



## Chapter 15

# Resources and Waste

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# 15. Resources and Waste

## 15.1 Introduction

This Chapter describes the potential significant effects of the Proposed Development in relation to resource and waste management. **Chapter 4, Description of the Proposed Development** provides a description of the Proposed Development whilst **Chapter 5, Construction Strategy** describes the construction strategy. The following aspects of the Proposed Development are particularly relevant to the resource and waste assessment:

- **Design:** Throughout the design for the Proposed Development, consideration has been given to the minimisation of resource usage and to the generation of waste through retention of material on site and material use and reuse;
- **Construction:** During the construction of the Proposed Development, material usage will be minimised and material will be reused, where possible. Waste will be generated from site clearance, excavation and construction works;
- **Operation:** During operation, waste will be generated from the operation of the Proposed Development. Maintenance activities will also generate minor quantities of waste; and
- **Decommissioning:** Waste will also be generated at the end of the Proposed Development’s lifespan during any decommissioning works.

The use of resources and the potential for waste and surplus materials to be generated during the Construction, Operation and Decommissioning of the Proposed Development are assessed herein. The potential environmental effects of the use of resources and the generation and management of solid waste arisings are examined in the context of the existing local and national resource and waste management environment. Mitigation measures are identified, where necessary, to reduce the impact of the use of resources and generation of waste by the Proposed Development during Construction, Operation and Decommissioning.

### 15.1.1 Sustainable resource and waste management principles

#### 15.1.1.1 Circular economy

The principal objective of sustainable resource and waste management is to use material resources more efficiently, where the value of products, material and resources is maintained in the economy for as long as possible such that the generation of waste is minimised. To achieve resource efficiency there is a need to move from a traditional linear economy to a circular economy (refer to **Image 15.1**).

The Department of Environment, Climate and Communication’s (DECC) A Waste Action Plan for a Circular Economy – Ireland’s National Waste Policy 2020 – 2025 (DECC, 2020) notes that:

*“In a circular economy the value of products and materials is maintained for as long as possible; waste and resource use are minimised, and resources are kept within the economy when a product has reached the end of its life, to be used again and again to create further value.”*

The European Union (EU) Circular Economy Action Plan (European Commission, 2020) notes that:

*“... the EU needs to accelerate the transition towards a regenerative growth model that gives back to the planet more than it takes, advance towards keeping its resource consumption within planetary boundaries, and therefore strive to reduce its consumption footprint and double its circular material use rate in the coming decade.”*



**Image 15.1: Simplified model of the circular economy for materials and energy (European Environment Agency (EEA, 2016)**

Where residual waste generation is unavoidable, it will be dealt with in a way that follows the waste hierarchy (as illustrated in **Image 15.1**) and set out in Directive 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste (hereafter referred to as the ‘Waste Framework Directive’).

The European Commission has adopted a new Circular Economy Action Plan (European Commission, 2020); one of the main blocks of the European Green Deal, Europe’s new agenda for sustainable growth.

The Circular Economy Action Plan identifies buildings and construction as a key area where there are opportunities for resource efficiency and circularity.

The Department of Environment, Climate and Communications (DECC) published the Whole of Government Circular Economy Strategy 2022 – 2023 in December 2021 (DECC, 2021). The Strategy aims to support and implement measures that significantly reduce Ireland’s circularity gap, so that Ireland’s rate is above the EU average by 2030.

In July 2022, the Government issued into law the Circular Economy and Miscellaneous Provisions Act, 2022 (DECC, 2022). This Act places the Strategy and the commitment to a circular economy on a clear statutory footing. It underpins Ireland’s shift from a ‘take-make-waste’ linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will to significantly reduce our greenhouse gas emissions. The Act is a key step in the successful transition of Ireland’s economy to a circular economy and is evidence of Government’s commitment to the achievement of that goal.

### 15.1.1.2 The Waste Hierarchy

The waste hierarchy supports the need to achieve efficient use of material resources, minimise the amount of waste produced (or otherwise increase its value as a resource) and reduce, as far as possible, the amount of waste that is disposed to landfill.



Image 15.2: Waste hierarchy (European Commission)

## 15.2 Methodology

### 15.2.1 Study area

The study area for waste and resources generation assessment from the Proposed Development comprises the areas and activities within the Proposed Development boundary (refer to **Chapter 4, Description of the Proposed Development**) and the wider Cork Region and the Southern Region (SR).

Waste from the Proposed Development may be accepted at sites nationally and internationally (which are suitably licensed or permitted for the waste volume and type) for treatment, recovery and / or disposal. However, as waste management planning in Ireland takes place on a regional basis, the study area generally for waste treatment, recovery and disposal comprises Cork and the SR, which takes in the following 10 Local Authority administrative areas:

- Limerick City and County Council;
- Tipperary County Council;
- Wexford County Council;
- Carlow County Council;
- Kilkenny County Council;
- Waterford City & County Council;
- Cork City Council;
- Cork County Council;
- Kerry County Council; and
- Clare County Council.

Where data is available at a local authority or regional level, this has been used. National data has been used where this is the only available level at which the data in question is published.

