

The background is a vibrant yellow. It is decorated with several abstract geometric shapes in shades of blue, teal, and white. These include circles, semi-circles, and rounded rectangular shapes, some of which are layered or overlapping. The shapes are scattered across the page, with a concentration in the top right and bottom left corners.

Chapter 22

Summary of Mitigation & Monitoring Measures

Contents

22.	Summary of Mitigation & Monitoring Measures	1
22.1	Introduction	1
22.2	Mitigation and Monitoring Schedules	1
22.3	General Mitigation Requirements	2
22.4	Traffic and Transport	2
22.5	Air Quality	3
22.6	Climate.....	3
22.7	Noise and Vibration	4
22.8	Population.....	6
22.9	Human Health.....	6
22.10	Biodiversity	7
22.11	Water	17
22.12	Land, Soils, Geology and Hydrogeology	19
22.13	Archaeological and Cultural Heritage	21
22.14	Architectural Heritage	24
22.15	Landscape (Townscape) and Visual	32
22.16	Waste and Resources	34
22.17	Material Assets	36
22.18	Major Accidents and / or Disasters.....	37
22.19	Cumulative Impacts	37
22.20	References	38

22. Summary of Mitigation & Monitoring Measures

22.1 Introduction

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 Belfield / Blackrock to City Centre Core Bus Corridor Scheme (hereafter referred to as the Proposed Scheme).

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 have been incorporated, where appropriate.

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.

22.2 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.

Mitigation and monitoring measures specified within the EIAR technical assessments are also provided in Chapter 6 to Chapter 21 of this EIAR.

The timing and implementation of the mitigation and monitoring measures are indicated within this Chapter as occurring during the:

- Pre-construction Phase: Activities such as investigative surveys (e.g., bat surveys) that need to be undertaken in advance of the construction works;
- Construction Phase: The undertaking of physical works to construct elements of the Proposed Scheme, as outlined in Chapter 4 (Proposed Scheme Description); and
- Operational Phase: When the Proposed Scheme comes into operation (i.e., any mitigation associated with planned maintenance.

The following tables 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 4 of this EIAR (note that the CEMP summarises the Construction Phase mitigation only). 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)'. Note that in certain instances, a mitigation measure may be relevant to more than one environmental aspect (e.g., Mitigation Number WT1 is also a mitigation measure used in relation to Biodiversity).

22.3 General Mitigation Requirements

Table 22.1: General Construction Phase Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
GEN1	Section 5.10	Throughout (as required)	The mitigation measures appropriate to the construction contract summarised in this chapter have been included in the Construction Environmental Management Plan (CEMP) and its associated management plans (provided in Appendix A5.1 in Volume 4 of this EIAR).	Construction

22.4 Traffic and Transport

Table 22.2: Traffic and Transport Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
TT1	6.5.1	Throughout (as required)	<p>A Construction Environmental Management Plan (CEMP) has been prepared (included as Appendix A.5.1 in Volume 4 of this EIAR) and will be implemented (and developed further as required) by the appointed contractor.</p> <p>A detailed Construction Traffic Management Plan will be prepared (and included in the CEMP) and will be implemented by the appointed contractor.</p> <p>The appointed contractor will also prepare (and include in the CEMP) and implement a Construction Stage Mobility Management Plan (CSMMP), to actively encourage personnel to travel to site by sustainable means.</p>	Construction

22.5 Air Quality

Table 22.3: Air Quality Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
AQ1	7.5.1	Construction Compound and throughout (as required)	<p>A series of mitigation measures will be implemented by the appointed contractor to minimise dust nuisance impacts:</p> <ul style="list-style-type: none"> Public roads affected by the Proposed Scheme works will be regularly inspected for soiling associated with the construction activities and cleaned as necessary; Material handling systems and stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays (or similar dust suppression methods) will be used as required if particularly dusty activities associated with the Construction Compound are necessary during dry or windy periods; During movement of dust generating materials both on and off-site, trucks will be covered with tarpaulin, and before entrance onto public roads, trucks will be checked to ensure the tarpaulins are properly in place; The appointed contractor will provide a site hoarding of 2.4m height along noise sensitive boundaries, at a minimum, at the Construction Compound, which will assist in minimising the potential for dust impacts off-site; and The appointed contractor will keep the effectiveness of the mitigation measures under review and revise them as necessary. In the event of dust nuisance associated with the Proposed Scheme occurring outside the works boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem. 	Construction

22.6 Climate

Table 22.4: Climate Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
CL1	8.7.1	Throughout (as required)	<p>A series of mitigation measures have been incorporated into the Proposed Scheme with the goal of reducing the embodied carbon associated with the Construction Phase. These mitigation measures include:</p> <ul style="list-style-type: none"> The replacement, where practicable, of concrete containing Portland cement with concrete containing ground granulated blast furnace slag (GGBFS); Where practicable, materials will be reused within the extent of the Proposed Scheme; and Where practicable, materials will be sourced locally to reduce the embodied emissions associated with transport. 	Construction

22.7 Noise and Vibration

Table 22.5: Noise and Vibration Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
NV1	9.5.1.1	Throughout (as required)	<p>The appointed contractor will be required to take specific noise abatement measures to the extent required and comply with the recommendations of BS 5228–1 (BSI 2014a) and European Communities Noise Emissions by Equipment for Use Outdoors (Amendment) Regulations 2006 (S.I. No 241/2006). The mitigation measures outlined below for the Construction Phase have also been included in the Construction and Environmental Management Plan (Appendix A5.1 in Volume 4 of this EIAR).</p> <p>These measures will ensure that:</p> <ul style="list-style-type: none"> • During the Construction Phase, the appointed contractor will be required to manage the works to comply with the limits detailed in Section 9.2.4.1 in Chapter 9 of this EIAR using methods outlined in BS 5228–1 (BSI 2014a). • The best means practicable, including proper maintenance of plant and equipment, will be employed to minimise the noise produced by on-site operations. 	Construction
NV2	9.5.1.1	Throughout (as required)	<p>The appointed contractor will put in place the most appropriate noise control measures depending on the level of noise reduction required at individual working areas i.e., based on the construction threshold values for noise and vibration set out in Tables 9.10 and 9.13 in Chapter 9 of this EIAR. Reference to Table 9.47 in Chapter 9 of this EIAR indicates that intrusive works occurring within 45m of Noise Sensitive Locations (NSLs) will need specific noise control measures to reduce impacts depending on time period over which they will occur, i.e., daytime or evening.</p>	Construction
NV3	9.5.1.1.1	Throughout (as required)	<p>The potential for any item of plant or equipment to result in exceedance of construction noise thresholds (Tables 9.10 and 9.13 in Chapter 9 of this EIAR), will be assessed prior to the item being brought onto the site. The least noisy item of plant or equipment will be selected wherever practicable (e.g., plant or equipment items with sound attenuation incorporated). Should a particular item of plant or equipment already on the site be found to exceed the construction noise levels, the first action will be to identify whether or not the item can be replaced with a quieter alternative.</p>	Construction
NV4	9.5.1.1.2	Construction Compound and throughout (as required)	<p>The following measures will be implemented by the appointed contractor to control noise levels at source in order to remain below the threshold values for noise set out in Table 9.10 in Chapter 9 of this EIAR, which relate to specific site considerations:</p> <ul style="list-style-type: none"> • For mobile plant items such as dump trucks, planers, excavators and loaders, the installation of an acoustic exhaust, utilising an acoustic canopy to replace the normal engine cover and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB; • For percussive tools such as pneumatic concrete breakers and tools a number of noise control measures include fitting mufflers or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed. • The Construction Compound is in close proximity to NSLs (refer to Table 9.38 in Chapter 9 of this EIAR). Noisy items of plant or equipment will be sited away from noise sensitive boundaries; • Where compressors, generators and pumps are located in proximity to NSLs and have potential to exceed the construction noise thresholds, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation; and • Resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds, while other noise nuisance can be controlled by fixing resilient materials in between the surfaces in contact. 	Construction
NV5	9.5.1.1.3	Throughout (as required)	<p>Erection of localised demountable enclosures or screens will be used around breakers or drill bits, as required, when in operation in proximity to NSLs boundaries with the potential to exceed the construction noise thresholds. Annex B of BS 5228–1 (BSI</p>	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			2014a) (Figures B1, B2 and B3) provide typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on site from standard materials.	
NV6	9.5.1.1.3	Construction Compound	The appointed contractor will provide a site hoarding of 2.4m height along noise sensitive boundaries, at a minimum, at the Construction Compound.	Construction
NV7	9.5.1.1.3	Construction Compound and throughout (as required)	Careful planning of the Construction Compound including the placement of site buildings and stores between the site and NSLs will also be considered by the appointed contractor.	Construction
NV8	9.5.1.1.4	Throughout (as required)	Construction activities will be scheduled in a manner that reflects the location of the site and the nature of neighbouring properties. Construction activities / plant or equipment items will be considered with respect to their potential to exceed construction noise thresholds at NSLs and will be scheduled according to their noise level, proximity to sensitive locations and possible options for noise control. In situations where an activity with potential for exceedance of construction noise thresholds is scheduled (e.g., road widening and utility diversions or activities with similar noise levels identified in Table 9.28 in Chapter 9 of this EIAR). Other construction activities associated with the Proposed Scheme will be scheduled to avoid significant cumulative noise levels.	Construction
NV9	9.5.1.1.5	Throughout (as required)	The NTA will establish clear forms of communication that will involve the appointed contractor and NSLs in proximity to the works so that residents or building occupants are aware of the likely duration of activities likely to generate noise or vibration that are potentially significant as set out in Tables 9.10 and 9.13 in Chapter 9 of this EIAR.	Construction
NV10	9.5.1.1.6	Throughout (as required)	During the Construction Phase the appointed contractor will carry out noise monitoring at representative NSLs to evaluate and inform the requirement and/or implementation of noise management measures. Noise monitoring will be conducted in accordance with ISO 1996–1 (ISO 2016) and ISO 1996–2 (ISO 2017). The selection of monitoring locations will be based on the nearest representative NSLs to the working area which will progress along the length of the Proposed Scheme.	Construction
NV11	9.5.1.2	Throughout (as required)	During the Construction Phase the appointed contractor will carry out vibration monitoring at buildings and structures where proposed works have the potential to be at or exceed the vibration limit values in Table 9.13 in Chapter 9 of this EIAR. Vibration from construction activities will be limited to the values set out in Table 9.13 in Chapter 9 of this EIAR to avoid any form of potential cosmetic damage to buildings and structures.	Construction
NV12	9.5.1.2	Throughout (as required)	The appointed contractor will implement the following mitigation measures during the Construction Phase: <ul style="list-style-type: none"> • A clear communication programme will be established by NTA 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 as per Table 9.14 in Chapter 9 of this EIAR; • Activities capable of generating significant vibration effects with respect to human response (as per Table 9.11 in Chapter 9 of this EIAR) will be restricted to daytime hours only, as far as practicable; and • Appropriate vibration isolation (such as resilient mounts to pumps and generators) will be applied to plant and equipment, where required and where feasible. 	Construction

