Chapter 19
Material Assets

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19. Material Assets

19.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) has considered the potential impacts on material assets associated with the Construction and Operational Phases of the Swords to City Centre Core Bus Corridor Scheme (hereafter referred to as the Proposed Scheme).

The design of the Proposed Scheme has been developed to a stage where all potential environmental impacts can be identified, and a fully informed environmental impact assessment can be carried out. It is likely that the Proposed Scheme will be constructed by a contractor appointed under a Design and Build form of Contract. The contractor engaged will be responsible for finalising the design of the Proposed Scheme in compliance with the Employer's Requirements, including compliance with the requirements of the EIAR and Natura Impact Statement (NIS) (including all mitigation measures) and any development consent conditions. Minor modifications may be made to the current design at the detailed design stage to avail of opportunities to improve the design in the light of experience on the ground or other innovations. Any such minor modifications, however, will not give rise to any impacts which are more significant than those already identified and assessed in this EIAR.

During the Construction Phase, the potential impacts on material assets arising from the Proposed Scheme have been assessed, including potential impacts on utilities and potential impacts arising from the importation of construction materials, which result from construction activities such as utility diversions, road resurfacing and road realignments.

During the Operational Phase, the potential impacts on material assets associated with changes in utility demand from new infrastructure associated with the Proposed Scheme have been assessed. The assessment has been carried out according to best practice and guidelines relating to material asset assessment as outlined in Section 19.2.

The aim of the Proposed Scheme when in operation, is to provide enhanced walking, cycling and bus infrastructure on this key access corridor in the Dublin region, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor. The objectives of the Proposed Scheme are described in Chapter 1 (Introduction). The Proposed Scheme, which is described in Chapter 4 (Proposed Scheme Description), has been designed to meet these objectives.

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

19.2 Methodology

Material assets are resources of both natural and human origin that have intrinsic value. The Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA EIAR Guidelines) (EPA 2022) discuss material assets as follows:

> '*In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils.*'

The EPA EIAR Guidelines specifically list built services, roads and traffic, and waste management as topics which fall into the category of material assets. Further to this, the Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission 2017) references buildings, other structures, mineral resources, and water resources as material assets. This EIAR includes separate chapters covering a number of those listed material assets and other material assets as follows:

- Roads and traffic – Chapter 6 (Traffic & Transport);
- Employment and land use assets – Chapter 10 (Population);
- Ecological assets – Chapter 12 (Biodiversity);
- Waterways, rivers and streams – Chapter 13 (Water);
- Soils, lands, and mining or quarrying potential – Chapter 14 (Land, Soils, Geology & Hydrogeology);
- Cultural heritage assets – Chapter 15 (Archaeological & Cultural Heritage) and Chapter 16 (Architectural Heritage);
- Visual amenity assets – Chapter 17 (Landscape (Townscape) & Visual); and
- Waste management – Chapter 18 (Waste & Resources).

The focus of this Chapter is on built services, specifically:

- Major infrastructure and utilities; and
- Imported material, excluding the materials which are covered in Chapter 18 (Waste & Resources).

Major infrastructure includes items such as canals, railway lines and Luas lines interacting with the Proposed Scheme. Existing utility information has been collated from the utility service providers and utility (ground penetrating radar (GPR)) surveys have been carried out, as required. In addition, as part of the design development, the diversions and changes required to existing utilities infrastructure have been considered.

Conservative estimates have been prepared of the quantities of materials that may be needed for construction to inform the impact assessment of the Proposed Scheme. For the purpose of this Chapter, imported materials includes materials which are sourced from outside the Proposed Scheme, namely the major construction materials (concrete granular fill / aggregate, asphalt, and structural steel). The impacts associated with the transportation of the material to the site have been considered within the assessments of construction traffic in Chapter 6 (Traffic & Transport), Chapter 7 (Air Quality) and Chapter 9 (Noise & Vibration).

19.2.1 Study Area

The study area with regard to major infrastructure and utilities comprises all areas within the Proposed Scheme, including both permanent and temporary land take boundaries.

19.2.2 Relevant Guidelines, Policy and Legislation

This Chapter has been prepared in accordance with the following guidance:

- Guidelines on the Information to be Contained in Environmental Impacts Assessment Reports (EPA 2022);

- Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission 2017); and
- Institute of Environmental Management and Assessment (IEMA) Guide to: Materials and Waste in Environmental Impact Assessment – Guidance for a Proportionate Approach (IEMA 2020).

19.2.3 Data Collection and Collation

All major infrastructure and utilities which may be impacted by the Proposed Scheme have been assessed including:

- The Aviation Fuel Pipeline;
- Railway lines;
- The Royal Canal;
- Luas Green Line;
- Electricity;
- Water;
- Drainage;
- Gas; and
- Telecommunications.

Existing utility information was requested from utility companies and service providers. The following service providers provided utility information for the study area of the Proposed Scheme:

- Dublin City Council (DCC);
- Fingal County Council (FCC);
- Electricity Supply Board (ESB) Networks / EirGrid;
- Gas Networks Ireland (GNI);
- Irish Water; and
- Telecommunications providers.

The types and quantities of the major materials which will need to be imported for the construction of the Proposed Scheme have also been established.

19.2.4 Appraisal Method for the Assessment of Impacts

The assessment of the potential impact of the Proposed Scheme on material assets has been undertaken having regard to the EPA EIAR Guidelines (EPA 2022). The following issues have been considered as part of the assessment of impacts:

- Potential for impacts on major infrastructure and public utilities and the need to adequately protect them during the Construction Phase;
- Requirement for connections to public utilities by the Proposed Scheme during both the Construction and Operational Phases; and
- Use of imported materials required for the construction of the Proposed Scheme.

Each impact has been categorised based on:

- Quality of the impact;
- Significance of the impact; and
- Duration of the impact.

The definition of these impact characteristics as per the EPA EIAR Guidelines is provided in Table 1.4 in Chapter 1 (Introduction). These characteristics have been used to assess the quality and duration of all impacts.

