



**ENVIRONMENTAL  
SOLUTIONS LTD**

Panther Environmental Solutions Ltd,  
Units 3 & 4, Innovation Centre,  
Institute of Technology,  
Green Road, Carlow, Ireland.  
R93 W248.

Telephone: 059-9134222

Email: [info@pantherwms.com](mailto:info@pantherwms.com)

Website: [www.pantherwms.com](http://www.pantherwms.com)

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# **CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLAN**

**FIRTREE DEVELOPMENTS LTD.,  
BAGENALSTOWN INDUSTRIAL PARK,  
ROYAL OAK ROAD,  
BAGENALSTOWN,  
CO. CARLOW**

<b>REPORT NO:</b>	PES_C&D WMP_19_9457	<b>DATE:</b>	19 <sup>th</sup> July 2019
<b>AUTHOR:</b>	Lorraine Wyse, BSc.	<b>REVIEWED:</b>	Mike Fraher, BSc.

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## **1. INTRODUCTION**

Panther Environmental Solutions Ltd. was commissioned by the applicant, Firtree Developments Ltd., to compile a detailed Construction and Demolition Waste Management Plan (C&D WMP) for the proposed development, comprising of the construction of four industrial units, with approximate footprints of 8,283m<sup>2</sup>, 8,584m<sup>2</sup>, 3,399m<sup>2</sup> and 3,594m<sup>2</sup>, at Bagenalstown Industrial Park, Royal Oak Road, Bagenalstown, Co. Carlow.

The purpose of the C&D WMP is to outline the manner in which construction and demolition waste would be managed throughout the construction phase of the proposed development, to ensure compliance with the relevant waste legislation and to ensure waste management activities from the site would not have an adverse impact upon the environment.

The C&D WMP details the types and estimated quantities of the wastes that would be generated, the waste management methods proposed for the site and waste storage details, in addition to outlining how waste would be managed in accordance with the waste hierarchy (Section 21A of the Waste Management Act 1996, as amended).

The C&D WMP would cover the following range of works associated with the construction phase of the project:

- ) Ground preparation works;
- ) Development of site infrastructure;
- ) Construction of buildings and hardstanding areas;
- ) Landscaping of entire site including open soft landscaped areas.

This plan also includes information on the legislative framework and policy framework for construction and demolition waste management in Ireland.

It should be noted that quantities of materials present in this report are estimated and subject to detailed design and therefore should not be taken as definitive.

This document has been prepared taking cognisance of the “*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects*”, published in 2006 by the Department of Environment, Heritage and Local Government (DoEHLG).

### **1.1 REQUIREMENT FOR THE PLAN**

A Construction and Demolition Waste Management Plan should be prepared for proposed projects which meet or exceed the thresholds set out in the DoEHLG publication, “*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects*”, as outlined below:

- ) New residential development of 10 houses or more;
- ) New developments other than (1) above, including institutional, educational, health and other public facilities, with an aggregate floor area in excess of 1,250m<sup>2</sup>;

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- ) Demolition/renovation/refurbishment projects generating in excess of 100m<sup>3</sup> in volume, of C&D waste;
- ) Civil Engineering projects producing in excess of 500m<sup>3</sup> of waste, excluding waste materials used for development works on the site.

**1.2 LIVE DOCUMENT**

The C&D WMP is a “live” document, and would be reviewed and updated as necessary throughout the construction phase.

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**2. LEGISLATIVE FRAMEWORK AND PLANNING POLICY**

**2.1 LEGISLATIVE CONTEXT**

The main legislation pertaining to waste management in Ireland and of potential relevance to the proposed development includes the following:

**EU Legislation:**

- ) Council Directive 1999/31/EC on the Landfilling of Waste;
- ) Waste Framework Directive 2008/98/EC;
- ) European List of Waste, Commission Decision 2000/532/EC;
- ) Council Directive 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;
- ) WEEE Directive 2012/19/EU.

**Irish Legislation:**

- ) Waste Management Act 1996 as amended;
- ) Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. 821 of 2007) and (Amendment) Regulations (S.I. 86 of 2008, S.I. 320 of 2014, S.I. 198 of 2015);
- ) Waste Management (Licensing) Regulations 2000 (S.I. 185 of 2000) , 2004 (S.I. 395 of 2004), (Amendment) Regulations 2010 (S.I. 350 of 2010);
- ) Waste Management (Planning) Regulations 1997 (S.I. 137 of 1997);
- ) Waste Management (Collection Permit) Regulations 2007 (S.I. 820 of 2007) and (Amendment) Regulations 2008 to 2016;
- ) Waste Management (Hazardous Waste) Regulations 1998 (S.I. 163 of 1998) and Waste Management (Hazardous Waste) (Amendment) Regulations 2000 (S.I. 73 of 2000);
- ) Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009), European Union (Household Food Waste and Bio-waste) Regulations 2013 (S.I. 71 of 2013) and European Union (Household Food Waste and Bio-waste) Regulations 2015 (190 of 2015);
- ) European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (WEEE) (S.I. 149 of 2014);
- ) European Union (Batteries and Accumulators) Regulations 2014 (S.I. 283 of 2014) and (Amendment) Regulations (S.I. 349 of 2014, S.I. 347 of 2015);
- ) Waste Management (Shipments of Waste) Regulations 2007 (S.I. 419 of 2007);
- ) European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011 (S.I. 324 of 2011);

