DOSA

DENIS O'SULLIVAN & ASSOCIATES

CONSULTING ENGINEERS

RESIDENTIAL DEVELOPMENT, AT CARRIGALINE ROAD & CHURCHYARD LANE, DOUGLAS, CORK

CONSTRUCTION RESOURCE & WASTE MANAGEMENT PLAN

DATE 16/01/2025

REVISION 2

JOB NO. 7114

Joyce House, Barrack Square, Ballincollig, Co. Cork

T 021 4871781 F 021 4874157 info@dosa.ie www.dosa.ie

DOCUMENT CONTROL

PROJECT NAME: Residential Development, at Carrigaline Road & Churchyard Lane, Douglas, Cork

PROJECT NUMBER: 7114

REVISION	DATE	FILE NAME: Residential Development, at Carrigaline Road & Churchyard Lane, Douglas, Cork			
0	14.10.2024	DESCRIPTION: Construction Resource & Waste Management Plan			
			PREPARED	CHECKED	APPROVED
		INITIAL	BO'S	BO'S	BO'S
		DATE	04.10.2024	14.10.2024	14.10.2024
1	13.01.2025	FILE NAME: Residential Development, at Carrigaline Road & Churchyard Lane, Douglas, Cork			
		DESCRIPTION: Construction & Environmental Waste Management Plan			
			PREPARED	CHECKED	APPROVED
		INITIAL	BO'S	BO'S	BO'S
		DATE	13.01.2025	13.01.2025	13.01.2025
2	16.01.2025	FILE NAME: Residential Development, at Carrigaline Road & Churchyard Lane, Douglas, Cork			
		DESCRIPTION: Construction & Environmental Waste Management Plan			
			PREPARED	CHECKED	APPROVED
		INITIAL	BO'S	BO'S	BO'S
		DATE	16.01.2025	16.01.2025	16.01.2025
#	Insert Date	FILE NAME:			
		DESCRIPTION: Insert description			
			PREPARED	CHECKED	APPROVED
		INITIAL	Initials	Initials	Initials
		DATE	Insert Date	Insert Date	Insert Date
#	Insert Date	FILE NAME:			
		DESCRIPTION: Insert description			
			PREPARED	CHECKED	APPROVED
		INITIAL	Initials	Initials	Initials
		DATE	Insert Date	Insert Date	Insert Date

Contents

1 Introduction 4

1.1 Aim of the Plan 4

1.2 Methodology 4

1.3 Need for the Plan 4

1.4 Format of the Plan 5

2 Policies, Legislation and Guidance 6

2.1 National Level 6

2.2 Relevant Guidance 9

2.3 Waste Legislation 10

2.4 Waste Soils Classification 12

3 Project Description 14

3.1 Site Location 14

3.2 Site Topography 14

3.4 Proposed Development 15

3.5 Construction Phase 16

3.5.1 Details of the Non-Hazardous Wastes to be produced 16

3.5.2 Details of Potentially Hazardous Wastes to be produced 16

4 Roles & Responsibilities 19

4.1 Client 20

4.2 Design Team 20

4.3 Contractor 20

5 Design Approach 21

5.1 Design for Reuse and Recycling 21

5.2 Design for Green Procurement 21

5.3 Design for Material Optimisation 22

5.4 Design for Flexibility and Deconstruction 22

6 Key Material & Quantities 23

6.1 Type of Waste 23

6.2 Summary of Potential Waste Streams (LoW / EWC Codes) 24

6.3 Soil Generation 27

6.4 Construction Waste Generation 27

6.4.1 Native Non-Contaminated Soils 28

6.4.2 Mixed C&D Waste 29

6.4.3 Wood / Timber....29
6.4.4 Metals....29
6.4.5 Paper, plastics and Packaging....29
6.4.6 Canteen / Office Waste....29
6.4.7 Other wastes....29
6.4.8 Tracking and Documentation Procedures for Off-Site Waste....30
6.4.9 Construction Waste Management Costs....30
7 Site Management....31
7.1 Resource / Environmental Manager - Responsibilities....31
7.2 Site Compound Location....31
7.3 Training....31
7.3.1 Disposal / Recycling Proposals for Each Waste Stream....32
7.3.2 Proposed Management Strategy for each Waste Stream....32
7.4 Record Keeping....33
7.5 Communications....33
7.6 Outline Waste Audit Procedures....34
8 Consultation with Relevant Bodies....35

1 Introduction

Denis O'Sullivan & Associates were engaged as Consulting Engineers for the proposed development at Carrigaline Road & Churchyard Lane, Douglas, Cork. This document should be read in conjunction with DOSA's CEMP.

This document comprises the Construction Resource & Waste Management Plan (CRWMP) and the principal objective of this CRWMP is to provide a framework at the planning stage of the project to facilitate the further development of a project specific Detailed C&D RWMP by the Contractor. The following waste management considerations will apply for the entire life-cycle of this construction project.

1.1 Aim of the Plan

The purpose of this plan is to provide sufficient information to ensure that the management of construction waste is undertaken in accordance with all relevant legislation and best practice standards (as set out in Section 2 of this document). The principal aim of this plan is to ensure efficient use of material resources, reduce waste at source and reduce the quantity of waste that requires final off-site disposal to landfill in accordance with the waste hierarchy. A secondary aim is to facilitate the transition to a more circular economy thereby minimising the need for new inputs of virgin materials and energy, while reducing environmental pressures linked to resource extraction, emissions and waste management.

1.2 Methodology

This document has been prepared in accordance with the relevant industry standard guidance document; 'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects' (EPA, 2021). This guidance supersedes the 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects' (Department of Environment, Heritage and Local Government (DoEHLG), 2006);

In addition, the following relevant best practice guidance documents have also been consulted;

- Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' (EPA, 2018);
- A review of Design and Construction Waste Management Practices on Selected Case Studies – Lessons Learned' (EPA, 2015);
- Design out Waste: Preparation of Waste Reduction Factsheets for Design Teams' (EPA, 2015); and,
- Development of an Audit Methodology to Generate Construction Waste Projection Indicators for the Irish Construction Industry' (EPA, 2009).

1.3 Need for the Plan

Within Section 3.1 of the guidance (EPA, 2021), it states that 'it is recommended that planning authorities stipulate that a Resource and Waste Management Plan (RWMP) shall be submitted for all construction and demolition projects as best practice to inform the planning consent process. It is recommended that all planning permissions granted include compliance with the RWMP as a standard condition of planning.'

The level of detail presented in the RWMP should be reflective of the scale and complexity of the project and whether the project is within Tier 1 (smaller scale projects) or Tier 2 (larger scale projects) threshold. Tier 2: Larger scale projects are defined by the EPA as those 'including Strategic Infrastructure Developments, Strategic Housing Developments, infrastructure projects (road, rail, gas, energy)' or any project above the relevant Tier 1 thresholds. The proposed development comprises 124 no. residential dwellings/units, therefore this project is classed as a Tier 2 development.

This document applies only to the construction stage of the proposed development.

1.4 Format of the Plan

This is a live document which will be updated and added to throughout the project lifecycle. This document will provide a framework for waste management and will clearly identify the processes that will be implemented onsite, whilst also seeking to ensure compliance with relevant waste legislation, government policy objectives and project specific waste objectives. The Plan will provide a mechanism for monitoring and auditing waste management performance and compliance for the duration of the project.

The evolution of a single plan through a project lifecycle is recommended to ensure preventative and resource efficiency initiatives are undertaken, data are captured, and targets are set and measured throughout the project. This plan will evolve through the project from initial pre-construction phase followed by implementation at construction phase.

This construction resource and waste management plan (CRWMP) will be added to by the contractor. The CRWMP needs to be regularly revisited throughout a project's lifecycle so that opportunities to maximise waste reduction/ efficiencies are exploited throughout, and that data is added to on an ongoing basis so that it is as accurate as possible.

2 *Policies, Legislation and Guidance*

2.1 National Level

The implementation of the Waste Management Act in 1996 provided a legal basis for waste management, practice and infrastructure in Ireland. Following the implementation of this Act, government policy moved from primarily relying on landfill disposal towards a more sustainable system of waste treatment through the promotion of recycling and recovery. The policy document entitled 'Changing our ways' (DoEHLG, 1998) set specific targets for recycling and consolidated the now familiar waste hierarchy of prevention, minimisation, reuse/recycling, energy recovery and disposal. This approach was supported by subsequent legislation.

In 2002, the policy statement 'Preventing and Recycling Waste: Delivering Change' (DoEHLG, 2002) specifically focused on waste prevention and recycling. This document emphasised the importance of adopting a hierarchical approach, with prevention highlighted as the most desirable option. Various national waste prevention programmes and best practice guidance documents were subsequently delivered by the government.

The relevant guidance document in respect of the preparation of waste management plans for the construction sector was subsequently published by the DoEHLG in 2006, entitled 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects'. The purpose of these guidelines was to promote an integrated approach to the management of C&D waste which all parties from planners, designers, contractors and regulators can adopt throughout the project lifecycle, to ultimately minimise the generation of C&D waste and to establish specific thresholds for the requirement of Waste Management Plans.