22.8 Population

Table 22.6: Population Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
N/A	N/A	N/A	No additional mitigation or monitoring measures are considered necessary beyond those already identified in other environmental assessments.	N/A

22.9 Human Health

Table 22.7: Human Health Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
HH1	11.5.1	Throughout (as required)	Mitigation for adverse psychosocial responses to the Construction Phase will include providing the public with sufficient information to enable people to plan their days, journeys and activities around the construction works and take control of their options to some extent. The appointed contractor will put in place a Communications Plan in accordance with the NTA requirements. The Plan will provide a mechanism for members of the public to communicate with the NTA and the appointed contractor, and for the NTA and the appointed contractor to communicate important information on various aspects of the Proposed Scheme to the public. This will include timely communication to the local community on the planned works activities, timings and traffic management.	Construction
HH2	11.5.1	St. Vincent's University Hospital	Access to St. Vincent's University Hospital will be maintained by the appointed contractor. The Construction Traffic Management Plan will set out measures to minimise any delay for emergency response vehicles, specifically ambulances, in accessing the hospital.	Construction

22.10 Biodiversity

Table 22.8: Biodiversity Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
BD1	12.5.1	Throughout (as required)	Where deemed necessary a suitably experienced and qualified ecologist will be employed by the appointed contractor. The ecologist will advise the appointed contractor on ecological matters during construction, communicate all findings in a timely manner to the NTA and statutory authorities, acquire any licenses / consents required to conduct the work, and supervise and direct the ecological measures associated with the Proposed Scheme.	Construction
BD2	12.5.1.2.1	Throughout (as required)	<p>Habitat Loss / Fragmentation</p> <p>Where practicable, areas of vegetation, including habitats of Local Importance (Higher Value), (i.e., mixed broadleaved woodland, scattered trees and parkland, tree line and hedgerow habitat types) which lie within the footprint, or along the boundary of the Proposed Scheme, will be retained.</p> <p>The areas of vegetation to be retained are shown on the Landscaping General Arrangement drawings (BCIDC-ARP-ENV_LA-1415_XX_00-DR-LL-9001) in Volume 3 of this EIAR.</p> <p>These areas will be protected by the appointed contractor for the duration of construction works and fenced off at an appropriate distance.</p>	Construction
BD3	12.5.1.2.1	Throughout (as required)	<p>Habitat Loss / Fragmentation</p> <p>To mitigate loss of habitat, the proposed planting incorporated into the Proposed Scheme will be implemented by the appointed contractor. This planting is listed below and displayed on the Landscaping General Arrangement drawings (BCIDC-ARP-ENV_LA-1415_XX_00-DR-LL-9001) in Volume 3 of this EIAR:</p> <ul style="list-style-type: none"> • 349 street trees planted; • 558m of proposed hedgerow; • 1,241m² of proposed species rich grassland; • 4,990m² of proposed ornamental planting; • 176m² of proposed native planting; and, • 2,928m² of proposed amenity grassland planting. 	Construction
Refer to WT1 – WT4 in Table 22.9	-	Construction Compound and throughout (as required)	<p>Habitat Degradation – Surface Water Quality</p> <p>In terms of mitigation, a Surface Water Management Plan (SWMP) and Environmental Incident Response Plan (EIRP), as provided in the Construction Environmental Management Plan (Appendix A5.1 in Volume 4 of this EIAR), 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.</p> <p>It will be a condition of the Employer’s Requirements that the successful contractor, immediately following appointment, must detail in the SWMP how it is intended to effectively implement all the applicable measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.</p> <p>At a minimum, all the control and management measures set out in the SWMP will be implemented by the appointed contractor. This includes measures relating to:</p> <ul style="list-style-type: none"> • Construction Compound management including the storage of fuels and materials; 	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			<ul style="list-style-type: none"> Control of Sediment; Use of Concrete; Management of vehicles and plant including refueling and wheel wash facilities (if necessary); and Monitoring. <p>Specific mitigation measures which the appointed contractor will implement in relation to Surface Water quality at the Construction Compound, Booterstown Marsh and Canal tow path at Wilton Terrace are outlined in WT2, WT3 and WT4.</p>	
Refer AQ1 in Table 22.3	-	Construction Compound and throughout (as required)	<p>Habitat Degradation – Air Quality</p> <p>The mitigation measures which will be applied by the appointed contractor to control dust emissions during the Construction Phase are outlined in Table 22.3 of this Chapter of the EIAR.</p>	Construction
BD4	12.5.1.2	Throughout (as required)	<p>Habitat Degradation – Invasive Species</p> <p>The NTA will ensure that a confirmatory pre-construction invasive species survey will be undertaken by a suitably qualified specialist to confirm the absence and/or extent of all Third Schedule invasive species within the footprint of the Proposed Scheme.</p> <p>Where an infestation is confirmed / identified within the footprint of the Proposed Scheme, this will require the implementation of a Non-Native Invasive Species Management Plan (ISMP) (refer to the Plan contained in the CEMP in Appendix 5.1 of Volume 4 of this EIAR). Following the confirmatory pre-construction survey, mitigation measures outlined in BD5 and BD6 will be implemented, as required.</p>	Pre-Construction / Construction
BD5	12.5.1.2	Throughout (as required)	<p>Habitat Degradation – Invasive Species</p> <p>Where a pre-construction invasive species re-survey identifies newly established non-native invasive species within the footprint of the Proposed Scheme, the ISMP produced will provide a detailed description of the infestations (e.g. approximate area of the respective colonies (m²), where feasible; approximate total number of stems, pattern of growth and information on other vegetation present), and where necessary, include calculations of volumes of infested soils to be excavated.</p> <p>The ISMP will be finalised following the pre-construction survey as advised by a suitably qualified specialist, with regard to the Management of Invasive Alien Plant Species on National Roads - Technical Guidance (TII 2020a) and Standard (TII 2020b) and other species-specific guidance documents including those listed in the ISMP, as necessary.</p>	Pre-Construction / Construction
BD6	12.5.1.2	Throughout (as required)	<p>Habitat Degradation – Invasive Species</p> <p>The NTA will ensure that all control measures specified in the Proposed Scheme ISMP shall be implemented by a suitably qualified and licenced specialist prior to the construction of the Proposed Scheme to control the spread of newly established non-native invasive species within the footprint of the Proposed Scheme. Furthermore, the appointed contractor will adhere to control measures specified within the ISMP throughout the Construction Phase of the Proposed Scheme.</p> <p>The site will be monitored by the appointed contractor after control measures have been implemented. Any re-growth, will be subsequently treated as detailed in the Proposed Scheme ISMP.</p>	Pre-Construction / Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
Refer to WT1 – WT4 in Table 22.9	-	Throughout (as required)	<p><u>Rare and Protected Plant Species</u> <u>Habitat Degradation – Surface Water Quality</u></p> <p>In terms of mitigation, a Surface Water Management Plan (SWMP) and Environmental Incident Response Plan (EIRP), as provided in the Construction Environmental Management Plan (Appendix A5.1 in Volume 4 of this EIAR), 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.</p> <p>It will be a condition of the Employer’s Requirements that the successful contractor, immediately following appointment, must detail in the SWMP how it is intended to effectively implement all the applicable measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.</p> <p>At a minimum, all the control and management measures set out in the SWMP will be implemented by the appointed contractor. This includes measures relating to:</p> <ul style="list-style-type: none"> • Construction Compound management including the storage of fuels and materials; • Control of Sediment; • Use of Concrete; • Management of vehicles and plant including refueling and wheel wash facilities (if necessary); and • Monitoring. <p>Specific mitigation measures which the appointed contractor will implement in relation to Surface Water quality at the Construction Compound, Booterstown Marsh and Canal tow path at Wilton Terrace are outlined in WT2, WT3 and WT4.</p>	Construction
BD7	12.5.1.4.1.1	Refer to Figure 12.6.2 in Chapter 12 of this EIAR.	<p><u>Bats</u> <u>Protection of Bats during Vegetation Clearance</u></p> <p>Four trees with Potential Roosting Features (PRF’s) were identified within the footprint of the Proposed Scheme. The following mitigation measures will be implemented by the appointed contractor to protect the PRFs:</p> <ul style="list-style-type: none"> • Retained trees with PRFs will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches, or root system of the tree which could disturb roosting bats. Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist; • Where fencing is not feasible due to insufficient space, protection for the tree will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it; • The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g., hydrocarbons) or concrete washout areas will not be undertaken within 10m of any retained trees, hedgerows and treelines; • A qualified arborist engaged by the appointed contractor will assess the condition of, and advise on any repair works necessary to, any trees which are to be retained or that lie outside of the Proposed Scheme footprint but whose RPA is impacted by the works; • Where works are required within the RPA, the mitigation measures as set out in the method statement within the Arboricultural Impact Assessment (refer to Appendix A17.1 of this EIAR) will be implemented and • There will be no additional lighting within 5m of the PRF during the Construction Phase of the Proposed Scheme to avoid disturbance to roosting bats. 	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
BD8	12.5.1.4.1.2	Throughout (as required)	<p>Bats <u>Habitat Loss and Fragmentation</u></p> <p>Planting of treeline, hedgerow and grassland habitats within the Proposed Scheme footprint will be carried out by the appointed contractor, as detailed in the landscape drawings which will provide suitable habitat for the bat species recorded within the study area (Refer to the Landscaping General Arrangement drawings (BCIDC-ARP-ENV_LA-1415_XX_00-DR-LL-9001) in Volume 3 of this EIAR.</p>	Construction
BD9	12.5.1.4.1.3	Construction Compound, and active works areas.	<p>Bats <u>Disturbance of Flight Patterns / Foraging Routes as a result of Lighting Impacts</u></p> <p>The appointed contractor in liaison with the suitably qualified licensed ecologist(s) will ensure that lighting at the construction compound, and active work areas in proximity to known bat activity, will be designed to minimise light spill and be cognisant of light-spill onto these areas.</p> <p>Mitigation measures to reduce light spill will include the following:</p> <ul style="list-style-type: none"> • the use of sensor / timer triggered lighting; • LED luminaires to be used where practicable; • column heights to be considered to minimise light spill; and • accessories such as baffles, hoods or louvres to be used to reduce light spill and direct it only where needed. 	Construction
BD10	12.5.1.4.1.3	Throughout (as required)	<p>Bats <u>Measures to Prevent Disturbance / Displacement</u></p> <p>Where night time works are required the appointed contractor will liaise with the engaged suitably qualified and licenced ecologist(s) and implement measures to mitigate the impact of such works (especially works carried adjacent to watercourses with known bat activity).</p>	Construction
BD11	12.5.1.4.2	Throughout (as required)	<p>Badgers <u>Disturbance / Displacement</u></p> <p>The NTA will ensure that a confirmatory pre-construction check of all suitable badger habitat will be completed within the 12-month period prior to any construction works commencing.</p> <p>The presence of any new setts or significant badger activity will be treated and/or protected in accordance with the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (NRA, 2005b).</p>	Pre-Construction
BD12	12.5.1.4.2	Throughout (as required)	<p>Badgers <u>Protection of Badgers from Accidental Harm During Construction (Excavations)</u></p> <p>To protect badgers from indirect harm during construction, where practicable open excavations will be covered when not in use and backfilled as soon as practicable by the appointed contractor.</p> <p>Excavations will also be covered at night, where practicable, and any deep excavations which must be left open will have appropriate egress ramps in place to allow mammals to safely exit should they fall in.</p>	Construction
BD13	12.5.1.4.2.3	Construction Compound, watercourses and throughout (as required)	<p>Badger <u>Lighting</u></p> <ul style="list-style-type: none"> • See BD9 which relates to lighting mitigation measures. 	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
Refer to WT1 in Table 22.9	12.5.1.4.2.3	Construction Compound and throughout (as required)	<p>Otter <u>Habitat Degradation / Reduced Prey Availability – Water Quality</u></p> <p>In terms of mitigation, a Surface Water Management Plan (SWMP) and Environmental Incident Response Plan (EIRP), as provided in the Construction Environmental Management Plan (Appendix A5.1 in Volume 4 of this EIAR), 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.</p> <p>It will be a condition of the Employer’s Requirements that the successful contractor, immediately following appointment, must detail in the SWMP how it is intended to effectively implement all the applicable measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.</p> <p>At a minimum, all the control and management measures set out in the SWMP will be implemented by the appointed contractor. This includes measures relating to:</p> <ul style="list-style-type: none"> • Construction Compound management including the storage of fuels and materials; • Control of Sediment; • Use of Concrete; • Management of vehicles and plant including refueling and wheel wash facilities (if necessary); and • Monitoring. <p>Specific mitigation measures which the appointed contractor will implement in relation to Surface Water quality at the Construction Compound, Booterstown Marsh and Canal tow path at Wilton Terrace are outlined in WT2, WT3 and WT4.</p>	Construction
