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OPERATIONAL WASTE MANAGEMENT PLAN (OWMP)

PRESENTED TO

Zolbury Ltd.

Large-Scale Residential Development at Blackglen Road, Sandyford, Dublin 18

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1 INTRODUCTION

Enviroguide Consulting has produced this Operational Waste Management Plan (OWMP) at the request of Zolbury Ltd. for a Large-Scale Residential Development on a site of approx. 3.86 hectares located on lands at Blackglen Road, Sandyford, Dublin 18.

The Proposed Development will consist of 192 no. residential units ranging from 2-5 storeys in height, associated resident amenity facilities, a childcare facility, all boundary treatment and landscaping works, site services connections and all site development works. A full project description is included in Section 3 of this report.

The OWMP has been prepared to ensure that the management of waste during the operational phase of the Proposed Development is undertaken in accordance with current legal and industry standards including the 'Waste Management Act 1996, as amended', and associated Regulations including, 'Protection of the Environment Act 2003 as amended', 'Litter Pollution Act 1997 as amended', the 'Eastern-Midlands Waste Region Waste Management Plan' and the 'Dún Laoghaire-Rathdown County Council (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-laws, 2019'.

The plan will be subject to review if a planning permission is granted and any material-changes in the proposed operational strategy will be subject to agreement with Dun Laoghaire-Rathdown County Council at project construction and operational stages.

This OWMP aims to provide a detailed plan for the storage, handling, collection, and transport of the wastes generated at the development in a manner that does not present a risk to human health or the environment, or a risk of common waste related nuisance such as litter or odour.

The OWMP is designed to ensure that waste arising from the operational phase of the project is managed to incentivise waste prevention and to encourage the segregation of waste so that it can be managed in accordance with the Waste Hierarchy. Diversion of waste from landfill and waste prevention will be the overarching philosophy adopted. The plan estimates the type and quantity of waste to be generated from the Proposed Development during the operational phase and provides a strategy for managing the different waste streams.

This OWMP considers the requirements of national and regional waste policy, legislation, and other local authority guidelines. In addition, it takes account of the following guidance:

- *"Sustainable Urban Housing: Design Standards for New Apartments", July 2023* and
- *BS 5906:2005 Waste management in buildings — Code of practice*

2 OVERVIEW OF WASTE MANAGEMENT IN IRELAND

Operational Waste Management Plans are prepared to support planning applications in Ireland. The purpose of this Operational Waste Management Plan is to detail and plan how waste generated during the operational phase of the Proposed Development will be managed. This will include requirements for waste storage provisions, access to authorised waste collection and proximity to additional recycling facilities.

The Proposed Development is located in the Dún Laoghaire-Rathdown County Council (DLRCC) planning district. In preparing this document, consideration has been given to the requirements of DLRCC Environment Department, national and regional waste policy, legislation, and other Local Authority Guidelines.

2.1 European and Irish Legal Context

Waste Legislation in Europe and the Republic of Ireland (hereinafter referred to as “Ireland”) is extensive and often complex.

The Waste Framework Directive (Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste) is a core component of waste regulations across Europe. The Waste Framework Directive (which was transposed into Irish law in 2011) ‘S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011’, encourages the prevention, recycling, and processing of waste. The Waste Framework legislation establishes the legal structure for the prevention and management of waste in Ireland. It sets out a Waste Hierarchy which priorities waste prevention, preparation for re-use, recycling, and energy recovery. Waste disposal is the last resort and least favourable option. The Directive requires Member States to adopt waste management plans and waste prevention programmes. It also governs the reporting on waste generation, waste treatment, and capacity and sets down mandatory targets for waste diversion, collection, and treatment.

The new WFD (Directive (EU) 2018/851 of the European Parliament, amending Directive 2008/98/EC on waste) was approved by the EU in July 2018, and was transposed into Irish Law in July 2020. The new WFD forms part of the circular Economy Package adopted by the EU; it requires EU Member States to improve their waste management systems, to improve the efficiency of resource use, and to ensure that waste is valued as a resource.

In Ireland, the primary platform for waste legislation is the ‘Waste Management Act 1996, as amended’, and the ‘Protection of the Environment Act 2003, as amended’. ‘The Waste Management Act, as amended’, has been brought into effect by making a series of subordinate regulations, covering a range of specific ‘priority’ waste types such as food waste, waste electrical and electronic equipment, batteries etc. The Act has been further amended by enacting regulations, mainly the Waste Directive Regulations which addresses new EU environmental initiatives and strengthen areas where problems have arisen.

One of the guiding principles of European waste legislation, which has in turn been incorporated into the ‘Waste Management Act, as amended’, and subsequent Irish legislation, is the principle of “Duty of Care”. This implies that the waste producer is responsible for waste from the time it is generated until its legal disposal (including its method of disposal).

As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final waste treatment destination, waste contractors will be employed to physically transport waste to the final waste destination. It is therefore imperative that residential development management companies undertake on-site management of waste in accordance with all legal requirements and employ appropriately authorised waste contractors to undertake off-site management of their waste in accordance with all legal requirements. This includes the requirement that a waste contractor handle, transport, and reuse/recover/recycle/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

Each appointed Waste Contractor must hold a valid waste collection permit to transport waste which is issued by the National Waste Collection Permit Office (NWCPO). Waste treatment facilities must also be appropriately permitted (Waste Facility Permit or Certificate of Registration) or licensed by the Local Authority or Environmental Protection Agency to accept the waste. The Management Company appointed will be responsible for ensuring that all Waste Contractors hold the appropriate authorisations.

2.2 Waste Policy in Ireland

In addition to waste regulations, Ireland has adopted waste management policies. Waste management policy is adopted by the government and is detailed in a set of policy documents which have been produced since 1998:

- Waste Management: Changing Our Ways (1998)
- Preventing and Recycling Waste: Delivering Change (2002)
- Taking Stock & Moving Forward (2004)
- National Strategy on Biodegradable Waste Management (2006)
- A Resource Opportunity – Waste Management Policy in Ireland (2012)
- A Waste Action Plan for a Circular Economy (2020)

'A Waste Action Plan for a Circular Economy: Ireland's National Waste Policy 2020-2025' was published by the Department of Communications, Climate Action and Environment in September 2020. This policy sets out a number of important policy actions with the aim of transforming the current economic and waste system from linear to circular. These include the following actions:

- A shift towards a policy framework which rewards circularity and moves away from the waste of resources.
- Increased accountability of products that producers place on the market through levies on non-recyclable waste and the overuse of packaging.
- Targets for recycling (65% by 2035), food waste (reduced by 50% by 2030) and waste to landfill (no more than 10% by 2035).
- To support households, awareness and education measures will be strengthened; the waste collection industry will be encouraged to play a role in such measures.
- All Regional Waste Management Plans will be replaced with a National Waste Management Plan for a Circular Economy.
- A standardising of the colour coding of bins (Mixed Municipal Waste (MMW) / General Waste to be designated as a 'recovery' bin: colour black; Dry Mixed Recyclables (DMR)

bin: colour green; Glass bin: colour blue, Organic (food) Waste bin to be designated as ‘organic waste recycling bin’: colour brown).

