

**Luas Finglas**

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# **Environmental Impact Assessment Report 2024**

## **Chapter 25: Summary of Mitigation Measures, Monitoring & Residual Impacts**

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## GLOSSARY OF FREQUENTLY USED TERMS

Acronym	Term
ADR	Acronym used for Agreement Concerning the International Carriage of Dangerous Goods by Road legislation
ALARP	as low as reasonably practicable
BS	British Standard
BSI	British Standard Institute
C&D RWMP	Construction & Demolition Resource and Waste Management Plan
CCTV	Closed Circuit Television
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
CNT	Construction noise threshold
CTMP	Construction Stage Traffic Management Plan
DCC	Dublin County Council
DMP	Dust Management Plan
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EIRP	Environmental Incident Response Plan
ERT	Electrical Resistivity Tomography
EU	European Union
FCC	Fingal County Council
GPR	Ground Penetrating Radar
GQRA	Generic Quantitative Risk Assessment
HSE	Health Service Executive
IAPS	Invasive Alien Plant Species
ICW	Integrated Constructed Wetland.
IFI	Inland Fisheries Ireland
ISMP	Invasive Species Management Plan
MANDS	Major Accidents and/or Natural Disasters.
MHLGH	Minister of Housing, Local Government and Heritage
NIS	Natura Impact Statement
NSL	Noise Sensitive Location
OHL	Overhead Line
OPW	Office of Public Works
PCA	Project Conservation Architect
PM	Particulate Matter
PTMP	Preliminary Traffic Management Plan
QI	Qualifying Interest

<b>Acronym</b>	<b>Term</b>
RPA	Root Protection Area
RWMP	Resource & Waste Management Plan
SCI	Special Conservation Interest
SMMP	Soil & Material Management Plan
SPA	Special Protected Area
SuDS	Sustainable Drainage Systems
SWMP	Surface Water Management Plan
TII	Transport Infrastructure Ireland

## SECTION 25: SUMMARY OF MITIGATION MEASURES, MONITORING AND RESIDUAL IMPACTS

### 25.1 Introduction

#### 25.1.1 Purpose of this Report

The purpose of this Chapter is to collate the mitigation and monitoring measures identified in the Environmental Impact Assessment Report (EIAR) that are considered necessary to protect the environment, prior to the commencement of, and throughout the duration of the Construction and / or Operational Phases of the Luas Finglas Scheme (hereafter referred to as the proposed Scheme).

A Construction Environmental Management Plan (CEMP) has been prepared as part of the EIAR including all the mitigation and monitoring measures to be implemented during the Construction Phase. The mitigation measure outlined in CEMP will be included in this chapter.

The design of the proposed Scheme has evolved through comprehensive design iteration, with particular emphasis on minimising the potential for environmental impacts, where practicable, whilst ensuring the objectives of the proposed Scheme are attained. In addition, feedback received from the comprehensive consultation programme undertaken throughout the option selection and design development process has been incorporated, where appropriate.

Section 39 of the 2001 Act (as amended by the Planning and Development (Strategic Infrastructure) Act 2006 and the European Union (Railway Orders) (Environmental Impact Assessment) (Amendment) Regulations 2021 (S.I. No. 743/2021)) specifies the information that must be provided in the EIAR that accompanies a Railway Order application.

Section 39(1)(b)(iv) of the 2001 Act requires the EIAR to contain ‘a description of any features of the proposed railway works and of any measures envisaged to avoid, prevent or reduce and if possible offset likely significant adverse effects on the environment.’

Annex IV of the EIA Directive states that the description of the project must include:

*‘7. A description of the measures envisaged to avoid, prevent, reduce, or if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparing of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.’*

As described throughout this EIAR, the design of the proposed Scheme has been progressed taking account of environmental constraints and considerations that have been identified in assessments. This has enabled the avoidance of potential environmental impacts, wherever possible.

This chapter also summarises the potential significant residual impacts which may result from the Construction and Operational Phases of the proposed Scheme. Refer to Chapter 7 to Chapter 22 of this EIAR for the full impact assessments.

Residual impacts are the final or intended impacts which occur after the proposed mitigation measures have been implemented. They refer to the degree of change that will occur after the proposed mitigation measures have taken effect.

### 25.1.2 Outline Scheme Description

The proposed Scheme comprises a high-capacity, high-frequency light rail running from Broombridge to Charlestown, connecting Finglas and the surrounding areas with Dublin’s wider public transport network by providing a reliable, and efficient public transport service to the city centre via Broombridge.

As shown in Volume 4 - Map Figure 1-1, starting from Broombridge, the proposed Scheme travels northwards, crossing the Royal Canal and the Maynooth railway line adjacent to Broome Bridge. It then runs adjacent to the east of Broombridge Road and the Dublin Industrial Estate. It then crosses the Tolka Valley Park before reaching the proposed St Helena’s Stop and then proceeds northwards towards the proposed Luas Finglas Village Stop. From here, the route passes through a new corridor created within the Finglas Garda Station car park, making its eastern turn onto Mellowes Road. The route then proceeds through Mellowes Park, crossing Finglas Road, towards the proposed St Margaret’s Road Stop. Thereafter, the proposed line continues along St Margaret’s Road before reaching the terminus Stop proposed at Charlestown.

The proposed Scheme has been designed to integrate with the existing and future transport network, providing connections with bus services at all new Stops, mainline rail services at Broombridge, and a Park & Ride facility to intercept traffic on the N/M2. In addition, the proposed Scheme through the inclusion of integrated cycle lanes and cycling infrastructure sets out to facilitate multimodal "cycle- light rail transit (LRT) trips" as a key aspect of the Luas Finglas scheme.

The proposed Scheme will comprise a number of principal elements as outlined in Table 25-1 and Table 25-2. A full description of the proposed Scheme is provided in the following chapters of this EIAR:

- Chapter 1 (Introduction);
- Chapter 5 (Description of the proposed Scheme); and
- Chapter 6 (Construction Activities).

**Table 25-1: Overview of the Key Features of the proposed Scheme**

Scheme Key Features	Outline Description
<b>Permanent Scheme Elements</b>	
<b>Light Rail Track</b>	3.9km 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)
<b>Depot Stabling Facility</b>	A new stabling facility (with stabling for eight additional LRVs) will be located just south of the existing Broombridge terminus, as an extension of the Hamilton depot area.
<b>Luas Stops</b>	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.
<b>Main Structures</b>	Two new Light Rail Transit (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 proposed Scheme. In addition, the existing overbridge at Mellowes Park will be demolished.
<b>At Grade Signalised Junctions</b>	10 at grade signalised junctions will be created at: Lagan Road, Ballyboggan 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.

Scheme Key Features	Outline Description
<b>Uncontrolled Crossings</b>	13 at grade uncontrolled crossings (11 pedestrian / cycle crossings and two local accesses located at: Tolka Valley Park, St Helena's, Farnham pitches, Patrickswell Place, Cardiff Castle Road, Mellowes Park, St Margaret's Road, and ESB Networks.
<b>Cycle Facilities</b>	Cycle lanes are a core part of the proposed Scheme in order to facilitate multimodal "cycle-LRT trips". Approximately 3km of segregated cycle lanes and 100m of non-segregated cycle lanes along the route. Covered cycle storage facilities will be provided at Broombridge Terminus, Finglas Village Stop and St Margaret's Road Stop and within the Park & Ride facility. "Sheffield" type cycle stands will be provided at all stop locations.
<b>Power Substations</b>	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.
<b>Park &amp; Ride Facility</b>	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 to facilitate multimodal "cycle-LRT trips". The building will feature photovoltaic (PV) panel roofing and is the location for an additional radio antenna. This strategic Park & Ride facility will intercept traffic on the N/M2, before congestion begins to form.
Temporary Scheme Elements	
<b>Construction Compounds</b>	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.

**Table 25-2: Summary of New Bridges of the proposed Scheme**

Identity	Location	Description
Royal Canal and Rail Bridge	Approximately 10m east of the existing Broome Bridge and then continuing north, parallel with Broombridge Road on its east side	The proposed bridge is an eight-span structure consisting of two main parts: a variable depth weathering steel composite box girder followed by a constant depth solid concrete slab. The bridge has the following span arrangement: 35 + 47.5 + 30 + 17 + 3x22 + 17m. Steel superstructure extends over the first three spans. The bridge deck is continuous over the full length of 212.5m and has solid approach ramps at both ends.
Tolka Valley Park Bridge	Approximately 30m west of the existing Finglaswood Bridge	A three-span structure with buried end spans, thus appearing as a single span bridge. End spans as well as part of the main span consist of post-tensioned concrete variable depth girder, the central section of the main span is a suspended weathering steel composite box girder. The overall length of the bridge is 65m with spans 10m, 45m, 10m.

## 25.2 Mitigation and Monitoring Schedules

Mitigation and monitoring measures have been identified as environmental commitments and overarching requirements which shall avoid, reduce or offset potential impacts. Such measures have been proposed for all impacts that were determined to result in a moderate significance or above. Routine mitigation measures were also applied for some impacts considered to be of lower significance (for example, management of construction related impacts), or in circumstances where the mitigation measures are considered a material benefit to the receptor.

Mitigation and monitoring measures specified within the EIAR technical assessments are also provided in Chapter 7 to Chapter 22 of this EIAR.