### 15.2.2 Relevant guidelines, policy and legislation

The following guidelines and policy documents were considered when undertaking the waste and resources assessment:

- Cork County Council (2022). Cork County Development Plan 2022 – 2028;
- DECC (2019). Consultation on the Transposition of the Circular Economy Waste Package;
- DECC (2020). A Waste Action Plan for a Circular Economy: Ireland’s National Waste Policy 2020 – 2025;
- DECC (2021). Whole of Government Circular Economy Strategy 2022 – 2023;
- DECC (2022). Climate Action Plan 2023;
- EPA (2018). Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-hazardous;
- EPA (2019) Guidance on Soil and Stone By-products in the context of Article 27 of the European Communities (Waste Directive) Regulations 2011;
- EPA (2020a). By-Product - Guidance Note. A guide to by-products and submitting a by-product notification under Article 27 of the European Communities (Waste Directive) Regulations, 2011;
- EPA (2020b). Guidance to Planners, Planning Authorities and An Bord Pleanála on the Management of Excess Soil and Stone from Developments;
- EPA (2021a). The Circular Economy Programme 2021 – 2027;
- EPA (2021b). Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects;
- EPA (2021c) National Hazardous Waste Management Plan 2021 – 2027;
- EPA (2022a). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (the ‘EPA guidelines’);
- EPA (2022b). Municipal Waste Statistics for Ireland;
- EPA (2023a). Construction and Demolition Waste Statistics for Ireland;
- EPA (2023b). Hazardous Waste Statistics for Ireland;
- EPA (2023c). Biodegradable municipal waste to landfill;
- European Commission (2015). Closing the Loop: An EU Action Plan for the Circular Economy;
- European Commission (2018). EU Construction and Demolition Waste Management Protocol;
- European Commission (2020). Circular Economy Action Plan for a Cleaner and More Competitive Europe;
- Regional Waste Management Offices (2020). Construction & Demolition Waste, Soil and Stone Recovery / Disposal Capacity; and
- Southern Waste Regional Authority (2015). Southern Region Waste Management Plan 2015-2021.

#### 15.2.2.1 Directives and legislation

- Waste Framework Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste;
- S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2020 (hereafter referred to as the Waste Directive Regulations);

- S.I. No. 86/2008 - Waste Management (Facility Permit and Registration) Regulations 2008, as amended;
- S.I. No. 821/2007 - Waste Management (Facility Permit and Registration) Regulations 2007;
- S.I. No. 820/2007 - Waste Management (Collection Permit) Regulations 2007, as amended;
- S.I. No. 419/2007 - Waste Management (Shipments of Waste) Regulations 2007;
- Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste (hereafter referred to as the Landfill Directive);
- Number 10 of 1996 - Waste Management Act 1996 Revised (hereafter referred to as the Waste Management Act 1996); and
- S.I. No. 26 of 2022 – Circular Economy and Miscellaneous Provisions Act 2022.

A summary of key policy and legislation is included as **Appendix 15.1** in **Volume 4** of this EIAR.

### 15.2.3 Appraisal method for assessment of impacts

The potential environmental impacts of solid waste and resource use and management associated with the Proposed Development were assessed with respect to the Construction, Operational and Decommissioning phases. These impacts may be neutral, positive or negative, and are dependent on the measures employed to prevent and / or manage the resources used and waste generated.

#### 15.2.3.1 Assessment methodology

The likely impacts are assessed by describing waste and by-products generation and management from the Proposed Development and comparing this to the current waste and by-product management baseline in Ireland. The impact assessment and waste management options have been considered with regard to the waste hierarchy and the Waste Framework Directive.

The following factors were considered when determining the significance of the impacts of the Proposed Development on the various aspects of the receiving environment:

- Desk study of current practices for waste and by-product management in Ireland;
- Data gathered on the types and quantities of waste and by-product generation and management from the Proposed Development;
- An assessment of the likely environmental impacts that may arise from the quantity of waste requiring disposal to landfill, in line with the significance criteria from the EPA guidelines, as set out in **Chapter 1, Introduction**;
- The surplus materials arising and waste infrastructure capacity in the SR, in which the Proposed Development is located; and
- A review of the Proposed Development in the context of the waste hierarchy and circular economy principles to determine the mitigation measures required.

### 15.2.4 Data collection and collation

A desk study was undertaken, comprising reviews of:

- Relevant policy and legislation, which creates the legal framework for waste and resource management in Ireland;
- Estimated surplus materials and by-product generation for the Construction Phase of the Proposed Development;
- Operational Phase waste;
- Proposed Development design to identify appropriate mitigation and move waste management up the waste hierarchy through implementation of best practice, where possible;



- Types, quantities and management of construction and demolition (C&D) waste arisings generated in Ireland and the relevant Local Authority and SR jurisdictions;
- Types, quantities and management of commercial and industrial waste generated in Ireland and SR jurisdictions (Regional Waste Management Offices, 2020); and
- Availability (type and capacity) of waste infrastructure within the Local Authority jurisdiction and SR.

### 15.2.5 Waste management principles

During the Construction Phase of the Proposed Development, the appointed contractor will have regard to the following principles of the waste hierarchy, in line with the Waste Framework Directive (see **Image 15.2**).

