

**CHAPTER 14 – WASTE MANAGEMENT**

**Appendix 14.1 Outline Construction and Demolition Waste Management Plan**



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**APPENDIX 14.1  
CONSTRUCTION &  
DEMOLITION WASTE  
MANAGEMENT PLAN FOR A  
DATA CENTRE,  
GRANGECastle BUSINESS  
PARK, DUBLIN 22**

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Technical Report Prepared For

**EdgeConnex Ireland**

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Report Prepared By

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<b>Contents</b>	<b>Page</b>
1.0 Introduction .....	3
2.0 Construction & Demolition Waste Management in Ireland.....	3
2.1 National Level .....	3
2.2 Regional Level .....	5
2.3 Legislative Requirements .....	6
3.0 Description of the Project .....	7
3.1 Location, Size and Scale of the Development .....	7
3.2 Overview of the Non-Hazardous Wastes to be produced .....	7
3.3 Potential Hazardous Wastes Arising .....	8
3.4 Main Construction and Demolition Waste Categories .....	9
4.0 Estimated Waste Arisings .....	10
4.1 Demolition Waste Generation .....	10
4.2 Construction Waste Generation .....	10
4.3 Proposed Waste Management Options.....	12
4.4 Tracking and Documentation Procedures for Off-Site Waste .....	14
5.0 Estimated Cost of Waste Management .....	15
5.1 Reuse .....	15
5.2 Recycling .....	15
5.3 Disposal .....	15
6.0 Demolition Procedures.....	<b>Error! Bookmark not defined.</b>
7.0 Training Provisions .....	16
7.1 Waste Manager Training and Responsibilities .....	16
7.2 Site Crew Training .....	16
8.0 Record keeping.....	16
9.0 Outline waste audit procedure.....	17
9.1 Responsibility for Waste Audit.....	17
9.2 Review of Records and Identification of Corrective Actions.....	17
10.0 Consultation with relevant bodies.....	18
10.1 Local Authority .....	18
10.2 Recycling/Salvage Companies.....	18
11.0 References .....	19

**Table 3.1** Typical waste types generated and LoW codes (individual waste types may contain hazardous substances) ..... 9

**Table 4.1** Estimated off-site reuse, recycle and disposal rates for demolition waste .....10

**Table 4.2** Waste materials generated on a typical Irish construction site .....11

**Table 4.3** Predicted on and off-site reuse, recycle and disposal rates for construction waste  
11

## 1.0 INTRODUCTION

AWN Consulting Ltd (AWN) has prepared this Construction and Demolition (C&D) Waste Management Plan (WMP) for the proposed data centre and 3 no. power generation plant at Ballymakailly, Co. Dublin.

This C&D WMP includes information on the legal and policy framework for C&D waste management in Ireland, estimates of the type and quantity of waste to be generated by the proposed development and makes recommendations for management of different waste streams.

The purpose of this report is to provide information necessary to ensure that the management of C&D waste at the site is undertaken in accordance with current legal and industry standards including the *Waste Management Acts 1996-2011* and associated Regulations<sup>1</sup>, *Protection of the Environment Act 2003* as amended<sup>2</sup>, *Litter Pollution Act 1997* as amended<sup>3</sup> and the *Eastern-Midlands Region Waste Management Plan 2015-2021*<sup>4</sup>. In particular, this report aims to ensure maximum recycling, re-use and recovery of waste with diversion from landfill, where possible. It also seeks to provide guidance on the appropriate collection and transport of waste to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil or water resources).

In the preparation of this report consideration has been given to the requirements of National and Regional waste policy, legislation, and other guidelines (referred to in Section 2.0). However, in determining the structure and content of the document, the following two publications have been referenced in particular:

- Department of the Environment, Heritage and Local Government (DoEHLG), Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (2006)<sup>5</sup>.
- FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and Site Managers, (2002)<sup>6</sup>.

The above guidance documents are considered to define best practice for C&D projects in Ireland and describe how C&D projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

## 2.0 CONSTRUCTION & DEMOLITION WASTE MANAGEMENT IN IRELAND

### 2.1 NATIONAL LEVEL

The Irish Government issued a policy statement in September 1998 titled as *‘Changing Our Ways*<sup>7</sup> which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this Strategy was to recycle at least 50% of C&D waste within a five-year period (by 2003), with a progressive increase to at least 85% over fifteen years (by 2013).

