



**Clifton Scannell Emerson**  
Associates

# **EIAR Chapter 13 Material Assets: Resources & Waste Management Suir Island Infrastructure Links**



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## 13 Material Assets: Resources & Waste Management

### 13.1 Introduction

This chapter has also been prepared to address the issues associated with material assets associated with waste management during the construction and operational phases of the proposed development as described in Chapter 2 and the Outline Construction Methodology appended therein.

A site-specific Outline Resource and Waste Management Plan (RWMP) has been prepared by Clifton Scannell Emerson Associates Consulting Engineers and AWN Consulting Ltd. to deal with waste generation during the demolition, excavation and construction phases of the proposed development and has been included as **Appendix 13.1**.

The Chapter has been prepared having regard to European Commissions Guidelines, Guidance on the preparation of the Environmental Impact Assessment Report (2017), the EPA Guidelines on the Information to be contained in EIAR (2022) and the EU Commission Notice on changes and extensions to projects, 2021.

The RWMP will ensure the sustainable management of wastes arising at the Development Site in accordance with legislative requirements and best practice standards.

### 13.2 Methodology

#### Waste Management

The assessment of the impacts of the proposed development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management, including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

This Chapter is based on the proposed development, as described in Chapter 2 (Project Description & Planning Policy Context), and considers the following aspects:

- Legislative context;
- Construction phase (including demolition, site preparation and excavation);
- Operational phase; and
- Decommissioning Phase

A desktop study was conducted which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the Construction and Operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research as well as other available research sources.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in **Section 13.6**.

A detailed review of the existing ground conditions on a regional, local, and site-specific scale are presented in Chapter 6 of this EIAR (Land, Soils, Geology and Hydrogeology).

### 13.2.1 Legislation & Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) (as amended) which is transposed into national legislation in Ireland by the European Communities (Waste Directive) Regulations 2011 (as amended). The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 13-1).



Figure 13-1: Waste Hierarchy (Source: European Commission)

EU and Irish National waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. Circular Economy (CE) is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products. (Figure 13-2).



Figure 13-2: Circular Economy (Source: Repak)

Transport Infrastructure Ireland (TII) published *The Management of Waste from National Road Construction Project* in December 2017. The document is intended to assist all parties – designers, local authorities, contractors, etc. – on how the challenge of effective waste management is to be met in a road-building context. In particular, the document will:

- Help all parties understand the complicated legal framework which governs the management of wastes generated by national road construction projects;
- Set out good practice to ensure that effective waste management remains a priority throughout the design and construction stages of national road projects; the purpose being to minimise the environmental impacts of roads-related construction waste, as well as the volume of the actual waste being generated and to facilitate compliance with the provisions of the Waste Management Acts; and
- Provide information to facilitate an effective dialogue between road contractors, relevant statutory bodies and third parties on how waste should be correctly handled in a road-building context.

There are currently no Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the *Southern Regional (SR) Waste Management Plan 2015 – 2021*, *BS 5906:2005 Waste Management in Buildings – Code of Practice*, the Tipperary County Council (TCC) Waste Management By-Laws (2018), the EPA National Waste Database Reports 1998 – 2019 and the EPA National Waste Statistics Web Resource.

### 13.2.2 Terminology

Note that the terminology used herein is consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

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**Waste** - Any substance or object which the holder discards or intends or is required to discard.

**Prevention** - Measures taken before a substance, material or product has become waste, which reduce:

- a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
- b) the adverse impacts of the generated waste on the environment and human health; or
- c) the content of harmful substances in materials and products.

**Reuse** - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

**Preparing for Reuse** - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

**Treatment** - Recovery or disposal operations, including preparation prior to recovery or disposal.

**Recovery** - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

**Recycling** - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

**Disposal** - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I of the Waste Framework Directive sets out a non-exhaustive list of disposal operations.

### **13.3 Receiving Environment**

In terms of physical waste infrastructure, TCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the SR Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, municipal waste landfills, material recovery facilities and waste transfer stations.

### **13.4 Characteristics of the Proposed Development**

#### **13.4.1 Demolition Phase**

The demolition stage will involve the excavation of hard standing areas, roads, and curbs. The demolition areas are identified in the Engineering Planning Report provided with this application.

Further detail on the waste materials likely to be generated during the demolition works are presented in the project specific RWMP in **Appendix 13.1**. The RWMP provides an estimate of the main waste types likely to be generated during the C&D phase of the proposed development. The reuse, recycling / recovery and disposal rates have been estimated using the EPA National Waste Reports and the developments targeted recycling and reuse rates and these are summarised in Table 13-1.



Table 13-1: Estimated off-site Reuse, Recycle and Disposal Rates for Demolition Waste

Waste Type	Tonnes	Reuse/Recycle		Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Concrete, Bricks, Tiles, Ceramics	18.0	30	5.4	65	11.7	5	0.9
Asphalts	54.0	0	0.0	25	13.5	75	40.5
<b>Total</b>	<b>72.0</b>		<b>5.4</b>		<b>25.2</b>		<b>41.4</b>

### 13.4.2 Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The appointed Contractor will be contractually required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

There will be soil, stones, clay and made ground excavated to facilitate construction of the development. The development engineers (Clifton Scannell Emerson Associates) have estimated that 2,000m<sup>3</sup> of material will need to be excavated to do so. It is currently envisaged that 500m<sup>3</sup> will be able to be retained and reused onsite for landscaping and fill, the remaining material, will need to be removed offsite due to the limited opportunities for reuse on site. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

If any material that requires removal from the site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Article 27 classification (European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011). For more information in relation to the envisaged management of by-products, refer to the RWMP (**Appendix 13.1**).

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2019). Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste, including potential pollutant concentrations and leachability. It is anticipated that the surplus material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities / landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment / recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction phase workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site during the Construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.



Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project specific RWMP (**Appendix 13.1**). The RWMP provides an estimate of the main waste types likely to be generated during the Construction phase of the proposed development. These are summarised in Table 13-2.

*Table 13-2: Predicted on and off-site reuse, recycle and disposal rates for construction waste*

Waste Type	Tonnes	Reuse/Recycle		Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	5.9	10	0.6	80	4.7	10	0.6
Timber	5.0	40	2.0	55	2.7	5	0.2
Metals	1.4	5	0.1	90	1.3	5	0.1
Concrete	1.1	30	0.3	65	0.7	5	0.1
Other	2.7	20	0.5	60	1.6	20	0.5
<b>Total</b>	<b>16.1</b>		<b>3.5</b>		<b>11.0</b>		<b>1.5</b>

### 13.4.3 Operational Phase

There will be a limited quantity of waste generation from the operational phase of this development, and this will be limited to waste bins provided in the public bins and the toilet facilities for hygiene products. All waste associated with the provided public bins and toilets will be managed and removed from site by TCC or an appointed contractor and taken to a suitably licensed waste facility for storage and disposal. The quantity of waste generated will be limited in nature and is expected to be less than 50kg per week.

## 13.5 Potential Impacts of the Proposed Development

### 13.5.1 Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during site demolition, excavation and construction. General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be *short-term, significant and negative*.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the SR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the development site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable.

There is a quantity of excavated material which will need to be excavated to facilitate the proposed development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 6. It is anticipated that c. 1,500 m<sup>3</sup> of excavated material will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

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### 13.5.2 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

*Waste contractors will be required to service* the proposed development on a regular basis to remove waste.