Table 19.1 provides the significance criteria used to identify the significance of impacts on major infrastructure and utilities. For the purposes of assessing the impacts on major infrastructure and utilities, an impact is deemed to be not significant from a rating of Imperceptible to Moderate, and significant from Significant to Profound.

Table 19.1: Significance Criteria for Major Infrastructure and Utilities

Significance Level	Criteria
Profound	Where there is a continuous utility interruption of more than a week; Where additional demand on a utility would consume all remaining capacity; or Where there is a permanent disruption* of a major piece of infrastructure.
Very Significant	Where there is a continuous utility interruption of more than 48 hours; Where additional demand on a utility would significantly reduce the available capacity of that utility; or Where there is long-term disruption* of a major piece of infrastructure.
Significant	Where there is a continuous utility interruption of more than 24 hours; Where there is significant additional demand on a utility; or Where there is a medium-term disruption* of a major piece of infrastructure.
Moderate	Where there are discrete utility interruptions of no more than eight hours for up to seven consecutive days; Where the additional demand on a utility is relatively large; or Where there is a short-term disruption* of a major piece of infrastructure.
Slight	Where there are discrete utility interruptions of no more than eight hours for up to three days; Where additional demand on a utility is relatively small; or Where there is a temporary disruption* of a major piece of infrastructure.
Not Significant	Where there is a utility interruption of no more than eight hours on a single day; Where additional demand on a utility is quantifiable but is too small to have any impact on capacity; or Where there is a brief disruption* of a major piece of infrastructure.
Imperceptible	Where there is no utility interruption during diversion works; Where additional demand on a utility has no material change; or Where there are minor changes on a major piece of infrastructure which has no material impact on its usability.
*Disruption with respect to major infrastructure refers to the closure or significant reduction in usability of the infrastructure.	

For the significance of the impacts associated with imported materials, in addition to the EPA EIAR Guidelines (EPA 2022), the IEMA Guide to: Materials and Waste in Environmental Impact Assessment (IEMA 2020) (hereafter referred to as the IEMA Guidance) has been used. For materials, the sensitivity of the receptor (Table 19.2) and the magnitude of the impact (Table 19.3) are assigned and used to determine the significance of the impact (Table 19.4).

Table 19.2: Sensitivity Criteria for Materials (IEMA 2020)

Value	Description
	On balance, the key materials required for construction of a development …
Very High	Are known to be insufficient in terms of production, supply and / or stock; and/or Comprise no sustainable features and benefits compared to industry-standard materials*.
High	Are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock; and/or Comprise little or no sustainable features and benefits compared to industry-standard materials*.
Medium	Are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock; and / or Are available comprising some sustainable features and benefits compared to industry-standard materials*.
Low	Are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock; and / or Are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials*.
Negligible	Are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock; and / or Are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials*
*Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content (including excavated and other arisings); support the drive to a circular economy; or in some other way reduce lifetime environmental impacts.	

Table 19.3: Assessing Magnitude for Materials (IEMA 2020)

Value	Description
	The assessment is made by determining whether through a development, the consumption of …
Major	…one or more materials is >10% by volume of the regional* baseline availability;
Moderate	…one or more materials is between 6–10% by volume of the regional* baseline availability;
Minor	…one or more materials is between 1–5% by volume of the regional* baseline availability
Negligible	…no individual material type is equal to or greater than 1% by volume of the regional* baseline availability.
No Change	…no materials are required.
* or where justified, national.	

Table 19.4: Determining Significance for Materials (IEMA 2020)

Sensitivity (or Value) of Receptor	Magnitude of Impact					
		No Change	**Negligible**	**Minor**	**Moderate**	**Major**
	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Sight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Sight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

In accordance with the IEMA Guidance an impact is deemed to be significant if it has a significance level of Moderate, Large or Very Large, while Neutral or Slight are deemed to be not significant.

19.3 Baseline Environment

The Proposed Scheme will commence at Pinnock Hill Roundabout and will run along the R132 (Swords Road, Drumcondra Road Upper, Drumcondra Road Lower, Dorset Street Lower and Dorset Street Upper), Frederick Street North, Parnell Square East, Cavendish Row, Granby Row and Parnell Square West.

There are a number of utilities in place along and crossing the Proposed Scheme, the majority of which are buried within and along the roadways and footpaths. These utilities include:

- ESB electricity lines (high, medium and low voltage) and associated infrastructure;
- Gas Networks Ireland gas mains (high, medium and low pressure) and associated infrastructure;
- Irish Water potable water mains and associated infrastructure;
- Irish Water sewer lines (foul and combined sewers) and associated infrastructure;
- Local Authority surface water drainage network and associated infrastructure;
- Eir, Enet and Virgin Media telecommunications lines and associated infrastructure;
- Local Authority traffic signal ducting; and
- The Aviation Fuel Pipeline between Dublin Port and Dublin Airport (not yet fully constructed at the time of preparation of this EIAR).

The following outlines the baseline environment with respect to material assets.

19.3.1 Major Infrastructure and Existing Utilities

The Proposed Scheme interacts with several pieces of major infrastructure, namely two railway lines, the Royal Canal and the Luas Green Line.

The Proposed Scheme will cross two railway lines in Drumcondra. The Proposed Scheme passes under one railway line at Drumcondra Station which serves both intercity trains (Dublin – Sligo) and commuter trains on the Western Commuter line and the South Western Commuter line. This is a busy line throughout the day. The Proposed Scheme also crosses over another railway line at Binns Bridge beside the Royal Canal, just south of the other line. This serves the Docklands spur of the Western Commuter line and is only operational at peak times Monday to Friday.

The Proposed Scheme will cross the Royal Canal at Binns Bridge which links Drumcondra Road Lower and Dorset Street Lower. The Royal Canal is mainly used for leisure activities, namely boating and angling within the waterway, and walking and cycling along the pathways running alongside it. The 2nd Lock is located adjacent to Binns Bridge.

