ORANMORE LRD
CARTRON
ORANMORE
CO GALWAY

MARSHALL YARDS
DEVELOPMENT COMPANY LTD.

OPERATIONAL WASTE MANAGEMENT PLAN

May 2024

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Contents

1.0 INTRODUCTION

AKM Consulting Engineers were commissioned by Marshall Yards Development Company Ltd. to prepare an Operation Waste Management Plan (OPWMP) for a proposed residential development of 171 residential units and a creche at Cartron, Oranmore, Co. Galway.

Figure 1.1 Subject site outlined in red / magenta

This document presents the applicants Operational Phase Waste Management Plan (OWMP) for the control, management and monitoring of waste associated with the proposed residential development at Cartron, Oranmore, Co. Galway.

The Objective of this Waste Management Plan is to maximise the quantity of waste recycled by providing sufficient waste recycling infrastructure, waste reduction initiatives and waste collection and waste management information to the residents of the development.

The Goal of this Waste Management Plan is to achieve a residential recycling rate of 50% of managed municipal waste in accordance with *The Connaught Ulster Waste Management Plan 2015-2021.*

The Waste Management Plan shall be integrated into the design and operation of the development to ensure the following:

That sufficient waste management infrastructure is included in the design of the development to assist residents minimise the generation of mixed waste streams.

That the principle of waste segregation at source is the integrated into the development by the provision of separate bin systems, signage and notifications.

That all waste materials generated by site activities are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the Waste Management Act 1996 and all associated Waste Management Regulations.

2.0 WASTE MANAGEMENT POLICY

2.1 National

At the national level, the Irish Government introduced a policy statement in 1998, *'Changing Our Ways'*, outlining objectives to prevent, minimise, reuse, recycle, recover, and dispose of waste. The policy emphasised reduced landfill reliance and alternative waste management methods. It aimed for at least 35% municipal waste recycling.

A 2002 policy document, *'Preventing and Recycling Waste – Delivering Change'*, proposed programmes to increase waste recycling and divert landfill use. Waste minimisation was prioritised. The 2002 review, '*Making Ireland's Development Sustainable – Review, Assessment and Future Action*', reinforced this view, stressing the need to break the link between economic growth and waste generation.

A 2004 review, *'Taking Stock and Moving Forward'*, assessed waste management progress in Ireland between 1998 and 2003. It noted a significant increase in waste brought to local authority landfills and highlighted the challenge of expanding dry recyclable collection services.

In 2020, the Irish Government published *'A Waste Action Plan for a Circular Economy'* (WAPCE) for 2020-2025 in response to the European Green Deal. The WAPCE reorients policy toward creating circular production and consumption patterns and includes over 200 measures across various waste areas.

The Whole of Government Circular Economy Strategy 2022-2023, *'Living More, Using Less'* (2021), sets a course for Ireland's transition to circularity across all sectors and government levels. The Circular Economy and Miscellaneous Provisions Act 2022, signed into law in 2022, supports this shift toward sustainable production and consumption patterns.

Since 1998, the Environmental Protection Agency (EPA) has produced periodic *'National Waste (Database) Reports*'. The most recent report, published in 2020, provided key statistics on municipal waste generation, recycling, recovery, and disposal in Ireland.

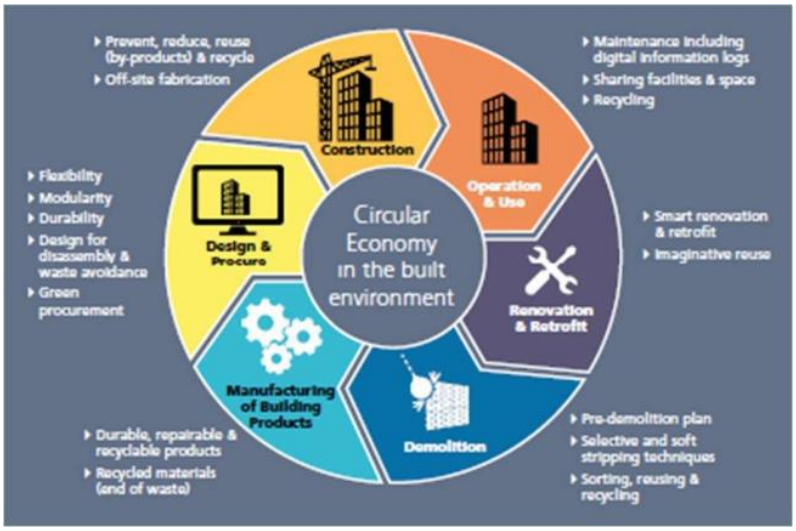


Figure 2.1: Circular Economy in the Built Environment (Source: EPA)

