

The background is a vibrant yellow. It is decorated with several abstract geometric shapes in shades of blue and teal. These include circles, semi-circles, and rounded rectangles, some of which are white with a colored border. The shapes are scattered across the page, creating a modern, clean aesthetic.

Chapter 22

Summary of Mitigation & Monitoring Measures

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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 Bray 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 has 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 either 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 Project Description); and
- Operational Phase: When the Proposed Scheme commences 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 Appendix A5.1 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 Mitigation Measures

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
GEN1	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 A5.1 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 Compounds 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 contract 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; and The appointed contractor will provide a site hoarding of 2.4m height along noise sensitive boundaries, at a minimum, at the Construction Compounds, which will assist in minimising the potential for dust impacts off-site. <p>The appointed contractor will keep the effectiveness of the mitigation measures under review and revise them as necessary. In the event of dust nuisance occurring 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.</p>	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 feasible, 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 (Noise & Vibration) of this EIAR using methods outlined in BS 5228–1 (BSI 2014a); and • 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 Table 9.9 and Table 9.12 in Chapter 9 (Noise & Vibration) of this EIAR. Table 9.46 in Chapter 9 of this EIAR indicates that intrusive works occurring within 65m 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 to result in exceedance of construction noise thresholds (Table 9.9 and Table 9.12 in Chapter 9 (Noise & Vibration) of this EIAR) will be assessed prior to the item being brought onto the site. The least noisy item of plant will be selected wherever practicable (e.g. plant items with sound attenuation incorporated). Should a particular item of plant already on the site be found to exceed the construction noise thresholds, the first action will be to identify whether the item can be replaced with a quieter alternative.</p> <p>The appointed contractor will evaluate the choice of excavation, breaking or other working method taking into account various ground conditions and site constraints. Where alternative lower noise generating equipment are available that will provide equivalent structural / excavation / breaking results, these will be selected to control noise within the relevant thresholds, where it is practicable to do so.</p>	Construction
NV4	9.5.1.1.2	Throughout (as required)	<p>The following measures will be implemented by the appointed contractor to control noise at source in order to remain below the threshold values for noise set out in Table 9.9 in Chapter 9 (Noise & Vibration) 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 muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed; • The Construction Compounds are in close proximity to NSLs (refer to Table 9.34 in Chapter 9 (Noise & Vibration) 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

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
NV5	9.5.1.1.3	Throughout (as required)	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 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.	Construction
NV6	9.5.1.1.3	Throughout (as required)	The appointed contractor will provide a site hoarding of 2.4m height along noise sensitive boundaries, at a minimum, at the Construction Compounds.	Construction
NV7	9.5.1.1.3	Throughout (as required)	Careful planning of the Construction Compounds 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 9.46 in Chapter 9 (Noise & Vibration) of this EIAR), other construction activities will be scheduled to not results in 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 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 Table 9.9 and Table 9.12 in Chapter 9 (Noise & Vibration) 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 9.12 in Chapter 9 (Noise & Vibration) of this EIAR. Vibration from construction activities will be limited to the values set out in Table 9.12 in Chapter 9 (Noise & Vibration) 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 9.13 in Chapter 9 (Noise & Vibration) of this EIAR. The nature and duration of the works will be clearly set out in all communication circulars as necessary; • Activities capable of generating significant vibration effects with respect to human response (as per Table 9.13 in Chapter 9 (Noise & Vibration) 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)	Access to all hospitals and schools will be maintained. Mitigation for Construction Phase access to hospitals and schools are set out in Appendix A5.1 CEMP in Volume 4 of this EIAR.	Construction
HH2	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 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 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 work activities, timings and traffic management.	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

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
BD2	12.5.1.2.1	Throughout (as required)	<p><u>Habitat Loss / Fragmentation</u></p> <p>Where practicable, areas of vegetation including habitats of Local Importance (Higher Value), (i.e. mixed broadleaved woodland (WD1), scattered trees and parkland (WD5), hedgerow (WL1), treeline (WL2) and immature woodland (WS2) 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 (BCIDB-JAC-ENV_LA-0013_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><u>Habitat Loss / Fragmentation</u></p> <p>To mitigate loss of habitat, proposed planting incorporated into the Proposed Scheme will be implemented by the appointed contractor listed below. This planting is listed below and displayed on the Landscaping General Arrangement drawings BCIDB-JAC-ENV-LA-0013_XX-DR-LL-0001 in Volume 3 of this EIAR:</p> <ul style="list-style-type: none"> • 551 trees planted; • 1,662m of proposed hedgerow; • 3,942m² of proposed species-rich grassland; • 1,721m² of proposed ornamental planting; • 4,153m² of proposed native tree planting; and • 25,050m² of proposed amenity grassland planting. 	Construction
Refer to WT1 – WT2 in Table 22.9	12.5.1.2.2	Construction Compounds and throughout (as required)	<p><u>Habitat Degradation – Surface Water Quality</u></p> <p>In terms of mitigation a Surface Water Management Plan (SWMP) has been prepared (provided in the CEMP, in 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"> • A Requirement for a Pollution Incident Response Plan • Construction Compound management including the storage of fuels and materials; • Control of Sediment; • Use of Concrete; • Management of vehicles and plant including refuelling and wheel wash facilities (if necessary); and • Monitoring. <p>Specific mitigation measures which the appointed contractor will implement in relation to surface water quality in Section 3 and 4 of the Proposed Scheme are outlined in WT2.</p>	Construction
BD4	12.5.1.2.3	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 outlined in LSGH8 and LSGH 9 in Table 22.10 in this Chapter of the EIAR.</p>	Construction
Refer to AQ1 in Table 22.3	12.5.1.2.4	Construction Compounds and throughout (as required)	<p><u>Habitat Degradation – Air Quality</u></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

