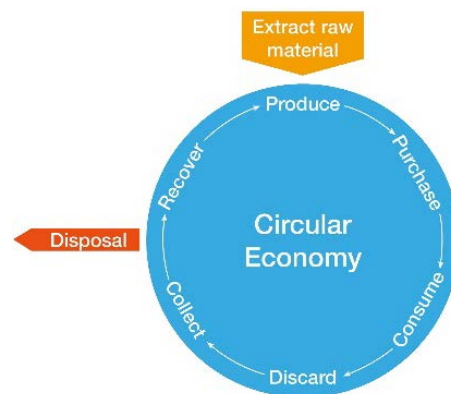


## 13 Resource and Waste Management

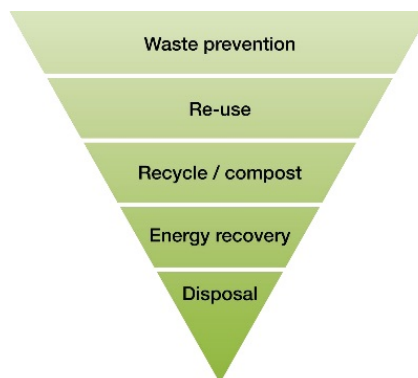
### 13.1 Introduction

This chapter of the EIA describes the potential for waste to be generated during the excavation, construction and operation of the Proposed Project. Mitigation measures are proposed to reduce the impact of the waste generated by the Proposed Project in the excavation, construction and operational phases.

The principal objective of sustainable resource and waste management is to use material resources more efficiently, where the value of products, materials and resources are maintained in the economy for as long as possible and the generation of waste minimised. To achieve resource efficiency there is a need to move from a traditional linear economy to a circular economy (See **Figure 13.1**).



**Figure 13.1: Circular Economy**



**Figure 13.2: Waste Hierarchy**

However, where residual waste is generated, it should be dealt with in a way that follows the waste hierarchy (see **Figure 13.2**) and actively contributes to the economic, social and environmental goals of sustainable development.

This chapter of the EIA examines the potential environmental effects of the generation and management of solid waste streams arising from the Proposed Project, in the context of the existing local and national resource and waste management environment. The Proposed Project is located within the Local Authority of Dublin City Council (DCC)-South East Area.

## 13.2 Assessment Methodology

### 13.2.1 General

This Chapter is based on the Proposed Project, as described in Chapter 4 ‘*Proposed Project Description*’. This section sets out the methodology followed in carrying out this resource and waste impact assessment. This resource and waste management assessment considers the following aspects:

- The legislative context;
- The construction phase, including excavation; and
- The operational phase.

A review was undertaken which included the following tasks:

- Review of relevant policy and legislation which creates the legal framework for resource and waste management in Ireland (refer to **Appendix 13.1**), including the Eastern - Midlands Regional Waste Management Plan 2015-2021;
- Description of waste generation during the construction and operational phases; and
- The Proposed Project was systematically reviewed to identify mitigation and move waste management up the waste hierarchy through implementation of best practice (refer to the aforementioned **Figure 13.1** and **Appendix 13.1**).

### 13.2.2 Guidance and Legislation

Resource and waste management takes place in a policy and legislative framework. A review of relevant legislation, policy and best practice guidance was undertaken to inform the impact assessment and recommended mitigation.

The key components of EU, national and local policy, legislation and guidance relevant to the Proposed Project (see **Appendix 13.1**) are summarised as follows:

- Prevention of waste is the preferred option such that the value of products, materials and resources are maintained in the economy for as long as possible and the generation of waste minimised;
- Where construction waste is generated it should be source separated to facilitate reuse, recycling and maximise diversion of waste from landfill;
- Where waste may not be prevented, reused or recycled it should be transported and disposed of in accordance with applicable legislation and without causing environmental pollution;
- Waste may only be transferred from the Proposed Project by a waste collection permit holder and delivered to an authorised waste facility (a facility which holds a certificate of registration, waste facility permit or waste licence); and
- Businesses must keep footpaths, pavements and gutters adjacent to premises litter free. Organisers of major events also have responsibilities in relation to collection and management of litter resulting from events.

### 13.2.3 Impact Assessment Methodology

Impacts significance and rating is as set out in the EIAR guidance documents described in Chapter 1 ‘Introduction’.

## 13.3 Baseline Environment

The Proposed Project is located within the Local Authority of Dublin City Council (DCC)-South East Area.

In order to establish a baseline and review capacity in relation to construction wastes a review of published data and statistics was undertaken.

The most recent figures published by the Environmental Protection Agency relating to construction and demolition (C&D) waste are for the year 2011 with some limited hazardous construction and demolition waste data published relating to the year 2012. Approximately 3 million tonnes of this was soil and stones. In addition, just over 1 million tonnes of ‘other’ C&D waste was generated, and comprised metal, wood, glass etc.