2.2 Regional

In terms of waste planning, Ireland is split into three waste regions: the Eastern-Midlands Waste Region, the Southern Waste Region, and the Connacht-Ulster Waste Region. Galway County Council and this proposed development fall under the Connacht-Ulster Waste Region and will use this framework for guidance.

Each of the three waste management regions has formulated a waste management plan, designed to offer a safe and sustainable framework for waste prevention and management. The Connaught Ulster Waste Region's current plan is the *Waste Management Plan 2015-2021*.

The plan outlines a series of policy actions aimed at fostering a positive shift in the behaviour and mindset of households, businesses, and industries towards waste prevention. Additionally, the plan aims to transition the Connaught Ulster Region from a traditional waste disposal approach to a circular economy model, transforming waste into a valuable resource for the future. The key policy actions of the plan are as follows:

- Initiating communication, awareness, and on-the-ground activities that result in a lasting change in people's attitudes towards waste;
- Implementing a 1% annual reduction in per capita household waste generation throughout the plan's six-year period;
- Achieving a 50% recycling rate for managed municipal waste by 2020;
- Eliminating the direct disposal of unprocessed residual municipal waste to landfill, starting in 2016;
- Expanding source-segregated kerbside collection services in the region and prioritising the adoption of a three-bin system for both households and commercial entities;
- Enforcing regulations pertaining to household and commercial waste management in order to address the issue of uncontrolled waste;
- Conducting thorough assessments to ensure that current and future waste facilities do not adversely affect environmentally sensitive areas;
- Developing the waste management sector into a thriving, sustainable industry that generates and sustains healthy employment opportunities.

2.3 County Development Plan

The development plan relevant to the proposed development is the Galway County Development Plan 2022-2028 which outlines the local authority's pledges to supply and execute infrastructural services that will augment the local environment and bolster sustainable economic growth and housing development. With respect to waste management in the county, the development plan outlines the following objectives:

- Implement and support the strategic objectives of the Waste Action Plan for a Circular Economy – Ireland’s National Waste Policy 2020-2025
- Implement and support the strategic objectives of the Connaught Ulster Regional Waste Management Plan 2015-2021 and any subsequent Waste Management Plan adopted during the current development plan period.
- Promote circular economy principles, prioritising prevention, reuse, recycling and recovery, and to sustainably manage residual waste. New developments will be expected to take account of the provisions of the Waste Management Plan for the Region and observe those elements of it that relate to waste prevention and minimisation, waste recycling facilities, and the capacity for source segregation.

2.4 Legislative Requirements

The principal legislative instruments overseeing waste management in Ireland, which apply to the project, include:

- Waste Management Act 1996, as amended;
- Environmental Protection Agency Act 1992, as amended;
- Litter Pollution Act 1997, as amended;
- Planning and Development Act 2000, as amended; and
- Circular Economy and Miscellaneous Provisions Act 2022.

These Acts and associated regulations facilitate the incorporation of relevant European Union Policy and Directives into Irish law. A core principle of European waste legislation, which has been integrated into the Waste Management Act 1996 as amended and subsequent Irish legislation, is the "*Duty of Care*". This means that waste producers are responsible for waste from generation to legal disposal (including the disposal method). As it is typically impractical for waste producers to physically transfer all waste to the final disposal site, waste contractors will be employed for waste transportation for the proposed development.

Waste contractors must handle, transport, and reuse/recover/recycle/dispose of waste in a manner that prevents adverse environmental impacts resulting from these activities.

A waste contractor must possess a collection permit issued by the National Waste Collection Permit Office (NWCPO) to transport waste. Waste receiving facilities must also be suitably permitted or licensed. Facility operators cannot accept waste without a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the Waste Management (Facility Permit & Registration) Regulations 2007, as amended, or a waste or IED (Industrial Emissions Directive) licence granted by the EPA. The COR/permit/licence will specify the types and quantities of waste that can be received, stored, sorted, recycled, recovered, and/or disposed of at the specified site.

