OUTLINE OPERATIONAL WASTE MANAGEMENT PLAN

FOR

PROPOSED MIXED-USE DEVELOPMENT

AT

Wayside, Enniskerry Road, Kilternan, Dublin 18

June 2022

ON BEHALF OF

Liscove Limited

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1 INTRODUCTION

Enviroguide Consulting has produced this Operational Waste Management Plan (OWMP) at the request of Liscove Limited for a Mixed-Use Housing Development located on lands at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18.

A full project description is in included in Section 3 of this report. The development consists of a mix of apartments, houses, duplexes and commercial aspects.

This 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, 2015-2021', and 'Dún Laoghaire-Rathdown County Council (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-laws, 2019'.

In preparing this document, consideration has been given to the requirements of national and regional waste policy, legislation and other guidelines.

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

In particular, 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 takes into account the requirements of national and regional waste policy, legislation, and other guidelines such as guidance published by Dun Laoghaire-Rathdown County Council (DLRCC) for the preparation of OWMPs, '*Guidance Notes for Waste Management in Residential and Commercial Developments, Dun Laoghaire-Rathdown County Council, February 2020'*, which is the only Local Authority Guidance available to date in relation to OWMPs. In addition, it takes account of the following guidance:

- *"Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities issued under Section 28 of the Planning and Development Act, 2000 (as amended)", December 2020* and
- *BS 5906:2005 Waste management in buildings — Code of practice*

2 OVERVIEW OF WASTE MANAGEMENT IN IRELAND

Operational Waste Management Plans are required through the planning process 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 Dun Laoghaire-Rathdown (DLRCC) planning district. In preparing this document, consideration has been given to the requirements of DLRCC's Environment Department and to national and regional waste policy, legislation, and other Local Authority Guidelines.

2.1 European and Irish Legal Context

Waste Legislation in Europe and Ireland is extensive and often complex. Waste framework legislation establishes the legal structure for the prevention and management of waste in Ireland. This legislation governs the reporting on waste generation, waste treatment, and capacity. It also sets down mandatory targets for waste diversion, collection, and treatment.

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. 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.

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 address 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 proposed 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 (general waste bin to be designated as a 'recovery' bin: colour black; mixed dry recycling bin: colour green; organic waste bin to be designated as 'organic waste recycling bin': colour brown).

2.3 Regional Waste Management Plans & Local Bye-laws

Dun Laoghaire-Rathdown County Council is located within the Eastern-Midlands Waste Region (EMWR) which is one of Ireland's three waste management regions. The framework for the prevention and management of waste for this regional is set out in the Eastern-Midlands Waste Region Waste Management Plan 2015-2021, a statutory document underpinned by national and EU waste legislation. The strategic vision of the regional waste management plan (WMP) is to rethink the approach to managing wastes. In order to achieve this vision, the WMP has set out three specific and measurable performance targets:

- 1% reduction per annum in the quality of household waste generated per capita over the period of the Eastern Midlands Region Waste Management Plan.
- Reduce to 0% the direct disposal of unprocessed municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.
- Achieve a recycling rate of 50% of managed municipal waste by 2020.

The current regional waste management plans will be replaced by the National Waste Management Plan for a Circular Economy (NWMPCE), which is currently in the consultation/ drafting stage, in line with the policy set out in the Waste Action Plan for a Circular Economy.

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 apartment element of the development. Sufficient access and egress for waste collection vehicles will be provided.

3 DESCRIPTION OF THE PROJECT

3.1 Description of the Development

The development site is located on lands at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18.

The Proposed Developmentis for the construction of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre, which will provide a creche (439 sq m), office (317 sq m), medical (147 sq m), retail (857 sq m), convenience retail (431 sq m) and a community facility (321 sq m). The 383 No. residential units will consist of 27 No. 1 bedroom units (19 No. apartments and 8 No. duplexes), 128 No. 2 bedroom units (78 No. apartments and 50 No. duplexes), 171 No. 3 bedroom units (108 No. houses, 3 No. apartments and 60 No. duplexes) and 57 No. 4 bedroom units (57 No. houses). The proposed development will range in height from 2 No. to 5 No. storeys (including podium/ undercroft level in Apartment Blocks C and D and in the Neighbourhood Centre).