The timing and implementation of the mitigation and monitoring measures are indicated within this Chapter during one of the following periods:

- Pre-Construction Phase (PC): Activities such as investigative surveys (e.g. bat surveys) that need to be undertaken in advance of the construction works;
- Construction Phase (C): The undertaking of physical works to construct elements of the proposed Scheme, as outlined in Chapter 6 (Construction Activities); and
- Operational Phase (O): When the proposed Scheme comes into operation (i.e. any mitigation associated with planned maintenance).

The following tables (Table 25-3 through Table 25-19) summarise the Construction and Operational Phase mitigation outlined in the relevant EIAR technical assessments but should be read in conjunction with the mitigation outlined in the specific chapter and also with the Construction Environmental Management Plan (CEMP) in Volume 5 – Appendix A6.1 of this EIAR (note that the CEMP summarises the Construction Phase mitigation only). The Contractor will be responsible for ensuring the proper implementation of all mitigation measures and commitments detailed in the CEMP throughout the Construction Phase.

Where appropriate, the location to which the mitigation relates to is identified and where the mitigation measure is scheme wide the location is given as 'throughout (as required)'.

## 25.3 General Mitigation Requirements

**Table 25-3: General Mitigation Measures**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
GM-1	A6.1 CEMP 1.1	Throughout (as required)	General Impacts	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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 appointed Contractor will further develop the CEMP to include additional details of inspection procedures.</p> <p>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.</p>	PC/C
GM-2	EIAR A6.6 (EIRP)	Throughout (as required)	General Impacts	<p>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-</p>	PC

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				compliance incident with any permit or licence, 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.	
GM-3	NIS-7.1.2	Throughout (as required)	General Impacts	<p>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 list of measures below will be incorporated into site compound environmental management:</p> <ul style="list-style-type: none"> <li>▪ 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);</li> <li>▪ Site compounds will not be located within core foraging areas utilised by protected wintering bird species;</li> <li>▪ Only plant and materials necessary for the construction of the works will be permitted to be stored at the compound location;</li> <li>▪ All subcontractors will be given induction toolbox talk so that they are aware of material storage arrangements;</li> <li>▪ 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;</li> <li>▪ Bunded storage of fuels and refuelling area. Bunds shall be 110% capacity of the largest vessel contained within the bunded area;</li> <li>▪ 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 licensed waste contractor at a licenced site. Records will be maintained of material taken off site for disposal;</li> <li>▪ Suitable precautions will be taken to prevent spillages from equipment containing small quantities of hazardous substances (for example, chainsaws and jerry cans) including: <ul style="list-style-type: none"> <li>– Each container or piece of equipment will be stored in its own drip tray made of a material suitable for the substance being handled;</li> <li>– 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</li> <li>– Containers and equipment will be stored on a firm, level surface;</li> </ul> </li> </ul>	PC

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
				<ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ The site environmental manger will be responsible for maintaining all training records and weekly environmental inspections;</li> <li>▪ Drainage collection system for washing area will be provided to prevent run-off into surface water system;</li> <li>▪ Stockpiling of spoil and spoil-like materials will be appropriately located within the compounds to minimise exposure to prevailing winds; and</li> <li>▪ 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.</li> </ul>	
GM-4	A6.1 CEMP 1.8.4	Throughout (as required)	General Impacts	A Dust Management Plan contained 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 dust during construction. This will be incorporated by each Contractor into their Plans and implemented as part of their works.	PC / C
GM-5	A6.1 CEMP 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

## 25.4 Human Health

Detail on the mitigation measures that are linked to human health outcomes can be found in the following EIAR chapters:

- Chapter 10 (Water);
- Chapter 11 (Land and Soils: Soils, Geology & Hydrogeology);
- Chapter 13 (Air Quality);
- Chapter 14 (Climate);
- Chapter 15 (Noise & Vibration);
- Chapter 18 (Material Assets: Traffic & Transport); and
- Chapter 22 (Risk of Major Accidents & Disasters).

These are summarised in the relevant sections of this Chapter. The mitigation already outlined in these chapters will effectively mitigate any human health risks without the need for any additional mitigation.

The Contractor and Operator will have to implement a Construction Environmental Management Plan and a Health and Safety Plan to protect workers, control environmental pollution, and protect members of local communities from construction and operational activities. A Construction Environmental Management Plan (CEMP) has been prepared for the EIAR and can be found in Volume 5 - Appendix A6.1 of this EIAR.

No additional mitigation, over and above that outlined in the chapters above, is proposed for Human Health. The identified mitigation measures for the impacts relevant to the human health assessment are detailed in Tables 7-15 and 7-16 of Chapter 7 (Human Health).

## 25.5 Population

**Table 25-4: Population Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
PM-1	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. <ul style="list-style-type: none"> <li>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; and</li> <li>Signage should indicate to park users the reason for the works and the partial severance and the expected duration that will be in place.</li> </ul>	C	Slight to moderate
PM-2	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: <ul style="list-style-type: none"> <li>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.</li> </ul>	C	Slight to moderate
PM-3	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	Slight to moderate
PM-4	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	Slight to moderate

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
PM-5	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	Slight to moderate
PM-6	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	Slight to moderate
PM-7	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	Slight to moderate
PM-8	8.5.2	St Helena's and Mellows Road	Annoyance, severance and noise impact.	The Contractor will minimise the duration of works in neighbourhoods in the vicinity of St Helena's and Mellows Road, acknowledging issues of localised sensitivity and higher than average deprivation: <ul style="list-style-type: none"> <li>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 period as possible and, along with barriers such as hoarding, must not be allowed to persist longer than is necessary; and</li> <li>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.</li> </ul>	C	Slight to moderate
PM-9	8.5.2	Ravens Court	Proximity to works, noise and annoyance. Loss of green space and garden space.	Works at the entrance to Ravens 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. <ul style="list-style-type: none"> <li>If necessary, an alternative temporary entrance will be provided. The boundary of the estate will be rebuilt with</li> </ul>	C	Slight to moderate

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
			Impacts on access on entrance.	a comparable or enhanced façade compared with that at present.		
PM-10	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 Gardaí in accessing premises or vehicles: <ul style="list-style-type: none"> <li>The same considerations apply to the Luas crossing of Mellowes Road given the roads use in times of emergency by either the Gardaí or the nearby fire service.</li> </ul>	C	Slight to moderate
PM-11	8.5.2	Mellowes Road	Traffic queues Safety of road users	Arrangements for emergency services will be provided to quickly bypass works and traffic queues on Mellowes Road: <ul style="list-style-type: none"> <li>The appointed Contractor will ensure maximum safety of accessibility to community facilities on Mellowes Road during construction given their use by vulnerable population subsets.</li> </ul>	C	Slight to moderate
PM-12	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: <ul style="list-style-type: none"> <li>Consideration will be given to the car parking needs of employees of the Finglas Resource Centre to avoid competition for remaining places.</li> </ul>	C	Slight to moderate
PM-13	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: <ul style="list-style-type: none"> <li>Maintain access between two halves of Tolka Valley Park. Maintain access to Mellowes Park from Mellowes Road, unless very temporary restrictions are needed; and</li> </ul>	C	Slight to moderate

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>Allow for continuity and safety of the weekly park runs in both Tolka Valley Park and Mellowes Park.</li> </ul>		
PM-14	8.5.2	R135 Finglas Road	Cyclist and pedestrian paths diversion could cause confusion	<p>Construction of crossing facilities at the R135 Finglas Road will be ready for use prior to the demolition of the pedestrian overbridge:</p> <ul style="list-style-type: none"> <li>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.</li> </ul>	C	Slight
PM-15	8.5.2	St Margaret's Road	<p>Effect of works on residential amenity, access and crossing of works</p> <p>Effect of works on attractiveness of shopping and on direct access to businesses</p>	<p>The appointed Contractor will implement the following mitigation measures:</p> <ul style="list-style-type: none"> <li>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;</li> <li>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;</li> <li>Ensure continuity of electricity supply for businesses on the east side of St Margaret's Road or otherwise minimum interruptions flagged in advance;</li> <li>Ensure continuity of access for businesses on the east side of St Margaret's Road; and</li> <li>Provide alternative car parking, where possible, during construction and operation for residents of McKelvey estate located beside St Margaret's Road.</li> </ul>	C	Slight to moderate
PM-16	8.5.2	St Margaret's Court	Proximity to properties. Severance prior to installation of new crossing. Minor works inside estate.	The appointed Contractor will ensure new uninterrupted access arrangements are in place for businesses and for residents of St Margaret's Court where existing access will be directed impacted by construction of the proposed Scheme:	C	Slight to moderate

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>They will provide highly visible signage to direct customers and suppliers to this new access.</li> </ul>		
PM-17	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	Slight to moderate
PM-18	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	Positive, long term and significant
PM-19	8.5.3	Throughout (as required)	Safety during road crossings	Extend integration of the scheme with the bus network by facilitating access from Luas Stops to nearby bus stops with associated signalised crossing facilities or good lines of sight for road crossings.	O	Positive and long term
PM-20	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	O	Positive, long term and significant
PM-21	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	O	Positive, long term and significant
PM-22	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	Positive, long term and profound

