Material Assets: Resource & Waste Management section 19.5.2	Throughout (as required)	Impacts on the environment	Off-site construction, prefabricated products / modules and pre-cast units will be used to prevent waste	C
WR-4	Chapter 19: Material Assets: Resource & Waste Management section 19.5.2	Throughout (as required)	Impacts on soil and land	All excavated materials will be re-used on site if appropriate	C
WR-5	Chapter 19: Material Assets: Resource & Waste Management section 19.5.2	Throughout (as required)	Impacts on traffic and transportation	To minimise the impacts of importation of construction materials, a proportion of site-won materials generated during the works will be re-used within the project area. Where importation of fill is necessary, imported materials will be sourced from reputable quarries within the EMWR.	C
WR-6	Chapter 19: Material Assets: Resource & Waste Management section 19.5.2	Throughout (as required)	Impacts on the environment	The appointed Construction Contractor will be responsible for the update and implementation of the Construction Environmental Management Plan. compliant management of all waste generated by construction activities.	C
WR-7	Chapter 19: Material Assets: Resource & Waste Management section 19.5.2.2	Throughout (as required	Impacts on the environment	The Contractor will update and implement the Construction & Demolition Resource and Waste Management Plan (C&D RWMP) with site specific information on how waste arisings will be controlled and managed.	PC
WR-8	Chapter 19: Material Assets: Resource & Waste Management section 19.5.2.3	Throughout (as required	Impacts on soil	Excavated material will be properly managed and stored to reduce impacts associated with storage of soil and stone. Different types of excavated material will be stored separately, i.e., where applicable, made ground will be stockpiled separate to soils and subsoils, which will be stockpiled separate to rock.	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
WR-9	Chapter 19: Material Assets: Resource & Waste Management section 19.5.2.3	Throughout (as required	Impacts on soil	Contaminated soil will be stockpiled separately to minimize the risk of cross contamination	C
WR-10	Chapter 19: Material Assets: Resource & Waste Management section 19.5.2.3	Throughout (as required	Impacts on soil	Waste to be removed from site will be transported by vehicles with a valid Waste Collection Permit. All waste removed will be sent to a suitably licensed, permitted or registered waste facility for compliant handling and recovery or disposal.	C
WR-11	Chapter 19: Material Assets: Resource & Waste Management section 19.5.2.3	Throughout (as required	Impacts on soil	Material that cannot be re-used as part of the on-site works and require transfer off site, will be considered a by-product under Article 27 of the European Communities (Waste Directive) Regulations 2011.	C
WR-12	Chapter 19: Material Assets: Resource & Waste Management section 19.5.3	Throughout (as required	Impacts on the environment	The assessment of any environmental impacts and effects associated with materials and waste during maintenance or any large-scale future renewal or improvement works, will be undertaken by the future Operator in accordance with all legal and other necessary requirements. The future Operator will be required to be accredited to ISO 14001 Environmental Management Systems (or similar) for the operation and maintenance of the proposed Scheme.	O
WR-13	Chapter 19: Material Assets: Resource & Waste Management section 19.5.3	Throughout (as required)	Impacts on the environment	The Operator will prepare Operational waste plans to ensure that the aims of the Sustainability Plans are met. The Operator will be required to have a Sustainability Plan which will be linked to the ISO 14001 accreditation (or similar).	O
ACHM-1	Chapter 20: Cultural Heritage section 20.5.1	Throughout (as required)	Impacts on archaeological elements	In accordance with the TII Code of Practice for Archaeology, a TII Project Archaeologist has been appointed to oversee and manage the archaeological elements of the proposed Scheme. All archaeological consultants appointed to the proposed Scheme shall comply with the TII Code of Practice and shall liaise directly with the TII Project Archaeologist in relation to all archaeological requirements.	PC