#### 15.2.5.1 Prevention and minimisation

Waste prevention and minimisation are the most environmentally sustainable means of managing surplus material from demolition, excavation and construction materials. The principles of prevention and minimisation of waste are inherent in the design of the Proposed Development.

#### 15.2.5.2 Reuse

Article 27 of the European Union (Waste Directive) Regulations 2020 (Article 27) allows a material producer to determine, under certain circumstances, that a material is a by-product and not a waste. Substances or objects, such as soil and stones produced during construction projects, can be determined as a by-product if they satisfy all of the following criteria:

1. Further use of the material is certain;
2. The material can be used directly without any further processing other than normal industrial practice;
3. The material is produced as an integral part of the production process; and
4. Further use is lawful, in that the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

Substances or objects will be a by-product if they meet each of the conditions detailed in Article 27. The baseline area for reuse of by-products in accordance with Article 27 comprises the whole country, as no regional distinction is made in the Article 27 register.

Where it is proposed to use an Article 27 EPA notification in relation to excavation material from the Proposed Development, the appointed contractor will be responsible for ensuring compliance with Regulation 27 of the European Union (Waste Directive) Regulations 2011-2020 including notification to the EPA, seeking a determination from the EPA on the matter and compliance with all relevant Agency guidance on the matter.

Where it is proposed to use soil from off-site which is a by-product and subject to Regulation 27 of the European Union (Waste Directive) Regulations 2011-2020, the appointed contractor is responsible for carrying out any necessary due diligence regarding the material and ensuring that all EPA guidelines relating to that Article 27 notification have been complied with before the soil is imported into the site. Where feasible, appropriate and available construction by-products arising from other sites will be used in the development of this site in place of virgin materials.

#### 15.2.5.3 Recycling, recovery and disposal

Where surplus materials are generated that cannot be reused, these will be regarded as waste and will be delivered to recycling or recovery facilities authorised in accordance with the Waste Management Act, 1996, as amended, which hold a Certificate of Registration, Waste Facility Permit or EPA Licence.

All wastes removed from site will be transported by the holder of the appropriate waste collection permit, granted in accordance with the S.I. No. 820/2007 - Waste Management (Collection Permit) Regulations 2007, as amended.



The option of disposal is the least desirable outcome for surplus material generated by the Proposed Development and will only be considered where it is not possible to deliver wastes for recycling or recovery to appropriately licensed / permitted facilities for reuse / recycling purposes.

In addition, where waste facility capacity does not exist within Ireland for management of specific waste streams, such as hazardous soils, these will be exported for treatment, recovery or disposal in accordance with the provisions of S.I. No. 419/2007 - Waste Management (Shipments of Waste) Regulations 2007, and in accordance with current practice in Ireland.

It will be the responsibility of the appointed contractor, under the Waste Management Act 1996, as amended, to ensure that all material delivered to authorised waste facilities is correctly classified and will meet the waste acceptance criteria of the receiving site.

It will be the responsibility of the appointed contractor to secure agreements for reuse, recycling or disposal of surplus materials from the Proposed Development in construction projects or authorised facilities, where appropriate, in accordance with the Waste Management Act, 1996 as amended, and associated regulations.

Where feasible recycled components or materials will be used in the development of this site in place of virgin materials, subject to the provisions of the Waste Management Act, 1996 as amended and Regulation 28 of the European Union (Waste Directive) Regulations 2011-2020.

## 15.3 Baseline Environment

### 15.3.1 Construction waste

#### 15.3.1.1 National

List of Waste (LoW) codes for typical C&D wastes are included as **Appendix 15.2** in **Volume 4** of this EIAR.

In 2021, the latest year for which there are published statistics available, 9 million tonnes of C&D waste were generated in Ireland, representing an increase of 0.8 million tonnes from 2020 (EPA, 2023a). Of this waste, approximately 7.7 million tonnes comprised soil and stones, making up approximately 85% of the material waste stream.

A breakdown of the composition of C&D waste in Ireland in 2021 is set out in **Table 15.1**. These figures should be considered as a guide only, as C&D waste can vary significantly from one project to another, depending on the nature of the development and the waste management practices employed on-site.

**Table 15.1: Composition of C&D waste material collected in Ireland in 2021 (EPA, 2023a)**

C&D waste type	Quantity (tonnes)	Proportion of material stream (%)
Soils, stones & dredging spoil	7,696,287	85.1%
Concrete, brick, tile & gypsum	608,235	6.7%
Mixed C&D waste	362,380	4.0%
Metal	257,558	2.8%
Bituminous mixtures	87,343	1.0%
Segregated wood, glass & plastic	31,946	0.4%
<b>Total</b>	<b>9,043,749</b>	<b>100%</b>

Data issued by the EPA demonstrates that final treatment operations (backfilling, recycling, energy recovery, disposal) of C&D waste materials varied greatly between material streams. By far the largest quantity of C&D waste was used for backfilling (a recovery operation), which mainly reflects the dominance of soil and stones in the overall composition mix.

The EPA reports that Ireland achieved 85% material recovery of construction and demolition waste in 2021 (EPA, 2023a). Under the Waste Framework Directive (2008/98/EC) Member States must achieve 70% of material recovery of non-hazardous, non-soil-and-stone C&D waste by 2020.