The Proposed Scheme will end on Parnell Square, adjacent to the Luas Green Line. The frequency of the Luas in this area can be as little as every 5 minutes during peak times each direction. It is therefore a very busy section of infrastructure.

Table 19.5 lists the types of major utilities within the study area of the Proposed Scheme, that will be along or will cross the Proposed Scheme. Most utilities are buried beneath the roads or footpaths, with a mixture of main trunk routes as well as branches off these main routes existing along the entire length of the Proposed Scheme.

Table 19.5: Utilities Within the Proposed Scheme Study Area

Utility Provider	Service Type	Description
ESB	High Voltage Electricity	Underground 220kV (kilovolt) lines
		Underground 110kV lines
		Underground 38kV lines
	Medium Voltage Electricity	Underground lines
	Low Voltage Electricity	Underground lines
		Overhead single phase lines
		Overhead three phase lines
Gas Networks Ireland	High Pressure Gas	200mm steel main at 19bar
		300mm steel main at 19bar
		400mm steel main at 40bar
		500mm steel main at 40bar
	Medium Pressure Gas	32mm polyethylene main at 4bar
		63mm polyethylene main at 4bar
		90mm polyethylene main at 4bar
		125mm polyethylene main at 4bar
		180mm polyethylene main at 4bar
		250mm polyethylene main at 4bar
		315mm polyethylene main at 4bar
		100mm steel main at 4bar
		250mm steel main at 4bar
		300mm steel main at 4bar
	Low Pressure Gas	Numerous sizes of polyethylene and steel mains at 25mbar along entire route
Irish Water	Potable Water	Trunk and distribution mains of various diameters and materials, with supporting infrastructure such as valves and hydrants
	Sewer Lines	Foul sewer lines and associated infrastructure
		Combined sewer lines and associated infrastructure
Local Authorities	Surface Water Sewer Network	Surface water sewer networks and associated infrastructure
	Traffic Signals	Ducting for traffic signals and associated infrastructure
Telecommunications	Virgin Media	Underground cables and associated infrastructure
	Eir	Underground cables and associated infrastructure
	Enet	Enet cables along the majority of the route
Independent Pipeline Company Ltd.	Aviation Fuel	The Aviation Fuel Pipeline is currently under construction and once completed, will connect Dublin Airport and Dublin Port, allowing aviation fuel to be piped from the port to the airport. The Proposed Scheme will cross the Aviation Fuel Pipeline at the junction between the R132 Swords Road and Corballis Road, just outside Dublin Airport.

19.3.2 Imported Material

The quantities of material which are currently imported to the area covered by the Proposed Scheme under baseline conditions are low. Currently material is only imported as part of maintenance activities which are undertaken on the existing roadways, cycle lanes, footpaths, utilities and verges. These activities would largely involve repair of road, cycle lane and footpath surfaces, repainting of road markings, drainage maintenance and repair, utility works, landscaping and winter maintenance.

A report entitled Essential Aggregates: Providing for Ireland's Needs to 2040 (Irish Concrete Federation 2019) was published in 2019 which details and quantifies Ireland's natural aggregate reserves. At the time of publication of that report, Ireland had approximately 500 active large commercial quarries, approximately 220 ready mixed concrete plants, 20 large scale precast concrete plants and 40 plants producing bitumen bound road surfacing materials.

The Irish Concrete Federation quantifies the annual production of these materials in Ireland on their website (Irish Concrete Foundation 2020), with the 2019 figures (the most recent available) being as follows:

- Five million cubic metres of ready-mixed concrete;
- 135 million concrete blocks;
- 38 million tonnes of aggregates;
- Two million tonnes of bituminous road surfacing materials; and
- Two million square metres of paving products.

19.4 Potential Impacts

This Section presents potential impacts that may occur due to the Proposed Scheme, in the absence of mitigation. This informs the need for mitigation or monitoring to be proposed (refer to Section 19.5). Predicted residual impacts taking into account any proposed mitigation are then presented in Section 19.6.

19.4.1 Characteristics of the Proposed Scheme

19.4.1.1 Major Infrastructure and Utilities

Construction of the Proposed Scheme has the potential to have an impact on existing infrastructure and utilities in order to accommodate changes to junction layouts or changes to carriageway widths. Where protection of utilities in place is not an option, this will involve realignment, upgrade or replacement of this infrastructure as part of the works within those areas. Each proposed modification to the existing infrastructure or utilities is outlined in this Chapter. Where utility diversions are proposed, the approximate length of the diversions is provided in Table 19.6 to Table 19.9. The potential impacts would occur predominantly during the Construction Phase.

During the Operational Phase, some utilities will be required for the Proposed Scheme. This will include electricity connections for such elements as new street lighting, junction signalling and real-time passenger information (RTPI) displays at bus stops. There will also be some amendments to existing surface water drainage to control and/or attenuate surface water runoff from any additional paved surfaces.

19.4.1.2 Imported Material

Material will be required to construct the Proposed Scheme. These materials will mainly be comprised of standard construction materials, paving materials, landscaping materials, street furniture, paints, lighting, junction infrastructure materials and fill materials, as required. This Chapter covers the major materials needing to be imported to the site for the purposes of construction of the Proposed Scheme (i.e. concrete, granular fill / aggregate, asphalt and structural steel). Any materials arising from within the Proposed Scheme boundary which are to be reused within the Proposed Scheme (e.g. excavated soils), are assessed in Chapter 18 (Waste & Resources).

19.4.2 ‘Do Nothing’ Scenario

In the ‘Do Nothing’ scenario, the Proposed Scheme would not be implemented and there would be no changes to existing infrastructure or utilities as a result of the Proposed Scheme. Therefore, there would be a Neutral impact on infrastructure and utilities under the ‘Do Nothing’ scenario.

