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APPENDIX 10-2

CARBON CALCULATIONS

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Embodied Carbon

Construction Movements	TII Embodied Carbon Tool Inputs					
Material	Category	Sub-Category	Material	Quantity	Unit	Emodied tCO2e
Aggregate/Sand/Crushed Stone	Series 600 Earthworks	Backfill/Fill	Aggregates and sand, from virigin land won resource, bulk, loose	19,368,000	kg	84.444
Macadam Tarmac	Series Number 700: Pavements	Pavement Surface	Asphalt, 3% (bitumen) binder content (by mass)	2,800	tonne	140.28
Concrete	Series Number 1700: Structural Concrete	In Situ Concrete - general	Cement General (UK Average)	6,347,690	kg	5,154.32
Total						5,379.05

Traffic and Transport

TII Construction Transport Inputs				
# of Vehicle Movements	Transport Type	Distance (km)	Activity over Entire Construction Phase (km)	Transport tCO2e
4,396	HGV - All - Average	17.34	76,226.64	82.668
626	LGV - Average	17.34	10,854.84	3.372
				86.0

Waste

Waste Stream Emissions							
Waste Type	Quantity	Reused/Recovery %age	Reused/Recovery Tonnes	Recycle %age	Recycle Tonnes	Disposal %age	Disposal tonnes
Metal	667	5	33	90	600	5	33
Segregated Wood, Glass, & Plastic	333	15	50	65	217	20	67
Bituminous mixtures	333	0	0	25	83	75	250
Mixed waste	2667	0	0	0	0	100	2667
Concrete, bricks tiles and similar	2333	95	2217	0	0	5	117
Soil and Stones	27000	75	20250	0	0	25	6750
	33,333.00		22,550.00		900.00		9,884.00

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Embodied Carbon Assumptions		
Item	Description	Assumption
Quarry (Q) Distance	0	21 km
Volume of Average Artic Truck	Calculation completed based on the average artic truck having a carrying capacity of 20 tonnes	20 tonnes
Concrete	Footpaths will require 170m3 of concrete and buildings will require 2,660m3 of concrete. Therefore there will be approximately 2,830m3 of concrete required for this Proposed Development. The TII Carbon tool requires these units to be in kg. The density of concrete to be used at the Site m is assumed to have average density of approximately 2,243m3/kg. Based on an assumed 2,830m3 of concrete being required this would result in approximately 6,347,690kg being used for the Proposed Development.	6347690 kg
Macadam Tarmac	The Proposed Development will require 1,200m3 of Macdam tarmac. The TII Carbon tool requires these units to be in tonne. The density of macadam tarmac to be used at the Site is assumed to have average density of approximately 2.4tonnes/m3. Based on an assumed 1,200m3 of tarmac being required this would result in approximately 2,800 tonnes being used for the Proposed Development.	2800 tonnes
Fill	Footpaths will require 510m3 of fill, buildings will require 6,650m3 of fill, and roads will require3,600m3 of fill. Therefore there will be approximately 10,760m3 of fill required for this project The TII Carbon tool requires these units to be in kg. The density of concrete to be used at the Site m is assumed to have average density of approximately 1,800m3/kg. Based on an assumed 10,760m3 of concrete being required this would result in approximately 19,368,000kg being used for the Proposed Development.	19368000 kg

Please note that the assumptions for the embodied carbon and traffic assumptions are made based on best estimates of material sources. In reality the location of material sources will be dependent on what is available at the time of construction. The implications of distance variations on the estimation for carbon calculations is of a very low magnitude within the context of the overall carbon calculations and considered appropriate for the purposes of assessment in the EIAR.

Traffic Assumptions		
Item	Description	Assumption
Truck Emissions Factor	Calculated from an HGV - All - Average emission factor as provided in the TII Carbon Tool	1.07296
Construction Material Delivery Distance	It has been assumed that all material will be imported from locally from nearby towns/cities (ie the average distance from Galway, Athenry, Moycullen, Oranmore, and Headford to the site)	17.34 km
Construction Phase HGV Movements	As identified in Section 15.2.10.6.1 of Chapter 15 Material Assets, it is estimated a total of 4,396 no. 2 way HGV delivery trips will be generated during the total construction stage of the development	4,396
Construction Phase LGV Movements	As identified in Section 15.2.10.6.1 of Chapter 15 Material Assets, it is estimated that for a development of this size, 40 – 50 site operatives will be employed at the height of the construction works. This would equate to an approx. 40 PCU vehicle (Vans and Cars) trips to and from the site during the construction days. As stated in Section 4.3.1 of Chapter 4, it is expected that the construction work will take approximately 24 months to complete based on a Monday-Saturday working week (i.e 626 days). Therefore there will be approximately 939 PCU vehicle trips to and from the site during the construction phase.	626

Large Artic Emission Factor	Calculated from an HGV - All - Average emission factor as provided in the TII Carbon Tool. Source: 2024 DEZNZ emission factors - 'Delivery vehicles' tab, All artics HGVs and used Average laden weight. 2024 DEZNZ emission factors - 'WTT - delivery vehs & freight' tab, all artics HGVs and used Average laden weight.	1.0845
Car Emission Factor	Calculated from LGV - Average emission factor as provided in the TII Carbon Tool. Source: 2024 DESNZ emission factors - 'Delivery vehicles' tab, Van - Average (up to 3.5 tonnes). 2024 DESNZ emission factors - 'WTT - delivery vehs & freight' tab, Van - Average (up to 3.5 tonnes)..	0.31064

Please note that the assumptions for the embodied carbon and traffic assumptions are made based on best estimates of material sources. In reality the location of material sources will be dependent on what is available at the time of construction. The implications of distance variations on the estimation for carbon calculations is of a very low magnitude within the context of the overall carbon calculations and considered appropriate for the purposes of assessment in the EIAR.