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
PM-23	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	O	Neutral and long term
PM-24	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. <ul style="list-style-type: none"> <li>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.</li> </ul>	O	Positive, long term and profound

## 25.6 Biodiversity

**Table 25-5: Biodiversity Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
BD-1	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	C	Long-term neutral impact of no notable significance (not significant)

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				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.		
BD-2	9.5.2.5	Throughout (as required)	Impacts on invasive species	<p>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.</p> <p>The mitigation measures for invasive species will utilise the below best practice management guidance documents, where relevant; and are to be reference within the proposed Scheme's Invasive Species Management Plan:</p> <ul style="list-style-type: none"> <li>▪ The Management of Invasive Alien Plant Species on National Roads – Technical Guidance (TII, 2020a);</li> <li>▪ The Management of Invasive Alien Plant Species on National Roads – Standard (TII, 2020b);</li> <li>▪ Invasive Species Ireland (ISI) - Best Practice Management Guidelines for Japanese Knotweed (ISI, 2008a);</li> <li>▪ 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); and</li> <li>▪ Inland Fisheries Ireland - Biosecurity Protocol for Field Survey Work (IFI, 2010).</li> </ul>	PC	Long-term neutral impact of no notable significance (not significant)

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
BD-3	9.5.2.5	Throughout (as required)	The spread / expansion of non-native invasive species	<p>The Contractor will appoint a suitably qualified specialist conducting works to monitor any vegetation clearance, and treatment of non-native invasive species.</p> <ul style="list-style-type: none"> <li>▪ 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; and</li> <li>▪ Where an infestation is confirmed / identified within the footprint of the proposed Scheme, this will require the implementation of the final ISMP.</li> </ul>	PC	Long-term neutral impact of no notable significance (not significant)
BD-4	9.5.2.5	Throughout (as required)	Presence of non-native invasive species	<p>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:</p> <ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ 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; and</li> <li>▪ All control measures specified in the final ISMP shall be implemented by a suitably qualified and licenced specialist prior to the Construction Phase</li> </ul>	PC/C	Long-term neutral impact of no notable significance (not significant)

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				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	9.5.2.5	Throughout (as required)	Spread of INNS could pose public health and safety risks	<p>The adherence to a set of biosecurity measures, including:</p> <ul style="list-style-type: none"> <li>▪ the fencing off / demarcating of the individual invasive species;</li> <li>▪ communicating the location, risk and hazards associated with invasive species to construction personnel (e.g. Giant hogweed);</li> <li>▪ identifying dedicated access points into and out of fenced-off areas;</li> <li>▪ the installation of designated decontamination facilities (where appropriate);</li> <li>▪ protocols around the removal of contaminated soils; and</li> <li>▪ seed and fragment checks on boot, tyres and tracks entering and leaving the work site.</li> </ul> <p>As required by law, licences for the disposal of contaminated materials will be obtained, as well as the utilisation of licensed facilities:</p> <ul style="list-style-type: none"> <li>▪ 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;</li> </ul>	PC/C	Long-term neutral impact of no notable significance (not significant)

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>▪ 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</li> <li>▪ 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.</li> </ul>		
BD-6	9.5.2.5	Tolka Valley Park Bridge	Spread of invasive species	<p>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.</p> <p>The following hygiene measures shall be undertaken for the proposed Scheme:</p> <ul style="list-style-type: none"> <li>▪ 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);</li> <li>▪ 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 at toolbox talks specific to each INNS to personnel on site and</li> </ul>	C	Long-term negative impact of no notable significance (not significant)

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>particular attention will be given to INNS that have the potential to cause injuries such as Giant Hogweed;</p> <ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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 equivalent 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;</li> <li>▪ 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</li> <li>▪ Where small volumes (e.g. volumes capable of being double bagged in quarantine bags such as</li> </ul>		

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				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	9.5.2.5	Throughout (as required)	Impacts from soil excavation	<p>The following mitigation measures will be implemented during excavation works:</p> <ul style="list-style-type: none"> <li>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;</li> <li>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;</li> <li>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;</li> </ul>	C	Long-term neutral impact of no notable significance (not significant)

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>▪ 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</li> <li>▪ 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.</li> </ul>		
BD-8	9.5.2.5	Throughout (as required)	Impacts from disposal of INNS material	<ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ 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</li> </ul>	C	Long-term neutral impact of no notable significance (not significant)

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>National Road Construction Projects (TII 2017); and</p> <ul style="list-style-type: none"> <li>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.</li> </ul>		
BD-9	9.5.2.5	Throughout (as required)	Risk of water contamination from application of Herbicides	<p>Measures to be implemented during the application of Herbicides:</p> <ul style="list-style-type: none"> <li>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;</li> <li>It should be noted that where a chemical treatment is to be used, there is a risk of contaminating a watercourse; and</li> <li>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.</li> </ul>	C	Long-term neutral impact of no notable significance (not significant)
BD-10	9.5.2.5	Throughout (as required)	Presence of non-native invasive species during maintenance of the proposed Scheme	<ul style="list-style-type: none"> <li>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</li> </ul>	O	Long-term neutral impact of no notable significance (not significant)

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>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;</p> <ul style="list-style-type: none"> <li>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; and</li> <li>If invasive plants are found, then they will be treated as per the measures outlined in the ISMP and any species-specific guidelines.</li> </ul>		
BD-11	9.5.2.6	Throughout (as required)	Impact on fauna	<p>Scheme-wide fauna mitigation:</p> <ul style="list-style-type: none"> <li>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;</li> <li>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;</li> <li>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</li> <li>Work should be carried out in daylight hours wherever possible and lighting on site should be kept to a minimum.</li> </ul>		Long-term neutral impact of no notable significance (not significant)
BD-12	9.5.2.7	Tolka Valley Road to St	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	C	Long-term neutral impact of no notable

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
		Helena's Road		<p>the amenity grasslands (West Farnham area - Western playing pitches and East Farnham area Erin's Isle GAA pitches), located within and adjacent to the proposed Scheme:</p> <ul style="list-style-type: none"> <li>▪ 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; and</li> <li>▪ 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.</li> </ul>		significance (not significant)
BD-13	9.5.2.7	St Helena's Road to Cardiff Castle Road	Impacts on winter bird species	<p>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.</p> <ul style="list-style-type: none"> <li>▪ The standard guidance and plans listed in Chapter 9 (Biodiversity) will also be required in order to protect the health of amenity grassland habitats utilised by protected wintering bird species; and</li> </ul>	C	Long-term neutral impact of no notable significance (not significant)

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
BD-14	9.5.3.1	Throughout (as required)	Bird collision	<p>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.</p> <ul style="list-style-type: none"> <li>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 LRT bridge over the Royal Canal; and Tolka Valley Park bridge; and along the tracks within the Tolka Valley Park and Farnham areas.</li> </ul>	O	Long-term neutral impact of no notable significance (not significant)
BD-15	Table 9-34	River Tolka, Royal Canal	<p>The degradation of overall water quality and the vegetation of Annex I habitats as a result of pollutants such as hydrocarbon.</p> <p>Air (dust) pollution generated during the Construction Phase could negatively impact habitats, adversely impacting photosynthesis and the biological functions of valued flora.</p> <p>The spread of invasive species such as Japanese Knotweed, from the construction site into this Natura 2000 site via the River Tolka may have serious adverse impacts on present Annex habitats, displacing native species.</p>	<p>Strict adherence to:</p> <ul style="list-style-type: none"> <li>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); and</li> <li>Relevant Area Specific Mitigation Measures outline in the Biodiversity chapter.</li> </ul>	C/O	Long-term neutral impact of no notable significance (not significant)

## 25.7 Water

**Table 25-6: Water Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
W-1	10.5.1.1	Throughout (as required)	Pollution of surface water	<p>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):</p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p>At a minimum, all the control and management measures set out in the CEMP and SWMP will be implemented. This includes measures relating to:</p> <ul style="list-style-type: none"> <li>A requirement for a Pollution Incident Response Plan;</li> <li>Construction compound management including the storage of fuels and materials;</li> <li>Control of sediment;</li> <li>Use of concrete;</li> <li>Management of vehicles and plant including refuelling and wheel wash facilities (if necessary); and</li> <li>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.</li> </ul>	PC/C	
W-2	EIAR Appendix A6.6	Throughout (as required)	Contamination of surface water	<p>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.</p> <ul style="list-style-type: none"> <li>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</li> </ul>	PC/C	

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>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;</p> <ul style="list-style-type: none"> <li>▪ 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 foreperson's vehicles will carry large spill kits at all times;</li> <li>▪ Absorbent material will be used with pumps and generators at all times and used material disposed of in accordance with the Waste Management Plan; and</li> <li>▪ 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.</li> </ul> <p>Regular inspections and maintenance of plant and machinery checking for leaks, damage or vandalism will be made on all plant and equipment.</p> <p>In the event of a spill the appointed Contractor will ensure that the following procedure are in place:</p> <ul style="list-style-type: none"> <li>▪ Emergency response awareness training for all personnel on-site works;</li> <li>▪ 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;</li> <li>▪ 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; <ul style="list-style-type: none"> <li>– Absorbent granules;</li> <li>– Absorbent mats/cushions;</li> <li>– Absorbent booms; and</li> </ul> </li> </ul>		