BD14	12.5.1.4.3.1	Throughout (as required)	<p>Otter <u>Loss of Breeding/ Resting Sites</u></p> <p>The NTA will ensure that a confirmatory pre-construction check of all suitable otter habitat will be completed by a suitably qualified ecologist within the 12-month period prior to any construction works commencing.</p> <p>The presence of any new holt/couch sites will be treated and/or protected in accordance with the Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (NRA, 2008c).</p>	Pre-Construction
BD15	12.5.1.4.3.2	Throughout (as required) especially in relation to working areas in proximity to the River Dodder, Grand Canal and Construction Compound	<p>Otter</p> <ul style="list-style-type: none"> • The appointed contractor will engage a suitably qualified and/or licensed ecologist(s) to oversee and advise works at watercourse crossings; • Where a new or reactivated holt is encountered, within 150 metres (up and downstream) of the watercourse crossing, the qualified ecologist(s) will consult with the NPWS in conjunction with the NTA and appointed contractor; • The qualified ecologist will review method statements, oversee works, provide advice to the appointed contractor(s), deliver toolbox talks and temporarily halt works, if, and as, necessary, having conferred with the NTA; • To protect otters from indirect harm during construction, where practicable open excavations will be covered when not in use and backfilled as soon as practicable by the appointed contractor; • Excavations will also be covered at night, where practicable, and any deep excavations which must be left open will have appropriate egress ramps in place to allow mammals to safely exit should they fall in; and 	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			<ul style="list-style-type: none"> Fencing requirements as per the Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes (NRA, 2008) will be erected around the Construction Compound and other working areas which are in close proximity to significant watercourses and have suitable roaming territory for otter. 	
BD16	12.5.1.4.3.4	Construction Compound, watercourses and throughout (as required)	<p>Otter Lighting</p> <ul style="list-style-type: none"> See BD9 which relates to lighting mitigation measures. 	Construction
BD17	12.5.1.4.3.4	Throughout (as required)	<p>Otter Measures to Prevent Disturbance / Displacement</p> <p>Where night time works are required the appointed contractor will liaise with the engaged suitably qualified and licenced ecologist(s) and implement measures to mitigate the impact of such works (especially works carried adjacent to watercourses with known otter activity).</p>	Construction
Refer to WT1 in Table 22.9	12.5.1.4.3.5	Throughout (as required where vegetation is present)	<p>Marine Mammals</p> <p>Habitat & Food Resource Degradation – Water Quality</p> <p>In terms of mitigation, a Surface Water Management Plan (SWMP) and Environmental Incident Response Plan (EIRP), as provided in the Construction Environmental Management Plan (Appendix A5.1 in Volume 4 of this EIAR), 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.</p> <p>It will be a condition of the Employer’s Requirements that the successful contractor, immediately following appointment, must detail in the SWMP how it is intended to effectively implement all the applicable measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.</p> <p>At a minimum, all the control and management measures set out in the SWMP will be implemented by the appointed contractor. This includes measures relating to:</p> <ul style="list-style-type: none"> Construction Compound management including the storage of fuels and materials; Control of Sediment; Use of Concrete; Management of vehicles and plant including refueling and wheel wash facilities (if necessary); and Monitoring. <p>Specific mitigation measures which the appointed contractor will implement in relation to Surface Water quality at the Construction Compound, Booterstown Marsh and Canal tow path at Wilton Terrace are outlined in WT2, WT3 and WT4.</p>	Construction
BD18	12.5.1.5.1.1	Throughout (as required)	<p>Breeding Birds</p> <p>Habitat Loss and Loss of Breeding / Resting Sites</p> <p>Planting of treeline, hedgerow and grassland habitats within the Proposed Scheme footprint will be carried out by the appointed contractor, as detailed in the landscape drawings (Refer to the Landscaping General Arrangement drawings (BCIDC-ARP-ENV_LA-1415_XX_00-DR-LL-9001) in Volume 3 of this EIAR for locations.</p>	Construction
BD19	12.5.1.5.1.2	Throughout (as required)	<p>Breeding Birds</p>	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			<p><u>Mortality Risk</u></p> <p>Where practicable, vegetation (e.g., hedgerows, trees, scrub, bankside vegetation and grassland) will not be removed, between the 01 March and the 31 August, to avoid direct impacts on nesting birds.</p> <p>Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist as engaged by the appointed contractor, for the presence of breeding birds prior to clearance.</p> <p>Areas found not to contain nests will be cleared within 3 days of the nest survey, otherwise repeat surveys will be required. Vegetation clearance will not commence where nests are present, works will resume when birds have fledged and nests are no longer in use, or an agreement is reached with NPWS.</p>	
BD20	12.5.1.5.1.3	Construction Compound	<p><u>Breeding Birds</u></p> <p><u>Disturbance / Displacement</u></p> <p>The appointed contractor will implement the noise mitigation measures described in NV4, NV6 and NV7 (Table 22.5 in this Chapter)</p>	Construction
BD21	12.5.1.5.2.1	Boosterstown Marsh, Blackrock College, Blackrock Park	<p><u>Wintering Birds</u></p> <p><u>Measures to reduce mortality and risks to Special Conservation Interest (SCI) birds due to Vegetation Loss during Construction Phase</u></p> <p>Where practicable, the removal of screening vegetation (e.g., hedgerows, trees, scrub, bankside vegetation and grassland) from Boosterstown Marsh, Blackrock College and Blackrock Park will be undertaken outside of the breeding bird season (01 March to the 31 August) and before the arrival of the wintering birds. Therefore, clearance works at Boosterstown Marsh, Blackrock College and Blackrock Park will commence in September and be concluded before the start of October.</p> <p>However, where the construction programme does not allow these seasonal restrictions to be observed, then these areas will be inspected by a suitably qualified ecologist as engaged by the appointed contractor, for the presence of wintering birds prior to clearance. Where wintering birds are observed the suitably qualified ecologist will, in discussion with the appointed the contractor, advise how works will be appropriately undertaken.</p>	Construction
BD22	12.5.1.5.2.3	Construction Compound	<p><u>Wintering Birds</u></p> <p><u>Measures to Prevent Disturbance and Displacement Impacts during Construction</u></p> <p>The following mitigation measures will be put in place at the Construction Compound by the appointed contractor to minimise disturbance to SCI bird species:</p> <ul style="list-style-type: none"> The appointed contractor will undertake the establishment of the construction compound outside of the wintering bird season (October to March), where practicable. However, where the construction programme does not allow this seasonal restriction to be observed, then the construction compound will be inspected by a suitably qualified ecologist as engaged by the appointed contractor, for the presence of wintering birds prior to establishment. Where wintering birds are observed the suitably qualified ecologist will, in discussion with the appointed contractor, advise how works will be appropriately undertaken. Hoarding of the Construction Compound will be in place prior to the arrival of wintering birds and will be retained on all sides of the compound for the duration of the works. <p>In addition to lighting at the Construction Compound aligning with BD9, the lighting column heights will be considered by the appointed contractor, so as not to act as an obstacle to birds.</p>	Construction
Refer to AQ1 in Table 22.3	7.5.1	Throughout (as required)	<p><u>Measures to Prevent Air Quality Impacts to Qualifying Interests (QI)/SCI Species Habitat during Construction</u></p>	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			<ul style="list-style-type: none"> See AQ1 which relates to mitigation measures to minimise dust nuisance impacts. 	
Refer to WT1 in Table 22.9	-	Construction Compound and throughout (as required)	<p><u>Breeding Birds / Wintering Birds</u></p> <p><u>Water Quality</u></p> <p>In terms of mitigation, a Surface Water Management Plan (SWMP) and Environmental Incident Response Plan (EIRP), as provided in the Construction Environmental Management Plan (Appendix A5.1 in Volume 4 of this EIAR), 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.</p> <p>It will be a condition of the Employer’s Requirements that the successful contractor, immediately following appointment, must detail in the SWMP how it is intended to effectively implement all the applicable measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.</p> <p>At a minimum, all the control and management measures set out in the SWMP will be implemented by the appointed contractor. This includes measures relating to:</p> <ul style="list-style-type: none"> Construction Compound management including the storage of fuels and materials; Control of Sediment; Use of Concrete; Management of vehicles and plant including refueling and wheel wash facilities (if necessary); and Monitoring. <p>Specific mitigation measures in relation to Surface Water quality at the Construction Compound, Booterstown Marsh and Canal tow path at Wilton Terrace are outlined in WT2, WT3 and WT4.</p>	Construction
BD23	12.5.1.7.1	Throughout (as required)	<p><u>Amphibians</u></p> <p><u>Habitat Loss, Disturbance & Mortality Risk</u></p> <p>If vegetation clearance works by the appointed contractor are to begin during the season where frogspawn or tadpoles may be present (i.e., February to mid-summer), or where breeding adult newts, their eggs or larvae may be present (i.e., mid-March to September), a pre-construction survey of suitable habitat will be undertaken by a suitably qualified ecologist engaged by the appointed contractor to determine whether breeding amphibians are present. Where amphibians are present, mitigation measures outlined in BD24, BD25, and BD26 will be completed before works recommence.</p>	Construction
BD24	12.5.1.7.1	Throughout (as required)	In the case of common frog, any frog spawn, tadpoles, juvenile or adult frogs present will be captured, under licence from NPWS, and removed from affected habitat by hand net and translocated to the nearest area of available suitable habitat, beyond the Zone of Influence (Zol) of the Proposed Scheme.	Construction
BD25	12.5.1.7.1	Throughout (as required)	In the case of smooth newt, individuals will be captured, under licence from NPWS, and removed from affected habitat either by hand net or by trapping and translocated to the nearest area of available suitable habitat, beyond the Zol of the Proposed Scheme. If used, the type and design of traps shall be approved by the NPWS. This is a standard and proven method of catching and translocating smooth newts.	Construction
BD26	12.5.1.7.1	Throughout (as required)	If the size or depth of the habitat feature is such that it cannot be determined by visual survey whether all amphibians have been captured, the suitably qualified ecologist engaged by the appointed contractor will advise on the appropriate course of action to confirm that no amphibian species remain.	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			If drainage of the habitat feature is deemed to be the appropriate course of action, any mechanical pumps used will have a screen fitted, and be sited, such that no amphibian species can be sucked into the pump mechanism. Any capture and translocation works shall be undertaken immediately in advance of site clearance/construction works commencing.	
Refer to WT1 in Table 22.9	-	Construction Compound and throughout (as required)	<p><u>Amphibian / Fish / Invertebrates - Habitat Degradation – Water Quality</u></p> <p>In terms of mitigation, a Surface Water Management Plan (SWMP) and Environmental Incident Response Plan (EIRP), as provided in the Construction Environmental Management Plan (Appendix A5.1 in Volume 4 of this EIAR), 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.</p> <p>It will be a condition of the Employer’s Requirements that the successful contractor, immediately following appointment, must detail in the SWMP how it is intended to effectively implement all the applicable measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.</p> <p>At a minimum, all the control and management measures set out in the SWMP will be implemented by the appointed contractor. This includes measures relating to:</p> <ul style="list-style-type: none"> • Construction Compound management including the storage of fuels and materials; • Control of Sediment; • Use of Concrete; • Management of vehicles and plant including refueling and wheel wash facilities (if necessary); and • Monitoring. <p>Specific mitigation measures in relation to Surface Water quality at the Construction Compound, Booterstown Marsh and Canal tow path at Wilton Terrace are outlined in WT2, WT3 and WT4.</p>	Construction
BD27	12.5.1.2	Throughout (as required)	<p><u>Habitat Degradation – Groundwater</u></p> <p>The mitigation measures which will be applied by the appointed contractor to control pollution of soil and groundwater during the Construction Phase are also outlined in LSGH7, LSGH8 and LSGH 9 in Table 22.10 of this Chapter of the EIAR.</p>	Construction
BD28	12.5.2.2.1	Throughout (as required)	<p><u>Habitat Degradation – Surface Water Quality</u></p> <p>The proposed SuDs drainage system, as shown in Surface Water Drainage Works drawings (BCIDC-ARP-DNG_RD-1415_XX_00-DR-CD-9001) in Volume 3 of this EIAR, will be installed by the appointed contractor during the Construction Phase.</p> <p>In the Operational Phase the maintenance regime for SuDS will be carried out by the Local Authorities and will be subject to their management procedures. No additional mitigation is required.</p>	Operation
BD29	12.5.1.2	Throughout (as required)	<p><u>Habitat Degradation – Invasive Species</u></p> <p>Once the Proposed Scheme is in operation, the Local Authorities will implement a maintenance and management regime subject to their management procedures, where any introduction of non-native invasive plant species will be managed. No additional mitigation is required.</p>	Operation
BD30	12.5.2.5.2.1	Throughout (as required)	<p><u>Wintering Birds</u></p> <p><u>Habitat Loss / Fragmentation during Operational Phase</u></p>	Operation