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- J Litter Pollution Act 1997, Litter Pollution Regulations 1999 (S.I. 359 of 1999) and Litter Pollution (Increased Notice Payment) Order 2007 (S.I. 558 of 2007);
- J Waste Management (Landfill Levy) Regulations 2015 (S.I. 189 of 2015);
- J Waste Management (Prohibition of Waste Disposal by Burning) Regulations 2009 (S.I. 286 of 2009) and (Amendment) Regulations (S.I. 504 of 2013, S.I. 538 of 2015, S.I. 599 of 2017);
- J European Communities (Waste Directive) Regulations 2011 (S.I. 126 of 2011), (Amendment) Regulations 2016 (S.I. 315 of 2016), and European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. 223 of 2015), European Union (Waste Directive) (Recovery Operations) Regulations 2016 (S.I. 372 of 2016);
- J Local Government Act and associated regulations.

## **2.2 PLANNING POLICIES, PLANS AND OTHER GUIDANCE**

Policies, plans and guidance documents pertaining to waste management and of potential relevance to the proposed development include the following:

- J European Waste Catalogue and Hazardous Waste List (2002), Environmental Protection Agency;
- J National Waste Prevention Programme Annual Report for 2016, Environmental Protection Agency;
- J Southern Region Waste Management Plan 2015-2021 and Associated Reports;
- J Carlow County Development Plan 2015–2021;
- J Muine Bheag / Royal Oak Local Area Plan 2017–2023;
- J Carlow County Council’s Draft Litter Management Plan (2018–2020);
- J Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (2006), Department of Environment, Heritage and Local Government.

### **Southern Region Waste Management Plan 2015-2021**

The proposed development site is located on the outskirts of Bagenalstown. Co. Carlow, and is therefore within the area covered by the Southern Region Waste Management Plan 2015-2021. This plan covers the ten local authority areas of Carlow, Clare, Cork County, Cork City, Limerick City and County, Kerry, Kilkenny, Tipperary, Waterford City and County and Wexford. The vision of the waste management plan is as follows:

*“The strategic vision of the regional waste plan is to rethink our approach to managing waste, by viewing our waste streams as valuable material resources, leading to a healthier environment and sustainable commercial opportunities for our economy”.*

The plan sets out a number of waste management policies for the region, in accordance with the main strategic principals of the plan including waste management hierarchy, source

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segregation, opportunity, self-sufficiency and proximity, protection, co-operation, balanced and sustainable infrastructure and the polluter pays principle.

Targets of the South Region Waste Management Plan include a 50% reuse / recycling rate of municipal waste by 2020 and a 70% reuse / recycling / material recovery rate of construction and demolition waste (excluding soil and stones) by 2020.

**Carlow County Development Plan 2015–2021**

The Carlow County Development Plan 2015 – 2021 outlines one environmental policy with regards waste for the county. The relevant sections of this policy to the proposed development are outlined in Table 2.1 below.

**Table 2.1:** Sections of Waste Management Policy Relevant to the Proposed Development

REFERENCE	POLICY
Env. – Policy 1	<ul style="list-style-type: none"> <li>) Implement the provisions of the Waste Management Hierarchy and the Regional Waste Management Plan 2005-2021, and any subsequent review of this Waste Management Plan as it applies to this Council area. All prospective developments in the County will be expected to take account of the provisions of the Regional Waste Management Plan and adhere to those elements of it that relate to waste prevention and minimisation, waste recycling facilities, and the capacity for source-segregation</li> <li>) Ensure the provision of quality cost effective waste infrastructure and services, which reflect and meet the needs of the community and to ensure that the ‘polluter pays’ principle is adhered to in all waste management activities</li> <li>) Assess planning applications with regard to the waste produced by proposed developments including the nature and amount produced and proposed method of disposal. Developments should ensure that production/disposal methods do not give rise to environmental pollution, result in undue loss of amenity or be detrimental to public health</li> <li>) Ensure that all significant construction/demolition projects include construction and demolition waste management plans. These plans should seek to focus on waste minimisation in general and optimise waste prevention, re-use and recycling opportunities and are required for developments of five or more housing units or commercial or industrial developments on sites in excess of 0.5 hectares</li> <li>) Promote and encourage education and awareness on all issues associated with waste management, at household, industry and community level</li> <li>) Promote and facilitate communities to become involved in environmental awareness activities and community-based recycling initiatives or environmental management initiatives that will lead to local sustainable waste management practices</li> </ul>

**Muine Bheag / Royal Oak Local Area Plan 2017-2020.**

The Muine Bheag / Royal Oak Local Area Plan 2017-2020 outlines five policies in relation to waste management for the area, as outlined in the table below.