In 2011 the revised EU Waste Framework Directive was transposed into Irish law by the European Commission (Waste Framework Directive) Regulations 2011 (SI 126 of 2011) (EC, 2008). The Waste Framework Directive focussed on sustainable and efficient materials management strategy and provides a legal basis for the waste hierarchy. Therefore, the waste hierarchy presented in Figure 2.1 should be applied as a priority in Ireland.

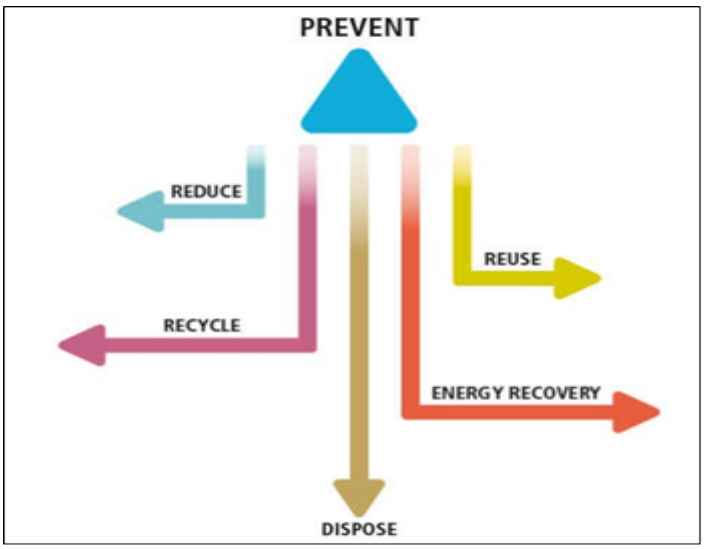

Figure 2.1 – Accepted Best Practice Waste Hierarchy (EPA, 2018)

In 2012 the Government published a new policy document entitled 'A Resource Opportunity Waste Management Policy in Ireland' (DoECLG, 2012). This document sets out the steps to be implemented on a national scale to make further progress on resource efficiency and seeking the elimination of landfilling of municipal waste in Ireland. This approach is further supported by subsequent guidance including the EPA publication 'Green Procurement: Guidance for the Public Sector' (EPA, 2014) which clearly states the following Core Green Public Procurement (GPP) Criteria for the Construction sector:

- Construction environmental management plan;
- Staff training;
- Management of fuel and hazardous substances;
- Use of secondary aggregate and recycled materials;
- Water Management; and,
- Waste Management.

This EPA (2014) publication 'Green Procurement: Guidance for the Public Sector' clearly sets out the responsibility of the Contractor with regard to waste management and disposal, as follows:

'The Contractor must apply appropriate measures in order to reduce and recover waste that is produced during the construction activity. The Contractor shall prepare and submit a waste management plan with its tender which shall form part of the Construction Management Plan to be agreed with the Contracting Authority in advance of the commencement of works. The waste management plan must be prepared in accordance with the Department of Environment, Community and Local Government Best practice guidelines on the preparation of waste management plans for construction and demolition projects (2006)'. Contractors are responsible for disposing of all waste generated under the contract in accordance with the Waste Management Act 1996 as amended. The Contractor must have full use of, or access to, waste disposal facilities with appropriate licenses and permits. The Contractor must provide copies of valid EPA Waste licences and Local Authority Waste Permits (including those relating to their subcontractors or brokers, where applicable) for collection and waste treatment/disposal/export facilities'.

According to the EPA (2021) 'Green Public Procurement: Guidance for the Public Sector' *'Ireland has committed to implementing green public procurement (GPP) in all tenders using public funds by 2023'.* The Department of Communication, Climate Action and Environment published *'A Waste Action for a Circular Economy – Ireland's National Waste Policy 2020-2025*' report, in September 2020. This document was prepared in response to the 'European Green Deal' and sets out a roadmap for the transition to a new economy, where climate and environmental challenges are instead seen as opportunities. This report replaces the previous National Waste Management Plan *'A Resource Opportunity Waste Management Policy in Ireland' (2012).*

The 'Waste Action for a Circular Economy' report focuses on transition to a circular economy, shown in Figure 2.2, and the need to plan for C&D waste management at the earliest possible stage in a construction project, ideally at concept stage.

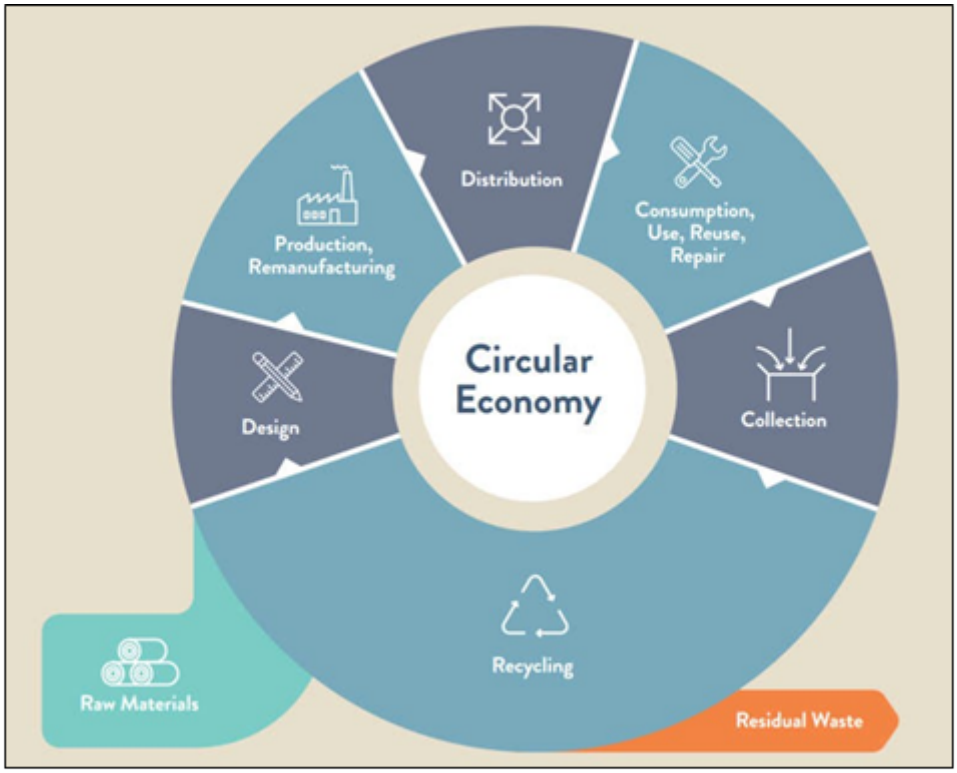

Figure 2.2 - The Circular Economy (DoCCAE, 2020)

The overarching objectives of this action plan are to:

- *'Shift the focus away from waste disposal and treatment to ensure that materials and products remain in productive use for longer thereby preventing waste and supporting reuse through a policy framework that discourages the wasting of resources and rewards circularity;*
- *Make producers who manufacture and sell disposable goods for profit environmentally accountable for the products they place on the market;*
- *Ensure that measures support sustainable economic models (for example by supporting the use of recycled over virgin materials); harness the reach and influence of all sectors including the voluntary sector, R&D, producers / manufacturers, regulatory bodies, civic society; and,*
- *Support clear and robust institutional arrangements for the waste sector, including through a strengthened role for Local Authorities (LAs).'*

The headline points on C&D waste in the Waste Action Plan are as follows:

- *'Project Ireland 2040 sets out the State's development goals over the next 20 years which allows for the opportunity to forecast large, specific C&D waste streams with a focus on preventing or efficiently managing the waste from these areas;*
- *Prevention of soil arisings which are a significant financial burden on the sector are to progress by placing value on the used material where possible. There is a strong focus on Article 27 by-product and Article 28 end-of-waste decision making process. These processes are to be streamlined and detailed guidance will be developed for specific problematic materials;*

- *The use of recycled construction materials will be incentivised (potentially by introducing a levy on virgin aggregates);*
- *The plan looks to make national end-of-waste decisions for specific construction and demolition waste streams at the earliest possible stage; and,*
- *The 2006 Best Practice Guidelines for construction and demolition waste will be revised to improve the Preparation of Waste Management Plans for Construction and Demolition Waste Projects'.*

2.2 Relevant Guidance

The EPA (2021) *'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects'* supersedes the Department of Environmental, Heritage and Local Government (DoEHLG) (2006) *'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects'.*

Since the publication of the 2006 guidelines, waste policy in Europe has shifted from the established linear economic model to a circular economic model. *'Circular economy-inspired interventions focus not only on increasing recycling quantitatively but also on:*

- *Reducing the use of virgin resources;*
- *Keeping materials in the economy as long as possible;*
- *Maintaining their intrinsic value/quality as high as possible; and,*
- *Reducing hazardous substances in products and waste'. (EPA, 2021).*

The resource and waste management approaches presented in the EPA (2021) guidelines are based on international principles of optimising resources and reducing waste on construction projects through:

- Prevention;
- Reuse;
- Recycling;
- Green Procurement Principles;
- Off-Site Construction;
- Materials Optimisation; and,
- Flexibility and Deconstruction.