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			<p>To mitigate loss of habitat, the proposed planting incorporated into the Proposed Scheme will be implemented by the appointed contractor. This planting is listed below and displayed on the Landscaping General Arrangement drawings (BCIDC-ARP-ENV_LA-1415_XX_00-DR-LL-9001) in Volume 3 of this EIAR.</p> <ul style="list-style-type: none"> • 349 street trees planted; • 558m of proposed hedgerow; • 1,241m² of proposed species rich grassland; • 4,990m² of proposed ornamental planting; • 176m² of proposed native planting; and, • 2,928m² of proposed amenity grassland planting. 	
BD31	12.5.2.5.1	Boosterstown Marsh pNHA	<p><u>Habitat Loss / Fragmentation – Boosterstown Marsh</u> Reinstatement works in relation to Boosterstown Marsh pNHA will be carried out by the appointed contractor as per the Landscaping General Arrangement drawings (BCIDC-ARP-ENV_LA-1415_XX_00-DR-LL-9001). No additional mitigation is required</p>	Operation
BD32	12.5.2.5.1.	Throughout (as required)	In line with the maintenance contract the appointed contractor will carry out annual post construction monitoring, over a 2-year period to ensure the successful re-establishment of vegetation within the Proposed Scheme.	Operation
BD33	12.5.2.5.2	Boosterstown Marsh, Blackrock College, Blackrock Park	<p><u>Wintering Birds</u> <u>Habitat Loss / Fragmentation during Operational Phase</u> In addition to BD35, re-establishment of vegetation, including re-grassing, at these areas is to be done outside of the wintering bird season, but as soon as practicable after completion of a section of works.</p>	Operation

22.11 Water

Table 22.9: Water Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
WT1	13.5.2.1	Construction Compound and throughout (as required)	<p>A Surface Water Management Plan (SWMP) and Environmental Incidents Response Plan (EIRP) has been prepared (provided in the CEMP, Appendix A5.1 in Volume 4 of this EIAR), 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.</p> <p>It will be a condition of the Employer's Requirements that the successful contractor, immediately following appointment, must detail in the SWMP how it is intended to effectively implement all the applicable measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.</p> <p>At a minimum, all the control and management measures set out in the SWMP will be implemented by the appointed contractor. This includes measures relating to:</p> <ul style="list-style-type: none"> • Construction Compound management including the storage of fuels and materials; • Control of Sediment; • Use of Concrete; • Management of vehicles and plant including refueling and wheel wash facilities (if necessary); and • Monitoring. 	Construction
WT2	13.5.2.2	Construction Compound	<p>The following measures will be implemented by the appointed contractor</p> <ul style="list-style-type: none"> • The slit drain in the centre of the car park will be sealed for the duration of the construction programme (it is assumed the construction compound will be retained for the full length of the construction programme); • The appointed contractor will ensure that appropriate spill control equipment is available (e.g., a suitably sized floating boom), to control any spillages to the watercourses should a spillage occur; • The existing gravel-like surface will be retained to reduce the likelihood of silty water runoff. Geotextile membranes will be installed in high-risk areas; • Existing grassed areas which provide a buffer to the pond outlet will be retained; • Silt fencing will be installed along the boundary to the pond outlet (as a defence against any overland runoff of silty water or spillages of chemicals or hydrocarbons); • Fuel storage will be located on the western boundary of the construction compound – nearest the road and as far as possible from the slit drain and pond outlet. There is an existing wall here which will prevent any spillages reaching surface water drains in the road. All fuel will be stored in accordance with the SWMP; • Storage of other materials will be located on the western boundary of the construction compound – nearest the road and as far as possible from the pond outlet; • All potentially contaminating materials will be stored in covered areas; • Wheel wash areas will be closed-cycle. There will be no discharge of wheel wash water to surface water drains. Off-site disposal of contaminated and silty water and sludge will be required; and • Wastewater from cabins will be contained. Where discharge to the local sewer is required consent from the local authority will be obtained (a temporary permit). 	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			<ul style="list-style-type: none"> The appointed contractor will undertake a risk assessment due to the close proximity of the existing surface water drainage system to the Construction Compound. 	
WT3	13.5.2.2	Boosterstown Marsh	<p>The following measures will be implemented by the appointed contractor:</p> <ul style="list-style-type: none"> If dewatering of the footings of the wall is required, water will be settled in a siltbuster tank (or similar) before being discharged as clean, uncontaminated surface water to local surface water systems; Surface water drains will be clearly identified and marked as such; Surface water drains in the road will be protected through the use of a silt curtain (or similar) to prevent silty water runoff from entering during construction. This will be placed as close to the works as is practicable and at the very least no further than alongside the footpath edge; No refuelling will take place at this location – refuelling of plant and machinery will be undertaken at the Construction Compound; and The generic mitigation measures outlined in the SWMP for the management of vehicles and plant will be implemented by the appointed contractor. 	Construction
WT4	13.5.2.2	Canal Tow Path at Wilton Terrace	<p>The following measures will be implemented by the appointed contractor:</p> <ul style="list-style-type: none"> Retaining wall: <ul style="list-style-type: none"> The concrete for the foundations will be poured in dry weather only; Silt fences will be used along the top of the bank to reduce the likelihood of silty water runoff and cement washings reaching the canal; and Any water collected behind the silt fences will be settled using a siltbuster tank (or similar) and then discharged to the foul sewer (with permission from Dublin City Council). Oil filled cable: <ul style="list-style-type: none"> Ground Investigation will be carried out in this location to determine whether there is contamination present. If any is detected, excavated materials will be removed to a licensed waste facility by a licensed contractor and will not be used in any landscaping or backfilling activities; and A construction method statement detailing the measures taken to avoid the cable will be prepared by the appointed contractor in advance of construction works at the location. 	Construction
WT5	13.5.3	Throughout (as required)	In the Operational Phase the infrastructure (including the maintenance regime for SUDS) will be carried out by the local authorities and will be subject to their management procedures.	Operational