From 2010 to 2011 there was a 10% decrease in the total quantity of construction waste collected in Ireland. C&D waste collection has decreased annually from a peak of almost 18 million tonnes in 2007. This decrease is reflective of the significant downturn which occurred in the construction industry at this time. In addition, the EPA reported that in 2012, excluding natural and stone waste, 97% by weight of C&D was prepared for reuse, recycling and other material recovery (including beneficial backfilling using waste as a substitute).

The quantity of C&D waste managed in Ireland is indicative of economic activity. At the peak of the economic and construction boom in 2007, approximately 17.8 million tonnes of C&D waste was collected for treatment. This fell to 3 million tonnes in 2011. Preliminary data for 2014 indicate increases in construction and demolition waste generation since 2011, most likely as a result of economic growth. 3.31 million tonnes of construction and demolition waste was generated in 2014 according to preliminary EPA data. The EPA notes in its Report “Ireland’s Environment –An Assessment 2016” that *“With a government policy focus on the provision of social housing, major road infrastructural projects and the new children’s hospital, C&D waste generated will increase again in the coming years.”*

The national policy document, Changing Our Ways (Department of the Environment and Local Government, 1998), sets a target of 85% recycling of C&D waste by 2013. More recently the 2008 EU Waste Framework Directive sets a target of 70% by weight for C&D wastes. As such, with a recovery rate of 97% in 2012, Ireland exceeded the targets by a considerable margin.

An indicative breakdown of the composition of construction and demolition waste is set out in **Table 13.1** below. These figures should be considered as a guide only- as construction and demolition waste can vary depending on the nature of the development and waste can vary significantly from one project to another, depending on the nature of the development and the waste management practises employed on-site.

**Table 13.1: Composition of Construction and Demolition Waste (Non-Hazardous)**

Category	Composition
Soil and Stone	45%
Concrete, brick, tiles and ceramics	31%
Asphalt / Tar	1%
Metals	6%
Wood	7%
Other	10%

The construction sector also generates hazardous waste such as lead-acid batteries, waste electrical and electronic equipment, asbestos solvent-based paints and varnishes, pesticides and waste oils.

### 13.3.1 Operational Wastes

Wastes generated during the operational phase typically comprise municipal waste from waste receptacles at the College Green area and adjoining streets.

## 13.4 Characteristics of the Proposed Project

### 13.4.1 Introduction

Dublin City Council are committed to sustainable waste management and the waste management hierarchy set out in the WU Waste Framework Directive (Directive 2008/98/EC). This waste management hierarchy is as follows:

- Prevention;
- Preparing for reuse;
- Recycling;
- Recovery; and
- Disposal.

Waste prevention and minimisation is the most environmentally sustainable means of managing excavated material and construction wastes. Prevention and minimisation of waste is inherent in the design of the Proposed Project and where feasible architectural features will be retained and reused within the Proposed Project.

A significant proportion of surplus excavation material from the Proposed Project will consist of inert construction waste and soil and stones which can be accepted for recovery and recycling at EPA licenced and permitted facilities. Off-site recycling/ recovery activities can include:

- Processing of stone to produce construction aggregate;
- Infilling of quarries; and
- Raising land for site improvement or development.

The option of delivery of inert uncontaminated material for disposal to landfill is the least desirable destination for surplus material generated by the Proposed Project and will only be considered where sufficient capacity cannot be secured at appropriately licensed/permitted facilities for recovery purposes. It is unavoidable that a small percentage of excavation material, due to the presence of contaminants will have to be disposed of off-site. All material presented for disposal will have to meet the receiving sites waste acceptance criteria.

Research was undertaken to determine if licensed capacity is likely to exist at authorised and regulated facilities for acceptance of surplus material generated from the Proposed Project. The case studies presented in **Appendix 13.2** identify a number of named facilities. The identified facilities merely represent a subset of the total number of facilities available in the Greater Dublin Area. The case studies are provided for demonstrative purposes and it will be responsibility of the Contractor to secure agreements for acceptance of the surplus spoil in similar authorised and regulated facilities, in accordance with Waste Management legislation and requirements.

There is considered to be adequate capacity in the region to receive the wastes likely to be generated by the construction and operation of the Proposed Project.

### 13.4.2 Demolition Phase

There will be no demolition required as part of the Proposed Project.