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
BD5	12.5.1.2.5	Throughout (as required)	<p><u>Habitat Degradation – Non-Native Invasive Plant Species</u></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 A5.1 of Volume 4 of this EIAR). Following the confirmatory pre-construction survey, mitigation measures outlined in BD6 and BD7 will be implemented, as required.</p>	Pre-Construction / Construction
BD6	12.5.1.2.5	Throughout (as required)	<p><u>Habitat Degradation – Non-Native Invasive Plant Species</u></p> <p>Where a pre-construction invasive species re-survey has confirmed the presence of previously identified Third Schedule non-native invasive species, or 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
BD7	12.5.1.2.5	Throughout (as required)	<p><u>Habitat Degradation – Non-Native Invasive Plant Species</u></p> <p>The NTA will ensure that all control measures specified in the Proposed Scheme ISMP shall be implemented by a suitably qualified and licensed specialist prior to the construction of the Proposed Scheme to control the spread of 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
BD8	12.5.1.3	Throughout (as required)	<p><u>Rare and Protected Plant Species</u></p> <p>As a precautionary measure in respect of opposite-leaved pondweed known to be present in the Grand Canal, the mitigation measures relating to the protection of water quality in receiving watercourses during construction will be applied by the appointed contractor. These measures are detailed in outlined in WT1 – WT2 in Table 22.10 in this Chapter of the EIAR.</p>	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
Refer to WT1 – WT2 in Table 22.9	12.5.1.3.1	Construction Compounds and 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) has been prepared (provided in the CEMP, in 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"> • A requirement for a Pollution Incident Response Plan; • Construction Compound management including the storage of fuels and materials; • Control of Sediment; • Use of Concrete; • Management of vehicles and plant including refuelling and wheel wash facilities (if necessary); and • Monitoring. <p>Specific mitigation measures which the appointed contractor will implement in relation to surface water quality in Section 3 and 4 of the Proposed Scheme are outlined in WT2.</p>	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
BD9	12.5.1.4.1.1	UCD and Section 3 (Loughlinstown Roundabout to Bray North (Wilford Roundabout) (Refer to Figure 12.7.2 in Volume 3 of this EIAR)	<p>Bats <u>Protection of Bats During Vegetation Clearance</u></p> <p>While no active roosts were identified during the multidisciplinary surveys within the footprint of the Proposed Scheme, a total of 30 trees with Potential Roost Features (PRFs) were identified within the footprint of the Proposed Scheme (permanent and temporary land-take) during the multidisciplinary surveys (see Figure 12.7.2 in Volume of this EIAR). Of these trees, 19 will be removed during the Construction Phase of the Proposed Scheme, and the following mitigation measures will be implemented by the appointed contractor:</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 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; and 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 in Volume 4 of this EIAR) will be implemented. Where the qualified arborist engaged by the appointed contractor is required to assess the condition of, and advise on any repair works necessary to, any trees which are to be retained (including PRF-containing trees or category U trees¹), these will be notified to the appointed ecologist to be surveyed to confirm if these trees are PRFs (as done for the pre-construction surveys outlined in BD9). Where trees with previously identified or new PRF(s) require works including removal for example due to poor condition, they will be subject to mitigation as described in BD9; and There will be no additional lighting within 5m of any tree with PRFs during the Construction Phase of the Proposed Scheme to avoid potential disturbance to roosting bats. 	Construction

¹ Category U trees are defined under BS5837:2012 as those tree in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years. Typically they are trees that are dead or show serious, irremediable, structural defect, and from a health and safety perspective are often removed.