2.5 Galway County Council Waste Bye-Laws

The Galway County Council (GCC) "*Bye-Laws for the Segregation, Storage, and Presentation of Household and Commercial Waste"* (2019) came into effect on 1st November 2019. These Bye-Laws establish enforceable requirements for waste holders regarding storage, separation, and presentation of waste within the GCC functional area. Key requirements relevant to the development include:

- Kerbside waste presented for collection must not be presented earlier than 6.00 pm on the day before the designated waste collection day;
- Commercial waste shall not be deposited at any bring facility provided by or on behalf of Laois County Council.
- Documentary evidence, such as receipts, statements or other proof of payment, demonstrating compliance with this bye-law shall be presented to an authorised person within a time specified in a written request from either that person or from another authorised person employed by Galway County Council.

The complete text of the Waste Bye-Laws is available on the GCC website.

3.0 WASTE CLASSIFICATION

3.1 Waste Categories

The development is expected to generate both non-hazardous and hazardous wastes, which can be classified into several categories. The following are the typical waste materials that will be generated at the development on a daily basis:

- Dry Mixed Recyclables (DMR): This includes materials such as wastepaper (newspapers, magazines, brochures, catalogues, leaflets), cardboard and plastic packaging, metal cans, plastic bottles, aluminium cans, tins, and Tetra Pak cartons.
- Organic waste: This refers to food waste and green waste generated from internal plants/flowers.
- Glass
- Mixed Non-Recyclable (MNR)/General Waste

In addition to these typical waste materials, there will be some other waste types generated in small quantities that need to be managed separately. These include:

- Green/garden waste generated from plants/flowers
- Batteries (both hazardous and non-hazardous)
- Waste electrical and electronic equipment (WEEE) (both hazardous and non-hazardous)
- Printer cartridges/toners
- Chemicals (such as paints, adhesives, resins, detergents, etc.)
- Lightbulbs
- Textiles (rags)
- Waste cooking oil (if generated by residents)
- Furniture (and occasionally other bulky wastes)
- Abandoned bicycles

To comply with waste legislation and guidance, wastes should be segregated according to the above categories. This will help to maximize the re-use, recycling, and recovery of waste, while minimising the amount sent to landfill.

3.2 EU Waste Codes

The European Commission released the “European Waste Catalogue and Hazardous Waste List” in 1994. In 2002, the EPA published a condensed version of these documents, titled the “European Waste Catalogue and Hazardous Waste List”. However, this document has now been replaced by the EPA's “Waste Classification - List of Waste & Determining if Waste is Hazardous or Non-Hazardous”, which has been valid since June 1st, 2015. This waste classification system is applicable throughout the EU and forms the basis for all national and international waste reporting, including those related to waste collection permits, CORs, permits, licenses, and the EPA National Waste Database.

According to the classification system, each type of waste is defined by a code. Table 3.1 below provides the List of Waste (LoW) code, also known as European Waste Code (EWC), for the typical waste materials that are expected to be generated during the operation of the development.

Waste Material Categories	LoW/EWC Code
Paper and Cardboard	20 01 01
Plastics	20 01 39
Metals	20 01 40
Mixed Non-Recyclable Waste	20 03 01
Glass	20 01 02
Biodegradable Kitchen Waste	20 01 08
Oils and Fats	20 01 25
Textiles	20 01 11
Batteries and Accumulators*	20 01 33* - 34
Printer Toner/Cartridges*	20 01 27* - 28
Green Waste	20 02 01
WEEE*	20 01 35*-36
Chemicals (solvents, pesticides, paint & adhesives, detergents, etc.) *	20 01 13*/19*/27*/28/29*30
Fluorescent tubes and other mercury containing waste*	20 01 21*
Bulky Wastes	20 03 07
* Individual waste may contain hazardous materials	

Table 3.1: Waste Material Categories and LoW Codes

3.3 Estimated Waste Figures

The *British Standard 5906:2005 Waste Management in Buildings - Code of Practice* outlines the weekly waste production for different building types. It provides an equation to estimate the weekly waste generated by domestic or residential buildings, which considers the number of dwellings and the average number of bedrooms per dwelling. This equation is outlined below:

Weekly Waste (litres) = (number of dwellings x ((70 x average number of bedrooms) + 30)

To calculate the waste storage requirements for the proposed development, the waste will be segregated and stored into four designated waste streams:

- Dry Mixed Recyclable (DMR)
- Mixed Non-Recyclable (MNR)
- Organic Waste
- Glass

The volume of waste produced can be estimated using the equation, and a 60:25:10:5 split between DMR, MNR, Organic Waste and Glass waste is considered a reasonable estimate for the waste breakdown. Table 3.2 shows the estimated weekly waste volumes produced by each residential unit based on the number of bedrooms.