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Waste Assumptions		
Item	Description	Assumption
Waste Quantities	Waste Quantities have been determined from Table 3 and Table 4 in the Construction and Demolition Waste Management Plan (Appendix A below)	Waste Quantities from Table 3 and Table 4 in Appendix A Below
Waste Transportation Distances	It has been assumed that all waste material will be exported to local appropriately authorised waste licensed facilities. Have used the average distance from Galway, Athenry, Moycullen, Oranmore, and Headford to the site for this assumption.	17.34 km

Please note that the assumptions for waste emissions are made based on best estimates of material sources. In reality the location of material sources will be dependent on what is available at the time of construction. The implications of distance variations on the estimation for carbon calculations is of a very low magnitude within the context of the overall carbon calculations and considered appropriate for the purposes of assessment in the EIAR.

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APPENDIX A

CONSTRUCTION WASTE AND DEMOLITION MANAGEMENT PLAN

TOBIN

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Kingston Stables Ltd.

Large Residential Development at Kingston, Knocknacarra, Galway.

LRD West

Construction & Demolition Waste Management Plan (CDWMP)

BUILT ON KNOWLEDGE

Document Control Sheet	
Document Reference	11893 - Construction & Demolition Waste Management Plan (CDWMP)
Client:	Kingston Stables Ltd.
Project Reference	11893

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Rev	Description	Author	Date	Reviewer	Date	Approval	Date
P01	Issued for Planning	MN	05/06/2026	RB	10/06/2026	RB	10/06/2026
P02	Updated EPA C&D Waste Statistics	MN	22/06/2026	RB	22/06/2026	RB	22/06/2026
P03	Updated Development Description	MN	02/07/2026	RB	02/07/2026	RB	02/07/2026

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1. INTRODUCTION

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Waste Management is an integral requirement essential in the promotion of sustainable development, enhancing good public health and the protection of environment. The following outlines the waste management strategy for the development.

The proposed development will give rise to a variety of waste streams. Given the scale of the development and the volumes of waste that will be generated during construction, it is imperative to ensure that waste management at the site is tightly controlled and has the least possible impact on the surrounding environment.

The purpose of the Construction & Demolition Waste Management Plan (CDWMP) will ensure that waste storage and movement within the development takes place in a manner which complies with relevant legislation and has a minimal impact on the nearby existing commercial and residential areas and ensures, where prevention is not possible, that maximum reuse, recycling and recovery of waste with diversion from landfill, wherever possible.

The current legal and industrial standards adopted to generate this document include:

- **Waste Management Act 1996, as amended -**
- **Waste Management (Facility Permit and Registration) Regulations, as amended.**
- **Waste Management (Collection Permit) Regulations, as amended.**
- **European Union (Packaging) Regulations, as amended.**
- **European Union (Waste Electrical and Electronic Equipment) Regulations, as amended.**
- **Waste Management (Hazardous Waste) Regulations, as amended.**

The plan estimates the type and quantity of waste to be generated from the proposed development during the Construction and Demolition phases and provides a strategy for managing the different waste streams. Guidance will also be given to ensure appropriate method of transportation of waste is used to prevent littering or other serious environmental pollution.

In preparation of the CDWMP, the following publication has been used as references:

- Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects (Department of the Environment and local Government 2021).

These guidelines cover issues to be addressed at the preplanning stage through to project completion and these include:

- Predicted Construction and Demolition wastes.
- Waste disposal/recycling of C&D wastes at the site.
- List of sequence of operations to be followed.
- Provision of training for waste managers and site crew.
- Details of proposed record keeping system.
- Details of waste audit procedures and plans.
- Details of consultation with relevant stakeholders.

1.1 Waste Management Context

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The primary legislative instrument that governs waste management in Ireland is the Waste Management Act (WMA) 1996, as amended. The WMA is a key instrument which, among others, implements the EU Waste Framework Directive (Directive 2008/98/EC) in Ireland. The WMA provides for a general duty on everyone not to hold, transport, recover or dispose of waste in a manner that causes or is likely to cause environmental pollution. The WMA also sets out the provisions for the collection of waste and for its recovery/disposal.

Any person or contractor engaged in the collection of waste on a commercial basis is required to hold a Waste Collection Permit in accordance with the requirements of the Waste Management (Collection Permit) Regulations, as amended. A Waste Collection Permit is issued to appropriate contractors by the National Waste Collection Permit Office (NWCPO).