2.3 National Waste Management Plan & Local Bye-laws

The National Waste Management Plan for a Circular Economy 2024 -2030 sets out the framework for the prevention and management of waste across Ireland. This document is a statutory document underpinned by national and EU waste legislation.

The strategic vision of the Plan is to rethink the approach to managing waste, and to move towards a 'circular economy' approach where resources are reused or recycled as much as possible, and the overall generation of waste is minimised.

In order to achieve this vision, the Plan has set out a number of specific and measurable performance targets:

- Achieve a recycling rate of 55% by 2025, 60% by 2030 and 65% by 2035
- Mitigate total waste growth to 0% growth per person over the life of the Plan (baseline for total waste generated per person per year is 2.7 tonnes based on NWCPO data).
- 6% aggregate reduction in all residual municipal waste by 2030 (including commercial and household) (Baseline 0.37 tonnes rMSW per person).
- Reduce contamination in municipal bins. This is measured as ‘material compliance’ which is the fraction of appropriate material placed in each of the residual, recyclable or food waste recycling bins.
    - A material compliance target of 90% in the dry recycling bin as a minimum standard.
    - A target of 10% per annum increase in material compliance in the residual bin is applied in this Plan. This represents a potential 90% material compliance rate by the end of 2030.

The relevant Priority Actions identified by the Plan in regard to the management of Municipal Household Waste are as follows:

- *“Maximise households on kerbside systems, standardise the identification of bins and promote items accepted for recycling using visual representation.”*
- *“Identify appropriate segregated waste collection systems for apartments and mixed-use developments and support the waste industry in the implementation of these systems.”*

The Dun Laoghaire-Rathdown County Council Storage, Presentation and Collection of Household and Commercial Waste Bye-Laws 2019 (hereinafter referred to as ‘the bye-laws’) place some additional obligations in how waste is stored and managed at the development. The bye-laws state that “A management company of an apartment complex shall ensure that

adequate numbers of waste containers are available for use by holders of waste in such complex for residual waste, dry recyclable waste and biological waste (where a collection service for such waste fraction is provided)." The number of bins to be provided at this development are further detailed in Section 4.3 of this report.

The bye-laws state the waste is to be separated at source. Any such separated recyclable waste shall not be deposited into a container designated for residual household kerbside waste and no such residual waste shall be deposited into a container designated for recyclable household kerbside waste. Food waste arising must also be separated at source.

Section 8(h) of the bye-laws state "A management company of an apartment complex shall ensure that adequate access and egress is available for refuse freighters collecting waste from such a complex" for the collection of waste. This requirement has been taken into account when designing the development. Sufficient access and egress for waste collection vehicles will be provided.

This OWMP also takes into account the objectives of Chapter 10 of the Dún Laoghaire-Rathdown County Development Plan 2022 – 2028:

Policy Objective EI11: Resource Management "It is a Policy Objective to implement the Eastern-Midlands Region Waste Management Plan 2015-2021 and subsequent plans, in supporting the transition from a waste management economy towards a circular economy, to enhance employment and increase the value recovery and recirculation of resources. Underpinning this objective is the requirement to conform to the European Union and National Waste Management Hierarchy of the most favoured options for waste as illustrated below subject to economic and technical feasibility and Environmental Assessment. (Consistent with RPO 10.25 of the RSES)."

Policy Objective EI12: Waste Management Infrastructure, Prevention, Reduction, Reuse and Recycling (Circular Economy approach) "To ensure new developments are designed and constructed in line with the Council's Guidelines for Waste Storage Facilities"

Dún Laoghaire-Rathdown County Council released a Guidance Note in February 2020, "Guidance Notes for Waste Management in Residential and Commercial Developments". This document sets out requirements for Common Waste Storage Areas design, Waste related requirements within Residential Units, Initial Waste Management, and Waste Collection systems. This document has been consulted in the formulation of the Operational Waste management Plan.

3 DESCRIPTION OF THE PROJECT

3.1 Description of the Development

The proposed development shall provide for a Large-Scale Residential Development (LRD) on a site of approx. 3.86 hectares on lands at Blackglen Road, Sandyford, Dublin 18.

The proposed development will consist of 192 no. residential units ranging from 2-5 storeys in height, associated resident amenity facilities, a childcare facility, all boundary treatment and landscaping works, site services connections and all site development works to include:

a) The Construction of 192 no. residential units, in the form of 6 no. new apartment buildings (A1 – B4), 40 duplexes (C1, C2, C2A) and 14 houses (D1 & D2), to include 33 no. 1-beds, 84 no. 2 -beds, 61 no. 3-beds and 14 no. 4-beds as follows:
   - Block A1 (4 storeys) comprising 15 no. apartments (3 no. 1 bed units, 6 no. 2 bed units & 6 no. 3 bed); a crèche facility of approx. 378.2 sq. m with associated outdoor play space of approx. 170 sq. m; and resident amenity facilities of approx. 31.6 sq. m.
   - Block A2 (3-4 storeys) comprising 26 no. apartments (2 no. 1 bed units, 20 no. 2 bed units and 4 no. 3 bed units) and resident amenity facilities of approx. 353.6 sq. m.
   - Blocks B1 and B2 (2-5 storeys) comprising 51 no. apartments (15 no. 1 bed units, 29 no. 2 bed units, 7 no. 3 bed units).
   - Blocks B3 and B4 (2-5 storeys) comprising 46 no. apartments (13 no. 1 bed units, 23 no. 2 bed units and 10 no. 3 bed units).
   - Duplex Units C1 (4 storeys), C2 and C2A (3 storeys) comprising 40 duplexes (6 no. 2 bed units, 20 no. 3 bed units and 14 no. 4 bed units).
   - House Units D1 and D2 (2 storeys) comprising 14 houses (14 no. 3 bed units).

b) Total Open space (approx. 10,854 sq. m) is proposed in the form of public open space (approx. 8,686 sq. m), and residential communal open space (approx. 2,168 sq. m). Each residential unit is afforded with associated private open space in the form of a garden/terrace/balcony.

c) The development will be served via a new vehicular access via Blackglen Road. This will be designed as a priority junction with pedestrian and cycle crossings where required to tie in with the Blackglen Road Improvement Scheme.

d) A new toucan crossing is proposed across Blackglen Road just to the east of the new vehicular access. This toucan crossing has been designed as per TL607 of the Cycle Design Manual to allow crossing of pedestrians and cyclists to the northern side of Blackglen Road for improved public transport access.

e) Emergency access only is proposed via Woodside Road.

f) A dedicated wildlife corridor is proposed to the east/south-east side of the site and a public open space (approx. 307m in length) tree trail to the west/north-west side of the site.

g) Basement/Podium car park areas are proposed below Blocks B1, B2, B3 and B4. A total of 226 no. car parking spaces are proposed, which includes 2 no. car club spaces, 12 no. accessible spaces and 47 no. EV charging spaces (198 no. long-stay spaces, 18 no. visitor space & 10 no. car parking spaces for creche use), in addition to 9 no. motorcycle spaces.

h) A total of 484 no. bicycle spaces are proposed in the form of 422 no. long stay bicycle spaces 42 short-term stay visitor parking.

i) 2 no. ESB substation at surface level.

j) Bin Storage areas for the Duplex blocks are proposed at ground level adjacent to the Duplex blocks.

k) All associated site and infrastructural works to include provision for water services; foul and surface water drainage and connections; internal roads, attenuation proposal; permeable paving; all landscaping works including green infrastructure zones; green roofs; and general plant areas; photovoltaic panels; landscaped boundary treatment; footpaths; public lighting; and electrical services.