As discussed above, Article 27 of the European Union (Waste Directive) Regulations 2020 allows a material producer to determine, under prescribed circumstances, that a material is a by-product and not a waste and so can be reused onsite or offsite within the industry.

On receipt of Article 27 notifications at the EPA, materials can be determined as a waste or a by-product. In some cases, no determination is issued by the EPA, meaning the material has not been determined as a waste. In 2021, the EPA assessed 123 by-product notifications. The EPA determined that 459,836 tonnes of the soil and stone notified were by-product, and 600 tonnes were waste. Notifications for 152,400 tonnes were withdrawn (EPA, 2023a).

The EPA reports that a total of 466,941 tonnes of hazardous waste was generated in Ireland in 2021, representing a decrease of 16 per cent (over 90,000 tonnes) from 2020 (EPA, 2023b). Hazardous waste types include wastes from dredging spoil, contaminated soils, waste treatment, solvents and hazardous elements of waste electrical and electronic equipment. In 2021, 52% of hazardous waste was treated in Ireland and 48% of hazardous waste was exported. Hazardous waste treatment in Ireland takes place on site of generation (95,130 tonnes) or at Irish hazardous waste management facilities (148,575 tonnes).

### 15.3.1.2 Regional

The Regional Waste Management Offices (RWMO) have published an updated Construction & Demolition Waste, Soil and Stone Recovery / Disposal Capacity report (2020), which states that:

*“(Licensed) Capacity in the SR is growing with the latest data indicating the Region has 17% of the national capacity.”*

A summary of facilities with a waste licence and the corresponding capacity for the SR is presented in **Table 15.2**. A summary of facilities with a waste facility permit and the corresponding capacity for the SR is presented in **Table 15.3**. A summary of facilities with a certificate of registration and the corresponding capacity for the SR is presented in **Table 15.4**.

**Table 15.2: Summary of SR waste capacity – facilities with waste licence (RWMO, 2020)**

County	No. facilities	Annual capacity (application stage) (tonnes)	Annual capacity (licenced, un-commenced) (tonnes)	Annual capacity (active and available) (tonnes)
Wexford	2	80,000	-	400,000
Kilkenny	1	-	-	125,000
Cork (County)	4	300,000	580,000	-
<b>SR sub-total</b>	<b>7</b>	<b>380,000</b>	<b>580,000</b>	<b>525,000</b>

**Table 15.3: Summary of SR waste capacity – facilities with waste facility permit (RWMO, 2020)**

No. facilities	Permitted capacity (lifetime) (tonnes)	Intake 2018 (tonnes)	Remaining capacity (lifetime) (tonnes)
80	5,749,119	820,035	1,919,779

**Table 15.4: Summary of SR waste capacity – facilities with certificate of registration (RWMO, 2020)**

No. facilities	Registered capacity (lifetime) (tonnes)	Intake 2018 (tonnes)	Remaining capacity (lifetime) (tonnes)
83	1,284,682	188,892	453,559

### 15.3.2 Imported material

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 Federation, 2023), 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.

### 15.3.3 Municipal Waste

Municipal waste will be generated in small quantities during the Construction Phase of the Proposed Development. Municipal waste in Ireland is made up of household waste as well as commercial and other waste that, because of its nature or composition, is similar to household waste. According to the EPA, Ireland generated 3.2 million tonnes of municipal waste in 2020 (EPA, 2022b).

Of the 3.2 million tonnes of municipal waste generated in Ireland in 2020, 42% was used in energy recovery, 30% was used in material recycling, 16% was landfilled, 11% was used in composting/anaerobic digestion and 1% was unmanaged. Of the 3.2 million tonnes of municipal waste, 57% is estimated to be from households and 43% is estimated to be from commercial and public service sources. Since 2001, significant changes have occurred in the management of municipal waste in Ireland, notably the dramatic decline in landfilling over this period, accompanied by increased levels of recycling in the early 2000s and subsequently an increase in the share of municipal waste sent for energy recovery since 2011.

In September 2020, the Government published a new national waste strategy, the National Waste Action Plan. The following targets were noted in the Waste Action Plan for municipal waste in Ireland, which will be implemented using waste collection permit conditions:

- Municipal solid waste (MSW) recycling rate of 55%, 60%, and 65% by 2025, 2030 and 2035 respectively; and
- Limit the amount of MSW to landfill to 10% by 2035.

To achieve these targets from the 30% recycling rate in 2020, improvements are required in waste reduction, segregation and contamination rates. The EPA estimates that (Government of Ireland, 2019):

*“... Ireland’s municipal recycling (including organic waste for composting and anaerobic digestion through the organic bin) rate could increase from 41% to 62% if all recyclable (including organic) material was removed from the general waste bins and placed into the correct mixed dry recycling and organic waste bins.”*

Biodegradable municipal waste (BMW) comprises those elements of the municipal waste stream that will degrade biologically, for example food waste, garden and parks waste, waste paper and cardboard. Under the Landfill Directive, Ireland is committed to meeting targets for the diversion of BMW from disposal to landfill, including a limit of less than 610,000 tonnes to landfill. The quantity of BMW disposed to landfill in 2022 was 129,572 tonnes (EPA, 2023c), which is well within Ireland’s current limit.

