Operational Waste Management & Recycling Strategy

Donore Project, Donore Avenue, Dublin 8

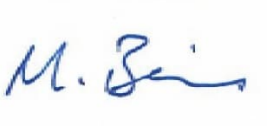
The Land Development Agency

Project number: 60648061

24 November 2022

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
			
Lynn Morgan Associate Environmental Consultant	Mike Bains, Technical Director	Mike Bains, Technical Director	Mike Bains, Technical Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	08/07/2022	Draft	YES	Mike Bains	Technical Director
1	25/07/2022	Final	YES	Mike Bains	Technical Director
2	25/08/2022	Final V1	YES	Mike Bains	Technical Director
3	16/09/2022	Final V2	YES	Mike Bains	Technical Director
4	18/11/2022	Final V3	YES	Mike Bains	Technical Director
5	24/11/2022	Final V4	YES	Mike Bains	Technical Director

Distribution List

# Hard Copies	PDF Required	Association / Company Name
	1	Metropolitan Workshop (architect)

Prepared for:

The Land Development Agency

Prepared by:

Lynn Morgan
Associate Environmental Consultant
M: 07769 933 644
E: lynn.morgan@aecom.com

AECOM Limited
Sunley House
4 Bedford Park, Surrey
Croydon CRO 2AP
United Kingdom

T: +44 20 8639 3500
aecom.com

© 2022 AECOM Limited. All Rights Reserved.

This document has been prepared by AECOM Limited (“AECOM”) for sole use of our client (the “Client”) in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM.

Table of Contents

Figures

Tables

1. Executive Summary

1.1 AECOM Limited (hereafter referred to as 'AECOM') has been appointed by The Land Development Agency (hereafter referred to as the 'Applicant') to prepare an Operational Waste and Recycling Management Strategy (hereafter referred to as the 'Strategy') for a residential development at a site located on the former St. Teresa's Gardens, Donore Avenue, Dublin 8 (hereafter referred to as the 'Proposed Development') located within the administrative boundary of Dublin City Council (DCC).

1.2 In accordance with Section 175(4) of the Planning and Development Act, 2000 (as amended), The Land Development Agency, on behalf of DCC, gives notice of its intention to make an application for approval to An Bord Pleanála under Section 175(3) of the Planning and Development Act, 2000 (as amended) for a seven year approval to carry out the following proposed development which is located on a site of c. 3.26 hectares (ha), located on the former St. Teresa's Gardens, Donore Avenue, Dublin 8.

1.3 The site is bound by Donore Avenue to the north-east, Margaret Kennedy Road to the north-west, The Coombe Women & Infants University Hospital to the west, the former Bailey Gibson factory buildings to the south-west, and the former Player Wills factory to the south-east. The development will consist of the construction of a residential scheme of 543 no. apartments on an overall site of 3.26 ha.

1.4 The development (Gross Floor Area, GFA of c. 53,227 sqm) contains the following mix of apartments: 225 no. 1 bedroom apartments (36 no. 1-person and 189 no. 2-person), 274 no. 2 bedroom apartments (including 52 no. 2 bed 3-person apartments and 222 no. 2 bed 4-person apartments), 44 no. 3 bedroom 5-person apartments, together with retail / café unit (168 sqm), mobility hub (52 sqm) and 952 sqm of community, artist workspace, arts and cultural space, including a crèche, set out in 4 no. blocks.

1.5 The breakdown of each block will contain the following apartments:

- Block DCC1 comprises 111 no. apartments in a block of 6-7 storeys;
- Block DCC3 comprises 247 no. apartments in a block of 6-15 storeys;
- Block DCC5 comprises 132 no. apartments in a block of 2-7 storeys; and
- Block DCC6 comprises 53 no. apartments in a block of 7 storeys.

1.6 The Proposed Development will also provide for public open space of 3,408 sqm, communal amenity space of 4,417 sqm and an outdoor play space associated with the crèche. Provision of private open space in the form of balconies or terraces is provided to all individual apartments.

1.7 The Proposed Development will provide 906 no. residential bicycle parking spaces, which are located within secure bicycle stores. 5% of these are over-sized spaces which are for large bicycles, cargo bicycles and other non-standard bicycles. In addition, 138 spaces for visitors are distributed throughout the site.

1.8 A total of 79 no. car parking spaces are provided at undercroft level. Six of these are mobility impaired spaces (2 in each of DCC1, DCC3 and DCC5). 50% of standard spaces will be EV fitted. Up to 30 of the spaces will be reserved for car sharing (resident use only). A further 15 no. on-street spaces are proposed, consisting of:

- 1 no. accessible bay (between DCC5 and DCC6);
- 1 no. short stay bay (between DCC5 and DCC6);
- 1 no. crèche set-down / loading bay (between DCC5 and DCC6);
- 1 no. set-down / loading bay (northern side of DCC5);
- 1 no. set-down / loading bay (northern side of DCC3); and
- 10 no. short stay spaces (north-east of DCC1).