## 13.6 Remedial and Mitigation Measures

### 13.6.1 Construction Phase

The following mitigation measures will be implemented during the construction phase of the proposed development:

As previously stated, a project specific RWMP has been prepared in line with the requirements of the requirements of The EPA, *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects* (2021) and is included as **Appendix 13.1**. The mitigation measures outlined in the RWMP will be implemented in full and form part of mitigation strategy for the site. The mitigation measures presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (**Appendix 13.1**) in agreement with TCC and in compliance with any planning conditions or submit an addendum to the RWMP to TCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will implement the RWMP throughout the duration of the proposed excavation and construction phases.

A quantity of topsoil and sub soil will need to be excavated to facilitate the proposed development. The Project Engineers have estimated that 1,500m<sup>3</sup> of excavated material will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
  - Concrete rubble (including ceramics, tiles and bricks);
  - Plasterboard;
  - Metals;
  - Glass; and
  - Timber.

- 
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible;
  - All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
  - Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
  - A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;
  - All construction staff will be provided with training regarding the waste management procedures;
  - All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
  - All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
  - All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the EC (Waste Directive) Regulations (2011). EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, and the SR Waste Management Plan 2015 – 2021. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

### 13.6.2 Operational Phase

The following mitigation measures will be implemented during the operational phase of the proposed development:

- TCC / the operator during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of waste management of this site in line with the TCC waste management strategy, ensuring a high level of recycling, reuse, and recovery at the site where possible.

The following mitigation measures will be implemented:

- TCC / the operator will ensure on-site segregation of all waste materials into appropriate categories where possible.
- TCC / the operator will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- TCC / the operator will ensure that all waste collected from the site of the proposed development will be reused, recycled, or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- TCC / the operator will ensure that all waste leaving the Site will be transported by suitable permitted contractors and taken to suitably registered, permitted, or licensed facilities.

These mitigation measures will ensure the waste arising from the proposed Project is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997*, the *EMR Waste Management Plan (2015 - 2021)* and the

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TCC waste by-laws. It will also ensure optimum levels of waste reduction, reuse, recycling, and recovery are achieved

## **13.7 Predicted Impacts of the Proposed Development**

### **13.7.1 Construction Phase**

A carefully planned approach to waste management as set out in **Section 13.6** and adherence to the RWMP (which include mitigation) (**Appendix 13.1**) during the construction phase will ensure that the predicted effect on the environment will be *short-term, imperceptible, and neutral*.

### **13.7.2 Operational Phase**

During the operational phase, a structured approach to waste management as set out in **Section 13.6** will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented the predicted impact of the operational phase on the environment will be *long-term, imperceptible and neutral*.

## **13.8 Residual Impacts**

The implementation of the mitigation measures outlined in **Section 13.6** will ensure that high rates of reuse, recovery and recycling are achieved at the Site of the proposed development during the construction and operational phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

## **13.9 Cumulative Impacts**

A comprehensive review of all other projects occurring in the vicinity of the proposed development has been completed by undertaking a review of the Tipperary County Council online planning applications portal and identifying all recently approved and live planning applications in the vicinity of the River Suir, upstream and downstream of the proposed development site. Relevant project identified during this review are listed in Section 1.15 of the EIAR Chapter 1 Introduction and are examined for their potential to result in likely significant effects to the Lower River Suir SAC. In addition to the planning application projects to Tipperary County Council as listed in Section 1.15, Tipperary County Council have also applied for Part VIII planning for the refurbishment of the Suir Island gardens located adjacent to the proposed Suir Island Infrastructure Links development. The Part VIII Planning Application for the Suir Island Gardens development was approved in October 2022.

### **Construction Phase**

There are existing developments close by, along with the multiple permissions remaining in place in the area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase.

Due to the high number of waste contractors in the Southern Region there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be **short-term** and **not significant**.

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### **Operational Phase**

There are existing public areas and pedestrian areas all around the vicinity of the development site. All of the current public spaces will generate similar waste types during their operational phases. TCC / the operator or authorised waste contractors will be required to collect waste materials as required. An increased density of development in the area is likely to improve the efficiencies of waste collections in the area.

Other developments in the area, will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a **long-term** and **imperceptible**.

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## 13.10 References

- BS 5906:2005 Waste Management in Buildings – Code of Practice
- Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
- DCCAE, Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021)
- Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
- Department of Environment and Local Government (DoELG) Waste Management – Changing Our Ways, A Policy Statement (1998).
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- EPA, European Waste Catalogue and Hazardous Waste List (2002)
- EPA, National Waste Database Reports 1998 – 2020.
- FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002).
- TCC, Tipperary Development Plan 2022 – 2028 (2022)
- Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
- Planning and Development Act 2000 ( No. 30 of 2000) as amended
- Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
- US EPA, Characterisation of Building Uses (1998);
- Waste Management Act 1996 - 2021 (No. 10 of 1996) as amended.

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## Appendix 13.1 Outline Resource & Waste Management Plan







**Clifton Scannell Emerson**  
Associates

# Outline Resource & Waste Management Plan

## Suir Island Infrastructure Links



Comhairle Contae Thiobraid Árann  
Tipperary County Council

**Client: Tipperary County Council**

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Civil  
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## 1 Introduction

Tipperary County Council (TCC, 'the Client') has commissioned Clifton Scannell Emerson Associates (CSEA) to prepare an Outline Resource and Waste Management Plan (RWMP) for the proposed Suir Island Infrastructure Links project, located in Clonmel, Co. Tipperary.

This plan will provide information necessary to ensure that the management of construction and demolition waste at the site is undertaken in accordance with the current legal and industry standards including the Waste Management Act 1996 as amended and associated Regulations, Environmental Protection Agency Act 1992 as amended, Litter Pollution Act 1997 as amended and the Southern Region Waste Management Plan 2015 – 2021. In particular, this plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible.

### **1.1 Overview of the purpose of the Outline Waste Management Plan**

This RWMP has been developed to ensure that waste arising on-site during the construction and demolition phase of the Suir Island Infrastructure Links proposed development will be managed and disposed of in a way that complies with the relevant regulations and to ensure that optimum levels of reduction, reuse and recycling are achieved. It also seeks to provide guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This outline document has been prepared to inform the Contractor of the minimum requirements imposed for the proposed construction works and shall be used in compiling the detailed Construction and Demolition Waste Management Plan, which in turn, will form an integral part of the Environmental Operating Plan (EOP) for the proposed construction works.

This document is preliminary in nature as it has been prepared at a stage when quantities are based on the design developed to a sufficient level of detail to inform the environmental impacts to be assessed in the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS). However, changes may occur during detailed design stages which may alter the volumes of waste.

Prior to the commencement of construction works, a Resource and Waste Manager (who may also be the Site Environmental Manager), will be appointed by the Contractor to undertake the development of the detailed RWMP and the management of all waste materials arising from the construction of the works. The nature of the project would require the majority of construction materials to be imported but the aim to reuse, insofar as practicable, shall be considered by the Contractor and Resource and Waste Manager.

The Contractor's RWMP must contain (but not be limited to) the following measures:

- Details of waste storage (e.g. skips, bins, containers) to be provided for different waste and collection times;
- Details of where and how materials are to be disposed of, i.e. landfill or other appropriately licensed waste management facilities;
- Details of storage areas for waste materials and containers;
- Details of how unsuitable excess materials will be disposed of, where necessary;
- Details of storage areas for waste materials and containers;
- Details of how unsuitable excess materials will be disposed of where necessary; and
- Details of how and where hazardous waste such as oils, diesel and other hydrocarbons or other chemical wastes are to be stored and disposed of in a suitable manner.

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This outline RWMP has been prepared based on the '*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects*' published in 2021 by the Environmental Protection Agency. These Guidelines outline the requirements of developing Resource & Waste Management Plan prior to construction and during the site works.