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
BD10	12.5.1.4.1.2	Throughout (as required) and specifically at UCD and Section 3 (Loughlinstown Roundabout to Bray North (Wilford Roundabout) (Refer to Figure 12.7.2 in Volume 3 of this EIAR)	<p>Bats – Roost Loss</p> <p><u>Potential Roost Feature Re-Appraisal (First Step of Pre-Construction Survey)</u></p> <p>The NTA will ensure that a confirmatory pre-construction survey of all trees identified as containing PRFs and trees to be retained within the boundary of the Proposed Scheme shall be rechecked for PRFs by an experienced bat specialist engaged by the NTA as part of the pre-construction surveys. The survey will:</p> <ul style="list-style-type: none"> • Confirm trees previously identified with PRFs which are to be retained are still standing; and • Identify whether new PRF features (if any) may have developed owing to damage or management change to trees with PRFs in the intervening period between the original surveys and grant of planning. <p><u>Pre-Construction Survey</u></p> <p>In the unlikely event that additional PRFs are detected during the pre-construction survey it is recommended that;</p> <ul style="list-style-type: none"> • In advance of any clearance all trees deemed to contain PRFs which are subject to felling / clearance will be checked for the presence of bats by a suitably qualified / licenced bat specialist (using an endoscope under a separate licence held by that individual); • In the unlikely event that bats are found on the proposed development site during construction works such as vegetation clearance, works will immediately cease in that area and the local NPWS Conservation Ranger will be contacted; • An application will then be made to the National Parks and Wildlife Service for a derogation licence to permit actions affecting bats or their roosts that would normally be prohibited by law; • After licence approval from the NPWS (which may include the necessity for additional mitigation measures to those recommended here) bats may be removed by a bat specialist licenced to handle bats and released in the area in the evening following capture; and • Only then will PRF trees be felled and this should be undertaken 'in sections' where the section can be handled to avoid sudden movements or jarring of the sections. <p><u>Installation of Bat Boxes</u></p> <p>In addition to mitigation proposals that may arise as result of the pre-construction survey (e.g. emergence surveys and confirmation of roost), it is proposed to install generalist / self-cleaning bat boxes for each PRF tree that is confirmed to be removed:</p> <ul style="list-style-type: none"> • Standard Schwegler 1FFH (2 number) and 3FF boxes (1 number) for all PRF trees to be removed; • The boxes will be installed three months in advance of felling of any PRF tree and in public spaces managed by the Local Authority as close as possible to areas of the PRF tree to be felled and which overlap with areas of bat activity confirmed during activity surveys undertaken as part of the EIAR; • The boxes will be installed on the tree at a height of 3-5m and firmly fixed to tree trunk; • Where practicable, the bat boxes will be installed in an east, south and west orientation and protected from undue disturbance by selective placement away from light spill and at a height more than 3.5m; • There will be a minimum of 1m clearance (e.g. no overhanging branches or ivy encroachment near installed box) around each bat box opening; and • Installed bat boxes will be labelled and data (reference number, GPS location and photographic record) will be supplied to Bat Conservation Ireland, Local Authority Biodiversity Officer and National Parks and Wildlife Service. 	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
BD11	12.5.1.4.1.3	Woodbrook Side Lodge	<p><u>Protection of Bats During Demolition of Woodbrook Side Lodge</u></p> <p>In addition to the measures outlined above, the following are in respect of the removal (and relocation and rebuilding) of Woodbrook Side Lodge which has been identified as being potentially suitable to support roosting bats:</p> <p>Bats could occupy suitable roosting features at any time prior to the commencement of works. Therefore, there is an inherent risk that bats could be affected by the proposed demolition works. The following mitigation procedures will be followed:</p> <ul style="list-style-type: none"> • Woodbrook Side Lodge must be re-surveyed prior to its demolition to ensure there are no roosting bats present. A suitably qualified and experienced ecologist must carry out internal and external inspections of the building as well as a minimum of one bat emergence survey and one bat re-entry survey during the active bat season (generally taken as mid-April to mid-September inclusive). • Where a bat roost is encountered, all relevant works will cease and an application for a derogation licence shall be submitted by the suitably qualified / licensed bat specialist to the NPWS to seek permission for the removal of the roost. 	
BD12	12.5.1.4.1.4	Throughout (as required)	<p><u>Bats</u></p> <p><u>Habitat Loss and Fragmentation</u></p> <p>Where practicable, habitats of importance to bats such as scattered trees and parkland, treeline and hedgerow habitat types, which lie within the footprint, or along the boundary of the Proposed Scheme, that are not directly impacted by the Proposed Scheme will be retained. These areas will be protected for the duration of construction works and fenced off at an appropriate distance. Vegetation to be retained is shown on Landscaping General Arrangement drawings (BCIDE-JAC-LA-0013_XX_00-DR-LL-9001) in Volume 3 of this EIAR.</p> <p>To minimise the loss of habitat associated with the Proposed Scheme, there are also areas within the Proposed Scheme footprint which are included for mitigation planting where general construction works will not be undertaken. Proposed planting incorporated into the Proposed Scheme will be implemented, shown as design mitigation, as listed below and displayed on the Landscaping General Arrangement Drawings (BCIDE-JAC-LA-0013_XX_00-DR-LL-0001) in Volume 3 of this EIAR:</p> <ul style="list-style-type: none"> • 551 trees planted; and • 1,662m of proposed hedgerow. 	Construction
BD13	12.5.1.4.1.5	Throughout (as required)	<p><u>Bats</u></p> <p><u>Disturbance of Flight Patterns / Foraging Routes as a Result of Lighting</u></p> <p>The appointed contractor in liaison with the suitably qualified licensed ecologist(s) will ensure that lighting at the construction compounds, 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; • Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only where needed; and • Where night-time works are required the appointed contractor will liaise with the engaged suitably experienced and qualified ecologist(s) and implement measures to mitigate the impact of such works (especially works carried out adjacent to watercourses with known bat activity e.g. River Dodder and Grand Canal). 	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
BD14	12.5.1.4.2.1	Throughout (as required)	<p><u>Badgers</u> <u>Disturbance / Displacement</u></p> <p>The NTA will ensure that a confirmatory pre-construction check of all suitable badger habitat will be completed by a suitably qualified ecologist within 12 months 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
BD15	12.5.1.4.2.2	Throughout (as required)	<p><u>Badgers</u> <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
BD16	12.5.1.4.2.3	Throughout (as required)	<p><u>Badgers</u> <u>Lighting</u></p> <p>See BD11 which relates to lighting mitigation measures.</p>	Construction
BD17	12.5.1.4.3.1	Throughout (as required)	<p><u>Otter</u> <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 2006b).</p>	Pre-Construction
BD18	12.5.1.4.3.2	Throughout (as required)	<p><u>Otter</u> <u>Measures to Prevent Injury / Mortality Impacts</u></p> <p>Prior to construction works commencing, the appointed contractor will engage the services of a suitably qualified ecologist to conduct a pre-construction otter survey of the Proposed Scheme in accordance with Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes (NRA 2006b).</p>	Construction
Refer to WT1 – WT2 in Table 22.9	12.5.1.4.3.3	Construction Compounds and throughout (as required)	<p><u>Otter</u> <u>Habitat Degradation / Reduced Prey Availability – Water Quality</u></p> <p>The mitigation measures which will be applied by the appointed contractor for surface water quality during the Construction Phase are outlined in WT1 – WT2 in Table 22.9.</p>	Construction
BD19	12.5.1.4.3.4	Throughout (as required)	<p><u>Otter</u> <u>Lighting</u></p> <p>See BD11 which relates to lighting mitigation measures.</p>	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
Refer to WT1 – WT2 in Table 22.9	12.5.1.4.4.1	Construction Compounds and throughout (as required)	<p><u>Marine Mammals</u> <u>Habitat and Food Resource Degradation – Water Quality</u></p> <p>In terms of mitigation a Surface Water Management Plan (SWMP) has been prepared (provided in the CEMP, in 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"> • A requirement for a Pollution Incident Response Plan • Construction Compound management including the storage of fuels and materials; • Control of Sediment; • Use of Concrete; • Management of vehicles and plant including refuelling and wheel wash facilities (if necessary); and • Monitoring. <p>Specific mitigation measures which the appointed contractor will implement in relation to surface water quality in Section 3 and 4 of the Proposed Scheme are outlined in WT2.</p>	Construction
BD20	12.5.1.5.1.1	Throughout (as required)	<p><u>Breeding Birds</u> <u>Habitat Loss and Fragmentation</u></p> <p>Where possible, habitats of importance to breeding birds such as scattered trees and parkland, treeline and hedgerow habitat types, which lie within the footprint, or along the boundary of the Proposed Scheme, that are not directly impacted will be retained. These areas will be protected for the duration of construction works and fenced off at an appropriate distance. Vegetation to be retained is shown on the Landscaping General Arrangement drawings (BCIDE-JAC-LA-0013 _XX_00-DR-LL-9001) in Volume 3 of this EIAR.</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 (BCIDE-JAC-LA-0013 _XX_00-DR-LL-9001) in Volume 3 of this EIAR for locations.</p>	Construction
BD21	12.5.1.5.1.2	Throughout (as required)	<p><u>Breeding Birds</u> <u>Mortality Risk</u></p> <p>Where practical, vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between 01 March and 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>	Construction
BD22	12.5.1.5.1.3	Throughout (as required)	<p><u>Breeding Birds</u> <u>Disturbance / Displacement</u></p> <p>The appointed contractor will implement the noise mitigation measures described in NV4, NV6 and NV7 in Table 22.5 in this Chapter.</p>	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
BD23	12.5.1.5.2.1	Throughout (as required) and specifically at Shanganagh Park and the Wilford Junction	<p><u>Wintering Birds</u> <u>Measures to Prevent Disturbance and Displacement Impacts to SCI birds due to vegetation loss During Construction</u> Where practicable, the removal of screening or overhanging vegetation (e.g., hedgerows, trees, scrub, bankside vegetation and grassland) will be undertaken outside of the breeding bird season (01 March to the 31 August) and before the arrival of the wintering birds at the start of October. 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
Refer to WT1 – WT2 in Table 22.9	12.5.1.5.1.1 & 12.5.1.5.2.2	Construction Compounds and throughout (as required)	<p><u>Breeding Birds / Wintering Birds</u> <u>Habitat Degradation – Water Quality</u> The mitigation measures which will be applied by the appointed contractor for surface water quality during the Construction Phase are outlined in WT1 – WT2 in Table 22.9.</p>	Construction
BD24	12.5.1.7.1	Throughout (as required)	<p><u>Amphibians</u> <u>Habitat Loss, Disturbance and Mortality Risk</u> 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 BD23, BD24 and BD25 will be completed before works recommence.</p>	Construction
BD25	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 a 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 (ZoI) of the Proposed Scheme.	Construction
BD26	12.5.1.7.1	Throughout (as required)	In the case of smooth newt, individuals will be captured, under a 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 ZoI 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 newt.	Construction
BD27	12.5.1.7.1	Throughout (as required)	<p>If the size or depth of the habitat feature is such that it cannot be determined by a 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. 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.</p>	Construction
Refer to WT1 – WT2 in Table 22.9	12.5.1.7.2; 12.5.1.8.1 & 12.5.1.9.1	Construction Compounds and throughout (as required)	<p><u>Amphibians / Fish / Invertebrates – Freshwater Molluscs</u> <u>Habitat Degradation – Surface Water Quality</u> The mitigation measures which will be applied by the appointed contractor for surface water quality during the Construction Phase are outlined in WT1 – WT2 in Table 22.9.</p>	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
BD28	12.5.2.2.1.1	Throughout (as required)	<p><u>Habitat Degradation – Surface Water Quality</u></p> <p>The proposed SuDs drainage system, as shown in Proposed Surface Water Drainage Works drawings (BCIDB-JAC-DNG_RD-0013_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>	Operational
BD29	12.5.2.2.2	Throughout (as required)	<p><u>Habitat Degradation – Non-Native 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>	Operational
BD30	12.5..4.1.3	Throughout (as required)	<p><u>Bats</u></p> <p><u>Monitoring of Bat Boxes</u></p> <p>Where bat boxes are installed as part of the Construction Phase of the Proposed Scheme, monitoring is required under best practice guidance (e.g., Marnell <i>et al.</i>, 2022 - Bat Mitigation Guidelines for Ireland) The level of post-installation monitoring will be dependent on the roost type and the number of bats present. A precautionary approach will be assumed on the basis that bats using these PRFs reflect species that were typically noted during the activity surveys and are occasionally identified from urban transport corridors.</p> <p>The NTA will ensure that annual inspections of installed bat boxes will be undertaken for two years or as advised by a suitably qualified ecologist, to confirm occupancy.</p> <p>Where no occupancy is noted in year one, the boxes will be relocated to another mature tree and details communicated with the BCI, the local authority Biodiversity Officer and the NPWS.</p>	Operational
BD31	12.5.2.4.1.4	Woodbrook Side Lodge	<p><u>Bats</u></p> <p><u>Monitoring of Confirmed Roost for Demolition of Woodbrook Side Lodge (Where a Roost is Confirmed)</u></p> <p>Where a compensatory roost is required to enable the demolition and later rebuilding of the lodge, this would require the application of a derogation licence, and approval of NPWS. The following precautionary approach is proposed to compensate for loss of as roost if confirmed. Given that the rebuilt house is privately owned, the use of bat bricks or similar is not proposed as access for post-installation monitoring (one, three and five years) cannot be guaranteed, and the light spill from adjacent road and commercial premises is considered unfavourable. Thus, similar to the installation of bat boxes for the loss of trees containing PRFs, it is proposed that species-specific bat boxes, of suitable capacity to reflect the nature of the roost to be removed will be installed in retained trees as close as is practical to the location of rebuilt Woodbrook Side Lodge, in trees to the immediate north-east.</p> <p>The boxes will be checked for presence of bats or signs of bat occupancy once per year in years one, three and five post-construction by an appropriately licensed and qualified ecologist. The results of these surveys will be shared with BCI, the local authority Biodiversity Officer and the NPWS. While the success of the proposed bat mitigation strategy will not be measured by occupancy of roosts by bats, it is considered to be best practice and appropriate to implement a monitoring plan to gather information and assess whether the bat population has responded favourably to mitigation measures. Post-works licence returns would likely be required for the discharge of obligations attached to the derogation licence (which could be in addition to the strategy in respect of the roost removal, to which will need to be submitted to the Department of Housing, Local Government and Heritage, following the completion of licensable works.</p>	Operational
BD32	12.5.2.4.1.5	Throughout (as required)	Where feasible, operational lighting will be kept to a minimum and light spill avoided	Operational