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 on lands at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18. Figure 3-1 presents the proximity of the development site to local bring bank facilities. There are a large civic amenity centres in Shankill and Dun Laoghaire servicing the Dun Laoghaire Rathdown area, with numerous bring banks throughout the region for glass bottle collection.

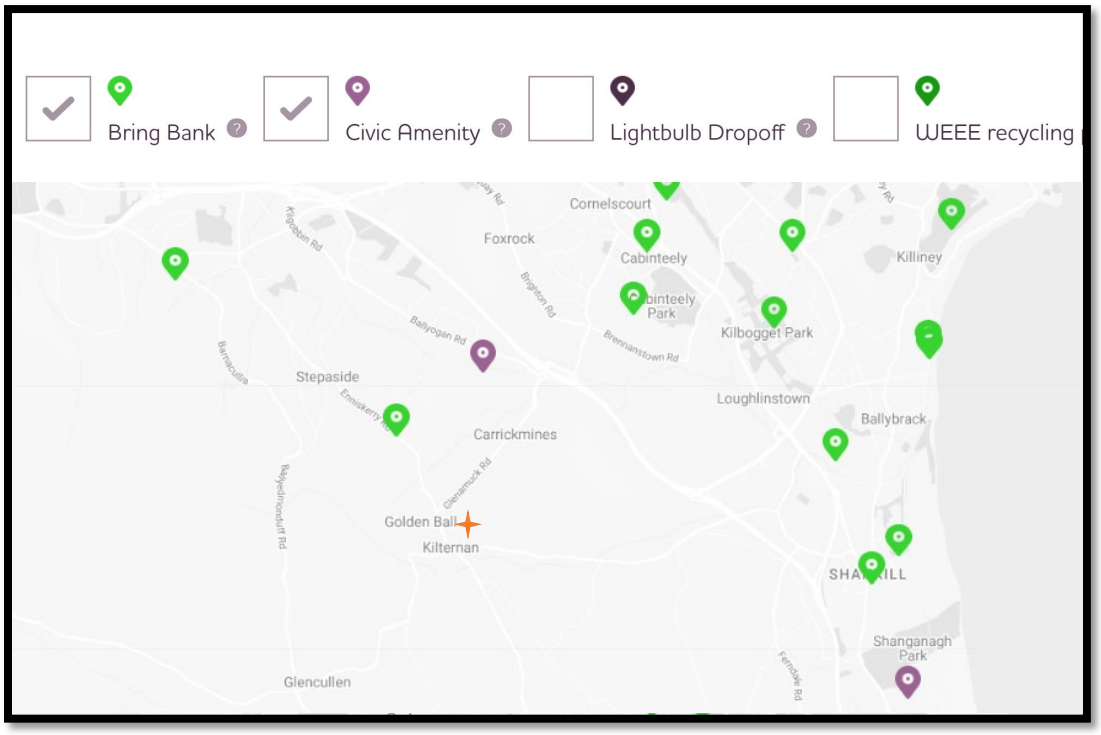

Figure 3-1 Bring Banks and Civic Amenity Recycling Centre Located in proximity to the Proposed Development (Source: Repak), site location identified with orange star.

4 WASTE GENERATION AND STORAGE

4.1 Waste Types Arising – Residential (Apartments, Duplexes and Houses)

The predicted waste types that will be generated at the Proposed Development residential properties include the following:

i. Mixed Municipal Waste (MSW) / General Waste;
ii. Dry Mixed Recyclables (DMR) - includes 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 on a daily basis, 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 Waste Types Arising – Crèche Facility

The crèche facility will generate similar waste types to domestic waste types;

- Dry mixed recyclables
- Mixed Municipal (non-recyclable)
- Organic (food) waste
- Glass

with some additional commercial “office” type wastes such as paper and printer ink, batteries, and waste electrical and electronic equipment (WEEE).