### **1.2 Commitment to adherence to the WMP**

This outline RWMP has been prepared for the provision of waste management for the construction phase of the Suir Island Infrastructure Links project, taking into account the many guidance documents on the management and minimisation of construction and demolition waste, including:

- Environmental Protection Agency (EPA) (2021) Best Practice Guidelines on the Preparation of Waste Management Plans for construction and Demolition Projects;
- Provisions of the Waste Management Acts, 1996-2011 and associated Regulations;
- Construction Industry Research and Information Association (CIRIA) document 133 Waste Minimisation in Construction;
- TII (2017) Guidelines for the Management of Waste from National Road Construction Projects. Transport Infrastructure; and,
- National Construction & Demolition Waste Council (NCDWC) 2006 Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects.

### **1.3 Relevant Documents**

The following documents are available to the Contractor, which shall be reviewed as part of the process to compile the detailed RWMP:

- Outline Construction Environmental Management Plan (OCEMP) Report No. RPT-20\_071-044;
- Preliminary Construction Health and Safety Plan (To be compiled during Tender Stage);
- Chapter 12 of Environmental Impact Assessment Report: Material Assets Resources and Waste Management

### **1.4 EU, National and Regional Waste Policies and Legislation**

The main legislation that governs waste management in Ireland and relates to the Construction & Demolition activities at the proposed development are listed below:

- **Waste Framework Directive 2018/851/EC** The Waste Framework Directive sets down basic requirements for all EU member states for handling waste and it also defines wastes. To comply with the Directive, EU members must ensure that:
  - Waste disposal does not present a risk to Air, Water, Soil, Plants and Animals;
  - Waste disposal must not constitute a public nuisance;
  - Illegal waste disposal must be prohibited;
  - An integrated and effective network of waste disposal plants is available; and
  - Audits and inspections are carried out on entities involved waste disposal;
- **Landfill Directive 1999/31/EC**. This Directive seeks to further the aims of the 1991 Directive in relation to landfill sites. It aims to prevent or reduce as far as possible, the negative effects on the environment from landfilling sites. In order to achieve this, it seeks to:
  - Separate hazardous and non-hazardous wastes;
  - Introduce rigorous technical requirements for landfills;
  - Phase in the prohibition of landfilling specific wastes including solid and liquid hazardous wastes;
  - Oblige operators to pre-treat hazardous waste;



- Introduce phased targets for the reduction of biodegradable waste being landfilled
- **Waste Management Act 1996 (No 10 of 1996) as amended 2001 (No 36 of 2001)**, 2003 (No. 27 of 2003) and 2011 (No. 20 of 2011). Sub-ordinate and associated legislation include:
  - European Communities (Waste Directive) Regulations 2001
  - Waste Management Act 1996 (10/1996)
  - Waste Management (Amendment) Act 2001 (36/2001), other than s. 14
  - Protection of the Environment Act 2003 (27/2003), Part 3
  - Waste Management (Electrical and Electronic Equipment) Regulations 2005 (S.I. No. 290 of 2005), Part 5
  - Waste Management (Environmental Levy) (Plastic Bag) Order 2007 (S.I. No. 62 of 2007)
  - Waste Management (Registration of Brokers and Dealers) Regulations 2008 (S.I. No. 113 of 2008)
  - Waste Management (Landfill Levy) Order 2008 (S.I. No. 168 of 2008)
  - Environment (Miscellaneous Provisions) Act 2011 20/2011), Part 4
- **National Waste Policy**

The National Waste Policy 2020-2025 ‘A Waste Action Plan for a Circular Economy’ was published in September 2020 by the Department of Communications, Climate Action and Environment. The new national waste policy will inform and provide direction to waste planning and management in Ireland for the coming years. The policy shifts the focus from waste disposal and treatment to ensure that materials and products remain in productive use for longer durations.

The policy document contains over 200 measures across various waste areas including Construction and Demolition (C&D). The policy goals for C&D are to:

- Revise the 2006 Best Practice Guidelines for C&D Waste;
- Streamline by-product notification and end-of-waste decision making processes; and
- Working group to develop national end-of-waste application for priority waste streams

The policy outlines the significant projected contributions that soils and stones make to overall C&D wastes between 2020 and 2022. These projections are provided in Table 1-1.

*Table 1-1: Construction and Demolition Projections, (A Waste Action Plan for a Circular Economy, National Waste Policy 2020-2025)*

	2020	2021	2022
<b>Total C&amp;D Waste</b>	6,410,000	6,570,000	6,930,000
<b>Of which soils and stones</b>	5,000,000	5,130,000	5,410,000

- **Regional Policy**

The proposed development is located in the Local Authority area of Tipperary County Council (TCC). The Southern Region Waste Management Plan 2015 – 2021 is the regional waste management plan to the administrative area, published in May 2015. Currently the Southern Region and other regional waste management plans are under review.

The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of “70% preparing for reuse, recycling and other recovery of construction and demolition waste” (excluding natural soils and stones and hazardous wastes) to be achieved by 2020.

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Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €130 - €150 per tonne of waste, which includes a €75 per tonne landfill levy introduced under the Waste Management (Landfill Levy) (Amendment) Regulations 2012.

The South Tipperary Development Plan 2009 – 2015 (as varied 2017) sets out a number of policies and objectives for Tipperary (South) in line with the objectives of the regional waste management plan. The plan identifies the development of recycling in order to minimise the use of landfill as the main objective of the City Council. Waste policies with a particular relevance to the proposed development are:

The proposed development Waste Policy falls under the Southern Waste Region, which comprises of 10 local authority areas namely; Carlow, Clare, Cork County, Cork City, Limerick City & County, Kerry, Kilkenny, Tipperary, Waterford City & County and Wexford.

The Region covers 42% of the land mass of the country, with a population of over 1.5 million people. The settlement patterns in the region are evenly split between urban and rural areas, with the four cities of Cork, Limerick, Kilkenny and Waterford having the highest population and strongest centres of economic activity. The Southern Region Waste Management Office is responsible for steering and implementing Waste Management Policies in the region.

The Role of the Southern Region Waste Management Office is:

- To facilitate and service the regional waste steering committee in the implementation of the objectives set out in the Southern Region Waste Management Plan 2015 - 2021. To develop a prioritised programme of objectives, targets and key performance indicators to ensure that the aims of the Plan are delivered;
- To assist, facilitate and coordinate, in partnership with the member local authorities, the implementation of the objectives, policies, actions and targets of the Plan;
- To prepare annual reports as required for the region, reporting on performance under each of the policy headings contained within the Plan;
- To maintain and establish task groups on specific issues when required;
- To prepare applications for grant assistance for regional projects;
- To identify, coordinate and facilitate the training needs of the region to ensure effective implementation of the Plan;
- To proactively promote prevention, minimisation, reuse and recycling of waste in accordance with the waste hierarchy and in association with industries, businesses, other statutory and non-statutory Agencies; and
- To foster community awareness of waste management issues in association with the Environmental Awareness Officers in each of the member local authorities.

## 2 Design Approach

The 'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects' guidelines into the preliminary design, to help future review processes to identify and evaluate resource reduction measures and investigate the impact on cost, time, quality, buildability, second-life and management post demolition and construction. Further details on these design principals can be found within the aforementioned guidance document.

The following approaches optimises resources and reduces waste on construction projects through:

- Prevention of wastes as far as practicable;
- Reuse of suitable materials;
- Recycling materials at the source;
- Selecting suppliers based on Green Procurement Principles;

- 
- Off-Site Construction provides a controlled space for fabrication, thus reducing wastes;
  - Materials Optimisation; and
  - Flexibility and Deconstruction.