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>– Track-mats, geotextile material and drain covers.</li> <li>▪ 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;</li> <li>▪ All tank and drum storage areas on the site will, as a minimum, be bunded to a volume not less than the following:               <ul style="list-style-type: none"> <li>– 110% of the capacity of the largest tank or drum within the bunded area, or</li> <li>– 25% of the total volume of substances which could be stored within the bunded area.</li> </ul> </li> <li>▪ 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);</li> <li>▪ 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;</li> <li>▪ Designated locations for refuelling are within site compound;</li> <li>▪ Potentially contaminated run off from plant and machinery maintenance areas will be managed within the site compound surface water collection system; and</li> <li>▪ Damaged or leaking containers will be removed from use and replaced immediately.</li> </ul>		
W-3	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	Adverse, Imperceptible and Short-term
W-4	10.5.1.3	River Tolka	Disruption to the hydromorphology of the River Tolka.	<p>The mitigation measures during the Construction of the Tolka Valley Bridge will be as follows:</p> <ul style="list-style-type: none"> <li>▪ During excavation of the abutments, pumped groundwater shall not discharge directly to the River Tolka;</li> </ul>	C	Adverse, Imperceptible and Short-term

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
			<p>River Tolka polluted by construction activities.</p> <p>Increase surface water runoff.</p> <p>Increased flood risk.</p> <p>Section of watercourse in shadow.</p>	<ul style="list-style-type: none"> <li>Excavation of the abutments shall only be carried out during the summer months (April to September);</li> <li>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;</li> <li>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;</li> <li>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</li> <li>The Contractor will maintain awareness of rainfall event and weather forecasts by Dublin City Council (DCC) and Met Éireann</li> </ul>		
W-5	10.5.1.4	Royal Canal Luas Bridge	<p>Increased sediment loading as a result of silty water runoff.</p> <p>Increased flood risk.</p> <p>Section of watercourse in shadow.</p>	<p>The mitigation measures of the Royal Canal and Rail Overbridge will be as follows:</p> <ul style="list-style-type: none"> <li>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;</li> <li>This section will require the installation of geotextile sandbag barriers to protect the Royal Canal and its bankside vegetation;</li> <li>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</li> <li>Groundwater pumping will not be discharged directly to the Royal Canal.</li> </ul>	C	Adverse, Imperceptible and Short-term

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
W-6	10.5.1.5	Bachelors Stream	Increased sediment in runoff. Increased surface water runoff.	<p>The mitigation measures for Bachelors Stream will be as follows:</p> <ul style="list-style-type: none"> <li>In addition to the measures in the SWMP, silt screens will be provided on the open sections of Bachelors Stream; and</li> <li>Fine screens or grilles to be placed across gullies to ensure that silt is caught before becoming washed into piped networks.</li> </ul>	C	Adverse, Imperceptible and Short-term
W-7	10.5.1.6	Integrated Constructed Wetland (ICW)	<p>Loss of habitat and functionality of ICW due to bridge construction.</p> <p>Section of ICW in shadow.</p> <p>Increased surface water runoff.</p> <p>Increased sediment in runoff.</p>	<p>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:</p> <ul style="list-style-type: none"> <li>Location and repositioning of surface water connection between the Finglaswood Stream and the ICW;</li> <li>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;</li> <li>Expansion of Cell 1 to the North and South, with associated extension of clay liner;</li> <li>Removal of unsuitable plant species within the ICW and replanting with appropriate species;</li> <li>Removal of accumulated silt within three cells of ICW;</li> <li>Clearing of pipes connecting Cells 1 to 2A and 2A to 2B, and 2B to open water pond;</li> <li>Removal of trees and root networks within cell 2B, together with associated repair of clay liner;</li> <li>Reconstruction of embankment and pipe connection between Cell 2B and open water pond;</li> <li>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</li> <li>Monitoring of ICW establishment.</li> </ul> <p>In addition, silt fences and geotextile sandbags will be established adjacent to the ICW:</p>	PC	Adverse, Imperceptible and Short-term

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>▪ Silt screens to be provided adjacent to the section of the ICW which is to be impacted by the construction of the abutments;</li> <li>▪ Sheet piling will be used during the construction of the abutments. This will limit the excavation extents, and hence impacts on the ICW; and</li> <li>▪ Prior to works commencing on the ICW, the inlet pipe into the ICW is to be relocated away from the location of the abutment</li> </ul>		
W-8	10.5.1.7	Construction Compound	Contamination of surface water. Water quality.	<p>Mitigation measures for the construction compounds will be as listed below:</p> <ul style="list-style-type: none"> <li>▪ All chemical and fuel filling locations will be contained within signposted, designated bunded areas, a minimum of 10m from any surface water drain;</li> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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</li> <li>▪ Storage areas will be covered, wherever possible, to prevent rainwater filling the bunded areas.</li> </ul>	C	Adverse, Imperceptible and Short-term
W-9	10.5.1.8	Haul Road	Re-exposure of historically settled contaminants within or near the waterbodies. Adjacent landscape will be impacted.	<p>Mitigations for the haul roads include the following:</p> <ul style="list-style-type: none"> <li>▪ 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</li> </ul>	C	Adverse, Imperceptible and Short-term

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>water runoff from haulage roads will be allowed to runoff onto 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;</p> <ul style="list-style-type: none"> <li>▪ 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</li> <li>▪ 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.</li> </ul>		
W-10	10.5.1.9	Park & Ride	Surface water quality	<p>Mitigation for the construction of the Park &amp; Ride includes the following:</p> <ul style="list-style-type: none"> <li>▪ During the Construction Phase of the Park &amp; 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.</li> </ul>	C	Adverse, Imperceptible and Short-term
W-11	10.5.1.10	Tolka Valley Park Historical Landfill	Contamination with leachate from the historical landfill	<p>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:</p> <ul style="list-style-type: none"> <li>▪ 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</li> </ul>	C	Adverse, Imperceptible and Short-term

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>for regular testing of excavated soils to monitor the suitability of the soil for re-use; and</p> <ul style="list-style-type: none"> <li>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.</li> </ul>		
W-12	EIAR A6.4 - SWMP	Throughout (as required)	Increased sediment in runoff	<p>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:</p> <ul style="list-style-type: none"> <li>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);</li> <li>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;</li> <li>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;</li> <li>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;</li> <li>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;</li> <li>To prevent the spread of any accidental discharge into the surface water network, oil booms will be on hand when</li> </ul>	C	Adverse, Imperceptible and Short-term

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>construction activities are located beside aquatic habitats in order to control and minimise the spread of the spill;</p> <ul style="list-style-type: none"> <li>▪ Washout of concrete plant will occur at a designated impermeable area with waste control facilities;</li> <li>▪ Wherever reasonably possible, pre-cast concrete bridge features should be utilised to minimise the risk of a concrete-based pollution event;</li> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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</li> </ul>		

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>that they are installed to best practice standard and correctly located in their assigned areas; and</p> <ul style="list-style-type: none"> <li>Silt fences will be repaired and/or replaced as necessary by the Contractor as part of the on-going environmental monitoring programme.</li> </ul>		
W-13	10.4.7.2	Throughout (as required)	Drainage system	<p>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:</p> <ul style="list-style-type: none"> <li>Sealed carrier pipes are designed so as not to generate surcharge from the pipes during the 1 in 2-year Critical Storm Condition (This Critical Storm Condition will incorporate a 20% Climate Change Allowance);</li> <li>Filter Drains are designed so as not to generate surcharge out of the pipe during the 1 in 5-year Critical Storm condition;</li> <li>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;</li> <li>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</li> <li>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.</li> </ul>	O	Negligible, Imperceptible and Permanent

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
W-14	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 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.	O	Negligible, Imperceptible and Permanent
W-15	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: <ul style="list-style-type: none"> <li>This pond will intercept overland flow and provide an additional level of treatment before outfalling into the ICW.</li> </ul>	O	Beneficial, Imperceptible and Permanent
W-16	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: <ul style="list-style-type: none"> <li>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;</li> <li>Catchpit chambers 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;</li> </ul>	O	Beneficial, Imperceptible and Permanent

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>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; and</li> <li>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.</li> </ul>		
W-17	10.4.7.2	ICW	<p>Decreased sediment in runoff.</p> <p>Surface or subsurface runoff from historical landfill flowing into the ICW.</p>	Monitoring of ICW (Integrated Constructed Wetland) establishment during the Operational Phase.	O	Beneficial, Imperceptible and Permanent
W-18	10.4.7.2	Tolka Bridge	Increase in flood risk	<p>The following mitigation measures during Operational Phase will be implemented:</p> <ul style="list-style-type: none"> <li>For the Tolka Valley Park Bridge, the abutments have been set back 5m from the edge of the river to provide adequate space for flood flow;</li> <li>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;</li> <li>The Park &amp; 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</li> <li>Where nature-based SuDS features are not considered adequate for attenuating surface water runoff from</li> </ul>	O	Adverse, Imperceptible and Permanent

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				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.		
W-19	10.5.2	Throughout (as required)	Drainage systems	<p>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.</p> <p>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.</p>	O	

## 25.8 Land, Soils, Geology and Hydrogeology

**Table 25-7: Land, Soils, Geology and Hydrogeology Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
LSGH-1	EIAR Appendix A6.1 - CEMP	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	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	No likely significant residual impacts
LSGH-3	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	C	No likely significant