1.9 In addition, 4 no. motorcycle spaces are also to be provided.

1.10 Vehicular, pedestrian and cyclist access routes are provided from a new entrance to the north-west from Margaret Kennedy Road. Provision for further vehicular, pedestrian and cyclist access points have been made to facilitate connections to the planned residential schemes on the Bailey Gibson and Player Wills sites for which there are extant permissions (Ref. No.'s ABP-307221-20 and ABP-308917-20).

1.11 The development will also provide for all associated ancillary site development infrastructure, including site clearance and demolition of the boundary wall along Margaret Kennedy Road and playing pitch on the eastern side of the site and associated fencing / lighting, the construction of foundations, ESB substations, switch room, water tank rooms, storage room, meter room, sprinkler tank room, comms room, bin storage, bicycle stores, green roofs, hard and soft landscaping, play equipment, boundary walls, attenuation area and all associated works and infrastructure to facilitate the development, including connection to foul and surface water drainage and water supply..

1.12 The principal aim of this Strategy is to demonstrate how sustainable methods for waste and recycling management have been taken into account for the operational phase of the Proposed Development. Furthermore, with regards to waste and recycling management within the Proposed Development, this Strategy has the following aims:

- To contribute towards achieving current and long-term national, Eastern Midlands Region (EMR) and DCC targets for waste minimisation, recycling and re-use;
- To comply with all applicable legal requirements for handling operational waste and recycling;
- To achieve high standards of waste management performance, through giving due consideration to the waste generated during operation of the Proposed Development; and
- To provide a convenient, clean and efficient waste management strategy that enhances the operation of the Proposed Development and promotes recycling.

1.13 Once operational, the Proposed Development is anticipated to produce approximately 85,247 litres (L) of (un-compacted) waste and recycling per week. Of this, approximately 79,640 L will arise from residential uses per week and approximately 5,607 L will arise from commercial uses per week. Waste and recycling arisings per week will equate to approximately 11,914 tonnes of waste and recycling per year (i.e. based on the following approximate densities: Mixed Dry Recyclables (MDR) – 62 kg/m^3 (Kilograms per meters cubed), Food waste – 667 kg/m^3, Glass – 277 kg/m^3 and Residual waste – 81 kg/m^3 (Ref. 1)).

1.14 Each residential block has been divided into core areas (D1a-D1b, D3a-D3d, D5a-D5b and D6a) and each core area will be provided with individual residential bin stores (totalling 9 bin stores) for mixed dry recyclables (MDR), residual wastes, glass waste and food waste at ground level (shown on the architect's Lower Ground Floor Plans).

1.15 Separate commercial bin stores will be provided to serve the proposed commercial activities in two of the blocks. These will comprise of two bin stores serving the creche and artists work spaces in DCC5 and two bin stores serving the retail unit and arts and cultural space in DCC3.

1.16 Each block DCC1, DCC3, DCC5 and DCC6 will have designated bin presentation areas (4 bin presentation areas in total). The bins will be moved to and from the bin presentation areas by the building management team to facilitate the weekly collections. Bins will only be stored temporarily in these locations. Separate collections are anticipated (MDR and glass bins one day, with residual and food bins will be on another day) and space for bin presentation areas will be provided to reflect this. Bin presentation areas will be located in close proximity to service/access roads to allow easy access for Refuse Collection Vehicles (RCVs).

1.17 These provisions will result in waste and recycling produced during the operation of the Proposed Development and all waste and recycling infrastructure introduced to the Proposed Development being managed in accordance with the guidelines published by the EMR, DCC, British Standards (BS) 5906:2005 Waste Management in Buildings – Code of Practice and Department of Housing, Planning and Local Government (DoHPLG)'s Sustainable Urban Housing: Design Standards for New Apartments.

1.18 In relation to this Strategy, waste is defined as per the Waste Framework Directive (2008/98/EC) as "*any substance or object within the holder discards or intends to or is required to discard*".

2. Introduction

Overview

2.1 AECOM Limited (hereafter referred to as 'AECOM') has been appointed by The Land Development Agency (hereafter referred to as the 'Applicant') to prepare an Operational Waste and Recycling Management Strategy (hereafter referred to as the 'Strategy') for a residential development at a site located on the former St. Teresa's Gardens, Donore Avenue, Dublin 8 hereafter referred to as the 'Proposed Development') located within the administrative boundary of Dublin City Council (DCC).