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	Construction Compounds and throughout (as required)	<p>A Surface Water Management Plan (SWMP) 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 within the Employer's Requirements that the successful contractor(s), 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"> • A requirement for a Pollution Incident Response Plan • Construction Compounds management including the storage of fuels and materials • Control of Sediment; • Use of concrete; • Management of Vehicles and Plant, including refuelling and wheel wash facilities (if necessary); and • Monitoring. <p>Specific mitigation measures which the appointed contractor will implement in relation to surface water quality in Section 3 and 4 of the Proposed Scheme are outlined in WT2.</p>	Construction
WT2	13.5.2.2	Section 3c (Quinn's Road to Bray North (Wilford Roundabout)) and Section 4 (Bray North (Wilford Roundabout) to Bray South (Fran O'Toole Bridge))	<p>Following implementation of the general mitigation measures, the majority of impacts will be not significant. However Significant impacts are predicted for the Dargle_040, a segment of which is a designated salmonid river, as a result of the extensive road construction works proposed in Section 4c of the Proposed Scheme.</p> <p>Approximately 600m of the Proposed Scheme in this section has some surface water connection to the River Dargle as it flows through Bray, the segment of the Dargle_040 which is designated a salmonid river. The existing drainage system in this location also includes some combined sewer connections, however as a precautionary measure it is assumed that all of the gullies in this location drain to the River Dargle. In order to prevent any silty water or hydrocarbons entering the water body during construction it is proposed to use 'silt sacs' or the equivalent in every gully along the entire length of the Proposed Scheme in this catchment (Chainage A17900 to A18500) as construction progresses. These will capture any silt in the surface water. During the connection of the new kerbside edge drains into the existing surface water system, there is a higher risk of contamination. This connection will only be carried out in dry weather. All refuelling here will be carried out at the Construction Compound BR1 only and adhere to the control measures outlined in the SWMP.</p> <p>In Section 3c of the Proposed Scheme, which drains to the other segment of the Dargle_040 (Rathmichael River), silt sacs will also be deployed for up to 250m north and south of the point at which the water body is crossed (between Chainage A16850 to A17350). As hydrocarbons can be carried long distances in surface water drains, whereas silt in water tends to drop out of suspension in a shorter distance, no mobile plant will be refuelled within 500m of the crossing (between Chainage A16600 to A17600). Any refuelling needed in this section must be carried out within Construction Compound BR1.</p>	Construction

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	14.5.1.1	Throughout (as required)	<u>Loss or Damage of Topsoil</u> Excavated topsoils will be stockpiled by the appointed contractor using appropriate methods to minimise the effects of weathering. Care will be taken in reworking this material to minimise dust generation, groundwater infiltration and generation of runoff.	Construction
LSGH2	14.5.1.1	Throughout (as required)	<u>Loss or Damage of Topsoil</u> 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. Where practical the removal of topsoil from the Proposed Scheme will be avoided. 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 to allow maximum opportunity for the reuse of materials on site.	Construction
LSGH3	14.5.1.2	Throughout (as required)	<u>Excavation of Potentially Contaminated Ground</u> The appointed contractor will ensure that excavations shall be kept to a minimum, using shoring or trench boxes where appropriate. 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.	Construction
LSGH4	14.5.1.2	Throughout (as required)	<u>Excavation of Potentially Contaminated Ground</u> The appointed contractor will be responsible for regular testing of excavated soils to monitor the suitability of the soil for reuse.	Construction
LSGH5	14.5.1.2	Throughout (as required)	<u>Excavation of Potentially Contaminated Ground</u> Samples of ground suspected of contamination will be tested for contamination by the appointed contractor during the detailed 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.	Construction
LSGH6	14.5.1.2	Circle K in Bray (Section 4 (Bray North (Wilford Roundabout) to Bray South (Fran O'Toole Bridge))	<u>Excavation of Potentially Contaminated Ground</u> The decommissioning works at Circle K in Bray will require mitigation if ground contamination is encountered during the construction works. A ground investigation shall be undertaken prior to the construction works to inform a remedial strategy for the decommissioning and removal of any below ground infrastructure associated with the storage of fuel under the forecourt. This remedial strategy will include any measures required to remediate soil contamination and/or determine the appropriate ultimate disposal options for contaminated material.	Construction
LSGH7	14.5.1.2	Throughout (as required)	<u>Excavation of Potentially Contaminated Ground</u> Any dewatering in areas of contaminated ground shall be designed by the appointed contractor to minimise the mobilisation of contaminants into the surrounding environment.	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
LSGH8	14.5.1.3	Throughout (as required)	<u>Pollution of Soil and Groundwater</u> Good construction management practices as outlined in the CIRIA guidance Control of Water Pollution from Construction Sites – Guidance for consultants and contractors (Masters-Williams et al. 2001) will be employed by the appointed contractor to minimise the risk of transmission of hazardous materials as well as pollution of adjacent watercourses and groundwater. The construction management of the site will take account of these recommendations to minimise as far as possible the risk of soil, groundwater and surface water contamination.	Construction
LSGH9	14.5.1.3	Throughout (as required)	<u>Pollution of Soil and Groundwater</u> Measures to be implemented to minimise the risk of spills and contamination of soils and waters include: <ul style="list-style-type: none"> Employing only competent and experienced workforce, and site-specific training of site managers, foremen and workforce, including all subcontractors, 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 all Construction Compounds. 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 kit to be provided and to be 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)	<u>Pollution of Soil and Groundwater</u> An Environmental Incident Response Plan, as described in the CEMP (Appendix A5.1 CEMP 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 such aspects as 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)	<u>Pollution of Soil and Groundwater</u> 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	15.5.1.1	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