The Operational Waste Management Plan addresses waste management for the development once it is operational i.e., post the construction phase.

3.2 Proximity of the Development to Recycling Facilities

The development site is located at Blackglen Road, Sandyford, Dublin 18. Figure 3-1 presents the proximity of the development site to local bring bank facilities. There is a large civic amenity centre in Carrickmines servicing the Sandyford area, with numerous bring banks throughout the region for glass bottle collection.

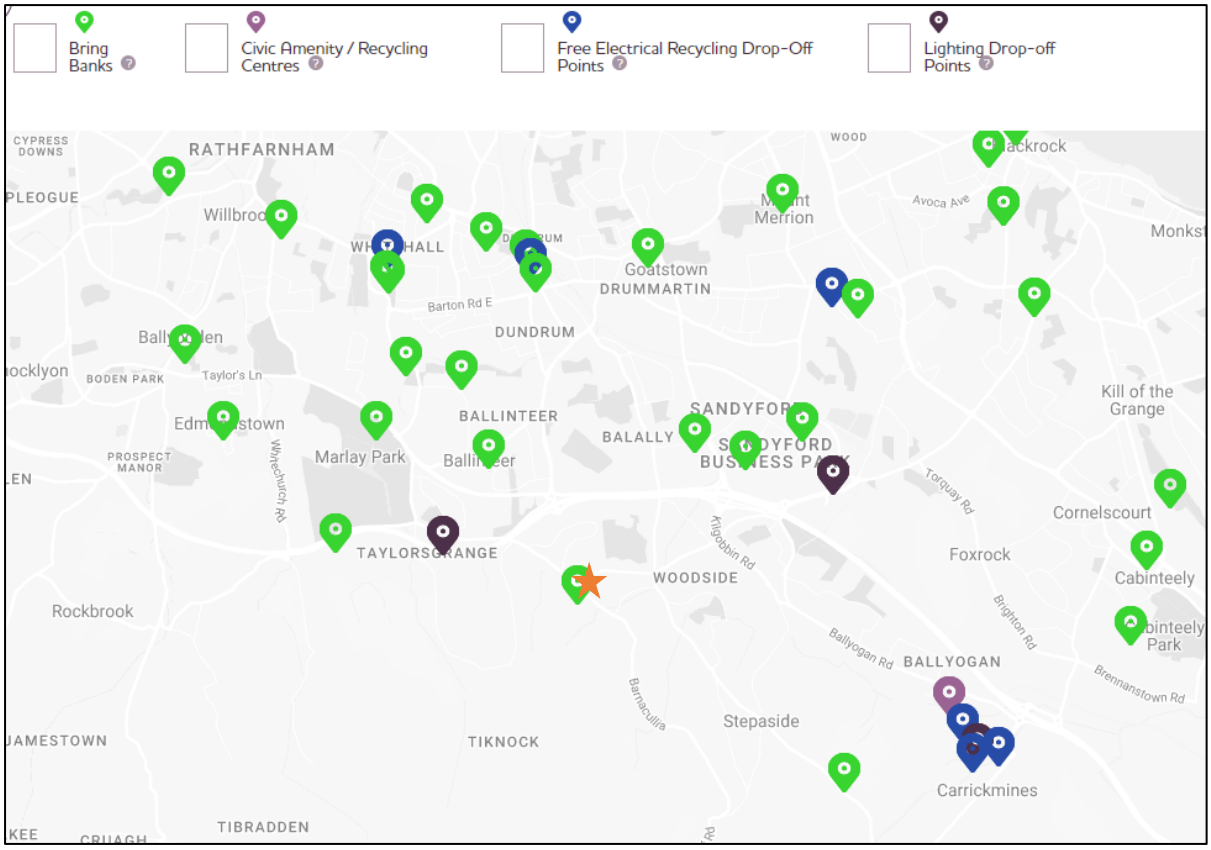


Figure 3-1 Bring Banks and Civic Amenity Recycling Centre Located in proximity to the Proposed Development (Source: Repak), site location identified with an orange star.

4 WASTE GENERATION AND STORAGE

4.1 List of Waste Codes

Correct classification of waste 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. In 1994, the '*European Waste Catalogue'* was published by the European Commission. In 2002, the EPA published a document titled the '*European Waste Catalogue and Hazardous Waste List*'. This document has been replaced by the EPA '*Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* which became valid from the 1st of July 2018.

The waste classification system applies across the EU and is the basis for all national and international waste reporting obligations such as those associated with waste collection permits, certificates of registration, waste facility permits and EPA Waste and IED licences and EPA National Waste Database.

The EPA document '*Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous' (EPA, 2018)* consolidates the legislation and allows the generators of waste to classify the waste as hazardous or non-hazardous and in the process to assign the correct List of Waste entry.

Under the classification system, different types of wastes are fully defined by a code. The List of Waste (LoW) code (previously referred to as European Waste Code or EWC) for typical waste materials expected to be generated during the operation of the Proposed Development are provided in Table 4-1.

Table 4-1 Expected Waste Types and List of Waste Codes

Waste Description	List of Waste Code
Mixed Municipal Waste	20 03 01
Dry Mixed Recyclables	20 03 01
Biodegradable Kitchen Waste	20 01 08
Glass	20 01 02
Bulky wastes	20 03 07
Waste electrical and electronic equipment*	20 01 35* 21 01 36
Batteries and accumulators*	20 01 33* 20 01 34
Textiles	20 01 11
Fluorescent tubes and other mercury containing waste*	20 01 21
Chemicals (solvents, pesticides, paints & adhesives, detergents, etc.)*	20 01 13/19/27-28/29-30

Plastic	20 01 39
Metals	20 01 40
Paper and Cardboard	20 01 01

**Individual waste type may contain hazardous materials*

4.2 Residential

4.2.1 Waste Types Arising

The predicted waste types that will be generated at the Proposed Developments residential units include the following:

i. Mixed Municipal Waste (MMW) / General Waste;
ii. Dry Mixed Recyclables (DMR) - including cardboard, plastic packaging, aluminium cans, tins, paper, and Tetra Pak cartons;
iii. Organic (food) Waste; and
iv. Glass.

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

- Bulky wastes – including furniture, carpets, mattresses.
- Waste electrical and electronic equipment (WEEE);
- Batteries.
- Textiles – clothes or soft furnishings.
- Light bulbs or fluorescent tubes.
- Chemicals – old medicines, paints, detergents; and
- Waste oil - cooking oil.