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**Table 2.2:** Waste Management Policies of the Muine Bheag / Royal Oak Local Area Plan

REFERENCE	POLICY
WMP 1	To support the minimisation of waste creation and to promote and encourage education and awareness on all issues associated with waste prevention, minimisation, reuse, recycling and recovery, at household, industry and community level.
WMP 2	To safeguard the environment by seeking to ensure that residual waste is disposed of appropriately.
WMP 3	To seek to ensure that Muine Bheag and Royal Oak are served by adequate recycling facilities in the form of kerbside collection, civic site and bring bank recycling facilities and to adequately maintain existing recycling facilities.
WMP 4	To support the implementation of the Southern Waste Management Plan 2015- 2021, Carlow County Council’s Litter Management Plan 2014 - 2017, the National Waste Prevention Programme, the EPA’s National Hazardous Waste Management Plan 2014-2020 and any superseding versions of these plans over the lifetime of this Local Area Plan.
WMP 5	To seek to manage and dispose of construction waste in a way that ensures the provisions of the Waste Management Acts and Southern Waste Management Plan 2015-2021. Construction Waste Management Plans will be implemented where relevant to minimise waste and ensure correct handling and disposal of construction waste streams in accordance with the Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects, Department of the Environment, July 2006.

**Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (2006)**

These guidelines outline the manner in which construction and demolition waste should be managed throughout the construction phase of a project.

The guidelines outline the aspects which should be addressed in a Construction and Demolition Waste Management Plan, including waste arising, specific waste management objectives, methods proposed for prevention, reuse and recycling and material handling procedures.



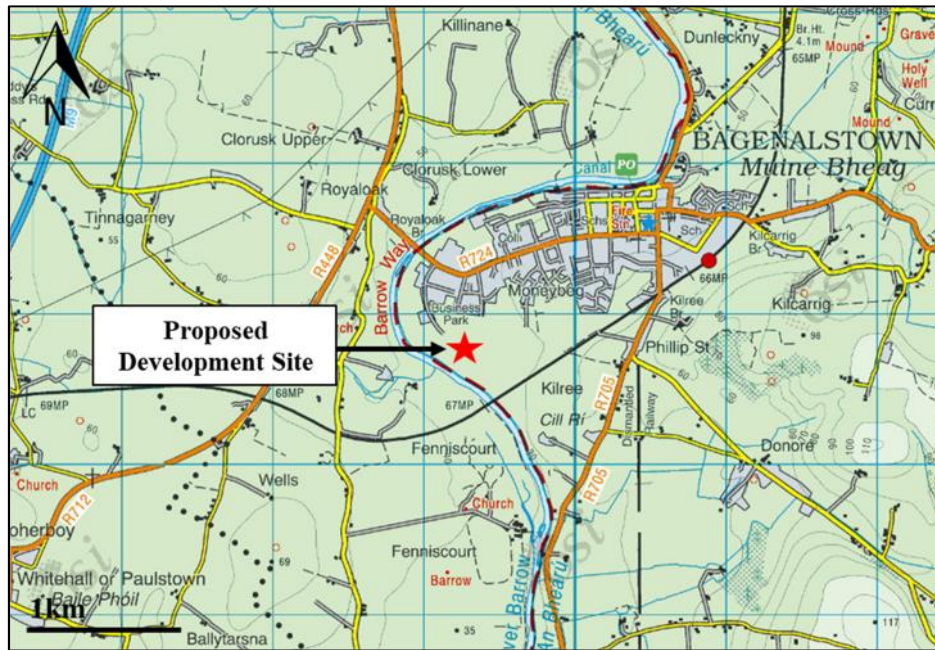
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### 3. DESCRIPTION OF THE PROJECT

#### 3.1 LOCATION, DESIGN AND SCALE OF THE DEVELOPMENT

The proposed development site is located on the outskirts of Bagenalstown, as shown in Figure 3.1 below. Access to the site is via the R724, approximately 590m east from the R448 road. The site is at an approximate elevation of 30-40m above sea level and is bordered to the north, south and east by agricultural land and to the west by Bagenalstown Industrial Park. The landuse of the surrounding area is a mixture of housing, commercial and retail development, in addition to agricultural land comprising of pasture and tillage.



**Figure 3.1:** Site Location at Bagenalstown, Co. Carlow.

The proposed development would comprise of the construction of four industrial units, with approximate footprints of 8,283m<sup>2</sup>, 8,584m<sup>2</sup>, 3,399m<sup>2</sup> and 3,594m<sup>2</sup>, for the purpose of light industrial / manufacturing activities and offices at Bagenalstown Industrial Park. The proposed development would also include the construction of surface water and foul sewer drainage systems, site access road, and all ancillary development works including internal road surfacing, boundary construction, the provision of outdoor artificial lighting and site landscaping.

With regards the boundaries of the proposed development site, the majority of the boundary would comprise of paladin fencing. To the front of each unit's site, the boundary would comprise of a retaining free-standing wall with twin-wire welded mesh fence panels.