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
ACHM-2	Chapter 20: Cultural Heritage section 20.5.1	Throughout (as required)	Impacts on archaeological elements	All Contractors and Cultural Heritage consultants appointed to the proposed Scheme shall comply with the TII Luas Finglas Cultural Heritage Strategy which will be prepared and agreed with the MHLGH in advance of receipt of an ERO	PC
ACHM-3	Chapter 20: Cultural Heritage section 20.5.2.2	Throughout (as required	Impacts on archaeological elements	All archaeological investigations, including test excavations, preservation by record (excavation) and archaeological monitoring, will be undertaken by a suitably qualified archaeologist in accordance with a Section 26 (2) Excavation Licence	C
ACHM-4	Chapter 20: Cultural Heritage section 20.5.2.3	Throughout (as required	Impacts on archaeological elements	Preliminary and final report on findings must be developed to fulfil licence conditions. Reporting requirements will be included in the Cultural Heritage Strategy and contract documents as produced by the TII Project Archaeologist.	C
ACHM-5	Chapter 20: Cultural Heritage section 20.6.2	Throughout (as required)	Impacts on archaeological elements	Mitigation measures which may be undertaken prior to and during the Construction Phase include: ▪ Full measured, written, drawn and photographic surveys; ▪ Detailed construction methodology (demolition, removal, storage, relocation/reinstatement, rebuilding, repair and rehabilitation of archaeological and cultural heritage monuments; appropriate screening; monitoring of vibration); ▪ Dive, underwater and wade surveys (including metal detecting); ▪ Geophysical surveys; ▪ Archaeological test excavations (including metal detecting); ▪ Archaeological monitoring (including metal detecting); and ▪ Preservation by record (Archaeological excavation).	C
ACHM-6	Chapter 20: Cultural Heritage section 20.6.2	River Tolka	Impacts on archaeological elements	Archaeological monitoring will be carried out during enabling and construction works. Should archaeological remains be confirmed, further archaeological mitigation such as preservation in situ or full archaeological excavation will be required.	C
ACHM-7	Chapter 20: Cultural Heritage section 20.6.2	Tolka valley Park	Impacts on heritage constraints	Archaeological monitoring will be carried out during enabling and construction works at the locations of cultural heritage constraints within this area.	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				Should archaeological remains be confirmed, further archaeological mitigation such as preservation in situ or full archaeological excavation will be required.	
ACHM-8	Chapter 20: Cultural Heritage section 20.6.2	Broome Bridge, Finglaswood Bridge, Royal Canal and towpath, St. Helena House and King Williams Rampart South Section	Impacts on heritage constraints	The visual impact on the settings of Broome Bridge (CHC 6), Finglaswood Bridge (CHC 13), Royal Canal and towpath (CHC 8 and CHC 9), St. Helena House (CHC 20) and King Williams Rampart South Section (CHC 24) will be mitigated by the preparation of a full written and photographic record of the existing setting of these constraints prior to the commencement of construction.	C
ACHM-9	Chapter 20: Cultural Heritage section 20.6.2	Broome Bridge, Finglaswood Bridge, Royal Canal and towpath, St. Helena House and King Williams Rampart South Section	Impacts on heritage constraints	The visual impact on the settings of Broome Bridge (CHC 6), Finglaswood Bridge (CHC 13), Royal Canal and towpath (CHC 8 and CHC 9), St. Helena House (CHC 20) and King Williams Rampart South Section (CHC 24) will be mitigated by the preparation of a full written and photographic record of the existing setting of these constraints prior to the commencement of construction.	PC
ACHM-10	Chapter 20: Cultural Heritage section 20.6.2	Canal and Railway Bridge: Broome Bridge, Canal: Royal Canal towpath, Bridge: Finglaswood Bridge	Impacts on heritage constraints	The indirect impact on the setting of this constraint will be mitigated by pre-works recording and the sensitive design of the proposed Scheme	O
LVA-1	Chapter 21: Landscape and Visual Amenity section 21.5.1.4	Royal canal	Impacts on Landscape	Public Realm measures include a new bus set down area, tree planting and seating within the footpath area, a new covered bike parking area, retention of existing tree and screen planting bordering the track and ramps either side of the Canal Ecological mitigation will include reinstatement of canal side vegetation, Primary Design Mitigation Measure H-Vegetation Reinstatement.	C
			Visual Impacts	▪ Fast growing, evergreen, columnar tree planting will be planted either in the northwest corner of the Broombridge Luas Stop within the amenity grass, or directly in front of the residential properties on the footpath at the corner of Broombridge Road and Bannow Road.	PC / C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ Further liaison with the residents of R003 Bannow Road will be carried out to determine if this screening measure is preferred.	
LVA-2	Chapter 21: Landscape and Visual Amenity section 21.5.1.5	Broombridge Road/Industrial Estate	Impacts on landscape	Along the Broombridge Road corridor, there will be a cycle lane and a separate tree-lined footpath on the western side, this is included as Primary Design Mitigation Measure J- Streetscape Planting and Measure Q- Public Realm. These measures will act as a planted buffer between road, cycle path and footpath, to aid traffic calming and to highlight safe crossing points and improve the streetscape quality. ▪ The proposed roadside avenue trees are Mitigation Measure L–Tree Strategy, will reinforce the Key Landscape Feature of this character area ▪ Primary Design Mitigation M–Biodiversity with pollinator friendly plant mixes. ▪ The Primary Design includes over two thirds of the track as green track in this character area as Primary Design Mitigation I-Track Vegetation. The detailing of abutment walls of the proposed Luas bridge adjacent to footpaths is included as Primary Design Mitigation Q–Public Realm enhancements to create improvements at a pedestrian scale.	C
			Visual Impacts	Measures incorporated within the proposed Scheme to reduce visual impacts for people working in Broombridge Road / Industrial Estate R006-R016 include Primary Design Mitigation Measure U-Boundary Treatment Typologies; the typologies have been agreed with local commercial stakeholders. These measures combined with the streetscape proposals Q–Public Realm enhancements to create improvements at a pedestrian scale maintain the channelled view towards the Tolka Valley Park in a northerly direction will mitigate visual obstruction for workers in this location	C
LVA-3	Chapter 21: Landscape and	Tolka valley park	Impacts on landscape	Mitigation G-Vegetation Removal to minimise the removal of healthy trees, there will be Mitigation Measure H-Vegetation Reinstatement of the Integrated Constructed Wetlands after	PC / C / O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
	Visual Amenity section 21.5.1.6			construction of the proposed bridge and replacement of amenity grassland. ▪ Primary Design Mitigation I–Track Vegetation and Mitigation J-Streetscape Planting to create a planted buffer between track, pedestrian and bicycle within the park and safety will be reinforced by the inclusion of Mitigation R-Trackside Safety Lighting and using LRT timber bollards to further delineate the green track perimeter and the LRV swept path ▪ Mitigation T-SuDS drainage methods will be implemented through the park to promote sustainable drainage methods ▪ Mitigation Measure V-Barrier Boundary Treatment and the inclusion of anti-trespass measures and wheel traps at park entrances to prevent anti-social wheeled access ▪ There will be minimal lighting within the park (Measure W-Light Mitigation for Wildlife) in accordance with DCC lighting policy, to avoid disturbance to nocturnal species. ▪ The proposed Scheme alignment within the park will be maintained as per Mitigation Measure Z in accordance with maintenance strategies aligned with DCC Parks management objectives including monitoring of reinstatement works in public areas ▪ Ecological Mitigation - will include reinstatement of the Integrated Constructed Wetlands under the proposed Luas bridge. Refer to Chapter 8 (Biodiversity) for mitigation measures.	
			Visual Impacts	Primary Mitigation Measures incorporated within the proposed Scheme to reduce visual impacts at this location for people using the park R017 includes green track Mitigation Measure I-Track Vegetation ▪ Mitigation Measure Y-Lighting for Passenger Safety (Otherwise, lights will be restricted to along cycle lanes where night-time activity is required for cyclist safety and Measure W-Light Mitigation for Wildlife, to minimise light emission in locations where sensitive habitats and nocturnal	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				species are present to avoid disturbance i.e. no lights to be facing River Tolka where bats are present. ▪ Mitigation Measure U-Boundary Treatment Typologies have been agreed with local stakeholders will maintain the low levels of visual impacts for industrial property owners R013-R016 on Ballyboggan Road and R019 staff of the DCC Park Depot ▪ Residents in R020- R021 will also notice Measure U-Boundary Treatment Typologies and Measure X-Light Mitigation for Residents, which avoids pollution. Local residents will still have visibility the proposed Luas bridge and OCS causing a degree of visual clutter reducing the visual amenity towards the park. Refer to Chapter 8 (Biodiversity) for mitigation measures.	
LVA-4	Chapter 21: Landscape and Visual Amenity section 21.5.1.7	St Helenas	Landscape Impacts	Measure G-Vegetation Removal will minimise removal of existing trees in the northern part of the open space and close to St Helena's House and Measure I-Track Vegetation will maintain the soft character of the space ▪ Mitigation Measure K-Woodland Vegetation, includes the use of native woodland to along eastern perimeter which will create visual screening for the residential area and enhance the space as an ecological corridor. ▪ Mitigation Q-Public Realm proposal at the northern end of the space will include trackside seating and resting areas to consider the site's topography (high point of the area) and take advantage of the views to the Tolka Valley Park, the urban skyline and the Wicklow mountains as well as towards the western façade of St Helena's House (Key landscape Features). ▪ Tree and shrub planting plus street furniture will create a sense of enclosure and enhance streetscape value in this character area and complement the historical setting of St Helena's Resource Centre and the adjacent Childcare Centre	C / O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ Mitigation R-Trackside Safety and the use of LRT timber bollards, will delineate the green track perimeter and the LRV swept path to increase trackside safety ▪ Measure W-Light Mitigation for Wildlife will ensure the eastern side of the open space remains unlit and dark to facilitate bat commuting routes. ▪ The LRT corridor within the park will be maintained as per Mitigation Measure Z in accordance with maintenance strategies aligned with DCC Parks management objectives including monitoring of reinstatement works in public areas Refer to Chapter 8 (Biodiversity) for mitigation measures.	
			Visual Impacts	Primary Mitigation K-Woodland Vegetation includes the use of native woodland to along eastern perimeter will create visual screening for the residential area (R020, R025, R026, R033, R034, R035, R036, R021, R022, R023, R027, R028, R029, R030, R031, R032, R038, R039, R040 and R043). ▪ Mitigation X- Light Mitigation for Residents, will reduce light pollution for local people. ▪ For people passing through the linear open space (R018) Mitigation L-Tree Strategy will maintain channelled views to the south and in addition to the improved visual amenity from Mitigation Q-Public Realm the visual impact ▪ For Staff and visitors in the St Helena's Childcare Centre (R042), Mitigation U -Boundary Treatment Typologies, will be applied to the 2.25m high noise barrier on the northern side of the Childcare Centre and will improve local privacy for users of this resource ▪ Secondary Mitigation AA is required at this location to soften the appearance of the wall/noise barrier and to assimilate the wall into the area. Fast growing, evergreen, flowering climbing plants will be grown against the internal and external surface of the wall. Refer to Chapter 8 (Biodiversity) for mitigation measures.	C / O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
LVA-5	Chapter 21: Landscape and Visual Amenity section 21.5.1.8	Farnham Park	Impacts on landscape	Within Farnham Park Mitigation Measure G-Vegetation Removal will minimise the loss of healthy trees around the perimeter of the park which is a Key Landscape Feature. ▪ The Primary Design includes green track in this character area as Primary Design Mitigation I-Track Vegetation and Mitigation J-Streetscape Planting to create a planted buffer between track, pedestrian and bicycle within the park and safety will be reinforced by the inclusion of Mitigation R-Trackside Safety Lighting and through the use of LRT timber bollards to further delineate the green track perimeter and the LRV swept path ▪ Secondary Mitigation Measures CC-Ecological Mitigation will include replacement of amenity grassland utilised by protected wintering bird species ▪ Mitigation Measure P-Open Space will ensure relocation of the established sports pitches as opposed to removal and Mitigation Measure S-Trackside Safety Fencing will provide ball stop fencing beside the LRT and the east of the sport pitches to protect LRT passage ▪ Mitigation Measure O- Connectivity between Spaces will improve movement between local spaces by provision of new footpaths and removal of fencing. Footpaths will be constructed in between the sports pitches and the trackside infrastructure A cycle lane and footpath will also be constructed on the eastern side of the park. Earth mounding will create a spectator view for the sports pitches The LRT corridor within the park will be maintained as per Mitigation Measure Z in accordance with maintenance strategies aligned with DCC Parks management objectives including monitoring of reinstatement works in public areas	PC / C / O
			Visual Impacts	Mitigation G-Vegetation Removal will minimise the removal of existing trees, will maintain the screening effect of the perimeter planting for residents in R046-R049, R050, and R054 Mitigation W-Light Mitigation for Wildlife will ensure lighting is located at pedestrian track crossing points on eastern boundary	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				to reduce light emission for sensitive habitats and nocturnal species (bats). Mitigation I-Track Vegetation, the use of Green Track bed treatment rather than a hard track design will minimise impacts on the visual amenity of the park for people using the open space (R044). Refer to Chapter 8 (Biodiversity) for mitigation measures.	
LVA-6	Chapter 21: Landscape and Visual Amenity section 21.5.1.9	Wellmount Road	Impacts on Landscape	Mitigation Measure G-Vegetation Removal, there will be minimal removal of existing trees along Casement Road at the southern end of this character area, and additional tree planting will be concentrated on the eastern side of the proposed track to reinforce existing planting. Measure X-Light Mitigation for Residents and Measure W-Light Mitigation for Wildlife will ensure that proposed lighting will be restricted to one side of the track to minimise nighttime glare to maintain the dark corridors for bats. Measure I-Track Vegetation, will help maintain the green soft character of this linear space. Mitigation J-Streetscape Planting will create a planted buffer between track, pedestrian and bicycle within the linear space and safety will be reinforced by the inclusion of Mitigation R-Trackside Safety Lighting. Mitigation O-Connectivity between Spaces, will improve movement between local open space by provision of new footpaths and removal of fencing. Refer to Chapter 8 (Biodiversity) for mitigation measures.	C
			Visual Impacts	Mitigation Measure X-Light Mitigation for Residents, will be applied and will reduce light pollution for these residents (R051-R053, R054-R056, R057, R059, R061, R062, R069-R075) plus Mitigation I-Track Vegetation will avoid changes to visual amenity of this linear space	PC / C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				▪ Mitigation U-Boundary Treatment Typologies, these have been agreed with local residents in Ravens Court (R076) and from the overlooking properties of R073-R075 on Cardiff Castle Road. ▪ Secondary Mitigation AA is required at this location to soften the appearance of the wall and to assimilate the wall into the linear park. Fast growing, evergreen, flowering climbing plants will be grown against the external surface of the wall. ▪ Further liaison with the residents of Ravens Court (R076) will be carried out to determine if planting is preferred for the internal wall finish inside the cul de sac. ▪ Mitigation I-Track Vegetation will be applied, and the use of Green Track bed treatment rather than a hard track design will minimise impacts on the visual amenity of the park for people using the open space (R060 and R063). ▪ Mitigation G-Vegetation Removal will be applied to minimise the loss of existing trees at this location. This will maintain the screening effect of the perimeter planting for receptors working in R058, R064, and R081 in combination with Mitigation J-Streetscape Planting. These measures will reduce visibility towards the proposed Scheme. Refer to Chapter 8 (Biodiversity) for mitigation measures.	
LVA-7	Chapter 21: Landscape and Visual Amenity section 21.5.1.10	Finglas Main Street West	Impacts on Landscape	Mitigation Measures G-Vegetation Removal, this will minimise loss of existing trees along Mellowes Road and will preserve the channelled view towards the prominent buildings of the Civic Offices on the northern side and the Garda station on the southern side (Key Landscape Feature). Mitigation Q-Public Realm will be applied and will provide streetscape enhancements, proposed street furniture including seating areas, shelters, bicycle storage and signage. Paving will comprise granite paving either side of the proposed stop and a separate tree-lined footpath. The track will be granite paved (Embedded Track) in this character area directly in front of the civic buildings, but green track elsewhere (Mitigation I-Track Vegetation).	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				Refer to Chapter 8 (Biodiversity) for mitigation measures.	
			Visual Impacts	▪ Mitigation G-Vegetation Removal will be applied in this location to minimise the loss of existing trees and will maintain the screening effect of the perimeter planting for residential receptors R077, in combination with Mitigation J-Streetscape Planting. These measures will allow visibility of the public realm improvements ▪ For receptors R082, R084, R085, R086, R083 and R086 the implementation of J-Streetscape Planting will provide a planted buffer between track, road, cycle path and footpath, to aid traffic calming and to highlight safe crossing points and allow visibility of the public realm improvements Mitigation Q-Public Realm Refer to Chapter 8 (Biodiversity) for mitigation measures.	C
LVA-8	Chapter 21: Landscape and Visual Amenity section 21.5.1.11	Mellowes Park	Impacts on Landscape	Mitigation Measures G-Vegetation Removal, to minimise the loss of existing trees except where necessary for the track alignment and for the proposed substation access. Mitigation Measure P-Open Space, will be implemented to relocate open space areas and sports pitches as opposed to removal of these facilities; this will maintain a circular walk / jogging trail within the park Measures X-Light Mitigation for Residents, and W-Light Mitigation for Wildlife, will ensure that light emissions will be restricted to one side of the track to minimise nighttime glare and allow for dark corridors for bats Measure R-Trackside Safety Lighting will provide safe, lit, crossing points of Luas tracks for pedestrians and cyclists and LRT timber bollards (in park areas) to further delineate the green track perimeter and the LRV swept path. Mitigation I-Track Vegetation will help maintain the green, planted character of this linear space.	C / O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				Measure S-Trackside Safety Fencing (ball stop fencing), will be implemented beside LRT along eastern boundary of park and will protect the LRT passage Measure T-Drainage will include SuDS attenuation areas will be incorporated along the eastern side of the park. The LRT corridor within the park will be maintained as per Mitigation Measure Z in accordance with maintenance strategies aligned with DCC Parks management objectives including monitoring of reinstatement works in public areas. Refer to Chapter 8 (Biodiversity) for mitigation measures.	
			Visual Impacts	Primary Mitigation L-Tree Strategy, will be applied to this park including the implementation of avenue trees, and linear planted areas which will reduce visibility of the LRT for Residents in R094-R117 Mitigation X-Light Mitigation for Residents, will also be applied to minimise light emissions and reduce light pollution Primary Mitigation L-Tree Strategy, will be applied to this park including the implementation of avenue trees, and linear planted areas which will reduce visibility of the LRT for Residents in R125-127 Mitigation X-Light Mitigation for Residents, will also be applied to minimise light emissions and reduce light pollution People using the open space (R065) Mitigation Measure I-Track Vegetation, will be implemented, the Green Track bed treatment rather than a hard track design, will reduce visibility of the LRT. Refer to Chapter 8 (Biodiversity) for mitigation measures.	C
LVA-9	Chapter 21: Landscape and Visual Amenity section 21.5.1.12	Finglas Road Corridor	Impacts on landscape	Mitigation Measures G-Vegetation Removal to minimise the removal of existing trees, in particular those along Casement Road that visually separate the residential area from the road corridor.	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				Measure J-Streetscape Planting will be applied in this area including the provision of Street trees and soft landscape areas along North Road to act as a planted buffer, to aid traffic calming and to highlight safe crossing points for pedestrians and cyclist. Refer to Chapter 8 (Biodiversity) for mitigation measures.	
			Visual Impacts	For residents in Casement Road R128-R130 the implementation of Mitigation G-Vegetation Removal will minimise the loss of existing trees, in combination with Mitigation J-Streetscape Planting along North Road, will help create visual screening for residents towards the proposed Park & Ride facility. Mitigation I-Track Vegetation and the use of Green Track bed treatment over a portion of the track at the road junction will reduce visible of the proposed Scheme for residents in North Road R131-R135 Mitigation Q-Public Realm enhancements including planting, street furniture and seating areas, in combination with the removal of the roundabout and the pedestrian footbridge will create an improvement to the visual amenity of this area. Refer to Chapter 8 (Biodiversity) for mitigation measures.	C
LVA-10	Chapter 21: Landscape and Visual Amenity section 21.5.1.13	Charlestown/St Margarets	Impacts on landscape	Measure J-Streetscape Planting, the provision of street trees and soft landscape areas which will create a planted buffer between track, road, cycle path and footpath, to aid traffic calming and to highlight safe crossing points Measure J in combination with Measures I-Track Vegetation, Green Track bed treatment, will create streetscape improvements along the road corridor. Mitigation Measure Q-Public Realm will provide enhancements and street furniture including seating areas, combined with Measure U- Boundary Treatment Typologies will mitigate impacts on visual amenity by the proposed Scheme and will further improve the character of the road corridor	C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			Visual Impacts	▪ Residents in R135, R138, R150, R153 -R155, R157, R159, R160-R162, R170- R171 will have their visual impacts of the proposed Scheme reduced by the implementation of Mitigation I-Track Vegetation, Green Track bed treatment, which will replace 50% of the road surface ▪ Mitigation Q-Public Realm enhancements including planting, street furniture and seating areas will also create an improvement to the visual amenity of this area ▪ Mitigation Measure U-Boundary Treatment Typologies will delineate the proposed Scheme from front gardens, but high levels of visual intrusion will remain due to the proximity of the proposed Scheme ▪ Secondary Mitigation BB is required at this location to screen the proposed Scheme and maintain privacy into the residential properties. Fast growing, evergreen, columnar tree planting will be planted either inside the front garden or in the footpath to screen visibility of the proposed Scheme. Further liaison with the residents of St Margaret's Court (R151) will be carried out to determine if this screening measure is preferred ▪ Mitigation Measure J-Streetscape Planting will provide a planted buffer between track, road, cycle path and footpath, to aid traffic calming and to highlight safe crossing points. This will benefit people using the sports pitches (R165) and reduce visibility towards the proposed Scheme ▪ Receptors working in R141-R149, R152, R156, R158, R163, R164, R166 will have reduced visual impacts from the proposed Scheme by the implementation Mitigation J-Streetscape Planting. The planted buffer between track, road, cycle path and footpath, will aid traffic calming and highlight safe crossing points and will allow visibility of the public realm improvements (Measure Q). Refer to Chapter 8 (Biodiversity) for mitigation measures.	C
MMM-1	Chapter 22: Risk of Major Accidents and	Throughout (as required)	Impact on critical infrastructure due to	Best practice measures for the protection of third-party assets will be specified by TII and implemented by the Contractor on site.	PC / C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
	Disasters section 22.6.2		construction works, including settlement	Where the works would directly impact on an asset, diversion strategies have been developed and agreed with asset owners. Where the works could potentially impact on assets through ground movements associated with the works, ground movement assessments have been prepared and will be developed further by the Contractors prior to construction as agreed with the asset owner. Protective measures will be undertaken to keep the risk of utilities settlement to a minimum. Prior to excavation works being commenced, the latest service records will be sought, and localised confirmatory surveys will be undertaken to verify the locations of services. Where diversions, or modifications, are required to utility infrastructure, service interruptions and disturbance to the surrounding residential, commercial and/or community property may be unavoidable. Any disruption will be minimised and planned in advance by the appointed Contractor. Emergency accesses along the route of the proposed Scheme will be retained insofar as is possible throughout the Construction Phase. Where construction works for the proposed Scheme will interface with emergency access arrangements, the appointed Contractor will consult with the affected landowners / site operators and the emergency services to agree, where required, alternative emergency access arrangements and changes to response plans for the duration of the works	
MMM-2	Chapter 22: Risk of Major Accidents and Disasters section 22.6.2	Throughout (as required)	Impacts on traffic	All temporary traffic measures required during the Construction Phase are outlined in the CTMP and will be updated and implemented by the appointed Contractor. Designated haul routes defined in the CTMP will be followed. All HGV loads will be covered or tied securely before leaving and coming to site. Refer to the CTMP (Appendix A6.2 of EIAR).	PC / C
MMM-3	Chapter 22: Risk of Major Accidents and Disasters section 22.6.2	Throughout (as required)	Impacts on water resources	The CEMP and SWMP have been prepared and will be updated and implemented by the Contractor, having regard to best practice guidance.	PC / C