These principles are applied to the Resource and Waste Management Plan (RWMP) through both the pre- construction phase and the construction phase. The evolution of a single plan through a project lifecycle is recommended to ensure preventative and resource efficiency initiatives are undertaken, data is captured, and targets set and measured throughout the project. The evolution of the plan through the project from initial pre- construction phase (in green) followed by implementation at construction phase (in orange) is illustrated in Figure 2.3 below.

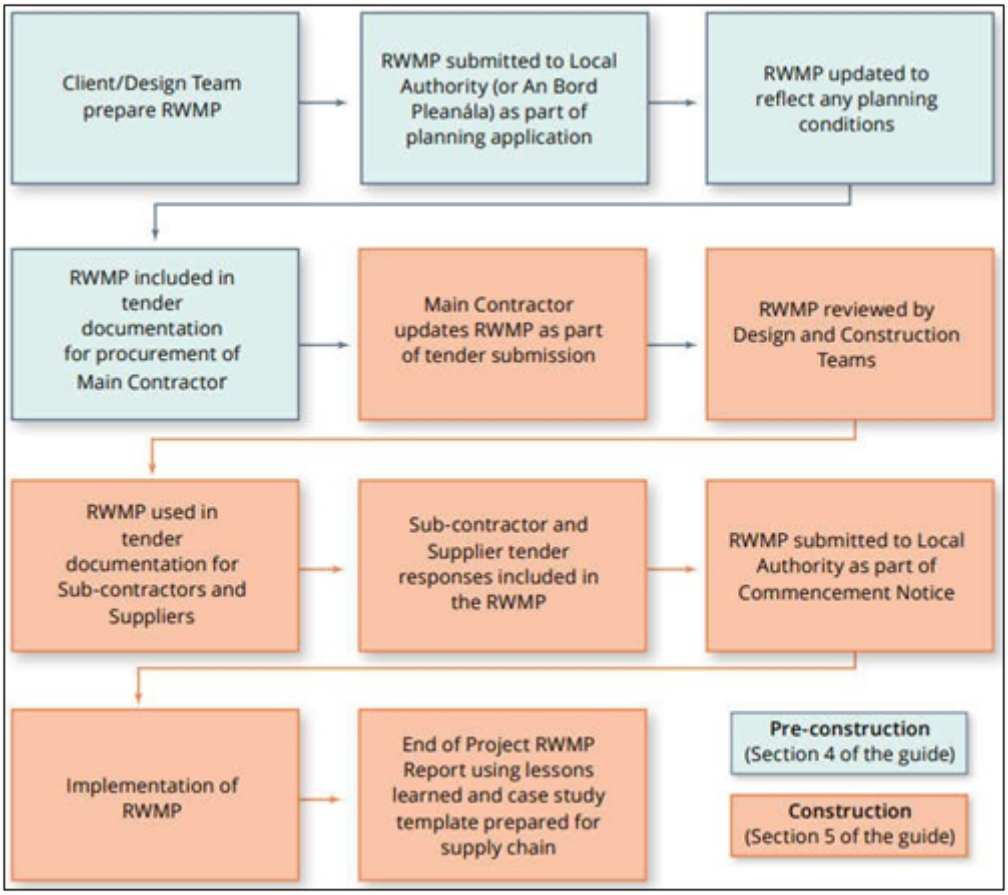

Figure 2.3 - Project Life Cycle of the RWMP (EPA, 2021)

According to the EPA (2021) the level of detail presented in the RWMP should be reflective of the scale and complexity of the project and whether the project is within the following Tier 1 or Tier 2 thresholds.

- Tier 1: Smaller scale projects, below the following thresholds:
  - 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 1,250m^2;
  - Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m^2; and,
  - Demolition projects generating in total less than 100m^3 in volume of C&D waste.
- Tier-2 projects: Larger scale projects, including Strategic Infrastructure Developments, Strategic Housing Developments, infrastructure projects (road, rail, gas, energy) or any project above Tier 1 thresholds (presented above).

2.3 Waste Legislation

It will be the Contractor's responsibility to ensure that they are familiar and comply with the requirements of all relevant waste legislation for the duration of the project. The following non-

exhaustive list of legislative requirements typically apply to the construction stage of major developments:

- Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste, as amended, 2018 (S.I. 2018/851);
- European Communities (Waste Directive) Regulations (Directive 2008/98/EC) 2011 (SI 126 of 2011) as amended 2016 (S.I 315 of 2016), as amended, 2018 (S.I. 2018/851), as amended 2020 (S.I. No. 323 of 2020);
- Waste Management Act of 1996, 2001 and 2003;
- Litter Pollution Act of 1997, and as amended in 2009 and 2017;
- Litter Pollution Regulations 1999, S.I. No. 359 of 1999);
- European Communities (Waste Electrical and Electronic Equipment) Regulations 2011 (S.I. 355 of 2011), as amended 2011 (S.I. No. 397 of 2011) 2013, (S.I. No. 32 of 2013);
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014) and 2019 (S.I No. 233 of 2019);
- Waste Management (Facility Permit and Registration) Regulations 2007, S.I. No. 821 of 2007, as amended, 2008 (S.I. No. 86 of 2008), 2015 (S.I. No. 198 of 2015), 2019 (S.I. No. 250 of 2019);
- Waste Management (Collection Permit) Regulations 2007, S.I. No. 820 of 2007), as amended, 2015 (S.I. No. 197 of 2015), 2016 (S.I. No. 24 of 2016);
- Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended 2010 (S.I. No. 350 of 2010);
- Waste Management (Miscellaneous Provisions) Regulations, 1998, S.I. No. 164 of 1998;
- Waste Management (Landfill Levy) Regulations 2008, S.I. No. 199 of 2008, as amended 2009, (S.I. No. 550 of 2009), 2010 (S.I. No. 31 of 2010), 2012 (S.I. No. 221 of 2012), 2013 (S.I. No. 194 of 2013), 2015 (S.I. No. 189 of 2015), 2019 (S.I. No.182 of 2019);
- Waste Management (Hazardous Waste) Regulations, 1998, as amended, 2000 (S.I. No. 73 of 2000);
- Waste Management (Shipment of Waste) Regulations 2007, S.I. No. 419 of 2007;
- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998);
- European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011, S.I. No 324 of 2011;
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (S.I. No. 121 of 1994);
- Waste Management (Transfrontier Shipment of Waste) Regulations 1998, as amended, 2014 (S.I. No. 861 of 2014);
- Waste Management (Tyres and Waste Tyres) Regulations 2007 (S.I. No. 664 of 2007), 2017, as amended (S.I. No. 400 of 2017) and 2018 (S.I. No. 96/2018);
- European Union (Batteries and Accumulators) Regulations 2014, S.I. No. 283 of 2014, as amended, 2014 (S.I. No. 349 of 2014), 2015 (S.I. No. 347 of 2015);
- Waste Management (Registration of Brokers and Dealers) Regulations 2008, SI No. 113 of 2008;

- Waste Management (Prohibition of Material Disposal by burning) Regulations 2009, S.I No. 286 of 2009, as amended 2013 (S.I. No. 504 of 2013), 2017 (S.I. No. 599 of 2017);
- European Waste Catalogue (EWC) and Hazardous Waste List 2002;
- Waste Management (Food Waste) Regulations 2009, S.I. No 508 of 2009, as amended, 2015 (S.I. No. 430 of 2015);
- European Union (Properties of Waste Which Render It Hazardous) Regulations 2015, S.I. No. 233 of 2015 as amended 2018 (S.I. No. 383/2018);
- Air Pollution Act, 1987 (Emission Limit Values for use of Asbestos) Regulations, 1990, S.I. No. 28 of 1990, as amended 1996 (S.I. No. 264/1996);
- EC (Control of Emissions of Gaseous & Particulate Pollutants from Non-Road Mobile Machinery) Regulations 2007, S.I. No.147 of 2007, as amended, 2011 (S.I. No. 263 of 2011), 2012 (S.I. No. 407 of 2012), 2013 (S.I No. 417 of 2013), 2016 (S.I. No. 2016/1628);
- The EU Regulation 2037/2000 (CFC's, HCFC's, Halons) - Ozone Depleting Substances. Control of Substances that Deplete the Ozone Layer Regulations 2006, S.I. No 281 of 2006, as amended, 2011 (S.I. No. 465 of 2011);
- EU F Gas Regulations 2014, S.I. No. 517 of 2014;
- Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended 2015 (S.I No 542 of 2015);
- Planning and Development Acts 2000 to 2015, as amended 2018, 2019 and 2020;
- Protection of Environment Act 1992 as amended 2003 and 2017;
- European Union (Ship Recycling) (Waste) Regulations 2019 (SI. No 13/2019);
- European Union (Environmental Impact Assessment) (Waste) Regulations 2013 SI. No. 505 of 2013;
- Industrial Emissions Directive 2010/75/EU; and,
- Landfill Directive 1999/31/EC.