New storm water and domestic wastewater drainage systems would be constructed. Storm water, comprised of rainwater run-off from roofs and paved areas, would be collected at each unit's site via a system of gullies and stormwater drains and would pass through a silt trap and oil interceptor. Stormwater from each unit would be attenuated in a suitably designed (to engineer's specification) attenuation tank prior to leaving the site. The stormwater from the proposed development site would connect with an existing stormwater line from Bagenalstown Industrial Park to the River Barrow.

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Wastewater from the development would be collected at each unit’s site within a holding tank and pumped to the existing sewer line in Bagenalstown Industrial Park, where it would undergo treatment at Bagenalstown Waste Water Treatment Plant (WWTP) prior to discharge to the River Barrow.

The applicant has appointed a construction works contractor, Milltown Developments Ltd., to the proposed development, should the planning application be successful. The estimated construction timeframe, including landscaping activities, for the proposed development is 18 months, with hours of operation from 8am to 5pm, Monday to Friday. Construction works would be confined to the proposed development footprint.

During construction works, a temporary site compound would be established within the western portion of the proposed development site, and would house the temporary office, equipment and materials storage and construction staff welfare facilities including a canteen, toilet and first aid supplies. The temporary site compound would also be used for the storage of fuels and oils required for the various construction plant, in addition to housing waste receptacles.

During construction works, waste would be generated, including concrete and excavated soils and stones. Waste would be segregated onsite, and would be reused in infilling processes where applicable and landscaping where permitted and where possible, with remaining wastes sent for recycling or disposal as appropriate.

Further details on the construction phase of the proposed development are provided in the Construction Environmental Management Plan prepared as part of the application (Ref. PES\_CEMP\_19\_9457).

**3.2 DETAILS OF WASTES TO BE GENERATED**

During the project, construction and demolition waste (“C&D waste”) would be generated at the site, with the main likely waste streams outlined in the table below.

**Table 3.1:** Predicted Main Construction Waste Streams

WASTE TYPE	EWC CODE	ORIGIN
Concrete	17 01 01	Waste concrete may arise due to surplus concrete from pouring activities and washings from ready-mix trucks.
Bricks	17 01 02	Damaged / defected brick waste may arise during the construction of the industrial units.
Tiles and Ceramics	17 01 03	Waste tiles / ceramics may arise during the construction activities.
Mixture of Concrete, Bricks, Tiles and Ceramics	17 01 07	As detailed in 17 01 01, 17 01 02 and 17 01 03 above.
Wood	17 02 01	Wood waste may arise in small volumes during construction works, including building and shuttering works, due to damaged / defected wood, off-cuts and

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WASTE TYPE	EWC CODE	ORIGIN
		surplus wood.
Glass	17 02 02	Glass waste may arise due to damaged / defected glass and accidental breakages.
Plastic	17 02 03	Plastic waste may arise due to damaged / defected products.
Metals (including alloys)	17 04 01 - 07	Waste metal may arise due to damaged / defected metal, off-cuts and surplus metal.
Soils and Stones	17 05 04	Excavated soils and stones waste would arise during site excavations and earth-moving activities.
Insulation Materials	17 06 04	Waste may arise due to damaged / defected insulation panels and off-cuts.
Bituminous mixtures, coal tar and tarred products	17 03	Waste may arise due to surplus material from tarring of internal road network.
Biodegradable waste	20 02 01	Limited volumes of green waste would be generated during the removal of hedgerows and three mature trees within the central portion of the proposed site.

The temporary site compound, which would house the site offices and staff welfare facilities such as a canteen, would generate limited amounts of waste, including the following:

- ) Paper and cardboard – EWC 15 01 01 and EWC 20 01 01;
- ) Biodegradable / food waste – EWC 20 01 08;
- ) Plastics – EWC 15 01 02 and EWC 20 01 39;
- ) Metals – 20 01 40;
- ) Mixed municipal waste – EWC 20 03 01;
- ) Sanitary waste – EWC 20 03 04.

Other waste materials that may arise during construction works in small volumes include:

- ) Waste Oils and Liquid Fuels – EWC 13 02 and EWC 13 07;
- ) Waste from Electrical and Electronic Equipment – EWC 16 02;
- ) Cables – EWC 17 04 11;
- ) Paints – EWC 20 01 28;
- ) Batteries – EWC 16 06.

Wastes from EWC fractions EWC 13 02, EWC 13 07, EWC 16 02 and EWC 16 06 may be hazardous.

The BRE Waste Benchmark Data, published in June 2012, provides guidance on the construction waste estimates based on the gross internal floor area. Table 3.2 below details the typical construction industry waste generation per 100m<sup>2</sup> floor area.