Similarly, with respect to imported material, the ‘Do Nothing’ scenario means that there is no requirement to import material for the construction of the Proposed Scheme. Therefore, this material is not consumed by the Proposed Scheme, and the impact under the ‘Do Nothing’ scenario is Neutral.

19.4.3 Construction Phase

19.4.3.1 Major Infrastructure and Utilities

The following outlines the key potential impacts on major infrastructure and utilities as a result of the Construction Phase of the Proposed Scheme. Major infrastructure includes railway lines, the Royal Canal and the Luas Green Line. Major utilities include the Aviation Fuel Pipeline, major electricity overhead lines and underground cables, water distribution and foul and surface water infrastructure, gas mains and telecommunications infrastructure. Please refer to Chapter 20 (Risk of Major Accidents and / or Disasters) for an assessment of the impacts associated with major accidents involving utilities. Additionally, there will be some demand on existing utilities by the construction activities (i.e. by Construction Compounds or equipment), which is also addressed as relevant in the following Sections. Chapter 5 (Construction) should also be referenced for additional detail on the Construction Phase of the Proposed Scheme.

The main Construction Phase impacts will arise from the requirement to divert utilities. The proposed utility diversions are listed in Table 19.6 to Table 19.9. To the best of the engineering experience and judgement available and based on the available records and preliminary reasonable site investigations, it is expected that the utility diversion will be to the stated length. It is likely however that modifications to these proposed measures may be required at the detailed design / construction stage, and any such modifications (if required) will not give rise to any impacts which are any more significant than those already identified and assessed in this Chapter, and will not alter the summary of potential Construction Phase impacts presented in Table 19.13.

19.4.3.1.1 Major Infrastructure

As outlined in Section 19.3.1, the Proposed Scheme will cross a number of pieces of major infrastructure, namely two railway lines and the Royal Canal, and the Proposed Scheme will end adjacent to the Luas Green Line.

The railway lines will not be impacted by the Proposed Scheme. There will be no works required to the railway bridge over the Proposed Scheme at Drumcondra Station or to Binns Bridge over the railway line and the Royal Canal. There will also be no interaction between the Proposed Scheme and the Luas Green Line.

As a result of the lack of direct interaction between the Proposed Scheme and the major infrastructure located along the Proposed Scheme, there is predicted to be no significant impact to any of these major infrastructure assets during the Construction Phase.

19.4.3.1.2 Aviation Fuel Pipeline

The Proposed Scheme will cross the Aviation Fuel Pipeline at the junction between the R132 Swords Road and Corballis Road, just outside Dublin Airport. Construction of the Proposed Scheme will not require any diversion of the Aviation Fuel Pipeline as it will be installed at a depth greater than the excavation depths required for the construction of the Proposed Scheme and will therefore have no likely significant impact on the pipeline.

19.4.3.1.3 Electricity

The Construction Compounds will require electricity to power any temporary office and welfare facilities during the Construction Phase. Power for the Construction Compounds will be supplied through a connection into the electricity network, or where this is unavailable, via generators. Temporary electricity provision for works areas along the Proposed Scheme to power items such as temporary lighting, temporary traffic signals and other construction equipment will be provided through generators, as required.

The electricity demand during the Construction Phase is considered to be a Negative, Not Significant, Short-Term impact.

A number of interfaces between the existing electricity infrastructure and the Proposed Scheme have been identified, some of which will require diversion of the infrastructure as outlined in Table 19.6 and shown in the ESB Assets Alterations Drawings (BCIDB-JAC-UTL_UE-0002_XX_00-DR-CU-9001) in Volume 3 of this EIAR.

As a result of these diversions, there may be temporary local interruptions to the electricity provision during works on that infrastructure.

Table 19.6: Potential Major Electricity Infrastructure Diversions

Approximate Chainage	Description	Proposed Measure (Approximate)	Figure Sheet Reference
Pinnock Hill to Airside Junction			
A0150 – A0200	Medium voltage underground duct	50m diversion	Sheet 1 of 37
A0190 – A0320	Medium voltage underground duct	130m diversion	Sheet 1 of 37
A0700 – A0850	Low voltage overhead line	150m diversion	Sheet 3 of 37
A0800 – A0850	Low voltage underground duct	100m diversion	Sheet 3 of 37
A0800	Medium voltage underground duct	75m diversion	Sheet 3 of 37
Airside Junction to Northwood Avenue			
A2710	Medium voltage underground duct	90m diversion	Sheet 8 of 37
A4280 – A4310	Medium voltage underground duct	30m diversion	Sheet 12 of 37
A4290 – A4650	Low voltage overhead line	360m diversion	Sheet 12 of 37
A4875	Low voltage underground line	Minipillar relocation	Sheet 14 of 37
A4975	Low voltage underground line	Minipillar relocation	Sheet 14 of 37
A5180 – A5240	Low voltage overhead line	80m diversion	Sheet 15 of 37
Northwood Avenue to Shantalla Road			
A5880	Low voltage overhead line	Pole relocation	Sheet 17 of 37
A5920 – A6020	Medium voltage underground duct	110m diversion	Sheet 17 of 37
A6500 – A7010	Low voltage overhead line	290m diversion, to be underground	Sheet 19 of 37
A6500 – A7010	Low voltage overhead line	250m diversion	Sheet 19 of 37
A6680 – A6740	Medium voltage underground duct	85m diversion	Sheet 19 of 37
A6725 – A6750	Low voltage underground duct	50m diversion	Sheet 19 of 37
A6750 – A6800	Low voltage underground duct	50m diversion	Sheet 19 of 37
A7140 – A7300	Medium voltage underground duct	160m diversion	Sheet 21 of 37
A7180 – A7280	Low voltage overhead line	115m diversion	Sheet 21 of 37
A7300 – A7450	Low voltage overhead line	190m diversion	Sheet 21 of 37
Shantalla Road to Botanic Avenue			
A8150 – A8220	Low voltage underground duct	80m diversion	Sheet 25 of 37
A8350 – A8690	Low voltage overhead line	340m diversion	Sheet 25 of 37
A8340 – A8550	Medium voltage underground duct	215m diversion	Sheet 25 of 37
A8820 – A8950	Medium voltage underground duct	140m diversion	Sheet 28 of 37
A9930 – A10060	Low voltage underground duct	130m diversion	Sheet 31 of 37
A9930 – A10060	High voltage underground duct	130m diversion	Sheet 31 of 37
Botanic Avenue to Granby Row			
N/A	N/A	N/A	N/A