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
MMM-4	Chapter 22: Risk of Major Accidents and Disasters section 22.6.2	Throughout (as required)	Impacts on infrastructure/assets	Compliance with design standards that include, but is not limited to, the following: EN 1990 Eurocode - Basis of structural design, EN 1993 Eurocode 3. Design of steel structures, EN 1993-1 Design of steel structures. General rules and rules for buildings, Degree of impact protection. Compliance with material standards to include, but is not limited to, the following: I.S. EN 1992-1-1:2005 (Eurocode 2, Part 1-1) – Design of concrete structures – General rules and rules for buildings.; I.S. EN 1993-1-1:2005 (Eurocode 3, Part 1-1) – Design of steel structures General Rules and rules for buildings.; I.S. EN 1996-1-1:2005 (Eurocode 6, Part 1-1) – Design of masonry structures. General Rules for reinforced and unreinforced masonry structures	C
MMM-5	Chapter 22: Risk of Major Accidents and Disasters section 22.6.2	Throughout (as required)	Impacts on Luas derailment	Design measures accepted by the regulator (CRR) to manage risks in order for licence to be granted including. These include CRR; CRR-G-016-C Guideline for Application for Acceptance of New Light Rail Rolling Stock; and CRR-G-032-B Guideline for Application for Acceptance of New Light Rail Works or New Light Rail Rolling Stock. All equipment will be compliant with Electromagnetic Compatibility and Interference (EMC and EMI) standards as required under the relevant EU standards. Implement design and periodic inspections and maintenance as part of the Operational Strategy. Operation and maintenance manuals communicated early, robustly completed and maintained. Training to be provided, sufficient resources to be in place and compliance with best practice guidelines and procedures including compliance with EN 1991-1-7:2006: General Actions: Accidental Action and Road Drainage and the Water Environment (TII, 2015). Safe system of working. Design to appropriate environmental parameters (i.e., wind and water), including designed-in consideration of climate change including compliance with EN 1991-1-4:2005: General Actions:	PC / O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				Wind Actions and International and National guidance and best practice. Equipment failure will be corrected as quickly as possible, and the action taken dependent on the nature of the failure. CCTV installation at Stops monitoring open section lines, for real-time monitoring. High integrity of safety critical functions required in reference and detailed design. Reinforcement of the passenger visual signalling and the security in the fencing surrounding the LRV access and the operational line.	
MMM-6	Chapter 22: Risk of Major Accidents and Disasters section 22.6.2	Throughout (as required)	Fire/explosion impacts	All construction materials used will be required to meet the requirements of BS EN 13501-1 Fire Classification of Construction Products and Building Elements. The constructed elements will be subject to fire testing in line with the requirements of Fire Resistance Test – General Requirements (BS EN 1363-1:2020 and EN 1992-1-2:2004 General Rules. Structural Fire Design. Safety features at Stops to minimise the risk of fire. Proposed emergency evacuation protocols will be adopted for emergency events along the railway line and at Stops.	C / O
MMM-7	Chapter 22: Risk of Major Accidents and Disasters section 22.6.2	Throughout (as required)	Impacts from infectious diseases	An Environmental Incident Response Plan (EIRP) has been prepared as part of CEMP and will be finalised and updated by the appointed Contractor. All guidance, standard operating procedures and control measures issued by the Government will be strictly adhered to	C / O
MMM-8	Chapter 22: Risk of Major Accidents and Disasters section 22.6.2	Throughout (as required)	Impacts from hydrological events	EIRP to detail the procedures to be taken in the event of a flood. Site staff will maintain awareness of flood and weather forecasts on an ongoing basis as well as receiving warnings from Dublin City Council, Fingal County Council and Met Éireann as appropriate so advance measures can be put in place. Drainage design includes allowances for climate change ensuring that the proposed Scheme is protected from significant flood events. Refer to the Chapter 10 (Water).	O

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				Cooperation with the relevant authorities, such as the local authorities and the OPW will be undertaken. Regular inspections and maintenance of drainage system and attenuation ponds will be undertaken.	
CIEI-1	Chapter 24: Cumulative Impacts section 24.6	Throughout (as required)	Impacts on stakeholders	The appointed Contractor will ensure appropriate construction planning of the proposed Scheme and other nearby developments to prevent potential cumulative impacts of general construction developments on communities, infrastructure and the environment	PC
CIEI-2	Chapter 24: Cumulative Impacts section 24.6	Throughout (as required)	Impacts on stakeholders	The appointed Contractor will adhere to the details of the CEMP, Traffic Management Plan as well as mitigation and monitoring measures outlined in Chapter 25 (this chapter) to ensure that potential negative impacts are avoided or reduced.	C / O

Table A6 1-6: NIS Mitigations (Construction Stage)