4.3 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
Mixed Dry 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*

4.4 Waste Storage Capacity Requirements - Houses

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

Table 4-2 No. of Houses and types

House Type	No. Beds	Access	No.
3 Bed House	3 bed	ground floor	108
3 Bed House	4 bed	ground floor	57

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 4-3 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 70L 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 43,590L per week, or an average of 275L 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
3 Bed house	108	70	3	30	**25,920**	240
4 Bed house	57	70	4	30	**17,670**	310
Total Dwellings	**165**			**Total litres**	**43,590**	**275**

4.5 Waste Storage Arrangements 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 (non-recyclable) waste, dry mixed recyclables and 120 litre wheelie bin for organic 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 house (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.

4.6 Waste Storage Capacity Requirements – Residential 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 week. 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 Unit Types (Apartments and Duplexes)

Unit Description	1 BED	2 BED	3 BED	Total
Duplex BLOCK A1 & A2	2	8	2	12
Duplex BLOCK B1	0	10	10	20
Duplex BLOCK C	0	8	8	16
Duplex BLOCK D	0	7	7	14
Neighbourhood Centre - Duplex BLOCK	6	0	6	12
Neighbourhood Centre - Apartment Block A	2	13	3	18
Neighbourhood Centre - Apartment Block B	4	19	0	23
Apartment Block C	12	21	0	33
Apartment Block D	1	25	0	26
Duplex BLOCK B2 & B3	0	17	17	34
Duplex BLOCK D1	0	0	10	10
Total	**27**	**128**	**63**	**218**

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 apartment blocks 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 70L 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 Calculations of Waste Arising (Apartments and Duplexes)

Duplex BLOCK A1 & 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	8	**70**	2	**30**	**1,360**
3 Bed	2	**70**	3	**30**	**480**
	12		**Total Litres**		**2,040**

Duplex BLOCK B1					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/Unit/Week**
1 Bed	0	**70**	1	**30**	**0**
2 Bed	10	**70**	2	**30**	**1,700**
3 Bed	10	**70**	3	**30**	**2,400**
	20		**Total Litres**		**4,100**

Duplex BLOCK C					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/Unit/Week**
1 Bed	0	**70**	1	**30**	**0**
2 Bed	8	**70**	2	**30**	**1,360**
3 Bed	8	**70**	3	**30**	**1,920**
	16		**Total Litres**		**3,280**

Duplex BLOCK D					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/Unit/Week**
1 Bed	0	**70**	1	**30**	**0**
2 Bed	7	**70**	2	**30**	**1,190**
3 Bed	7	**70**	3	**30**	**1,680**
	14		**Total Litres**		**2,870**

Neighbourhood Centre - Duplex BLOCK					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/Unit/Week**
1 Bed	6	**70**	1	**30**	**600**
2 Bed	0	**70**	2	**30**	**0**
3 Bed	6	**70**	3	**30**	**1,440**
	12		**Total Litres**		**2,040**

Neighbourhood Centre - Apartment Block A					
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	13	**70**	2	**30**	**2,210**
3 Bed	3	**70**	3	**30**	**720**
	18		**Total Litres**		**3,130**