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>Contractor(s) to ensure that material is appropriately managed during the Construction Phase.</p> <p>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.</p>		residual impacts
LSGH-4	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	No likely significant residual impacts
LSGH-5	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	No likely significant residual impacts
LSGH-6	11.5.2.1	Throughout (as required)	Surplus soil arising from earthworks	<p>Material that is not suitable for re-use, will be removed off site for treatment, recycling or disposal at an authorised waste management facility.</p> <p>The Construction and Demolition Resource and Waste Management Plan (C&amp;D RWMP) will address the analysis of waste arisings, methods proposed for the prevention, re-use and recycling of wastes, and material handling procedures.</p>	C	No likely significant residual impacts
LSGH-7	11.5.2.2	Throughout (as required)	Potentially contaminated soil Posing risk to human health	<p>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).</p> <p>The updated CEMP will identify construction methodologies for the proposed Scheme and standard operating procedures that will be</p>	C	No likely significant residual impacts

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				implemented to minimise the impact. The appointed Contractor(s) will implement in full all of the measures set out in the CEMP.		
LSGH -8	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	No likely significant residual impacts
LSGH-9	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 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	C	No likely significant residual impacts
LSGH-10	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	No likely significant residual impacts
LSGH-11	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	No likely significant residual impacts
LSGH-12	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	No likely significant residual impacts

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
LSGH-13	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	No likely significant residual impacts
LSGH-14	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	No likely significant residual impacts
LSGH-15	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.  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.	C	No likely significant residual impacts
LSGH-16	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	No likely significant residual impacts

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
LSGH-17	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	No likely significant residual impacts
LSGH-18	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	No likely significant residual impacts

## 25.9 Land Take

**Table 25-8: Land Take Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
LT-1	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. <ul style="list-style-type: none"> <li>▪ 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.</li> </ul>	C	Slight to Moderate

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
LT-2	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	Slight to Moderate
LT-3	12.4.2.2	Throughout (as required)	Temporary restriction to property access	<p>The appointed Contractor will implement the following measures:</p> <ul style="list-style-type: none"> <li>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;</li> <li>Alternative designated safe crossing points will be provided;</li> <li>Reinstatement of landscape areas;</li> <li>New landscaping and provision of new maintenance access to canal bank and footpaths; and</li> <li>New access and parking arrangements at resource centre and school will be provided.</li> </ul>	C	Slight to Moderate
LT-4	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	Slight
LT-5	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	Moderate. Compensation will be payable in accordance with the provisions of the compulsory acquisition legislation
LT-6	Table 12-8	Area 30	Reduction in residual land area. Impacting	Provision of new boundary treatment.	C	Moderate

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
			future development potential due to reduced area			

## 25.10 Air Quality

**Table 25-9: Air Quality Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
AQ-1	13.5.1.3	Throughout (as required)	Risk from asbestos-containing materials	<p>A Demolition Survey of all buildings to be demolished will be required prior to commencement of any such demolition works:</p> <ul style="list-style-type: none"> <li>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; and</li> <li>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.</li> </ul>	PC	No likely significant residual impacts
AQ-2	13.5.1.1 CEMP – 1.8.4.1	Throughout (as required)	Dust emission, increase level of PM10	<p>A 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:</p> <ul style="list-style-type: none"> <li>The monitoring of Construction Phase dust deposition levels, PM10, PM2.5 and NO2 will be developed and implemented as part of the Dust Management Plan;</li> </ul>	PC	No likely significant residual impacts

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>▪ The DMP will include monthly reporting of dust deposition, real-time PM10 and PM2.5 continuous monitoring and/or visual inspections;</li> <li>▪ The results of the dust deposition, real-time PM10 and PM2.5 continuous monitoring will be reported versus relevant limit values; and</li> <li>▪ Six months of pre-construction dust monitoring will be undertaken at all sites to establish a baseline prior to construction works. The data will assist in confirming if the construction of the proposed Scheme has the potential for any air quality impacts which contribute to the risk of the respective limit values, or target values or alert thresholds being exceeded.</li> </ul>		
AQ-3	13.5.1.1	Throughout (as required)	Dust emission on site	<p>The following measures will be implemented by the site Environmental Manager (EM) to avoid dust emission on site:</p> <ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ Make the complaints log available to the local authority when asked; and</li> <li>▪ 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.</li> </ul>	C	Neutral, Not Significant and Medium-Term.
AQ-4	13.5.1.1	Throughout (as required)	Dust emission	<p>The appointed Contractor will:</p> <ul style="list-style-type: none"> <li>▪ Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;</li> <li>▪ Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;</li> </ul>	C	Neutral, Not Significant and Medium-Term.

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>▪ Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;</li> <li>▪ Avoid site runoff of water or mud;</li> <li>▪ Keep site fencing, barriers and scaffolding clean using wet methods;</li> <li>▪ Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site; and</li> <li>▪ Cover, seed or fence stockpiles to prevent wind whipping.</li> </ul>		
AQ-5	13.5.1.1	Throughout (as required)	Traffic emissions	<p>The appointed Contractor will:</p> <ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable;</li> <li>▪ Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas;</li> <li>▪ Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials; and</li> <li>▪ Efficiently schedule deliveries undertaken to minimise emissions.</li> </ul>	C	Neutral, Not Significant and Medium-Term.
AQ-6	13.5.1.1	Throughout (as required)	Dust emissions from construction	<p>The following mitigation measures will be implemented by the Contractor:</p> <ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ Ensure an adequate water supply on the site for effective dust/particulate matter suppression / mitigation, using non-potable water;</li> <li>▪ Use enclosed chutes and conveyors and covered skips;</li> <li>▪ Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate;</li> </ul>	C	Neutral, Not Significant and Medium-Term.

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>▪ Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages after the event using wet cleaning methods;</li> <li>▪ Avoid scabbling (roughening of concrete surfaces) if possible;</li> <li>▪ Ensure sand and other aggregates are stored in banded 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;</li> <li>▪ 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</li> <li>▪ For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.</li> </ul>		
AQ-7	13.5.1.1	Throughout (as required)	Dus emission from demolition activity	<p>The following mitigation measures will be implemented:</p> <ul style="list-style-type: none"> <li>▪ Soft strip inside buildings before demolition of retaining walls and windows in the rest of the building to provide a screen against dust;</li> <li>▪ 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;</li> <li>▪ Avoid explosive blasting, using appropriate manual or mechanical alternatives; and</li> <li>▪ Bag and remove any biological debris or damp down such material before demolition.</li> </ul>	C	Neutral, Not Significant and Medium-Term.
AQ-8	13.5.1.1	Throughout (as required)	Dust emission from earthworks	<p>The appointed Contractor will undertake the following works:</p> <ul style="list-style-type: none"> <li>▪ Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces;</li> <li>▪ Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil; and</li> <li>▪ Only remove the cover in small areas during work and not all at once.</li> </ul>	C	Neutral, Not Significant and Medium-Term.

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
AQ-9	13.5.1.1	Throughout (as required)	Dust emission on trackout	<p>The appointed Contractor will:</p> <ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ Avoid dry sweeping of large areas;</li> <li>▪ Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;</li> <li>▪ Inspect on-site haul routes for integrity and instigate necessary repairs to the surface;</li> <li>▪ Record all inspections of haul routes and any subsequent action in a site logbook;</li> <li>▪ Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned;</li> <li>▪ Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site);</li> <li>▪ 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</li> <li>▪ Access gates to be located at least 10m from receptors.</li> </ul>	C	Neutral, Not Significant and Medium-Term.
AQ-10	13.5.1.2	Throughout (as required)	Potential for Aspergillus airborne during demolition and earthworks	<p>Survey and prevention works with respect to <i>Aspergillus</i> will take place before construction commences by a competent contractor in proximity to any sensitive buildings and hospitals or health clinics.</p> <ul style="list-style-type: none"> <li>▪ 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; and</li> <li>▪ 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.</li> </ul>	PC/C	Neutral, Not Significant and Medium-Term.
AQ-11	13.5.1.1	Throughout (as required)	Dust soiling. Human health.	<p>Monitoring measures that will be implemented by the EM include:</p> <ul style="list-style-type: none"> <li>▪ Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection</li> </ul>	C	Negligible

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>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;</p> <ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ Monthly monitoring of dust deposition levels shall be undertaken for the duration of construction for comparison with the guideline of 350mg/m<sup>2</sup>/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;</li> </ul> <p>If dust levels are measured to be above the guideline of 350mg/m<sup>2</sup>/day, the mitigation measures in the area shall be reviewed and improved to ensure that dust deposition is reduced to below 350mg/m<sup>2</sup>/day;</p> <ul style="list-style-type: none"> <li>▪ 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.</li> </ul>		