4.2.2 Waste Storage Capacity Requirements

4.2.2.1 Houses

The following housing types and numbers will be provided the development:

Table 4-2 No. of Houses and types

House Type	Description	No. Beds	Access	No
D1	House	3 Bed	Ground Floor	14

The number of bedrooms is required to complete the calculations of waste volumes generated as per the BS 5906:2005 Waste management in build*ings — Code of practice.* The calculation for typical weekly waste arisings and subsequent storage requirements for domestic dwellings is as follows:

number of dwellings × {(volume arising per bedroom [70 L] × average number of bedrooms) + 30}[a]

[a] *Based on average household occupancy.*

Table 4-3 below includes the calculations of waste arising using the formula provided in the *BS 5906:2005 Waste management in buildings — Code of practice.* Table 4-3 details the number of dwellings for each accommodation type. The volume arising per bedroom is assumed to be 70 litres (L) as per the calculation formula provided. An additional 30L is added onto every dwelling for each calculation. It is expected that this additional volume is to allow for sufficient storage capacity in periods of seasonal variations resulting in high waste generation. The total volume of waste generated weekly from the houses is 3,360L per week, or an average of 240L per house per week.

Table 4-3 Estimated Waste Volumes for Houses

House Type	No. of dwellings	Volume waste generated per Bedroom (70L)	No. of Bedrooms	Additional 30L	Total Litres All Units	Total Litres Per Unit per week
D1 & D2	14	70	3	30	**3,360**	**240**
			Total litres		3,360	240

4.2.2.2 Apartments and Duplexes

For the apartment and duplex buildings, it is necessary to calculate the required bin storage capacity based on the number of units and the number of bedrooms in each unit. The capacity requirements have been based on a worst-case scenario of full occupancy and collections of bins every second week, which is preferable to weekly collections from a resource efficiency perspective. It should be noted that this leaves scope for increased frequency of collections should this ever be required.

Table 4-4 Description and Number of Apartments and Duplexes

	1 BED	2 BED	3 BED	4 BED	Total
A1	3	6	6	0	15
A2	2	20	4	0	26
B1 & B2	15	29	7	0	51
B3 & B4	13	23	10	0	46
C1, C2 & C2A (Duplex)	0	6	20	14	40
Total	**33**	**84**	**47**	**14**	178

The British Standard BS5906:2005 *Waste management in buildings — Code of practice* provides guidance in respect of waste generation for domestic and commercial premises to calculate the storage, containment, and equipment requirements for effective waste management. Calculations provided in this British Standard document have been used to

calculate the waste storage capacity requirements for the apartments and duplexes in this Proposed Development. Table 4-4 details the Schedule of Accommodation for apartments and duplexes.

The number of bedrooms is required to complete the calculations of waste volumes generated as per the *BS 5906:2005 Waste management in buildings — Code of practice.*

The calculation for typical weekly waste arisings and subsequent storage requirements for domestic dwellings is as follows:

number of dwellings × {(volume arising per bedroom [70 L] × average number of bedrooms) + 30}[a]

[a] *Based on average household occupancy.*

Table 4-5 below includes the calculations of waste arising using the formula provided in the *BS 5906:2005 Waste management in buildings — Code of practice.* Table 4-5 details the number of bins required to service the volume of waste arisings. The volume arising per bedroom is assumed to be 70 litres (L) as per the calculation formula provided. An additional 30L is added onto every dwelling for each calculation. It is expected that this additional volume is to allow for sufficient storage capacity in periods of seasonal variations resulting in high waste generation.

Table 4-5 Estimated Waste Volumes for Apartments and Duplexes

A1					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/ Unit/Week**
1 Bed	**3**	**70**	1	**30**	**300**
2 Bed	**6**	**70**	2	**30**	**1,020**
3 Bed	**6**	**70**	3	**30**	**1,440**
	15		**Total Litres**		**2,760**
A2					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/ Unit/Week**
1 Bed	**2**	**70**	1	**30**	**200**
2 Bed	**20**	**70**	2	**30**	**3,400**
3 Bed	**4**	**70**	3	**30**	**960**
	26		**Total Litres**		**4,560**
B1 & B2					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/ Unit/Week**
1 Bed	**15**	**70**	1	**30**	**1,500**
2 Bed	**29**	**70**	2	**30**	**4,930**
3 Bed	**7**	**70**	3	**30**	**1,680**
	51		**Total Litres**		**8,110**

B3 & B4					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/ Unit/Week**
1 Bed	**13**	**70**	1	**30**	**1,300**
2 Bed	**23**	**70**	2	**30**	**3,910**
3 Bed	**10**	**70**	3	**30**	**2,400**
	46		**Total Litres**		**7,610**

C1 (Duplex)					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/ Unit/Week**
2 Bed	**0**	**70**	2	**30**	**0**
3 Bed	**14**	**70**	3	**30**	**3,360**
4 Bed	**14**	**70**	4	**30**	**4,340**
	28		**Total Litres**		**7,700**

C2 (Duplex)					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/ Unit/Week**
2 Bed	**2**	**70**	2	**30**	**340**
3 Bed	**2**	**70**	3	**30**	**480**
4 Bed	**0**	**70**	4	**30**	**0**
	4		**Total Litres**		**820**

C2A (Duplex)					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/ Unit/Week**
2 Bed	**4**	**70**	2	**30**	**680**
3 Bed	**4**	**70**	3	**30**	**960**
4 Bed	**0**	**70**	4	**30**	**0**
	8		**Total Litres**		**1,640**
Total Weekly waste arising, all apartments and duplex's					**33,200**

The calculations completed in Table 4-5 conclude that the typical weekly waste arising is 33,200L.

It is preferable to accommodate fortnightly collection in the interests of promoting source segregation and waste minimisation efforts and encouraging the use of the recycling and food waste bins. This waste collection model has the added benefit of reducing the cost burden on the occupants and management company.

Based on fortnightly waste collections, there would therefore be a requirement to accommodate storage for a volume of 66,400L, or the equivalent of 60 no. 1,110L wheeled bins.

Based on fortnightly waste collections, it is anticipated that 57 no.1,100L bins and 64 no. 140L bins (or equivalent) will be required in the waste storage areas as detailed in Table 4-6 below (23 no. 1,100L bins for Mixed Municipal Waste (MMW), 34 no. 1,100L bins for Dry Mixed

Recyclables (DMR), 41 no. 140L bin for Organic (food) Waste, and 23 no. 140L bin for Glass). The percentage of recyclable and non-recyclable wastes are set out in Table 4-7.