Strategy Overview

2.2 Through the lens of the Circular Economy Model, the Strategy aims to promote a circular approach by exploring opportunities for reusing and recycling during the operation of the Proposed Development in accordance with the Waste Hierarchy (see Section 3).

2.3 Following on from the prevention and reduction of waste, this Strategy will encourage the separation and sorting of waste and recycling in-line with the Waste Hierarchy. Measures will be implemented to maximise the amount of material arising from the Proposed Development that is recycled/composed and minimise the amount of waste that is sent to landfill.

2.4 This Strategy provides a review of the requirements placed upon the Proposed Development under legislation and implemented policy at all levels of government (i.e. national (Ireland), regional (Eastern Midlands Region (EMR) and local (DCC)). Consideration has also been given to the requirements included in local standards, local planning policy and guidance documents i.e. Dublin City Development Plan 2022-2028 (Ref. 2). so as to comply with relevant objectives and targets. British Standards Institute (BSI), Waste Management in Buildings, Code of Practice (BS 5906:2005) (Ref. 3) has also been used within this document to calculate the waste and recycling arising from the Proposed Development and to provide guidance on the requirements the bin stores should adhere to following best practice.

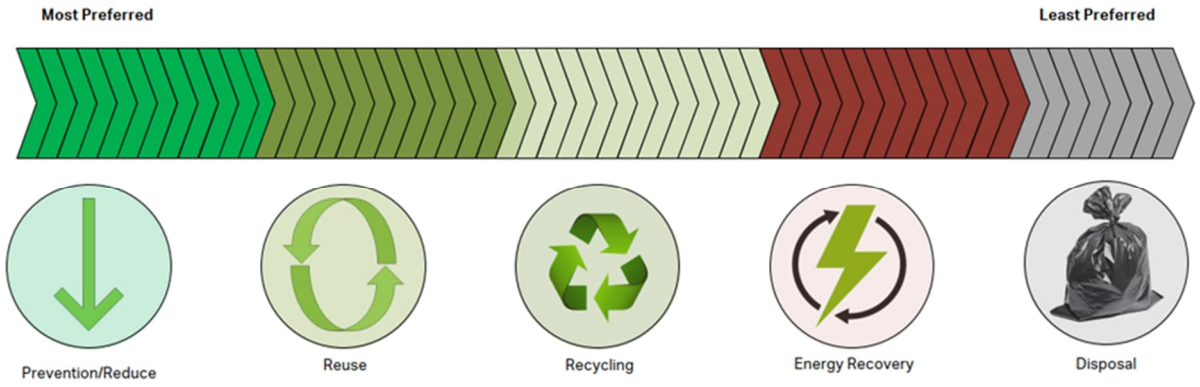
2.5 The methodology used to identify and estimate volumes of waste and recycling generated during operation of the Proposed Development is provided in Section 6. Following this, the approach taken towards waste and recycling management within the Proposed Development is discussed. This includes a breakdown of the waste and recycling management process, including handling, storage area provision, and collection arrangements. All recycling management and waste material reduction measures are compliant with BS 5906:2005 (Ref. 3), EMR's Waste Management Plan 2015-2021 (Ref. 4) and Sustainable Urban Housing: Design Standards for New Apartments (Ref. 5).

2.6 This Strategy has been written by AECOM, using information provided by Metropolitan Workshop (hereafter referred to as the 'Architects').

3. Waste Hierarchy and the Circular Economy

3.1 The Waste Hierarchy encourages the management and reduction of waste material. It is representative of a complex process influenced by the optimal management of any given product/waste material. A basic representation of the Waste Hierarchy is provided in **Figure 1**.