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**Table 3.2:** BRE Waste Benchmark for Predicting and Forecasting Construction Waste

PROJECT TYPE	NUMBER OF PROJECTS DATA RELATES TO	AVERAGE TONNES/100M <sup>2</sup>
Residential	256	16.8
Public Buildings	23	22.4
Leisure	21	21.6
Industrial Buildings	23	<b>12.6</b>
Healthcare	22	12.0
Education	60	23.3
Commercial Other	4	7.0
Commercial Offices	14	23.8
Commercial Retail	48	27.5
Total number of projects	<b>471</b>	-

For a total building area of 23,860 m<sup>2</sup>, and an average of 12.6 tonnes of waste per 100m<sup>2</sup> of floor area, the construction waste generated translates to approximately 3,006 tonnes.

The following table outlines the typical breakdown of construction and demolition waste type expected to be generated from a typical site such as this, based on the EPA Waste Data, *Construction & Demolition Waste Statistics For Ireland* (March 2018). This table also gives an estimate of the construction waste (breakdown) which might be generated based on information currently available.

**Table 3.3:** Waste Materials Generated and Estimated Construction Water Quantities

WASTE TYPES	PERCENTAGE (EPA FIGURES)	WASTE TONNES ESTIMATE
Metal waste	5.24%	157.5
Glass waste	0.09%	2.7
Paper and cardboard waste	0.01%	0.3
Plastic waste	0.01%	0.3
Wood waste	1.57%	47.2
Waste containing PCBs	0.00%	0
Mixed waste	0.08%	2.4
Mineral waste	12.11%	364
Asbestos waste	0.19%	5.7
Soil and stones	74.35%	2,235
Residue from treatment of mixed waste	6.35%	190.9
<b>Total</b>	<b>100</b>	<b>3,006</b>

It should be noted that no asbestos waste would be anticipated to be generated at the site. Therefore, the estimated figure of 5.7 tonnes of asbestos waste can be discounted.

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The following table outlines the estimated volumes of wastes to be generated during the project, in addition to the proposed project targets. It should be noted that the figures below are estimates, and therefore, are for indicative purposes only. During the detailed design stage of the project, the construction works contractor would review the estimated volume of wastes to be generated.

**Table 3.4:** Estimated Volumes of Wastes Generated and Targets

WASTE TYPE	TONNES	REUSE / RECOVERY		RECYCLING		DISPOSAL	
		%	TONNES	%	TONNES	%	TONNES
Mineral Waste (i.e. Concrete, Bricks)	364	20	72.8	60	218.4	20	72.8
Metal	157.5	5	7.9	90	141.7	5	7.9
Wood	47.2	40	18.9	55	26	5	2.3
Glass	2.7	0	0	90	2.4	10	0.3
Mixed Waste	2.4	0	0	0	0	100	2.4
Paper & Cardboard	0.3	0	0	100	0.3	0	0
Plastic	0.3	0	0	95	0.28	5	0.02
Soils & Stones	2,235	90	2,012	0	0	10	223
Other (for example residue from treatment of mixed waste, insulation materials, bituminous mixtures, and waste hydrocarbons)	190.9	20	38.2	40	76.4	40	76.4
<b>TOTAL (Rounded)</b>	<b>3,000</b>		<b>2,150</b>		<b>465</b>		<b>385</b>

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**4. WASTE ARISING**

**4.1 WASTE HIERARCHY**

Throughout the construction phase, the construction works contractor would manage the wastes generated in order of priority in accordance with Section 21A of the Waste Management Act 1996, as amended, as per the waste hierarchy below.



**Figure 4.1: Waste Hierarchy**

Wastes would be segregated as much as possible in order to avoid cross contamination. Where practical, the generation of wastes at source would be reduced through measures such as the efficient ordering and purchasing of materials to reduce surplus materials, the correct storage and handling of materials to minimise the generation of damaged materials, the return of uncured concrete to the batching plant where possible and the re-using of shutters for concrete works.

Where it is not possible to avoid the generation of wastes, wastes would be sent for recycling or recovery as a priority. The generation of waste for disposal would be minimised as much as is practical.

**4.2 WASTE HANDLING**

**Construction Waste Management**

Waste materials generated by construction activities would be managed according to the Department of the Environment, Heritage and Local Government's 2006 Publication - Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects.

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Prior to the commencement of development, the construction works contractor would identify a permitted waste contractor(s) who would be employed to collect and dispose of all wastes arising from the project works. In addition, the construction works contractor would identify all waste licensed/permitted facilities that would accept all expected waste exported off-site and would maintain copies of all relevant Waste Permits/Licences as required. Further details are provided in the sections below.

In order to ensure that waste is minimised and segregated correctly, the construction works contractor would ensure that all staff personnel, sub-contractors and any other relevant personnel are appropriately informed by means of clear signage, verbal instruction and induction training. Waste management training, as part of site induction, would discuss the waste hierarchy and detail the segregation of waste materials at source and storage methods, in addition to including a section on hazardous waste management. Site induction training, verbal instruction and signage would aim to train site personnel so that they are in a position to:

- ) Distinguish reusable materials from materials suitable for recycling;
- ) Ensure maximum segregation at source;
- ) Co-operate with the construction site manager on the best location's for stockpiling reusable materials;
- ) Separate materials for recovery;
- ) Identify and liaise with operators of waste collection and waste management operators.