Table 4-6 Breakdown of Bin Numbers & Capacity for fortnightly Collections (Apartments and Duplexes)

No. of Bins	Size of Bins	Total Litre Capacity	Waste Type
23	140	3,220	Glass
41	140	5,740	Organic (food) Waste
34	1,100	37,400	Dry Mixed Recyclables (DMR)
23	1,100	25,300	Mixed Municipal Waste (MMW)
TOTAL		**71,660**	

		Waste Types to be Generated								Total Storage Volume Required per WSA
		Glass		Organic (food) Waste		Dry Mixed Recyclables (DMR)		Mixed Municipal Waste (MMW)		
WSA ID	**Total No. of Units**	**Bin Capacity (l)**	**No. bins required**	**Bin Capacity (l)**	**No. bins required**	**Bin Capacity (l)**	**No. bins required**	**Bin Capacity (l)**	**No. bins required**	
A1	15	140	2	140	4	1,100	3	1,100	2	6,340
A2	26	140	4	140	6	1,100	5	1,100	4	11,300
B1 & B2	51	140	5	140	9	1,100	8	1,100	5	16,260
B3 & B4	46	140	5	140	10	1,100	7	1,100	5	15,300
C1 (Duplex)	28	140	5	140	9	1,100	8	1,100	5	16,260
C2 (Duplex)	4	140	1	140	1	1,100	1	1,100	1	2,480
C2A (Duplex)	8	140	1	140	2	1,100	2	1,100	1	3,720
		3,220		**5,740**		**37,400**		**25,300**		**71,660**
% Of waste type		**4.5%**		**8.0%**		**52.2%**		**35.3%**		**100.00%**
		65%						35%		

Table 4-7 Breakdown of Waste Storage Capacity into Recyclable and Non-Recyclable (Apartments and Duplexes)

The total capacity of the number of bins actually provided is 71,660L (or the equivalent of just over 65 no. 1100L wheeled bins) which exceeds the required capacity for fortnightly collections.

On this basis, the bin storage capacity comfortably allows for fortnightly collections which is more efficient, leaving adequate contingency to increase collection frequency should that be required during unusually high-volume periods such as Christmas.

4.2.3 Waste Storage Arrangements

4.2.3.1 Houses

All houses are provided with rear gardens. All houses have space within the curtilage of the dwelling to facilitate a three-bin system for the collection in standard 240 litre wheelie bins for Mixed Municipal Waste (MMW) / General Waste, Dry Mixed Recyclables (DMR) and 120 litre wheelie bin for Organic (food) Waste. The bins provided will be typical of the widely rolled out “three bin system” which is provided as standard by the waste management contractor, conforming to the requirements for residents to source segregate organic and recyclable waste from the non-recyclable waste stream.

It is concluded that adequate capacity is provided for the estimated volume of waste arising at each dwelling (as detailed in Table 4-3), through the provision of ample storage space for a three wheelie bin collection system of approximately 600 litre capacity with space for larger bins if required, based on fortnightly collections, and taking into account that glass bottles generated will be recycled by the occupants at nearby bring bank facilities.

4.2.3.2 Apartments and Duplexes

A dedicated shared Waste Storage Area has been provided between every 8 no. duplex units.

A number of dedicated, shared Waste Storage Areas are provided within the communal amenity spaces to serve the apartment units. These Waste Storage Areas are centrally located to ensure security and ease of access for residents throughout the development.

Residents will be required to segregate waste into the following waste categories:

- Mixed Municipal Waste (MMW) / General Waste;
- Dry Mixed Recyclables (DMR) - includes cardboard, plastic packaging, aluminium cans, tins, paper, and Tetra Pak cartons;
- Organic (food) Waste; and
- Glass.

The layout and design of the apartments and the duplexes will ensure that there is adequate provision for the temporary storage of segregated materials prior to deposition in communal Waste Storage Areas. Adequate space is allocated in the kitchen area to accommodate a three-compartment bin for waste segregation at source. In-sink macerators will not be provided in the apartments and duplexes.

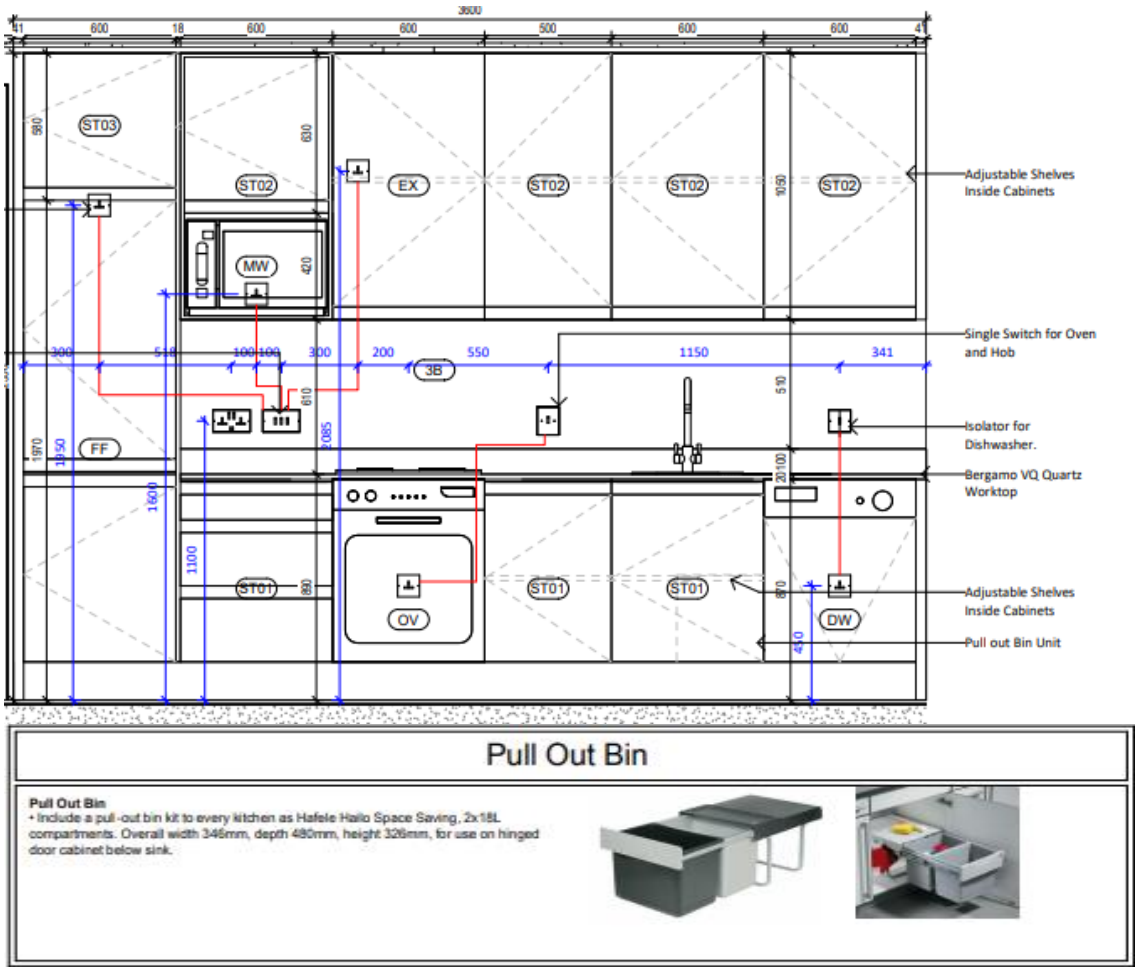


Figure 4-1 Bin Allocation in Kitchen

The Management Company will be responsible for the provision of a leaflet to all new tenants encouraging good waste segregation and pictorial information detailing the waste streams that can be placed in each bin. In addition to this, clauses that support waste segregation targets will be included in relevant legal documentation e.g., tenancy agreements where possible.