NIS Reference	Sub-Section	Location	Description of Mitigation or Monitoring Measure/ Environmental Commitment	Implementation Stage
7.1.1	Standard environmental best practice	Throughout (as required)	The activities required for the proposed Scheme's Construction Phase shall remain within the boundary of the proposed site, bar select compound areas, which will be located in adjacent lands for mitigation control reasons. The CEMP will also strictly adhere to best practice environmental guidance including but not limited to the following: ▪ CIRIA Guidance C532: Control of water pollution from construction sites. Guidance for consultants and contractors. (CIRIA, 2019 - www.ciria.org); ▪ CIRIA Guidance C741: Environmental good practice on site guide (Charles & Edwards, 2015; CIRIA, 2019 - www.ciria.org); ▪ CIRIA Guidance C750D: Groundwater control: design and practice (Preene et al., 2016; CIRIA, 2019 - www.ciria.org); ▪ CIRIA (C512): Environmental Handbook for Building and Civil Engineering Projects (CIRIA, 2000); ▪ CIRIA (C697): The SUDS Manual (CIRIA, 2015); ▪ CIRIA (C649) Control of water pollution from linear construction projects: Site guide (CIRIA 2006a); ▪ CIRIA (C848): Control of water pollution from linear construction projects: Technical guidance (CIRIA, 2006b);	C

NIS Reference	Sub-Section	Location	Description of Mitigation or Monitoring Measure/ Environmental Commitment	Implementation Stage
			▪ Inland Fisheries Ireland: Guidance on Protection of Fisheries During Construction Works In and Adjacent to Waters (IFI, 2016); and ▪ Inland Fisheries Ireland: A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning (IFI, 2020)	
7.1.2	Compound environmental management	Throughout (as required)	The construction contractor will be required to ensure good environmental management within the site compounds set up along the length of the proposed Scheme. The below list of measures will be incorporated into site compound environmental management: Site compounds will not be set up within Flood Zone A or B lands in accordance with the Office of Public Works (OPW) 'Planning System and Flood Risk Management Guidelines' (2009); Site compounds will not be located within core foraging areas utilised by wintering QI bird species; Only plant and materials necessary for the construction of the works will be permitted to be stored at the compound location; Site establishment by the contractor will include the following: ▪ Site offices; ▪ Site facilities (canteen, toilets, drying rooms, etc.); ▪ Office for construction management team; ▪ Secure compound for the storage of all on-site machinery and materials; ▪ Temporary car parking facilities; ▪ Temporary fencing; ▪ Site Security to restrict unauthorized entry; All sub-contractors will be given induction toolbox talk so that they are aware of material storage arrangements; Construction materials within the compound will be stored in a designated area in an organised manner so as to protect them from accidental damage and deterioration as a result of exposure; Bunded storage of fuels and refuelling area. Bunds shall be 110% capacity of the largest vessel contained within the bunded area; A separate container will be located in the contractor's compound to store absorbents used to contain spillages of hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste contractor at a licenced site. Records will be maintained of material taken off site for disposal;	C

NIS Reference	Sub-Section	Location	Description of Mitigation or Monitoring Measure/ Environmental Commitment	Implementation Stage
			A maintenance programme for the bunded areas will be managed by the site environmental manager. The removal of rainwater from the bunded areas will be their responsibility. Records will be maintained of materials taken off site for disposal; The site environmental manger will be responsible for maintaining all training records and weekly environmental inspections; Drainage collection system for washing area to prevent run-off into surface water system; Stockpiling of spoil and spoil-like materials will be appropriately located within the compounds to minimise exposure to prevailing winds; and All refuelling of vehicles will be carried out at the fuel stores within the main site compound and only ADR-trained personnel will be permitted to operate fuel bowsers.	
7.1.3	General mitigation measures ensuring the protection of surface water, groundwater and air quality throughout the proposed Scheme site	Throughout (as required)	Surface Water Management Plan, in order to safeguard the local surface water network, and in turn the local groundwater network, from surface water-based pollution events, the following must be strictly adhered to: The construction contractor will ensure compliance with environmental quality standards specified in the relevant legislation, namely European Communities (Environmental Objectives (Surface Waters)) Regulations, 2009 (S.I. No. 272 of 2009 and amendments), and the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293 of 1988); Oil booms and oil soakage pads should be maintained on-site to enable a rapid and effective response to any accidental spillage or discharge. These shall be disposed of correctly and records will be maintained by the environmental manager of the used booms and pads taken off site for disposal; Management of silt-laden water on-site, including procedures for accidental leaks / spills to ground, as well as water quality monitoring to ensure compliance with environmental quality standards specified above; At no point during the construction phase will treat water be discharged to local surface water network without the water quality meeting the statutory limits as set under the environmental quality standards specified above; Fail-safe site drainage and bunding through drip trays on plant and machinery will be provided to prevent discharge of chemical spillage from the sites to surface water; To prevent the spread of any accidental discharge into the surface water network, oil booms will be on hand when construction activities are located beside aquatic habitats in order to control and minimise the spread of the spill; Washout of concrete plant will occur at a designated impermeable area with waste control facilities;	C

NIS Reference	Sub-Section	Location	Description of Mitigation or Monitoring Measure/ Environmental Commitment	Implementation Stage
			Wherever reasonably possible, pre-cast concrete bridge features should be utilised to minimise the risk of a concrete-based pollution event; Concrete delivery, concrete pours and related construction methodologies will be part of the procedure agreed with the contractor to mitigate any possibility of spillage or contamination of the local environment. Particular attention will be paid during the pouring process in order to avoid leakages or spills of concrete; Temporary stockpiles will be monitored for leachate generation. These stockpiles will be placed within designated areas and not located within the vicinity of watercourses, wetlands or artificial surface water drainage features; Excavated contaminated soils (most likely present Tolka Valley Park) will be segregated and securely stored in a designated area where the possibility of runoff generation or infiltration to ground or surface water drainage has been eliminated through bunding and imperviable geotextile linings. The contaminated soils will then be classified as clean, inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC. Furthermore, the contractor will ensure that no cross-contamination with clean soils happens elsewhere throughout the proposed Scheme site; Silt fencing will be installed prior to the commencement of any construction works in order to enhance the protection of identified water features (River Tolka, Tolka Valley Park wetlands and Royal Canal). Shallow interceptor trenches will be installed in front of these silt fences where possible, as there are space and depth constraints within certain areas of Tolka Valley Park. An Ecological Clerks of Works (ECoW) will be present during the installation of these protective measures to ensure that they are installed to best practice standard and correctly located in their assigned areas. The following sub-section (7.1.4) will provide greater detail on specific locations of these silt fence / trench sections; and Silt fences will be repaired and/or replaced as necessary by the contractor as part of the on-going environmental monitoring programme.	
7.1.3	General mitigation measures (as above)	Throughout (as required)	Protection of Surface Water, Groundwater and Air Quality In order to protect surface water, groundwater and air quality throughout the proposed Scheme site, the contractor will be required to develop and implement a Surface Water Management Plan, Pollution Control Plan and Dust Management Plan. The minimally required list of mitigations measures outlined below will be incorporated into these plans.	C
7.1.3	General mitigation measures (as above)	Throughout (as required)	Pollution Control Plan Spill kits containing absorbent pads, granules and booms will be stored in the site compound with easy access for delivery to site in the case of an emergency. A minimum stock of spill kits will be maintained at all times and site forepersons' vehicles will carry large spill kits at all times.	C

NIS Reference	Sub-Section	Location	Description of Mitigation or Monitoring Measure/ Environmental Commitment	Implementation Stage
			Absorbent material will be used with pumps and generators at all times and used material disposed of in accordance with the Waste Management Plan. All used spill materials e.g., Absorbent pads, will be placed in a bunded container in the contractor's compound. The material will be disposed of by a licenced waste contractor at a licenced facility. Records will be maintained by the environmental site manager. Regular inspections and maintenance of plant and machinery checking for leaks, damage or vandalism will be made on all plant and equipment. In the event of a spill the contractor will ensure that the following procedure are in place: Emergency response awareness training for all personnel on-site works. Appropriate and sufficient spill control materials will be installed at strategic locations within the site. Spills kits for immediate use will be kept in the cab of mobile equipment. Spill kits must include suitable spill control materials to deal with the type of spillage that may occur and where it may occur. Typical contents of an on-site spill kit will include the following as a minimum: ▪ Absorbent granules; ▪ Absorbent mats/cushions; ▪ Absorbent booms ▪ Track-mats, geotextile material and drain covers. All potentially polluting substances such as oils and chemicals used during construction will be stored in containers clearly labelled and stored with suitable precautionary measures such as bunding within the site compound; All tank and drum storage areas on the site will, as a minimum, be bunded to a volume not less than the following: 110% of the capacity of the largest tank or drum within the bunded area, or 25% of the total volume of substances which could be stored within the bunded area. All hydrocarbons to be utilised during construction are to be appropriately handled, stored and disposed of in accordance with the TII document 'Guidelines for the crossing of watercourses during the construction of National Road Schemes' (NRA, 2008); The site compound fuel storage areas and cleaning areas will be rendered impervious and will be constructed to ensure no discharges will cause pollution to surface or ground waters; Designated locations for refuelling are within site compound; Potentially contaminated run off from plant and machinery maintenance areas will be managed within the site compound surface water collection system;	

NIS Reference	Sub-Section	Location	Description of Mitigation or Monitoring Measure/ Environmental Commitment	Implementation Stage
			Damaged or leaking containers will be removed from use and replaced immediately.	
7.1.3	General mitigation measures (as above)	Throughout (as required)	Dust Management Plan The following measures will be implemented to prevent excavation- and cement-based dusts entering the local surface water network and QI supporting ex-situ habitats: Limit the breaking of the topsoil or earth stripping from occurring during dry and windy weather; Wheel washing of vehicles leaving the site, covering of fine dry loads or spraying of loads prior to exiting the site, and if necessary regular cleaning of public roads in the vicinity of the entrance; The utilisation of pre-cast concrete features will minimise the generation of the concrete-based dusts throughout the proposed Scheme site; and Stockpiling of spoil and spoil-like materials will be appropriately located and covered and/or sprayed where possible to minimise exposure to prevailing winds, which will in turn minimise the generation of dust within the site.	C
7.1.4	Area 30	S30.1: Broombridge Stabling Site	Area specific mitigation measures are not required for Area 30 - S30.1: Broombridge Stabling Site during the Construction Phase, given its lack of surface water connection to local watercourses and its unsuitability for utilisation by flocks of QI bird species. The standard guidance and plans listed in sub sections 7.1.1, 7.1.2 and 7.1.3 will prove sufficient to address the required level mitigation need in this area.	
7.1.4	Area 31	S31.1: Broombridge to Tolka Valley Park (including Rail Overbridge)	In addition to the standard guidance and plans listed in sub sections 7.1.1, 7.1.2 and 7.1.3, the Broombridge to Tolka Valley Park (including Rail Overbridge) section requires specific surface water run-off control measures to ensure that pollutants do not enter the surface water pathway connecting the site to the Natura 2000 sites during site enabling and bridge construction works. This section will require the installation of geotextile sandbag barriers to protect the Royal Canal and its bankside vegetation. See Chapter 9 of this EIAR for the indicative locations of these proposed geotextiles sandbag barriers, the locations of which may be relocated provide there is acceptable rationale backing the relocation, as well as assurance that the functional integrity of the mitigation measures is not compromised. Figure 7-2 also highlights the indicative location of this section's site compound away from the canal. The local topography will help ensure no surface water from the compound reaches the canal. An ECoW will be present throughout the enabling and construction works in this section given the sensitivity of the habitats in this location, and the Royal Canal's status as surface water pathway to the Dublin Bay Natura 2000 sites	C