## 25.11 Climate

**Table 25-10: Climate Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
CM-1	14.5.1	Throughout (as required)	General Management	<ul style="list-style-type: none"> <li>Maintaining existing tree corridors to minimise tree clearance. Carbon storage associated with existing trees; and</li> <li>Landscape design strategy to be implemented to address carbon and climate adaptation.</li> </ul>	PC	Negative, Minor Adverse, Short-Term and Not Significant
CM-2	14.5.1	Throughout (as required)	Emission of GHG	<p>The following mitigation measures will be put in place to minimise emissions:</p> <ul style="list-style-type: none"> <li>Construction machinery engines will be turned off when machinery is not in use;</li> <li>A regular maintenance schedule for all construction plant machinery shall be undertaken to maintain optimum machinery efficiency;</li> <li>Minimise and prevent idling of construction vehicles and plant and equipment both on-site and in construction compounds;</li> <li>Efficiently schedule deliveries undertaken to minimise emissions;</li> <li>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;</li> <li>Sustainable timber post fencing will be specified over steel in boundary treatments; and</li> <li>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.</li> </ul>	C	Negative, Minor Adverse, Short-Term and Not Significant
CM-3	14.5.1	Throughout (as required)	Embodied Carbon	<p>Elements that will mitigate construction carbon include:</p> <ul style="list-style-type: none"> <li>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;</li> <li>The design is based on the use of a grass track which reduces concrete requirements;</li> </ul>	C	Negative, Minor Adverse, Short-Term and Not Significant

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>▪ Facilitating sustainable material use, such as Green Cement and recyclable material;</li> <li>▪ Divert waste materials from landfill / incineration to re-use onsite or offsite or recycling material;</li> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ Implement a Waste Management Plan for Construction and Demolition Waste as part of the CEMP;</li> <li>▪ 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;</li> <li>▪ 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</li> <li>▪ 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.</li> </ul>		

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
CM-4	14.5.1	Throughout (as required)	Climate change	<ul style="list-style-type: none"> <li>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;</li> <li>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;</li> <li>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 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;</li> <li>Integrate and maintain measures to manage construction and operational surface water and stormwater runoff;</li> <li>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; and</li> <li>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.</li> </ul>	C	Negative, Minor Adverse, Short-Term and Not Significant
CM-5	14.4.1.3	Throughout (as required)	GHG Climate change	<p>The following additional Operational Phase mitigation measures will be implemented:</p> <ul style="list-style-type: none"> <li>Installation of a Solar PV panel array on the Park &amp; 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</li> </ul>	O	Minor Adverse, and Not Significant

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>approx. 96 tCO<sub>2eq</sub> per annum or 5,760 tCO<sub>2eq</sub> over the lifetime of the proposed Scheme;</p> <ul style="list-style-type: none"> <li>▪ The power supply for the proposed Scheme will be delivered from electrical sub-stations via an Overhead Contact System (OCS). Power will be supplied to the sub-stations from the national grid;</li> <li>▪ 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;</li> <li>▪ 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 tCO<sub>2eq</sub> per annum or 11,640 tCO<sub>2eq</sub> over the 60-year lifetime of the proposed Scheme;</li> <li>▪ Achieve Net Zero for operational energy by the design year through energy efficiency, innovation, green power purchases and offsetting residual emissions; and</li> <li>▪ 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.</li> </ul>		

## 25.12 Noise and Vibration

**Table 25-11: Noise and Vibration Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation Measure / Environmental Commitment and Monitoring measures	Implementation Stage	Residual impacts
NV-1	15.5.1.1	Throughout (as required)	Impacts on stakeholders	<p>The main principles and standards required for noise mitigation are outlined as follows:</p> <ul style="list-style-type: none"> <li>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;</li> <li>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;</li> <li>The selection of plant items will be required to comply and European Communities Noise Emissions by Equipment for Use Outdoors (Amendment) Regulations 2006;</li> <li>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</li> <li>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.</li> </ul> <p>The key principles relating to noise mitigation will be applied across all construction activities for the proposed Scheme:</p> <ul style="list-style-type: none"> <li>Noise control at Source: Selection of quiet plant, site layout, attenuation at source, operational control (hours and periods); and</li> <li>Noise Control along Pathway: Localised screening to plant items on site, enclosures, site buildings, site hoarding and noise barriers.</li> </ul>	C	Negative, slight to significant and brief to short term
NV-2	15.5.1.1	Throughout (as required)	Impacts on stakeholders	<p>Selection of quiet plant:</p> <ul style="list-style-type: none"> <li>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</li> </ul>	C	Negative, slight to significant and brief to short term

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation Measure / Environmental Commitment and Monitoring measures	Implementation Stage	Residual impacts
				<p>generating equipment that would economically achieve, in the given ground conditions, equivalent structural / excavation / breaking results, these will be selected to control noise emissions; and</p> <ul style="list-style-type: none"> <li>The use of non-percussive piling methodologies will be used across the proposed Scheme to control noise and vibration impacts.</li> </ul>		
NV-3	15.5.1.1	Throughout (as required)	Impacts on stakeholders	<p>If replacing a noisy item of plant is not a viable or practical option, noise control “at source” will be followed:</p> <ul style="list-style-type: none"> <li>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;</li> <li>Equipment powered by mains electricity shall be used in preference to equipment powered by internal combustion engines or locally generated electricity;</li> <li>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;</li> <li>Reverse alarms from mobile plant within construction compounds, will be broadband to reduce tonal elements from this source;</li> <li>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;</li> <li>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;</li> <li>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;</li> </ul>	C	Negative, slight to significant and brief to short term

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation Measure / Environmental Commitment and Monitoring measures	Implementation Stage	Residual impacts
				<ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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</li> <li>▪ 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.</li> </ul>		
NV-4	15.5.1.1	Throughout	Construction working hours	<p>From a consideration of construction working hours, a number of mitigation measures will be implemented:</p> <ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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</li> <li>▪ For work areas where night-time activities will be required, as far as practicable, activities with highest noise emissions will be scheduled</li> </ul>	C	Negative, slight to significant and brief to short term

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation Measure / Environmental Commitment and Monitoring measures	Implementation Stage	Residual impacts
				<p>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.</p> <p>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 area greater than 10kg/m<sup>2</sup> will give adequate sound insulation performance.</p>		
NV-5	15.5.1	Throughout (as required)	Impacts on stakeholders	<p>Consultation with stakeholders:</p> <ul style="list-style-type: none"> <li>The project team including Employer, Contractor and Local Authorities will engage in regular meetings to discuss the approach to noise management;</li> <li>A particular emphasis should be placed on the risk of noise impacts during any out of hours work;</li> <li>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;</li> <li>The Contractor will distribute information circulars informing people of the progress of works and any likely periods of significant noise and vibration; and</li> <li>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.</li> </ul>	C	Negative, slight to significant and brief to short term
NV-6	15.5.1	Throughout (as required)	Impacts on stakeholders	<p>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:</p> <ul style="list-style-type: none"> <li>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.</li> </ul>	C	Negative, slight to significant and brief to short term
NV-7	15.5.1.2	Throughout (as required)	Impacts on stakeholders	<p>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 vehicles will be securely fastened before leaving site to avoid excessive 'rattling'</p>	C	Negative, slight to significant and brief to short term

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation Measure / Environmental Commitment and Monitoring measures	Implementation Stage	Residual impacts
NV-8	15.5.1.3	Throughout (as required)	Construction Vibration impacts  Human discomfort	<p>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:</p> <ul style="list-style-type: none"> <li>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</li> <li>Reduce the resistance to bored piles by “mudding in”. This technique involves lubricating the borehole with a small amount of bentonite slurry.</li> </ul> <p>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:</p> <ul style="list-style-type: none"> <li>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;</li> <li>Activities capable of generating significant vibration effects with respect to human response will be restricted to daytime hours only; and</li> <li>Appropriate vibration isolation shall be applied to plant (such as resilient mounts to pumps and generators), where required and where feasible.</li> </ul>	C	Negative, slight to significant and brief to short term
NV-9	15.5.2.1	St Helena’s Childcare Centre	Increased airborne noise	<p>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.</p> <p>The boundary treatment will be constructed from a suitable dense material such as masonry or solid timber fencing, offering suitable sound attenuation.</p>	O	Negative, not significant and long term
NV-10	15.5.2.2	Throughout (as required)	Noise from rail corrugation and squeal	<p>Grinding rail surfaces will be carried out to reduce rail generated noise from rail and wheel roughness.</p> <p>As part of the rail maintenance programme conduct rail lubrication at these locations to minimise the risk and magnitude of any squeal noise</p>	O	Negative, not significant and long term

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation Measure / Environmental Commitment and Monitoring measures	Implementation Stage	Residual impacts
				generated as provided by on-board lubrication systems aboard all Luas fleet, both existing and proposed.		
NV-11	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	Negative, not significant and long term
NV-12	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	Negative, not significant and long term

## 25.13 Electromagnetic Compatibility and Interference

**Table 25-12: Electromagnetic Compatibility Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impact	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impact
ECI-1	16.6.1	Throughout (as required)	Impacts on wayside conductors from ESB Overhead lines	Carry out an induced voltage study to quantify the magnitude of induced voltage and determine the risk and if technical or operational mitigation measures are required	PC, C, O	Not Significant
ECI-2	16.6.1	Throughout (as required)	Impacts on personnel working near overhead lines	Review working procedures to ensure OHL is earthed when personnel are working near the line.	PC, C	Not Significant
ECI-3	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	Not Significant
ECI-4	16.6.1	Throughout (as required)	Impacts on Garda and Fire station Radio 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	Not Significant
ECI-5	16.6.1	Throughout (as required)	Impacts from interference of nearby emitters on wayside equipment, LRVs, etc	Ensure LRV equipment meets EN 50121-3-2 immunity levels. Ensure wayside equipment and LRV stop equipment meets appropriate immunity standard. Ensure substation equipment meets immunity levels in EN 50121-5 or other appropriate immunity standard	C, O	Not Significant
ECI-6	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.	PC, C	Not Significant