Waste Category	Waste Volume in litres/week per unit			
	1 bed unit	2 bed unit	3 bed unit	4 bed unit
DMR (60%)	60	102	144	186
MNR (25%	25	43	60	78
Organic Waste (10%)	10	17	24	31
Glass (5%)	5	9	12	16
Total	**100**	**170**	**240**	**310**

Table 3.2: Estimated waste volumes per week by unit type

When the development is fully complete and at full occupancy, the total waste on a weekly basis is estimated to be as per Table 3.3 below.

	Total Waste Volume in m^3/week by unit type				
	1 bed unit	2 bed unit	3 bed unit	4 bed unit	Total
DMR (60%)	1.2	7.3	13.8	1.5	23.9
MNR (25%	0.5	3.1	5.8	0.6	9.9
Organic Waste (10%)	0.2	1.2	2.3	0.2	4.0
Glass (5%)	0.1	0.6	1.2	0.1	2.0
Total	**2.0**	**12.2**	**23.0**	**2.5**	**39.8**

Table 3.3: Estimated total development waste volume per week by unit type

4.0 WASTE STORAGE

Each residential unit will have its own dedicated bin storage space. Where the bin storage is located at the front of the residence, it should be concealed and designed to harmonise with the overall structure. Figures 4.1 and 4.2 below illustrate the proposed private bin storage details for the various residential unit types where bin storage is located at the front of the unit. All other units will have bin storage located in its own dedicated private open space or in rear gardens.

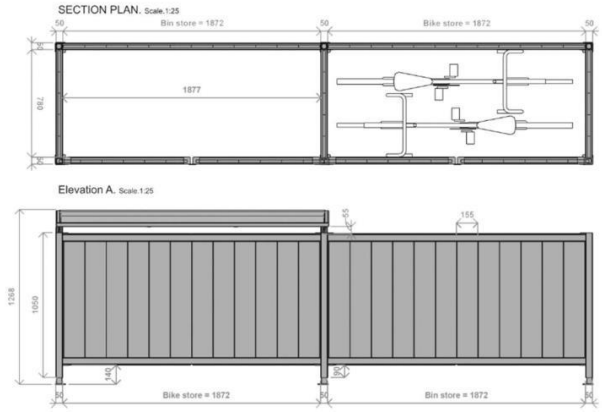


Figure 4.1: Bin Store drawings

Figure 4.2: Example of bin stores at front of dwellings

Each bin storage area will contain three separate bins to enable optimal segregation and recycling. These bins will manage DMR, MNR, and Organic Waste. Waste glass generated by the development will be processed off-site at one of the four nearby bring bank facilities.

All bins will be securely housed within the bin storage area, only being wheeled to the kerbside on collection days and returned to the storage area after waste pickup. Each residential unit type will have a bin storage area of adequate size to accommodate the necessary quantity and dimensions of bins for effective waste management. Table 4 below offers a comprehensive overview of the potential range and size of bins for waste storage. As evident from Figure 4.1 and Table 4.1, each bin storage area can easily fit 3 units of 240L bins if needed.

Bin Volume (litres)	Bin Height	Bin Width (mm)	Bin Depth
80	935	450	510
120	935	480	545
140	1060	480	545
240	1070	580	740
360	1100	600	880
660	1210	1370	780
1100	1315	1370	1055

Table 4.1: Dimensions for standard bins in Ireland

The resident or designated Facilities Management Company will oversee waste management at the proposed development. Each residential unit will receive an information booklet detailing the waste management strategy for the property, which, at a minimum, will include waste segregation methods, waste storage practices within the dwellings, recycling initiatives applicable to the development, and other waste-related issues relevant to the residents.

4.1 Common Bin Stores

There is no requirement for common waste storage areas or bin stores as each of the residential units will have their own private waste storage area.