NIS Reference	Sub-Section	Location	Description of Mitigation or Monitoring Measure/ Environmental Commitment	Implementation Stage
7.1.4	Area 31	S31.2: Tolka Valley Park Bridge	Prior to commencement of the enabling works in this area, a series of biosecurity measures will have to be undertaken to prevent spread of invasive species, namely Japanese Knotweed, Himalayan Balsam and potentially Giant Hogweed as well. Japanese Knotweed is present along the right (South) bank of the River Tolka, in location which will place it within the immediate vicinity of the proposed bridge's southern abutment. Himalayan Balsam is present on both banks but closer to the water's edge and not in the immediate vicinity of the works. There is the potential for Giant Hogweed seeds to be present in both banks. While not listed on Third Schedule list of the European Communities (Birds and Natural Habitats) Regulations 2011 [S.I.477/2011], the invasive Butterfly-bush present in this area should also be removed in the interest of the site's native floral composition. The mitigation measures for invasive species will utilise the below best practice management guidance documents, where relevant; and are to be reference within the project's Invasive Species Management Plan: The Management of Invasive Alien Plant Species on National Roads – Technical Guidance (TII, 2020a); The Management of Invasive Alien Plant Species on National Roads – Standard (TII, 2020b); Invasive Species Ireland (ISI) - Best Practice Management Guidelines for Japanese Knotweed (ISI, 2008a); Invasive Species Ireland - Best Practice Management Guidelines for Himalayan Balsam (ISI, 2008b); Invasive Species Ireland - Best Practice Management Guidelines for Giant Hogweed (ISI, 2008c); and Inland Fisheries Ireland - Biosecurity Protocol for Field Survey Work (IFI, 2010). Listed below is a brief detailing of necessary measures to be undertaken to ensure biosecurity within this section of the proposed Scheme, all of which will need to be included within the proposed Scheme's Invasive Species Management Plan: An updated invasive species baseline survey, conducted prior to the commencement of the proposed Scheme's enabling works. This updated baseline is required as invasive species may have continued to spread within and adjacent to the proposed Scheme's site since the last invasive species or habitat survey was conducted on-site; As per TII guidance (TII, 2020a), this additional invasive species survey will include detailed maps of the precise location of each individual invasive species plant, as well as photos of these specific locations;	C

NIS Reference	Sub-Section	Location	Description of Mitigation or Monitoring Measure/ Environmental Commitment	Implementation Stage
			The pre-construction surveys will be undertaken by suitable experts with competence in identifying the species concerned; The adherence to a set of biosecurity measures, including: the fencing off / demarcating of the individual invasive species; communicating the location, risk and hazards associated with invasive species to construction personnel (e.g., Giant Hogweed); identifying dedicated access points into and out of fenced-off areas; the installation of designated decontamination facilities (where appropriate), protocols around the storage of infested soils; and seed and fragment checks on boot, tyres and tracks entering and leaving the work site. Best practice measures for the treatment of soils contaminated with invasive species (including potential seeds and fragments of mature plants) to prevent the accidental spread of said invasive species; As required by law, licences for the disposal of contaminated materials will be obtained, as well as the utilisation of licensed facilities; In regard to the importation of soil and other materials, the CAontractor will only utilise traceable topsoil for landscaping that has been cleared of any invasive species material; Measures to be implemented during the application of herbicides – Commitment to the appointment of a suitably qualified/registered/licensed pesticides advisor for any works requiring the use of pesticides, and safety precautions for consideration in the use of pesticides near watercourses. Areas which contained invasives species, where invasives were treated on-site or removed, prior to the enabling and construction works will require an on-going post-construction monitoring programme to ensure that there is no reestablishment of any invasive species within these areas.	
7.1.4	Area 31	S31.2: Tolka Valley Park Bridge	Surface Water Mitigations In addition to the standard guidance and plans listed in sub sections 7.1.1, 7.1.2 and 7.1.3, the Tolka Valley Bridge section requires specific surface water run-off control measures to ensure that pollutants do not enter the surface water pathway connecting the site to the Natura 2000 sites. Following the treatment and removal of the invasive species from this section of the works, this section will require the installation of silt fences and geotextile sandbag barriers to protect the Tolka Valley Park ICWs and Pond, and the River Tolka. See Chapter 9 of this EIAR for the indicative locations of these proposed silt fences and geotextiles sandbag barriers, the locations	C

NIS Reference	Sub-Section	Location	Description of Mitigation or Monitoring Measure/ Environmental Commitment	Implementation Stage
			of which may be relocated provide there is acceptable rationale backing the relocation as well as assurance that the functional integrity of the mitigation measures is not compromised. An ECoW will be present throughout the enabling and construction works in this section given the sensitivity of the habitats in this location, and the River Tolka's status as a surface water pathway to the Dublin Bay Natura 2000 sites. The ECoW will be key overseer for when the surface water barriers (silt fences and geotextile sandbag barriers) are adjusted for the works on the creation of the bridge abutments; and the construction of the bridge's temporary falsework.	
7.1.4	Area 31	S31.3: Tolka Valley Park to Tolka Valley Road	The remainder of the Tolka Valley Park area / section will require the installation of silt fences and geotextile sandbag barriers to safeguard the Tolka Valley Park ICWs and Pond, and the River Tolka. See Chapter 9 of this EIAR for the indicative locations of these proposed silt fences and geotextiles sandbag barriers, the locations of which may be relocated provide there is acceptable rationale backing the location as well as assurance that the functional integrity of the mitigation measures is not compromised. Figure 7-4 in Chapter 9 of this EIAR also displays the location of this section's site compound. The standard guidance and plans listed in sub sections 7.1.1, 7.1.2 and 7.1.3 will also be required in order to protect the surface water and groundwater networks, as well as the health of amenity grassland habitats utilised by the QI bird species. An ECoW will be regularly present on-site during the works to ensure that all the prescribed mitigation measures are being strictly adhered to.	C
7.1.4	Area 32	S32.1: Tolka Valley Road to St Helena's Road	Seasonal construction constraints are required in order to mitigate for the risk of disturbance to QI bird species during the winter period within the amenity grasslands (West Farnham area - Western playing pitches and East Farnham area - Erin Isle GAA pitches), located within and adjacent to the proposed Scheme. Given that up to 64.59% of North Bull Island SPA's Light-bellied Brent Goose population, as well as smaller flocks of other QI species (Black-headed Gull, Herring and Curlew), can be present within the Farnham area during the high frequency utilisation months (December to February inclusive), a minimum disturbance buffer of 200m from the identified core foraging areas will be in place throughout these months (see Figure 7-5 bin Chapter 9 of this EIAR). This will mean that no enabling or construction works will be conducted within this 200m buffer for these months. This disturbance buffer (enabling construction work exclusion buffer) is reduced to minimum of 100m during the low frequency foraging months, namely October to November, and March to April. Works north of Wellmount Road can be conducted without any seasonal restrictions. The standard guidance and plans listed in sub sections 7.1.1, 7.1.2 and 7.1.3 will also be required in order to protect the health of amenity grassland habitats utilised by the QI bird species.	C

NIS Reference	Sub-Section	Location	Description of Mitigation or Monitoring Measure/ Environmental Commitment	Implementation Stage
7.1.4	Area 32	S32.2: St Helena's Road to Cardiff Castle Road	Similarly, to the Tolka Valley Road to St Helena's Road section, Area 32 - S32.2 will also be required to follow the seasonal restrictions on enabling and construction works within the Farnham area (see Figure 7-5 in Chapter 9 of this EIAR). This will mean that no enabling or construction works will be conducted within this 200m buffer between the months of December to February inclusive. This disturbance buffer (enabling construction work exclusion buffer) is reduced to minimum of 100m during the low frequency foraging months, namely October to November, and March to April. Works south of St Helena's Drive can be conducted without any seasonal restrictions. The standard guidance and plans listed in sub sections 7.1.1, 7.1.2 and 7.1.3 will also be required in order to protected the health of amenity grassland habitats utilised by the QI bird species	C
7.1.4	Area 32	S32.3: Finglas Village and Finglas Village Stop	Area specific mitigation measures are not required for Area 32 - S32.3: Finglas Village and Finglas Village Stop during the Construction Phase, given its lack of surface water connection to local watercourses and its unsuitability for utilisation by flocks of QI bird species. The standard guidance and plans listed in sub sections 7.1.1, 7.1.2 and 7.1.3 will prove sufficient to address the required level mitigation needed in this area.	C
7.1.4	Area 33	S33.1: Mellowes Park	While Mellowes Park supports Black-headed Gull, Herring Gull and Common Gull, these species were only observed occasionally and in low numbers, as result the park has not been deemed a core wintering bird foraging area. Therefore, it has been deemed that Area 33 - S33.1 Mellowes Park will not require specific mitigations during the Construction Phase, given its lack of surface water connection to local watercourses and its limited capacity to support three of the QI bird species. The standard guidance and plans listed in sub sections 7.1.1, 7.1.2 and 7.1.3 will prove sufficient to address the required level mitigation needed in this area.	C
7.1.4	Area 33	S33.2: R135/R104 junction	Area specific mitigation measures are not required for Area 33 - S33.2: R135/R104 junction during the Construction Phase, given its lack of surface water connection to local watercourses and its unsuitability for utilisation by flocks of QI bird species. The standard guidance and plans listed in sub-sections 7.1.1, 7.1.2 and 7.1.3 will prove sufficient to address the required level mitigation needed in this area.	C
7.1.4	Area 33	S33.3: St Margaret's Stop	Area specific mitigation measures are not required for Area 33 - S33.3: St Margaret's Stop during the Construction Phase, given its lack of surface water connection to local watercourses and its unsuitability for utilisation by flocks of QI bird species. The standard guidance and plans listed in sub sections 7.1.1, 7.1.2 and 7.1.3 will prove sufficient to address the required level mitigation needed in this area.	C
7.1.4	Area 33	S33.4: St Margaret's Road	Area specific mitigation measures are not required for Area 33 - S33.4: St Margaret's Road and Charlestown Terminus during the Construction Phase, given its lack of surface water connection	C

NIS Reference	Sub-Section	Location	Description of Mitigation or Monitoring Measure/ Environmental Commitment	Implementation Stage
		and Charlestown Terminus	to local watercourses and its unsuitability for utilisation by flocks of QI bird species. The standard guidance and plans listed in sub sections 7.1.1, 7.1.2 and 7.1.3 will prove sufficient to address the required level mitigation needed in this area.	

1.8.2 General Site Management

1.8.2.1 Construction Process

The proposed Scheme is a major construction project, and it will include many types of construction activities such as utility works, demolition, site clearance, earthworks, bridge works and railway works. The following sections outline the general construction site operations.