In response to the *Changing Our Ways* report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report titled *Recycling of Construction and Demolition Waste*<sup>8</sup> concerning the

development and implementation of a voluntary construction industry programme to meet the governments objectives for the recovery of construction and demolition waste.

In September 2020 the government released a new policy document outlining a new action plan for Ireland to cover the period of 2020-2025. This plan '*A Waste Action Plan for a Circular Economy*'<sup>9</sup> was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to a new economy, where climate and environmental challenges are turned into opportunities.

It aims to fulfil the commitment in the Programme for Government to publish and start implementing a new National Waste Action Plan. It is intended that this new national waste policy will inform and give direction to waste planning and management in Ireland over the coming years. It will be followed later this year by an All of Government Circular Economy Strategy. The policy document shifts focus away from waste disposal and moves it back up the production chain. To support the policy, regulation is already being used (Circular Economy Legislative Package) or in the pipeline (Single Use Plastics Directive). The policy document contains over 200 measures across various waste areas including Circular Economy, Municipal Waste, Consumer Protection & Citizen Engagement, Plastics and Packaging, Construction and Demolition, Textiles, Green Public Procurement and Waste Enforcement.

The National Construction and Demolition Waste Council (NCDWC) was launched in June 2002, as one of the recommendations of the Forum for the Construction Industry, in the Task Force B4 final report. The NCDWC subsequently produced *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* in July 2006 in conjunction with the Department of the Environment, Heritage and Local Government (DoEHLG).

The guidelines outline the issues that need to be addressed at the pre-planning stage of a development all the way through to its completion. These guidelines have been followed in the preparation of this document and include the following elements:

- Predicted construction and demolition wastes;
- Procedures to prevent and minimise wastes;
- Options for reuse/recycling/recovery/disposal of construction and demolition wastes;
- Provision of training for Waste Manager and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan; and
- Details of proposed consultation with relevant bodies i.e. waste recycling companies, Local Authority, etc.

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a C&D Waste Management Plan for developments. This development requires a C&D WMP under the following criterion:

- New developments other than (1) above, including institutional, educational, health and other public facilities, with an aggregate floor area in excess of 1,250 m<sup>2</sup>; and
- Demolition/renovation/refurbishment projects generating in excess of 100m<sup>3</sup> in volume, of C&D waste

Other guidelines followed in the preparation of this report include *'Construction and Demolition Waste Management – a handbook for Contractors and Site Managers'* published by FÁS and the Construction Industry Federation in 2002.

These guidance documents are considered to define best practice for C&D projects in Ireland and describe how C&D projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

## 2.2 REGIONAL LEVEL

The proposed development is located in the Local Authority area of South Dublin County Council (SDCC).

The *EMR Waste Management Plan 2015 – 2021* is the regional waste management plan for the SDCC area published in May 2015. The regional plan sets out the following strategic targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

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 specified in the *Waste Management (Landfill Levy) Regulations 2015*.

The *South Dublin County Council Development Plan 2016 – 2022<sup>10</sup>* sets out a number of objectives and actions for the South Dublin area in line with the objectives of the waste management plan.

Waste objectives and actions with a particular relevance to the proposed development are as follows:

Objectives:

- **IE5 Objective 1:** To support the implementation of the Eastern–Midlands Region Waste Management Plan 2015-2021 by adhering to overarching performance targets, policies and policy actions.
- **IE5 Objective 2:** To support waste prevention through behavioural change activities to de-couple economic growth and resource use.
- **IE5 Objective 3:** To encourage the transition from a waste management economy to a green circular economy to enhance employment and increase the value recovery and recirculation of resources.
- **IE5 Objective 8:** To secure appropriate provision for the sustainable management of waste within developments, including the provision of facilities for the storage, separation and collection of such waste.

Actions:

- Support and facilitate the separation of waste at source into organic and non-organic streams or other waste management systems that divert waste from landfill and maximise the potential for each waste type to be re-used and recycled or composted and divert organic waste from landfill, in accordance with the National Strategy on Biodegradable Waste (2006).
- Implement the objectives of the National Waste Prevention Programme at a local level with businesses, schools, householders, community groups and within the Council's own activities.
- Promote an increase in the amount of waste re-used and recycled consistent with the Regional Waste Management Plan and Waste Hierarchy and facilitate recycling of waste through adequate provision of facilities and good design in new developments.
- Implement the South Dublin Litter Management Plan 2015 - 2019.