Neighbourhood Centre - Apartment Block B					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/Unit/Week**
1 Bed	4	**70**	1	**30**	**400**
2 Bed	19	**70**	2	**30**	**3,230**
3 Bed	0	**70**	3	**30**	**0**
	23		**Total Litres**		**3,630**
Apartment Block C					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/Unit/Week**
1 Bed	12	**70**	1	**30**	**1,200**
2Bed	21	**70**	2	**30**	**3,570**
3 Bed	0	**70**	3	**30**	**0**
	33		**Total Litres**		**4,770**
Apartment Block D					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/Unit/Week**
1 Bed	1	**70**	1	**30**	**100**
2Bed	25	**70**	2	**30**	**4,250**
3 Bed	0	**70**	3	**30**	**0**
	26		**Total Litres**		**4,350**
Duplex BLOCK B2 & B3					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/Unit/Week**
1 Bed	0	**70**	1	**30**	**0**
2 Bed	17	**70**	2	**30**	**2,890**
3 Bed	17	**70**	3	**30**	**4,080**
	34		**Total Litres**		**6,970**
Duplex BLOCK D1					
Type	**No. of dwellings**	**Volume per Bedroom (70L)**	**No. of Bedrooms**	**Additional 30L**	**Total Litres/Unit/Week**
1 Bed	0	**70**	1	**30**	**0**
2 Bed	0	**70**	2	**30**	**0**
3 Bed	10	**70**	3	**30**	**2,400**
	10		**Total Litres**		**2,400**
Total weekly waste arising, all apartments and duplexs					**39,580**

The calculations completed in Table 4-5 conclude that a typical weekly waste arising is 39,580L.

It should be noted that the *BS 5906:2005 Standard* states "*where recycling capacity is provided, the waste capacity may be reduced, but only by up to one quarter of the recycling capacity provided*".

Based on weekly waste collections, and with the reduction policy applied, it is anticipated that 30 no.1,100L bins and 31 no. 240L bins (or equivalent) will be required in the waste storage areas as detailed in Table 4-6 below (12 no. 1,100L bins for mixed municipal waste, 18 no. 1,100L bins for dry mixed recyclables, 16 no. 240L bin for organic/food waste, and 15 no. 240L

bins 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 Weekly Collections (Apartments and Duplexes)

No. of Bins	Size of Bins	Total Litre Capacity/ Week (litres)	Waste Type
15	240	3,600	Food Waste
16	240	3,840	Food Waste
18	1100	19,800	Dry Mixed Recyclables
12	1100	13,200	Municipal Waste
TOTAL		**40,440**	

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

		Waste Types to be Generated								Total Storage Volume Required per block (liters)
		Glass		Food Waste		Dry-Mixed Recyclables		Municipal Waste		
Accommodation Block ID	**Total No. Units**	**Bin Capacity (l)**	**No. of units required**	**Bin Capacity (l)**	**No. of units required**	**Bin Capacity (l)**	**No. of units required**	**Bin Capacity (l)**	**No. of units required**	
Duplex Block A1 & A2	12	240	1	240	1	1100	1	1100	1	2,680
Duplex Block B1	20	240	2	240	2	1100	2	1100	1	4,260
Duplex Block C	16	240	1	240	1	1100	2	1100	1	3,780
Duplex Block D	14	240	1	240	2	1100	1	1100	1	2,920
Neighbourhood Centre - Duplex Block	12	240	1	240	1	1100	1	1100	1	2,680
Neighbourhood Centre - Apartment Block A	18	240	2	240	2	1100	1	1100	1	3,160
Neighbourhood Centre - Apartment Block B	23	240	1	240	1	1100	2	1100	1	3,780
Apartment Block C	33	240	1	240	1	1100	2	1100	1	3,780
Apartment Block D	26	240	1	240	1	1100	2	1100	1	3,780
Duplex Block B2 & B3	34	240	3	240	3	1100	3	1100	2	6,940
Duplex Block D1	10	240	1	240	1	1100	1	1100	1	2,680
Total Storage Capacity Required for each waste type		**3,600**		**3,840**		**19,800**		**13,200**		**40,440**
% Of waste type		**8.9%**		**9.5%**		**49.0%**		**32.6%**		**100.00%**
		67%						33%		

The total capacity of the number of bins actually provided is 40,440L (or the equivalent or just under 37 no. 1100L wheeled bins) which exceeds the required capacity for weekly collections.

Based on weekly waste collections, there would therefore be a requirement to accommodate storage for a volume of 40,440L (or the equivalent or just under 37 no. 1100L wheeled bins).