Waste materials collected by a suitably permitted waste contractor can only be transported to appropriately permitted or licensed waste facilities. Authorization for receiving waste materials is provided in accordance with the Waste Management (Facility Permit & Registration) Regulations, as amended for waste permits and certificates of registration (COR) granted by the relevant Local Authority. Waste management authorizations granted by the Environmental Protection Agency (EPA) are issued in accordance with the Waste Management (Licensing) Regulations 2004, as amended and the Environmental Protection Agency (Industrial Emissions) (Licensing) Regulations 2013, as amended.

1.2 Relevant Policy

1.2.1 National Policy

Ireland's waste management policy is based on the EU waste hierarchy (Figure 1) and includes a range of measures across five tiers namely, prevention/minimization, reuse, recycling, recovery, and disposal.

National waste management policy is set out in Ireland's Circular Economy Strategy 2026-2028. It is focused on facilitating the transition to a circular economy (Figure 2) through a suite of actions aimed at capturing the maximum value of all resources across various waste streams.

The strategy aims to

- Increase Ireland's Circular Material Use Rate (CMUR) by 2 percentage points annually, reaching 12% by 2030
- Support economic expansion, while improving resource productivity and reducing dependency on virgin raw materials
- Strengthen Ireland's position as a centre for sustainable design, advanced manufacturing, and innovative circular business models
- Empower people and communities to make sustainable, cost-effective choices through initiatives such as the introduction of a pilot National Repair Voucher Scheme
- Support local authorities in developing reuse, repair, and recycling hubs nationwide
- Place digitalisation and data-driven innovation at the core of the circular transition

The Circular Economy Strategy builds on strong policy foundations established over recent years, including the Circular Economy Act 2022, the Waste Action Plan for a Circular Economy, the Green Public Procurement Strategy and Action Plan, the Climate Action Plan, and the National Waste Management Plan for a Circular Economy.

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It is consistent with EU policy supporting the transition to a circular economy, including the European Green Deal, and aligns with the waste hierarchy framework. The Circular Economy and Miscellaneous Provisions Act 2022 establishes the legislative basis for advancing the transition to a circular economy in Ireland.

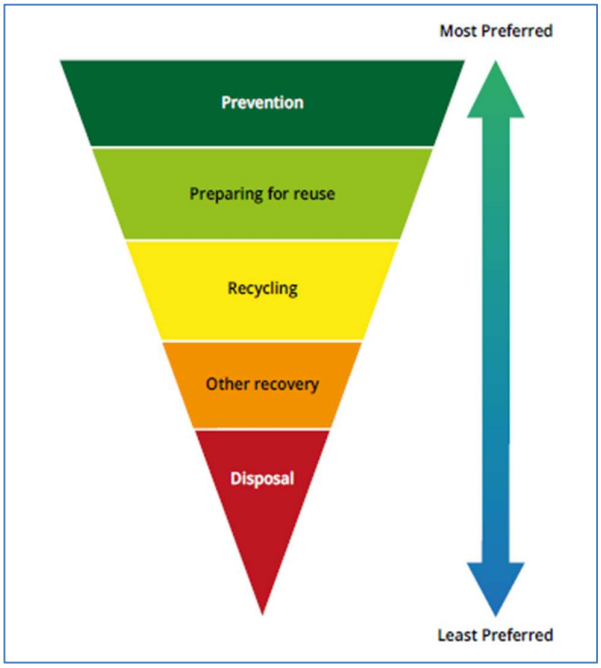


Figure 1.1 Waste Management Hierarchy (Source: EPA)

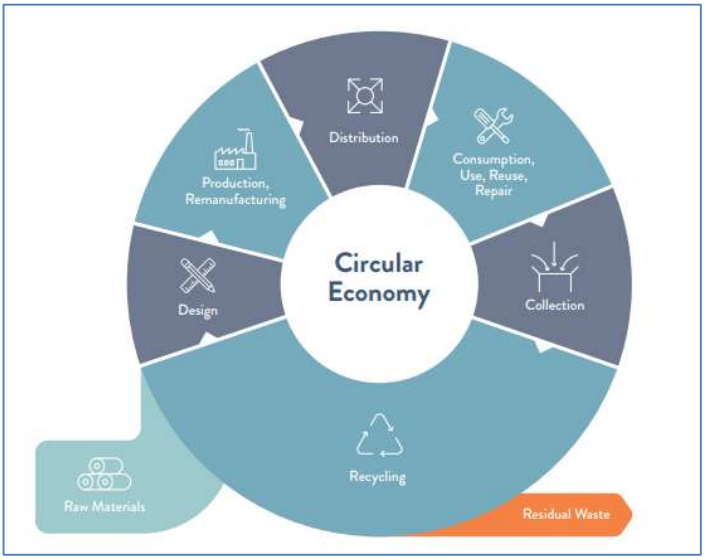


Figure 1.2 The Circular Economy (Source: EPA)

In respect of Construction and Demolition waste specifically, the plan outlines that a review of producer responsibility initiatives will examine the appropriate financial mechanisms to ensure compliance by producers with their obligations and that those sectors which are generating significant waste, and which do not have successful voluntary initiatives in place, will be considered for specific regulation as part of the review. The document states that specific producer responsibility requirements for construction and demolition projects over a certain threshold will be considered.