22.12 Land, Soils, Geology and Hydrogeology

Table 22.10: Land, Soils, Geology and Hydrogeology Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
LSGH1	14.5.1	Throughout (as required)	<p><u>Loss or Damage of Topsoil</u></p> <p>Excavated topsoils will be stockpiled by the appointed contractor using appropriate methods to minimise the effects of weathering.</p> <p>Care will be taken in reworking this material to minimise dust generation, groundwater infiltration and generation of runoff.</p>	Construction
LSGH2	14.5.1	Throughout (as required)	<p><u>Loss or Damage of Topsoil</u></p> <p>All topsoil or subsoil shall be assessed for re-use within the Proposed Scheme by the appointed contractor ensuring the appropriate handling, processing and segregation of the material.</p> <p>Where practical the removal of topsoil from the Proposed Scheme will be avoided.</p> <p>All earthworks will be undertaken in accordance with TII Specification for Road Works (SPW) Series 600 Earthworks (TII 2013) and project specific earthworks specifications ensuring that all excavated material and imported material is classified using the same methodology so as to allow maximum opportunity for the reuse of materials on site.</p>	Construction
LSGH3	14.5.1.2	Throughout (as required)	<p><u>Loss or Damage of Topsoil</u></p> <p>The appointed contractor will ensure that excavations will be kept to a minimum, using shoring or trench boxes where appropriate.</p> <p>For more extensive excavations, a temporary works designer shall be appointed by the appointed contractor to design excavation support measures in accordance with all relevant guidelines that minimises the excavation of contaminated ground.</p>	Construction
LSGH4	14.5.1.2	Throughout (as required)	<p><u>Loss or Damage of Topsoil</u></p> <p>The appointed contractor will be responsible for regular testing of excavated soils to monitor the suitability of the soil for reuse.</p>	Construction
LSGH5	14.5.1.2	Throughout (as required)	<p><u>Loss or Damage of Topsoil</u></p> <p>Samples of ground suspected of contamination will be tested for contamination by the appointed contractor during the ground investigation 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.</p>	Construction
LSGH6	14.5.1.2	Throughout (as required)	<p><u>Loss or Damage of Topsoil</u></p> <p>Any dewatering in areas of contaminated ground will be designed by the appointed contractor to minimise the mobilisation of contaminants into the surrounding environment.</p>	Construction
LSGH7	14.5.1.3	Throughout (as required)	<p><u>Pollution of Soil and Groundwater</u></p> <p>Good construction management practices, as outlined in the CIRIA guidance, Control of Water Pollution from Construction Sites – Guidance for consultants and contractors (Masters-Williams <i>et al.</i>, 2001), will be employed by</p>	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			the appointed contractor to minimise the risk of transmission of hazardous materials as well as pollution of adjacent watercourses and groundwater.	
LSGH8	14.5.1.3	Throughout (as required)	<p><u>Pollution of Soil and Groundwater</u></p> <p>The construction management of the site by the appointed contractor will take account of the recommendations of the CIRIA guidance Control of Water Pollution from Construction Sites – Guidance for consultants and contractors (Masters-Williams <i>et al.</i>, 2001) to minimise as far as possible the risk of soil, groundwater and surface water contamination.</p>	Construction
LSGH9	14.5.1.3	Construction Compound and throughout (as required)	<p><u>Pollution of Soil and Groundwater</u></p> <p>Measures to be implemented by the appointed contractor to minimise the risk of spills and contamination of soils and waters include:</p> <ul style="list-style-type: none"> • Employing only competent and experienced workforce, and site-specific training of site managers, foremen and workforce, including all sub-contractors, in pollution risks and preventative measures; • Ensure that all areas where liquids (including fuel) are stored, or cleaning is carried out, are in designated impermeable areas that are isolated from the surrounding area and within a secondary containment system, e.g., by a roll-over bund, raised kerb, ramps or stepped access; • The location of any fuel storage facilities shall be considered in the design of the Construction Compound. These are to be designed in accordance with relevant guidelines and codes of best practice and will be fully bunded; • Good housekeeping at the site (daily site clean-ups, use of disposal bins, etc.) during the entire Construction Phase; • Potential pollutants to be adequately secured against vandalism; • Provision of proper containment of potential pollutants according to codes of best practice; • Thorough control during the entire Construction Phase to ensure that any spillage is identified at early stage and subsequently effectively contained and managed; and • Spill kits will be provided and kept close to the storage area. Staff to be trained on how to use spill kits correctly. 	Construction
LSGH10	14.5.1.3	Throughout (as required)	An Environmental Incident Response Plan, as described in the CEMP (Appendix A5.1 in Volume 4 of this EIAR), will be implemented by the appointed contractor, which will identify the actions to be taken in the event of a pollution incident. It will address containment measures, emergency discharge routes, a list of appropriate equipment and clean-up materials and notification procedures to inform the relevant environmental protection authority.	Construction
LSGH11	14.5.1.3	Throughout (as required)	Sediment control methods are outlined in the Surface Water Management Plan within the CEMP (Appendix A5.1 in Volume 4 of this EIAR) and these will be implemented by the appointed contractor.	Construction