Capacity from composting and anaerobic digestion, municipal waste landfill, Material Recovery Facilities (MRFs), integrated waste management facilities, municipal waste incinerators and cement kilns accepting wastes for co-incineration can all be used to treat municipal waste.

## **15.4 Potential Impacts**

This section presents potential impacts that may occur due to the Proposed Development, in the absence of mitigation. This informs the need for mitigation or monitoring to be proposed (refer to Section 15.45). Predicted residual impacts taking into account any proposed mitigation measures are then presented in Section 15.7.

### **15.4.1 Characteristics of the Proposed Development**

#### **Construction Phase**

Aspects considered in the assessment of resource use and waste management for the Construction Phase included the following:

- Site clearance: removal of vegetation;
- Excavation: excavation of below ground material such as soil and stones;
- Imported material: import of materials for the construction of the Proposed Development;
- Construction: waste materials generated from and in relation to the construction of the Proposed Development; and
- Municipal waste.

#### **Operational Phase**

The generation of project related C&D waste from the maintenance of the proposed bridge was considered in the assessment of resource use and waste generation for the Operational Phase.

#### **Decommissioning Phase**

Surplus material sources from the potential decommissioning of the Proposed Development were considered in the assessment for the Decommissioning Phase.

These impacts are addressed in further detail below.

### **15.4.2 ‘Do-Nothing’ Impact**

The ‘Do-Nothing’ alternative considers the likely scenario that would arise, assuming the Proposed Development were not progressed, i.e., if nothing were done. In the ‘Do-Nothing’ scenario, the Proposed Development would not be constructed and the waste materials described herein would not be generated. The resultant resource and waste impact would be neutral.

### 15.4.3 Construction Phase

#### 15.4.3.1 Introduction

Typical C&D wastes that are likely to arise during the Construction Phase of the Proposed Development are set out in **Appendix 15.2** in **Volume 4** of this EIAR, including EPA LoW codes.

The most environmentally sustainable means of managing excavation and construction material is its prevention and minimisation. Refer to Section 15.1.1 for the principles of waste management. The appointed contractor will be responsible for the implementation of these for the Proposed Development. In recent years, there has been a shift in focus on best practice waste management and waste minimisation in construction and an increase in the reuse of construction by-products in projects.

#### 15.4.3.2 Site clearance

There are no buildings or structures currently present on the proposed site which will require demolition. However, clearance of some areas of the site will be required, with the resultant generation of organic materials.

Organic materials, including vegetation from shrub, tree or grass clearance or deposits removed from within drainage ditches, will generate only minor quantities of waste material for treatment at organic waste facilities. It is estimated that approximately 415 tonnes of cleared vegetation will be generated as a result of the Proposed Development.

There is adequate capacity for the management of such wastes – refer to Section 15.3. Segregation facilities may be provided, where necessary, on the construction site to ensure that the recovery and recycling of such wastes is maximised.

Considering the minor quantities of organic waste that will be generated during the site clearance works and the available treatment capacity for the waste generated, the predicted impact of site clearance, in the absence of mitigation, is negative, not significant and short-term.

#### 15.4.3.3 Excavation

Excavation waste will arise from such activities as:

- Excavation for utility diversions;
- Excavation for footways / embankments;
- Excavation for piling works; and
- Excavation for foundations / piers.

In total, it is estimated that the construction of the Proposed Development will require the excavation of approximately 5,950 tonnes (bulk weight) of material. This material will comprise made ground, topsoil and subsoil.

It is estimated that approximately 300mm will need to be excavated under the proposed embankments and tie ins at grade footways / cycleways to allow for competent formation layers to be placed. The total amount of material estimated to be generated from these works will be approximately 2,260 tonnes (bulk weight).

In addition to the excavated topsoil, it is estimated that approximately 1,950 tonnes (bulk weight) of piling spoil material and approximately 1,740 tonnes (bulk weight) of excavated material for the pile caps will be generated.

Following the completion of the construction works, it is estimated that approximately 32,400 tonnes of construction surfacing material will be removed from site.

In line with current practice in Ireland, surplus materials and wastes from the Proposed Development will be managed as follows:

- Where practicable, naturally occurring excavated material will be reused within construction in the Proposed Development in accordance with Article 3 of the Waste Management Act, 1996, as amended;

- Excavation material will be used as general landscape fill within the Proposed Development and on other projects requiring the types of materials generated, where practicable, through Article 27 of the European Union (Waste Directive) Regulations, 2020. Reuse of topsoil and excavated material within the Proposed Development is proposed, where practicable. The material will also be subject to testing to ensure it is suitable for its proposed end use;
- Should material meet the acceptance criteria set out in Article 28 of the Waste Directive Regulations (EPA 2020), this material will be delivered to recovery or disposal facilities which are authorised to collect this material under the Waste Management Act 1996 (i.e., which hold a Certificate of Registration, Waste Facility Permit or EPA Licence), should such recovery or disposal facilities become available by the time of commencement of construction of the Proposed Development;
- In accordance with the law, all excavation wastes requiring removal from site for recycling or recovery will be delivered to facilities which are authorised under the Waste Management Act, 1996 (i.e., which hold a Certificate of Registration, Waste Facility Permit or EPA Licence). Examples of recycling / recovery activities for excavation material include:
  - Processing of stone to produce construction aggregate;
  - Backfilling of quarries; and
  - Raising land for site improvement or development.
- Any hazardous waste arising will be managed by the appointed contractor in accordance with the applicable legislation;
- Screening of material may be undertaken for the Proposed Development, which will be a decision for the appointed contractor; and
- In accordance with the law all wastes removed from site will be transported by the holder of the appropriate waste collection permit, granted in accordance with S.I. No. 820/2007 - Waste Management (Collection Permit) Regulations, 2007.