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1.2.2 Waste Management Plan

The current waste policy framework in Ireland is set out in the National Waste Management Plan for a Circular Economy 2024–2030, which provides a comprehensive framework for the prevention and management of waste in a safe and sustainable manner. The plan aims to transform Ireland's approach to waste by promoting a circular economy, where waste is viewed as a valuable resource that can support environmental protection and sustainable economic development. It also highlights the importance of improving resource efficiency across key waste streams, including construction and demolition waste, which has significant potential for reuse and recycling due to its material characteristics.

1.2.3 Galway Development Plan

The statutory development plan applicable to the proposed development is the *Galway City Development Plan 2023–2029*. This plan sets out the policies and objectives of Galway City Council for the proper planning and sustainable development of the city over the plan period. It includes commitments to provide infrastructure and services that support environmental quality, sustainable economic growth, and housing delivery.

With regard to waste management within the city, the Development Plan includes the following key objectives:

1. To support the provision of waste management infrastructure that promotes waste minimisation, reuse, recycling, and recovery, and to regulate waste activities in accordance with the 'polluter pays' and 'proximity' principles, in line with regional and national waste policy.

2. To ensure waste management practices are consistent with EU and national policy, prioritising waste prevention, reuse, and recycling within a circular economy framework.

3. To support the implementation of the *National Waste Management Plan for a Circular Economy 2024–2030* and any subsequent plans relevant to Galway.

4. To require adequate waste storage, segregation, and recycling facilities in new residential, commercial, and industrial developments in accordance with Council standards.

5. To ensure the appropriate and sustainable siting of waste facilities, having regard to surrounding land uses, transport, and environmental considerations.

6. To support litter management initiatives, including the implementation of the City Council's Litter Management Plan.

7. To ensure appropriate remediation of contaminated lands as part of development proposals.

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2. WASTE MANAGEMENT OBJECTIVES

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The following waste management objectives are identified for the proposed development:

- Maximize the on-site segregation of demolition and construction wastes.
- Consider all reuse opportunities for material surpluses within the site.
- Avoid oversupply of incoming construction materials which have the potential to become waste; and
- Engage licensed waste contractors that can provide maximum off-site reuse, recovery and recycling of waste materials in preference of disposal throughout construction and demolition phases.

The national target for preparing for reuse, recovery, and recycling of construction waste (excluding soil and stone) is 70%, and the waste industry in Ireland is currently achieving 82%. The National Waste Management Plan for a Circular Economy 2024-2030 has set ambitious targets, including a recycling rate of 55% for municipal waste by 2025, and 60% for municipal waste by 2030.

The target set for C&D waste management for this project is 80% which is expected to be achievable based on the construction waste types outlined in Section 4 below.

The main contractor will be required to comply with this project target and will be required to engage suitably permitted waste contractors that will provide a commitment to achieving, or exceeding, this target.

3. PROJECT DESCRIPTION

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TOBIN were appointed by Kingston Stables Ltd. to provide engineering consultancy services for a proposed Large Residential Development (LRD) at Kingston, Knocknacarra, Galway, off the Western Distributor Road in Knocknacarra. The proposed site location is shown in Figure 3.1 below.

Planning permission is sought by Kingston Stables Limited for development of a Large-Scale Residential Development (LRD) for a 10-year planning permission, on a site which extends to 2.9 ha on lands located at Rahoon, Knocknacarra, Galway.

The proposed development will consist of the following:

1. Provision of 133 no. residential units in 2 no. development areas with a mix of duplex and house types on a site area of 2.9 ha. The buildings range between 2 no. and 3 no. storeys in height. The development will comprise the following:
    - 51 no. 3-bed townhouses;
    - 6 no. 4-bed townhouses;
    - 1 no. 1-bed duplex apartments;
    - 1 no. 2-bed duplex houses;
    - 37 no. 2-bed ground floor duplex apartments;
    - 37 no. 3-bed duplex houses.
2. Demolition of existing structures (388 sqm);
3. Vehicular access to the proposed development from a permitted road (Planning Reference 24/60370 refers);
4. Upgrades to the permitted road (Planning Reference 24/60370 refers);
5. Pedestrian and cycle access to the adjacent proposed Kingston Park (ACP Ref: 323873);
6. Conversion and upgrade of an existing structure to a cafe (65.6 sqm);
7. The provision of public open space;
8. The provision of 192 no. bicycle parking spaces;
9. The provision of 143 no. car parking spaces;
10. Public lighting, bin stores, signage, services, 2 no. ground mounted substation kiosks, site landscaping and all ancillary site development and enabling works.