1.8.2.2 Working Hours

The timing of construction activities, standard working hours and the rate of progress of construction works are a balance between efficiency of construction and minimising nuisance and significant effects. The contractors will require their staff and Subcontractors to adhere to the standard construction working hours.

Standard working hours, as set out in Volume 2 – Chapter 6 (Construction Activities) section 6.6, are from 07:00hrs to 19:00hrs on weekdays (excluding Bank and Public Holidays) and from 07:00hrs to 13:00hrs on Saturdays. This includes standard delivery hours to the construction sites.

Table A6 1-7: Standard Working Times

Days	Hours
Monday to Friday	07:00 hrs to 19:00 hrs (this includes a half hour to prepare site at each end, giving 11 hours working: 07:30 hrs to 18:30 hrs)
Saturday	07:00 hrs to 13:00 hrs (this includes a half hour to prepare site at each end, giving 5 hours working: 07:30 hrs to 12:30 hrs)
Sunday/Public Holidays, including annual and extraordinary events	None (only by exception, with those activities listed below under additional working hours)

The Standard working times will be included in the Works Requirements and construction will take consideration of sensitive receptors, in particular any nearby residential areas. Working hours on roads requiring lane closures will be restricted so as to minimise impact on traffic during peak traffic hours. These traffic management restrictions will be included in the Works Requirements.

Most construction activities will be undertaken during the proposed standard working hours, as outlined above, however there will be a number of activities that require working outside of these standard hours. These will include:

- Utilities, roadworks and other works affecting traffic may be extended to working outside of standard hours;
- Large structure works and concrete pours and may require working outside of standard hours.
- Track bed and track laying and associated concrete batching;
- Dewatering excavations, the pumping of groundwater will be continuous (24 hours a day, seven days a week) for the duration required for construction at each location; and
- ‘Special/abnormal’ deliveries: may require extended hours or overnight deliveries.

1.8.2.3 Construction Compounds and Access

As part of preparatory works, the construction compounds will be set up, which will include installation of the necessary facilities including the site office, welfare facilities, etc. Controlled access to the construction compounds will be implemented, fencing will be erected, and lighting will be installed. The construction compounds will be secured with Closed-Circuit Television (CCTV), to ensure safe storage of all material, plant and equipment. The construction compounds are described in Chapter 6 (Construction Activities) of the EIAR.

Temporary working areas located along the proposed alignment will be provided to aid the construction of the Works. These strips of land will be located either side of the alignment and will be used for logistics and access along the route. Temporary and permanent land-take boundaries for the proposed Scheme are detailed in Chapter 12 (Land Take) of the EIAR and in the property drawings and schedules.

Haul roads will be required to connect the Works to the public road network. These roads will be the main route for vehicles entering the site, including deliveries and arrival and departure of the workforce. The haul roads are described in Chapter 6 (Construction Activities) of the EIAR.

1.8.2.4 Good Housekeeping

The contractors will always ensure good housekeeping practices on site to prevent negative visual impacts, accidents and/or complaints from the public. This will include, but not be limited to, the following requirements:

- General maintenance of working areas and cleanliness of welfare facilities and storage areas; All contractors will be made aware of material storage arrangements at induction and through toolbox talks. Materials will be stored in a designated area in an organised manner so as to protect them from damage, deterioration and loss;
- Provision of a site layout map showing key areas such as first aid posts, material storage, spill kits, material and waste storage and welfare facilities;
- Weekly environmental inspections to identify any evidence of poor housekeeping practices;
- Maintenance of all construction plant, material and equipment and ensure these are in good order, clean and tidy;
- Keep construction compounds, access routes and designated parking areas free and clear of excess dirt, scrap wood, rubbish piles at all times;
- Details of site managers contact numbers and public information signs (including warning signs) will be provided at the boundaries of the working areas. Any complaints from the public regarding waste and housekeeping will be entered in the complaints register and actioned as required;
- Provision of appropriate welfare facilities for site personnel at all main compounds. The facilities will include canteens, toilets, showers, locker rooms and first aid posts. The facilities will be connected to the mains services and drainage, where reasonably practicable;
- Installation of appropriate security, lighting, fencing and hoarding at each working area;
- Keep hoarding and fencing free of graffiti or posters;
- Effective prevention of oil, grease or other objectionable matter being discharged from any working area;
- Provision of appropriate waste management facilities at each working area and regular collections to be arranged;
- Maintenance of wheel washing facilities and other contaminant measures as required in each working area;
- Effective prevention of infestation from pests and vermin, including arrangements for regular disposal of food and material attractive to pests;
- No discharge of site runoff or water discharge without agreements of the relevant authorities;
- Installation of fencing and signage around any known invasive species;
- Protection of any historical heritage on site;
- Maintenance of public rights of way, diversions and entry/exit areas around working areas for pedestrians and cyclists where practicable; and
- Material handling and/or stockpiling of materials/spoil, where permitted, will be appropriately located to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.

1.8.3 Water and Energy Management Plan

The contractor will complete a Water and Energy Management Plan with consideration of associated impacts on the natural and built environment.

It will describe how water supply, usage and wastewater arisings will be managed during the construction stages of the proposed Scheme. Specifically, it will detail:

- Management of water supply at offices and welfare units, for wheel washing, for surface washing, for dust suppression and for concrete batching;
- Detail where water for each site will be sourced from;
- Identify strategies for minimising water use and for conserving water; and

- Identify treatment and means of disposal of wastewater at site compounds.

The plan will also consider and make commitments with regard to emissions to the atmosphere, resource usage and energy consumption during construction.

1.8.4 Dust Management Plan

The following Dust Management Plan has been prepared as part of the EIAR which provides the strategy to be adopted in order to manage dust during construction. This will be incorporated by each contractor into their Plans and implemented as part of their works. This plan and mitigation measures are in accordance with the IAQM (Institute of Air Quality Management) Guidance, with the mitigation measures proposed in accordance with the determination that the highest risk category should be applied to the Construction Phase of the proposed Scheme.

1.8.4.1 Construction Phase Mitigation Measures

Communications

- As part of stakeholder communications display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager; and
- Display the head or regional office contact information.

Dust Management

- Dust Management to include monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections.

Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the local authority when asked;
- Record any exceptional incidents that cause dust and/or air emissions, either on or offsite, and the action taken to resolve the situation in the logbook; and
- Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary if applicable, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.

Monitoring

- 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 100 m of site boundary, with cleaning to be provided if necessary;
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked; and
- 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

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period;
- Avoid site runoff of water or mud;

- Keep site fencing, barriers and scaffolding clean using wet methods;
- 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
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating vehicle/machinery and sustainable travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles;
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable;
- Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas; and
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes and conveyors and covered skips;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- 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.

Waste Management

- Avoid bonfires and burning of waste materials.

The IAQM Guidance Mitigation Measures applicable to the specific works undertaken are as follows:

Measures specific to demolition

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust;
- Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground;
- Avoid explosive blasting, using appropriate manual or mechanical alternatives; and
- Bag and remove any biological debris or damp down such material before demolition.

Measures specific to earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable; and
- Only remove the cover in small areas during work and not all at once.

Measures specific to construction

- Avoid scabbling (roughening of concrete surfaces) if possible;
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures specific to trackout

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;
- Avoid dry sweeping of large areas;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- Record all inspections of haul routes and any subsequent action in a site logbook;
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned;
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable);
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; and
- Access gates to be located at least 10m from receptors where possible.

Construction Phase *Aspergillus* Mitigation Measures

Aspergillus is a fungus that is found in soil and has the potential to be made airborne during demolition or excavation. *Aspergillus* is of particular concern near hospitals or health clinics where immune suppressed patients are accommodated. While no such sensitive receptors were identified within the proposed Scheme construction area, a competent contractor will be appointed to prepare an *Aspergillus* Prevention Plan taking into account the National Guidelines for the Prevention of Nosocomial Aspergillosis (HSE 2018) which provides a risk assessment for aspergillus and preventative dust mitigation measures and in Appendix B of the document pre-project planning and contractor advice. Survey and prevention works with respect to *Aspergillus* will take place before construction commences by a competent contractor in proximity to any sensitive buildings and hospitals or health clinics. If pre-construction surveys indicate that *Aspergillus* is a risk, the prevention works will include sealing the windows to the façades that are in close proximity to the hospital to prevent fugitive dust entering the hospital through windows. These works will form part of an *Aspergillus* Prevention Plan to be completed by a specialist and will ensure the prevention of *Aspergillus* spores spreading. Research has found that dust suppression techniques, such as proposed also prevent the suspension of aspergillus successfully (Fournel et al. 2010).

Construction Phase Asbestos Mitigation Measures

Asbestos is the name for a group of natural occurring mineral fibres which are strong and both heat and chemically resistant. Due to these properties, asbestos was commonly used in the past as insulation and fireproofing. It was also used as a component in other building materials. Asbestos can be found in any industrial, commercial, public or residential building built or refurbished before the year 2000. There are three main types of asbestos found in Ireland – chrysotile (white asbestos), amosite (brown asbestos) and crocidolite (blue asbestos). The risk associated with exposure to asbestos relates to the possibility that the fibres within the asbestos containing material can become released into the air and are then inhaled. Breathing in air containing asbestos fibres can lead to asbestos-related diseases (mainly cancers of the chest and lungs). These diseases will not occur immediately and can take from 15 – 60 years to develop.

A Demolition Survey of all buildings to be demolished will be required prior to commencement of any such demolition works. This will include an intrusive asbestos-containing materials survey, which will involve destructive inspection. Prior to commencement of the demolition works, all asbestos containing materials identified by the Management Asbestos Survey and Refurbishment and Demolition Survey, will be removed by a suitably trained and competent person. Asbestos-containing materials will only be removed from site by a suitably permitted/licensed waste contractor and will be brought to a suitably licensed facility. The Health and Safety Authority will be contacted where needed in relation to the handling of asbestos and material will be dealt with in accordance with the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006, as amended and associated approved Codes of Practice.

1.8.5 Carbon Management Plan

Subject to planning approval, the appointed Contractor will implement a whole-life Carbon Management Plan aligned to PAS 2080:2023 Carbon management in buildings and infrastructure which has been used to inform the detailed design, build and operation of the proposed Scheme. The TII Carbon Assessment Tool for the calculation of emissions arising from the Construction Phase (e.g., embodied carbon in construction materials, energy, and fuel use) and maintenance emissions is aligned with PAS 2080.

1.8.6 Noise and Vibration Management Plan

The following Noise and Vibration Management Plan has been prepared as part of the EIAR which provides the strategy to be adopted in order to manage noise and vibration during construction. This will be incorporated by each contractor into their Plans and implemented as part of their works. This plan and mitigation measures are in accordance with the mitigation and monitoring measures identified in Chapter 15 (Noise and Vibration) of this EIAR.