**Waste Contractors**

The collection of wastes from the site would be undertaken by suitably authorised waste hauliers, and would only be recycled / recovered or disposed of at suitably licenced waste facilities.

The construction works contractor would appoint a waste contractor(s) for the construction phase. The waste contractor(s) appointed for the project would have experience in construction waste management and would be appropriately licenced, holding the relevant waste collection permit and/or waste licences for the types of waste anticipated to be generated during construction works.

The waste contractor(s) would be appropriately licenced in compliance with the following regulations:

- ) Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007);
- ) Waste Management (Collection Permit) Amendment Regulations 2008 (S.I. No. 87 of 2008);
- ) Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. No. 821 of 2007);
- ) Waste Management (Facility Permit and Regulations) Amendment Regulations 2008 (S.I. No. 86 of 2008).

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The construction works contractor would ensure that copies of all waste contractors' collection permits and licences would be available for inspection, as discussed in Section 8.

**Waste Storage Area**

The temporary site compound would be the main designated location for waste receptacles onsite. Suitable waste receptacles would be provided by the appointed waste contractor(s) during the construction phase, with skips / bins allocated to specific waste streams to avoid contamination. The number and size of waste receptacles would be determined following the appointment of the waste contractor(s). Waste receptacles would be appropriately labelled.

Where waste fuels and oils are generated, they would be stored within a bunded container in a designated area of the site compound. Any hazardous materials would be stored separately from non-hazardous waste, and would be stored within bunded containers / upon a bund where appropriate.

The removal of waste from the site would be undertaken on a regular basis, preventing large volumes of waste accumulating onsite.

**Waste Minimisation**

Waste minimisation and prevention would be the responsibilities of the construction works contractor, who would ensure the following:

- ) The efficient ordering and purchasing of materials to reduce surplus materials;
- ) Materials would be ordered in appropriate sequence to minimise materials stored on site;
- ) The correct storage of materials to minimise the generation of damaged materials, for example keeping materials packaged until they are ready to be used and storing materials which are vulnerable to water damage via precipitation under cover and raised above the ground;
- ) The handling of materials with care, to avoid undue damage;
- ) The return of uncured concrete to the batching plant where possible;
- ) The re-use of shutters for concrete works;
- ) Where practical and where permitted, certain waste streams would be used during infill works (if required);
- ) Where possible, excavated subsoil and topsoil would be reused for the reinstatement and landscaping of the development site.

The construction works contractor would reuse materials onsite where possible. In particular, soils and stones (EWC 17 05 04) would be used for site levelling and landscaping purposes. Where generated, and where applicable, inert wastes (such as concrete (EWC 17 01 01), bricks (EWC 17 01 02) and soils and stones (EWC 17 05 04)) would be used for infilling activities (should infilling activities be required).



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The reuse of materials onsite would reduce the requirement for imported material to the site, which would have the following positive environmental impacts to the construction phase:

- ) Reduction in imported materials to the site;
- ) Reduction in the requirement for virgin aggregate materials from quarries;
- ) Reduction in energy required to extract, process and / or transport virgin materials / aggregates;
- ) Reduced HGV movements associated with the delivery of imported materials to the site;
- ) Reduced noise levels associated with reduced HGV movements;
- ) Reduction in the amount of landfill space required to accept C&D waste.

**Management of Waste Streams**

As mentioned above, wastes generated would be managed by the construction works contractor in order of priority in accordance with Section 21A of the Waste Management Act 1996, as amended. Table 3.4 provides targets for the reuse, recovery, recycling and disposal of the various waste streams.

**Excavated Soils and Stones:**

Based on current calculations, it is estimated that approximately 2,235 tonnes of excavation materials would be generated for the proposed development. However, it is likely that this figure is an over-estimate.

Soils and stones arising from excavations would be reused in the reinstatement (for example as cut and fill activities and engineering fill) and landscaping processes where possible. This would be investigated by the construction works contractor and would be subject to appropriate testing to ensure the material is suitable for its proposed end use.

Any excess excavated soils would be collected by a licenced waste contractor and either reused for reinstatement / landscaping activities at other sites if suitable or disposed of as appropriate. Alternatively, the construction works contractor would investigate if excavated soils can be classified as a by-product under Article 27 of the Waste Directive Regulations, 2011. If a local use for the material is identified, and if the proposed end use meets the requirements of the Article 27 regulations, there would be no requirement to send this material to a waste facility.

In the unlikely event of any evidence of soil contamination being found during work on site, the appropriate remediation measures would be employed. Areas of potentially contaminated soil would be isolated and tested for contamination in accordance with the 2002 Landfill Directive (2003/33/EC). Any work of this nature would be carried out in consultation with, and with the approval of, the EPA and the Environmental Department of Carlow County Council. Pending the results of laboratory testing, this material would be excavated and exported off-site, by an appropriately Permitted Waste Contractor holding an appropriate Waste Collection permit and that this hazardous material, and be sent for appropriate treatment / disposal to an appropriately Permitted / Licenced Waste Facility.

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**Concrete, Bricks, Tiles and Ceramics:**

Surplus concrete would be returned to the batching plant where possible. An impermeable concrete washout area (separate to vehicle wheel wash) would be installed by the construction works contractor, if required. Excess concrete and washings from ready mix trucks would be deposited in the designated contained area only. The main contractor would arrange for removal from site of concrete at regular intervals. Where concrete, blocks and bricks, tiles and ceramics arise from construction activities, they would be crushed and used for ground-fill material where deemed suitable (should infill activities be required). Where these materials cannot be reused onsite, they would be diverted for recycling if possible.

**Wood:**

Waste wood would be reused for shuttering where suitable. Wood that is uncontaminated (free from preservatives and paints) would be segregated and recycled. Any wood not deemed suitable for recycling would be disposed of as appropriate.

**Metal:**

Metal is highly recyclable and has a considerable rebate value. Where metal cannot be reused onsite, the majority would be recycled.

**Glass:**

Small volumes of waste glass may be generated during the construction phase. As glass can contaminate other segregated waste streams, it would be collected separately where possible. The majority of glass would be recycled.

**Other Recyclables:**

These include plastic, cardboard and office waste such as paper. Where possible, the different recyclables would be segregated onsite and sent for recycling. With regards packaging waste, the construction works contractor would investigate the possibility of returning the packaging to the supplier.

**Food Waste:**

Food waste on site would arise from food consumption by construction staff. Suitable food waste bins would be provided by the contractor in the construction compound and the contractor would ensure that these are regularly removed and emptied. Food waste would be sent for composting or anaerobic digestion.

**Mixed Municipal Waste and Other Non-Recyclable Waste:**

Wastes not suitable for reuse or recycling would be stored in separate waste receptacles. Prior to removal from site, the EHS Officer or delegate would inspect the receptacles to ensure they contain no recyclable material or materials which can be reused.

**Green Waste:**

Green waste may be sent for composting if not possible to reuse onsite during landscaping / re-instatement activities, or for disposal as deemed appropriate by the waste contractor.

**Sanitary Waste:**

Sanitary waste from the holding tank located within the temporary site compound would be collected by a licenced waste contractor on a regular basis.

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**Hazardous Materials:**

Hazardous waste would be managed in accordance with the Waste Management (Hazardous Waste) Regulations 1998 and 2000. Small quantities of hazardous waste may be generated onsite. Examples of potentially hazardous wastes include fuels and oils, batteries, paints, adhesives and sealants. Hazardous waste would be stored separately from non-hazardous waste, would be appropriately labelled and would be stored upon bunds where appropriate. The construction works contractor would ensure that the appointed waste contractor is licenced to transport / accept hazardous waste prior to the waste leaving the site. Depending on the type of hazardous material, the waste may be recovered, recycled or disposed of appropriately.

**Waste Electrical and Electronic Equipment (WEEE):**

This waste, if generated, would be stored separately from other waste streams and would be covered pending collection. WEEE can contain hazardous components such as batteries and mercury containing fluorescent tubes. All hazardous wastes would be stored in appropriate secure bunded containers prior to removal from site. Some hazardous wastes may not be stored with other wastes. This would be determined by the contractor and appropriate precautions taken.

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## **5. ESTIMATED COST OF WASTE MANAGEMENT**

An outline of the costs associated with waste management during the project is provided below. The total cost of waste management during the project would be measured and would take into account the handling costs, storage costs, transportation costs, the revenue generated from recycling rebates and disposal costs including the landfill tax.

### **5.1 REUSE**

Where materials are reused onsite, savings would be made in transportation costs and the associated recycling / recovery / disposal costs. Where materials cannot be reused onsite but may be reused elsewhere, for example topsoil, this material would often be taken from the site for a nominal fee or free of charge.

### **5.2 RECYCLING**

Waste contractor recycling fees are considerably less than disposal costs. Where recycling streams are segregated, the associated fee may be further reduced. For some waste streams, for example metals, waste contractors would provide a rebate, which can be offset against the costs of collection and transportation.

### **5.3 DISPOSAL**

Disposal rates are typically around €125-€150 per tonne, which includes the landfill levy cost of €75 per tonne, as specified in the Waste Management (Landfill Levy) Regulations 2015 (S.I. 189 of 2015). Waste contractors would also impose a charge for the collection of the waste skips. Where C&D waste is segregated from other wastes, waste contractors may charge less, as they may be able to salvage items from the waste, such as clean rubble for fill material, prior to disposal.

## **6. DEMOLITION PLAN**

The principle objective of a Demolition Plan is to ensure that in projects where a building or structure requires demolition, the sequence of operations to be followed is predetermined and documented, thereby ensuring that an appropriately selective dismantling / demolition methodology is employed.

The only existing structure at the development site is the remains of an agricultural yard, comprising of concrete walls. In the absence of any existing buildings or structures of significance, no demolition works would be required for this project, and therefore a demolition plan is not required.

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## **7. ROLES, RESPONSIBILITIES AND TRAINING**

### **7.1 ROLES AND RESPONSIBILITIES**

The applicant, Firtree Developments Ltd., has appointed a construction works contractor, Milltown Developments Ltd., to the proposed development, should the planning application be successful.

#### **Project Manager**

The Construction Works Contractor Project Manager would be responsible for the overall implementation of the Construction and Demolition Waste Management Plan. The Project Manager would ensure that there are sufficient resources available to support the implementation of this C&D WMP.

#### **Waste Manager**

The construction works contractor would appoint a Waste Manager from the construction team. This would most likely be the EHS Officer for the site. The Waste Manager would be suitably trained in waste management, in how to maintain a waste record keeping system and how to perform waste audits for the site.

The Waste Manager would have overall responsibility for waste management at the site, and, in addition to the Project Manager, would be responsible for the implementation of the C&D WMP. The role of the Waste Manager would ensure that the opportunity is taken to educate all colleagues, site staff, including external contractors and suppliers, about alternatives to conventional construction waste disposal. The Waste Manager would liaise with the Project Manager on a regular basis with regards the implementation of the C&D WMP.

#### **Site Staff**

All site personnel would be responsible for the effective implementation of the C&D WMP, and would be trained on waste management by the Waste Manager.

### **7.2 TRAINING**

Training of site personnel, sub-contractors and any other relevant personnel would be the responsibility of the Waste Manager. A waste training programme would be organised and would be included as part of induction training and also via toolbox talks where required. The training programme would communicate the contents of the C&D WMP, discuss the waste hierarchy and detail the segregation of waste materials at source and storage methods. The training programme would also include a section on hazardous wastes, and the dangers of hazardous waste explained.

The waste training programme would aim to train site personnel so that they are in a position to:

- ) Distinguish reusable materials from materials suitable for recycling;
- ) Ensure maximum segregation at source;

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- ) Co operate with site manager on the best location's for stockpiling reusable materials;
- ) Separate materials for recovery;
- ) Identify and liaise with operators of waste collection and waste management operators.

**8. RECORD KEEPING**

The construction works contractor would develop a record keeping system that would ensure that details of all waste types generated at the site, in addition to movement and treatment, are recorded. All materials being transferred from the site, whether for recycling or disposal, would be subject to a documented tracking system which can be verified and validated.

The Waste Manager would record the following:

- ) Waste removed for reuse offsite;
- ) Waste removed for recycling;
- ) Waste removed for disposal;
- ) Reclaimed waste materials brought on-site for reuse.

The Waste Manager would maintain copies of the waste contractors' relevant waste collection permits and waste licences.

For each movement of waste and for each type of waste, the construction works contractor would obtain a signed waste docket from the waste contractor, detailing the weight, type of material, source and destination of material and whether the material is going for recycling, recovery or disposal. Where possible, this system would be linked to the delivery records for the site, which would allow the percentage of C&D waste generated per material to be determined.

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**9. WASTE AUDITING PROCEDURE**

Waste auditing during the construction phase of the project would be the responsibility of the Waste Manager. The Waste audit would cover the following elements:

- ) A systematic study of all waste management practices which have been adopted onsite;
- ) Special attention should be dedicated to obvious opportunities for waste reduction, but all areas and stages within the project should be reviewed;
- ) Details of raw material inputs and the quantity, type and composition of all waste from the site should be identified;
- ) The audit findings should highlight corrective actions that may be taken in relation to management policies or site practices in order to bring about further waste reductions;
- ) A tracking system shall be stipulated to determine the success or failure of corrective actions.

The Waste Manager would review all records for the waste generated onsite, in addition to records for waste transferred offsite. This would be undertaken on a quarterly basis at a minimum. The Waste Manager would check that a signed waste docket is available for each movement of waste and for each type of waste. Should waste movements not be accounted for, the reasons should be investigated to determine why the record keeping system, as discussed in Section 8 above, has not been maintained.

Each waste type would be examined, in order to determine where the largest percentage of waste generation occurred. This would allow the construction works contractor to prioritise and address specific waste streams, and would assist in setting targets.

Waste management costs would also be reviewed as part of the Waste Audit.

Upon completion of the construction phase, a final summary report would be prepared, summarising the outcomes of the waste management processes adopted and the total reuse / recycling / recovery / disposal figures for the project.

Ongoing consultation with the waste contractor(s) and Carlow County Council would be undertaken to ensure that the best practicable option is being followed for waste management at the site.

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**10. CONSULTATION WITH RELEVANT BODIES**

Upon planning approval, the construction works contractor would begin the process of engaging with waste contractors for the proposed development. The waste contractor(s) would have experience in C&D waste management and would be appropriately licenced, holding the relevant waste collection permit and / or waste licences for the types of waste anticipated to be generated during construction works. Where required, upon appointment of the waste contractor(s) for the project, details of the proposed destination of each waste stream would be provided to Carlow County Council.

**11. REFERENCES**

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