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
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 ACH7 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 the licensing requirements agreed.	Construction
ACH4	15.5.1.1	Throughout (as required) and St Stephens Green	Ground-breaking works in the environs of national monuments will require archaeological consent from the Minister of Housing, Local Government and Heritage (HLGH). There is one national monument in the vicinity of the Proposed Scheme, St. Stephen's Green. Mitigation measures, in this instance, will be archaeological monitoring of all ground-breaking, excavation or earth-moving works, under Ministerial Directions from the Minister, under the terms of the National Monuments (Amendment) Act 2004.	Construction
ACH5	15.5.1.1	Throughout (as required)	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
ACH6	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
ACH7	15.5.1.1.1	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
ACH8	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
ACH9	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. As part of the licensing requirements, it is essential for the appointed contractor to provide sufficient notice to the archaeologist(s) in advance of the construction works commencing.	Construction
ACH10	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. 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 client's archaeologist and will be a matter for discussion between the NTA and the licensing authorities.	Construction
ACH11	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

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
ACH12	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
ACH13	15.5.1.2	Throughout (as required)	Features of a 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
ACH14	15.5.1.3.1.1	Leeson Street to Donnybrook (Anglesea Road Junction) St Stephen's Green (National Monument – RMP DU018-020334)	With regard to ground-breaking works, excavation, or earth-moving works in the vicinity of St Stephen's Green national monument (RMP DU018-020334), archaeological consent is required from the Minister of HLGH. The necessary consent will be obtained by the archaeologist engaged by the appointed contractor. Archaeological monitoring of the works will require Ministerial Directions from the Minister under the terms of the National Monuments (Amendment) Act 2004.	Construction
ACH15	15.5.1.3.1.2	Leeson Street to Donnybrook (Anglesea Road Junction) Within Zone of Archaeological Protection (ZAP) for Historic City of Dublin (DU018-020) and Donnybrook (DU018-060); and at RMP/SMR sites DU018-020249 (Leeson Street Upper) and DU018-061 (Morehampton Road)	Archaeological monitoring (as defined in ACH2) under licence will take place, where any preparatory ground-breaking or ground reduction works are required (as defined in Section 15.4.1 in Chapter 15 (Archaeological & Cultural Heritage) of this EIAR), at the following locations: <ul style="list-style-type: none"> • Within the designated ZAP for the Historic City of Dublin (DU018-020); • Within the designated ZAP for Donnybrook (DU018-060); and • At the following RMP / SMR sites, where associated features may survive below ground within the Proposed Scheme: the 'sites' of former dwellings, DU018-020249 on Leeson Street Upper and DU018-061 on Morehampton Road. <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
ACH16	15.5.1.3.1.3	Leeson Street to Donnybrook (Anglesea Road Junction) Non-Designated Sites (Bridge and mill race / former watercourse in Donnybrook; and former tramline from Leeson Street Lower to Anglesea Bridge)	Archaeological monitoring (as defined in ACH2) under licence will be carried out at the site of a bridge and mill race / former watercourse in Donnybrook (CBC0013AH001) and along the route of the former tramline from Leeson Street Lower to the southern side of Anglesea Bridge (DCIHR 18-11-002, 18-16-007 and 18-15-030 and 22-04-001) in order to identify and record any remnants of the former tramline that might survive beneath the road surface.	Construction
ACH17	15.5.1.3.2	Leeson Street to Donnybrook (Anglesea Road Junction) Coal-hole covers and cellar openings on Leeson Street Lower	The coal-hole covers (CBC0013CH001) and cellar openings (CBC0013CH002) on Leeson Street Lower will be recorded in situ. The surrounding granite setting if present will also be recorded, noting the presence and characteristics of any channel which has been carved into the setting. If works are required in these areas, the coal-hole covers, and their corresponding granite setting, and the cellar settings will be numbered and removed for safekeeping for the duration of the works. They will subsequently be reinstated in the same location at the completion of works to their original position or as close to it as possible.	Construction
ACH18	15.5.1.3.2	Leeson Street to Donnybrook (Anglesea Road Junction) Junction of Eglington Terrace and Donnybrook Road	The granite bollards at the junction of Eglington Terrace and Donnybrook Road (CBC0013CH003) should be recorded in situ. If required by the Proposed Scheme the bollards will be removed under archaeological supervision and in accordance with a method statement agreed with the statutory authorities. This will protect the cultural heritage features from any adverse impacts and ensure that they are stored safely at an agreed location. They will be reinstated in either their original locations or an appropriate location once the works are completed.	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
ACH19	15.5.1.4.1	Donnybrook (Anglesea Road Junction) to Loughlinstown Roundabout RMP/SMR sites (DU023-007, DU023-011, DU026-119)	Archaeological monitoring (as defined in ACH2) under licence will take place, where any preparatory ground-breaking or ground reduction works are required (as defined in Section 15.4.1 in Chapter 15 (Archaeological & Cultural Heritage) of this EIAR), at the following locations: <ul style="list-style-type: none"> At the following RMP / SMR sites, where associated features may survive below ground within the Proposed Scheme: the sites DU023-007, DU023-011 and DU026-119. 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
ACH20	15.5.1.4.1.1	Donnybrook (Anglesea Road Junction) to Loughlinstown Roundabout Non-Designated Site (Former tramline)	Archaeological monitoring (as defined in ACH2) under licence will be carried out along the route of the former tramline on the northernmost end of the Proposed Scheme section in order to identify and record any remnants of the former tramline that might survive beneath the road surface (DCIHR 22-04-001).	Construction
ACH21	15.5.1.5.1	Loughlinstown Roundabout to Bray North (Wilford Roundabout) Kiltuck Church (RMP DU026-054)	Archaeological monitoring (as defined in ACH2) under licence will take place, where any preparatory ground-breaking or ground reduction works are required (as defined in Section 15.4.1 in Chapter 15 (Archaeological & Cultural Heritage) of this EIAR), at the following location: <ul style="list-style-type: none"> At the site of Kiltuck Church (RMP DU026-054) in Shanganagh. In this area 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
ACH22	15.5.1.5.2	Loughlinstown Roundabout to Bray North (Wilford Roundabout) Shankill Main Street	The mosaics along Shankill Main Street (CBC0013CH004) will be lifted carefully and stored during construction and either reinstated in their original location or to an appropriate alternative location within the village.	Construction
ACH23	15.5.1.6.1	Bray North (Wilford Roundabout) to Bray South (Fran O'Toole Bridge) ZAP for Bray	Archaeological monitoring (as defined in ACH2) under licence will take place, where any preparatory ground-breaking or ground reduction works are required (as defined in Section 15.4.1 in Chapter 15 (Archaeological & Cultural Heritage) of this EIAR), at the following locations: <ul style="list-style-type: none"> Within the designated ZAP for Bray (WI004-001); this area includes the area of the castle site (WI004-001006 and cross slab find spot (WI004-001001). 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
ACH24	15.5.1.6.2	Bray North (Wilford Roundabout) to Bray South (Fran O'Toole Bridge) 1798 Memorial in Bray	CBC0013CH005, a 1798 memorial on Castle Street will be moved and stored for the duration of the works and subsequently reinstated, in its original position or as close to it as possible.	Construction
ACH25	15.5.1.7.1	Construction Compound Locations	Archaeological monitoring (as defined in ACH2) will take place at the early stages of construction, where any preparatory ground-breaking or ground reduction works are required (as defined in Section 15.4.1 in Chapter 15 (Archaeological & Cultural Heritage) of this EIAR) at Construction Compounds BR1 and BR2. This will be undertaken in order to establish the presence or absence, as well as the nature and extent, of any archaeological deposits, features or sites that may be present in these areas.	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	Protected Structures: St Anne's Catholic Church, Shankill (RMP DU026-109, DLR RPS 1805) – granite boundary wall.	Mitigation will include recording of the feature by an appropriate architectural heritage specialist engaged by the appointed contractor, prior to of the Construction Phase, in accordance with the methodology provided in Appendix A16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR. A similar boundary treatment will be reinstated on the new alignment	Construction
AH2	16.5.1.1	Protected Structures: Rubble wall to the north of Castle Farm Dublin Road, Shankill (CBC0013BTH045; associated with Boundary wall to Kiltuc Church - RMP DU026-054001, CBC0013BTH043, and the old demesne wall of Shanganagh Castle - RMP DU026-120, DLR RPS 1845, 2089, NIAH 60260146, 60260148, and NIAH 2556)	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