2.4 Waste Soils Classification

According to the EPA Document 'Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous *'correct classification is the foundation for ensuring that the collection, transportation, storage and treatment of waste is carried out in a manner that provides protection for the environment and human health and in compliance with legal requirements'* (EPA, 2018).

The waste classification system within this EPA guidance document applies across the EU and is the basis for all national and international waste reporting obligations.

Since 2015, waste classification is based on:

- Commission Decision of 18 December 2014, amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European parliament and of the Council (2014/955/EEC) [referred to hereafter as 'The List of Waste (LoW)'].

Commission Regulation (EU) No 1357/2014 of 18 December 2014, replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives.

Soils requiring offsite disposal should be appropriately characterised, prior to transport and disposal, as follows;

- Representative chemical analytical results are input into a waste classification tool (to determine the relevant List of Waste (LoW) Code) and if the waste soils are hazardous or non-hazardous;
- Representative Waste Acceptance Criteria (WAC) analytical results are then separately screened against the relevant screening values (as established under the European Communities Council Decision ((EC) 92003/33/EC) 'COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC); and,
- All waste soils removed from site must be transported by appropriately permitted hauliers and must be disposed of to an appropriately authorised disposal / recovery facility (via. valid Certificate of Registration, Waste Facility Permit, or Waste Facility Licence).

3 *Project Description*

3.1 Site Location

The subject site is located to the south-east of Douglas Village shopping centre and just off East Douglas Street on the Carrigaline Road. The subject site presents a greenfield landscape characterised by its level terrain. Bordered by the Carrigaline Roads to the east, Churchyard Lane to the west, the Telephone Exchange to the south, and a residential dwelling alongside a restaurant and bar to the north. The land is currently zoned mixed use development in the Current Development Plan

A snapshot of the site is outlined in Figure 1-1 below.

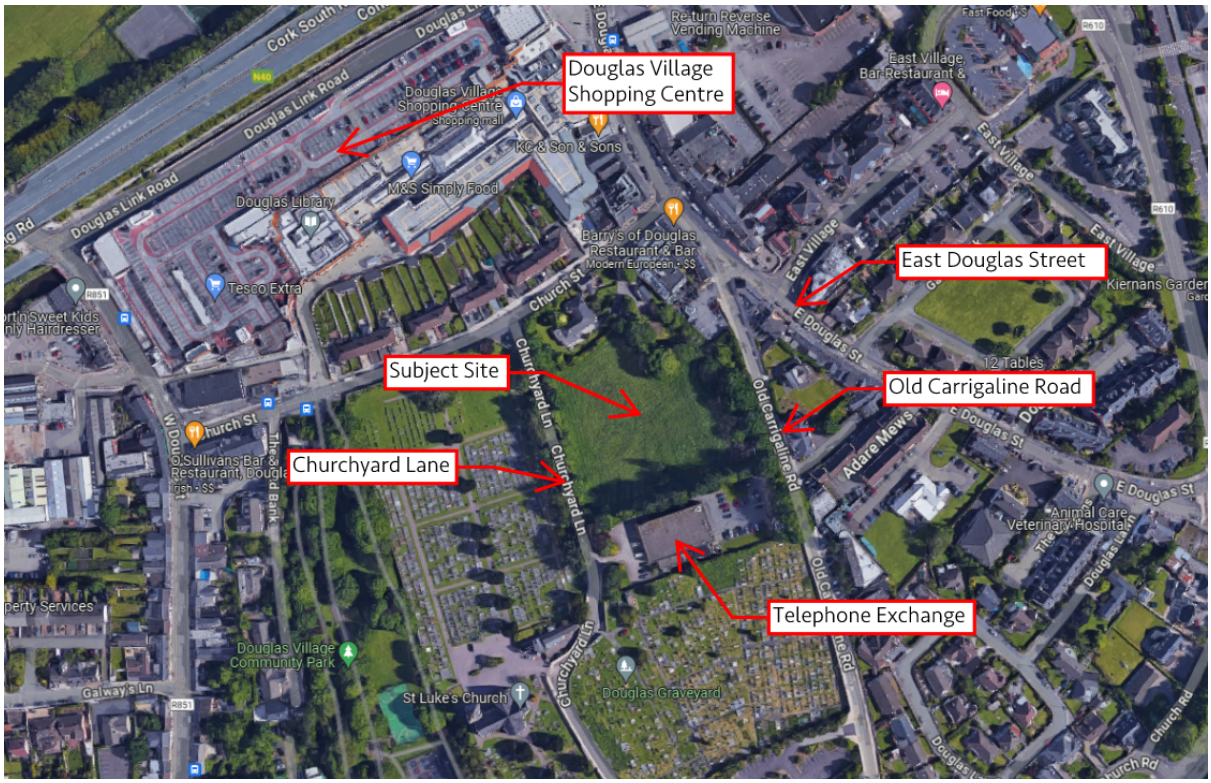

Figure 3-1 Site Location (Google Maps)

3.2 Site Topography

The subject site presents a greenfield landscape characterised by its level terrain. There is a very gentle incline from South to Northerly direction to a low point on the Northern boundary which is approximately 5.00m OD.

3.3 Site History

There are two previous planning applications on the site for a mixed use development dated 2016 & 2018. Both planning application had been granted by Cork County Council but were appealed to An Bord Pleanála and refused.

3.4 Proposed Development

The proposed development on the site entails the construction of 124 no. residential apartments (consisting of a mix of 1, 2 and 3 bed units), 1 no. cafe unit and 2 no. office units, in a development ranging in height from 1 to 5 storeys and all associated site development works including footpaths, car and bicycle parking, drainage, bicycle and bin stores, lighting, fencing, landscaping/amenity areas, ESB substation/switchroom and plant room. Site development works include 2 no. new uncontrolled pedestrian crossings and footpath improvements on Churchyard Lane which requires the removal of 6 no. existing on-street car parking spaces. The proposed development works include a connection and construction of a new storm water and foul sewer along Carrigaline Road. Access to the site will be via a new vehicle access point and a new pedestrian connection from Carrigaline Road and 2 new pedestrian connections onto Churchyard Lane. The new vehicular access requires the removal of 4 no. existing car parking spaces. This comprehensive proposal outlines a significant residential development that aims to contribute to the local area while providing a range of housing options for potential residents.



Figure 3-2 Proposed Site Layout (O'Mahony Pike Architecture/Urban Design)

3.5 Construction Phase

3.5.1 Details of the Non-Hazardous Wastes to be produced

Waste materials generated during the construction stage will primarily comprise topsoil and excavated subsoil during the installation of structural foundations, installation of the storm water (including detention basin) and foul water drainage works, watermains and laying of cable ducts, surplus general building waste materials, and waste generated by construction workers.

In accordance with good practice, excavated soils will be reused onsite where feasible, including for boundary treatment and landscaping purposes, if suitable. Any surplus soils will be disposed of offsite in accordance with all relevant waste management legislation and best practice requirements.

Should any ground contamination be encountered during the construction phase of the development the Employer and Employers Representative, and the Resource Manager should be immediately notified and consulted with. Appropriate measures must be put in place, as set out below, including appropriate transport and disposal of such waste materials to a suitably licenced facility in accordance with all relevant waste legislation.

According to the EPA '*Correct classification is the foundation for ensuring that the collection, transportation, storage and treatment of waste is carried out in a manner that provides protection for the environment and human health and in compliance with legal requirements'*. Hence soils requiring offsite disposal must be characterised as per the requirements of the relevant Waste Acceptance Criteria (WAC) under the European Communities Council Decision ((EC) 92003/33/EC) 'COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC'. Soils requiring offsite disposal will also require waste classification in strict accordance with the requirements of the EPA as set out in the following document 'Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous' (EPA, 2018). All waste soils removed from site must be transported by appropriately permitted hauliers and must be disposed of to an appropriately authorised disposal / recovery facility (via. valid Certificate of Registration, Waste Facility Permit, or Waste Facility Licence).

Surplus construction materials including concrete blocks, cladding, metals, tiles, glass, plastics, packaging, and timber will be generated during the Construction Phase. Materials will be segregated and recycled were possible; all other materials will be disposed of offsite in accordance with all relevant waste management legislation and best practice requirements. Additional waste generated by onsite personnel during the construction works will broadly include the following; canteen waste, waste arising from temporary onsite self- contained welfare facilities, and a minor volume of waste electrical and electronic equipment. A breakdown of the likely waste streams which will be generated is presented in Section 6.

3.5.2 Details of Potentially Hazardous Wastes to be produced

3.5.2.1 Fuels, Oils and Chemicals

Hazardous materials (fuels, oils and chemicals) will be used at the site during the Construction Phase. As per industry standards any fuel and oils temporarily stored onsite will be stored in double skinned / appropriately bunded storage tanks, in a secure dedicated fuel storage location onsite. All other chemicals including paints, varnishes, glues, adhesives, degreasing agents and cleaning agents will be securely stored in a dedicated temporary bunded chemical store onsite. All machinery

including any generators / pumps used onsite should be checked at the start of each work shift for evidence of any fuel or oil leaks (and removed offsite for any repairs as may be required).