### **2.1 Designing For Prevention, Reuse and Recycling**

The following aspects were investigated during the preliminary design stage of the proposed development:

- Establishing the potential for any reusable site assets (structures, equipment, materials, soils, etc.);
- Assessing any existing structures/hardstanding areas on the site that can be refurbished either in part or wholly; and
- Enabling the optimum recovery of materials on site, and where materials cannot be reused, recycling is given precedence above transporting materials to waste storage facilities.

### **2.2 Designing for Green Procurement**

Waste prevention measures such as the reuse of materials and the off-site fabrication of the bridges has been incorporated into the preliminary design of the proposed development. During the detailed design stage where material quantities will be finalised, further measures to reduce wastes will be implemented into the contract documents. The measures included are systems such as 'Just-in-Time' delivery and specific ordering procedures that avoid the creation of excessive waste.

### **2.3 Designing for Off-Site Construction**

Use of off-site manufacturing has been shown to reduce residual wastes by up to 90% (volumetric building versus traditional). The decision to use off-site construction is typically cost led but there are significant benefits for resource management.

### **2.4 Designing for Materials Optimisation During Construction**

To ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite. This helps to reduce the environmental impacts associated with transportation of materials and from waste management activities. This includes investigating the use of standardised sizes for certain materials to help reduce the amount of off-cuts produced on site, focusing on promotion and development of off-site manufacture.

### **2.5 Designing for Flexibility and Deconstruction**

Design flexibility has and will be investigated throughout the design process to ensure that where possible products (including bridges) only contain materials that can be recycled and are designed to be easily disassembled. Material efficiency is being considered for the duration and end of life of a building project to produce; flexible, adaptable spaces that enable a resource-efficient, low-waste future change of use; durability of materials and how they can be recovered effectively when maintenance and refurbishment are undertaken and during disassembly/deconstruction.

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## 3 Description of the Proposed Development

### 3.1 Project Description

The Suir Island Infrastructure site is located in centre of Clonmel, with the development encompassing areas of The Quays, Suir Island and Raheen Road. Refer to Figure 3-1 for the locality and site extent map.

The proposed development will consist of:

- Two pedestrian bridges, the first bridge linking the proposed North Plaza on The Quay/Quay St/Sarsfield St Junction to Suir Island, and the second bridge connecting Suir Island to Raheen Road.
- Provision of a new public open space called the North Plaza which will be aligned with Sarsfield Street. The steps and ramp will be visible from O'Connell Street creating a new landmark in the town of Clonmel and will encourage pedestrian movement towards the River Suir. The bicycle access ramp is designed to be as transparent as possible so as not to block the view of Suir Island from Sarsfield Street. This plaza is an ideal setting for impromptu performances and social gathering.
- Modification of traffic direction and carriageway width around the North Plaza and The Quay and Quay St.
- Provision of a bus stop on the western side of the North Plaza located in Quay Street with five benches providing comfortable facilities for public transport users.
- Upgrading of the existing 2-metre-wide sidewalk along The Quay Street into a 4-metre-wide shared pedestrian/cycle path which will provide unencumbered access to the proposed plaza area underneath the elevated access ramp.
- Provision of a sloping landscaped terrace with public seating, located inside the hairpin-shaped access ramp leading up to the northern bridge crossing, offering unencumbered views of the plaza area.
- Provision of three benches and a 9-metre-long stepped promenade seating area integrated into the circular-shaped plaza, offering exceptional views of the proposed development.
- Planting of various native tree species around the North Plaza to integrate the proposed development with the existing scenery of Suir Island and complement the visual experience of users.
- Installation of a 4-metre-wide curved pedestrian bridge, which allow users to discover the island 'from up high' by walking seamlessly between the trees while linking the project elements (Sarsfield Street, the berm embankment, and the south riverbank) along one sinuous route. The first bridge follows the geometry of Sarsfield Street and arrives on the island following the line of the berm embankment, which then links onto the second bridge facilitating a link to Denis Burke Park on Raheen Road, creating a direct connection for pedestrians/cyclists between the park and the Town Centre.
- Provision of a pedestrian path or promenade along the existing berm embankment across Suir Island linking the two pedestrian bridges, to facilitate access between Denis Burke Park on Raheen Road and the proposed North Plaza on The Quay.
- Construction of a pedestrian/bicycle ramp from the link promenade onto Suir Island Carpark. The ramp is fully integrated into the landscape by using the existing slope of the berm.
- Construction of three sets of steps connecting the link promenade to Suir Island carpark and the eastern end of Suir Island.
- Provision of a mini public space within Suir Island Carpark at the entrance to the proposed Suir Island Gardens.
- Provision of a south arrival point for the second bridge connecting Suir Island to the Raheen Road. The South Arrival Point will consist of one access ramp to the east and one set of steps to the west, integrated with the bridge landing level and running parallel to the footpath. These elements will be located outside the existing flood barrier.

- Road improvements for the safety of pedestrians/cyclists at the South Arrival Point, including the footpaths being widened and the road narrowed to accommodate 3.0-metre-wide lanes. Removal of three carparking spaces from the southern edge of the road to allow for wider footpaths.
- Installation of two uncontrolled pedestrian crossings positioned at either ends of the proposed access ramp and flight of steps to provide traffic calming at the South Arrival Point. This bridge arrival point will be located close to the school entrance of Raheen College, providing safe and convenient access for the schoolchildren.
- Access ramps and steps are located behind the flood barriers to allow access even during flood events.
- Construction of a new foul pumping station to be located within Suir Island car park which will facilitate future Irish Water connections. Wastewater will be pumped 0.1km approx. via rising main along the proposed bridge linking Suir Island to the proposed North Plaza where it will connect into the existing public network along The Quay.
- Ancillary site development works to include, but not limited to, surface water drainage, lighting and associated electrical works, hard and soft landscaping, road works to include surfacing and line marking, landscaping and installation of street furniture.
- All associated site works.