AH3	16.5.1.1	Protected Structures: Woodbrook Side Lodge (DLR RPS 1874, NIAH 60260162) and associated boundary wall, dressed granite pedestrian gateway and entrance gates (CBC0013BTH021)	<p>An architectural heritage specialist engaged by the appointed contractor will oversee the labelling, taking-down and reinstatement of affected historic fabric. 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> <p>The record of the Side Lodge, including the photographs in Appendix A16.4 in Volume 4 together with any surveys carried out as part of the proposed mitigation at the Side Lodge, will be lodged in the Irish Architectural Archive.</p> <p><u>Woodbrook Side Lodge (DLR RPS 1874, NIAH 60260162)</u></p> <p>Mitigation will include labelling the affected masonry, brickwork, and joinery prior to their careful dismantling and removal to safe storage by the appointed contractor. Architectural heritage features such as bricks, timber barge boards and the stone plaques on the gables are a key part of the character of the Side Lodge and its relationship to the Front Lodge (DLR RPS 1871).</p> <p>Where the bricks, bargeboards and stone plaques are found to be in good condition and suitable for reuse, they will be salvaged for anastylosis and will be incorporated in the new structure as detailed in the engineers drawings (in Volume 3 of this EIAR) and photographic record (Appendix A16.4 in Volume 4 of this EIAR). The bargeboards, brick courses, brick dressings and the plaques are to be reinstated on the gables to match the existing gables as indicated in the photographs in Appendix A16.4 in Volume 4 of this EIAR. The chimney will also be rebuilt. If found to be poor condition and unsuitable for reuse, facsimiles of the bargeboards will be made. New red clay bricks, where required, will be matched like for like to the existing in terms of size and colour. Inspection of the lodge revealed that the roof slates, ridge tiles and structure were replaced in a previous refurbishment, as were the rain water goods, render and the doors and windows. The walls will be dash rendered except where there are brick courses, dressings, or enrichments to the gables. The proposed fenestration and doors will be as specified on the engineers drawings.</p> <p><u>Associated boundary wall, dressed granite pedestrian gateway and entrance gates (CBC0013BTH021)</u></p> <p>Elements such as the granite jambs and lintel to the pedestrian gate and the gate piers to the vehicular entrance will be incorporated in a boundary wall which would be rebuilt on the new alignment to match the existing boundary wall.</p> <p>The granite masonry of the gate piers, jambs and lintels are to be labelled by an appropriate architectural heritage specialist engaged by the appointed contractor, and carefully taken down 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> <p>The boundary treatment will be reinstated on the new alignment and the entrance gates reassembled as per photographs, survey drawings and the architectural heritage specialist's direction. The pedestrian gate has the inscription 'Side Entrance Woodbrook' to its lintel, therefore the reinstatement of this gate will serve as a local reference to the Side Lodge.</p>	Construction
AH4	16.5.1.1	Protected Structures throughout (as required): 326 locations where structures of Regional Importance and Medium Sensitivity share a boundary with the Proposed Scheme (as listed in Appendix A16.2 Inventory of Architectural Heritage Sites in Volume 4 of this EIAR)	<p>Mitigation to offset the risk of damage will include recording, protection and monitoring of the structures or boundaries (as relevant) prior to, and 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 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
AH5	16.5.1.2	Architectural Conservation Areas: Belmont Avenue Architectural Conservation Area and Foxrock Architectural Conservation Area	Mitigation to offset the risk of damage will include recording, protection and monitoring of the sensitive fabric prior to, and for the duration of the Construction Phase. 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.	Construction
AH6	16.5.1.3	Conservation Areas: Leeson Street Lower Conservation Area, Grand Canal Conservation Area, and Dodder Conservation Area	Mitigation to offset the risk of damage will include recording, protection and monitoring of the historic fabric prior to, and for the duration of the Construction Phase. 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.	Construction
AH7	16.5.1.4	NIAH Structures: The Kiosk (NIAH 50110481)	Mitigation to offset the risk of damage will include recording, protection and monitoring of the sensitive fabric prior to, and for the duration of the Construction Phase. 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.	Construction
AH8	16.5.1.4	NIAH Structures: Newpark Lodge (NIAH 60230058) and Shandrum (NIAH 60230060)	Mitigation to offset the risk of damage will include recording, protection and monitoring of the sensitive fabric prior to, and for the duration of the Construction Phase. 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.	Construction
AH9	16.5.1.4	NIAH Structures: Fran O'Toole Bridge (NIAH 1630126)	Mitigation to offset the risk of damage will include recording, protection and monitoring of the sensitive fabric prior to, and for the duration of the Construction Phase. 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 will oversee any labelling, taking-down and reinstatement of the affected 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
AH10	16.5.1.5	Designed Landscapes: Castle Farm (CBC0013BTH045) in Shankill	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
AH11	16.5.1.5	Designed Landscapes: Rubble wall on Dublin Road and Beech Road in Shankill (CBC0013BTH040) – part of old Demesne wall of Sherrington (NIAH 60260153)	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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
AH12	16.5.1.5	Designed Landscapes: Gates and railings (DLR RPS 2074) and crenelated demesne wall on either side of the gates (CBC0013BTH037, CBC0013BTH036) of Crinken House south of Crinken Lane	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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
AH13	16.5.1.5	Designed Landscapes: Granite rubble wall (CBC0013BTH035) to Crinken House (DLR RPS 1971)	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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
AH14	16.5.1.5	Designed Landscapes: Demesne wall (CBC0013BTH032) to Askefield House (DLR RPS 1860)	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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
AH15	16.5.1.5	Designed Landscapes: Granite rubble demesne wall (CBC0013BTH030) with bevelled granite cap to Beauchamp House (NIAH 2552, DLR RPS 1862)	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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
AH16	16.5.1.5	Designed Landscapes: Demesne wall (CBC0013BTH025) associated with Corke Lodge (DLR RPS 1869)	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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
AH17	16.5.1.5	Designed Landscapes: Granite rubble demesne wall with bevelled granite coping (CBC0013BTH024) to the north of the entrance gates (DLR RPS 1871) to Woodbrook House (DLR RPS 1870, NIAH 5676)	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
AH18	16.5.1.5	Designed Landscapes: Wall south of the Front Lodge (DLR RPS 1871) to Woodbrook House (DLR RPS 1870, NIAH 5676)	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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
AH19	16.5.1.5	Designed Landscapes: Rendered gate piers and boundary wall to Ravenswell House (NIAH 4299)	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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
AH20	16.5.1.5	Designed Landscapes throughout (as required): 12 designated landscapes (Morehampton Grove (CBC0013BTH147), Ardmore House (DCC RPS 19), Woodview House (DLR RPS 9), Belfield House (DCC RPS 41), St Helen's (NIAH 2460), the entrance gates and gate lodge formerly associated with Claremont House (DLR RPS 2010,2077), Shanganagh Park Gates and Railings (NIAH 60260149), the boundary wall and gate piers of the Orchard (DLR RPS 1987), the boundary wall and gate piers of Askefield House (DLR RPS 1860, 2001), the boundary wall of the Aske (DLR RPS 1866), the entrance gates and boundary wall to Woodbrook House (DLR RPS 1870, 2090) and the entrance gates to Wilford House (DLR RPS 1873))	Mitigation will include recording, protection and monitoring of the sensitive fabric prior to and for the duration of the Construction Phase. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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
AH21	16.5.1.5	Designed Landscapes throughout (as required): Six designated landscapes (Airfield, Thornfield and Moylurg (CBC0013BTH106, CBC0013BTH105, NIAH 2425) on the Stillorgan Road, the gates and surviving lodge associated with the designed landscape of Stonehouse (CBC0013BTH101), the gates associated with the designed landscapes of Fort William, Mount Merrion Avenue (CBC0013BTH230) and the gates formerly associated with the designed landscapes of Sherrington, Dublin Road Shankill (NIAH 60260151))	Mitigation will include recording, protection and monitoring of the sensitive fabric prior to and for the duration of the Construction Phase. Recording and overseeing of protective measures is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
AH22	16.5.1.6	Other Structures: 20th century coursed granite rubble wall with crenelations (CBC0013BTH068) to the houses on the west side of the Dublin Road in Shankill	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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
AH23	16.5.1.6	Other Structures: Modern walls and piers to Carezza (CBC0013BTH064) in Shankill	Mitigation will include recording the existing fabric in position prior to the works, labelling the affected masonry and fabric. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee any labelling, taking-down and reinstatement of the affected 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
AH24	16.5.1.6	Other Structures throughout (as required): 117 Other Structures of Architectural Heritage Interest of Regional Importance and Medium Sensitivity which front onto the Proposed Scheme (as listed in Appendix A16.2 Inventory of Architectural Heritage Sites in Volume 4 of this EIAR)	Mitigation to offset the risk of damage will include recording, protection and monitoring of the structures or boundaries (as relevant) prior to, and for the duration of the Construction Phase. 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.	Construction
AH25	16.5.1.6	Other Structures: 42 Other Structures of Architectural Heritage Interest of Local Importance and Low Sensitivity which front onto the Proposed Scheme (as listed in Appendix A16.2 Inventory of Architectural Heritage Sites in Volume 4 of this EIAR)	Mitigation to offset the risk of damage will include recording, protection and monitoring of the structures or boundaries (as relevant) prior to, and for the duration of the Construction Phase. 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.	Construction
AH26	16.5.1.7.1	Post Boxes throughout (as required): 10 cast iron post boxes (NIAH 50920291, NIAH 50930153, CBC0013PB010, CBC0013PB009, CBC0013PB008, CBC0013PB007, CBC0013PB006, NIAH 60230075, NIAH 60260136, NIAH 602601630) of Regional Importance and Medium Sensitivity	Mitigation to offset the risk of damage will include recording, protection and monitoring of the post boxes prior to, and for the duration of the Construction Phase. 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.	Construction
AH27	16.5.1.7.1	Post Boxes throughout (as required): Two cast iron post boxes (NIAH 60230046, NIAH 60260102) of Local Importance and Low Sensitivity	Mitigation to offset the risk of damage will include recording, protection and monitoring of the post boxes prior to, and for the duration of the Construction Phase. 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.	Construction