While electricity interruptions, if required, will generally only occur for a set number of hours per day (no more than eight hours where reasonably practicable), the total number of interruption days for particular customers for each diversion cannot be ascertained at this stage, so a worst-case scenario of up to a week has been assessed. Using the criteria as outlined in Section 19.2.4 and Table 19.1, where diversion of an electricity line is required which will result in the planned interruption of electricity provision, the worst-case potential impact will be Negative, Moderate and Temporary.

19.4.3.1.4 Water

The Construction Compounds and construction areas will require a water supply for welfare facilities within the Construction Compounds, as well as for dust suppression at certain construction areas where the conditions require it. The Construction Compounds will be connected into the local mains water supply, where possible. Where a connection is not possible, water tankers will be used.

The potable water demand during the Construction Phase is considered to be a Negative, Not Significant and Short-Term impact.

A number of interfaces between the existing water infrastructure and the Proposed Scheme have been identified, some of which will require diversion of the infrastructure as outlined in Table 19.7 and shown in IW Water Asset Alterations Drawings (BCIDB-JAC-UTL_UW-0002_XX_00-DR-CU-9001) in Volume 3 of this EIAR. As a result of these diversions, there may be temporary local interruptions to water provision during works on that infrastructure.

Table 19.7: Potential Major Water Infrastructure Diversions

Approximate Chainage	Description	Proposed Measure (Approximate)	Figure Sheet Reference
Pinnock Hill to Airside Junction			
A0150	150mm PVC main	65m diversion	Sheet 1 of 37
A0150 – A0260	100mm PVC main	125m diversion	Sheet 1 of 37
Airside Junction to Northwood Avenue			
A1970 – A2030	225mm PVC main	175m diversion	Sheet 6 of 37
Northwood Avenue to Shantalla Road			
A6650 – A6990	100mm ductile iron main	340m diversion	Sheet 19 of 37
A7130 – A7240	100mm cast iron main	110m diversion	Sheet 20 of 37
A7130 – A7550	100mm cast iron main	425m diversion	Sheet 20 of 37
A7320 – A7380	3 inch cast iron main	65m diversion	Sheet 21 of 37
Shantalla Road to Botanic Avenue			
A8250	300mm ductile iron main	260m diversion	Sheet 25 of 37
A9925 – A10030	600mm ductile iron trunk main	210m diversion	Sheet 31 of 37
A9925 – A10030	225mm cast iron main	110m diversion	Sheet 31 of 37
Botanic Avenue to Granby Row			
N/A	N/A	N/A	N/A

While water interruptions, if required, will generally only occur for a set number of hours per day (no more than eight hours where reasonably practicable), the total number of interruption days for particular customers for each diversion cannot be ascertained at this stage, so a worst-case scenario of up to a week has been assessed. Using the criteria as outlined in Section 19.2.4 and Table 19.1, where diversion of a watermain is required which will result in the planned interruption of water provision, the worst-case potential impact will be Negative, Moderate and Temporary.

19.4.3.1.5 Wastewater and Surface Water Runoff

There will be wastewater and surface water runoff created by the Construction Compounds and construction areas. Wastewater will be created by welfare facilities within the Construction Compounds, and surface water runoff will emanate from any areas of the Construction Compounds and construction areas which are paved. The Construction Compounds will be connected into the local foul / combined sewers where possible, or where not possible, will have on-site tanks for the collection of foul water which will be emptied by means of a suction tanker and the wastewater shall be disposed of to a licensed wastewater treatment plant. Where required, temporary welfare facilities (for example portable toilets) will be used, which will be collected as required for offsite disposal of the wastewater to a suitably licensed facility.

The potential impact as a result of the demand on the foul water network during the Construction Phase will be a Negative, Not Significant and Short-Term impact.

There have been no major interfaces identified between the Proposed Scheme and the existing foul sewer network which will require any diversion works. Therefore, there will be no potential significant impact to the foul sewer network as a result of the construction of the Proposed Scheme.

There will be limited upgrade works required to the surface water drainage network to facilitate the changes to the road alignment and the impermeable surface area. Much of this work will involve the construction of new road gullies to align with the new kerb line. There will also be several Sustainable Drainage System (SuDS) measures

installed, namely swales, attenuation ponds and tanks, oversized pipes, filter drains, and tree pits, to control the flow of surface water. All surface water will continue to drain into existing networks and outfalls. Refer to Chapter 13 (Water) for further information on surface water drainage during the Construction Phase of the Proposed Scheme.

19.4.3.1.6 Gas

There will be no requirement for a connection to existing gas infrastructure during the Construction Phase of the Proposed Scheme. Therefore, it is predicted that there will be no significant impact associated with gas demand during the Construction Phase.

A number of interfaces between the existing gas infrastructure and the Proposed Scheme have been identified, some of which will require diversion of the infrastructure as outlined in Table 19.8 and shown in GNI Asset Alterations Drawings (BCIDB-JAC-UTL_UG-0002_XX_00-DR-CU-9001) in Volume 3 of this EIAR. As a result of these diversions there may be temporary local interruptions to gas provision during works on that infrastructure.