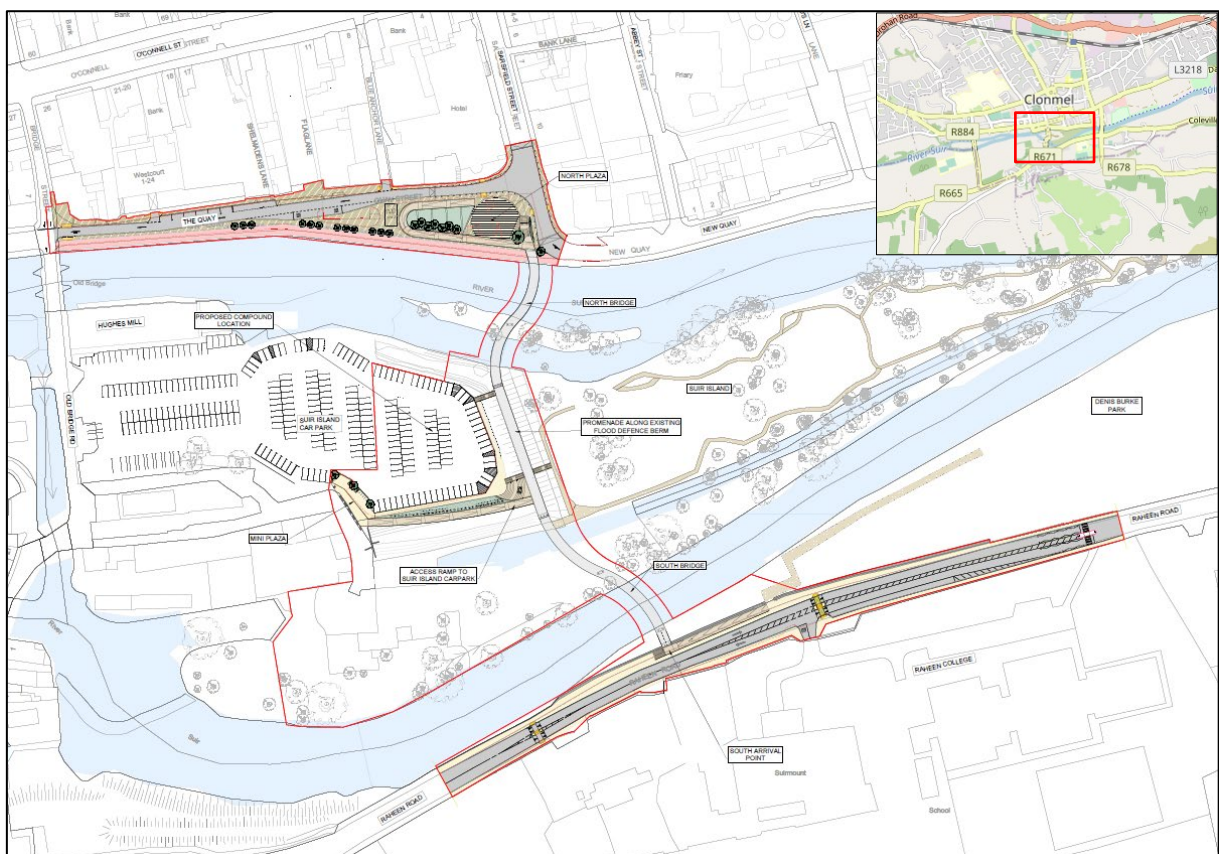


Figure 3-1: Site location and development extents map

### 3.2 Project Programme and Phasing

It is anticipated that the construction of the proposed development will be progressed as a single construction contract with the construction phase lasting approximately 18 months. The construction start date is envisaged for spring or early summer when the Suir River is not in spate and flood risk is reduced when constructing the bridge foundations located within the floodplain.



## 4 Waste Management Strategy

### 4.1 Scope

The Contractor will develop a RWMP which will detail the following but not limited to:

- Licensing of Waste Disposal Facilities;
- Site clearance quantities and areas;
- Excavations and disposal of materials;
- Importation, stockpiling and placing of fill;
- Reuse of construction materials sourced from the site;
- Recycling of materials not used, thus reducing waste volumes;
- Construction vehicle management; and
- Dust and noise reduction measures.

### 4.2 Waste and Recycling Management

The management of construction and demolition waste will reflect the waste management hierarchy, with waste prevention and minimisation being the first priority, followed by reuse and recycling. During site clearance and construction works, there are numerous opportunities for the beneficial reuse and recycling of materials. The subsequent use of recycled materials in construction works also reduces the quantities of waste which ultimately needs to be consigned to landfill sites.

The Contractor will develop and implement a plan and manage all waste with a goal of achieving the waste hierarchy in accordance with the relevant statutory provisions as shown in Figure 4-1.

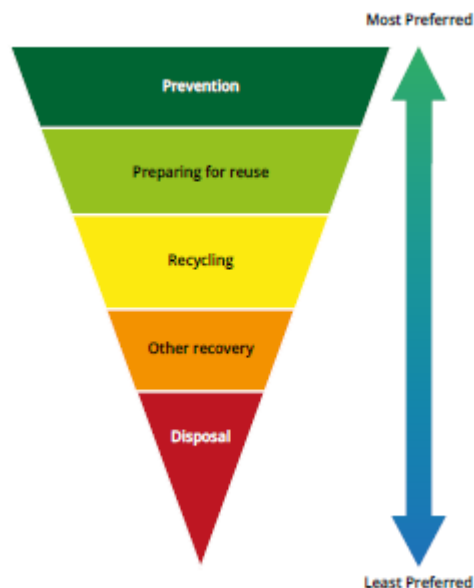


Figure 4-1: Waste Management Hierarchy as outline in the EPA Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects (2021)

#### Source Segregation

Wastes generated on the construction site will be identified and segregated according to their respective categories, as described by the European Waste Catalogue (EWC). Where possible, metal, timber,

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glass and other recyclable material will be segregated and removed off-site to a permitted/licensed facility for recycling.

In order to achieve this, designated waste storage areas will be created at the construction compound or other suitable locations for the storage of segregated wastes prior to transport for recovery/disposal at suitably licensed/permitted facilities. Suitably sized containers for each waste stream will be provided within the waste storage area and will be supervised by the Resource and Waste Manager who will be appointed by the Main Contractor. This will be the person responsible for the management of waste during the construction of the Suir Island Infrastructure Links project. The number and sizing of containers will be agreed with Waste Contractors in advance of construction works commencing. Source segregation of waste will result in cost savings to the project as well as providing an environmentally sound route for the management of all construction and demolition wastes.

### **Reuse**

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. Ground Investigations (GI) included Waste Acceptance Criteria testing. All samples fall within either the non-hazardous or inert limits. Some localised elevated levels of hydrocarbons (PAH) and heavy metals (Arsenic) are expected during construction phase, specifically in locations along the River Suir riverbed. Where excavated material is not to be reused within the works, the Contractor will endeavour to send material for recovery or recycling so far as is reasonably practicable. The Contractor will ensure that, if required, any off-site interim storage facilities for excavated material have the appropriate waste licences or waste facility permits in place.

### **Material Management**

In order to prevent and minimise the generation of waste, the Contractor will be required to ensure that raw materials are ordered so that the timing of delivery, the quantity delivered, and the storage is not conducive to the creation of unnecessary waste. The Contractor, in conjunction with the material suppliers, will be required to develop a programme showing the estimated delivery dates and quantities for each specific material associated with each element of construction and demolition works.

It is essential that the planning, construction and demolition works are undertaken in close collaboration with waste management contractors, in order to determine the best techniques for managing waste and to ensure an efficient recovery of materials for recycling. The Contractor will be required to continuously seek to improve the waste management process on-site during all stages of construction and maximise opportunities for reuse and recycling where they exist. The RWMP will be included as an agenda item at the weekly construction meetings. In addition, the plan will be communicated to the whole team (including the Client) at the monthly meetings. This will include any updates to earlier versions of the document.

### **Waste Auditing**

The 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 from the construction phase are delivered will be recorded along with the quantity of waste (in tonnes) delivered to each facility. Records will show all material recovered and disposed of.

The waste management strategy for the project will follow the accepted waste hierarchy and the Contractor will implement the following types of measures to reduce waste and maximize opportunities for recycling, insofar as practicable:



- 
- Materials for construction activities will be ordered as to require the minimum possible storage time;
  - Materials will be ordered, where possible, in correct quantities to prevent wastage;
  - Appointment of a Resource and Waste Manager, who will be responsible for handling, storage and delivery of materials to the proposed development;
  - Ensure that stored material is protected from damage from plant and environmental factors such as rain and wind;
  - Secure storage areas to prevent unauthorised access;
  - Establish a waste management compound to handle incoming waste from construction activities – this should facilitate the segregation of key waste streams to maximise the opportunity to re-use, recycle and return wastes generated on-site;
  - Provide a separate secured area for dealing with hazardous waste; and,
  - Provide separate facilities for the storage of fuels and chemicals.

## 5 Waste Streams Identification

### 5.1 Non-Hazardous Waste Streams

There will be soil, stones, clay and made ground excavated to facilitate construction of the development. It is estimated that 2,000m<sup>3</sup> of material will need to be excavated during the construction works. It is currently envisaged that 500m<sup>3</sup> will be able to be retained and reused onsite for landscaping and fill, the remaining material, will need to be removed offsite due to the limited opportunities for reuse on site. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and supply of materials will also be generated. The contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided on site during the construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

A general list of non-hazardous wastes which will arise from the construction works are:

- Topsoil, sub-soil, stones, made ground fill from excavations;
- Excess new concrete and bricks;
- Excess asphalt and tar products;
- Scrap metal;
- Cardboard and other packaging;
- Plastic including wrapping and packaging;
- Waste wood;
- Paper;
- Glass;
- Waste from portable toilets;
- Canteen and food wastes; and
- Damaged materials.