1.8.6.1 Noise

The main principles and standards required for noise mitigation are outlined as follows:

- The contractor undertaking the construction of the works will be required to take specific noise abatement measures to the extent required and comply with the recommendations of BS 5228–1 (BS 5228-1, 2014);
- The contractor will undertake a reassessment of noise levels once further information is available as part of the identification of mitigation measures. This will include details of all anticipated out of core hours work;
- The selection of plant items will be required to comply and European Communities Noise Emissions by Equipment for Use Outdoors (Amendment) Regulations 2006 (EC, 2006);
- The contractor will prepare a Noise and Vibration Management Plan (CNVMP) which will be formulated for the Construction Phase and used by all contractors based on the mitigation measures outlined in this chapter, and the CEMP. The CNVMP will be a live document; and
- As part of the CNVMP, a baseline noise study will be undertaken prior to the commencement of construction works in order to characterise the prevailing noise environment at impacted NSLs. This information will be used to inform the relevant CNTs.

The key principles relating to noise mitigation will be applied across all construction activities for the proposed Scheme:

- Noise control at Source: Selection of quiet plant, site layout, attenuation at source, operational control (hours and periods); and
- Noise Control along Pathway: Localised screening to plant items on site, enclosures, site buildings, site hoarding and noise barriers

The impact assessment has identified that mitigation measures are required across the proposed Scheme to control construction noise impacts. The approach for mitigation will follow the construction noise control hierarchy as above. BS 5228–1 (BS 5228-1, 2014) includes guidance on these measures which are set out briefly in the following paragraphs.

Note that the mitigation measures specified here are also part of the CEMP.

Selection of Quiet Plant

The potential for any item of plant to result in exceedance of construction noise thresholds will be assessed prior to the item being brought onto the site. The least noisy item of plant will be selected wherever practicable (e.g. plant items with sound attenuation incorporated). Should a particular item of plant already on the site be found to exceed the construction noise thresholds, the first action will be to identify whether the item can be replaced with a quieter alternative.

The contractor(s) will evaluate the choice of piling, excavation, breaking or other working method taking into account various ground conditions and site constraints. Where alternative lower noise generating equipment that would economically achieve, in the given ground conditions, equivalent structural/excavation/breaking results, these will be selected to control noise emissions, where deemed feasible.

The use of non-percussive piling methodologies will be used where possible across the proposed Scheme to control noise and vibration impacts.

Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, noise control “at source” will be followed. This refers to the modification of an item of plant, or the application of improved sound reduction methods in consultation with the supplier or the best practice use of equipment and materials handling to reduce noise. Proposed techniques will also be evaluated considering their potential effect on occupational health and safety. The following guidance relates to practical noise control at source techniques which relate to specific site considerations:

- For static plant such as compressors, generators, motors and pumps within each construction compound, the units will be surrounded by acoustic lagging or have acoustic enclosures providing air ventilation, as required, to ensure CNTs are not exceeded, particularly if required at night;
- Where practicable, equipment powered by mains electricity shall be used in preference to equipment powered by internal combustion engines or locally generated electricity;
- For mobile plant items such as dump trucks, cranes, excavators and loaders, the installation of an acoustic exhaust, utilizing an acoustic canopy to replace the normal engine cover and/or maintaining enclosure panels closed during operation can be used to reduce noise levels by up to 10dB;
- Reverse alarms from mobile plant within construction compounds, will be broadband to reduce tonal elements from this source;
- For piling plant, noise reduction can be achieved by enclosing the driving system in an acoustic shroud. For steady continuous noise, such as that generated by diesel engines, it is possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy to replace the normal engine cover;
- Mobile and stationary plant will be switched off or throttled back to a minimum when not in use (engines, motors and generators). Lorries, trucks and concrete vehicles will not be permitted to queue outside site compounds with engines left idling;
- For percussive tools such as pneumatic concrete breakers and tools used for utility diversion works and surface level ground breaking for track construction, a number of noise control measures include fitting a muffler or sound reducing equipment to the breaker ‘tool’, and ensuring any leaks in the air lines are sealed;
- For all materials handling within compounds, the contractor will ensure that best practice site noise control measures are implemented including ensuring that materials are not dropped from excessive heights and drop chutes/dump trucks are lined with resilient materials. This is an important consideration for site compounds where materials are loaded and unloaded;
- Resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can be controlled by fixing resilient materials in between the surfaces in contact;
- All items of plant will be subject to regular maintenance. All vehicles and mechanical plant will be maintained in good working order for the duration of the contract. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures; and
- The impact from works will be controlled using the best practicable means set out above and restricting significant noise and vibration generating activities to daytime hours where possible.

Construction Working - Hours of Work

From a consideration of construction working hours, a number of points arise:

- One of the key principles relating to control of noise impacts from construction relates to the periods and hours during which the construction works will take place. The construction working hours for the proposed Scheme are set out previously;
- The proposed construction working hours are mostly limited to daytime hours only from Monday to Friday and to Saturday morning periods. This approach assists with limiting the duration over which NSLs are exposed to construction noise impacts;
- It will be necessary to work overtime (including weekends) and night shifts at certain critical stages during the Construction Phase e.g. during works adjacent to live rail lines at Broombridge and some road works;
- Activities will be scheduled in a manner that reflects the location of the site and the nature of NSLs. Construction activities/plant items will be considered with respect to their potential to exceed CNTs at NSLs and will be scheduled according to their noise level, proximity to sensitive locations and possible options for noise control; and
- For work areas where night-time activities will be required, as far as practicable, activities with highest noise emissions will be scheduled during daytime periods and/or daytime shifts will set up the relevant sites for night-time periods to avoid unnecessary use of mobile plant, cranes, and material handling to occur during night-time periods.

Screening

Typically, screening is an effective method of reducing the noise level from construction work areas and can be used successfully as an additional measure to other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and receiver.

Given the linear nature of the works, it is likely that a standard construction hoarding will not be practical for many locations. Previously on Luas Green Line the use of temporary mobile noise screens was a successful measure to screen the works. It is proposed that a similar strategy be adopted for the proposed Scheme.

BS 5228–1 (BS 5228-1, 2014) states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the barrier will be such that there are no gaps or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the top of the barrier rather than the transmission through the barrier itself. In practice, screens constructed of materials with a mass per unit of surface area greater than 10kg/m^2 will give adequate sound insulation performance.

Consultation with Stakeholders

The following measures should be adopted:

- The proposed Scheme team including Client, contractor and Local Authorities will engage in regular meetings to discuss the approach to noise management during construction;
- A particular emphasis should be placed on the risk of noise impacts during any out of hours work;
- The contractor will provide proactive community relations and will notify the public and vibration sensitive premises before the commencement of any works forecast to generate appreciable levels of noise or vibration, explaining the nature and duration of the works;
- The contractor will distribute information circulars informing people of the progress of works and any likely periods of significant noise and vibration; and
- A designated noise liaison officer will be appointed to site during construction works. All noise complaints will be logged and followed up in a prompt fashion by the liaison officer.

Monitoring

During the Construction Phase, the contractor will be required to carry out noise and vibration monitoring at representative NSLs to evaluate and inform the requirement and/or implementation of noise and or vibration management measures.

A full monitoring and auditing programme will form part of the CNVMP which will be agreed with the Local Authorities prior to the commencement of the Construction Phase. As a minimum the monitoring programme will include an alert system for threshold exceedances, remote access and a platform for sharing monitoring results between the contractor, TII and DCC.

Note that it will be important to ensure that the monitoring regime accurately captures the baseline environment prior to construction beginning. Once construction work begins the monitoring will capture total noise from both construction and other environmental noise sources, e.g. traffic. It will therefore be necessary to use the baseline noise measurements to accurately assess the contribution of construction to the total noise.

1.8.6.2 Construction Traffic

Mitigation measures to reduce noise from construction traffic are limited to restricting speed limits, maintaining road surfaces and ensuring that all vehicles are properly maintained. In addition, any coverings on construction vehicles will be securely fastened before leaving site to avoid excessive 'rattling'.

1.8.6.3 Construction Vibration

The vibration from construction activities will be limited to the values. Limit values have been provided for the following building types:

- Residential and commercial properties of sound construction; and
- Protected structures and sensitive buildings such as those with no or minimal foundations.

It is understood that bored piling is to be used and this is a piling method which generates relatively low levels of vibration. Notwithstanding this, consideration should be given to the following methods to further mitigate the vibration levels:

- Minimise obstructions between the vibration source and the sensitive receiver, e.g. old basement floors, old foundations etc., which exacerbate the transmission of vibration; and
- Reduce the resistance to bored piles by "mudding in". This technique involves lubricating the borehole with a small amount of bentonite slurry.

In the case of vibration levels giving rise to human discomfort, and in order to minimise such impacts, the following measures shall be implemented during the construction period:

- A clear communication programme will be established by TII to inform adjacent building occupants in advance of any potential intrusive works which may give rise to vibration levels likely to result in significant effects. The nature and duration of the works will be clearly set out in all communication circulars as necessary;
- Activities capable of generating significant vibration effects with respect to human response be restricted to daytime hours only; and
- Appropriate vibration isolation shall be applied to plant (such as resilient mounts to pumps and generators), where required and where feasible.

1.8.7 Traffic Management Plan - Appendix A6.2

A Construction Traffic Management Plan (CTMP) has been prepared to demonstrate the manner in which the interface between the public and construction-related traffic will be managed and how vehicular movement will be controlled. The purpose of this CTMP is to demonstrate that the residual impacts to public road network during the Construction Phase of the proposed Scheme, which have been identified in the application documentation, can be minimised and that transport related activities are carried out as safely as possible and with the minimum disruption to other road users. This plan must be finalised by the Project Supervisor for the Construction Stage (PSCS)/Contractor prior to commencing the works and should not be implemented until it has been assessed and developed by the PSCS. The PSCS shall co-ordinate the implementation of the developed Traffic Management Plan during construction of the works. The Works

Requirements will require the implementation of all the applicable mitigation measures identified in the EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála in the CTMP.

The CTMP will take consideration of the Phasing requirements of the proposed Scheme which will ensure safe construction and minimise the impact on traffic on NMUs along the route of the proposed Scheme and maintaining flow of all modes of transport wherever practicable.

1.8.8 Invasive Species Management Plan - Appendix A6.3

The Invasive Species Management Plan (ISMP) has been prepared as part of the EIAR which provides the strategy to be adopted in order to manage and prevent the spread of non-native invasive plant species. This will be incorporated by each contractor into the Plans. Further details on the assessment of non-native invasive species, and associated mitigation measures are provided in Chapter 9 (Biodiversity) of this EIAR.

Of the INNS identified, two species (and potentially a third), namely Himalayan Balsam, Japanese Knotweed and Giant Hogweed, are located in a sensitive location by the proposed Tolka Valley Park Luas bridge; as such, these species will be the focus of biosecurity measures going forward. Of these, the Japanese Knotweed and Giant Hogweed boast salinity tolerances which may allow them to colonise saltmarsh habitats, and therefore pose a threat to the Dublin Bay Natura 2000 sites. As the Japanese Knotweed along the River Tolka will need to be removed to allow for the installation of the new bridge in this area, it is the most likely invasive species to be accidentally spread downstream into the Natura 2000 sites.