Fuel, oil and chemical spill kits should be available at the designated storage areas, along with the relevant Safety Data Sheet (SDS). SDS documents contain information on the potential hazards (health, fire, reactivity and environmental) and how to work safely with the relevant chemical. All site operatives should receive training in appropriate refuelling methods and machinery checks, and chemical handling methods to be implemented onsite. Taking account of these control measures, along with the fact that the volumes of paints, varnishes, glues, adhesives etc. will be minor, it is not expected that any waste fuel, oil or chemicals will be generated during the Construction Phase.

3.5.2.2 Contaminated Soils

Based on available information no potential sources of significant onsite ground contamination associated with current or historic land-use have been identified. Therefore, the risk of encountering significant ground contamination (i.e. hazardous soils) beneath the site is considered to be highly unlikely at this preliminary juncture.

Nonetheless excavation works during the Construction Phase should be monitored and in the highly unlikely event that contaminated materials are encountered these will need to be segregated from all uncontaminated soils, temporarily stored (any stockpiles should be lined and covered by heavy duty 1000-gauge plastic), sampled and analysed for relevant parameters (Waste Acceptance Criteria suite e.g. Rilta Disposal Suite). Any contaminated soils must be characterised as per the requirements of the relevant Waste Acceptance Criteria (WAC) under the relevant European Communities Council Decision (EC) (92003/33/EC) and classified in accordance with the requirements of the EPA as set out in the following documents 'Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous' (EPA, 2018). Any contaminated soils must be transported by appropriately permitted hauliers and disposed of to an appropriate EPA licensed Waste Facility in accordance with all relevant waste management legislation.

3.5.2.3 Non-native Invasive Species

The site was surveyed by Limosa Environmental for invasive plant species listed on the third schedule of the EC (Birds and Natural Habitats) Regulations 2011 S.I. No. 477/ 2011. Species surveyed for included Japanese knotweed (Reynoutria japonica) and associated hybrids. Surveys were undertaken during summer 2024 which is within the seasonally appropriate window to assess the Site for the presence of invasive plant species, refer to the submitted Ecological Impact Assessment as Part of this application.

The presence of Japanese knotweed was recorded within the extents of the Site, please refer to the Japanese Knotweed Management Plan completed by O'Donovan Agri Group.

Prior to and during construction activity, appropriate measures (designed, scoped and managed by a relevant specialist) will be required in order to remediate any identified Japanese Knotweed stems and any soils impacted by the plant roots.

In regard to non-native invasive species the following points should be noted;

- Regulations 49 and 50 of Part 6 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) outlines the legal context for the

prohibition of the introduction and dispersal of certain plant and animal species. Specifically, Section 49, paragraph 2 states that any person without the required licence "who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow" any plant species listed in Part 1 of the Third Schedule within the State shall be guilty of an offence.

- Under Section 50 paragraph 1, a person without the required licence "shall be guilty of an offence if he or she has in his or her possession for sale, or for the purposes of breeding, reproduction or propagation, or offers or exposes for sale, transportation, distribution, introduction or release" of any plant species listed in Part 1 of the Third Schedule or anything from which "a plant referred to in Part 1 of the Third Schedule can be reproduced or propagated or "a vector material listed in Part 3 of the Third Schedule".

4 Roles & Responsibilities

For the purposes of clarity, the roles and responsibilities of the project team for the proposed development should be determined at the very outset of the construction stage of this project. Key roles are typically performed by the Client, Engineer, and Contractor as presented in Table 4-1 below. Specific details will be determined during the Detailed Design and Contract stage.

Employer	Planning Agents
The Client: Barry's Field Ltd Tel: Contact:	The Planner: McCutcheon Halley Planning Consultants Tel: 021-4208710 Contact: Majella O'Callaghan
Employers Representative	Design Team
The Engineer: to be confirmed Tel: to be confirmed Contact: to be confirmed	The Architect: O'Mahony Pike Architects Tel: 021 4272775 Contact: Aoife Roche
Project Supervisor for the Design Process (PSDP)	Civil, Structural and Environmental Team
The Engineer: to be confirmed Tel: to be confirmed Contact: to be confirmed	Consultant: DOSA Tel: 021-4871781 Contact: Brian O'Sullivan
Masterplan Architect	Landscape Architect
The Architect: to be confirmed Tel: to be confirmed Contact: to be confirmed	Landscape Architect: Cunnane Stratton Reynolds Tel: 021 4969224 Contact: Andelka Tanasijevic
Project Supervisor Construction Stage (PSCS)	Contractor
The Contractor: to be confirmed Tel: to be confirmed Contact: to be confirmed	The Contractor: to be confirmed Tel: to be confirmed Contact: to be confirmed

Table 4-1 - Roles and Responsibilities

The EPA (2021) *'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects'* state that a number of responsibilities for the development of resource & waste management plans are identified for parties under Waste Framework Directive 2008/98/EC including the following:

- *'Original Waste Producer means anyone whose activities produce waste or anyone who carries out pre-processing, mixing or other operations resulting in a change in the nature or composition of this waste (in this case the Client); and,*
- *Waste Holder means the waste producer or the natural or legal person who is in possession of the waste (the Client)'.*

The EPA (2021) *'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects'*, highlights the responsibilities of the following key

personnel for implementing resource & waste management plans.

4.1 Client

The responsibilities of the client are as follows:

- Require the preparation and submission of an RWMP as part of the design and planning submission;
- Require the preparation and submission of an updated RWMP as part of the construction tendering process;
- Ensure that the RWMP is agreed and submitted to the local authority prior to commencement of works on site; and,
- Request the end-of-project RWMP from the Contractor.

4.2 Design Team

The responsibilities of the design team are as follows:

- Drafting and maintaining the RWMP through the design, planning and procurement phases of the project;
- Appointing a Resource Manager (RM) to track and document the design process, inform the Design Team and prepare the RWMP;
- Include details and estimated quantities of all projected waste streams;
- Incorporate relevant conditions imposed in the planning permission into the RWMP;
- Handover of the RWMP to the Contractor at commencement of construction for the development of the RWMP in a similar fashion to how the safety file is handed over to the Contractor; and,
- Work with the Contractor as required to meet the performance targets for the project.

4.3 Contractor

The responsibilities of the contractors are as follows:

- Adding to, implementing and reviewing the RWMP through construction (including the management of all suppliers and sub-contractors) as per the requirements of these guidelines;
- Identifying a designated and suitably qualified Resource Manager (RM) who will be responsible for implementing the RWMP;
- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- End-of-waste and by-product notifications addressed with EPA where required;
- Clarification of any other statutory waste management obligations, which could include on-site processing; Full records of all resources (both wastes and other resources) should be maintained for the duration of the project;
- Carry out training and site inductions; and,
- Preparing a RWMP Implementation Review Report at project handover.

5 Design Approach

5.1 Design for Reuse and Recycling

The site preparation works will involve excavation for the installation of foul and surface water drainage system works, structural foundations, internal roads and underground utilities during the construction phase.

In accordance with good practice, excavated soils will be reused onsite where feasible, including for boundary treatment and landscaping purposes, if suitable. Any excess topsoil to be transported offsite will be transported to an appropriately licenced, permitted or registered facility. The soil will be characterised in accordance with EPA, 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' and Council Decision, 2003 on establishing criteria and procedures for the acceptance of waste at landfills.

An application may be made to the EPA under Article 27 of the European Communities (Waste Directive) Regulations 2011 for the use of excess soil or materials as a by-product if a definite use and need for this material can be determined. Also an application may be made to the EPA under Article 28 which sets out the grounds by which a material, which is recovered or recycled from waste, can be deemed to be no longer a waste and complies with a set of end-of-waste criteria (substance/ object to be used for specific purposes, a market or demand exists, fulfils technical requirements and no overall adverse impact to human health or the environment).

During the construction, the contractor will review availability of recycled aggregates and other materials in the local area and decide on the most sustainable options, for example, the use of an on-site crusher for recycling of residual concrete to generate aggregates for use on site (subject to the appropriate waste consent, such as an Article 28 end of waste decision and once processing is industry standard practice, such as ensuring the aggregate outputs comply with the specifications of IS EN 13242).

The contractor will review 'new' materials to be used as part of the proposed development, which contain a recommended percentage of recycled content if they meet the functional, performance and regulatory requirements and are available locally at a reasonable cost.

Design for Reuse and Recycling is the most efficient way of designing low carbon infrastructure and feeds into the circular economy as opposed to a linear economy where product is treated as 'waste' at the end of its life.

Furthermore, standardised internal dry lining systems, standardised flooring systems and internal doors have all been considered within the design that allows for their disassembly and re-use at end of life stage.

5.2 Design for Green Procurement

When selecting suppliers, it is essential to assess the technical capabilities required for the products or services being procured. This is valuable from the buyers' point of view as suppliers that clearly cannot meet the requirements will be eliminated. In addition, it is also useful for the suppliers to get a clear understanding of how committed the Client is to protect sustainability and what will be essential for any submission to be successful.