A number of Waste Storage Areas have been allocated for the apartment and duplex residents at ground level. It will be the responsibility of the residents to bring their segregated waste to Waste Storage Areas and place into the appropriately labelled bins. Each bin will be clearly labelled to identify what wastes can and cannot be placed in the bin and labels will be pictorial. The route to the Waste Storage Areas, and the area itself, will be wheelchair accessible, adequately lit, and appropriately ventilated.

Residents will have secure access to the Waste Storage Areas (pin code or fob key). This will prevent unauthorised access to waste bins by the general public.

Any additional household wastes such as bulky waste, WEEE, batteries, textiles etc. must be brought by the apartment residents to a local recycling facility.

Access to a Waste Collection Service will be provided upon the first occupancy, irrespective of the occupancy levels of the new units.

4.3 Commercial

4.3.1 Waste Types Arising

The commercial facility (Creche) will generate similar waste types to residential waste types;

i. Mixed Municipal Waste (MMW) / General Waste;
ii. Dry Mixed Recyclables (DMR) - includes cardboard, plastic packaging, aluminium cans, tins, paper, and Tetra Pak cartons;
iii. Organic (food) Waste

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

- 'Office' type wastes such as paper and printer ink;
- Waste electrical and electronic equipment (WEEE);
- Batteries;
- Glass; and
- Light bulbs or fluorescent tubes.

4.3.2 Waste Storage Capacity Requirements

For the Creche, it is necessary to calculate the required bin storage capacity based on the floor area of the units.

It is estimated, based on the floor area of the Creche, that there will be a requirement for 1 no. 1100 Litre bin for Dry Mixed Recyclables (DMR), 1 no. 1100 Litre bin for Mixed Municipal Waste (MMW) / General Waste and 1 no. 140 litre bins for Organic (food) Waste, and Glass if required. Table 4-8 details the number of bins required to service the volume of waste arising.

Table 4-8 Bins Required for Waste Volumes at Commercial Units

		Organic (food) Waste	Glass	Dry Mixed Recy-clables (DMR)	Mixed Municipal Waste (MMW)
Bin Size	**Description**	**140 (L)**	**140 (L)**	**1,100 (L)**	**1,100 (L)**
Commercial Unit	Creche (72 Children)	1	1	1	1
	Community Space	1	1	1	1
	0	0	0	0	0
	0	0	0	0	0

Ample space is provided in the secure Creche Waste Storage Area to accommodate these receptacles. The Creche Waste Storage Area will only be accessible to the commercial unit staff members and will not be accessible to residents or members of the public. The Creche

is expected to generate similar waste types to the domestic dwellings as well as volumes of packaging waste. It will be incumbent on the occupier to arrange collection of materials such as ink cartridges. Additional space has been allocated within the Waste Storage Area in Block A2 to account for any additional waste that may arise from the residential facilities.

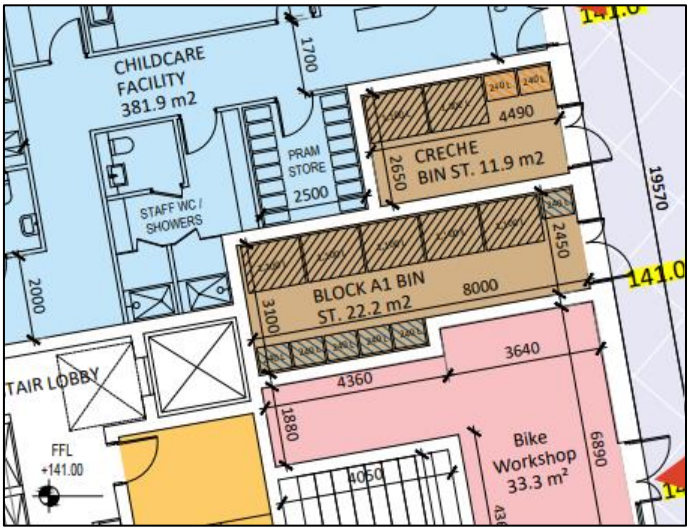


Figure 4-2 Layout of Bin Storage Area for Creche

4.4 Shared Waste Storage Areas

The Department of Housing, Planning and Local Government published guidelines in July 2023– "*Sustainable Urban Housing: Design Standards for New Apartments*". These Guidelines detail the provisions that need to be made for the storage and collection of waste materials in apartment schemes. These guidelines have been considered when preparing the design of the Waste Storage Areas.

The Waste Storage Areas for this residential development are strategically located and will have the following provisions as minimum:

i. **Access:** The Waste Storage Area will be accessible for the mobility impaired.
ii. **Lighting:** The Waste Storage Area will have adequate lighting. This is to ensure that waste will not be tipped in dimly lit areas and that the areas do not pose as a safety risk.
iii. **Spillage & drainage:** A non-slip surface will be provided to prevent slips or falls, and the Waste Storage Area will have adequate drainage which will be directed to foul sewer.
iv. **Security:** The Waste Storage Area will have restricted access and will be accessible by tenants and residents only. This is to prevent unauthorised access to the bins by the general public.
v. **Screening:** The Waste Storage Area will be appropriately screened to ensure it is not visible to the general public.
vi. **Ventilation:** A natural vent will be provided. All vents will be ducted to an external opening so that the Waste Storage Area will not cause an odour nuisance, taking into account the avoidance of nuisance for habitable rooms nearby.

vii. **Signage:** Pictorial signage will be provided to show residents and tenants what wastes can and cannot be placed in each bin. All signage will be provided by the management company appointed.

viii. **Environmental nuisance:** The Waste Storage Area will be in an enclosed area to avoid environmental nuisances such as litter. Regular waste collections will be required from the waste collection providers to prevent any other environmental nuisances such as odour or vermin. The management company appointed will be required to ensure there is adequate vermin control in place.

ix. **Vehicular Access:** The development has been designed to ensure that waste collection vehicles can safely access the development to collect the bins. Vehicular access for waste collection is included in the traffic management plan for the development.

Duplexes and apartments are provided with shared Waste Storage Areas containing a four-bin wheelie bin system. Figure 4-2 for Location and the internal layouts of the shared Waste Storage Areas.