4.2 Apartments

The 16 No. one bed maisonette apartments will have their own dedicated bin storage in the rear private open space that is dedicated to each unit. Please see Table 4.2 for further detail.

4.3 Duplexes

The 4 No. two bed duplex apartments will have their own dedicated bin storage in the rear private open space that is dedicated to each unit. Please see Table 4.2 for further detail.

4.4 Houses

The development will consist of 171 units in total, comprising 10 four-bedroom houses, 70 three- bedroom houses, and 71 two-bedroom houses, 4 two-bedroom duplex apartments and 16 one bedroom maisonettes.

Each household will need to sort their waste into DMR, MNR, Organic waste, and glass. All residents will have a private bin storage area capable of holding 3 units of 240L bins if necessary; however, the plan is to equip each storage area with the proposed bin sizes to optimise recycling efforts.

Residents must bring their sorted waste materials to their assigned bin storage area and deposit them into the appropriate bins. Each bin in the storage area will feature clear labels and colour- coding to prevent mixing of different waste streams. Signs will be posted on or above the bins, specifying the types of waste acceptable in each container.

Occasionally, residents may generate other waste materials, such as electronic waste, chemicals, lighting, furniture, and textiles. In such cases, they will be responsible for identifying temporary storage spaces within their units and disposing of these items properly.

Table 4.2 presents the specific bin allocation for each house bin storage area and assumes that the bin stores will be emptied on a weekly basis.

Weekly Storage Bin Requirement			
Unit Type	**DMR**	**MNR**	**Organic**
1 bed Maisonette	1 x 80L	1 x 80L	1 x 25l
2 bed House	1 x 120L	2 x 80L	2 x 25l
3 bed House	1 x 240L	3 x 80L	3 x 25l
4 bed house	2 x 240L	4 x 80L	4 x 25l

Table 4.2: Weekly bin requirement for each unit type

4.5 Creche

The crèche tenant will be required to segregate their waste into the following waste categories within their unit:

- Dry Mixed Recyclables;
- Mixed Non-Recyclables;
- Organic waste; and
- Glass

The crèche unit will store their waste within their own unit. Suitably sized bins should be strategically located within the unit as required by the tenant to facilitate segregation at source of these waste types.

All waste receptacles used should comply with the IS EN 840 2012 standard for performance requirements of mobile waste containers and should be clearly labelled and colour coded to avoid cross contamination of the different waste streams.

Graphical signage should be posted above or on the bins to show exactly which wastes can be put in each.

If there is food preparation carried out by the crèche tenant, organic waste from the kitchen should be collected in bins as close to the food preparation area as possible. Based on the recommended bin requirements, it is anticipated that dry mixed recyclables, mixed non-recyclables and organic waste will be collected on a weekly basis and glass collected less frequently as required. Other waste materials such as batteries, WEEE, light bulbs and cooking oil (if generated) will be generated less frequently and in smaller quantities. The crèche tenant will be required to store any of these wastes in appropriate receptacles within their own unit pending collection by a waste contractor. The crèche tenant will be required to maintain their bins and WSA in good condition.

The crèche tenant or personnel nominated by the building management company will be responsible for conveying the crèche bins from the crèche WSA to the collection point. Once emptied, bins should be promptly returned to the crèche WSA.

Batteries, WEEE, light bulbs and cooking oil (if generated) should be collected directly from the unit by the waste contractor(s).

The tenant should be made aware of the waste collection arrangements and all waste receptacles must be clearly identified and maintained in good condition as required by waste legislation and the requirements of the LCC Waste Bye-Laws.

4.6 Local Waste Management Facilities

Within the immediate vicinity of Cartron, Oranmore, there are four bring banks available for public use. These banks are situated at:

- Centra Doughiska (3.2km from the subject site),
- Ballybane Shopping Centre (4.8 km from the site), and
- Renmore Kingfisher Club (5.0km from the site).
- Oran Town Centre (1.5km from the site)

The glass recycling needs of the housing units at the development can be adequately met by these facilities, which can easily handle the full capacity of glass waste generated.