In terms of physical waste infrastructure, three municipal solid waste landfills remain operational in the Eastern Midlands Region (EMR) and are all operated by the private sector. There are a number of other licensed and permitted facilities in operation in the EMR including waste transfer stations, hazardous waste facilities and integrated waste management facilities. There are two existing thermal treatment facilities, one in Duleek, Co. Meath and a second facility in Poolbeg in Dublin.

### 2.3 LEGISLATIVE REQUIREMENTS

The primary legislative instruments that govern waste management in Ireland and applicable to the project are:

- Waste Management Act 1996 (No. 10 of 1996) as amended, as well as subordinate legislation<sup>1</sup>.
- Environmental Protection Act 1992 (No. 7 of 1992) as amended<sup>2</sup>.
- Litter Pollution Act 1997 (No. 12 of 1997) as amended<sup>3</sup>.
- Planning and Development Act 2000 (No. 30 of 2000) as amended.

These Acts and subordinate Regulations enable the transposition of relevant European Union Policy and Directives into Irish law.

One of the guiding principles of European waste legislation, which has in turn been incorporated into the Waste Management Acts 1996 – 2011 and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal reuse, recycling, recovery and/or disposal (including its method of reuse, recycling, recovery and/or disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final destination, waste contractors will be employed to physically transport waste to the final waste reuse, recycling, recovery and/or disposal site. Following on from this is the concept of *"Polluter Pays"* whereby the waste producer is liable to be prosecuted for pollution incidents, which may arise from the incorrect management of waste produced, including the actions of any contractors engaged (e.g. for transportation and disposal/recovery/recycling of waste).

It is therefore imperative that the appointed construction contractor(s) are legally compliant with respect to waste transportation, reuse, recycling, recovery and disposal. This includes the requirement that a contractor handle, transport and reuse/recycle/recover/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended, or a waste or Industrial Emissions (IE) licence granted by the EPA. The COR/permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

### **3.0 DESCRIPTION OF THE PROJECT**

#### **3.1 LOCATION, SIZE AND SCALE OF THE DEVELOPMENT**

The Proposed Development is described in detail in Chapter 2 (Description of the Proposed Development) of this EIA Report. It proposes the demolition of existing farm dwelling and associated garage and other farm buildings located to the north of the site and the construction of a pair of single storey data centre buildings (4 data halls) of c. 13,000sqm. The development will also include c. 2,400sqm office space. It is to be located within the north-western part of the overall lands that will include a generator yard of c. 5000sqm with 24 no. standby emergency generators with associated flues (each 25m high) to the east of the buildings. The data centres will be served by 37 car parking spaces of which 4 no. spaces will be disabled spaces. It is intended that 2 of these spaces will be provided for electrical charging vehicles. The data centre and associated elements will require a slight adjustment to the landscaping along the western boundary.

The application will also include the construction of a 3 no. gas powered generation plant in the form of 3 no. single storey buildings with a gross floor area of c., 9,000sqm that will contain 61 gas generators within all of the buildings with associated flues that will be 25m in height, and grouped in pairs. The development will also include an AGI Plant (c. 970 sqm) centrally along the southern boundary of the site. See Chapter 2 for a comprehensive description of the development. A description of the characteristics of the development relevant to waste are described in Section 14.22 – 14.41 of Chapter 14 (Waste Management).

#### **3.2 OVERVIEW OF THE NON-HAZARDOUS WASTES TO BE PRODUCED**

The project engineers (Pinnacle) have estimated that c. 15,034 m<sup>3</sup> of soil, subsoil and stones will be excavated, with c. 9,159 m<sup>3</sup> reused on site. The remaining c. 5,875 m<sup>3</sup> soil, subsoil and stones will require removal from the site. In addition c. 16,117 m<sup>3</sup> of topsoil is to be excavated, it is currently proposed that the majority of this excavated topsoil will be reused on site for landscaping.