4.7 Waste Storage Arrangements - Apartments and Duplexes

A number of dedicated, shared waste stores are provided within each of the communal amenity spaces to serve the apartment and duplex units. These bin stores are centrally located to ensure security and ease of access for residents throughout the development.

Apartment and duplex residents will be required to segregate waste into the following waste categories:

- Municipal Solid Waste;
- Dry Mixed recyclables;
- Glass; and
- Organic (food) waste.

The layout and design of the apartments and 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.

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 bin compound areas have been allocated for the apartment and duplex residents. It will be the responsibility of the residents to bring their segregated waste to the bin compound 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 bin compound area and the area itself will be wheelchair accessible, adequately lit and appropriately ventilated.

Residents will have secure access to the bin compound area (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 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.

4.8 Apartment and Duplex Bin Compound Areas

The Department of Housing, Planning and Local Government published guidelines in March 2020 – "*Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities*". 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 taken into account when preparing the design of the waste compound area.

The bin compounds for this residential apartment/ duplex development are located at strategic locations around the development to service each block. The bin compounds will have the following provisions as minimum:

i. **Access:** The bin compound will be accessible for the mobility impaired.
ii. **Lighting:** The bin compound will have adequate lighting. Energy saving lighting operated on sensors is planned. 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 compound will have adequate drainage which will be directed to foul sewer.
iv. **Security:** The bin compound areas 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. **Ventilation:** A natural vent will be provided. All vents will be ducted to an external opening so that the bin storage areas will not cause an odour nuisance, taking into account the avoidance of nuisance for habitable rooms nearby.
vi. **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. This will be a requirement in their agreement to ensure this is included in any agreement with a waste contractor or provided by them directly.
vii. **Environmental nuisance:** The compound will be in enclosed areas 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.
viii. **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.

There are x7 no. external shared communal bin stores throughout the development, and x3 no. internal shared communal bin stores (within Block C&D and the Neighbourhood Centre), containing a three bin wheelie bin system. See Figure 4-1 below for bin store locations across the development. Site Layout Plan (Ref: 21009 – PL101), which has been submitted as part of the planning application, details the shared bin storage areas.

Figure 4-1 Bin Store Locations on drawing 21009 – PL101 - Site Layout Plan marked with pink star

4.9 Waste Storage Capacity Requirements - Commercial/Retail

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 commercial units in this Proposed Development.

The calculation for typical weekly waste arisings and subsequent storage requirements for commercial units is as follows:

Volume Per M^2 Of Sales Area [10 L] × Sales Area

Based on weekly waste collections, it is anticipated that 20 no. 1,100L bins and 20 no. 240L bins (or equivalent) will be required in the waste storage areas as detailed in Table 4-10 below. The frequency of bin collections can be increased as required, and individual bin requirements can be adjusted once the overall bin capacity is met at a minimum.

Table 4-8 Breakdown of Bin Numbers & Capacity for weekly Collections (Commercial Units)

		Food Waste	Glass	Dry Mixed Recyclables	Municipal Waste	Total Capacity Provided (L)
Description	**M^2**	**No. of 240L Bins**	**No. of 240L Bins**	**No. of 1100L Bins**	**No. of 1100L Bins**	
Creche	439	2	2	2	1	4,260
Office	317	1	1	2	1	3,780
Medical*	147	1	1	1	1	2,680
Retail	857	4	2	4	3	9,140
Retail (convenience)	431	2	2	2	1	4,260
Community Facility	321	1	1	1	1	2,680

*An additional lockable, colour coded, hazardous waste storage will be provided for medical waste which will be managed and accessed by medical personnel only.

Ample space will be provided in the shared secure retail unit bin store to accommodate these receptacles. The bin store will only be accessible to the commercial unit staff members, and will not be accessible to residents or members of the public. The commercial units are 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.

4.10 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.