Table 19.8: Potential Major Gas Infrastructure Diversions

Approximate Chainage	Description	Proposed Measure (Approximate)	Figure Sheet Reference
Pinnock Hill to Airside Junction			
A0150 – A0390	Medium pressure line	140m diversion	Sheet 1 of 37
Airside Junction to Northwood Avenue			
A4180 – A4310	Medium pressure line	140m diversion	Sheet 12 of 37
Northwood Avenue to Shantalla Road			
A7150 – A7500	Low pressure line	350m diversion	Sheet 21 of 37
Shantalla Road to Botanic Avenue			
A8500 – A8800	Low pressure line	320m diversion	Sheet 27 of 37
A9100	Low pressure line	45m diversion	Sheet 28 of 37
A9925 – A10030	Low pressure line	105m diversion	Sheet 31 of 37
A9925 – A10030	Low pressure line	90m diversion	Sheet 31 of 37
Botanic Avenue to Granby Row			
N/A	N/A	N/A	N/A

While gas interruptions, if required, will generally only occur for a set number of hours per day (no more than eight hours where reasonably practicable), the total number of interruption days for particular customers for each diversion cannot be ascertained at this stage, so a worst-case scenario of up to a week has been assessed. Using the criteria as outlined in Section 19.2.4 and Table 19.1, where diversion of a gas main is required which will result in the planned interruption of gas provision, the worst-case potential impact will be Negative, Moderate and Temporary.

19.4.3.1.7 Telecommunications

Telecommunications access will be required at the Construction Compounds. The potential impact as a result of the demand on the telecommunications network during the Construction Phase will be a Negative, Not Significant, and Short-Term impact.

A number of interfaces between the existing telecommunications infrastructure and the Proposed Scheme have been identified, some of which will require diversion of the infrastructure as outlined in Table 19.9 and shown in Telecommunications Asset Alterations (BCIDB-JAC-UTL_UX-0002_XX_00-DR-CU-9001) in Volume 3 of this EIAR. As a result of these diversions there may be temporary local interruptions to the telecommunications provision during works on that infrastructure.

Table 19.9: Potential Telecommunications Infrastructure Diversions

Approximate Chainage	Description	Proposed Measure (Approximate)	Figure Sheet Reference
Pinnock Hill to Airside Junction			

Approximate Chainage	Description	Proposed Measure (Approximate)	Figure Sheet Reference
A0150 – A0230	Eir ducting	80m diversion	Sheet 1 of 37
A0730 – A0880	Eir ducting	145m diversion	Sheet 3 of 37
A0810	Eir ducting	26m diversion	Sheet 3 of 37
Airside Junction to Northwood Avenue			
A1650 – A1920	BT ducting	280m diversion	Sheet 5 of 37
A1650 – A2030	Eir ducting	392m diversion	Sheet 5 of 37
A1770 – A1990	Eir ducting	220m diversion	Sheet 6 of 37
A1810 – A2010	Virgin Media ducting	216m diversion	Sheet 6 of 37
A2030 – A2180	Virgin Media ducting	105m diversion	Sheet 6 of 37
A2070 – A2140	Eir ducting	75m diversion	Sheet 6 of 37
A2700 – A2820	Eir duction	139m diversion	Sheet 8 of 37
A2710 – A2830	Virgin Media ducting	128m diversion	Sheet 8 of 37
A4140 – A4400	Eir ducting	312m diversion	Sheet 12 of 37
A5300 – A5400	Eir ducting	100m diversion	Sheet 15 of 37
Northwood Avenue to Shantalla Road			
A5780 – A5920	Eir ducting	142m diversion	Sheet 17 of 37
A5780 – A6050	Eir ducting	280m diversion	Sheet 17 of 37
A6070 – A6320	Eir ducting	255m diversion	Sheet 17 of 37
A6660 – A6760	Eir ducting	110m diversion	Sheet 19 of 37
A7150 – A7610	Eir ducting	470m diversion	Sheet 21 of 37
A7300 – A7500	Eir ducting	210m diversion	Sheet 21 of 37
Shantalla Road to Botanic Avenue			
B0000 – B0280	Virgin Media ducting	242m diversion	Sheet 26 of 37
A9925 – A10050	ENET ducting	140m diversion	Sheet 31 of 37
Botanic Avenue to Granby Row			
N/A	N/A	N/A	N/A

While telecommunications interruptions, if required, will generally only occur for a set number of hours per day (no more than eight hours where reasonably practicable), the total number of interruption days for particular customers for each diversion cannot be ascertained at this stage, so a worst-case scenario of up to a week has been assessed. Using the criteria as outlined in Section 19.2.4 and Table 19.1, where diversion of a telecommunications line is required which will result in the planned interruption of telecommunications provision, the worst-case potential impact will be Negative, Moderate and Temporary.

19.4.3.2 Imported Material

The Construction Phase will require the importation of a number of key construction materials for the Proposed Scheme works. This material will include items such as concrete, granular fill / aggregate, asphalt, and structural steel. For a full description of the Construction Phase, please refer to Chapter 5 (Construction). An assessment of the climate impact from the carbon associated with these materials is included in Chapter 8 (Climate). Table 19.10 provides a conservative estimate of the quantities of the major materials required to complete the Construction Phase of the Proposed Scheme.

Table 19.10: Conservative Quantity Estimates of Major Construction Materials Required by the Proposed Scheme

Material	Estimated Quantity
Aggregate	57,200 tonnes
Asphalt Products	21,700 tonnes
Concrete	21,900 tonnes
Structural Steel	320 tonnes

The quantities of materials listed in Table 19.10 represents a very small proportion of the Irish quantities manufactured per year as outlined in Section 19.3.2. The estimated quantity of concrete required represents less than one percent of the total quantity produced in Ireland per annum. Similarly, assuming the aggregate composition of asphalt is 90–95% and concrete is 60–80%, the estimated total aggregate quantity required by the Proposed Scheme represents less than one percent of the total aggregate quantity produced in Ireland per annum.