At an early stage (pre-procurement), the client will have discussion with potential contractors, subcontractors and suppliers regarding the following:

- Waste prevention and minimisation during the construction stage;
- Proposed design solutions to encourage innovation in tenders and incentivise competitions to recognise sustainable approaches;
- Use ordering procedures that avoid waste, i.e. no over-ordering, take-back schemes for both material surplus and offcuts;
- Discuss options for packaging reduction with subcontractors and suppliers using measures such as 'Just-in-Time' delivery; and,
- Set reuse and recycling rates.

Green procurement integrates environmental considerations that include a combination of cost and quality into the procurement process. In order to help achieve this, both operational and embodied carbon targets for this project will be set out early on in collaboration with the design team in order to ensure that green procurement can take place. Through comparative data on embodied carbon, low carbon materials options will be favoured where possible. A sustainable construction plan will be developed that addresses all aspects of construction relating to design from reducing demolition, considering reuse / upcycling and recycling of existing materials to approaching suppliers for green construction materials e.g. Responsible Steel and adopt Design of Off-Site Construction. *'The use of off-site manufacturing reduces residual wastes by up to 90% (volumetric building versus traditional)'* (EPA, 2021). Low carbon additives to industry standard components will also be considered as part of this process e.g. the use of GGBS in concrete can be a way to reduce its carbon footprint whilst still achieving the structural and fire benefits of concrete.

5.3 Design for Material Optimisation

As stated in the EPA (2021) guidelines the key design principle for design for material optimisation *'is to ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite. This helps to reduce the environmental impacts associated with transportation of materials and from waste management activities.'*

Design for material optimisation includes the use of standardised sizes for certain materials to help reduce the number of offcuts produced on site, focusing on promotion and development of off-site manufacture.

5.4 Design for Flexibility and Deconstruction

It will be the contractor's responsibility to ensure that all products (including buildings) only contain materials that can be recycled and are designed to be easily disassembled, where possible. As per the EPA (2021) guidelines, the design team will '*consider material efficiency for the duration and end of life of a building project; flexible, adaptable spaces that enable a resource-efficient, low-waste future change of use; durability of materials and how they can be recovered effectively when maintenance and refurbishment are undertaken and during disassembly/deconstruction'.*

6 *Key Material & Quantities*

6.1 Type of Waste

The waste generated onsite is surplus or waste materials arising from either the materials imported to site or from those generated on site. Imported materials are those which are imported to site for inclusion into the temporary and permanent works (such as concrete, construction aggregates, asphalt and cabling etc.). Included within this waste stream is product packaging. This waste stream is produced from a range of potentially preventable activities. Such activities include damaged materials and the over ordering of materials. This waste stream is described as construction (C) waste within the RWMP. Site generated materials are those which exist within the proposed works footprint such as topsoil and sub-soil etc. This waste stream is categorised as excavated (E) waste within the RWMP. Refer to Table 6-1 for the breakdown of types of waste. For both groups of materials there are a number of considerations to waste management such as waste reduction, segregation of waste, disposal of waste, financial impacts of waste disposal and recording, monitoring, education and reviewing data.

Type of waste	Description
Imported material	Where possible, consideration should be given to the re-use of material back into the project development works. Any waste produced through the importation of materials needs to be monitored and included in the RWMP under construction works. Where possible, consideration should be given to the use of recycled imported material such as concrete, which has a higher recycled content.
Excavated materials (E)	Materials such as excavated soils should be segregated during the excavation process. Appropriately experienced staff should supervise the excavation works to manage the segregation of soil materials. Site-derived materials of a similar nature should be stockpiled together and any changes in the physical and/or chemical properties should prompt further segregation. Soils should be placed in clearly identified stockpiles and chemical testing undertaken to confirm the potential for re-use on site, or, if considered inappropriate for re-use (due to geotechnical or chemical properties or being surplus), to inform off site treatment and/or disposal routes. Where soil materials meet the geotechnical and chemical criteria for re-use given the proposed end use scenario, such materials may be re-used on site, if required. Any surplus materials should be removed from site for either direct beneficial use elsewhere (such as land remediation schemes) where an application may be made to the EPA under Article 27 of the European Communities (Waste Directive) Regulations 2011 for the use of excess soil as a by-product if a definite use and need for this material can be determined or for recycling or recovery at an appropriately permitted off-site facility. Where excavated materials are affected by contamination, such materials should be separated and sent for either treatment, where appropriate, or disposal at appropriately permitted facilities. Disposal of excavated material will be by licensed carriers, to licensed landfill sites and handled in accordance with the Waste Management Regulations.
Concrete	This waste will be generated by works and the buildings for the proposed project.
Wood	Packaging such as pallets.
Packaging	From construction materials, etc.
Plastic	Offcuts of pipework/ducting etc.

Vegetation	The majority of the existing trees along the boundary are being retained for the proposed project with planting of hedgerow and ornamental shrub and Herbaceous plants proposed. Additionally meadow planting is proposed as well as amenity grass and open spaces. Further landscape details are included in the Landscape Design for the proposed project. Where vegetation / landscaping elements are being removed, re-use of such materials should be considered where possible. E.g. suitable vegetation could be turned into mulch or compost to be re-used for landscape purposes.
Metals	Offcuts from reinforced concrete for building foundations. Metal components or assets removed for site clearance.
Paper and Cardboard	Packaging from components delivered to site.
Segregated Hazardous Waste	Nominal 1% to account for packaging that contained hazardous material such as oils, solvents, sealants etc.

Table 6-1 - Breakdown of Types of Waste

In relation to the overall works particular attention is drawn to the following waste/soil related activities:

- The site location deliveries/ removals are to phone ahead; Just-in-Time' (JIT) delivery processes; receive precise directions and named person to liaise with on site. The Contractor is to erect required signage approaching site and ensure deliveries are programmed to cause minimal disruption;
- Hazardous manual handling operations are to be avoided so far as is reasonably practicable; and,
- Note that waste generated by the project will be managed in compliance with Waste Management Act 1996, Waste Management (amended) Act 2003 and associated Regulations.

6.2 Summary of Potential Waste Streams (LoW / EWC Codes)

It is understood that all the waste arising from the construction works will be transported off site by an approved waste contractor holding all the necessary waste collection and transportation permits. All the waste arisings requiring reuse, recycling, recovery or disposal will be brought to facilities holding the appropriate Certificate of Registration, Waste Licence or Waste Permit, as required.

A summary of the main hazardous and non-hazardous waste streams which could arise during the Construction Phase are presented in Table 6-2, along with the relevant List of Waste (LoW) code. The LoW code (also referred to as European Waste Catalogue (EWC) code) serves as a common method of characterising various waste streams. Assignment of waste codes will determine how and where the generated waste can be disposed of. LoW codes must be selected for each waste type – a full description of each code is available on the EPA website.

It should be noted that the summary list presented in Table 6-2 is a non-exhaustive list and it will be the Contractors responsibility to ensure all waste streams generated onsite during the Construction Phase for this project are appropriately characterised, managed and disposed of in accordance with all relevant waste management legislation.

Waste Material	LoW Code
Concrete, bricks, tiles and ceramics	
Concrete	17 01 01
Bricks	17 01 02
tiles and ceramics	17 01 03
mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	17 01 07
Wood, glass and plastic	
Wood	17 02 01
Glass	17 02 02
Plastic	17 02 03
Bituminous mixtures, coal tar and tarred products	
bituminous mixtures	17 03 02
metals (including their alloys)	
mixed metals	17 04 07
Soil (including excavated soil from contaminated sites), stones and dredging spoil	
soil and stones containing hazardous substances	17 05 03*
soil and stones other than those mentioned in 17 05 03	17 05 04
Gypsum-based construction material	
Gypsum-based construction material	17 08 02
Other construction and demolition wastes	
mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	17 09 04
Wastes from electrical and electronic equipment	
discarded equipment containing chlorofluorocarbons, HCFC, HFC	16 02 11*

discarded equipment containing free asbestos	16 02 12*
discarded equipment containing hazardous components (16) other than those mentioned in 16 02 09 to 16 02 12	16 02 13*
discarded equipment other than those mentioned in 16 02 09 to 16 02 13	16 02 14
hazardous components removed from discarded equipment	16 02 15*
components removed from discarded equipment other than those mentioned in 16 02 15	16 02 16
Miscellaneous Waste	
Paper and cardboard	20 01 01
biodegradable waste (Green waste)	20 02 01
batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	20 01 33*
batteries and accumulators other than those mentioned in 20 01 33	20 01 34
Waste fuel oil and diesel	13 07 01*
Waste petrol	13 07 02*
Waste other fuels (including mixtures)	13 07 03*
Chemicals – Solvents	20 01 13*
Chemicals – Pesticides	20 01 19*
Chemicals - paint, inks, adhesives and resins containing hazardous substances	20 01 27*
Chemicals - paint, inks, adhesives and resins other than those mentioned in 20 01 27	20 01 28
Chemicals - detergents containing hazardous substances	20 01 29*
Chemicals - detergents other than those mentioned in 20 01 29	20 01 30
fluorescent tubes and other mercury-containing waste	20 01 21*
insulation materials other than those mentioned in 17 06 01 and 17 06 03	17 06 04

Table 6-2 - Summary list of LoW Codes, which may be relevant to the site

6.3 Soil Generation

The site preparation works will comprise the stripping of topsoil across the Site, excavation of subsoil and pouring of foundations for the residential units, installation of the storm water (including detention basin) and foul water drainage works, watermains and laying of cable ducts, and piling as required.