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## **5.2 Potentially Hazardous Waste Streams**

### **Contaminated Soil**

Site investigations and environmental soil testing were undertaken by Site Investigations Ltd (SIL) in March 2022. Environmental testing was carried out on six samples from the investigation and the results are shown in Appendix 8 of the Site Investigation report (ref 5931) submitted with this application. For material to be removed from site, Suite I (Rilta Suite) testing was carried out to determine if the material is hazardous or non-hazardous and then the leachate results were compared with the published waste acceptance limits of BS EN 12457-2 to determine whether the material on the site could be accepted as 'inert material' by an Irish landfill. Following this analysis of the solid test results, the leachate results generally remained within the Inert thresholds.

The Waste Classification report created using HazWasteOnline™ software shows that the material tested can be classified as non-hazardous material. Two samples did detect total petroleum hydrocarbons above the limit of detection but the level was low and not in the liquid phase so the soils can be classified as non-hazardous. Also, the Chromium VI value from ST03 exceeded the limits of detection and therefore, consultation with an Environmental Engineer is highly recommended and further testing completed if required.

If any potentially contaminated material is encountered, it will need to be segregated from clean / inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' 14 using the HazWasteOnline™ application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC 15, which establishes the criteria for the acceptance of waste at landfills.

In the event that Asbestos Containing Materials (ACMs) are found within the excavated material, the removal will only be carried out by a suitably permitted waste contractor, in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. All asbestos will be taken to a suitably licensed or permitted facility.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase, the contractor will notify TCC and provide a Hazardous / Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal / treatment, in addition to information on the authorised waste collector(s).

### **Fuels/Oils**

Fuels and oils are classed as hazardous materials; any on-site storage of fuel / oil, and all storage tanks and all draw-off points will be bunded and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and the site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel / oil waste generated at the site.

### **Invasive Plant Species**

A site invasive species survey was undertaken by Doherty Environmental in November 2021. This included a site walkover survey of the entire site, and around part of the outside perimeter to search for any invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011.

Evidence of an Japanese Knotweed (*Fallopia japonica*) stand was recorded at the eastern perimeter of the site, and also further into the Lower River Suir SAC area, outside the redline boundary. There was evidence that these have previously been treated over the past number of years.

Doherty Environmental have undertaken initial surveys to understand the extent of the infestation and will produce and Updated Japanese Knotweed Management Plan to manage the Knotweed during the construction and operational phase of the proposed Project, to which the Contractor will be required to adhere. Doherty Environmental Consultants prepared a Non-Native Invasive Species Management Plan for the proposed development which is appended to the Natura Impact Statement (NIS).

### **Other Known Hazardous Substances**

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

In addition, WEEE (containing hazardous components), printer toner / cartridges, batteries (Lead, Ni-Cd or Mercury) and / or fluorescent tubes and other mercury containing waste may be generated from during C&D activities or temporary site offices. These wastes, if generated, will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

## **6 Key Materials And Quantities**

### **6.1 Project Resource Targets**

Project specific resource and waste management targets for the proposed development is highlighted in this section of the RWMP based on the preliminary design. It is not expected that the detailed design stage will result in significant increase in waste volumes. It is expected for projects of this nature that a minimum of 70% of waste is fully re-used, recycled or recovered. Target setting will inform the setting of project-specific benchmarks to track target progress. Typical Key Performance Indicators (KPIs) that may be used to set targets include (as per guidelines):

- Weight (tonnes) or Volume (m<sup>3</sup>) of waste generated per construction value;
- Weight (tonnes) or Volume (m<sup>3</sup>) of waste generated per construction floor area (m<sup>2</sup>);
- Fraction of resource reused on site;
- Fraction of resource notified as by-product;
- Fraction of waste segregated at source before being sent off-site for recycling/recovery; and
- Fraction of waste recovered, fraction of waste recycled, or fraction of waste disposed.

### **6.2 Main Construction and Demolition Waste Categories**

The main non-hazardous and hazardous waste streams that could be generated by the construction activities at a typical site are shown in Table 6-1. The List of Waste (LoW) code (applicable as of 1 June 2015) (also referred to as the European Waste Code (EWC)) for each waste stream is also shown.

*Table 6-1: Typical C&D waste expected from the construction phase of the Proposed Development*

<b>Waste Material</b>	<b>LoW / EWC Code</b>
<b>Concrete, bricks, tiles and ceramics</b>	17 01
<b>Bricks</b>	17 01 01
<b>Tiles</b>	17 01 02
<b>Ceramics</b>	17 01 03
<b>Mixture of concrete, bricks, tiles and ceramics</b>	17 01 07

<b>Wood, glass and plastic</b>	17 02
<b>Wood</b>	17 02 01
<b>Glass</b>	17 02 02
<b>Plastic</b>	17 02 03
<b>Bituminous mixtures, coal tar and products</b>	17 03 01
<b>Bituminous mixtures containing other than those mentioned in 17 03 01</b>	17 03 02
<b>Metals (including their alloys)</b>	17 04
<b>Copper, bronze, brass</b>	17 04 01
<b>Aluminium</b>	17 04 02
<b>Lead</b>	17 04 03
<b>Zinc</b>	17 04 04
<b>Iron and Steel</b>	17 04 05
<b>Tin</b>	17 04 06
<b>Mixed Metals</b>	17 04 07
<b>Souls and stones containing hazardous substances</b>	17 05 04
<b>Soils and stones, other than those mentioned in 17 05 03*</b>	17 06 04
<b>Insulation and Construction Materials</b>	17 06 05
<b>Construction materials containing asbestos</b>	17 08 02
<b>Gypsum based construction material</b>	17 09 04
<b>Mixed C&amp;D waste not mentioned in 17 09 01 to 17 09 03</b>	17 09 04
<b>Paper and cardboard</b>	20 01 01
<b>Wood other than mentioned in 20 01 37</b>	20 01 38
<b>Soil and Stones</b>	20 02 02
<b>Mixed Municipal Waster</b>	20 03 01
<b>Hydraulic oils</b>	13 01 01
<b>Fuel oils and diesel</b>	13 07 01
<b>Aqueous liquid waste other than those mentioned in 16 10 01 (portable toilet wastes)</b>	16 10 02

### 6.3 Demolition Waste Generation

The demolition stage will involve the excavation of hardstanding areas, roads, and curbs. The demolition areas are identified in the planning drawings provided with this application. The anticipated demolition waste and rates of reuse, recycling / recovery and disposal are shown in Table 6-2, below.

Table 6-2: Estimated off-site reuse, recycle and disposal rates for demolition waste

Waste Type	Tonnes	Reuse/Recycle		Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Concrete, Bricks, Tiles, Ceramics	18.0	30	5.4	65	11.7	5	0.9
Asphalts	54.0	0	0.0	25	13.5	75	40.5
<b>Total</b>	<b>72.0</b>		<b>5.4</b>		<b>25.2</b>		<b>41.4</b>

### 6.4 Construction Waste Generation

Table 6-3 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA National Waste Reports and the joint EPA & GMIT study.

Table 6-3: Waste materials generated on a typical Irish construction site

Waste Types	%
Mixed C&D	33
Timber	28
Plasterboard	10
Metals	8
Concrete	6
Other	15
<b>Total</b>	<b>100</b>

Table 6-4, below, shows the estimated construction waste generation for the proposed development based on the gross footprint area of construction and other information available to date, along with indicative targets for management of the waste streams. The estimated amounts for the main waste types (with the exception of soils and stones) are based on an average large-scale development waste generation rate per m<sup>2</sup>, using the waste breakdown rates shown in Table 6-3.