### 13.4.3 Reuse and Relocation of Architectural Heritage Features

A number of architectural heritage features will be temporarily removed from College Green, carefully and appropriately stored during the proposed works and reused within the Proposed Project. These include the following:

- Statues including the Henry Grattan statue and Thomas Davis memorial which occupy the central reservation which will be repositioned. Two decorative lamps including seahorse sculptures which are “part of the assemblage” of the Henry Grattan statue will be relocated along with the statue;
- The four angels fountain which occupies the central reservation; and
- The existing flags and cobbles in Foster Place which will be re-laid within the Proposed Project.

## 13.5 Predicted Impacts

### 13.5.1.1 Do Nothing Scenario

The resource and waste management impact assessment assumes that under the “Do Nothing” scenario the Proposed Project will not be developed. Consequently, there will be a neutral impact on resource and waste management.

### 13.5.2 Excavation Phase

An estimated 15,172 m<sup>3</sup> material will be excavated in the course of the works. A summary of excavated material is included in **Table 13.2** below.

A significant proportion of the surplus excavation material from the project is likely to consist of soil and stones which may be accepted for recovery or recycling at waste licenced and permitted facilities. Case studies of authorised facilities which accept excavation soil and stones and construction waste in the region are described in **Appendix 13.2**. The Contractor may use these facilities or other similar authorised facilities for recovery or disposal of excavation soil and stones from the Proposed Project.

**Table 13.2: Estimated Quantity of Excavation, Material Reuse and Removal from Site resulting from the Proposed Project**

<b>Material</b>	<b>Estimated volume for excavation resulting from the Proposed Project requiring removal from site (m<sup>3</sup>)</b>
<b><u>Road/pathway materials (made ground)</u></b>	
Generated by open excavations	7,586
<b>Topsoil</b>	
Generated by open excavations	7,586
<b>Total volume</b>	<b>15,172</b>
<b>Estimated total weight (tonnes)</b>	<b>36, 512</b>

All excavated material which cannot be reused within the proposed development will be removed from site.

Where contaminated soil is encountered this will be delivered to appropriately licenced waste facilities for recovery/ disposal as appropriate.

The predicted impacts of excavation waste prior to implementation of mitigation measures is expected to be moderate, negative and short-term.

### 13.5.3 Construction Phase

Construction works, site offices and temporary works facilities are likely to generate construction waste. Construction waste is defined as waste which arises from construction and renovation activities. Also included within the definition are surplus and damaged products and materials arising in the course of construction work or used temporarily during the course of on-site activities.

Construction waste can vary significantly from site to site but typically would include the following non-hazardous fractions:

- Soil and stone.
- Concrete, brick, tiles and ceramics.
- Asphalt/tar.
- Metals.
- Wood.
- Other.

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

- Waste electrical and electronic components.
- Batteries.
- Asbestos.
- Wood preservatives.
- Liquid fuels.
- Contaminated soil.

In the case of the Proposed Project the most likely type of construction waste will be surplus concrete and unusable or damaged construction materials such as paving slabs.

Case studies of authorised facilities which accept excavation soil and stones and construction waste in the region are described in **Appendix 13.2**.

The predicted impact of construction waste prior to implementation of mitigation measures is expected to be slight, negative and short-term.

### 13.5.4 Operational Phase

Wastes generated during the operational phase will typically comprise municipal waste from litter bins and located on the civic plaza and street sweeping of the plaza by Dublin City Council. Management of litter is described below and overleaf.

#### Litter Bins

- Litter bins are placed throughout Dublin City Centre including College Green. Bins in the city centre are serviced/emptied a number of times per day due to high usage and prominent location. A specialised crew look after the maintenance and repair of bins across the City. **Figure 13.3** shows the model of bin which is currently in use in College Green.
- The Dublin City Council Litter Management Plan 2016-2018 notes that the use of “*smart litter bins using GPS and GIS technology will be assessed, piloted and adopted if feasible*”. Smart litter bin models can include solar powered compactors which reduce bin collection frequency. Models can also be purchased which include sensors and can communicate with waste collection teams over wireless mobile phone networks. Typically, notification is by e-mail or text message when bins are 85% full and require collection.

The use of Smart bins as part of the Proposed Project will be considered by Dublin City Council. An example of a smart bin is shown in **Figure 13.4** below.



## Street Sweeping

- Within the Dublin City Council area streets are organised into street sweeping categories. College Green is included in Category A which includes main city centre streets and high footfall areas. Category A streets are a priority of Dublin City Council and are swept daily. This level of sweeping is expected to be retained at the proposed plaza.
- An intensive street washing programme is implemented by Dublin City Council from April to October every year. This level of washing is expected to be retained at the proposed plaza.

The predicted impacts of operational waste prior to implementation of mitigation measures is expected to be imperceptible.