22.13 Archaeological and Cultural Heritage

Table 22.11: Archaeological and Cultural Heritage Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
ACH1	n/a	Throughout (as required)	The NTA will procure the services of a suitably-qualified archaeologist as part of its Employer's Representative team administering and monitoring the works.	Pre-Construction
ACH2	15.5.1.1	Throughout (as required)	The appointed contractor will make provision for archaeological monitoring to be carried out under licence to the Department of Housing, Local Government and Heritage (DHLGH) and the National Museum of Ireland (NMI), and will ensure the full recognition of, and the proper excavation and recording of, all archaeological soils, features, finds and deposits which may be disturbed below the ground surface. All archaeological issues will be resolved to the satisfaction of the DHLGH and the NMI.	Construction
ACH3	15.5.1.1	Throughout (as required)	The appointed contractor will ensure that the archaeologist as described in ACH5 will have the authority to inspect all excavation to formation level for the proposed works and to temporarily halt the excavation work, if, and as, necessary, having conferred with the NTA. They will be given the authority to ensure the temporary protection of any features of archaeological importance identified having conferred with the NTA. The archaeologist will be afforded sufficient time and resources to record and remove any such features identified in accordance with licensing requirements agreed.	Construction
ACH4	15.5.1.1	Throughout (as required)	The appointed contractor will make provision to allow for, the necessary archaeological monitoring, inspection and excavation works that may arise on the site during the Construction Phase.	Construction
ACH5	15.5.1.1	Throughout (as required)	An experienced and competent licence-eligible archaeologist will be employed by the appointed contractor to advise on archaeological and cultural heritage matters during construction to communicate all findings in a timely manner to the NTA and statutory authorities, to acquire any licenses / consents required to conduct the work, and to supervise and direct the archaeological measures associated with the Proposed Scheme.	Construction
ACH6	15.5.1.1	Ballsbridge to Merrion Square (Pembroke Road, Baggot Street and Fitzwilliam Street) CBC1415CH003, CBC1415CH004, CBC1415CH007	In the case of cellars, coal cellars and / or basements, the appointed contractor in consultation with the archaeologist engaged by them will make provision for a geodetic survey and recording of each individual structure which will be subject to impact. This survey and recording will be carried out in advance of any construction works on the cellar, coal cellar and/or basement.	Construction
ACH7	15.5.1.1.1	Throughout (as required)	Licence applications are made by the licence-eligible archaeologist to the National Monuments Service at the DHLGH. In addition to a detailed method statement, the applications must include a letter from the NTA that confirms the availability of adequate funding. There is a prescribed format for the letter that must be followed.	Construction
ACH8	15.5.1.1.1	Throughout (as required)	The archaeologist will be provided with information on where and when the various elements and ground disturbance will take place.	Construction
ACH9	15.5.1.1.1	Throughout (as required)	Once the presence of archaeologically significant material is established, full archaeological recording of such material is recommended in accordance with the licensing requirements.	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			If it is not possible for the construction works to avoid the material, full excavation of the archaeologically significant material will be recommended. The extent and duration of excavation will be advised by the archaeologist and will be a matter for discussion between the NTA and the licensing authorities.	
ACH10	15.5.1.1.1	Throughout (as required)	Secure storage for artefacts recovered during the course of the monitoring and related work will be provided by the appointed contractor.	Construction
ACH11	15.5.1.1.1	Throughout (as required)	During construction all construction traffic and the management of materials will be restricted where practicable by the appointed contractor so as to avoid any newly revealed archaeological or cultural heritage sites and their environs, to ensure no damage to a site of archaeological interest.	Construction
ACH12	15.5.1.1.1	Throughout (as required)	Features of cultural heritage interest that are required to be removed on a temporary basis or for a short-term period, will be removed under archaeological supervision and in accordance with a method statement in consultation with the NTA and the relevant statutory authorities.	Construction
ACH13	15.5.1.3.1	Stradbrook Road to Booterstown Avenue	The appointed contractor will ensure that archaeological monitoring under licence will take place, where any preparatory ground-breaking or ground reduction works are required, along the route of the former tramline along Rock Road (DCIHR 23-01-005). It is in these areas that there is a possibility to disturb intact archaeological layers and material. Licensed archaeological excavation, in full or in part, of any identified archaeological remains (preservation by record) or preservation in situ will be undertaken.	Construction
ACH14	15.5.1.4.1	Booterstown Avenue to Nutley Lane	The appointed contractor will ensure that archaeological monitoring under licence will take place: <ul style="list-style-type: none"> On Merrion Road in the vicinity of the recorded church site and graveyard (RMP DU023-053001, DU023-053002); On Merrion Road in the vicinity of the recorded tower house site RMP DU023-001001); On Merrion Road in the vicinity of the recorded fish-pond site (SMR DU023-001005); and Along the route of the former tramline along Rock Road (DCIHR 23-01-005). It is in these areas that there is a possibility to disturb intact archaeological layers and material. Licensed archaeological excavation, in full or in part, of any identified archaeological remains (preservation by record) or preservation in situ will be undertaken.	Construction
ACH15	15.5.1.5.1	Merrion Road (Nutley Lane to Ballsbridge)	The appointed contractor will ensure that archaeological monitoring under licence will take place along the route of the former tramline along Merrion Road (DCIHR 18-16-006 and DCIHR 22-04-001). It is in these areas that there is a possibility to disturb intact archaeological layers and material. Licensed archaeological excavation, in full or in part, of any identified archaeological remains (preservation by record) or preservation in situ will be undertaken.	Construction
ACH16	15.5.1.5.2	Merrion Road (Nutley Lane to Ballsbridge)	The stone trough (CBC1415CH002) will be removed if necessary, by the appointed contractor to protect it from any adverse impacts and will be returned to its current setting and as close as possible to its current location following works at this location.	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
ACH17	15.5.1.6.1	Ballsbridge to Merrion Square (Pembroke Road, Baggot Street and Fitzwilliam Street)	<p>The appointed contractor will ensure archaeological monitoring under licence will take place:</p> <ul style="list-style-type: none"> • At the recorded site of the earlier bridge (RMP DU018-059) at Ball's Bridge and within its ZAP; • Within the ZAP of the tower house site (Baggotrath Castle) at Eastmoreland Place, Baggot Street Upper and Pembroke Road (RMP DU018-055); • Along Baggot Street Upper and Lower, where cellars are present (CBC1415CH004); and • Along the route of the former tramline from Ballsbridge to Fitzwilliam Street Lower. <p>It is in these areas that there is a possibility to disturb intact archaeological layers and material. Licensed archaeological excavation, in full or in part, of any identified archaeological remains (preservation by record) or preservation in situ will be undertaken.</p>	Construction
ACH18	15.5.1.6.2	Ballsbridge to Merrion Square (Pembroke Road, Baggot Street and Fitzwilliam Street)	<p>The memorial (CBC1415CH005) will be protected from any adverse impacts during construction works and if necessary, for its protection, it will be removed under archaeological supervision by the appointed contractor. This will be undertaken in accordance with a method statement in consultation with the NTA and the statutory authorities. It will be returned to its current setting and as close as possible to its current location following completion of the works.</p>	Construction
ACH19	15.5.1.6.2	Ballsbridge to Merrion Square (Pembroke Road, Baggot Street and Fitzwilliam Street)	<p>All coal-hole covers on Baggot Street Upper / Lower and Fitzwilliam Street Lower (CBC1415CH003, CBC1415CH004, CBC1415CH007) will be recorded by the archaeologist engaged by the appointed contractor.</p> <p>The surrounding granite settings will also be recorded by the archaeologist, noting the presence and characteristics of any channel which has been carved into the settings.</p> <p>The coal-hole covers, and associated granite settings will be removed by the appointed contractor under archaeological supervision and in accordance with a method statement in consultation with the NTA and agreed with the statutory authorities.</p> <p>They will be reinstated in their original locations, or as close as possible to them, once the works are completed.</p>	Construction