Table 6-4: Predicted on- and off-site reuse, recycle and disposal rates for construction waste

Waste Type	Tonnes	Reuse/Recycle		Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	5.9	10	0.6	80	4.7	10	0.6
Timber	5.0	40	2.0	55	2.7	5	0.2
Metals	1.4	5	0.1	90	1.3	5	0.1
Concrete	1.1	30	0.3	65	0.7	5	0.1
Other	2.7	20	0.5	60	1.6	20	0.5
<b>Total</b>	<b>16.1</b>		<b>3.5</b>		<b>11.0</b>		<b>1.5</b>

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In addition to the waste streams shown in Table 6-3, there will be c. 2,000 m<sup>3</sup> of soil, stones, clay and made ground excavated to facilitate construction of new foundations, underground services, and the installation of public spaces and bridges. Any suitable excavated material will be temporarily stockpiled for reuse as fill and landscaping, where possible, but reuse on site is expected to be limited and all of the excavated material except for 500 m<sup>3</sup> is expected to be removed off-site for appropriate reuse, recovery and / or disposal.

### **6.5 Proposed Waste Management Options**

Waste materials generated will be segregated on-site, where it is practical. Where the on-site segregation of certain wastes types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source, where feasible. All waste receptacles leaving the site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the Tipperary region that provide this service.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring disposal off-site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required.

During construction, some of the sub-contractors on site will generate waste in relatively low quantities. The transportation of non-hazardous waste by persons who are not directly involved with the waste business, at weights less than or equal to 2 tonnes, and in vehicles not designed for the carriage of waste, are exempt from the requirement to have a waste collection permit (per Article 30 (1) (b) of the Waste Collection Permit Regulations 2007, as amended). Any sub-contractors engaged that do not generate more than 2 tonnes of waste at any one time can transport this waste off-site in their work vehicles (which are not designed for the carriage of waste). However, they are required to ensure that the receiving facility has the appropriate Certificate of Registration / permit / licence.

Written records will be maintained by the contractor(s), detailing the waste arising throughout the C&D phases, the classification of each waste type, waste collection permits for all waste contractors who collect waste from the site and Certificate of Registration / permit / licence for the receiving waste facility for all waste removed off-site for appropriate reuse, recycling, recovery and / or disposal

Dedicated bunded storage containers will be provided for hazardous wastes which may arise, such as batteries, paints, oils, chemicals, if required.

The anticipated management of the main waste streams is outlined as follows:

#### **Soil, Stone, Gravel, Clay & Made Ground**

The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The excavations are required to facilitate construction works so the preferred option (prevention and minimisation) cannot be accommodated for the excavation phase.

When material is removed off-site it could be reused as a by-product (and not as a waste). If this is done, it will be done in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011, which requires that certain conditions be met and that by-product notifications are made to the EPA via their online notification form. Excavated material should not be removed from site until approval from the EPA has been received. The potential to reuse material as a by-product will be confirmed during the course of the excavation works, with the objective of eliminating any unnecessary disposal of material.

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The next option (beneficial reuse) may be appropriate for the excavated material, pending environmental testing to classify the material as hazardous or non-hazardous in accordance with the EPA Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous publication. Clean inert material may be used as fill material in other construction projects or engineering fill for waste licensed sites. Beneficial reuse of surplus excavation material as engineering fill may be subject to further testing to determine if materials meet the specific engineering standards for their proposed end use.

Any nearby sites requiring clean fill/capping material will be contacted to investigate reuse opportunities for clean and inert material. If any of the material is to be reused on another site as a by-product (and not as a waste), this will be done in accordance with Article 27. Similarly, if any soils/stones are imported onto the site from another construction site as a by-product, this will also be done in accordance with Article 27. Article 27 will be investigated to see if the material can be imported onto this site for beneficial reuse instead of using virgin materials.

If the material is deemed to be a waste, then removal and reuse / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 as amended, the Waste Management (Collection Permit) Regulations 2007 as amended and the Waste Management (Facility Permit & Registration) Regulations 2007 as amended. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

In the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Transfrontier Shipment of Wastes (TFS).

#### **Bedrock**

While it is not envisaged that bedrock will be encountered, if bedrock is encountered, it is anticipated that it will not be crushed on site. Any excavated rock is expected to be removed off-site for appropriate reuse, recovery and / or disposal. If bedrock is to be crushed on-site, the appropriate mobile waste facility permit will be obtained from TCC.

#### **Silt & Sludge**

During the construction phase, silt and petrochemical interception will be carried out on run-off and pumped water from site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed off-site.

#### **Concrete Blocks, Bricks, Tiles & Ceramics**

The majority of concrete blocks, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and should be recycled, where possible. If concrete is to be crushed on-site, the appropriate mobile waste facility permit will be obtained from TCC.

#### **Hard Plastic**

As hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

#### **Timber**

Timber that is uncontaminated, i.e. free from paints, preservatives, glues, etc., will be disposed of in a separate skip and recycled off-site.



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### **Metal**

Metals will be segregated, where practical, and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

### **Glass**

Glass materials will be segregated for recycling, where possible.

### **Waste Electrical & Electronic Equipment (WEEE)**

Any WEEE will be stored in dedicated covered cages / receptacles / pallets pending collection for recycling.

### **Other Recyclables**

Where any other recyclable wastes, such as cardboard and soft plastic, are generated, these will be segregated at source into dedicated skips and removed off-site.

### **Non-Recyclable Waste**

C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip / receptacle will be examined by a member of the waste team (see Section 9.0) to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

### **Asbestos Containing Materials**

Any asbestos or ACM found on-site should be removed by a suitably competent contractor and disposed of as asbestos waste before the demolition works begin. All asbestos removal work or encapsulation work must be carried out in accordance with S.I. No. 589 of 2010 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.

### **Other Hazardous Wastes**

On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and / or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.

### **On-Site Crushing**

It is currently not envisaged that the crushing of waste materials will occur on-site. However, if the crushing of material is to be undertaken, a mobile waste facility permit will first be obtained from TCC, and the destination of the accepting waste facility will be supplied to the TCC waste unit.

## **7 Roles and Responsibilities**

The Best Practice Guidelines on the Preparation of Resource Waste Management Plans for Construction and Demolition Projects promotes that a Resource and Waste Manager should be appointed. The Resource and Waste Manager may be performed by number of different individuals over the life-cycle of the Project; however it is intended to be a reliable person chosen from within the Planning/Design/Contracting Team, who is technically competent and appropriately trained, who takes the responsibility to ensure that the objectives and measures within the Project RWMP are complied with. The Resource and Waste Manager is assigned the requisite authority to meet the objective and

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obligations of the RWMP. The role will include the important activities of conducting waste checks/audits and adopting construction and demolition methodology that is designed to facilitate maximum reuse and/or recycling of waste.

### **7.1 Role of the Tipperary County Council**

The Client is the body establishing the aims and the performance targets for the project.

- The Client has commissioned the preparation and submission of this outline RWMP as part of the design and planning submission;
- The Client is to commission the preparation and submission of an updated RWMP as part of the construction tendering process;
- The Client will ensure that the RWMP is reviewed by competent persons and submitted to the local authority prior to commencement of works on site;
- The Client is to request the end-of-project RWMP from the Contractor.