The main buildings at the site will be constructed from structural steel. It is expected that throughout the construction phase, waste will be produced from surplus steel and other metal materials and broken/off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials are also likely to 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 (wastepaper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite 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.

### 3.3 POTENTIAL HAZARDOUS WASTES ARISING

#### 3.3.1 Contaminated Soil

Geotechnical and environmental site investigations were carried out by Causeway Geotech in September 2018 during the preparation of the EIAR for the permitted development under South Dublin County Council Reg. Ref. SD19A/0042 / An Bord Pleanála Ref. ABP-305948-19.

During the site investigation a number of samples taken from a select number of trial pits and boreholes were analysed to identify and possible contamination on site. Samples were analysed for hydrocarbons (mineral oils, BTEX), PAHs, metals and phenols. There are no legislative thresholds for soil in Ireland and therefore results were compared with the Land Quality Management (LQM)/Chartered Institute of Environmental Health (CIEH) Suitable for Use Levels (S4ULs) for Human Health Risk Assessment (Nathaniel et al, 2015) which allow assessment based on health risk and use of the site. A review of the representative 24 no. soil quality analysis results EIAR Chapter 7 (Land Soil, Geology and Hydrogeology) does not indicate any notable contamination across the site.

All excavations should still be carefully monitored by a suitably qualified person to ensure that, if encountered, potentially contaminated soil is identified and segregated from clean/inert material. In the event that any potentially contaminated material is encountered, it will need to be 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*'<sup>11</sup> 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 *Decision 2003/33/EC*.

Excavation works will be carefully monitored by a suitably qualified person to ensure any potentially contaminated soil is identified and segregated in accordance with the above procedure.

If asbestos or asbestos containing material (ACMs) are identified in any further soil samples or during excavation, 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.

### 3.3.2 Fuel/Oils

As fuels and oils are classed as hazardous materials, any on-site storage of fuel/oil, 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.

### 3.3.3 Invasive Species

Ecological site surveys have been undertaken by Scott Cawley (SC) at this site and in the surrounding area as part of the site ecological assessment in 2021 as part of the EIAR. This included walkover surveys of the entire site and the perimeter of the site. There were no Schedule 3 non-native invasive species were recorded during baseline surveys.

### 3.3.4 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, waste electrical and electronic equipment (WEEE) containing hazardous components, printer/toner cartridges and batteries (Lead, Ni-Cd or Mercury) may be generated from the temporary site offices during construction works. These wastes will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

## 3.4 MAIN CONSTRUCTION AND DEMOLITION WASTE CATEGORIES

The main non-hazardous and hazardous waste streams that may typically be generated by the construction activities at the proposed site are presented in Table 1. The List of Waste code (also referred to as the European Waste code or EWC) for each waste stream is also shown.

**Table 3.1** *Typical waste types generated and LoW codes (individual waste types may contain hazardous substances)*

Waste Material	List of Waste Code
Concrete, bricks, tiles, ceramics	17 01 01-03 & 07
Wood, glass and plastic	17 02 01-03
Treated wood, glass, plastic, containing hazardous substances	17-02-04*
Bituminous mixtures, coal tar and tarred products	17 03 01*, 02 & 03*
Metals (including their alloys) and cable	17 04 01-11
Soil and stones	17 05 03* & 04
Gypsum-based construction material	17 08 01* & 02
Paper and cardboard	20 01 01

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Waste Material	List of Waste Code
Mixed C&D waste	17 09 04
Green waste	20 02 01
Electrical and electronic components	20 01 35 & 36
Batteries and accumulators	20 01 33 & 34
Liquid fuels	13 07 01-10
Chemicals (solvents, pesticides, paints, adhesives, detergents etc.)	20 01 13, 19, 27-30
Insulation materials	17 06 04
Organic (food) waste	20 01 08
Mixed Municipal Waste	20 03 01

\* individual waste type may contain hazardous substances

#### 4.0 ESTIMATED WASTE ARISING

##### 4.1 DEMOLITION WASTE GENERATION

Demolition works at the site will involve the demolition of existing structures on site. Demolition figures published by the EPA in the 'National Waste Reports'<sup>12</sup> and data from previous projects have been used to estimate the approximate break-down for indicative reuse (offsite), recycling and disposal targets of demolition waste. This breakdown is shown in Table 4.1.