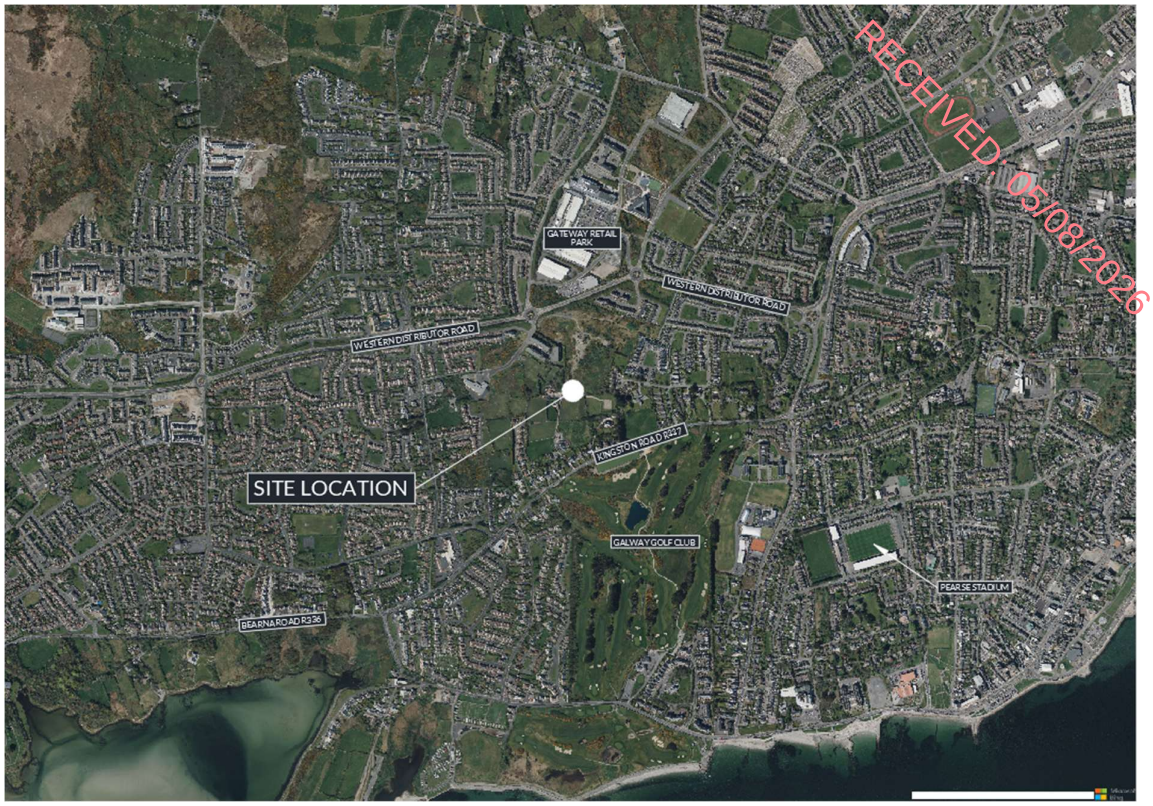


Figure 3.1: Site Location (Microsoft Bing)

4. WASTE ARISINGS

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C&D waste statistics from 2022 published by the EPA identify the principal waste types generated in the construction industry in Ireland as set out in Table 2.

Prior to the commencement of any demolition, excavation or construction works at the site a full audit of waste that will be generated on site will be carried out. For the purposes of this CDWMP a list of expected waste types that may be generated has been drawn up and the European Waste Catalogue Codes pertaining to each waste type is included in the table below which identifies the main waste types generated in the construction industry in Ireland.

Table 1 EPA C&D Waste Statistics

Waste Type	% of total (by weight)
Metal	2%
Segregated Wood, glass & plastic	1%
Bituminous mixtures	1%
Mixed waste	8%
Concrete, bricks, tiles and similar	7%
Soil and stones	81%

As above, soil and stones waste typically make up a significant proportion of C&D waste. Soil and stones are often managed through reuse and backfilling rather than recycling, which influences overall recovery rates.

During construction works, waste material will be generated mainly from material off-cuts and packaging. Oversupply of materials can also lead to waste generation. The typical waste materials generated will be concrete rubble, metals, wood and plastics, in the main.

Other waste types generated in smaller quantities on construction sites may include materials such as waste oils, resins, paints and adhesives. Some of these materials may be hazardous and will require specific handling procedures. It is expected that quantities of these materials will be small.

In addition to the typical waste materials that will be generated daily, there will be some additional waste types generated in small quantities within the development that will need to be managed separately including:

- Batteries;
- Waste electrical and electronic equipment (WEEE) (both hazardous and non-hazardous).
- Chemicals from cleaning and maintenance.
- Fluorescent tubes and other mercury containing waste.
- Textiles; and
- Furniture (and from time-to-time other bulky wastes).

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4.1 Demolition Waste

Methods for waste reduction will form the basic strategy for demolition waste management from the start. Where possible materials will be re-used. Careful extraction of materials will be undertaken to ensure that the highest proportion of the materials can be re-used. This will reduce the level of new materials required for the proposed site. This in turn reduces the impact on new resources and carbon emissions associated with the extraction, manufacture and transportation of materials to the site. If any of the excavated soil is found to be clean/inert, the site manager will investigate whether nearby construction sites may require clean fill material, to both minimize the costs of transport and to reuse as much material as possible.