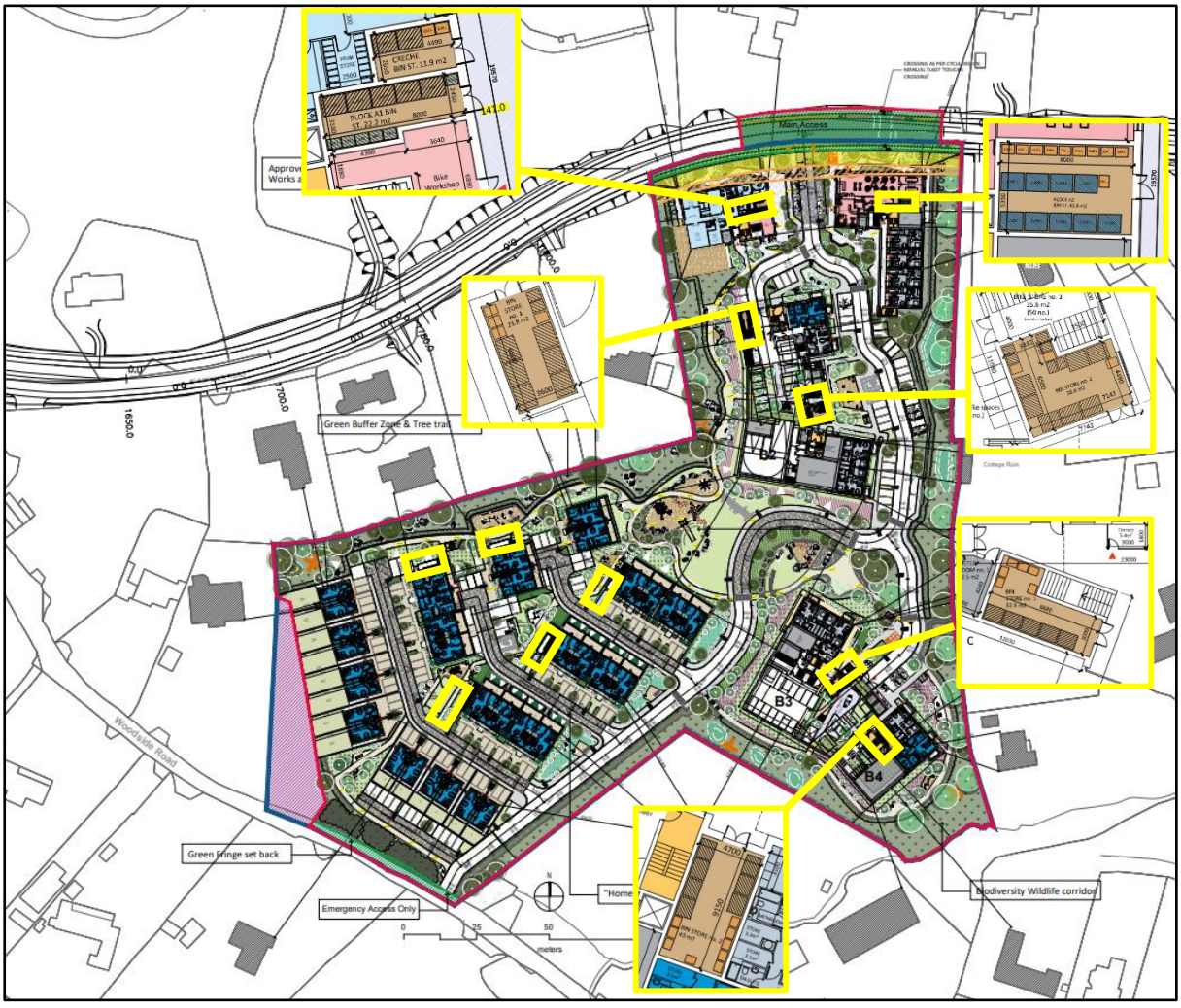


Figure 4-3 Location and Internal Layout of Residential Waste Storage Areas (Yellow)

4.5 Other Waste Materials

Other waste materials such as bulky waste, textiles, printer toner/cartridges, WEEE and batteries and other household hazardous wastes may be generated infrequently by the occupants of the residential units. Residents will be required to suitably store these wastes within their own dwellings and dispose of them appropriately at bring centres or civic amenity facilities. Details of nearby recycling centres and bring banks is available on the Repak.ie website. All occupants will be supplied with information by the management company on the location of recycling facilities in the area.

4.6 Recycling Rates & Targets

The Waste Storage Areas will be provided with receptacles and signage to promote a rate of 30% of the overall waste collected to be Mixed Municipal Waste (MMW) / General Waste and 70% of waste collected recyclable waste streams which will include Dry Mixed Recyclables (DMR) (packaging, papers, cardboards, plastics, aluminium, metals, and tin) and Organic (food) Waste.

All of the Mixed Municipal Waste (MMW) collected will be transported for further recovery. All MMW will be consigned to a recovery facility where it will undergo mechanical waste recovery, or it will be consigned to a facility for energy recovery. No MMW will be transported directly to landfill.

On review of bin usage by the appointed Management Company, MMW bins may be replaced with additional Organic (food) Waste or Dry Mixed Recyclables (DMR) bins to further increase waste segregation at source.

The ratio of bins detailed in this OWMP is in line with the European Commission's proposal to introduce 70% plus re-use and recycling targets for Mixed Municipal Waste (MMW) by 2030. This waste collection proposal also provides a waste management solution that has sufficient flexibility to support future targets and legislative requirements.

4.7 Bin Weight Limits & Dimensions

The DLRCC bye-laws state that Waste presented for collection by a holder shall not be overloaded.

Due to the capacity of bins being provided, bins will not be overloaded and will comply with the Bye-laws.

For the shared Waste Storage Areas, it is intended to use 1,100L bins of approximately 1300mm x 1000mm x 1300mm with a load capacity of no more than 240kg which will comply with IS EN 840 1997 for Dry Mixed Recyclables (DMR) and Mixed Municipal Waste (MMW), and 140L bins of 1060mm x 480mm x 550mm for Organic (food) Waste. All houses will be provided with standard sized, compliant wheelie bins from their bin provider.

All bins will be color-coded and labelled to avoid cross-contamination, green bin for Dry Mixed Recyclables (DMR), brown bin for Organic (food) Waste, black bin for Mixed Municipal Waste (MMW) / General Waste, and blue bins for Glass (in accordance with the Waste Action Plan

for Circular Economy). Use of and access to the Waste Storage Areas will be restricted to residents and waste contractors only. The Waste Storage Areas will not be visible to the public and will conform to the requirements of *BS 5906: 2005 – Waste Management in Buildings – Code of Practice*.

It is envisaged that residents of the apartments and duplexes will be subjected to a service management company service charge where waste management will be included in the fee.

5 WASTE COLLECTION

All collections must take place in compliance with conditions of the Waste Contractor's Waste Collection Permit for the region and in line with the Local Authority byelaws and the Waste Management (Waste Collection Permit) Regulations 2007 as amended. All residents are obliged by law to avail of the waste management service and must comply with local byelaws and Statutory Instruments in relation to the presentation of waste for collection. Waste collections for a four-bin system service will be available from the time of first occupancy (i.e. even if all dwellings are not occupied).

A waste collection service will be available to all occupants from first occupancy, irrespective of whether all units have been filled or not.

In all cases, waste collection vehicles will service the bins and the empty bins will be returned to the Waste Storage Areas. Bins will never be left outside the curtilage of the development. Access and egress of the waste collection vehicles will be in accordance with the Traffic Management Plan for the facility which has ensured the design allows for free-flowing movement of refuse collection vehicles throughout the development. BS 5906: 2005 – Waste Management in Buildings – Code of Practice has been taken into consideration when detailing vehicular access and egress to the development for the purposes of waste collection. See figure 5-1 for Swept Path Analysis.