**Table 4.1** Estimated off-site reuse, recycle and disposal rates for demolition waste

Waste Type	Tonnes	Reuse/Recovery		Recycle		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Glass	118.8	0	0.0	85	101.0	15	17.8
Concrete, Bricks, Tiles, Ceramics	673.2	30	202.0	65	437.6	5	33.7
Plasterboard	52.8	30	15.8	60	31.7	10	5.3
Asphalts	13.2	0	0.0	25	3.3	75	9.9
Metals	198.0	5	9.9	80	158.4	15	29.7
Slate	105.6	0	0.0	85	89.8	15	15.8
Timber	158.4	10	15.8	60	95.0	30	47.5
<b>Total</b>	<b>1320.0</b>		<b>243.5</b>		<b>916.7</b>		<b>159.7</b>

The appointed demolition contractor will be required to prepare a detailed demolition management plan prior to work commencing which should refine the above estimated waste figures.

## 4.2 CONSTRUCTION WASTE GENERATION

The below Table 4.2 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA *National Waste Reports*, the *GMIT<sup>13</sup>* and other research reports.

**Table 4.2** 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
Total	100

An assessment has been undertaken to estimate the quantity of construction waste likely to be generated from the proposed development.

Table 3 below shows the estimated construction waste generation for the development based on the gross floor area of construction and other information available to date, along with indicative targets for management of the waste streams. The estimated waste 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 4.2.

**Table 4.3** Predicted on and off-site reuse, recycle and disposal rates for construction waste

Waste Type	Tonnes	Reuse/Recovery		Recycle		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D Waste	501	10	50	80	401	10	50
Timber	425	40	170	55	234	5	21
Plasterboard	152	30	46	60	91	10	15
Metals	121	5	6	90	109	5	6
Concrete	91	30	27	65	59	5	5
Other (includes cabling, ducting, conduits, packaging and plastics)	228	20	46	60	137	20	46
Total	1519		345		1031		143

In addition, as noted in Section 3.2, the quantity of excavated material that will be removed has been estimated by Pinnacle the project engineers to be c. 5,875 m<sup>3</sup> of subsoil and stones material.. In addition c. 16,117 m<sup>3</sup> of topsoil is to be excavated, it is currently proposed that the majority of this excavated topsoil will be reused on site for landscaping.

It should be noted that until final materials and detailed construction methodologies have been confirmed, it is difficult to predict the construction waste that will be generated from

the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

All waste arising during the construction phase will be transported off-site by an approved waste contractor holding a current waste collection permit. All waste arising requiring reuse, recycling, recovery or disposal off-site will be brought to facilities holding the appropriate COR, licence or permit, as required.

### **4.3 PROPOSED WASTE MANAGEMENT OPTIONS**

#### **4.3.1 Waste Management Options for Excavated Materials**

The Waste Management 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. Any excavations carried out will be required to facilitate construction works.

In the event that any excavated material is removed off-site for reuse as a by-product (and not as a waste), it will be done in accordance with Article 27 of the *European Communities (Waste Directive) Regulations 2011*. Article 27 requires that certain conditions are met and that by-product decisions are made to the EPA via their online notification form. However, it is not currently anticipated that any excavated material will be removed offsite for reuse as a by-product. 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.

If any excavated material requires removal from site and is deemed to be a waste, then removal and reuse/recycling/ recovery/disposal of the material will be carried out in accordance with the *Waste Management Acts 1996 – 2011* 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 removed will dictate whether a COR, permit or licence is required by the receiving waste facility. 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 unlikely 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).

#### **4.3.2 Waste Management Options for other Construction Wastes**

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. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring reuse, recycling, recovery or disposal off-site will be transferred to a facility holding the appropriate COR, permit or licence, as required.

Mixed C&D waste (classified under the List of Waste code 17 09 04) is permitted for acceptance at a number of waste facilities in the region including Integrated Material Solutions landfill in north Dublin and a number of waste transfer stations.

Written records will be maintained by the contractor detailing the waste arising throughout the construction phase, the classification of each waste type, the contact details and waste collection permit number of all waste contractors who collect waste from the site and the end destination details for all waste removed and disposed offsite.