To ensure compliance with legislative requirements, only authorised waste collection permit holders and appropriately permitted waste contractors will be engaged to collect and remove waste from site. All waste removed from site will be deposited at a licensed waste facility.

Prior to the commencement of any demolition, excavation or construction works at the site a full audit of waste that will be generated on site will be carried out. For the purposes of this CDWMP a list of expected waste types that may be generated has been drawn up and the European Waste Catalogue Codes pertaining to each waste type is included in the table below. The lists have been prepared following a visit to the proposed development site.

Materials Type	Example	EWC Code
Soil & Stones	Overburden, soil, subsoil	17 05 04
Concrete	Pillars, wall foundation	17 01 01
Mixture of inert material	Mixed Concrete, Brick Rubble	17 01 07
Mixed Metals	Scrap metal, sheet roofing	17 04 07

4.2 Excavation Waste

The remaining volume of waste material (other than demolition waste) will be segregated according to type into individual skips pending removal by authorised waste collection permit holders. The waste categories subject to segregation during the site clearance and cut and fill phases will be determined based on the expected volumes of specific waste streams, as assessed by the Waste Manager.

Where a particular waste category arises in small quantities, such material will be placed in a mixed construction waste skip along with other low-volume waste streams, where individual segregation is not practical. This mixed waste will be transported to a Materials Recovery Facility (MRF) by an authorised contractor, where it will be further sorted into individual waste streams for reuse, recycling, recovery, or disposal in accordance with relevant waste management legislation.

It is anticipated that a significant proportion of materials, particularly soil and stones, will be reused on-site for landscaping and site restoration purposes, thereby reducing the need for off-site disposal and minimising the environmental impact of the development.

4.3 Recycle/Recovery Measures

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The following waste streams will be segregated for recycling and recovery off-site:

- Uncontaminated excavated spoil and stone, in excess of the quantities required on-site, will be removed for beneficial reuse at an authorised location. The Contractor shall ensure that the haulage contractor holds a valid Waste Collection Permit, and that the receiving facility is appropriately authorised to accept such material. Records of all truck movements to and from the site shall be maintained.
- Packaging waste will be segregated, where practicable, and deposited in designated recycling skips. This material will be removed off-site for recycling by an authorised waste contractor.
- Timber waste will be deposited in designated timber skips for collection by an authorised waste contractor.
- Mixed metals will be placed in appropriate skips for removal off-site by an authorised waste contractor.
- Glass waste will be returned to the supplier or directed to an appropriate recycling facility, where feasible.

Depending on the stage of works and anticipated waste types and volumes, the Contractor may utilise a single skip for mixed recyclable construction waste. This material will be collected by an authorised waste contractor and transferred to a Materials Recovery Facility for further segregation and processing.

The Contractor shall retain records of all skip collections and waste transfers from the site to demonstrate compliance with waste management legislation.

5. CATEGORIES OF CONSTRUCTION WASTE GENERATED

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In order to provide consistent waste classification across the EU, the European List of Waste (LoW) was established. This system identifies both hazardous and non-hazardous wastes, with hazardous wastes indicated by an asterisk (*). These classifications form the basis for national and international waste reporting and regulatory requirements.

The EPA has also published guidance documents to assist in the application of LoW codes. The relevant LoW codes for typical construction waste streams expected to be generated on this site are outlined below.

Table 2 EPA List of Waste Codes - General Construction

Waste Type	List of Waste Codes*
Metal	17 04 series
Glass	17 02 02
Paper & Cardboard	20 01 01
Plastic	17 02 03
Wood	17 02 01
Waste containing PCBs**	17 09 02*
Mixed waste	17 09 03*, 17 09 04
Mineral waste (concrete, bricks, etc.)	17 01 01 – 17 01 07
Asbestos	17 06 01*, 17 06 05*
Soil and stones	17 05 03* -17 05 08
Residue from treatment of mixed waste	e.g. 19 12 Series

6. CONSTRUCTION WASTE

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Construction waste is anticipated to consist primarily of surplus materials arising from demolition works and off-cuts of construction materials, including concrete blocks, bricks, tiles, and similar materials. Waste generated from packaging and the oversupply of materials is also expected.

The majority of waste generated is anticipated to arise from demolition activities and deep excavation required for the proposed development, as well as, to a lesser extent, associated civil engineering works. This material is expected to be largely inert and may be suitable for reuse on site, subject to appropriate testing and verification, thereby reducing the overall volume of waste requiring off-site disposal.

The development will involve the excavation of approximately 15,000m^3 of soil and stones associated with site clearance, bulk excavation, and the construction of building substructures and civil infrastructure. It is proposed to reuse suitable excavated materials within landscaped areas and as engineered fill, where appropriate, in order to minimise waste generation and reduce the need for imported materials.