22.14 Architectural Heritage

Table 22.12: Architectural Heritage Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
AH1	16.5.1.1	<p>Protected Structures:</p> <p>155 and 157 Merrion Road (DCC RPS 542 and 542a, odd numbers only), 151 to 153 Merrion Road (DCC RPS 5090, 5091, odd numbers only), the boundary treatment of the former Masonic School, now the Clayton Hotel, Merrion Road (DCC RPS 5086)</p>	<p>Recording the existing boundaries in position prior to the works, labelling the affected masonry, brickwork, railings, gates, gate posts, capping stones prior to their careful removal to safe storage, and their reinstatement on new lines, which reinstate the existing details, and the relationships between the entrances and the historic buildings.</p> <p>Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee the labelling, taking-down and reinstatement of the affected gates, railings, piers, bricks and masonry.</p> <p>Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.</p>	Construction
AH2	16.5.1.1	<p>Protected Structures:</p> <p>Relocation of the vehicular entrance gate to the former Pembroke Town Hall (DCC RPS 5084) to Anglesea Road and relocation of the existing egress from 1 Pembroke Road onto Waterloo Road)</p>	<p>Recording and labelling the affected sections of the boundary treatments in detail is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor, prior to the commencement of construction works.</p> <ul style="list-style-type: none"> The existence of a pedestrian gates in the location of the proposed vehicular entrances will help mitigate the loss of historic fabric as the existing gates will be adapted. The existing gates are to be taken down along with the end posts, sections of railing and plinths. The north end post to the pedestrian gate on Anglesea Road will be retained in position. Removed sections of historic fabric are to be stored safely for reuse. The southern end posts are to be reinstated in the widened entrances. The removed railings will be adapted to form gates to match the existing pedestrian gates. The existing and new gates will be reinstated; Historic fabric which is not directly affected by the proposed landscaping works or works to the gates, such as adjoining sections of railing, or other architectural heritage features will be protected by the appointed contractor during the course of works; The kerbs or edging to the flower beds will be recorded and labelled by the architectural heritage specialist before being carefully removed and stored for reuse by the appointed contractor in the proposed landscaping; Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR. 	Construction
AH3	16.5.1.1	<p>Protected Structures:</p> <p>North-west corner of McCartney Bridge (DCC RPS 872) to the Grand Canal tow path (CBC1415BTH211)</p>	<p>Recording, overseeing of protective measures and monitoring of the boundaries, which directly adjoin the Proposed Scheme, is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor.</p> <p>Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.</p>	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
		Royal Dublin Society complex, Merrion Road (DCC RPS 5085), the Department of Health Baggot Street Lower (DCC RPS 370, NIAH 50100635) and 53 Merrion Square South (DCC RPS 5151, NIAH 50100435) 302 further Protected Structures referenced in Appendix A16.2 Inventory of Architectural Heritage Sites in Volume 4 of this EIAR		
AH4	16.5.1.2	<u>Architectural Conservation Area</u> Seafort Parade candidate ACA and Booterstown Avenue candidate ACA	Recording, overseeing of protective measures and monitoring of protected structures, where they directly adjoin the Proposed Scheme at the junctions of Seafort Parade and Booterstown Avenue, is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH5	16.5.1.3	<u>Conservation Areas</u> The Dodder CA, Baggot Street Upper CA, Grand Canal CA, Baggot Street Lower CA, Fitzwilliam Street CA and Merrion Square CA	Recording, overseeing of protective measures and monitoring of boundary treatments, lamp posts, post boxes and historic paving and surface treatments is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH6	16.5.1.4	<u>NIAH</u> Mercy International Centre, Baggot Street Lower (NIAH 50100643) and the former Convent of Mary Reparatrice, Fitzwilliam Street (NIAH 50100455).	Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH7	16.5.1.5	<u>Designed Landscapes</u> Concrete boundary wall and a series of concrete piers and railings in a concrete plinth (CBC1415BTH032) to the boundary of Blackrock Park (DLR RPS 112, 115, 1888)	The boundary wall railings and gates (CBC1415BTH032) to Blackrock Park are to be carefully taken down by the appointed contractor to avoid damage to the entrance gate piers and railings (CBC1415BTH033, CBC1415BTH034), a folly within the park (CBC1415BTH250), the designed landscape of the park and also to retain the structural integrity of the adjoining road. Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor, in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR to avoid damage.	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			A new boundary wall treatment in keeping with the retained entrance piers is to be erected on the proposed alignment by the appointed contractor.	
AH8	16.5.1.5	Designed Landscapes Blackrock College, Rock Road, Blackrock (DLR RPS 99, NIAH 2484)	Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist engaged by the appointed contractor will oversee the labelling, taking-down and reinstatement of the affected gates, railings, piers, and masonry. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH9	16.5.1.5	Designed Landscapes Entrance to Willow Park School, Rock Road, Booterstown (DLR RPS 28, NIAH 2473)	Reinstatement or replacement of trees/shrubs by the appointed contractor will be undertaken by the appointed contractor in accordance with the Landscaping Design drawings (BCIDC-ARP-ENV_LA-1415_XX_00-DR-LL-9001) in Volume 3 of this EIAR. Any concrete bollards removed, will be replaced by the appointed contractor.	Construction
AH10	16.5.1.5	Designed Landscapes St. Mary's Home, formerly Merrion Castle, Merrion Road (NIAH2463)	Recording and labelling is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor, before the archway is carefully taken down and stored securely by the appointed contractor. The gateway and gates will be reinstated on the new alignment by the appointed contractor. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH11	16.5.1.5	Designed Landscapes Bloomfield House, Merrion Road (CBC1415BTH110)	Recording and labelling of the gothic gateway and wrought iron gates, is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor, before being carefully taken down and stored securely by the appointed contractor. The gateway and gates will be reinstated at the pedestrian plaza at the junction of Merrion Road and Nutley Lane as per the detailed survey which will be undertaken by the appointed contractor. The gates will also be reinstated in the archway and will remain open and in a fixed position. Works to historic fabric will be carried out by the appointed contractors in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH12	16.5.1.5	Designed Landscapes Wrought iron gate, granite plinths and railings (CBC1415BTH183) at the corner of Rolys Bistro, 7 Ballsbridge Terrace (CBC1415BTH178) and Herbert Park Road	Recording and labelling is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor of the wrought iron gate, granite plinths and railings before they are carefully taken down and stored securely by the appointed contractor. Railings will be reinstated by the appointed contractor on the new alignment in Herbert Park Road. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
AH13	16.5.1.5	Designed Landscapes Existing boundary treatment (CBC1415BTH118) to the RTE Campus Montrose, Nutley Lane (CBC1415BTH124) to Nutley House, Elm Park Golf & Sports Club (NIAH 2440)	The appointed contractor will retain the masonry from the existing wall and store in a secure location for reuse in the new boundary treatment. Works to be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH14	16.5.1.5	Designed Landscapes Blackrock Park (DLR RPS 115) Herbert Park (CBC1415BTH183) and Merrion Square Park (DCC RPS 5194)	Recording, overseeing of protection measures and monitoring of the sensitive fabric including the 19th century entrance gate piers and railings (CBC1415BTH033, CBC1415BTH034) at the west end of the park, a folly (CBC1415BTH250), within Blackrock Park, the retained portions of the wrought iron gate, granite plinths and railings to Herbert Park (CBC1415BTH183), railings to Merrion Square Park (DCC RPS 5194) are to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH15	16.5.1.6	Other Structures Railings and gateway to Rock Road (CBC1415BTH058)	The appropriate architectural heritage specialist engaged by the appointed contractor will record the existing boundaries in position prior to the commencement of works, label the affected railings and granite plinths, piers, gates and other ironwork. prior to their careful removal for safe storage, and reinstatement on the new line. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH16	16.5.1.6	Other Structures Merrion View Avenue (CBC1415BTH131)	Recording and labelling of the existing gate piers, gates, other ironwork and rubble wall in position prior to the works commencing is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The modern granite wall will be carefully taken down to avoid damage to the piers and the materials will be stored securely for reuse by the appointed contractor. The wall will be rebuilt on the new alignment using the existing materials and coursed on a like-for-like basis. The south pier will be retained in situ and protected against damage during the construction works. The north pier and gates will be carefully taken down and the materials stored securely for reuse before being reinstated on the new alignment. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH17	16.5.1.6	Other Structures 183 further architectural heritage structures – refer to Appendix A16.2 Inventory of	Recording, overseeing of protective measures and monitoring of the sensitive fabric, which directly adjoin the Proposed Scheme, is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor.	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
		Architectural Heritage Sites in Volume 4 of this EIAR	Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	
AH18	13.5.1.7.1	<u>Street Furniture</u> 13 Post boxes; Phoenix Terrace, Williamstown (CBC1415PB003); 238 Merrion Road (CBC1415PB005); Ailesbury Road (CBC1415PB007); Sandymount Avenue (CBC1415PB013); 43 Pembroke Road (CBC1415PB008); 63 Pembroke Road (BC1415PB009); Baggot Street Lower (CBC1415PB010, CBC1415PB011); Mount Street Upper (CBC1415PB012); and Nutley Lane (CBC1415PB006).	Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH19	13.5.1.7.2	<u>Street Furniture</u> Lamp posts, throughout - refer to Appendix A16.2 Inventory of Architectural Heritage Sites in Volume 4 of this EIAR	Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee the labelling, taking-down and reinstatement of the affected lamp posts by the appointed contractor. The lamp posts will be carefully removed and stored securely by the appointed contractor. Lamps posts to be reinstated by the appointed contractor in close proximity (within 2m) of their existing positions. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH20	13.5.1.7.3	<u>Statuary & Street Furniture</u> Concrete trough located at the former Allied Irish Bank offices on Merrion Road (CBC1415BTH237)	The architectural heritage specialist engaged by the appointed contractor will oversee the labelling and taking-down of the trough by the appointed contractor. The trough will be removed and stored securely by the appointed contractor. The trough to be reinstated by the appointed contractor in the vicinity of its original location. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
AH21	13.5.1.7.3	<u>Statuary & Street Furniture</u> A kiosk, and railings to the pocket park (CBC1415BTH198) on the corner of Pembroke Road and Northumberland Road	Recording and labelling of the kiosk, railings and component parts prior to the commencement of works is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The kiosk, railings and component parts will be dismantled and removed to secure storage by the appointed contractor. The kiosk and railings will be reinstated by the appointed contractor in liaison with the architectural heritage specialist.	Construction
AH22	13.5.1.7.3	<u>Statuary & Street Furniture</u> The Black Rock Dolmen (CBC1415BTH015). A Milestone to Rock Road (DLR RPS 1). A Limestone Celtic Memorial Cross in Herbert Park (CBC1415BTH185). A Milestone to Pembroke Road (CBC1415MS002). The Electrical Cabinet Pembroke Road (CBC1415BTH250).	Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH23	16.5.1.8	<u>Paving & Surface Treatments</u> Historic kerb realignments - refer to Appendix A16.2 Inventory of Architectural Heritage Sites in Volume 4 of this EIAR	Recording and labelling of the existing historic kerbs in position prior to the works commencing is to be undertaken by the appointed contractor. If the historic kerbs are to be moved, they will be carefully removed by the appointed contractor and stored securely prior to their reinstatement. The architectural heritage specialist will oversee the labelling, careful removal, and reinstatement of the affected kerbs. Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR	Construction
AH24	16.5.1.8	<u>Paving & Surface Treatments</u> Coal hole cover (CBC1415BTH266) and its granite surround located at 95 Baggot Street Lower	Recording of the coal hole cover and its granite surround in position is to be undertaken, prior to works commencing, by an appropriate architectural heritage specialist engaged by the appointed contractor. The coal hole cover and its surround will be carefully removed and stored securely by the appointed contractor. The architectural heritage specialist will oversee the labelling, careful removal and reinstatement of the coal hole cover and the granite surround.	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			Works to historic fabric will be carried out by the appointed contractors in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR	
AH25	16.5.1.8	<u>Paving & Surface Treatments</u> Two No. cobbled surfaces to lane at 1 Fitzwilliam St Lower and to the gutter on the west side of Fitzwilliam Street Lower (CBC1415BTH236, CBC1415BTH241)	<p>Where practicable, cobbled surfaces will be retained in situ by the appointed contractor rather than reinstated.</p> <p>Recording and labelling of the cobble setts is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor prior to the commencement of works.</p> <p>The cobble setts will be carefully removed and stored securely by the appointed contractor.</p> <p>The architectural heritage specialist will oversee the careful removal and reinstatement of the cobble setts.</p> <p>The appointed contractor will liaise with the architectural heritage specialist engaged by them to identify a new position for the setts within the gutter and lane in Fitzwilliam Street Lower.</p> <p>Works to historic fabric will be carried out in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR</p>	Construction
AH26	16.5.1.8	<u>Paving & Surface Treatments</u> McCartney Bridge (DCC RPS 872), granite paving (CBC1415BTH210)	<p>The proposed mitigation measure is the retention of the flagstones and kerbs in-situ, and their integration into the proposed new paving design, where practicable.</p> <p>Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.</p>	Construction
AH27	16.5.1.8	<u>Paving & Surface Treatments</u> Jostle stones at 59 Pembroke Road (CBC1415BTH242), two locations on Lad Lane (CBC1415BTH244), and two locations at 109a Baggot Street lower (CBC1415BTH243)	<p>The mitigation measure is the retention of the jostle stones in-situ, and their integration into the proposed new paving design, where practicable.</p> <p>Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.</p>	Construction
AH28	16.5.1.8	<u>Paving & Surface Treatments</u> Changes in the alignments of the footpath and proposed paving treatments which are in close proximity to 35 coal holes and their granite surrounds (refer to Section	<p>The mitigation measure is the retention of the coal holes in-situ, and their integration into the proposed new paving design, where practicable.</p> <p>Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.</p>	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
		16.5.1.8 in Chapter 16 of the EIAR)		
AH29	16.5.1.8	<p><u>Paving & Surface Treatments</u></p> <p>Changes in the alignments of the footpath and proposed paving treatments which are in close proximity to other surface treatments (locations provided in Table 16.15 in Chapter 16 of the EIAR)</p>	<p>The mitigation measure is the retention of the various grilles, cellar hatches and cellar lights in-situ, and their integration into the proposed new paving design, where practicable.</p> <p>Architectural heritage specialist engaged by the appointed contractor to record, protect and monitor the grilles, cellar hatches and cellar lights for the duration of the Construction Phase.</p> <p>Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.</p>	Construction