Dedicated storage containers will be provided for hazardous wastes which may arise such as batteries, paints, oils, chemicals etc., as required. The containers used for storing hazardous liquids will be appropriately banded or will be stored on suitably sized spill pallets.

It should be noted that until the main contractor is appointed, it is not possible to provide information on the specific destinations of each waste stream. Prior to commencement construction of the proposed development and removal of any waste off-site, details of the proposed destination of each waste stream will be provided to the local authority. The management of the main construction waste streams are detailed as follows:

#### 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.

#### 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 placed into a dedicated skip and recycled off-site. Clean timber is typically recycled as chipboard.

#### Metal

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

#### Plasterboard

Plasterboard from the construction phase will be stored in a separate skip, pending collection for recycling. The site manager and project engineers will ensure that oversupply of new plasterboard is carefully monitored to minimise waste.

### Glass

Glass materials will be segregated for recycling, where possible.

### Waste Electrical and Electronic Equipment

Waste electrical and electronic equipment (WEEE) will be stored in dedicated covered cages/receptacles/pallets pending collection for recycling off site.

### 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 offsite.

### Non-Recyclable Waste

Construction 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 6.0) 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.

### Hazardous Wastes

On-site storage of any hazardous wastes produced (i.e. contaminated soil in the unlikely event that it is 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.

## **4.4 TRACKING AND DOCUMENTATION PROCEDURES FOR OFF-SITE WASTE**

All waste will be documented prior to leaving the site. Waste will be weighed by the waste contractor, either by weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the contractor.

All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Act 1996* as amended, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* as amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project Waste Manager will maintain a copy of all waste collection permits on-site.

If the waste is being transported to another site, a copy of the Local Authority COR, waste permit or EPA Waste/IE Licence for that site will be provided to the nominated project Waste Manager. If the waste is being shipped abroad, a copy of the TFS document will be obtained from Dublin City Council (as the relevant authority on behalf of all local authorities

in Ireland) and kept on-site along with details of the final destination (permits, licences etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

If any surplus soil or stone is being removed from the site for reuse on another construction site as a by-product, this will need to be done in accordance with Article 27 of the *EC (Waste Directive) Regulations, 2011*. Similarly, if any soil or stone are imported onto the site from another construction site as a by-product, this will also be done in accordance with Article 27. It is not currently envisaged the Article 27 will be used for this development.

All information will be entered in a waste management recording system to be maintained on site.

## **5.0 ESTIMATED COST OF WASTE MANAGEMENT**

An outline of the costs associated with different aspects of waste management is provided below. The total cost of construction waste management will be measured and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

### **5.1 REUSE**

By reusing materials on site, there will be a reduction in the transport and offsite recycling/recovery/disposal costs associated with the requirement for a waste contractor to take the material away to landfill.

Clean and inert excavated material which cannot be reused on site may be used as capping material for landfill sites, or for the reinstatement of quarries, etc. as previously discussed. This material is often taken free of charge for such purposes, reducing final waste disposal costs. However, it is not currently anticipated that there will be surplus excavated material.

### **5.2 RECYCLING**

Salvageable metals will earn a rebate which can be offset against the costs of collection and transportation of the skips. Clean uncontaminated cardboard and certain hard plastics can also be recycled. Waste contractors will typically charge less to take segregated wastes, such as recyclable waste, from a site than mixed waste streams.

### **5.3 DISPOSAL**

Landfill charges in the Eastern-Midlands region are currently at around €130-150 per tonne (which includes a €75 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015*). In addition to disposal costs, waste contractors will also charge a fee for provision and collection of skips.

Collection of segregated construction waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a registered, permitted or



licensed facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to landfill.

## **6.0 TRAINING PROVISIONS**

A member of the construction team will be appointed as the Waste Manager to ensure commitment, operational efficiency and accountability during the construction phase of the project.

### **6.1 WASTE MANAGER TRAINING AND RESPONSIBILITIES**

The nominated 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 him/her in the organisation, operation and recording of the waste management system implemented on site. The Waste Manager will have overall responsibility to oversee, record and provide feedback to the Project Manager on everyday waste management at the site. Authority will be given to the Waste Manager to delegate responsibility to subcontractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The 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 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 C&D WMP.