4.11 Recycling Rates & Targets

Waste collection areas will be provided with receptacles and signage to promote a rate of 30% of the overall waste collected to be non-recyclable municipal solid waste and 70% of waste collected recyclable waste streams which will include dry mixed recyclables (packaging, papers, cardboards, plastics, aluminium, metals, and tin), glass, and food waste.

All of the municipal solid waste (MSW) collected will be transported for further recovery. No MSW will be transported directly to landfill. All MSW 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.

On review of bin usage by the appointed Management Company, MSW bins may be replaced with additional food waste or mixed dry recyclable bins to further increase waste segregation at source.

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

4.12 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 bin storage areas and crèche, 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 recyclables and mixed municipal waste, and 240L bins of 1100mm x 740mm x 660mm for food waste and glass. 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 recyclables, brown bin for organic waste, black bin for mixed non-recyclable waste and blue bins for glass waste (in accordance with the Waste Action Plan for Circular Economy). Use of and access to the waste storage area in the apartment buildings will be restricted to residents and waste contractors only. The waste storage area will not be visible to the public and it 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 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 by-laws 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 By-Laws and Statutory Instruments in relation to the presentation of waste for collection. Waste collections for a three 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.

Records of the collections from the apartment blocks 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 accessible for collection from the bin store by the waste management operatives and to assist on collection day to wheel out and replace bins during collection where required.

The staff of the commercial facilities will be responsible for arranging their own waste collection, and the bins are accessible via the entrance to the side of the roadway where they can be emptied and returned to the bin compound.

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.

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 three-bin system for the collection of separate organic waste, mixed dry recyclables, and general residual waste from the apartment/duplex buildings.

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 bin compound area to ensure that all bins collected are returned to the bin compound area 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. Recyclables and organic 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 area will meet the requirements as detailed in the *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities issued under Section 28 of the Planning and Development Act, 2000 (as amended).*

8 REFERENCES

Waste Management Acts 1996, as amended.

Protection of the Environment Act 2003 as amended.

Litter Pollution Act 1997 as amended.

Eastern-Midlands Waste Region Waste Management Plan, 2015-2021, Eastern-Midlands Region, 2015.

Dún Laoghaire-Rathdown County Council (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-laws, 2019.

Guidance Notes for Waste Management in Residential and Commercial Developments, Dun Laoghaire-Rathdown County Council, February 2020

Waste Framework Directive (Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste).

European Communities (Waste Directive) Regulations 2011, S.I. No. 126/2011.

Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended

Waste Management: Changing Our Ways, The Department of the Environment and Local Government, 1998.

Preventing and Recycling Waste: Delivering Change, The Department of the Environment and Local Government, 2002.

Taking Stock & Moving Forward, The Department of the Environment and Local Government, 2004.

National Strategy on Biodegradable Waste Management, Department Environment, Heritage and Local Government, 2006.

A Resource Opportunity – Waste Management Policy in Ireland, Department of the Environment, Community and Local Government, 2012.

Waste Action Plan for a Circular Economy - Ireland's National Waste Policy 2020-2025, Department of the Environment, Climate and Communications, 2020.

European Waste Catalogue, European Commission, 2002.

Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous, Environment Protection Agency, 2018.

Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities issued under Section 28 of the Planning and Development Act, 2000 (as amended), Department of Housing, Planning and Local Government, December 2020.

Waste Management in Buildings – Code of Practice, British Standard, BS 5906:2005, 2005.

Mobile Waste and Recycling Containers Part 1: Containers with 2 wheels with a capacity up to 400 l for comb lifting devices — Dimensions and design, British Standard, BS EN 840-1:2012, 2012.

Mobile waste containers. Containers with four wheels with a capacity from 750 l to 1700 l with flat lid(s), for wide trunnion or BG-and/or wide comb lifting devices. Dimensions and design, British Standard, BS EN 840-4:1997, 1997.

Municipal Waste Statistics for Ireland, EPA Waste Data Release, September 25th, 2020