It will be the responsibility of the appointed contractor to secure agreements for acceptance of surplus excavation materials from the Proposed Development in authorised and regulated facilities, in accordance with the Waste Management Act, 1996, as amended, and associated regulations.

All material from the excavation works will need to be tested by the appointed contractor for quality and contamination. Material that is not contaminated could potentially be reused as general landscape fill material in the construction works under the provisions of Article 27 of the European Union (Waste Directive) Regulations, 2020. Material that meets the necessary acceptance criteria but is not required on site will be delivered to an authorised soil recovery facility.

Material that requires recycling will be sent to authorised waste facilities and may be used in accordance with Article 28 of the European Union (Waste Directive) Regulations, 2020 – S.I. 126 of 2020 as amended. Article 28 sets the criteria which must be complied with, and the EPA must use to determine if a waste reaches ‘*end of waste*’ status and becomes a material.

Should excavated material containing hazardous substances be discovered as part of the Proposed Development, this will be delivered to a facility authorised to accept hazardous wastes in accordance with the terms of an Industrial Emissions Licence or Waste Licence or exported from Ireland for treatment, recovery or disposal in accordance with current industry practice and the provisions of the Waste Management (Shipments of Waste) Regulations, 2007 – S.I. No. 419 of 2007.

Considering the available treatment capacity for the C&D waste generated during the excavation works and the proposed waste management procedures and controls outlined above, the predicted impact of excavation waste during the Construction Phase, in the absence of mitigation, is negative, slight and short-term.

#### 15.4.3.4 Imported material

The Construction Phase will require the importation of a number of key construction materials for the Proposed Development works. This material will include items such as concrete, hardcore, steel and fill material. An assessment of the climate impact from the carbon associated with these materials is included in **Chapter 12, Climate**. **Table 15.5** provides an estimate of the quantities of the major materials required during the Construction Phase of the Proposed Development.

**Table 15.5: Estimated quantities of major construction materials required**

Material	Estimated quantity (tonnes)
Concrete	3,000
Clause 804 hardcore	32,400
Reinforcing steel	187
Structural steelwork	88
Precast concrete elements	930
Embankment fill material	5,560
Link footway / cycleway surfacing	1,930

The quantities of materials listed in **Table 15.5** represent a very small proportion of the Irish quantities manufactured per year, as outlined in Section 15.3.2. As an example, the estimated quantity of concrete required represents less than 0.1% of the total quantity produced in Ireland per annum.

Importation of material to the Proposed Development 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 arise from the gathering / manufacture of the materials, and that once the materials are used within the Proposed Development, they are no longer available for other uses. There will also be impacts associated with the importation of materials through the requirement for heavy goods vehicles for delivery of the material and the use of materials. Impacts on other environmental aspects are addressed in **Chapter 7, Traffic and Transportation**, **Chapter 10, Noise and Vibration**, **Chapter 11, Air Quality** and **Chapter 12, Climate**.

As the materials required for the Construction Phase of the Proposed Development are generally readily available and the quantities of the materials required constitute an insignificant proportion of the quantities produced per annum in Ireland, the predicted impact associated with the requirement for imported materials is negative, slight and long-term.

#### 15.4.3.5 Construction waste

Construction works, site offices and temporary works facilities are also likely to generate waste. General construction waste can vary significantly from site to site but typically will include the following non-hazardous fractions:

- Soil and stone;
- Concrete;
- Bituminous mixtures;
- Metals; and
- Other.

The hazardous waste streams which could arise from construction activities include the following:

- Waste electrical and electronic equipment (WEEE) components;



- Batteries;
- Asbestos;
- Liquid fuels; and
- Contaminated soil.

Also included within this definition are surplus and damaged products and materials arising in the course of construction work or used temporarily during the course of on-site activities.

In the case of the Proposed Development, the most likely type of general construction waste will be surplus concrete and steel that may arise on-site. Quantities of these materials are estimated to be small, assumed to be between approximately 5% to 15% of construction material delivered to site (WRAP, 2014). There is adequate capacity for the management of such wastes. Segregation facilities will be provided to ensure that recovery and recycling of such wastes are maximised.

Considering the minor quantities of construction waste that will be generated during the Construction Phase and the available treatment capacity for C&D waste, the predicted impact of construction waste during the Construction Phase, in the absence of mitigation, is negative, not significant and short-term.

#### 15.4.3.6 *Municipal waste*

Minor quantities of general municipal waste will be generated by construction workers during the Construction Phase (e.g., from welfare facilities). Segregation facilities will be provided on the construction site, if necessary, to ensure that recovery and recycling of such wastes is maximised.