### **7.2 Role of the Client Advisory Team**

The Client Advisory Team or Design Team is formed of architects, consultants, quantity surveyors and engineers and is responsible for:

- Drafting and maintaining the RWMP through the design, planning and procurement phases of the project;
- Appointing a Resource and Waste Manager to track and document the design process, inform the Design Team and prepare the RWMP.
- Including details and estimated quantities of all projected waste streams with the support of environmental consultants/scientists. This should also include data on waste types (e.g. waste characterisation data, contaminated land assessments, site investigation information) and prevention mechanisms (such as by-products) to illustrate the positive circular economy principles applied by the Design Team;
- Managing and valuing the demolition work with the support of quantity surveyors;
- Handing over of the RWMP to the selected Contractor upon commencement of construction of the development, in a similar fashion to how the safety file is handed over to the Contractor;
- Working with the Contractor as required to meet the performance targets for the project.

### **7.3 Future Role of the Contractor**

The future demolition and construction Contractors have not yet been decided upon for this RWMP. However, once select they will have major roles to fulfil. They will be responsible for:

- Preparing, implementing and reviewing the (including the Pre-Demolition) RWMP throughout the demolition and construction phases (including the management of all suppliers and sub-contractors) as per the requirements of these guidelines;
- Identifying a designated and suitably qualified Resource and Waste Manager who will be responsible for implementing the RWMP;
- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- Implementing waste management policies whereby waste materials generated on site are to be segregated as far as practicable;
- Identifying and using suppliers with a track record of using sustainable procurement and manufacturing processes;
- Applying for the appropriate waste permits for construction materials recycling and wastes;

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- Identifying all destinations for resources taken off-site. As above, any resource that is legally classified as a 'waste' must only be transported to an authorised waste facility;
  - End-of-waste and by-product notifications addressed with the EPA where required;
  - Clarification of any other statutory waste management obligations, which could include on-site processing;
  - Full records of all resources (both wastes and other resources) should be maintained for the duration of the project; and
  - Preparing a RWMP Implementation Review Report at project handover.

## 8 Training

A member of the construction team will be appointed as the Resource and Waste Manager to ensure commitment, operational efficiency and accountability in relation to waste management during the C&D phases of the development.

### **Resource Manager Training and Responsibilities**

The nominated Resource and Waste Manager will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid them in the organisation, operation and recording of the waste management system implemented on site.

The Resource and Waste Manager will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the Resource and Waste Manager to delegate responsibility to sub-contractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The Resource and Waste Manager will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on site. The Resource and Waste Manager will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and be knowledgeable in how to implement this RWMP.

### **Site Crew Training**

Training of site crew in relation to waste is the responsibility of the Resource and Waste Manager and, as such, a waste training program should be organised. A basic awareness course will be held for all site crew to outline the RWMP and to detail the segregation of waste materials at source. This may be incorporated with other site training needs such as general site induction, health and safety awareness and manual handling.

This basic course will describe the materials to be segregated, the storage methods and the location of the Waste Storage Areas (WSAs). A sub-section on hazardous wastes will be incorporated into the training program and the particular dangers of each hazardous waste will be explained.

### **8.1 Waste Records**

The Contractor shall capture the full details of all wastes generated, stored, segregated and transported during all stages of the proposed construction works. Each consignment of construction and demolition wastes removed from the site will be documented in the form of a Waste Movement Record form, which will ensure full traceability of the material to its final destination. Separate record forms will be completed in respect to each waste transfer that takes place. The Contractor shall receive printed documents/records from waste disposal companies utilised, which quantifies the exact volume/weight of waste material removed from site. The sheet from the retrieval/transport company shall identify

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volumes of wastes transported to disposal and/or recycling facilities. All such records will be retained in a designated location and made available for auditing of the RWMP.

Consultations with waste contractors and Tipperary County Council throughout the construction phase shall be pursued by the Contractor to ensure best practices for waste management are being followed.

A waste tracking log should be used to track each waste movement from the site. On exit from the site, the waste collection vehicle driver should stop at the site office and sign out as a visitor and provide the security personnel or Resource and Waste Manager with a waste docket (or Waste Transfer Form (WTF) for hazardous waste) for the waste load collected. At this time, the security personnel should complete and sign the Waste Tracking Register with the following information:

- Date
- Time
- Waste Contractor
- Company waste contractor appointed by, e.g. Contractor or subcontractor name
- Collection Permit No.
- Vehicle Reg.
- Driver Name
- Docket No.
- Waste Type
- EWC / LoW

The waste vehicle will be checked by security personal or the Resource and Waste Manager to ensure it has the waste collection permit no. displayed and a copy of the waste collection permit in the vehicle before they are allowed to remove the waste from the site.

The waste transfer dockets will be transferred to the Resource and Waste Manager on a weekly basis and can be placed in the Waste Tracking Log file. This information will be forwarded onto the TCC Waste Regulation Unit when requested.

Each subcontractor that has engaged their own waste contractor will be required to maintain a similar waste tracking log with the waste dockets / WTF maintained on file and available for inspection on site by the main contractor as required. These subcontractor logs will be merged with the main waste log.

Waste receipts from the receiving waste facility will also be obtained by the site contractor(s) and retained. A copy of the Waste Collection Permits, Certificate of Registrations, Waste Facility Permits and Waste Licences will be maintained on site at all times and will be periodically reviewed by the Resource and Waste Manager. Subcontractors who have engaged their own waste contractors, should provide the main contractor with a copy of the waste collection permits and Certificate of Registration / permit / licence for the receiving waste facilities and maintain a copy on file, available for inspection on site as required.

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## 9 Outline Waste Audit Procedure

### 9.1 Responsibility of Waste Audits

The appointed Resource and Waste Manager will be responsible for conducting a waste audit at the site during the C&D phase of the proposed Project. Contact details for the nominated Resource and Waste Manager will be provided to the TCC Waste Regulation Unit after the main contractor is appointed and prior to any material being removed from site.

### 9.2 Review of Records and Identification of Corrective Actions

A review of all waste management costs and the records for the waste generated and transported off-site should be undertaken mid-way through the demolition and construction phase of the proposed Project.

If waste movements are not accounted for, the reasons for this should be established in order to see if and why the record keeping system has not been maintained. The waste records will be compared with the established recovery / reuse / recycling targets for the site. Each material type will be examined, in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved.

Upon completion of the C&D phase, a final report will be prepared, summarising the outcomes of waste management processes adopted and the total recycling / reuse / recovery figures for the development.

## 10 Consultation with Relevant Bodies

### 10.1 Local Authority

Once construction contractors have been appointed and have appointed waste contractors, and prior to removal of any C&D waste materials off-site, details of the proposed destination of each waste stream will be provided to the TCC Waste Regulation Unit.

TCC will also be consulted, as required, throughout the demolition, excavation and construction phases in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out.

### 10.2 Recycling/Salvage Companies

The appointed waste contractor for the main waste streams managed by the demolition and construction contractors will be audited in order to ensure that relevant and up-to-date waste collection permits and facility registrations / permits / licences are held. In addition, information will be obtained regarding the feasibility of recycling each material, the costs of recycling / reclamation, the means by which the wastes will be collected and transported off-site, and the recycling / reclamation process each material will undergo off-site.

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## 11 References

- Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
- DCCAE, Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021)
- Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
- Department of Environment and Local Government (DoELG) Waste Management – Changing Our Ways, A Policy Statement (1998).
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- Environmental Protection Agency (EPA) 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' ( 2021)
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- EPA and Galway-Mayo Institute of Technology (GMIT), EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015).
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- FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002).
- Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
- Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended
- Southern Region Waste Management Plan 2015 – 2021 (2015).
- TCC, Tipperary Development Plan 2022 – 2028
- Tipperary County Council (TCC), South Tipperary County Development Plan 2009-2015 (as varied 2017)
- Waste Management Act 1996 (No. 10 of 1996) as amended.



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