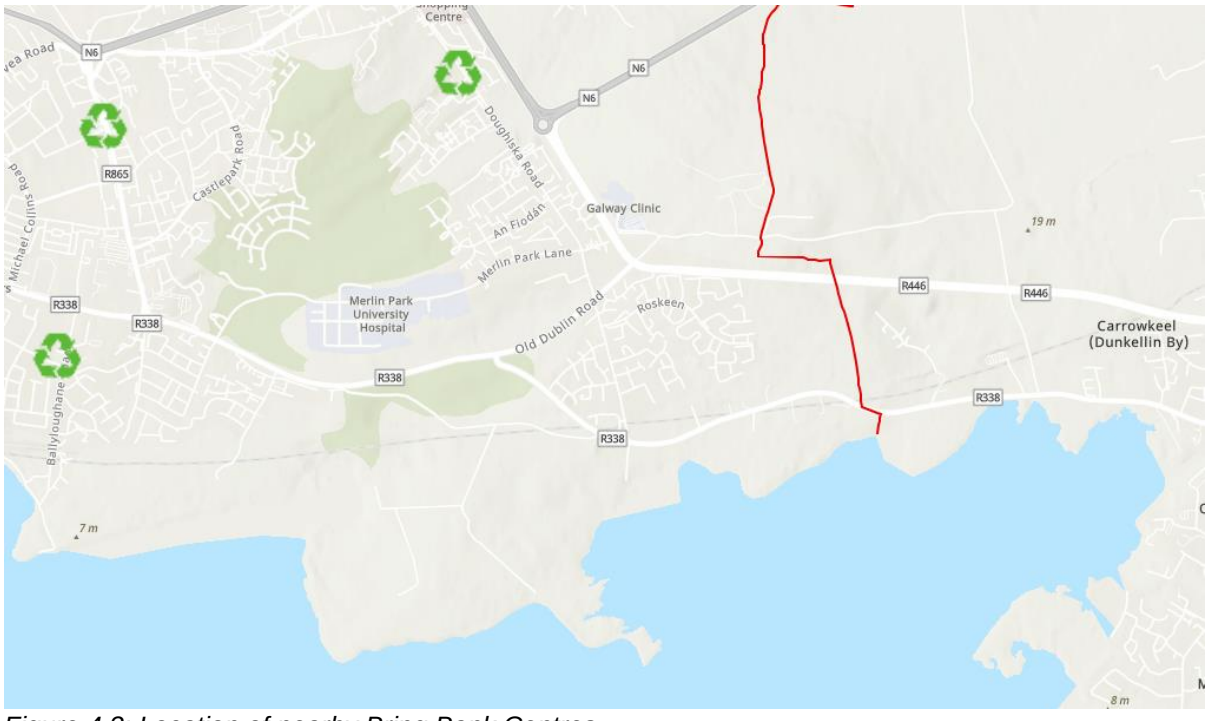


Figure 4.3: Location of nearby Bring Bank Centres

Galway County Council operates a recycling centre at Liosban Industrial Estate, Tuam Road, Galway. The recycling centre at Liosban Industrial Estate is located c.7.6km from the proposed development. The centre accepts the following waste materials:

- Aluminium cans;

- Food tins/metal cans;
- Plastic bottles;
- Tetrapak cartons;
- Glass bottles;
- Newspapers/magazines;
- Cardboard;
- Solid wood;
- Garden/green waste;
- Polystyrene;
- Plastic bags;
- Car batteries;
- Household batteries;
- Fluorescent tubes;
- Waste oil;
- Cooking oil;
- Ink cartridges;
- Mobile phones;
- Gas cylinders;
- Scrap metal;
- Clothes;
- Large electrical household appliances;
- Small electrical household appliances;
- Aerosol cans; and
- Herbicides & pesticides.

All residual waste generated by the proposed development can be managed by the Liosban recycling centre.

5.0 CONCLUSIONS

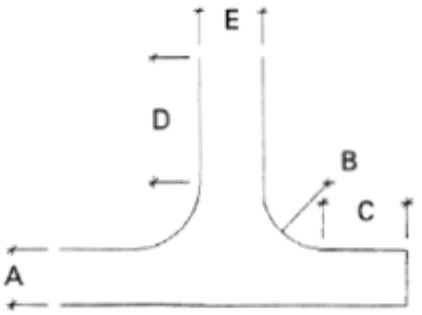
This OWMP has been developed to demonstrate that the proposed residential development at Cartron, Oranmore, Galway will be designed and managed in a way that provides residents and creche with the necessary waste management infrastructure. This will minimise residual waste generation while maximising opportunities for waste segregation and recycling. By implementing this OWMP, a high level of recycling, reuse, and recovery will be achieved at the development. All recyclable materials will be separated at the source, ensuring the most effective diversion from landfill possible.