Considering the minor quantities of municipal waste that will be generated during the Construction Phase and the available treatment capacity for municipal waste, the predicted impact of municipal waste during the Construction Phase, in the absence of mitigation, is negative, imperceptible and short-term.

#### 15.4.3.7 *Summary of predicted Construction Phase impacts*

A summary of the predicted (pre-mitigation) impacts during the Construction Phase is set out in **Table 15.6**. The Construction Phase of the Proposed Development is not predicted to give rise to significant impacts.

**Table 15.6: Summary of predicted Construction Phase impacts, in the absence of mitigation**

Assessment topic	Predicted impact
Site clearance waste	Negative, not significant and short-term
Excavation waste	Negative, slight and short-term
Imported material	Negative, slight and long-term
Construction waste	Negative, not significant and short-term
Municipal waste	Negative, imperceptible and short-term

#### 15.4.4 *Operational Phase*

Minor maintenance works to infrastructure are likely to occur during the Operational Phase. The maintenance works will be routine and will comprise maintenance of the following elements:

- Bridge steelwork;
- Bridge sables;
- Reinforced concrete structures;
- Embankments;
- Bridge bearings;

- Lighting; and
- Deck surfacing.

Refer to **Chapter 5, Construction Strategy** for further details.

The maintenance works will be infrequent and will generate only minor quantities of C&D waste.

Considering the minor quantities of project related C&D waste that will be generated during the Operational Phase and the available treatment capacity for C&D waste, the predicted impact of project related C&D waste during the Operational Phase, in the absence of mitigation, is negative, not significant and long-term.

#### 15.4.5 Decommissioning Phase

As outlined in **Chapter 4, Description of the Proposed Development**, the design life of the proposed new pedestrian and cyclist bridge is 120 years. During the potential future decommissioning works, the main bridge span and approach spans will be decommissioned by cutting the concrete decking and steel spans into a number of large sections. This will be done either *in situ* or at ground level, with the decking and spans being lifted out by a mobile crane and moveable gantry.

Decommissioning of the Proposed Development would result in the generation of waste materials, with a subsequent requirement for its management and removal off site for re-use, recycling, recovery or disposal. The primary materials likely to be generated from the decommissioning works will be steel from the main bridge span and approach spans, and concrete from the concrete decking. Segregation facilities will be provided to ensure that recovery and recycling of such wastes are maximised.

Considering the waste management procedures and controls that will be implemented, the predicted impact of waste during the Decommissioning Phase, in the absence of mitigation, is negative, not significant and short-term.

### 15.5 Mitigation and Monitoring

#### 15.5.1 Construction Phase

The Construction Phase is not predicted to give rise to significant negative impacts. However, a suite of mitigation measures is outlined which the appointed contractor will implement, and in any event, the appointed contractor will ensure that waste arisings will be managed in accordance with the waste hierarchy and in compliance with the provisions of the Waste Management Act, 1996, as amended.

A Construction Resource and Waste Management Plan (CRWMP) has been prepared and is included as **Appendix 15.3** in **Volume 4** of this EIAR. This has been prepared and will be implemented (and updated as necessary) by the appointed contractor in line with the Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (EPA, 2021b). The CRWMP outlines how waste arising during the Construction and Demolition Phase of the Proposed Scheme will be managed in a way that ensures compliance with the provisions of the Waste Management Act, 1996, as amended – refer to the CRWMP is included as **Appendix 15.3** in **Volume 4** of this EIAR. The appointed contractor will update the CRWMP in advance of construction commencing.

The following measures will be implemented during construction, where practicable, by the appointed contractor, to ensure the maximum quantity of material is reused in the Proposed Development, to comply with the provisions of the Waste Management Act, 1996, as amended, and to contribute to achieving the objectives set out in the Waste Action Plan for a Circular Economy (DECC, 2020):