Records of the collections from the apartments and duplexes will be maintained by the management company for the development including reports from the facilities to which the waste is taken. Residents of individual dwellings will be responsible for maintaining their own waste collection records.

All bins in the shared Waste Storage Areas will be accessible for collection by the waste management contractor. It will be the responsibility of the management company to ensure that bins are brought from the Waste Storage Areas to the Waste Staging Areas and made accessible for collection by the waste management operatives, and to assist on collection day to wheel out and replace bins during collection where required. It will be the responsibility of the management company to ensure that bins are returned to the Waste Storage Areas following collection.

The staff of the Creche will be responsible for arranging their own waste collection. It is the responsibility of the Creche staff to ensure that their bins are available for collection by the waste management operatives and to that they are returned to the Waste Storage Areas following collection.

Occupants of residential houses will be responsible for placing their own bins at the kerb for collection, and for the return of those bins to the storage areas within the curtilage of their dwelling in compliance with the DLRCC Bye Laws require that bins must not be presented before 6pm the previous night nor left out post collection beyond 9am the day following the day of collection.

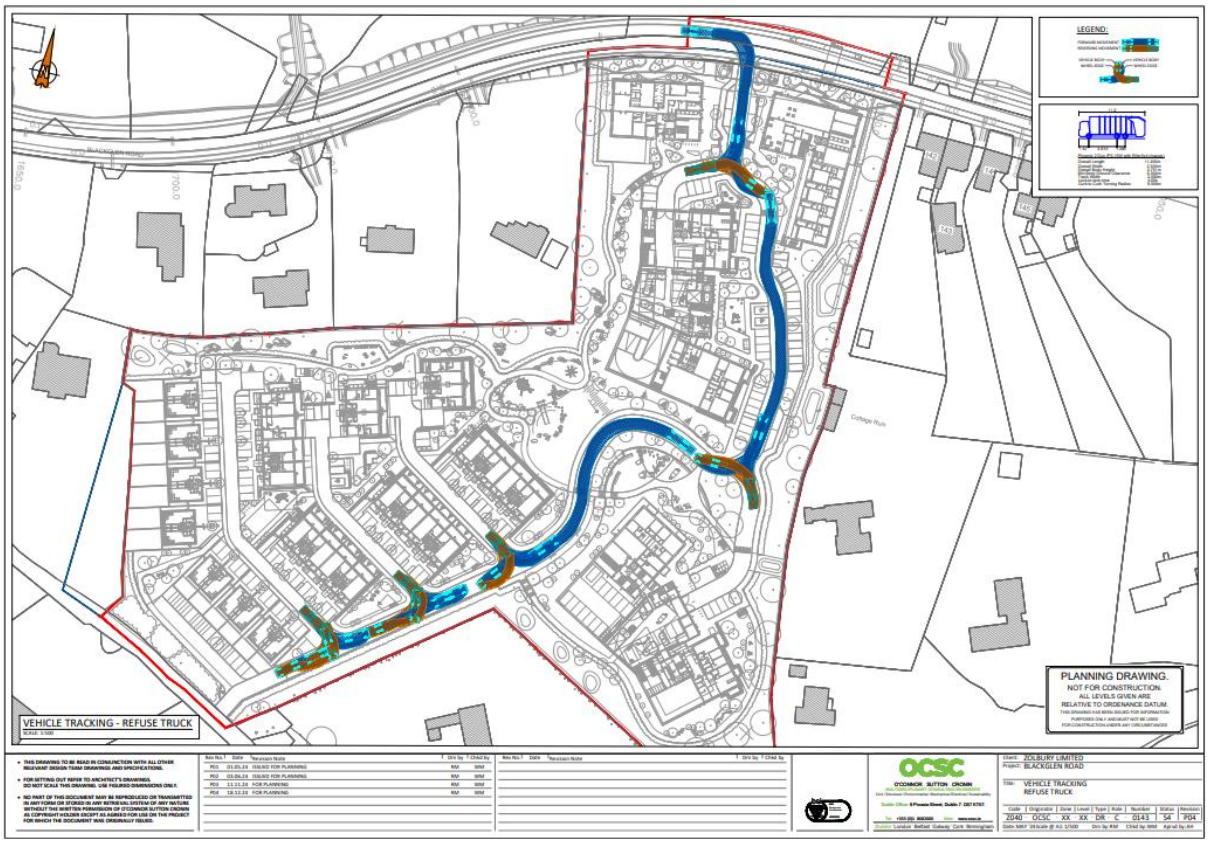


Figure 5-1 Swept Path Analysis

6 MANAGEMENT SYSTEM

6.1 Information and Communication

Written information will be provided by the appointed management company, to each tenant or other occupier about the arrangements for waste separation, segregation, storage, and presentation prior to collection. The information pack will also contain information about nearby recycling facilities. This information will also be included in information booklets provided to new occupants of properties on the development.

It shall be a condition of contract with the appointed management company to ensure that all residents will be provided with an information pack from the waste collection provider. This information pack will detail the waste streams that can and cannot be placed in the bins provided in the waste compound so that waste segregation is actively encouraged and the specific dates on which the bins will be collected are clearly identified.

A clause will be included in the contract with the waste collection provider to provide this information pack to new residents.

6.2 Waste Management Contracts

It will be a condition of any management contract at the development that adequate budgets are in place for the provision of all required waste management services including a four-bin system for the collection of separate Organic (food) Waste, Dry Mixed Recyclables (DMR), Mixed Municipal Waste (MMW) / General Waste and Glass from the apartments and duplexes.

In addition to the requirements set out in Section 6.1 Information and Communication, the Management Company appointed will be required to continually monitor the performance of the waste management system. This will include routine visual checks of the Waste Storage Areas to ensure that all bins collected are returned to the Waste Storage Areas and to ensure this area is maintained so as not to cause any environmental nuisance to residents. These checks will also assess if the bins are in good condition or need to be replaced where damage is identified.

Provision for bin cleaning will be included in the contract with the waste management contractor appointed to ensure the provision of bin cleaning services or replacement of clean bins by the waste contractor.

The Management Company will review all annual waste reports from the Waste Collection Company appointed to ensure that the waste collected is in line with the European recycling targets. Where poor recycling rates are noted information leaflets will be recirculated to all residents which will include information on what materials can be recycled and the waste streams that can be placed in bins. Residents will also be reminded of legal obligations where applicable. Further communication strategy to engage tenants and owner occupiers in good waste management practices will be adopted if deemed necessary.

Contingency policies will be in place to ensure continuity of service.

7 CONCLUSIONS

By implementing design and actions outlined in this OWMP, a high level of recycling, reuse and recovery will be achieved at the development in line with European targets. Dry Mixed Recyclables (DMR) and Organic (food) Waste will be segregated at source to reduce the quantity of residual waste materials requiring off-site recovery or disposal.

The source segregation of waste types as detailed in this report will help to achieve the targets set out in the *EMR Waste Management Plan 2015 – 2021.*

The design of the Waste Storage Areas will meet the requirements as detailed in the "*Sustainable Urban Housing: Design Standards for New Apartments",* July 2023.

8 REFERENCES

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