Importation of material to the Proposed Scheme site will be carried out throughout the Construction Phase, with different materials being required at different times. The main direct impacts associated with the importation of construction materials arises from the gathering / manufacture of the materials, and that once the materials are used within the Proposed Scheme they are no longer available for other uses. There will also be impacts associated with the importation of materials through the requirement of heavy goods vehicles for delivery of the material and the use of materials. Impacts are covered in more detail in Chapter 6 (Traffic & Transport), Chapter 7 (Air Quality), Chapter 8 (Climate) and Chapter 9 (Noise & Vibration) where relevant.

As the materials required for the Construction Phase of the Proposed Scheme are generally readily available, the sensitivity of the imported material will be Low. As the quantities of the material required constitute less than one percent of the quantities produced per annum in Ireland, the magnitude of the impact will be Negligible. Therefore, the potential impact associated with the imported materials will be Negative, Slight and Long-Term.

19.4.3.3 Construction Phase Impact Summary

Table 19.11 provides a summary of the potential impacts on material assets associated with the Construction Phase of the Proposed Scheme.

Table 19.11:Summary of Potential Construction Phase Impacts

Assessment Topic	Potential Impact
Major Infrastructure and Utilities	
Major Infrastructure	No significant impact
Aviation Fuel Pipeline	No significant impact
Electricity Demand	Negative, Not Significant, Short-Term
Electricity Interruption	Negative, Moderate, Temporary
Water Demand	Negative, Not Significant, Short-Term
Water Interruption	Negative, Moderate, Temporary
Wastewater Demand	Negative, Not Significant, Short-Term
Wastewater Interruption	No significant impact
Gas Demand	No significant impact
Gas Interruption	Negative, Moderate, Temporary
Telecommunications Demand	Negative, Not Significant, Short-Term
Telecommunications Interruption	Negative, Moderate, Temporary
Imported Material	
Use of Imported Material	Negative, Slight, Long-Term

19.4.4 Operational Phase

19.4.4.1 Major Infrastructure and Utilities

The main impacts on major infrastructure and utilities will be associated with the Construction Phase. However, there will be some demand on utilities by the Proposed Scheme once operational. These impacts are outlined in the following Sections.

19.4.4.1.1 Major Infrastructure

Upon completion of the Construction Phase, there will be no interaction between the operation of the Proposed Scheme and the railway lines, Luas Green Line and the Royal Canal. There will therefore be no Operational Phase impacts on these infrastructure assets as a result of the Proposed Scheme.

19.4.4.1.2 Aviation Fuel Pipeline

Upon completion of the Construction Phase, there will be no interaction between the operation of the Proposed Scheme and the Aviation Fuel Pipeline. There will therefore be no significant Operational Phase impacts on this infrastructure asset as a result of the Proposed Scheme.

19.4.4.1.3 Electricity

Once the Proposed Scheme is operational, electricity will be required to power such elements as street lighting, junction signalling and RTPI displays. Power for these types of equipment will be supplied via power cables which connect the equipment to an electricity supply cabinet. The anticipated impact on electricity demand during the Operational Phase will be Negative, Imperceptible and Long-Term.

19.4.4.1.4 Water Usage

The Proposed Scheme will not result in any additional water provision being required after the Construction Phase is completed. Therefore, there is no significant Operational Phase impact anticipated on water infrastructure as a result of the Proposed Scheme.

19.4.4.1.5 Wastewater and Surface Water Runoff

Once the Proposed Scheme is constructed, the hardstanding surface area will be larger in some places than before construction due to the construction of wider carriageways, cycle infrastructure and footpaths. This larger surface area will result in additional surface water runoff. Drainage upgrades and SuDS measures have been included as part of the design of the Proposed Scheme to attenuate any additional runoff. There will therefore be no significant Operational Phase impacts anticipated on surface water drainage infrastructure. Impacts on water courses and water quality as a result of any potential increase in surface water runoff through existing outfalls is covered in Chapter 13 (Water).

The Proposed Scheme will not require any foul sewer connection to operate. Therefore, there will be no significant Operational Phase impact anticipated on foul sewer infrastructure as a result of the Proposed Scheme.

19.4.4.1.6 Gas

The Proposed Scheme will not require any gas connection to operate. Therefore, there will be no significant Operational Phase impact anticipated on gas infrastructure as a result of the Proposed Scheme.

19.4.4.1.7 Telecommunications

Once the Proposed Scheme is operational, telecommunications links will be required for such equipment as traffic signal controllers, and for RPTI displays at bus stops and on bus information apps. Generally, this equipment will be connected to the local fibre optic cable network via ducting connected to fibre cabinets. In the case of the real-time bus information, cellular communications (3G / 4G / 5G) will be provided. This type of infrastructure is already in operation along the Proposed Scheme route. Therefore, any additional telecommunications requirements by any new infrastructure will be minimal.

Therefore, the anticipated impact on telecommunications demand during the Operational Phase will be Negative, Imperceptible and Long-Term.

19.4.4.2 Imported Material

Materials will be required during the Operational Phase for maintenance of the infrastructure. This will include repair of roadway, cycleway and footway surfaces, as well as repair of street furniture (including bus shelters and poles), and landscaping. However, as the Proposed Scheme largely involves the upgrade and alteration of existing roadways, the majority of material required for maintenance of the Proposed Scheme would have already been required for the maintenance of the existing roadways in the absence of the Proposed Scheme. Therefore the change in quantities of materials which will be required for the maintenance of the Proposed Scheme will be very small.

As the materials required for the Operational Phase of the Proposed Scheme are generally readily available, the sensitivity of the material will be Low. As the quantities of the material required for maintenance will be lower than the quantities required for the Construction Phase and therefore constitute less than one percent of the quantities produced per annum in Ireland, the magnitude of the impact will be Negligible. Therefore, the predicted impact associated with the imported materials will be Neutral and Long-Term.

19.4.4.3 Operational Phase Impact Summary

Table 19.12 provides a summary of the potential impacts on material assets associated with the Operational Phase of the Proposed Scheme.