- 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 Development;
- 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 non-hazardous excavation material cannot be reused within the Proposed Development works, material will be sent for recycling or recovery, where practicable;
- Excavations of made ground will be monitored by an appropriately qualified person to ensure that any hotspots of possible contamination are properly identified, with the contaminated material segregated and disposed of appropriately. Any potential contaminated material identified will be segregated and stored in an area where there is no possibility of runoff generation or infiltration to ground or surface water drainage. Care will be taken to ensure that the hotspot does not cross contaminate clean soils elsewhere throughout the site;
- If encountered, any potential asbestos during the Construction Phase will be managed using standard health and safety measures as outlined in ‘Asbestos-containing Materials (ACMs) in Workplaces: Practical Guidelines on ACM Management and Abatement’ (HSA, 2013). This document states that *“removal of asbestos from contaminated soil will require a specialist asbestos contractor for any friable asbestos to be removed”* and *“a risk assessment by an independent competent person should determine the most appropriate control measures and remediation strategies”* (HSA, 2013);
- Only a suitably experienced contractor shall be used to carry out the excavation works. During construction, they shall employ standard practices to manage risk from contaminated soils. These will be determined by the contractor depending on their construction practices but are likely to include the use of gloves, dust masks and potentially disposable overalls. These and other appropriate measures will minimise the exposure of site workers and members of the public;
- The site will be maintained to prevent litter and regular litter picking will take place throughout the site;
- ‘Just-in-time’ delivery will be used, where practicable, to minimise material wastage;
- Paints, sealants and hazardous chemicals will be stored in secure, bunded locations;
- All staff on-site will be trained on how to minimise waste (i.e., training, induction, inspections and meetings);
- Materials on-site will be correctly and securely stored;
- Where possible, recyclable material will be segregated and removed off site to a permitted / licensed facility for recycling. Waste stream colour coding and photographs will be used to facilitate segregation;
- On-site municipal waste arising will be source separated at least into dry mixed recyclables, biodegradable and residual wastes;
- Waste bins, containers, skip containers and storage areas will be clearly labelled with waste types which they should contain, including photographs as appropriate;
- Segregated skips will be used within a designated waste segregation area to be located in the on-site construction compound (particularly for hazardous, inert waste and general waste);
- The appointed contractor will record the quantity in tonnes and types of waste and materials leaving the site during the Construction Phase. 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 of waste in tonnes delivered to each facility. Records will show material which is recovered, which is recycled and which is disposed of;
- Waste generated on-site will be removed as soon as practicable following generation for delivery to an authorised waste facility;
- The appointed contractor will ensure that any off-site interim storage facilities for excavation material have the appropriate waste licences or waste facility permits in place;
- Where Article 27 notifications are required in relation to the Proposed Development, the appointed contractor will complete and submit these Article 27 notifications to the EPA for by-product reuse; and
- 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).

### 15.5.2 Operational Phase

All project related C&D waste generated from the maintenance works during the Operational Phase will be transferred from site by a waste collection permit holder and delivered to an authorised waste facility (i.e., a facility which holds a Certificate of Registration, Waste Facility Permit or Waste Licence) for the specific waste types it receives.

### 15.5.3 Decommissioning Phase

At the end of the Proposed Development's lifespan, data relating to the construction of the infrastructure on site, as built drawings and material specifications will be provided to the owners, where feasible. This data will inform and enable the reuse and recycling of all infrastructure elements.

All project related C&D waste generated during the Decommissioning Phase will be transferred from site by a waste collection permit holder and delivered to an authorised waste facility (i.e., a facility which holds a Certificate of Registration, Waste Facility Permit or Waste Licence) for the specific waste types it receives.

## 15.6 Cumulative Impacts

A review of Cork County Council (CCC), An Bord Pleanála (ABP) and Department of Housing, Local Government and Heritage (DHLGH) online planning records has indicated that other projects have been proposed within the surrounding area that may give rise to cumulative impacts (refer to **Chapter 20, Cumulative and Interactive Impacts**).

Taking the nearby proposed projects together in combination with the Proposed Development, it is considered that they could give rise to short term, slight, negative resource and waste management impacts on the capacity of waste management facilities and waste industry trends in Ireland during the Construction Phase due to an increased demand on waste recovery and / or disposal sites.

Appropriate mitigation measures have been proposed in this EIAR and, where required, in the planning documents for the other permitted / Proposed Developments in the vicinity – such that significant negative cumulative impacts are not predicted to occur.

## 15.7 Residual Impacts

### 15.7.1 Construction Phase

The Construction Phase of the Proposed Development is not predicted to give rise to any significant residual impacts with the adoption of the waste management principles and with the implementation of the identified mitigation measures. A summary of the predicted residual impacts during the Construction Phase, following the implementation of the appropriate mitigation measures, is set out in **Table 15.7**.

**Table 15.7: Summary of predicted Construction Phase residual impacts**

Assessment topic	Predicted impact (pre-mitigation and monitoring)	Residual Impact (post mitigation)
Site clearance waste	Negative, not significant and short-term	Negative, not significant and short-term
Excavation waste	Negative, slight and short-term	Negative, not significant and short-term
Imported material	Negative, slight and long-term	Negative, slight and long-term
Construction waste	Negative, not significant and short-term	Negative, not significant and short-term
Municipal waste	Negative, imperceptible and short-term	Negative, imperceptible and short-term

### 15.7.2 Operational Phase

The Operational Phase of the Proposed Development is not predicted to give rise to any significant residual impacts with the adoption of the waste management principles and with the implementation of the identified

mitigation measures. The predicted residual impact during the Operational Phase will be negative, not significant and long-term.

### 15.7.3 Decommissioning Phase

The Decommissioning Phase of the Proposed Development is not predicted to give rise to any significant residual impacts with the adoption of the waste management principles and with the implementation of the identified mitigation measures. The predicted residual impact during the Decommissioning Phase will be negative, not significant and short-term.

## 15.8 References

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S.I No. 10 of 1996 - Waste Management Act 1996, as amended.

S.I. No. 419 of 2007 - Waste Management (Shipments of Waste) Regulations 2007.

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

S.I. No. 821 of 2007 - Waste Management (Facility Permit and Registration) Regulations 2007.

S.I. No. 86 of 2008 - Waste Management (Facility Permit and Registration) Regulations 2008, as amended.

S.I. No. 26 of 2022 – Circular Economy and Miscellaneous Provisions Act 2022.