### **6.2 SITE CREW TRAINING**

Training of the site crew is the responsibility of the 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 C&D WMP 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. A sub-section on hazardous wastes will be incorporated into the training program and the particular dangers of each hazardous waste will be explained.

## **7.0 RECORD KEEPING**

Records should be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the waste arising's on site.

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 waste manager with a waste docket (or

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

Alternatively, 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.

A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste Licences will be maintained on site at all times. Subcontractors who have engaged their own waste contractors, should provide the main contractor with a copy of the waste collection permits and COR/permit/licence for the receiving waste facilities and maintain a copy on file available for inspection on site as required.

## **8.0 OUTLINE WASTE AUDIT PROCEDURE**

### **8.1 RESPONSIBILITY FOR WASTE AUDIT**

The appointed waste manager will be responsible for conducting a waste audit at the site during the C&D phase of the development.

### **8.2 REVIEW OF RECORDS AND IDENTIFICATION OF CORRECTIVE ACTIONS**

A review of all the records for the waste generated and transported off-site should be undertaken mid-way through the 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.

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## **9.0 CONSULTATION WITH RELEVANT BODIES**

### **9.1 LOCAL AUTHORITY**

Once the main contractor has been appointed and prior to removal of any waste materials offsite, details of the proposed destination of each waste stream will be provided to the local authority for their approval.

The local authority will also be consulted, as required, throughout the construction phase 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.

### **9.2 RECYCLING/SALVAGE COMPANIES**

Companies that specialise in C&D waste management will be contacted to determine their suitability for engagement. Where a waste contractor is engaged, each company will be audited in order to ensure that relevant and up-to-date waste collection permits and facility COR/permits/licences are held. In addition, information regarding individual construction materials will be obtained, including 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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## 10.0 REFERENCES

1 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). Subordinate and associated legislation includes:

- European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended 2011 (S.I. No. 323 of 2011)
- Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended 2008 (S.I. No. 87 of 2008) and 2016 (S.I. No. 24 of 2016)
- Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. No. 821 of 2007) as amended 2008 (S.I. No. 86 of 2008), 2014 (S.I. No. 310 and S.I. No. 546 of 2014) and 2015 (S.I. No. 198 of 2015)
- Waste Management (Licensing) Regulations 2000 (S.I. No. 185 of 2000) as amended 2004 (S.I. No. 395 of 2004) and 2010 (S.I. No. 350 of 2010)
- Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended 1998 (S.I. No. 164 of 1998), 2001 (S.I. No. 356 of 2002) and 2011 (S.I. No. 126 and No. 192 of 2011)
- Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
- European Communities (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
- Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended 2015 (S.I. No. 190 of 2015)
- European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 191 of 2015)
- European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended 2015 (S.I. No. 542 of 2015)
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
- European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended 2014 (S.I. No. 349 of 2014) and 2015 (S.I. No. 347 of 2015)
- Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended 2000 (S.I. No. 73 of 2000)
- Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended by European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011)
- The European Communities (Trans frontier Shipment of Hazardous Waste) Regulations 1988 (S.I. No. 248 of 1988) o European Union (Properties of Waste Which Render It Hazardous) Regulations 2015 (S.I. No. 233 of 2015)

2 Environmental Protection Act 1992 (Act No. 7 of 1992) as amended by the Protection of the Environment Act 2003 (Act No. 27 and S.I. No. 413 of 2003) and amended by the Planning and Development Act 2000 (Act No. 30 of 2000) as amended.

3 Litter Pollution Act 1997 (Act No. 12 of 1997) as amended by the Litter Pollution Regulations 1999 (S.I. No. 359 of 1999) and Protection of the Environment Act 2003, as amended.

4 Eastern-Midlands Waste Region, Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).

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- 5 Department of the Environment, Heritage and Local Government (DoEHLG), Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects, (2006).
  - 6 FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and Site Managers, (2002).
  - 7 Department of Environment and Local Government (DoELG) Waste Management – Changing Our Ways, A Policy Statement (1998).
  - 8 Forum for the Construction Industry, Recycling of Construction and Demolition Waste (1999).
  - 9 Department of Communications, Climate Action and Environment (DCCA), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
  - 10 South Dublin County Council (SDCC), Development Plan 2016-2022 (2016)
  - 11 EPA, Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2015)
  - 12 Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2012.
  - 13 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).