The following table provides an estimate of the construction waste likely to be generated, based on the information currently available:

Table 3 Estimated Waste Quantities

Waste Type	Quantity (Tonnes)
Metal	667
Segregated Wood, glass & plastic	333
Bituminous mixtures	333
Mixed waste	2,667
Concrete, bricks, tiles and similar	2,333
Soil and stones	27,000
Total	**33,333**

Table 4 Estimated Off-Site Reuse, Recycle and Disposal for Construction Waste

Waste Type	Quantity (Tonnes)	Reuse/ Recovery		Recycle		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Metal	667	5	33	90	600	5	33
Segregated Wood, glass & plastic	333	15	50	65	217	20	67
Bituminous mixtures	333	0	0	25	83	75	250
Mixed waste	2,667	0	0	0	0	100	2,667
Concrete, bricks, tiles and similar	2,333	95	2,217	0	0	5	117
Soil and stones	27,000	75	20,250	0	0	25	6,750
Total	**33,333**		**22,550**		**900**		**9,883**

It should be noted that until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the detailed design stage and construction process.

7. WASTE HANDLING

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The main Contractor will appoint suitably permitted waste contractor(s) to collect waste from the site and transport it to appropriately licensed or permitted waste management facilities. Any contaminated material encountered will be classified and disposed of at Local Authority–authorised landfill facilities.

A suitably permitted waste contractor will also be appointed by the Management Company to provide ongoing waste collection services for the completed development and to transport waste to licensed facilities. All waste receptacles presented for collection will be clearly labelled in accordance with relevant waste legislation. Waste will be managed and presented for collection in a manner that does not pose a risk to human health, traffic, or the environment, and does not give rise to nuisance through odours, litter, or visual impact.

7.1 ADDITIONAL WASTE STREAMS

In addition to typical daily waste arisings, the following waste types may be generated periodically and will be managed separately:

Waste Electrical and Electronic Equipment (WEEE)

The WEEE Directive (2002/96/EC) and associated Waste Management (WEEE) Regulations 2014 require high levels of reuse and recycling. Producers are responsible for the take-back of WEEE, regardless of whether a replacement product is purchased. Retailers must provide take-back services when a similar product is purchased.

Batteries

Waste batteries and accumulators will be managed in accordance with the Waste Management (Batteries and Accumulators) Regulations 2014. These must be segregated and collected separately for recycling and recovery. Producers are responsible for financing and arranging appropriate collection.

Fluorescent Tubes / Mercury-Containing Waste

Fluorescent tubes will be collected and disposed of as hazardous waste by suitably licensed contractors. These are typically removed by specialist maintenance contractors responsible for off-site disposal. Modern fittings are increasingly LED-based and non-mercury-containing.

Chemicals

Chemicals (including solvents, paints, adhesives, pesticides, and detergents) are mainly generated during construction works. Contractors undertaking such works are responsible for proper off-site disposal, although the main Contractor retains ultimate responsibility for compliance.

Textiles

Where feasible, textiles will be reused, recycled, or donated to charitable organisations.

Furniture / Bulky Waste

Bulky items such as furniture and carpets will be removed by the Contractor and transported to authorised facilities for reuse, recycling, or disposal.

Soils (Subsoils / Topsoils)

Excavated soils are expected to be predominantly inert and will be reused on-site where possible. Material removed off-site will be transported to licensed facilities.

Where applicable, reuse may be carried out under Waste Management (Collection Permit) Regulations 2007, subject to permit conditions. Any potentially contaminated materials will be segregated, tested, classified in accordance with Council Decision 2003/33/EC, and disposed of appropriately.

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7.2 Construction Materials

Concrete / Stone / Rubble

Clean inert materials will be reused on-site where possible (e.g. crushing for fill material) or transported to licensed facilities.

Recyclable Materials

Materials such as plastics, timber, metals, plasterboard, and glass will be:

- Segregated at source
- Stored in covered skips
- Collected by licensed contractors

The Contractor will minimise oversupply and waste generation.

7.3 Hazardous Materials

Specialist licensed contractors will be engaged to manage and remove contaminated materials. All such waste will be disposed of at facilities authorised under the Waste Management Act 1996 (as amended) and associated regulations.

7.4 Waste Facilities and Transport

There are multiple waste transfer and treatment facilities within the Connacht region capable of accepting C&D waste. However, contaminated soils may require transport outside the region for specialist treatment.

Details of waste destinations will be provided to Galway City Council prior to commencement of site works.

No waste will be removed off-site except to licensed or permitted facilities.

7.5 Classification and Handling of Excavated Materials

All excavated soil and stone will be classified in accordance with EPA Waste Classification guidance or using the HazWasteOnline system.

Waste destined for landfill must meet Waste Acceptance Criteria (WAC) in accordance with Council Decision 2003/33/EC.

Contaminated materials will be transported in covered and sealed vehicles to prevent:

- Dust emissions
- Run-off or leakage

7.6 On-Site Waste Management

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Construction waste streams including concrete, metals, plastics, plasterboard, glass, and timber will be segregated on-site into dedicated skips where space permits.

- Separate skips will be used for recyclable materials
- Mixed C&D waste skips will be used only for non-recyclables
- Site segregation will be monitored by the Project Environmental Manager

Off-site processing facilities may recover additional recyclable materials and produce “fines” suitable for engineering use.