Mitigation Number	EIAR Section Reference	Location	Description of Mitigation or Monitoring Measure / Environmental Commitment	Implementation Stage
AH28	16.5.1.7.2	Lamp Posts throughout (as required): 19 locations (CBC0013LP032 to CBC0013LP038, CBC0013LP015 to CBC0013LP018, CBC0013LP024 to CBC0013LP028, CBC0013LP007 CBC0013LP012 CBC0013LP013) where lamp posts of Regional Importance and Medium Sensitivity will be directly impacted	Mitigation will consist of the recording of the lamp posts in position prior to the works, the labelling of the affected fabric prior to its careful removal to safe storage, and their reinstatement in new positions in close proximity (within 2m) of their existing positions. 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. The works to the 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
AH29	16.5.1.7.2	Lamp Posts throughout (as required): 29 locations (CBC0013LP051, CBC0013LP052, CBC0013LP049, CBC0013LP039 to CBC0013LP048, CBC0013LP014, CBC0013LP019, CBC0013LP020, CBC0013LP021, CBC0013LP022, CBC0013LP023, CBC0013LP029, CBC0013LP002, CBC0013LP003, CBC0013LP004, CBC0013LP005, CBC0013LP006, CBC0013LP008, CBC0013LP009, CBC0013LP010, CBC0013LP011) where lamp posts of Regional Importance and Medium Sensitivity will be retained in position	Mitigation to offset the risk of damage will include recording, protection and monitoring of the lamp posts prior to, and for the duration of the Construction Phase. 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.	Construction
AH30	16.5.1.7.2	Lamp Posts throughout (as required): Three locations (CBC0013LP050, CBC0013LP030, CBC0013LP031) where lamp posts of Local Importance and Low Sensitivity will be retained in position	Mitigation to offset the risk of damage will include recording, protection and monitoring of the lamp posts prior to, and for the duration of the Construction Phase. 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.	Construction
AH31	16.5.1.7.3	Statuary and Street Furniture: Our Lady in the grounds of Saint Anne's Catholic Church Shankill (CBC0013BTH233)	Mitigation will include the recording of the statue and its component parts prior to the works, labelling the affected fabric prior to its careful dismantling and removal to safe storage, and the reinstatement of the statue in the vicinity of its original location. 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 statue. 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
AH32	16.5.1.7.3	Statuary and Street Furniture: Milestone on west side of old Dublin Road at Crinken (DCC RPS 1858, NIAH 60260172)	Mitigation will include the recording of the milestone in position prior to the works, labelling the affected fabric prior to its careful dismantling and removal to safe storage, and the reinstatement of the milestone. 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 statue. 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
AH33	16.5.1.7.3	Statuary and Street Furniture throughout (as required): Seven items (NIAH 50100148, CBC0013BTH157, CBC0013MS003, CBC0013BTH113, CBC0013BTH227, CBC0013MS002, CBC0013BTH091) directly adjoining the Proposed Scheme	Mitigation will consist of the recording, protection and monitoring prior to and during the Construction Phase. Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor and in accordance with the methodology provided in Appendix A.16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH34	16.5.1.7.4	Paving and Surface Treatments: Granite kerbs of Local Importance and Low Sensitivity to be repositioned, at Circle K Donnybrook Road (CBC0013BTH117)	Mitigation will include the retention of the kerbs in-situ, and their integration into the proposed new paving design where paths are widened. Where paths are to be narrowed, kerbs will need to be repositioned. Additional mitigation will be to record the kerbs in position prior to the works, labelling the affected fabric prior to their removal to safe storage, and the reinstatement of the kerbs on the new line. Recording is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor. The architectural heritage specialist will oversee the labelling, careful removal, storage and reinstatement of the affected kerbs. Works to kerbs will be carried out in accordance with the methodology provided in Appendix A.16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH35	16.5.1.7.4	Paving and Surface Treatments: Cellar hatches and granite surrounds on Leeson Street Lower (CBC0013BTH220, CBC0013BTH221, CBC0013BTH222, CBC0013BTH223, CBC0013BTH224)	Mitigation will consist of the recording, protection and monitoring prior to and during the Construction Phase. Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor and in accordance with the methodology provided in Appendix A.16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH36	16.5.1.7.4	Paving and Surface Treatments: Coal holes on Leeson street Lower (CBC0013BTH208, CBC0013BTH206, CBC0013BTH225, CBC0013BTH205, CBC0013BTH204, CBC0013BTH202, CBC0013BTH183, CBC0013BTH178, CBC0013BTH177, CBC0013BTH176, CBC0013BTH175, CBC0013BTH174)	Mitigation will consist of the recording, protection and monitoring prior to and during the Construction Phase. Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor and in accordance with the methodology provided in Appendix A.16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	Construction
AH37	16.5.1.7.4	Paving and Surface Treatments: Granite kerbs located on both sides of Leeson Street (CBC0013BTH170, CBC0013BTH171); Granite kerbs on the west side of Leeson Street Upper (CBC0013BTH153); on both sides of Donnybrook Road (CBC0013BTH119, CBC0013BTH120); on Anglesey Bridge (CBC0013BTH114).	Mitigation will consist of the recording, protection and monitoring prior to and during the Construction Phase. Recording, overseeing of protective measures and monitoring is to be undertaken by an appropriate architectural heritage specialist engaged by the appointed contractor and in accordance with the methodology provided in Appendix A.16.3 Methodology for Works Affecting Sensitive and Historic Fabric in Volume 4 of this EIAR.	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)	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. Trees and vegetation to be retained within and adjoining the works area will be protected in accordance with the British Standard Institution (BSI) British Standard (BS) 5837:2012 'Trees in relation to design, demolition and construction - Recommendations' (BSI 2012). Works required within the root protection area (RPA) of trees to be retained will follow a project-specific arboricultural methodology for such works, which will be prepared / approved by a professional qualified arborist. For details of trees to be retained refer to the Tree Protection Plans which are contained within the Arboricultural Impact Assessment (Appendix A17.1 in Volume 4 of this EIAR).	Construction
LV2	17.5.1	Throughout (as required)	Wherever practicable, trees and vegetation will be retained within 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. For details of trees and vegetation to be removed refer to Tree Protection Plans in the Arboricultural Impact Assessment (Appendix A17.1 in Volume 4 of this EIAR) and Landscape General Arrangements (BCIDB-JAC-ENV_LA-0013_XX_00-DR-LL-9001 in Volume 3 of this EIAR).	Construction
LV3	17.5.1	Throughout (as required)	The Arboricultural Assessment prepared for the Proposed Scheme will be fully updated by the appointed contractor at the end of the Construction Phase 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)	Where properties are subject to permanent and / or temporary acquisition (as listed in Section 17.4.3.2.8 and Section 17.4.4.2.8 in Chapter 17 (Landscape (Townscape) & Visual) of this EIAR), 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)	Where properties are subject to permanent and / or temporary acquisition (as listed in Section 17.4.3.2.8 and Section 17.4.4.3.8 in Chapter 17 (Landscape (Townscape) & Visual) of this EIAR), appropriate measures 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 and 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).	Construction
LV6	17.5.1	Throughout (as required)	Appropriate access to amenities and public open spaces 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	18.6.1	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 in line with the the Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (EPA 2021a). (Refer to the CDRWMP within Appendix A5.1 Construction and Environmental Management Plan (CEMP) in Volume 4 of this EIAR).	Construction
WR2	18.6.1	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 as follows: <ul style="list-style-type: none"> • Stockpiling of existing subbase, 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 bituminous mixtures will be specified in the Proposed Scheme, where practicable. 	Construction
WR3	18.6.1	Throughout (as required)	The following management measures will be implemented 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 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 Scheme, 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>	Construction