Listed below is a brief detailing of necessary measures to be undertaken to ensure biosecurity within this section of the LRT, all of which will need to be included within the proposed Schemes Invasive Species Management Plan:

- An updated invasive species baseline survey, conducted prior to the commencement of the proposed Scheme's enabling works. This updated baseline is required as invasive species may have continued to spread within and adjacent to the proposed Scheme's site since the last invasive species or habitat survey was conducted on-site;
- As per the TII guidance (TII, 2020a), this additional invasive species survey will include detailed maps of the precise location of each individual invasive species plant, as well as photos of these specific locations;
- The pre-construction surveys will be undertaken by suitable experts with competence in identifying the species concerned;
- The adherence to a set of biosecurity measures as set out in the ISMP in this EIAR, including:
  - Known or potentially infested areas within the working area of the proposed Scheme shall be clearly demarcated and fenced off in advance of works and access restricted until such time that treatment has commenced and / or construction works are monitored in accordance with the ISMP in the area. In relation to Japanese knotweed, the guidance recommends an exclusion buffer of 7m (metres) in all directions (within the works area and 3m vertically underground);
  - The implementation of clear signage in accordance with the TII IAPS standards will be erected at compounds, and at the boundary of the exclusion fencing. These signs will be briefed out at toolbox talks specific to each INNS to personnel on site and particular attention will be given to INNS that have the potential to cause injuries such as Giant hogweed.
  - Identify and create access points into exclusion areas for INNS. These are only to be used by specialist personnel for the removal of INNS and are not to be used by general site workers until such a time as all contaminated material has been removed from site and it is safe to enter.
  - Where it is practicable, a wheel wash and footwear washing facilities will be provided to ensure biosecurity measure are preventing the further potential spread of INNS. These locations are to be provided by the contractor. Where a dedicated / bespoke wheel wash cannot be installed owing to space limitations, the appointed contractor will ensure that no excavated loose material is allowed off site from within an exclusion zone.
  - Where plant that is used to excavate soils, it shall be visually checked for loose soil before movement to another part of site (where possible, the movements of tracked machinery should be restricted within the non-native invasive species exclusion zone). Loose soil shall be scraped off

and disposed of, and a solution of Virkon© (or similar approved disinfectant) applied to machinery to ensure that no obscured seed / root material remains viable. Vehicular movements within the exclusion area shall be minimised as far as is practical;
  - Unless in the exceptional circumstance that direction is given from a suitably qualified ecologist, no storage of contaminated soil on site. Instead, being disposed of in a licenced soil waste facility.

- Where small volumes (e.g. volumes capable of being double bagged in quarantine bags such as cut plants, bulbs or loose soil occur), it may be practical to bag the material and bring it to a clearly demarcated and dedicated quarantine area within the Construction Compounds until such time that the material is disposed of to an authorised facility, similar to the process of disposing of bulk excavated contaminated soil. Best practice measures for the treatment of soils contaminated with invasive species (including potential seeds and fragments of mature plants) to prevent the accidental spread of said invasive species.
- As required by law, licences for the disposal of contaminated materials will be obtained, as well as the utilisation of licensed facilities;
- In regard to the importation of soil and other materials, the construction contractor will only utilise traceable topsoil for landscaping that has been cleared of any invasive species material;
- Measures to be implemented during the application of herbicides – commitment to the appointment of a suitably qualified/registered/licensed pesticides advisor for any works requiring the use of pesticides, and safety precautions for consideration in the use of pesticides near watercourses; and
- Areas which contained invasives species, where invasives were treated on-site or removed, prior to the enabling and construction works will require an on-going post-construction monitoring programme to ensure that there is no reestablishment of any invasive species within these areas.

1.8.9 Surface Water Management Plan - Appendix A6.4

The Surface Water Management Plan (SWMP) has been prepared which details control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the Construction Phase of the proposed Scheme. It will be a condition of the Works Requirements that the successful contractor, immediately following appointment, must detail in the SWMP how it is intended to effectively implement all the applicable measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.

As identified in Chapter 9 (Biodiversity) of this EIAR and the SWMP, and in order to protect surface water, groundwater and air quality throughout the proposed Scheme's site, the construction contractor will be required to develop and implement a Surface Water Management Plan with the minimally required list of mitigations measures outlined below to be incorporated into this plan.

In order to safeguard the local surface water network, and in turn the local groundwater network, from surface water-based pollution events, the following must be strictly adhered to:

- The construction contractor will ensure compliance with environmental quality standards specified in the relevant legislation, namely European Communities (Environmental Objectives (Surface Waters)) Regulations, 2009 (S.I. No. 272 of 2009 and amendments), and the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293 of 1988);
- Oil booms and oil soakage pads should be maintained on-site to enable a rapid and effective response to any accidental spillage or discharge. These shall be disposed of correctly and records will be maintained by the environmental manager of the used booms and pads taken off site for disposal;
- Management of silt-laden water on-site, including procedures for accidental leaks / spills to ground, as well as water quality monitoring to ensure compliance with environmental quality standards specified above;
- At no point during the Construction Phase will treated water be discharged to local surface water network without the water quality meeting the statutory limits as set under the environmental quality standards specified above;
- Fail-safe site drainage and bunding through drip trays on plant and machinery will be provided to prevent discharge of chemical spillage from the sites to surface water;

- To prevent the spread of any accidental discharge into the surface water network, oil booms will be on hand when construction activities are located beside aquatic habitats in order to control and minimise the spread of the spill;
- Washout of concrete plant will occur at a designated impermeable area with waste control facilities.
- Wherever reasonably possible, pre-cast concrete bridge features should be utilised to minimise the risk of a concrete-based pollution event;
- Concrete delivery, concrete pours and related construction methodologies will be part of the procedure agreed with the contractor to mitigate any possibility of spillage or contamination of the local environment. Particular attention will be paid during the pouring process in order to avoid leakages or spills of concrete;
- Temporary stockpiles will be monitored for leachate generation. These stockpiles will be placed within designated areas and not located within the vicinity of watercourses, wetlands or artificial surface water drainage features;
- Excavated contaminated soils (most likely present Tolka Valley Park) will be segregated and securely stored in a designated area where the possibility of runoff generation or infiltration to ground or surface water drainage has been eliminated through bunding and imperviable geotextile linings. The contaminated soils will then be classified as clean, inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC. Furthermore, the contractor will ensure that no cross-contamination with clean soils happens elsewhere throughout the proposed Scheme's site;
- Silt fencing will be installed prior to the commencement of any construction works in order to enhance the protection of identified water features (River Tolka, Tolka Valley Park wetlands and Royal Canal). Shallow interceptor trenches will be installed in front of these silt fences where possible, as there are space and depth constraints within certain areas of Tolka Valley Park. An Ecological Clerks of Works (ECoW) will be present during the installation of these protective measures to ensure that they are installed to best practice standard and correctly located in their assigned areas. The following sub-sections will provide greater detail on specific locations of these silt fence / trench sections;
- Silt fences will be repaired and/or replaced as necessary by the construction contractor as part of the on-going environmental monitoring programme; and
- The contractor shall ensure access and egress for emergency vehicles to drainage and suds features is not restricted during the works. Site staff will maintain awareness of flood and weather forecasts on an ongoing basis as well as receiving warnings from Dublin City Council, Fingal County Council and Met Eireann as appropriates so advance measures can be put in place.

1.8.10 Construction and Demolition Resource and Waste Management - Appendix A6.5

The contractor will be required to develop a Construction and Demolition Resource and Waste Management Plan (C&D RWMP), which incorporates all of the measures outlined in this Chapter, Chapter 11 (Land and Soils) and Chapter 19 (Material Assets: Waste Management). The C&D WMP will identify how waste arisings are to be controlled and managed during the course of the proposed Scheme, in particular how waste prevention principles will be applied and how on-site waste will be minimised.

The Plan shall be produced by the contractor in accordance with the 'Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects' (EPA, 2021) which clearly sets out the contractor's proposals regarding the treatment, storage and disposal of waste. Any Class U2 material is to be disposed of at a suitably licensed waste facility.

1.8.11 Environmental Incident Response - Appendix A6.6

An Environmental Incident Response Plan (EIRP) has been prepared to ensure that in the unlikely event of an incident (environmental, or non-environmental), response efforts are prompt, efficient, and suitable for the particular circumstances. The EIRP details the procedures to be undertaken in the event of a significant release of sediment into a watercourse, or a significant spillage of chemical, fuel or other hazardous substances (e.g., concrete), non-compliance incident with any permit or license, or other such risks that could lead to a pollution incident, including flood risks. It will be a condition of the Employer's Requirements that the successful contractor, immediately following appointment must detail in the EIRP, the manner in which it is intended to effectively implement all the applicable mitigation measures identified in this EIAR

and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.

The EIRP will identify the onsite risks and appropriate responses. The focus of the measures in the EIRP is prevention of the incident arising in the first place. The EIRP will be reviewed and updated regularly so that it continues to apply to construction activities and is amended when applicable regulations are revised or when amendments are required by a regulatory authority. It will be the responsibility of the EM, or equivalent, as stipulated by the appointed contractor to maintain and change the EIRP as required. The EIRP may also require amendments from the various stakeholders or suppliers as the proposed Scheme progresses.

When an incident happens, it is important to learn from it and ensure that such an incident does not occur again. This may involve changing the method of work for a particular activity, providing containment or treatment materials, or simply training personnel so they are aware of the correct method of work. Similarly, if an audit of planned arrangements indicates that measures are not in place, or those in place need to be improved, action will be taken immediately.

A record of corrective actions and lessons learned will be kept and communicated to all relevant persons, teams, sub-contractors etc. across the proposed Scheme.

1.8.11.1 Storage of Materials and Waste

Storage of Materials and Waste on site will be in accordance with the measures outlined in this Chapter, Chapter 11 (Land and Soils) and Chapter 19 (Material Assets: Waste Management)

Waste may be stored at the Construction Compounds for a limited amount of time to help to limit the number of vehicle movements to and from site as far as possible to minimise effects on the local roads.

A register of all hazardous substances, which will either be used on site or expected to be present (in the form of soil and / or groundwater contamination) will be established and maintained. Hazardous wastes will be stored and handled in accordance with Hazardous Wastes Regulations.

1.9 References

Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects' (EPA, 2021)

British Standard Institution (BSI) British Standard (BS)5837:2012 'Trees in relation to in relation to design, demolition and construction -Recommendations' (BSI 2012

BS 3998:2010 Tree Work –Recommendations' (BSI 2010)

CIRIA (C512): Environmental Handbook for Building and Civil Engineering Projects (CIRIA, 2000)

CIRIA Guidance C532: Control of water pollution from construction sites. Guidance for consultants and contractors. (CIRIA, 2019 - www.ciria.org)

CIRIA Guidance C741: Environmental good practice on site guide (Charles & Edwards, 2015; CIRIA, 2019 - www.ciria.org)

CIRIA Guidance C750D: Groundwater control: design and practice (Preene et al., 2016; CIRIA, 2019 - www.ciria.org)

CIRIA (C649) Control of water pollution from linear construction projects: Site guide (CIRIA 2006a)

CIRIA (C697): The SUDS Manual (CIRIA, 2015)

CIRIA (C848): Control of water pollution from linear construction projects: Technical guidance (CIRIA 2006b)

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