All such material will be removed and disposed offsite to a suitably permitted / licenced waste recovery / disposal facility in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996, 2001 and 2003 and all subsequent waste management regulations as amended).

Any soil transported off-site will be characterised in accordance with EPA guidance, 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' and Council Decision, 2003 on establishing criteria and procedures for the acceptance of waste at landfills. An application may be made to the EPA under Article 27 of the European Communities (Waste Directive) Regulations 2011 for the use of excess soil as a by-product if a definite use and need for this material can be determined.

A ground investigation for the proposed development shall be carried out in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007), BS 5930:2015, and BS 1377 (Parts 1 to 9) (IGSL, 2021).

An agreed number of representative environmental soil samples shall be collected during the ground investigation at representative locations across the Site and analysed for a comprehensive suite of analytical parameters by a UKAS accredited laboratory (including asbestos containing material, heavy metals, key indicator parameters, petroleum hydrocarbons, polyaromatic hydrocarbons (PAHs), Volatile Organic Compounds (VOCs including tentatively identified compounds (TICs)), Semi Volatile Organic Compounds (SVOCs including TICs), Polychlorinated Biphenyls (PCBs) and the full Rilta Waste Acceptance Criteria (WAC) soil disposal suite).

6.4 Construction Waste Generation

A typical breakdown of C&D wastes generated during construction of this development type in Ireland is presented in Figure 6.1 below (EPA, 2009). This figure indicates the percentage breakdown of waste from New residential construction.

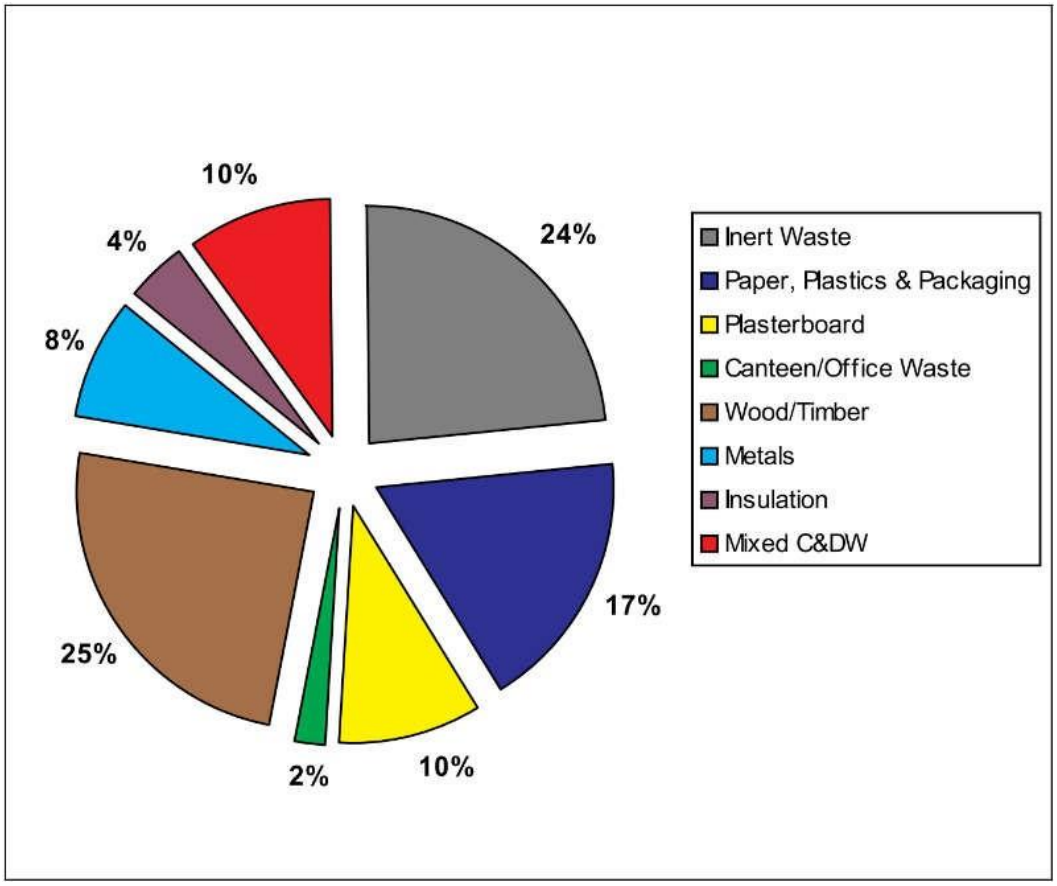

Figure 6.1 - New residential construction composition by volume (m3) (C&D Waste) (EPA, 2009).

Taking account of an average generated waste factor of 0.107m3 per m2 (of completed floor space) for 'new residential construction' (EPA, 2009), and based on the building floor space areas for the proposed development provided by the Architecture team, preliminary waste volumes have been calculated, and are estimated to be ca. 2,800m3.

It is noted that these volumes are based on literature values for representative Irish construction sites and are an approximate guideline only. In addition, no specific allowance has been made for C&D waste arising from the construction of access roads, utilities and services or any commercial units. Final volumes can only be confirmed via site audited waste disposal/recovery records.

Each waste stream will be managed onsite as follows. Table 6-4 shows the potential recycling/re-use targets of each waste stream for the proposed project.

6.4.1 Native Non-Contaminated Soils

The estimated volume of soil generated during the construction phase has yet to be determined, however will be minimised by reducing/eliminating the need for excavation and importing of capping layers. The balance of soil materials excavated from the site will be reused where possible for landscaping purposes, and infill where appropriate, ensuring that any residual soil waste is kept to a minimum. Any surplus soil will be characterised and removed offsite in accordance with all relevant waste management legislation.

6.4.2 Mixed C&D Waste

Following segregation onsite, any residual mixed C&D waste will be collected in containers specifically for mixed C&D waste; these will be removed offsite for subsequent offsite separation and disposal at a waste disposal/recovery facility.

6.4.3 Wood / Timber

Timber waste will be segregated in order to prevent contamination by other wastes and will be stored so as to limit the potential for this material to rot. Wooden pallets will be returned to relevant suppliers where possible. Timber offcuts will be reused onsite where feasible. A covered receptible for waste wood will be placed in the waste storage area, prior to removal from site for recycling. All such timber will be free from chemical treatment.

6.4.4 Metals

Metal waste will be generated during the project, particularly arising from the use of rebar. All waste metal will be segregated offsite at the waste disposal/recovery facility for reuse and recycling. Given the significant scrap value associated with metal waste, this waste will be stored in a dedicated container within a secure part of the site, and regular collections from site to the waste recycling facility will limit the potential for unauthorised entry and theft.

6.4.5 Paper, plastics and Packaging

Packaging wastes will be removed (paper / cardboard / plastic / general waste) offsite for subsequent offsite separation and disposal at a waste disposal / recovery facility. Waste packaging will be stored in dedicated containers in the waste storage area for collection and subsequent segregation and recycling.

6.4.6 Canteen / Office Waste

Onsite staff canteens will generate food and packaging waste. Dedicated containers will be provided at each canteen to permit easy segregation of these wastes; brown bins will be provided for compostable food waste, green bins will be provided for dry recyclables (packaging, hard plastic, paper, cardboard, tetrapak etc.) and black bins will be provided for any residual waste.

6.4.7 Other wastes

In addition to the above waste streams, other waste materials will be generated during the construction phase. These residual wastes will typically comprise non- recycling waste such as soiled paper / cardboard / plastics / cloth, canteen food waste, fibreglass, polystyrene insulations and plasterboard. These materials will be stored separately to all other waste streams in order to prevent any cross contamination.

All C&D waste materials will be segregated onsite into the various waste streams, via dedicated skips and storage areas. Waste will be removed from site by a suitably permitted waste haulage contractor. The Contractor should clearly identify all proposed waste haulage contractors within the project specific detailed RWMP. Each waste haulage contractor must hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO). All waste materials generated during the Construction Phase must be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility.

Waste type	Recycling/ Reuse %* (*WRAP best practice recovery rates)
Imported material	70-90
Excavated material	70-100
Concrete, track ballast etc	50-90
Wood	90
Packaging	95
Plastic	95
Metals	100
Paper and Cardboard	100
Haz soil	50
Foul waste	100

Table 6-4 - Potential Recycling/Re-use Targets

6.4.8 Tracking and Documentation Procedures for Off-Site Waste

All waste transport and disposal / recovery must be carried out in accordance with relevant waste management legislation (outlined in Section 2) and any subsequent future legislation which may apply. A nominated Waste Manager for the project will be responsible for ensuring correct tracking and documentation procedures are undertaken for all waste removed from site during the project. Each consignment of waste removed from site will be tracked and recorded. A site record detailing the date, truck registration, waste type, estimated volume and destination will be filed onsite for each consignment, along with the corresponding truck docket and weighbridge record at the offsite disposal/recovery destination. A copy of the relevant waste collection permits and waste permit / waste licence for the relevant disposal / recovery facilities will be available onsite for the duration of the project.