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 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. Prior to excavation works being commenced, localised confirmatory surveys will be undertaken by the appointed contractor to verify the results of the pre-construction assessments undertaken and reported in this EIAR. Where works are required in and around known 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 (as listed in Section 19.4.3 in Chapter 19 (Material Assets) in this EIAR), 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 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
MA6	19.5.1.2	Throughout (as required)	Construction materials will be managed on-site by the appointed contractor in such a way as to prevent over ordering and waste. Materials will be stored in appropriate storage areas or receptacles to reduce the potential for damage requiring replacement. 'Just-In-Time' ordering principles will be implemented by the appointed contractor where practicable to reduce the potential for over-ordering	Construction

22.18 Risk of Major Accidents and/or Disasters

Table 22.16: Major Accidents 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 & Environmental Interactions

Table 22.17: Cumulative Impacts & Environmental Interactions 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

Department of Transport, Tourism and Sport (2019). Traffic Signs Manual

European Commission (2018). The 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

Masters-Williams H, Heap H, Kitts H, Greenshaw L, Davis S, Fisher P, Hendrie M and Owens D (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532D), CIRIA, London

National Roads Authority (2005b). Guidelines for the Treatment of Badgers During the Construction of National Road Schemes

National Roads Authority (2008c). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes

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

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

Directives and Legislation

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

National Monuments (Amendment) Act 2004 (No. 22 of 2004)

Regulation (EC) no 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste

Waste Management Act 1996 (S.I No. 10 of 1996) as amended

Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007)

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