Table 19.12:Summary of Potential Operational Phase Impacts

Assessment Topic	Potential Impact
Major Infrastructure and Utilities	
Major Infrastructure	No significant impact
Aviation Fuel Pipeline	No significant impact
Electricity	Negative, Imperceptible, Long-Term
Water Usage	No significant impact
Wastewater	No significant impact
Surface Water Runoff	No significant impact
Gas	No significant impact
Telecommunications	Negative, Imperceptible, Long-Term
Imported Material	
Use of Imported Material	Neutral, Long-Term

19.5 Mitigation and Monitoring Measures

The following Section outlines the measures which will be adhered to in order to ensure that there are no significant impacts on material assets during the Construction and Operational Phases of the Proposed Scheme. No monitoring measures are considered to be required for material assets.

19.5.1 Construction Phase

19.5.1.1 Major Infrastructure and Utilities

The Proposed Scheme has been designed to minimise the impact on major infrastructure. This includes the avoidance of interactions with major utility infrastructure as far as possible. Where there are interfaces with existing utility infrastructure, the appointed contractor will ensure that protection is in place or diversion as necessary will be carried out to prevent long-term interruption to the provision of the affected services.

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. Proposed utility works are based on available records, and preliminary site investigations. 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.

Consultation has been undertaken with the major utility companies regarding the design, potential interfaces and measures required to protect or divert the infrastructure which is interfacing with the Proposed Scheme design. All utility companies for which diversions are proposed will continue to be consulted with National Transport Authority (NTA) oversight when designing any diversions to ensure that proposed diversions conform to the utility provider's requirements, where practicable, are acceptable to the NTA, and to ensure that service interruptions are kept to a minimum.

Where diversions, or modifications, are required to utility infrastructure (as listed in Section 19.4.3), 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.

19.5.1.2 Imported Materials

The Proposed Scheme has been designed to minimise the amount and extent of major construction works required, and therefore minimise the quantities of construction materials required. The majority of the Proposed Scheme will require minimal intervention, being comprised of lane reconfigurations, road marking layout changes, resurfacing works, and the construction of segregated cycle tracks.

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 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.

19.5.1.3 Summary of Construction Phase Impacts After Mitigation

Due to the fact that impacts are anticipated to be minimal and mitigation measures are largely inherent in the design of the Proposed Scheme, the predicted post mitigation impacts are unchanged as summarised in Table 19.13.

Table 19.13: Summary of Predicted Construction Phase Impacts Following the Implementation of Mitigation Measures

Assessment Topic	Potential Impact (Pre-Mitigation)	Predicted Impact (Post Mitigation)
Major Infrastructure and Utilities		
Major Infrastructure	No significant impact	No significant impact
Aviation Fuel Pipeline	No significant impact	No significant impact
Electricity Demand	Negative, Not Significant, Short-Term	Negative, Not Significant, Short-Term
Electricity Interruption	Negative, Moderate, Temporary	Negative, Moderate, Temporary
Water Demand	Negative, Not Significant, Short-Term	Negative, Not Significant, Short-Term

Assessment Topic	Potential Impact (Pre-Mitigation)	Predicted Impact (Post Mitigation)
Water Interruption	Negative, Moderate, Temporary	Negative, Moderate, Temporary
Wastewater Demand	Negative, Not Significant, Short-Term	Negative, Not Significant, Short-Term
Wastewater Disruption	No significant impact	No significant impact
Gas Demand	No significant impact	No significant impact
Gas Interruption	Negative, Moderate, Temporary	Negative, Moderate, Temporary
Telecommunications Demand	Negative, Not Significant, Short-Term	Negative, Not Significant, Short-Term
Telecommunications Interruption	Negative, Moderate, Temporary	Negative, Moderate, Temporary
Imported Material		
Use of Imported Material	Negative, Slight, Long-Term	Negative, Slight, Long-Term

19.5.2 Operational Phase

Due to the measures which are included within the design and the fact that impacts are anticipated to be minimal, there are no specific mitigation measures necessary during the Operational Phase. The predicted post mitigation impact is therefore unchanged, as summarised in Table 19.14.

Table 19.14: Summary of Predicted Operational Phase Impacts Following the Implementation of Mitigation Measures

Assessment Topic	Potential Impact (Pre-Mitigation)	Predicted Impact (Post Mitigation)
Major Infrastructure and Utilities		
Major Infrastructure	No significant impact	No significant impact
Aviation Fuel Pipeline	No significant impact	No significant impact
Electricity	Negative, Imperceptible, Long-Term	Negative, Imperceptible, Long-Term
Water	No significant impact	No significant impact
Wastewater	No significant impact	No significant impact
Surface Water Runoff	No significant impact	No significant impact
Gas	No significant impact	No significant impact
Telecommunications	Negative, Imperceptible, Long-Term	Negative, Imperceptible, Long-Term
Imported Material		
Use of Imported Material	Neutral, Long-Term	Neutral, Long-Term

19.6 Residual Impacts

No significant residual impacts have been identified either in the Construction or Operational Phases of the Proposed Scheme, whilst meeting the scheme objectives set out in Chapter 1 (Introduction).

19.6.1 Construction Phase

There will be no significant residual impacts on major infrastructure and utilities or as a result of imported material during the Construction Phase.

19.6.2 Operational Phase

There will be no significant residual impacts on major infrastructure and utilities or as a result of imported material during the Operational Phase.

19.7 References

Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

European Commission (EC) (2017). Environmental Impact Assessment of Projects - Guidance on the Preparation of the Environmental Impact Assessment Report

Institute of Environmental Management and Assessment (IEMA) (2020). IEMA Guide to: Materials and Waste in Environmental Impact Assessment - Guidance for a Proportionate Approach

Irish Concrete Federation (2019). Essential Aggregates Providing for Ireland's Needs to 2040

Irish Concrete Federation (2020). Industry at a Glance [Online]. Available from: www.irishconcrete.ie/industry-at-a-glance/

Directives and Legislation

Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment

Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment