


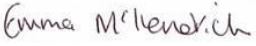
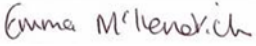

Outline Construction and Demolition Waste Management Plan

Proposed Residential Development at Glounthaune, Co.
Cork.

Bluescape Limited

Project number: 60592432
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Prepared by	Checked by	Verified by	Approved by
			
Aileen Prendergast Principal Engineer	Emma McKendrick Regional Director	Emma McKendrick Regional Director	Aileen Prendergast Principal Engineer

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Prepared for:
Bluescape Limited

Prepared by:

AECOM Ireland Limited
1st floor, Montrose House
Carrigaline Road
Douglas, Cork T12 P088
Ireland

T: +353 21 436 5006
F: +353 21 436 5156
aecom.com

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1. Introduction

1.1 Background

AECOM were appointed by Bluescape Limited to prepare an outline Construction Demolition Waste Management Plan (CDWMP) / Resource and Waste Management Plan (RWMP), herein known as ‘the plan’, in support of a Strategic Housing Development (SHD) planning application to An Bord Pleanála for a proposed residential development at Glounthaune, Co. Cork.

This plan has been prepared to accompany the planning application for the proposed development. The proposed layout of the development is detailed in the planning drawings prepared by Deady Gahan Architects.

The purpose of this plan is to detail how the Contractor is required to manage waste during the construction phase of the proposed development. The objective of this plan is to ensure that the development’s resources and construction & demolition (C&D) waste is managed in accordance with applicable legislation, local authority plans and policies and regional waste management targets. C&D wastes are defined as waste which arises from construction, renovation and demolition activities. As per the EPA ‘*Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects*’, April 2021, this plan will be built upon by the design team and contractor following approval of the submission. A Construction and Environmental Management Plan (CEMP) has also been prepared to accompany this application.

The project lifecycle of the plan during the project is illustrated in Figure 1, taken from Section 3.1 of the EPA ‘*Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects*’.

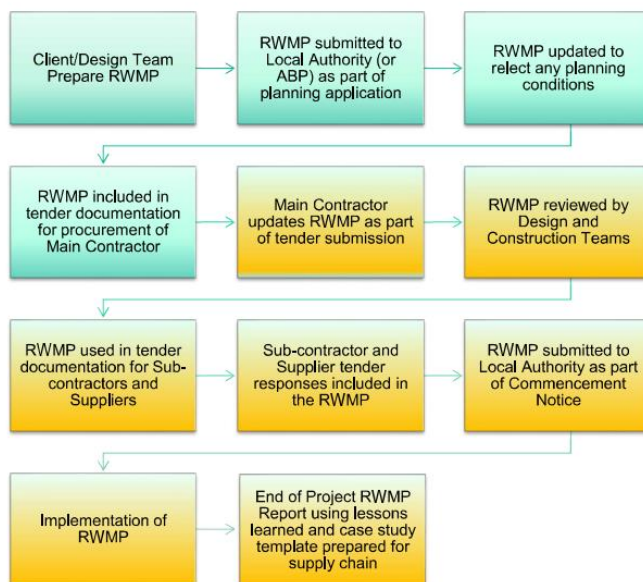


Figure 1 – Project Life Cycle of the CDWMP/ RWMP

1.2 Legislative Basis

Construction and demolition (C&D) waste is defined as waste which arises from construction, renovation and demolition activities, together with all waste categories mentioned in Chapter 17 of the List of Waste (LoW)¹. Also included within the definition are surplus and damaged products and materials arising during construction work or used temporarily during the course of onsite activities.

This plan has been prepared in accordance with EPA's guidance document *Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects*. The proposed residential development is classed as a Tier 2 development as set out in Section 3.1 of this guidance document.

Section 3.1 defines Tier 1 projects as '*Smaller scale projects, below the thresholds presented in Text Box 1*', and Tier 2 Developments as '*Larger scale projects, above the thresholds presented in Text Box 1*'. Figure 2 illustrates the thresholds presented in Text Box 1, taken from *Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects*.

Text Box 1: RWMP Thresholds

Developments below the following thresholds may be classed as Tier 1 development:

- New residential development of less than 10 dwellings;
- Retrofit of 20 dwellings or less;
- New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m²;
- Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m²; and
- Demolition projects generating less than 100m³ in volume of C&D waste.

Developments above these thresholds are classed as Tier-2 projects.

Figure 2 – Text Box 1

This CDWMP has therefore been prepared with reference to and taking account of the following legislation, plans and waste management guidance documents:

- The Waste Management Act 1996 – 2008, Amendments & Associated Regulations;
- CIRIA document 133 Waste Minimisation in Construction;
- The Litter Pollution Act 1997, as amended;
- The Southern Region Waste Management Plan 2015-2021;
- Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (DEFRA), September 2009;
- Designing out Waste: A Design Team Guide for Civil Engineering (WRAP); and
- Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects, Draft for Public Consultation, April 2021.

1.3 Objectives

The objectives of the CDWMP are as follows:

- Promote an integrated approach to waste management throughout the project construction stage and to set out appropriate responsibilities;

¹ Environmental Protection Agency, *Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous*, Valid from 5th July 2018

- Promote sustainable waste management in line with the waste management hierarchy;
- Provide an outline plan for the management of wastes arising from construction works for the project in accordance with the relevant Irish and EU waste management legislation; and
- Provide a framework for the designers and the Principal Contractor to appropriately manage waste generated during the course of the project.

This plan outlines methods to achieve waste prevention, maximum recycling and recovery of waste and provides recommendations for the management of the various anticipated waste streams. This plan also provides guidance on collection and transport of waste to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil or water resources).

2. Project Description

2.1 Site Location

The current site comprises primarily of a greenfield site. The site measures approximately 13.87 ha in total. The public road network surrounding the site is defined by Killahora Road (L-2969) to the north, Knockraha Road (L-2968) to the west, and The Terrace (L-2970) / Johnstown Close to the south.

The majority of the site is located to the north of the Terrace (L-2970). This site is primarily greenfield, currently used as agricultural lands with woodland areas at the southern end. These lands have not been developed previously. There is one derelict unit (total area of 148.2 sqm) located at the southern end, accessed from the Terrace (L-2970). The part of the site to the north of the Terrace is bounded by existing residential developments to the north, west and south.

The remainder of the site is located to the south of the Terrace (L-2970). This site is primarily greenfield with wooded areas throughout. These lands have not been developed previously. This part of the site is bounded by the L-2970 to the north, existing dwellings to the east and west, and Johnstown Close to the south.

There is a considerable variation in ground levels across the site which has been considered in developing the proposed layout. The site slopes from north to south from approximate +110 m OD Malin to +34.5 m OD Malin on The Terrace to approximately +3.30 m OD Malin.

2.2 Proposed Development

The proposed development consists of the construction of a mixed-use residential development of 289 no. residential units consisting of 201 no. dwelling houses and 88 no. apartment/duplex units, a two storey creche, 4 no. ESB substations and all ancillary site development works at Lackenroe and Johnstown (townlands), Glounthaune, Co. Cork. The proposed development will be constructed on lands to the north and south of the public road, L-2970, known locally as 'the Terrace'. A portion of the site to the south of 'the Terrace' was formerly within Ashbourne Garden and is considered to be within the curtilage and attendant grounds of Ashbourne House, which is a Protected Structure (Ref 00498).

The proposed development to the north of 'the Terrace' provides for 260 no. residential units comprising of 196 no. dwelling houses, 64 no. apartment/duplex units and a two storey creche. The 196 no. dwelling houses includes 5 no. 4 bedroom detached dwellings, 44 no. 4 bedroom semi-detached dwellings, 12 no. 4 bedroom townhouses, 2 no. 3 bedroom detached dwellings, 22 no. 3 bedroom semi-detached dwellings, 47 no. 3 bedroom townhouses and 64 no. 2 bedroom townhouses. The 64 no. apartment/duplex units contains 5 no. 3 bedroom units, 32 no. 2 bedroom units and 27 no. 1 bedroom units contained in 6 no. three storey apartment buildings, with ancillary bicycle parking and bins stores.

The proposed development to the south of 'the Terrace' provides for 29 no. residential units comprising of 5 no. dwelling houses and 24 no. apartments. The 5 no. dwellings include 1 no. 3 bedroom detached dwelling, 2 no. 3 bedroom townhouses and 2 no. 2 bedroom townhouses. The proposed apartments are provided in a four-storey mixed-use building containing a ground floor community unit and a commercial unit with apartments at ground and upper floor levels comprising 3 no. 3 bedroom units, 7 no. 2 bedroom units and 14 no. 1 bedroom units with ancillary rooftop terrace, car parking, bicycle parking and bin stores.

Vehicular access to 2 no. dwellings in the lands to the north of 'the Terrace' will be provided via an upgraded entrance from 'the Terrace' with vehicular access to the remainder of dwellings in the lands to the north of 'the Terrace' via the signalised junction from the L-2968 and internal road network permitted by Cork County Council reference 17/5699 and An Bord Pleanála reference 300128-17. A separate secondary emergency access is also proposed from the L-2969 to the north.

Vehicular access to the 5 no. dwellings to the south of the 'the Terrace' will be via a new entrance from 'the Terrace' and the proposed apartment building will be accessed from Johnstown Close. The proposed development also makes provision for a pedestrian link from the proposed development north of 'the Terrace' to Johnstown Close via 'the Terrace' which will include a signalised pedestrian crossing and associated traffic calming measures on 'the Terrace'.

Ancillary site works include the demolition of 1 no. existing derelict dwelling house and associated outbuildings, landscaping and servicing proposals including the realignment of the existing pedestrian/cycle route on Johnstown Close, the undergrounding of existing overhead lines, upgrade of the storm and foul sewer network to the south and east of the subject lands along 'the Terrace' and Johnstown Close (L-3004).

Figure 3 illustrates the extent and layout of the proposed development.



Figure 3 – Site Location and Layout

2.3 Engineering Challenges

The site presents a number of engineering challenges. These include topography, geology, physical form and lack of pedestrian connectivity between the upper and lower lands.

The site layout has been developed by the design team to work with the natural form, geology and constraints of the site while at the same time complying with technical design standards:

- The natural topography of the site was considered. Vehicular access to the lands to the north of 'the Terrace' will be via the signalised junction from the L-2968 and internal road network permitted by Cork County Council reference 17/5699 and An Bord Pleanála reference 300128-17. The new road is an extension of the road serving the phase 1 development. The road traverses west to east across with internal roads serving the development.
- A separate secondary emergency access is proposed to the L-2969 to the north.

- A 3m wide shared pedestrian / cycle path has been incorporated to provide access from Johnstown Close to Terrace Road and also from Terrace Road to the dwellings to the north, connecting at access Road 11. Given the topography of the site the minimum gradient achievable is 1 in 12. The maximum length between landings is 10m and a continuous handrail is proposed on down slope of the path. This ensures an accessible, integrated and permeable design.
- To shorten the distance between the points of pedestrian connectivity between Johnstown Close and the Terrace Road for non-disabled persons, 2m wide concrete steps have been incorporated into the slope. A more direct route from the Terrace Road to the dwellings to the north, connecting at access Road 11 within the development for use by non-disabled persons is also provided. Signage will be provided at the both ends of the path and where it intersects with the accessible path warning the route incorporates stairs. A cycle ramp is proposed on the stairs to allow cyclists to push their bicycle up/down the stairs.

Additional detail on the constraints considered as part of the design development of the proposals is provided in the Constraints Reports prepared to accompany this application.

2.4 Proposed Phasing

It is proposed to deliver the proposed development in 3 phases:

- Phase 1: 97 Units including the creche, community facility and commercial unit (shown in blue in Figure 4) This phase also includes the construction of the development access road through the site along with the pedestrian paths traversing from north to south through the site,
- Phase 2: 93 Units along the western boundary of the site (noted in green in Figure 4),
- Phase 3: 99 Units along the eastern boundary of the site (noted in yellow in Figure 4).

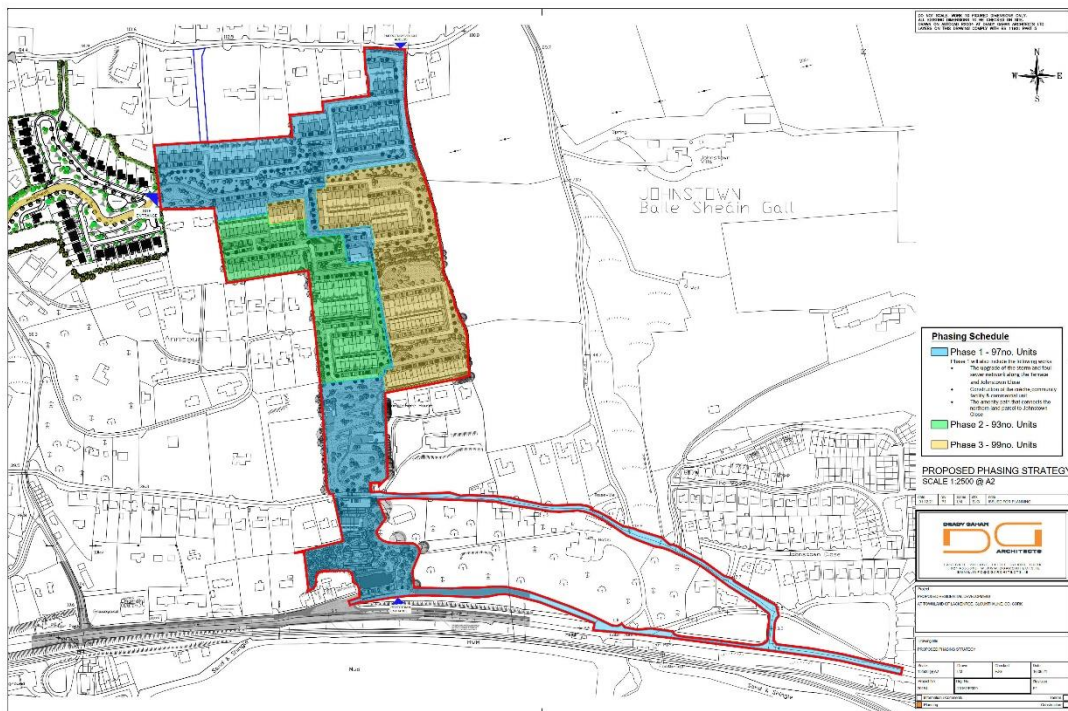


Figure 4 – Proposed Phasing Plan

2.5 Sequence of Works

It is estimated that the overall duration of the Construction Phase will be approximately 48 months. The main stages of construction will be progressed based on the following:

- Complete any necessary pre-construction surveys. Please refer to the EIAR accompanying this application for specified surveys.
- Implement all mitigation measures outlined in the application document,
- Confirm utility locations and divert utilities,
- Establish contractor's site compound and erection of site hoarding,
- Site clearance and top soil stripping,
- Cut and fill to level and re-grading works within site to formation level,
- Installation of services (drainage networks, water supply, electricity, etc.),
- Construction of roads, footpaths & hard/ soft landscaping,
- Installation of foundations/ footings for buildings and retaining walls,
- Construction of new buildings (houses, duplex units and creche),
- Connection to public services,
- Installation of substations,
- Provision of proposed road finishes,
- Provision of landscaping finishes,
- Complete all site finishes,
- Completion of any required testing and commission services within the development.

The above will be undertaken for each of the phases set out in Section 2.4. Table 1 presents the estimated cut and fill volumes associated with the proposed development.

Table 1. Excavation Volumes

Material	Cut Volume (m ³)	Fill Volume (m ³)	Net Volume (m ³)
Top Soil (400 mm depth)	41,772	13,925	27,798
Overburden	53,964	53,964	0
Rock	18,565	12,602 (crushed rock as fill)	5,963

2.5.1 Proposed Demolition Works

There is an existing derelict dwelling to the north of the Terrace that are to be demolished and replaced with two new residential units. Figure 5 illustrates the location of the existing derelict dwelling to be demolished. The total area of the derelict buildings is approximately 148 m².



Figure 5 – Location of existing dwellings to be demolished

2.6 Construction Phase Content

As per Appendix C of the EPA 'Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects', this plan is to be updated to reflect the following at Construction Phase:

- A summary of any significant design changes imposed since the Design Stage RWMP through mechanisms such as value engineering or other;
- Details of planning permission (if relevant) and in particular any conditions imposed in relation to resource management;
- Any issues related to ground contamination which were identified during the construction phase.

3. Roles & Responsibilities

All parties involved in the Project will have responsibility for waste management. Responsibility will vary at different stages of the project lifecycle, as set out below.

3.1 Pre-Construction Phase

Table 2 sets out the roles and responsibilities during the pre-construction phase of the proposed development.

Table 2. Pre-Construction Phase Waste Management – Key Responsibilities

Responsible Party		Responsibility	Project Stage
Client	Bluescape Limited	Appointment of competent Design Team, Resource Manager and Principal Contractor	Project initiation and subsequent tendering phases
		Responsibility of waste management from 'cradle to grave', including documentation of same.	All project stages
Design Team	Architect: Deady Gahan Architects Ltd Engineer: AECOM Landscape Architect: CSR Land Planning & Design	Design of Soil Excavation Plan Identification of Key Waste Streams Design to minimize waste generation in lifecycle of completed construction. Adequately provide for waste management in tender documents and declare all relevant information & data.	Pre-Construction

3.2 Construction Phase

Following appointment of a Contractor to undertake the works, the following information must be included in this section of the plan. Table 3 provides a description of the future role of the Contractor.

- Overview of the Construction Phase roles included Client, Client's Representative, Contractor, Sub-Contractors, etc.;
- Description of the role of the named Client and key personnel;
- Description of the role of the Contractor's Project Manager;
- Description of the role of the Contractor's Site Manager;
- Description of the role of the Contractor's nominated Resource Manager (RM);
- Description of the role of the Quantity Surveyor on procurement and purchasing;
- Description of the role of the named Sub-Consultants and Suppliers.

The appointed Contractor will be responsible for updating the plan.

Table 3. Construction Stage Waste Management – Key Responsibilities

Responsibility	Project Stage
Principal Contractor Construction & Demolition Waste Management Plan implementation	Project Implementation
Refinement and implementation of the outline CDWMP within their own over-arching Site Waste Management Plan (SWMP)	Project Implementation
Appoint competent and authorized waste management contractor(s)	Project tendering phase
Appoint trained, competent Waste Manager	Construction phase

Responsibility		Project Stage
Waste Manager	SWMP implementation	Project implementation
	Ensure that's the objectives of both the CDWMP and the contractors SWMP are achieved.	Construction stage
	Waste characterisation. Selection of techniques and design to minimize waste and to maximize recovery and recycling of waste during the project.	Project Design Phase and during project implementation
	Maintenance of Waste Documentation for 3 years.	Post-construction stage
	Completion of Final Waste Management Report	Construction stage
	Educate colleagues, site staff, external contractors and suppliers about alternatives to conventional construction waste disposal	Project Design Phase and during project implementation

4. General Waste Management Regulatory and Policy Requirements

Some specific points on waste management policy and regulatory requirements are set out as follows:

- Construction and Demolition (C&D) waste can be defined as all waste that arises from construction, renovation and demolition activities and includes all waste listed in Chapter 17 of the LoW, including hazardous and non-hazardous waste types.
- The EU Waste Framework Directive (2008/98/EC), enacted in Ireland under the Waste Directive Regulations, 2011 of the same title, requires Member States to take the necessary measures to achieve the minimum recycling/recovery target of 70% by weight for non-hazardous C&D waste, excluding naturally occurring materials, by 2020. The Directive specifies that such a target should be achieved by preparing for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other material.
- The Southern Region Waste Management Plan 2015 – 2021 (SR-WMP) was published in May 2015. Notable and relevant points are:
 - a. There has been a sharp drop in the number of available operational landfills nationally. Historically these were a significant outlet for C&D waste. Therefore, there is a need to maximize diversion of infill of C&D waste and consider alternative uses, for example, crushing and screening of masonry, stone and concrete wastes for re-use in a variety of engineering applications;
 - b. The need to progress towards a ‘circular economy’ whereby raw materials, traditionally almost entirely becoming waste in a linear life cycle, instead become a much smaller input into a circular approach to materials use from design through to production, through to consumption but then maximizing re-use and recycling to close the circle back to design. For example, C&D wastes can become raw materials in the design phase of a project;
 - c. The SR-WMP plan sets out a target of 70% of C&D waste re-use and recycling (excluding soil and stones) by year 2020; and
 - d. The SR-WMP brings in the concept of ‘upcycling’ which is the re-purposing of items that otherwise are seen as waste or useless products.

The Regional Waste Management Planning Offices (RWMPOs) have undertaken a study to quantify and analyse national capacity within the market for the management of soil and stone waste arisings, including hazardous, based on 2018 data. This report updates the Soil and Stone Recovery / Disposal Capacity report published in 2016. The report also documents data with respect to waste concrete and other CDW (construction and demolition waste).

The report delivers a 10-year forecasting exercise predicting the volumes of soil and stone, concrete, and other CDW generation.

The available capacity of the seven facilities in the SR is located in the eastern part of the region, in counties Wexford and Kilkenny, with one facility in each county. There are currently three licenced facilities in County Cork, one is inactive and two are licenced facilities that are yet to commence operation. When operational these facilities will have a combined annual capacity of 580,000 tonnes.

This study found that Cork is (or will be) well served by licenced capacity - *“The available intake data indicates that current volumes would support the development of long-term licenced capacity in these areas to support planned infrastructure and housing developments”*.

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

- Waste Management Act 1996 (S.I. No. 10 of 1996) as amended by the Waste Management (Amendment) Act 2001. Sub-ordinate legislation to this Act include:
 - European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended 2011 (S.I. No. 323 of 2011);
 - Waste Management (Collection Permit) Regulations S.I No. 820 of 2007 as amended 2008 (S.I No 87 of 2008);
 - Waste Management (Facility Permit and Registration) Regulations, S.I No. 821 of 2007 as amended 2008 (S.I No. 86 of 2008);
 - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended 2004 (S.I. No. 395 of 2004), 2010 and (S.I. No. 350 of 2010);
 - Waste Management (Packaging) Regulations 2003 (S.I. No. 61 of 2003) as amended 2004 (S.I. No. 871 of 2004), 2006 (S.I. No. 308 of 2006) and 2007 (S.I. No. 798 of 2007);
 - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997);
 - Waste Management (Landfill Levy) (Amendment) Regulations 2012 (S.I. No. 221 of 2012), as amended 2015 (S.I. No. 189 of 2015);
 - European Communities (Waste Electrical and Electronic Equipment) Regulations 2011;
 - Waste Management (Registration of Brokers and Dealers) Regulations 2008 (S.I. 113 of 2008); and
 - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009), as amended 2015 (S.I. 190 of 2015).
- Protection of the Environment Act 2003 (S.I. No. 413 of 2003).
- Litter Pollution Act 1997 (S.I. No. 12 of 1997).

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

4.1 Guidance Reference Documents

HSE ENV EP006	Company Waste Management Procedure
HSE EB 04	Waste Management on site
HSE ENV GN01	Site Waste Management Plan Guidance

5. Waste Hierarchy

Besides the requirements that the off-site handling of waste generated by this project are subject to the required statutory authorisations under the Waste Management Act, there is also a necessity that it conforms to the Waste Hierarchy². This hierarchy outlines that waste prevention and minimisation are the first priority in managing wastes, followed by waste reuse and recycling with disposal being considered as a last resort.

The EU Waste Directive (2008/98/EC) also mandates that hazardous waste generation should be avoided or at least minimised.

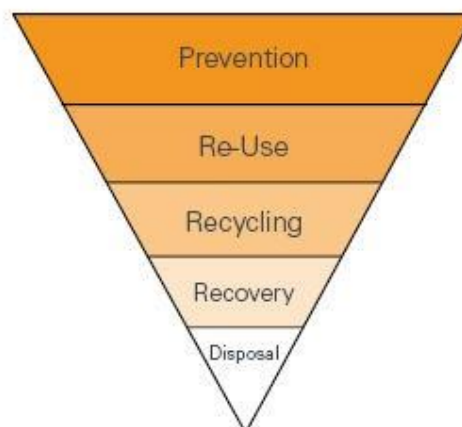


Figure 6 - EU Waste Hierarchy

Definitions defined in the Waste Framework Directive of key terms indicated in Figure 2 are (in order of priority):

- **Prevention** includes measures taken before a substance, material or product has become waste, that reduce (a) the quantity of waste, including through the reuse of products or the extension of the lifespan of products, (b) the adverse impacts of the generated waste on the environment and human health or (c) the content of harmful substances in materials and products.
- **Re-Use** is defined as any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.
- **Recycling** is any recovery operation by which waste materials are processed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.
- **Recovery** is defined as any operation, the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.

The Waste Hierarchy only applies to material that is defined as “waste”, so does not apply to the proportion of the spoil that is handled on-site in conformity with the statutory exclusions.

The Waste Management Hierarchy will be activated for any material which does not satisfy the exclusions; in this regard the contract documents for the detailed design/construction project will clearly set out the staged approach which the contractor will be required to adhere to through the use of the Waste Hierarchy.

² Waste Hierarchy as set out in Article 4 of the Waste Framework Directive (2008/98/EC) and transposed into Irish law via Section 21A of the Waste Management Act

5.1 Waste Minimisation

The following waste minimisation measures will be implemented during the course of the construction works:

- Facilitate recycling and appropriate disposal by on site segregation of all waste materials generated during construction into appropriate categories, including:
 - Topsoil, subsoil, gravel hard-core,
 - Concrete, bricks, tile, ceramics, plasterboard,
 - Asphalt, tar and tar products,
 - Metals,
 - Dry Recyclables e.g. cardboard, plastic, timber.
- All waste assessed by the Waste Manager as 'not suitable for reuse' will be stored in skips or other suitable receptacles in a designated area of the site, to prevent cross contamination between waste streams, dispersion and leaching;
- Wherever possible, leftover materials (e.g. timber off cuts) and any suitable demolition materials will be reused on-site;
- Uncontaminated excavated material (top-soil, sub soil, etc.) will be segregated, stockpiled and re-used on site in preference to importation of clean fill, where possible; and
- Where possible, the Waste Manager will ensure that all waste leaving site will be recycled or recovered.

6. Waste Identification, Classification, Quantification and Handling

6.1 Waste Identification, Classification and Quantification

The majority of waste generated will be soil and rock excavated during the course of the construction works. Should appropriate reuse be required, and practical, clean soil will be retained on site and reused in areas of soft landscaping, backfilling, etc. Crushed rock could be used in Crib or Gabion retaining walls. A record of the volumes and reuse requirements will be maintained by the Principal Contractor as part of their plan, as per Appendix C of the EPA 'Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects'.

During the construction phase, there will be some building material and packaging waste generated. This will mainly include excess ready-mix concrete and mortar, timber off cuts, plastics, metal off cuts, cladding and tile offcuts, asphalt, tar, tar products as well as plastic and cardboard waste from packaging and potential over-supply of materials.

All individual waste arisings shall be identified, recorded, classified and quantified (volume, weight) as early in the project lifecycle as possible but, inevitably, unanticipated waste arisings may occur as site work progresses, necessitating the need for a procedure to provide for waste classification as the site work proceeds.

It is anticipated that the majority of non-hazardous and inert waste generated will be suitable for reuse, recovery or recycling and will be segregated to facilitate the reuse, recovery and/or recycling, where possible.

A non-exhaustive list of anticipated wastes from the construction phase and preliminary classification as either hazardous or non-hazardous is presented in Table 2.

Table 4. Potential Non Hazardous and Hazardous Waste Classification

Hazardous Waste	Non-Hazardous Waste
Excess Electrical & Electronic Components	Asphalt
Liquid Fuels	Metals (stainless steel, mild steel, copper, aluminium)
Batteries	Wood (Clean), glass, plastic, paper and cardboard
Concrete (contaminated with dangerous substances)	Concrete (not contaminated with dangerous substances)
Excavated Soil (contaminated with dangerous substances)	Excavated soil/fill (not contaminated with dangerous substances)
Asphalt, tar and tar products	Municipal waste
Other construction and demolition wastes containing dangerous substances	

Wastes arising for the project will be segregated, identified and classified by the Principal Contractor in accordance with the EPA 'Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects', EPA, 2021.

Wastes shall not be removed from the site until properly classified, assigned a correct LoW code and all appropriate tracking and disposal documentation is in place.

For each waste stream identified and classified, and for each waste stream that may arise during the course of the works, the following shall be identified and documented by the Principal Contractor in their SWMP:

- An appropriate waste classification and correct LoW code; Where a waste type is considered a mirror entry, the classification of materials as non-hazardous and/or hazardous waste will be determined based on the www.hazwasteonline.com web-based waste assessment system (as recognized by the Environmental Protection Agency) and using Waste Acceptance Criteria in accordance with the European Communities (EC) Council Decision 2003/33/EC, which establishes criteria for the acceptance of waste at landfills;
- A suitable Waste Collection Contractor in possession of a valid Waste Collection Permit for the collection of waste within the Cork County Council area;
- Appropriate waste recovery, recycling or disposal facilities, including any required transfer stations whereupon the said facilities shall be in possession of a valid Waste Facility Certificate of Registration, permit or Waste License, as appropriate;
- A recovery, recycling or disposal plan for the waste, where applicable. Where any material is being recovered onsite or offsite for reuse; the Principal Contractor will provide confirmation of any application to the EPA under Article 27³ or Article 28⁴ to classify material as a by-product or as end of life waste respectively; and
- Final reconciled waste quantities generated, including details of waste disposal, reuse and recovery quantities.

6.2 Waste Handling

The site manager will maintain a record of all waste removed from the site. The record shall include information on the type of waste removed, the quantity removed, the date removed, details of whether the waste in question was being removed for either disposal or recovery/recycling, details of the transporter of waste, details of the facility to which waste is removed (including license or permit number). A location shall be identified where all records in regard to waste transport, recycling, disposal will be held for inspection.

Table 5. Waste Minimisation

Type	Waste Minimisation Decision Taken	By Whom	Intended Results
Demolition Methods	Segregate waste into separate skips for recycling	Contractor	Increased recycling of materials, reduce material to landfill
Materials	Provide segregated skips for material recycling: timber, metals, plastic, etc.	Contractor	Increased recycling of materials, reduce material to landfill
Materials	Request unpackaged materials from suppliers where applicable, e.g. palletised, skips, etc.	Contractor	Reduced packaging waste
Hazardous Materials	Any hazardous materials to be segregated in hazardous waste bin	Contractor	Hazardous waste items removed from site are to be disposed of by licenced contractor/ company.

³ Notification of by-product decisions by economic operators under Article 27 of the European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011

⁴ End-of-Waste Status under article 28 of the European Communities (Waste Directive) Regulations, 2011, S.I. No. 126 of 2011.

6.2.1 Segregation and Storage

Wastes generated during works will be segregated and temporarily stored on site (pending collection or for re-use on site) in accordance with the Contractor's pre-determined segregation and storage strategy.

The following minimum segregation and storage strategy requirements will be required:

- Waste streams will be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on site drawings;
- Waste storage, fuel storage and stockpiling and movement are to be undertaken with a view to protecting any essential services (electricity, gas, water) and with a view to protecting existing localised groundwater quality boreholes (if applicable);
- Roles and responsibilities of those managing the segregation and storage areas are to be identified;
- The waste storage area will contain suitably sized containers for each waste stream and will be agreed with the waste contractors in advance of the commencement of the project;
- All segregation and waste storage areas will be inspected regularly by the appointed Waste Manager;
- Waste will be stored on site, including metals, asphalt and soil stockpiles, in such a manner as to:
 - Prevent environmental pollution (bundled and/or covered storage, minimise noise generation and implement dust/odour/pest control measures, as may be required);
 - Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling and recovery; and
 - Prevent hazards to site workers and the general public during construction phase (largely noise, vibration, dust and pests).

6.2.2 Waste Permitting, Licences & Documentation

Under the Waste Management (Collection Permit) Regulations 2007, as amended, a collection permit to transport waste, which is issued by the National Waste Collection Permit Office (NWCPO), must be held by each waste collection contractor.

Waste may only be treated or disposed of at facilities that are licensed or permitted to carry out that specific activity (e.g. chemical treatment, landfill, incineration, etc.) for a specific waste type.

Operators of such facilities cannot receive any waste, unless they are 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 and Amendments or a waste license granted by the EPA. The COR/permit/license held will specify the type and quantity of waste permitted to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

Records of all waste movements and associated documentation will be held at the site. Records management and maintenance will be the responsibility of the Principal Contractor.

Further detail on waste documentation is provided in Section 10.

6.2.3 Predicted Waste Streams

The majority of the waste material generated by the proposed development will consist of excavated soil, gravel, rock associated with the proposed site layout. This material will be segregated from all other waste components in accordance with general waste segregation policy. Material that cannot be reused on site will be transferred to a Materials Recovery

Facility (MRF) by a fully licensed waste contractor where the waste will be further sorted into individual waste streams for recycling, recovery or disposal.

A temporary segregation bay will be set aside at the site for the duration of the construction and demolition phase of the development. The bay will include segregated areas for recyclable waste streams, such as gypsum (plasterboard), cardboard, timber, concrete/blocks/tiles, etc.

Cardboard

Cardboard will be segregated on site. The cardboard will be flattened and placed in a covered skip or tied and covered, to prevent the card getting wet. A recycling contractor will collect it as required.

Plasterboard

There will be a separate skip for plasterboard at the site. There are a number of specialist contractors that recycle plasterboard and they will be contracted to address this matter. Reprocessed gypsum powder, which makes up to 94% of the plasterboard, can be reprocessed into new plasterboard or converted for use in soil conditioners for the agricultural industry. The paper, which makes up to 6% of the plasterboard can be reused in various industries.

Soil/Subsoil

Excess excavated soil will be disposed of off-site. Soil will be removed and disposed of by contractors licensed under the Waste Management Act of 1996, the Waste Management (Permit) Regulations of 1998 and the Waste Management (Collection Permit) Regulations of 2001. This material will be used for fill material on other sites, or capping purposes on site, e.g. at a landfill.

Plastic

As plastic is now considered a highly recyclable material, much of the plastic generated during construction will be diverted from landfill and recycled. Clean plastic will be segregated at source and kept as clean as possible and stored in a dedicated covered skip.

Timber

There will be timber waste generated from the construction work as off-cuts or damaged pieces of timber. Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc, will all be recycled. It will be stored on site in a designated skip, and collected by a recycling contractor. Such companies shred the timber and use it for manufacture of wood products or for landscaping (wood chips etc).

Scrap Metal

Steel is a highly recyclable material and there are numerous companies that will accept waste steel and other scrap metals. A segregated skip will be available for steel storage on site pending recycling.

Asbestos

A specialised contractor will be employed to remove asbestos from site and to ensure that all traces of contaminated material from the site. Asbestos containing materials will be disposed of at a licensed asbestos disposal facility.

6.2.4 Control Measures

The site control measures to manage and minimise waste include:

- Signage on the site office/ welfare bins to separate them as environmental /domestic waste bins,

- Briefings for all sub-contractors via induction handouts,
- Specific checks in all waste carriers licences.

6.2.5 Monitoring and Measurement

All waste transfer notes will be checked and filed in the environmental plan for regular review and monitoring to ensure duty of Care Compliance.

The site control measured to manage and minimise waste include:

- Signage on the site office/ welfare bins to separate them as environmental /domestic waste bins,
- Briefings for all sub-contractors via induction handouts,
- Specific checks in all waste carriers licences.

6.3 Construction Phase Updates

Prior to commencing construction, the Contractor must update the resource inventory to list the following:

- Any changes to the generation volumes presented in the Design Phase Inventory;
- Any changes to the management routes presented in the Design Phase Inventory;
- The nominated permitted haulier who will be employed for each stream must be named along with the relevant permissions;
- The nominated destination site for all streams must be provided along with the relevant permissions.

7. Excavated Material Management

Project works will result in the excavation of soils and rock as part of the site development. An intrusive site investigation was undertaken in early July and August 2018.

Laboratory testing was carried out on representative samples. The following tests were carried out:

- Natural moisture content,
- Atterberg limits,
- PSD (Particle Size Distribution),
- Organic content,
- Sulphate, Chloride and pH tests,
- WAC (Waste Acceptability Criteria) contaminant tests by Chemtest.

The results of the laboratory testing are included in Appendix A. No exceedance levels were identified in any of the samples tested.

The Principal Contractor will, as part of their SWMP, prepare a project-specific Excavated Material Management Plan, which will detail the following as a minimum:

- Detail in-situ (prior to excavation) and ex-situ (post excavation) methodologies to classify waste soil for appropriate disposal, in accordance with relevant Irish and EU legislation and guidance, see Section 8.1 for more detail;
- Identify reuse requirements and soils suitable for reuse on site in consultation with the design team, including assessment methodology to determine which soils are suitable for re-use onsite, see Section 8.1.1 for more detail;
- Site management procedures, including waste minimisation, stockpile management, temporary storage procedures, waste license requirements, see Section 8.1.2; and Waste Management documentation, including waste generation record keeping, waste transfer notes, confirmation of appropriate disposal and details of any rejected consignments.

7.1 Excavated Soil & Materials

The SWMP to be developed by the Principal Contractor will detail relevant procedures including further environmental sampling, testing and assessment requirements, sampling protocols and sample density targets to supplement the existing soil data.

Where any hotspots of potential contamination are encountered, and prior to disposal, further assessment will be undertaken by a suitably qualified environmental scientist to determine the nature and extent of remediation required.

7.1.1 Soil and Crushed Rock for Reuse on Site

Where the Principal Contractor proposes to reuse excavated soil or crushed rock within the works e.g. as backfill, or crushed rock within crib retaining walls and where reuse is permitted in accordance with the relevant legislation and provided that the reuse meets the engineering requirements for material used within the works, the Principal Contractor shall set out their proposal for its management, documentation and reuse. This shall include:

- Define the criteria by which the suitability of the soils for reuse will be assessed (e.g. analytical parameters and limits);
- Delineation of areas where excavated soil is intended for disposal off-site as waste, and where it is intended for re-use on site;

- Identification and recording of the location from where the soil | rock will be excavated and its proposed re-use location and function;
- Engineering assessment to confirm its suitability for re-use; and
- Any proposed treatment or processing required enabling its reuse, as well as any associated treatment permits or licenses required.

7.1.2 Excavated Material for Removal Off-site

Where appropriate, excavated soil and material intended for recovery or disposal offsite shall require appropriate waste classification in order to select an appropriate receiving facility for the waste.

Assessment of the excavated material shall be carried out with due regard to the following guidance and legislation:

- EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002);
- Regulation (EC) No. 1272/2008: the classification, labelling and packaging of substances and mixtures (CLP);
- Environmental Protection Agency document entitled Waste Classification; List of waste and determining if waste is Hazardous or Non Hazardous; and
- UK Environment Agency Technical Guidance WM3: Waste Classification - Guidance on the classification and assessment of waste.

Waste soil and material intended for offsite disposal, recycling or recovery shall not be removed from site prior to appropriate waste classification and receiving written confirmation of acceptance from the selected waste receiving facility.

7.1.3 Stockpile Management

Soil stockpiles might be generated as part of the operations, for example while classification and acceptance at a waste facility is pending or awaiting reuse.

The contractor will consider the following measures to ensure that stockpiles are managed in an appropriate manner:

- A suitable temporary storage area shall be identified and designated;
- All stockpiles are to be assigned a stockpile number;
- Stockpiles shall not be positioned adjacent to ditches, watercourses or existing or future excavations;
- Soils will be stockpiled in the driest condition possible and tracked equipment will be used to reduce compaction;
- Contaminated or potentially contaminated soil shall be stockpiled only on hard-standing or high-grade polythene sheeting to prevent cross-contamination of the soil below;
- Soil stockpiles are to be covered with high-grade polythene sheeting to prevent run-off of rainwater and leaching of potential contaminants from the stockpiled material generation and/or the generation of dust; and
- Mixing of unclassified stockpiles of different origin, or of stockpiles having different classification, will not be carried out. When a stockpile has been sampled for classification purposes, it shall be considered to be complete and no more soil shall be added to that stockpile prior to disposal.

An excavation/stockpile register shall be maintained on site showing at least the following information:

- Stockpile number;
- Origin (i.e. location and depth of excavation);
- Approximate volume of stockpile;
- Date of creation;
- Description and Classification of material;
- Date sampled;
- Date removed from site;
- Disposal/recovery destination; and
- Photograph.

8. Hazardous Materials Waste Management

As the subject site is primarily greenfield and has not been developed previously it is not anticipated that hazardous material will be encountered during construction works. No contaminated materials were identified as part of the ground investigation work undertaken in 2018.

Where hazardous waste is generated/ encountered, the Principal Contractor must undertake the following:

- Immediate notification of the nature of the hazardous waste to the design team in writing;
- Submission of a revised plan detailing the nature and management of the hazardous waste prior to off-site waste disposal; and
- The Principal Contractor must establish a specific procedure for the management of the asbestos cement watermain which traverses the site. The management of such wastes shall be co-ordinated with the client representative, Irish Water and in accordance with the Safety and Health Plan for the overall works, in order to ensure that personnel within the construction site and the local residents are protected against exposure to asbestos. Prior to commencement of any asbestos removal works, the Principal Contractor shall identify a suitable Waste Collection Contractor with a Waste Collection Permit for the transfer of the asbestos cement pipework.

9. Waste Management Documentation

This plan will be updated by the Contractor to include a Waste Documentation System. The Principal Contractor will be responsible for implementation and auditing the Waste Documentation System on a regular basis.

The documentation to be maintained, as a minimum, shall be the following:

- The names of the agent(s) and transporter(s) of the wastes;
- The name(s) of the person(s) responsible for the ultimate recycling, recovery or disposal of the wastes;
- The ultimate destination(s) of the wastes;
- Written confirmation of the acceptance and recovery, recycling or disposal of any waste consignments;
- The tonnages and LoW code for all waste materials;

- Details of any rejected waste consignments;
- Waste Transfer Forms (WTF) for hazardous wastes transferred from site and associated appendices;
- Completed Transfrontier Shipment Forms (TFS) for hazardous wastes transferred abroad;
- Written documentation of waste classifications, including any related analyses; and
- Certificates of Recycling, Recovery, Re-Use or Disposal for all wastes transferred from the site.

All waste records will be maintained for at least a period of 3 years and must be subject to verification and validation. All waste documentation will be maintained and made available for inspection by the Principal Contractor. This will be stored in a safe place, preferably on site, during the project implementation phase. Electronic records will be placed on a secure server that is backed up regularly.

Allowance of time and resources will be made to collate outstanding waste records once the project implementation phase has been completed.

10. Financial Issues of Waste

An outline of the cost issues that should be considered associated with different aspects of waste management is provided below.

10.1 Reuse/ Recovery

By reusing materials on site, there will be a reduction in the transport and disposal costs associated with the requirement for a waste contractor to take the material away to landfill. Clean and inert soils, gravel, stones etc. which cannot be reused on site may be classified as a by-product (under Article 27 of the 2011 Waste Directive Regulations), used as capping material for landfill sites, or for the reinstatement of quarries etc. subject to approvals by EPA. This material is often taken free of charge for such purposes, or when used as capping in landfills will not attract the landfill tax levy, thereby reducing final waste disposal costs.

Rock excavated on the site could be used as granular fill within crib retaining walls if crushed and graded to form a well graded granular material with low fines content.

10.2 Recycling

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

10.3 Disposal

Typically, the current cost of disposal of waste of landfill exceeds €170 per tonne. From 1st July 2013, in accordance with the Waste Management (Landfill Levy) (Amendment) regulations 2013, the landfill level increased to €75 per tonne for waste disposed to landfill.

In addition to disposal costs, waste contractors will also charge a collection fee for skips. Collection of segregated C&D waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to landfill. Clean soil, rubble, etc. is also used as fill/capping material wherever possible.

11. Waste Audits

Details of the inputs of materials to the project site and the outputs of wastage arising from the Project will be investigated and recorded in a Waste Audit undertaken by the Principal Contractor.

This audit will identify the amount, nature and composition of the waste generated on the site. The Waste Audit will examine the manner in which the waste is produced and will provide a commentary highlighting how management policies and practices may inherently contribute to the production of demolition waste.

The Principal Contractor will be responsible for undertaking regular waste auditing and consulting with the local authority. The Design team may review the findings of the waste audits during the course of the construction stage. It is noted that this plan will be treated as a “live” document and regular review and update will be informed by the audit findings.

12. Waste Management Plan Awareness & Training

Copies of this plan must be made available to all personnel on site.

All site personnel and sub-contractors will be instructed about the objectives of these plans and informed of the responsibilities which fall upon them as a consequence of its provisions. Where source segregation and selective material reuse techniques apply, each member of staff will be given instructions on how to comply with the plan.

Posters will be designed to reinforce the key messages within the plan and will be displayed prominently for the benefit of site staff. Specialist training as may be required (e.g. asbestos containing materials handling) will be assessed or provided as required.