Mitigation Number	EIAR Section Reference	Location	Impact	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impact
				Review design to ensure it is aligned with strategy and minimises stray current. Inspect installation to ensure stray current mitigates are implemented.		
ECI-7	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	Not Significant
ECI-8	16.6.1	St Margaret's 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	Not Significant
ECI-9	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: <ul style="list-style-type: none"> <li>▪ EMC Control Plan;</li> <li>▪ EMC Hazard Analysis &amp; Risk Assessment;</li> <li>▪ Stray Current Strategy Management Plan;</li> <li>▪ EMC Simulation Studies; and</li> <li>▪ EMC Test Plans.</li> </ul>	PC, C, O	Not Significant

## 25.14 Material Assets: Infrastructure and Utilities

**Table 25-13: Infrastructure and Utilities Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation Measure / Environmental Commitment and Monitoring measures	Implementation Stage	Residual Impacts
MAM-1	EIAR Chapter 6 -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	Moderate

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation Measure / Environmental Commitment and Monitoring measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>All electrical relocations, isolations and de-energizations will be performed by a licensed electrical Subcontractor in advance of demolition.</li> </ul>		
MAM-2	17.5.1.1	Throughout (as required)	Impacts on Stakeholders	<p>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:</p> <ul style="list-style-type: none"> <li>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.</li> </ul>	C	Moderate
MAM-3	17.5.1.1	Throughout (as required)	Stakeholders (Utility companies)	Consultations have been undertaken with all major utility companies regarding proposed Scheme designs. Consultations will continue through the design development.	C	Slight
MAM-3	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	Slight
MAM-4	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	Moderate
MAM-5	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	Moderate
MAM-6	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	Moderate

## 25.15 Material Assets: Waste and Resources

**Table 25-14: Waste and Resources Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation Measure / Environmental Commitment and Monitoring measures	Implementation Stage	Residual Impacts
WR-1	19.5.1	Throughout (as required)	Designing for circular economy	<p>The proposed Scheme will use circular economy principles in construction to minimize the use of materials, energy and other resources These include,</p> <ul style="list-style-type: none"> <li>▪ Minimise resource consumption and waste generation;</li> <li>▪ Design for re-use and recovery;</li> <li>▪ Design for materials optimisation: simplifying layout and form to minimise material use;</li> <li>▪ Design for off-site construction; and</li> <li>▪ Design for the future (deconstruction and flexibility): identifying how materials can be designed to be more easily adapted over an asset lifetime.</li> </ul>	PC	Imperceptible
WR-2	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	Imperceptible
WR-3	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	Imperceptible
WR-4	19.5.2	Throughout (as required)	Impacts on soil and land	All excavated materials will be re-used on site if appropriate	C	Imperceptible
WR-5	19.5.2	Throughout (as required)	Impacts on traffic and transportation	<p>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 proposed Scheme area.</p> <ul style="list-style-type: none"> <li>▪ Where importation of fill is necessary, imported materials will be sourced from reputable quarries within the EMWR.</li> </ul>	C	Imperceptible
WR-6	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	Imperceptible

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation Measure / Environmental Commitment and Monitoring measures	Implementation Stage	Residual Impacts
WR-7	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	Imperceptible
WR-8	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. <ul style="list-style-type: none"> <li>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.</li> </ul>	C	Imperceptible
WR-9	19.5.2.3	Throughout (as required)	Impacts on soil	Contaminated soil will be stockpiled separately to minimize the risk of cross contamination	C	Slight
WR-10	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: <ul style="list-style-type: none"> <li>All waste removed will be sent to a suitably licensed, permitted or registered waste facility for compliant handling and recovery or disposal.</li> </ul>	C	Imperceptible
WR-11	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	Slight
WR-12	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: <ul style="list-style-type: none"> <li>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.</li> </ul>	O	Imperceptible
WR-13	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: <ul style="list-style-type: none"> <li>The Operator will be required to have a Sustainability Plan which will be linked to the ISO 14001 accreditation (or similar).</li> </ul>	O	Imperceptible

## 25.16 Material Assets: Traffic and Transport

**Table 25-15: Traffic and Transport Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation Measure / Environmental Commitment and Monitoring measures	Implementation Stage	Residual Impacts
TT-1	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	Imperceptible to Slight Adverse
TT-2	18.5.1	Throughout (as required)	Impacts on traffic	<p>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.</p> <p>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:</p> <ul style="list-style-type: none"> <li>▪ Pedestrians and Cyclists;</li> <li>▪ Public Transport;</li> <li>▪ General Traffic; and</li> <li>▪ Parking and Access</li> </ul>	C	Imperceptible to Slight Adverse
TT-3	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	Imperceptible to Slight Adverse

## 25.17 Cultural Heritage

**Table 25-16: Cultural Heritage Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage	Residual Impacts
ACHM-1	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. <ul style="list-style-type: none"> <li>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.</li> </ul>	PC	Imperceptible
ACHM-2	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	Imperceptible
ACHM-3	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	Imperceptible
ACHM-4	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	Imperceptible
ACHM-5	20.6.2	Throughout (as required)	Impacts on archaeological elements	Mitigation measures which may be undertaken prior to and during the Construction Phase include: <ul style="list-style-type: none"> <li>Full measured, written, drawn and photographic surveys;</li> <li>Detailed construction methodology (demolition, removal, storage, relocation/reinstatement, rebuilding, repair and rehabilitation of archaeological and cultural heritage monuments; appropriate screening; monitoring of vibration);</li> </ul>	C	Slight Adverse

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>▪ Dive, underwater and wade surveys (including metal detecting);</li> <li>▪ Geophysical surveys;</li> <li>▪ Archaeological test excavations (including metal detecting);</li> <li>▪ Archaeological monitoring (including metal detecting); and</li> <li>▪ Preservation by record (Archaeological excavation).</li> </ul>		
ACHM-6	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	Imperceptible to slight adverse
ACHM-7	20.6.2	Tolka Valley Park	Impacts on heritage constraints	<p>Archaeological monitoring will be carried out during enabling and construction works at the locations of cultural heritage constraints within this area.</p> <ul style="list-style-type: none"> <li>▪ Should archaeological remains be confirmed, further archaeological mitigation such as preservation in situ or full archaeological excavation will be required.</li> </ul>	C	Imperceptible
ACHM-8	20.6.2	Broome Bridge, Finglaswood Bridge, Royal Canal and towpath, St. Helena House and King William's 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 William's 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	Slight adverse to Imperceptible
ACHM-9	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	Slight adverse to Imperceptible
ACHM-10	20.6.2	Canal and Railway Bridge: Broome Bridge, Canal: Royal Canal	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	Slight adverse to Imperceptible

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage	Residual Impacts
		towpath, Bridge: Finglaswood Bridge				

## 25.18 Landscape and Visual Amenity

**Table 25-17: Landscape and Visual Amenity Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
LVA-1	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 <ul style="list-style-type: none"> <li>Ecological mitigation will include reinstatement of canal side vegetation, Primary Design Mitigation Measure H-Vegetation Reinstatement.</li> </ul>	C	Significant, Negative
			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. <ul style="list-style-type: none"> <li>Further liaison with the residents of R003 Bannow Road will be carried out to determine if this screening measure is preferred</li> </ul>	C / PC	Moderate, Negative
LVA-2	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 lane and footpath, to aid traffic calming and to highlight safe crossing points and improve the streetscape quality. <ul style="list-style-type: none"> <li>The proposed roadside avenue trees are Mitigation Measure L- Tree Strategy, will reinforce the Key Landscape Feature of this character area;</li> </ul>	C	Moderate, Positive

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>Primary Design Mitigation M–Biodiversity with pollinator friendly plant mixes;</li> <li>The Primary Design includes over two thirds of the track as green track in this character area as Primary Design Mitigation I–Track Vegetation; and</li> <li>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.</li> </ul>		
			Visual Impacts	<p>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.</p> <ul style="list-style-type: none"> <li>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</li> </ul>	C	Slight, Positive
LVA-3	21.5.1.6	Tolka Valley Park	Impacts on landscape	<p>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 construction of the proposed bridge and replacement of amenity grassland.</p> <ul style="list-style-type: none"> <li>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;</li> <li>Mitigation T–SuDS drainage methods will be implemented through the park to promote sustainable drainage methods;</li> <li>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;</li> </ul>	PC / C / O	Significant, Negative

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>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;</li> <li>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; and</li> <li>Ecological Mitigation - will include reinstatement of the Integrated Constructed Wetlands under the proposed Luas bridge. Ref Chapter 8 (Biodiversity).</li> </ul>		
			Visual Impacts	<p>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</p> <ul style="list-style-type: none"> <li>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 species are present to avoid disturbance i.e. no lights to be facing River Tolka where bats are present;</li> <li>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; and</li> <li>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.</li> </ul>	C	<ul style="list-style-type: none"> <li>Moderate, Negative</li> <li>Imperceptible</li> <li>Significant, Negative</li> </ul>
LVA-4	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	C / O	Slight, Positive