## 13.6 Mitigation Measures

### 13.6.1 Construction and Demolition Waste Management Plan

#### 13.6.1.1 Introduction

A CDWMP plan will be required to be developed by the Main Contractor(s) following appointment and prior to commencing works on site. The CDWMP addresses waste generation and arrangements made for prevention, reuse, recycling disposal and collection of recyclables and wastes. The CDWMP will be prepared in line with the *DoEHLG Best Practise Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects*.



### 13.6.1.2 Outline Construction and Demolition Waste Management Plan (CDWMP)

The following is an indicative list on the content of a CDWMP:

- Description of the Proposed Project;
- Wastes arising including proposals for minimisation/reuse/recycling;
- Procedures for prevention, reuse and recycling of wastes;
- Estimated cost of waste management;
- Roles including training and responsibilities for C&D Waste;
- Procedures for education of workforce and plan dissemination programme
- Record keeping procedures;
- Waste collectors, recycling and disposal sites including copies of relevant permits or licences; and
- Waste auditing protocols.

Using the information identified in this section and the outline Construction Environmental Management Plan in **Appendix 4.1** as a basis, the Contractor will be required to develop, implement and maintain a CDWMP for the construction phase of the Proposed Project.

### 13.6.2 Construction- General

In addition to the inherent design measures during the construction phase the following mitigation measures are proposed:

- The Contractor will minimise waste disposal so far as is reasonably practicable.
- Waste from the Proposed Project will be transported by authorised waste collectors in accordance with the Waste Management (Collection Permit) Regulations, 2007 as amended.
- Waste from the Proposed Project will be delivered to authorised waste facilities in accordance with the Waste Management Acts 1996 as amended.
- Source Segregation: Where possible metal, timber, glass and other recyclable material will be segregated during construction works and removed off site to a permitted/licensed facility for recycling. Waste stream colour coding, and photographs of wastes to be placed in each container as required, will be used to facilitate segregation. Where waste generation cannot be avoided this will maximise the quantity and quality of waste delivered for recycling and facilitate its movement up the waste hierarchy away from landfill disposal and reduce its environmental impact.
- Material Management: ‘Just-in-time’ delivery will be used so far as is reasonably practicable to minimise material wastage.
- Supply Chain Partners: The Contractor will engage with the supply chain to supply products and materials that use minimal packaging, and segregate packaging for reuse.

- Waste Auditing: The Main Contractor will record the quantity in tonnes and types of waste and materials leaving site during the construction phase.

### 13.6.3 Operation

As the impact of operational waste is predicted to be imperceptible, no mitigation is required.

## 13.7 Residual Impacts

Following the implementation of the mitigation described in **Section 13.5**, the residual impacts are expected to be as follows:

- The impact of excavation waste is expected to be slight, negative and short-term.
- The impact of construction waste is expected to be imperceptible.
- The impact of operational waste is expected to be imperceptible.

There is considered to be adequate capacity in the region to receive the wastes likely to be generated by the construction and operation of the Proposed Project.

## 13.8 Difficulties Encountered

No difficulties were encountered during the preparation of the resource and waste management impact assessment.

## 13.9 References

Conservation and Amenity Advice Service (CAAS) (2002). Guidelines on the Information to be contained in Environmental Impact Statements. Environmental Protection Agency (EPA), Johnstown Castle Estate, Wexford, Ireland.

CAAS (2003). Advice Notes on Current Practice in the Preparation of Environmental Impact Statements. EPA, Johnstown Castle Estate, Wexford, Ireland.

Department of Environment Community and Local Government (1998). Waste Management Changing our Ways. DoECLG, Dublin, Ireland.

Department of Environment Community and Local Government (2006). Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects. DoECLG, Dublin, Ireland.

Eastern Midlands Waste Region (2015). Eastern Midlands Region Waste Management Plan 2015-2021. Eastern Midlands Waste Regional Authority, Dublin, Ireland.

EPA (2014). National Waste Report 2012, Johnstown Castle, Wexford, Ireland

EPA (2014). National Municipal Waste Recovery Capacity. An Assessment for the Department of the Environment, Community and Local Government. Johnstown Castle, Wexford, Ireland.

EPA (2015). Waste Classification – List of Waste and Determining if Waste is hazardous or Non Hazardous. Johnstown Castle, Wexford, Ireland.

EPA (2015a). Revised Guidelines on the information to be contained in Environmental Impact Statements Draft. EPA, Johnstown Castle Estate, Wexford, Ireland.

EPA (2015b). Advice Notes for Preparing Environmental Impact Statements Draft. EPA, Johnstown Castle Estate, Wexford, Ireland.

FAS & Construction Industry Federation. 2002. Construction & Demolition Waste Management – A handbook for Contractors & Site Managers. FAS Environmental Unit, Upper Baggot Street, Dublin 4.

Dublin City Council (2016) Litter Management Plan 2016-2018. Dublin City Council, Dublin, Ireland.

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