22.15 Landscape (Townscape) and Visual

Table 22.13: Landscape (Townscape) and Visual Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
LV1	17.5.1	Throughout (as required)	<p>Mitigation and management measures are proposed to avoid, reduce or remediate, wherever practicable significant negative landscape (townscape) and visual effects of the Construction Phase of the Proposed Scheme. These measures will be carried out by the appointed contractor and are to be applied across the Proposed Scheme wherever necessary to avoid disturbance of landscape features or characteristics to be retained.</p> <p>Trees and vegetation to be retained within and adjoining the works area will be protected in accordance with British Standard Institution (BSI) British Standard (BS) 5837:2012 'Trees in relation to in relation to design, demolition and construction. Recommendations'. Works required within the root protection area (RPA) of trees to be retained will follow a project specific arboricultural methodology for such works, prepared / approved by a professional qualified arborist. For details of trees to be retained refer to Tree Protection Plans which are contained within the Arboricultural Impact Assessment (Appendix A17.1 in Volume 4 of this EIAR);</p>	Construction
LV2	17.5.1	Throughout (as required) especially on the grounds of Blackrock Park, Blackrock College, along Merrion Road, Pembroke Road, Baggot Street Upper and Lower, RTE Campus, Elm Park Golf & Sports Club, and St. Vincent's University Hospital	<p>Wherever practicable, trees and vegetation will be retained within the Proposed Scheme. This is of particular note where mature trees are a prominent and valuable asset within the urban realm such as within the grounds of Blackrock Park, Blackrock College, along Merrion Road, Pembroke Road, Baggot Street Upper and Lower, RTE Campus, Elm Park Golf & Sports Club, and St. Vincent's University Hospital and where mature trees are within private properties along the Proposed Scheme; Trees and vegetation identified for removal will be removed in accordance with 'BS 3998:2010 Tree Work – Recommendations' (BSI 2010) and best arboricultural practices as detailed and monitored by a professional qualified arborist engaged by the appointed contractor.</p> <p>For details of trees and vegetation to be removed refer to Tree Protection Plans which are contained within the Arboricultural Impact Assessment (Appendix A17.1 in Volume 4 of this EIAR) and Landscaping General Arrangement drawings (BCIDC-ARP-ENV_LA-1415_XX_00-DR-LL-9001) in Volume 3 of this EIAR.</p>	Construction
LV3	17.5.1	Throughout (as required)	The Arboricultural Impact Assessment prepared for the Proposed Scheme will be fully updated at the end of the Construction Phase by the appointed contractor and made available, with any recommendations for on-going monitoring of retained trees during the Operational Phase.	Construction
LV4	17.5.1	Throughout (as required) (especially Blackrock Park, Blackrock Clinic, Blackrock College, Nos. 85, 151 to 157 and Elm Court apartments, properties on Merrion Road, Elm Park Golf & Sports Club and St. Vincent's University Hospital)	Where properties are subject to permanent and / or temporary acquisition (especially Blackrock Park, Blackrock Clinic, Blackrock College, Nos. 85, 151 to 157 and Elm Court apartments, properties on Merrion Road, Elm Park Golf & Sports Club and St. Vincent's University Hospital) an inventory of boundary details and accesses, planting, paving, and other features that may be disturbed or removed will be prepared by the appointed contractor prior to commencement of construction works	Construction
LV5	17.5.1	Throughout (as required) (especially Blackrock Park, Blackrock Clinic, Blackrock	Where properties are subject to permanent and / or temporary acquisition (especially Blackrock Park, Blackrock Clinic, Blackrock College, Nos. 85, 151 to 157 and Elm Court apartments, properties on Merrion Road, Elm Park Golf & Sports Club and St. Vincent's University Hospital) appropriate measures	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
		College, Nos. 85, 151 to 157 and Elm Court apartments, properties on Merrion Road, Elm Park Golf & Sports Club and St. Vincent's University Hospital)	will be put in place by the appointed contractor to provide for protection of features, trees and vegetation to be retained, for continued access during construction, for adequate security and screening of construction works. All temporary acquisition areas will be fully decommissioned and reinstated at the end of the Construction Phase or at the earliest time after the reinstatement works are completed to the satisfaction of the NTA. Where boundary features, gates, railings, archways of heritage importance (and which contribute to landscape value) are to be affected by the works, mitigation measures should follow those outlined in Chapter 16 (Architectural Heritage).	
LV6	17.5.1	Blackrock Park and Elm Park	Appropriate access to amenities and public open spaces including Blackrock Park and Elm Park will be maintained by the appointed contractor.	Construction

22.16 Waste and Resources

Table 22.14: Waste and Resources Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
WR1	18.5.1	Throughout (as required)	A Construction and Demolition Resource and Waste Management Plan (CDRWMP) has been prepared and this will be implemented (and updated as necessary) by the appointed contractor - refer to the CDRWMP within Appendix A5.1 Construction Environmental Management Plan (CEMP) in Volume 4 of this EIAR.	Construction
WR2	18.5.1	Throughout (as required)	The following measures will be implemented during construction, where practicable, by the appointed contractor, to ensure the maximum quantity of material is reused on the Proposed Scheme and to contribute to achieving the objectives set out in the National Waste Action Plan for a Circular Economy as follows: <ul style="list-style-type: none"> • Stockpiling of existing sub-base, capping layer and topsoil material generated on-site for direct reuse in the Proposed Scheme where practicable (subject to material quality testing to ensure it is suitable for its proposed end use); and • Recycled aggregates and reclaimed asphalt will be specified in the Proposed Scheme, where practicable. 	Construction
WR3	18.5.1	Throughout (as required)	The following management measures will be implemented by the appointed contractor insofar as is reasonably practicable: <ul style="list-style-type: none"> • Where waste generation cannot be avoided, waste disposal will be minimised; • Opportunities for reuse of materials, by-products and wastes will be sought throughout the Construction Phase of the Proposed Scheme; • Possibilities for reuse of clean non-hazardous excavation material as fill on the site or in landscaping works will be considered following appropriate testing to ensure material is suitable for its proposed end use; • Where excavated material cannot be reused within the Proposed Scheme works, material will be sent for recovery or recycling; • Source segregation: Metal, timber, glass and other recyclable material will be segregated (and waste stream colour-coding will be used) during construction works and removed off site to a permitted / licensed facility for recycling; • Material management: 'Just-in-time' delivery, where practicable, will be used to minimise material wastage; • General construction waste and by-products will be reused within the Proposed Scheme, where practicable, or appropriately reused (in accordance with Article 27 of the Waste Directive Regulations), recovered, recycled or disposed of off-site, as arranged by the appointed contractor; and • Any hazardous waste arising will be managed by the appointed contractor in accordance with the applicable legislation. <p>Waste Auditing: The quantity and types of waste and materials leaving site during the Construction Phase will be recorded by the appointed contractor. The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the</p>	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
			<p>quantity to each facility. Records will show material, which is recovered, which is recycled, and which is disposed of.</p> <p>Where Article 27 notifications are required in relation to the proposed development, the appointed contractor will complete and submit these Article 27 notifications to the EPA for by-product reuse.</p> <p>Any off-site interim storage or waste management facilities for excavated material will have the appropriate EPA licence, Waste facility permit or Certificate of Registration, as appropriate, in place.</p> <p>The relevant appropriate waste authorisation will be in place for all facilities that wastes are delivered to (i.e., EPA Licence, Waste Facility Permit or Certificate of Registration).</p>	

22.17 Material Assets

Table 22.15: Material Assets Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
MA1	19.5.1.1	Throughout (as required)	Where there are interfaces with existing utility infrastructure, the appointed contractor will ensure that protection is in place or diversion as necessary will be carried out to prevent long-term interruption to the provision of the affected services.	Construction
MA2	19.5.1.1	Throughout (as required)	All possible precautions will be taken by the appointed contractor to avoid unplanned interruptions to any services during the Construction Phase of the Proposed Scheme. This will include appropriate investigation by the appointed contractor to identify the precise location of all utility infrastructure within the working areas prior to the commencement of excavation works. Where works are required in and around utility infrastructure, precautions will be implemented by the appointed contractor to protect the infrastructure from damage, in accordance with best practice methodologies and the requirements of the utility companies where practicable. 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 where possible, isolation of the section of infrastructure during works in the immediate vicinity.	Construction
MA3	19.5.1.1	Throughout (as required)	All utility companies for which diversions are proposed will continue to be consulted with NTA oversight when designing any diversions to ensure that proposed diversions conform to the utility provider's requirements, where practicable and acceptable to the NTA, and to ensure that service interruptions are kept to a minimum.	Construction
MA4	19.5.1.1	Throughout (as required)	Where diversions or modifications are required to utility infrastructure, service interruptions and disturbance to the surrounding residential, commercial and/or community property may be unavoidable. Where this is the case, it will be planned in advance by the appointed contractor. Required service interruptions will generally only occur for a set period of time per day (a set number of hours not exceeding eight hours where reasonably practicable) and will generally not be continuous for full days at a time. Prior notification will be given to all impacted properties. This notification will include information on when interruptions and works are scheduled to occur and the duration of such interruption. Any required works will be carefully planned by the appointed contractor to ensure that the duration of interruptions is minimised in so far as is practicable.	Construction
MA5	19.5.1.2	Throughout (as required)	Consideration will be given by the appointed contractor to the sustainability of material being sourced for the construction of the Proposed Scheme. In so far as is reasonably practicable, materials required for the construction of the Proposed Scheme will be sourced locally in order to reduce the amount of travelling required to get the material to the site. Key issues to be considered when sourcing materials for the Construction Phase will include the source, the material specification, production and transport costs, and the availability of the material. For quarried material sourced within the State, only quarries which are included in local authority quarry registers will be used by the appointed contractor to source any quarried material.	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
MA6	19.5.1.2	Throughout (as required)	<p>Construction materials will be managed on-site by the appointed contractor in such a way as to prevent over-ordering and waste.</p> <p>Materials will be stored in appropriate storage areas or receptacles to reduce the potential for damage requiring replacement.</p> <p>'Just In Time' ordering principles will be implemented by the appointed contractor where practicable in order to reduce the potential for over-ordering.</p>	Construction

22.18 Major Accidents and / or Disasters

Table 22.16: Major Accidents and / or Disaster Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
n/a	n/a	n/a	No additional mitigation or monitoring measures are considered necessary beyond those already identified in other environmental assessments and the CEMP (Appendix A5.1 in Volume 4 of this EIAR).	n/a

22.19 Cumulative Impacts

Table 22.17: Cumulative Impacts Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
CI&EI1	21.4.2.1	Throughout (as required)	Other major infrastructure projects could directly interface with the construction of the Proposed Scheme. Interface liaison will take place on a case-by-case basis through the NTA, as will be set out in the Construction Contract, to ensure that there is coordination between projects, that construction access locations remain unobstructed by the Proposed Scheme works and that any additional construction traffic mitigation measures required to deal with cumulative impacts are managed appropriately.	Pre-construction/Construction

22.20 References

British Standards Institution (BSI) (2010). BS 3998:2010 'Tree Work – Recommendations'

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

British Standards Institution (BSI) (2014). BS 5228-1:2009 +A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise

CIRIA (2001). CIRIA C532: Control of Water Pollution from Construction Sites – Guidance for consultants and contractors.

EPA (2021). Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects [Online] Available from https://www.epa.ie/publications/circular-economy/resources/C_and_D_Guidelines-.pdf

European Commission (2018). EU Construction and Demolition Waste Protocol and Guidelines.

ISO (2016). ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures.

ISO (2017). ISO 1996-2:2017 - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels.

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

TII (2020a). The Management of Invasive Alien Plant Species on National Roads – Technical Guidance

TII (2020b). The Management of Invasive Alien Plant Species on National Roads – Standard

Directives and Legislation

S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011 as amended

Waste Management Act 1996, as amended

S.I. No. 241/2006 – European Communities (Noise Emission by Equipment for Use Outdoors) (Amendment) Regulations 2006

S.I. No. 419/2007 - Waste Management (Shipments of Waste) Regulations 2007, as amended

S.I. No. 820/2007 - Waste Management (Collection Permit) Regulations 2007, as amended.

S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018