The waste management strategy outlined in this report ensures adequate waste storage capacity for the various types of segregated waste generated by the residential development and creche. Proper waste storage capacity has been provided based on the estimated waste generation levels for the development at full occupancy.

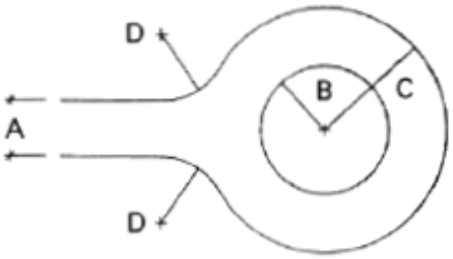
In summary, this report presents an Operational Waste Management Strategy that is fully compliant with all applicable waste legislation, policies, and best practice guidelines. It ensures effective operational waste management at the proposed development site.

The proposal complies with waste policy within the Galway County Development Plan.

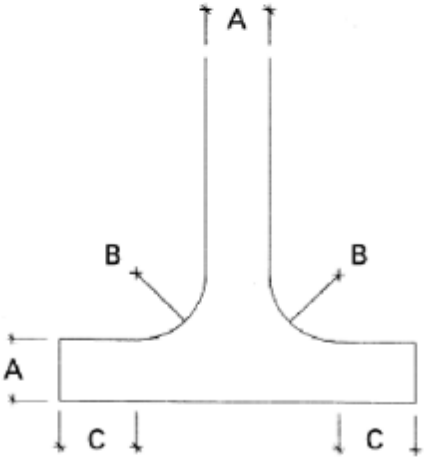
Appendix 1 - Bin Collection Vehicle dimensions and minimum turning requirements



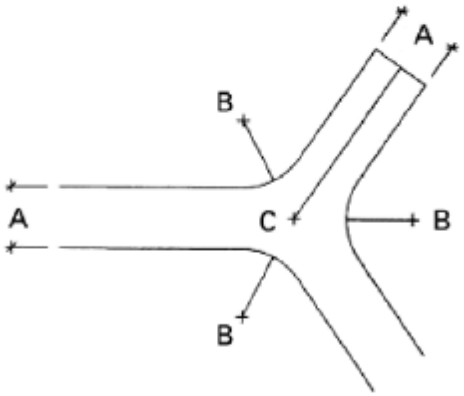
A	5m
B	6m
C	7m
D	5m
E	5.5m



A	5m
B	5.75m
C	11.5m
D	6m

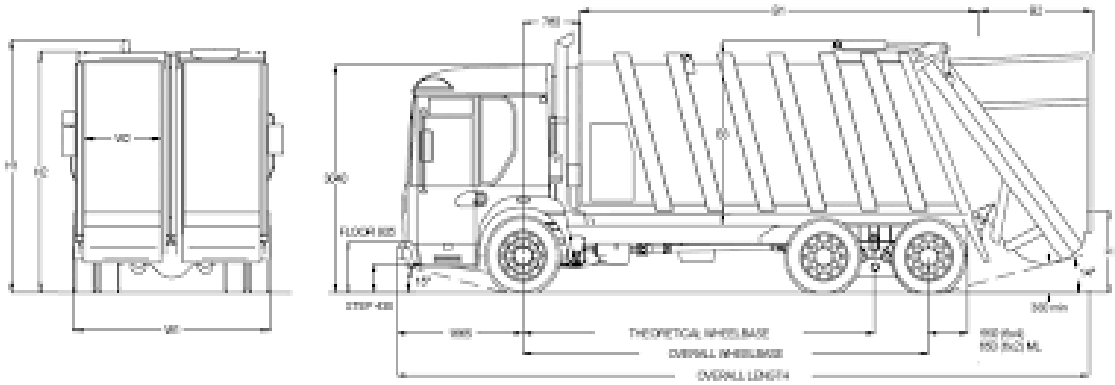


A	5.5m
B	6m
C	6.7m



A	5.5m
B	10.5m
C	16.6m

Appendix 2 - Bin Vehicle details



Zero emission bin trucks