6.4.9 Construction Waste Management Costs

Under the Waste Framework Directive 2008/98/EC and in accordance with the polluter-pays principle, there is a legal requirement that the costs of disposing of waste must be borne by the holder of waste or by the producers of the product from which the waste came, thereby placing the legal obligation for the management of the waste on the Client.

In terms of waste management and disposal costs, at this preliminary juncture it would not be feasible to estimate the total cost of waste management and disposal associated with the proposed development. Estimated costs will be determined by the Contractor.

7 Site Management

7.1 Resource / Environmental Manager - Responsibilities

The Contractor will nominate a Resource Manager for the duration of the Construction Phase. The Resource Manager will be responsible for the efficient operation of onsite waste management procedures; they will also be responsible for ensuring that all waste removed offsite is appropriately characterised (under the correct LoW / EWC code), transported and disposed of in accordance with all relevant waste management legislation. It will be the Waste Managers responsibility to maintain all waste management and disposal / recovery records onsite throughout the project. These site records should be made available for viewing by the Client, Employers Representative and statutory consultees (DLRCC, WCC, EPA) as required.

The Resource Manager should be appropriately trained in the correct documentary procedure, waste auditing and best practice methods in onsite waste minimisation and waste management toolbox talks with site operatives to highlight any specific waste management concerns will also be carried out should the need arise.

7.2 Site Compound Location

All C&D waste materials will be segregated onsite into the various waste streams, via labelled dedicated skips and storage areas. Waste will be removed from site by a suitably permitted waste haulage contractor. The Contractor should clearly identify all proposed waste haulage contractors within the project specific RWMP. Each waste haulage contractor must hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO).

The proposed locations of the site compounds are indicated in the CEMP. The locations of the site compounds are selected to avoid any potential impacts to environmental receptors and to reduce any potential for impact on sensitive human receptors. The site compounds will also act as a storage centre for construction materials.

7.3 Training

All site personnel should receive waste management information and environmental induction before commencing work on the project, which will include a module on resource management as part of their initial site briefing from the Resources Manager. The initial briefing should include a discussion of the key points set out in the RWMP, along with the specific procedures to be implemented onsite to segregate and appropriately store the generated waste and key control measures such as refuelling procedures and oil, fuel and chemical storage requirements. This will ensure that all onsite personnel are familiar with the site-specific waste management strategy.

As a minimum the following will be included in the induction, as per the EPA (2021) guidelines:

- *'Scope and content of the RWMP;*
- *Project commitments and targets;*
- *List of anticipated resources and wastes and volumes to be generated;*
- *Procedures for the proper identification and segregation of resources and wastes;*
- *Temporary storage and the location of the WSAs; and,*

- *Clear instruction on hazardous wastes will be incorporated into the training programme and the particular dangers of each hazardous waste.'*

The environmental induction shall be provided and delivered by the Contractor and be tailored to suit the tasks and responsibilities of site personnel from management and supervisory level through to site operatives. Toolbox talks on resource management should be provided on a continuous basis. Regular toolbox talks shall ensure site staff are aware of the resource management practices associated with their work and the appropriate control measures that are required to carry out their work in compliance with the RWMP.

7.3.1 Disposal / Recycling Proposals for Each Waste Stream

All C&D waste materials will be segregated onsite into the various waste streams, via dedicated skips and storage areas. Waste will be removed from site by a suitably permitted waste haulage contractor. Each waste haulage contractor must hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO).

All waste materials generated during the Construction Phase must be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility.

7.3.2 Proposed Management Strategy for each Waste Stream

Key principles set out in the guidelines (EPA, 2021) include optimising resources and reducing waste on construction projects through:

- Prevention
- Reuse;
- Recycling;
- Green Procurement Principles;
- Off-Site Construction;
- Materials Optimisation; and,
- Flexibility and Deconstruction.

These principles are applied to the RWMP through both the pre-construction phase and the construction phase. Therefore, every effort should be made to prevent and limit the amount of waste generated at the very outset of the project. At the preparatory phase of the Construction Phase the following measures will aid the prevention of waste in the first instance;

- *Select procurement routes to minimise unnecessary packaging – for example applying 'Just-in-Time' (JIT) delivery processes to minimise material spoilage;*
- *Use of 'consolidation centres' to support JIT delivery – these are strategically-located storage and distribution facilities where materials can be stored prior to JIT delivery to sites;*
- *Implement ordering procedures and supply chain systems that avoid waste, i.e. no over-ordering, use of take-back schemes for packaging, material surplus and offcuts;*
- *Select procurement routes that minimise unnecessary packaging; and,*
- *Plan the work sequence to reduce the potential for on-site residual resource generation.*

7.4 Record Keeping

The Contractor, through the appointed Resource Manager, will be responsible for ensuring that the full details of all materials deliveries, materials movements and C&D waste generated is recorded during the Demolition and Construction Phases. Each C&D waste consignment removed from and to site will be tracked and documented to ensure full traceability of the material from site to the final destination. A single record will be completed for each individual consignment.

The Contractor will also receive printed receipts / weighbridge records from the waste disposal / recovery facilities for each individual consignment. These records will enable the Contractor to accurately quantify the total volume of waste removed for offsite disposal / recovery for each individual waste stream. These records will be maintained onsite and will be made available for auditing.

The type of information to be recorded in the site tracking system is described below in accordance with relevant guidelines and legislation:

- For each movement of resource off-site, a signed docket/invoice will be obtained by the RM from the haulier/contractor detailing the following:
    - Name the resource / waste stream.
    - List of Waste (Low) Code for each stream (where applicable).
    - Quantity of material moved off-site by the haulier/contractor (tonnes).
- The name and authorisation of the haulier to transport the material – in the case of a 'waste' this requires a valid Waste Collection Permit (WCP). In the case of by-product or other materials that are not a waste, no WCP is required. In both cases the vehicle registration number should also be recorded for each load of material removed from site.
- The name and authorisation of the destination site for the resource – again for a 'waste' this requires a valid Cert of Registration, Waste Permit or Waste Licence and in the case of by-product the relevant by-product determination.
- The waste contractors must be required to provide details of end-use or waste treatment in waste reports.
- This recording will be carried out for each resource type and the system will also be linked with the delivery records. In this way, the percentage of residual resource generated for each material can be determined.
- The system will allow the comparison of these figures with the targets established for the prevention, reuse and recovery of resources to highlight successes or failures against these targets.

7.5 Communications

The following communication tasks are recommended for the Resource Manager through the construction phase as per the EPA (2021) guidelines:

- *'Internal reporting of resource statistics to the Client and the Contractor management. This includes performance relative to agreed targets and objectives which should be included as an agenda item at site meetings;*

- *Engaging with relevant local authority on any site inspection or enforcement audits undertaken at the site. All follow-up actions and corrective actions should be logged and reported to the local authority.*
- *Engaging with other stakeholders (EPA, public, etc.) as appropriate in relation to the resource management on site; and,*
- *Upon completion of construction, the RM will prepare a final report summarising the outcomes of resource management processes adopted, the total reuse and recovery figures and the final destinations of all resources taken off-site. This report will be issued to the Client, Contractor management and the local authority. The local authority may make such a requirement a condition of planning and require the formal sign-off of same by the local authority for full planning compliance.'*

7.6 Outline Waste Audit Procedures

According to EPA (2021) a resource Audit represents a systematic study of the waste management practices applied in the Project and is required to highlight firstly, the potential issues that can arise during the waste management process and secondly, the benefits of waste prevention and minimisation. Therefore, waste audits should be carried out routinely onsite by the Resource Manager. These audits will cover work practices, record keeping, and off-site tracking as follows in accordance with the EPA (2021) guidelines:

- When materials arrive on site, they will be properly recorded including the assignment of such materials to specific uses within the works;
- A review will be undertaken of onsite waste management practices to identify any improvements which may be required;
    - *'Ensure adequacy of site signage and need for any repairs or upgrades.*
    - *Adequacy of storage infrastructure and need for any repairs or upgrades.*
    - *Compliance with resource segregation protocols and observed contamination in any resource streams.*
    - *Assessment of observed Contractor and Sub-contractor work practices for compliance with the RWMP' (EPA, 2021).*
- Onsite waste management processes / material management from materials delivery through to waste disposal / recovery (including the quantity, type and composition of all waste) will be reviewed to identify any opportunities for waste reduction;
- Corrective actions will be highlighted and implemented following each audit. Such actions include applying 'lessons learned' regarding efficient waste management on this project to other projects in the future to enable further waste reduction; and
- The key steps and findings from each waste audit should be presented in a summary report.

8 Consultation with Relevant Bodies

Appropriate consultation should be undertaken with relevant bodies by various members of the project team as required throughout the project. Relevant consultees include, but are not limited to, the following;

- Cork City Council (as the relevant local authorities for waste matters);
- The EPA (as relevant regulatory body for environmental matters);
- NWCPO;
- Permitted hauliers; and,
- Suitably permitted / licenced waste disposal / recovery facilities.