7.7 Special Waste Streams

- WEEE will be stored separately (under cover if required)
- Cardboard packaging will be segregated to maximise recycling
- Hazardous wastes (e.g. oils, resins, paints) will be handled only by permitted contractors and may be suitable for recovery

8. RECORD KEEPING

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Once a waste contractor(s) has been appointed, the Project Environmental Manager will request copies of their waste collection permits, which will be retained on file at the site office. These permits must include an up-to-date list of approved vehicle registrations associated with the permit, which may be subject to spot checks by the Project Environmental Manager.

The waste contractor will also be required to identify the destination facilities for all waste materials. Copies of the relevant waste licences or permits for each receiving facility will be obtained and retained on file at the site office. The Project Environmental Manager will verify that the waste collection permits and facility licences/permits are valid and appropriate for the specific waste types proposed.

A waste log will be established and maintained by the Project Environmental Manager to record all waste movements off-site. The waste collection vehicle driver will be required to provide a signed waste docket for each load leaving the site (or a hazardous waste consignment note, where applicable). Each record must include:

- Waste collection permit number
- Waste type and European Waste Catalogue (EWC) code
- Description/treatment of the waste
- Source/origin of the waste
- Destination facility

Where available, the waste docket may include the weight of the waste, for example where collection vehicles are fitted with load cells. Alternatively, waste weights will be determined using a weighbridge at the receiving facility and must be provided to the Project Environmental Manager as soon as practicable following delivery.

In all cases, the waste contractor will be required to provide accurate and verifiable records of waste tonnages.

The waste contractor will also be required to report on the fate of the collected waste, including the proportion that is reused, recycled, recovered, or disposed.

The waste log will be used to identify the principal waste streams generated on-site and may be cross-referenced with material delivery records to determine waste generation rates. This information will enable the Project Environmental Manager to identify opportunities for improved material efficiency and waste reduction.

The collected data will also be used to assess project performance against the target of achieving a minimum of 80% reuse, recycling, and recovery of construction and demolition waste.

9. TRAINING, RESPONSIBILITIES & AUDITING

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The main Contractor will incorporate the waste management objectives outlined in Section 2 into the site induction for all personnel. The importance of waste segregation at source and maintaining a clean and orderly site will be emphasised. The locations of waste skips and designated storage areas will be clearly communicated during induction.

The appointed Project Environmental Manager will be trained in the implementation of the waste log system and the verification of waste documentation, as described in the previous section. The Project Environmental Manager will be responsible for delivering toolbox talks on waste management, organising additional training where required, and promoting good waste management practices throughout the project.

The Project Environmental Manager will liaise with Galway City Council to provide details of the waste facilities utilised and to submit waste data as required. Regular feedback on waste performance will also be provided to the project team in order to recognise good performance and identify areas for improvement.

The Project Environmental Manager will be fully familiar with the contents of this document and will ensure that all measures outlined herein are implemented and maintained for the duration of the project.

An audit checklist will be developed and implemented by the Project Environmental Manager to facilitate regular inspections of skips and waste storage areas across the site. These inspections will identify contamination issues, improper segregation, or other waste management concerns. Waste records for all off-site movements will also be reviewed, with the waste log cross-checked against hard copy dockets to ensure completeness and accuracy.

Where necessary, the Project Environmental Manager may carry out audits of receiving waste facilities to confirm that waste arising from the site is being managed in accordance with the information provided on waste documentation. While such audits are not proposed as a standard measure, they may be undertaken where issues or discrepancies are identified.

Upon completion of the construction phase, a final report will be prepared summarising the outcomes of the Waste Management Plan, including total quantities of waste generated and the percentage of reuse, recycling, and recovery achieved.

Waste management costs will also be monitored throughout the project, and opportunities for cost savings will be identified and communicated to the Project/Site Manager. Maximising on-site segregation typically reduces costs associated with mixed construction waste, which requires more extensive off-site processing.

10. INTERACTION WITH OTHER BODIES

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The Project Environmental Manager will ensure coordination with relevant bodies throughout the project, including compliance with construction traffic management requirements for waste collection vehicles.

Specialist waste management companies, where required, will be assessed for suitability, and their records reviewed to confirm that all relevant and current waste collection permits and licences are in place.

Waste contractors will also be consulted, where necessary, to obtain information on:

- The treatment of hazardous materials (if encountered)
- Waste handling costs
- Appropriate transportation methods for recycling, recovery, or reuse

Only authorised waste collectors holding valid waste collection permits issued by the National Waste Collection Permit Office (NWCPO) will be engaged for the removal of waste from the site.

The Project Environmental Manager will provide details to Galway City Council regarding the destination facilities for all waste materials and will supply waste records to the Local Authority as required.

At the time of writing, the following authorised waste collection permit holders operate in proximity to the development site:

- **Barna Recycling**, Carrowbrowne, Headford Road, Galway (Permit No. NWCPO-08-03604-09)
- **Walsh Waste & Recycling Ltd**, Deerpark Industrial Estate, Oranmore, Co. Galway (Permit No. NWCPO-08-03584-09)

Note: The above list is indicative only. The validity and scope of all waste collection permits and facility licences will be verified prior to appointment of any contractor.

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