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>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;</li> <li>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);</li> <li>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;</li> <li>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;</li> <li>Measure W-Light Mitigation for Wildlife will ensure the eastern side of the open space remains unlit and dark to facilitate bat commuting routes; and</li> <li>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.</li> </ul>		
			Visual Impacts	<p>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).</p> <ul style="list-style-type: none"> <li>Mitigation X- Light Mitigation for Residents, will reduce light pollution for local people;</li> <li>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;</li> </ul>	C / O	<ul style="list-style-type: none"> <li>Moderate, Positive</li> <li>Slight, Positive</li> <li>Slight, Positive</li> <li>Slight, Positive</li> </ul>

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>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; and</li> <li>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.</li> </ul>		
LVA-5	21.5.1.8	Farnham Park	Impacts on landscape	<p>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.</p> <ul style="list-style-type: none"> <li>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;</li> <li>Secondary Mitigation Measures CC-Ecological Mitigation will include replacement of amenity grassland utilised by protected wintering bird species;</li> <li>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; and</li> <li>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.</li> </ul> <p>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</p>	PC / C / O	Slight Negative

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				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		
			Visual Impacts	<p>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</p> <p>Mitigation W-Light Mitigation for Wildlife will ensure lighting is located at pedestrian track crossing points on eastern boundary to reduce light emission for sensitive habitats and nocturnal species (bats).</p> <p>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)</p>	C	Slight, Negative
LVA-6	21.5.1.9	Wellmount Road	Impacts on Landscape	<p>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.</p> <p>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.</p> <p>Measure I-Track Vegetation will help maintain the green soft character of this linear space.</p> <p>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.</p> <p>Mitigation O-Connectivity between Spaces, will improve movement between local open space by provision of new footpaths and removal of fencing.</p>	C	Slight, Negative
			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	<ul style="list-style-type: none"> <li>▪ Slight, Negative</li> <li>▪ Significant, Negative</li> </ul>

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ 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); and</li> <li>▪ 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.</li> </ul>		<ul style="list-style-type: none"> <li>▪ Slight, Neutral</li> <li>▪ Imperceptible, Neutral</li> </ul>
LVA-7	21.5.1.10	Finglas Main Street West	Impacts on Landscape	<p>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).</p> <p>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).</p>	C	Slight, Positive
			Visual Impacts	<ul style="list-style-type: none"> <li>▪ 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</li> </ul>	C	<ul style="list-style-type: none"> <li>▪ Slight Negative</li> </ul>

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>R077, in combination with Mitigation J-Streetscape Planting. These measures will allow visibility of the public realm improvements; and</p> <ul style="list-style-type: none"> <li>For receptors R082, R084, R085, R086, R083 and R086 the implementation of J-Streetscape Planting will provide a planted buffer between track, road, cycle lane and footpath, to aid traffic calming and to highlight safe crossing points and allow visibility of the public realm improvements Mitigation Q-Public Realm.</li> </ul>		<ul style="list-style-type: none"> <li>Imperceptible, Positive</li> </ul>
LVA-8	21.5.1.11	Mellowes Park	Impacts on Landscape	<p>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.</p> <p>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</p> <p>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</p> <p>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.</p> <p>Measure S-Trackside Safety Fencing (ball stop fencing), will be implemented beside LRT along eastern boundary of park and will protect the LRT passage</p> <p>Measure T-Drainage will include SuDS attenuation areas will be incorporated along the eastern side of the park.</p> <p>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.</p>	C / O	Slight Negative

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
			Visual Impacts	<p>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</p> <p>Mitigation X-Light Mitigation for Residents, will also be applied to minimise light emissions and reduce light pollution</p> <p>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</p> <p>Mitigation X-Light Mitigation for Residents, will also be applied to minimise light emissions and reduce light pollution</p> <p>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</p>	C	<ul style="list-style-type: none"> <li>Slight Negative</li> <li>Moderate Negative</li> <li>Slight Negative</li> </ul>
LVA-9	21.5.1.12	Finglas Road Corridor	Impacts on landscape	<p>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.</p> <p>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.</p>	C	<ul style="list-style-type: none"> <li>Slight Positive</li> </ul>
			Visual Impacts	<p>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 &amp; Ride facility.</p> <p>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</p> <p>Mitigation Q-Public Realm enhancements including planting, street furniture and seating areas, in combination with the removal of the</p>	C	<ul style="list-style-type: none"> <li>Significant, Negative</li> <li>Slight, Positive</li> </ul>

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				roundabout and the pedestrian footbridge will create an improvement to the visual amenity of this area.		
LVA-10	21.5.1.13	Charlestown/St Margarets	Impacts on landscape	<p>Measure J-Streetscape Planting, the provision of street trees and soft landscape areas which will create a planted buffer between track, road, cycle lane and footpath, to aid traffic calming and to highlight safe crossing points</p> <p>Measure J in combination with Measures I-Track Vegetation, Green Track bed treatment, will create streetscape improvements along the road corridor.</p> <p>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</p>	C	Slight, Positive
			Visual Impacts	<ul style="list-style-type: none"> <li>▪ 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;</li> <li>▪ Mitigation Q-Public Realm enhancements including planting, street furniture and seating areas will also create an improvement to the visual amenity of this area;</li> <li>▪ 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;</li> <li>▪ 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;</li> <li>▪ Mitigation Measure J-Streetscape Planting will provide a planted buffer between track, road, cycle lane and footpath, to aid traffic</li> </ul>	C	<ul style="list-style-type: none"> <li>▪ Moderate, Positive</li> <li>▪ Significant, Negative</li> <li>▪ Significant, Negative</li> <li>▪ Imperceptible, Neutral</li> <li>▪ Imperceptible, Positive</li> </ul>

Mitigation Number	EIAR Section Reference	Location	Impacts	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impacts
				<p>calming and to highlight safe crossing points. This will benefit people using the sports pitches (R165) and reduce visibility towards the proposed Scheme; and</p> <ul style="list-style-type: none"> <li>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 lane and footpath, will aid traffic calming and highlight safe crossing points and will allow visibility of the public realm improvements (Measure Q).</li> </ul>		

## 25.19 Major Accidents and Disasters

**Table 25-18: Major Accidents and Disasters Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impact	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impact
MMM-1	Section 22.6.2	Throughout (as required)	Impact on critical infrastructure due to construction works, including settlement	<p>Best practice measures for the protection of third-party assets will be specified by TII and implemented by the Contractor on site.</p> <p>Where the works would directly impact on an asset, diversion strategies have been developed and agreed with asset owners.</p> <p>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.</p> <p>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</p>	PC, C	Low

Mitigation Number	EIAR Section Reference	Location	Impact	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impact
				<p>may be unavoidable. Any disruption will be minimised and planned in advance by the appointed Contractor.</p> <p>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</p>		
MMM-2	Section 22.6.2	Throughout (as required)	Impacts on traffic	<p>All temporary traffic measures required during the Construction Phase are outlined in the CTMP and will be updated and implemented by the appointed Contractor.</p> <p>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).</p>	PC, C	Low
MMM-3	Section 22.6.2	Throughout (as required)	Impacts on water resources	<p>The CEMP and SWMP have been prepared and will be updated and implemented by the Contractor, having regard to best practice guidance.</p>	PC, C	Low
MMM-4	Section 22.6.2	Throughout (as required)	Impacts on infrastructure/assets	<p>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.</p> <p>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</p>	C	Low

Mitigation Number	EIAR Section Reference	Location	Impact	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impact
MMM-5	Section 22.6.2	Throughout (as required)	Impacts on Luas derailment	<p>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.</p> <p>All equipment will be compliant with Electromagnetic Compatibility and Interference (EMC and EMI) standards as required under the relevant EU standards.</p> <p>Implement design and periodic inspections and maintenance as part of the Operational Strategy. Operation and maintenance manuals communicated early, robustly completed and maintained.</p> <p>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.</p> <p>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: Wind Actions and International and National guidance and best practice.</p> <p>Equipment failure will be corrected as quickly as possible, and the action taken dependent on the nature of the failure.</p> <p>CCTV installation at Stops monitoring open section lines, for real-time monitoring. High integrity of safety critical functions required in reference and detailed design.</p> <p>Reinforcement of the passenger visual signalling and the security in the fencing surrounding the LRV access and the operational line.</p>	PC, O	Low
MMM-6	Section 22.6.2	Throughout (as required)	Fire/explosion impacts	<p>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</p>	C, O	Low

Mitigation Number	EIAR Section Reference	Location	Impact	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impact
				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.		
MMM-7	Section 22.6.2	Throughout (as required)	Impacts from infectious diseases	An Incident Management Plan is 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	Low
MMM-8	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). 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.	O	Low

## 25.20 Cumulative Impacts & Environmental Interactions

**Table 25-19: Cumulative Impacts & Environmental Interactions Mitigation Measures, Monitoring and Residual Impacts**

Mitigation Number	EIAR Section Reference	Location	Impact	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impact
CIEI-1	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	PC	Slight

Mitigation Number	EIAR Section Reference	Location	Impact	Description of Mitigation / Environmental Commitment and Monitoring Measures	Implementation Stage	Residual Impact
				cumulative impacts of general construction developments on communities, infrastructure and the environment		
CIEI-2	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	Slight