Figure 1. The Waste Hierarchy

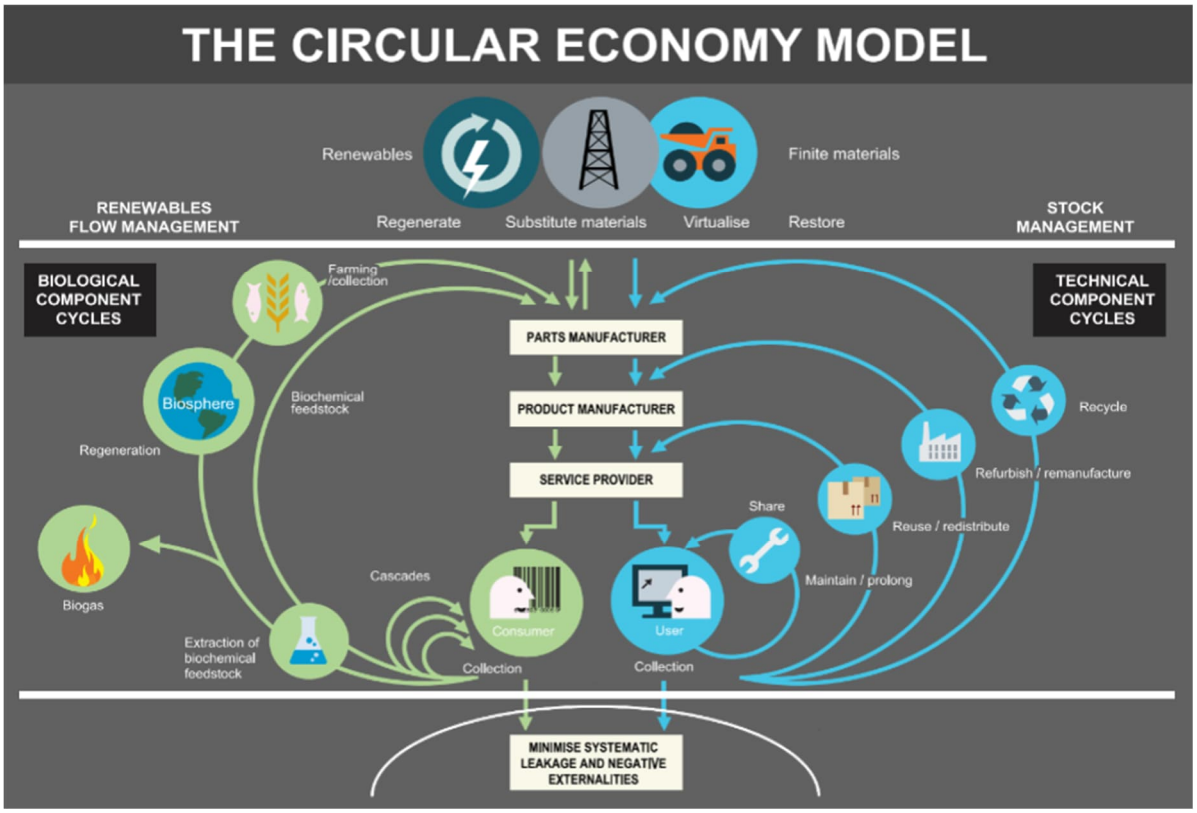


Source: Based upon the waste hierarchy concept presented in the EU Waste Framework Directive 2008/98/EC.

3.2 The prevention of waste sits at the top of the Waste Hierarchy. Prevention involves trying to reduce the amount of waste generated in the first place, for example by redesigning a product to use less, and fewer materials during manufacture.

3.3 The generation of waste in the UK and Ireland has historically been linked with economic growth, as demonstrated by a marked decline in waste generation timed with the onset of the recession in 2008. The Circular Economy Model (see **Figure 2**) aims to decouple economic growth from resource consumption, by keeping resources in use for as long as possible and trying to regenerate them at the end of their life.

Figure 2. The Circular Economy Model



Source: Ellen MacArthur Foundation.

3.4 It is likely that the future of waste prevention will look to adopt leasing/rental business models on a range of items (i.e. white goods, tools, phones and clothes) which in doing so will promote an economy of repair and refurbishment. Reduction of waste will also occur by reducing the amount of packaging per item through innovation. For the retail land use in the Proposed Development, food waste could be minimised by using apps such as OLIO (Ref. 6) to distribute any left-over food.

3.5 Reuse is the next tier of the Waste Hierarchy; it can involve the cleaning or repairing of products so they can be reused and redistributed as the same product. This helps to prevent products being disposed of once they become broken or dirty. Innovative exchange platforms to enable the reuse of materials include Globechain (Ref. 7) and Loop (Ref. 8).

3.6 The third tier of the Waste Hierarchy and outermost loop of the Circular Economy Model is recycling – the act of turning waste materials into new products. Recycling benefits the environment as it reduces the consumption of raw materials and diverts waste materials from final disposal routes (i.e. landfill and incineration).

4. Legislation and Planning Policy

Waste Legislation

4.1 A summary list of the legislation relevant to inform the management of operational waste and recycling arising from the Proposed Development is provided in this Section of the Strategy. Legislation of relevance to inform the development of the Strategy is as follows:

- The Waste Framework Directive (Directive 2008/98/EC) (Ref.9);
- The Directive on Waste Electrical and Electronic Equipment (WEEE Directive 2012/19/EU) (Ref. 10);
- The Directive on Batteries and Accumulators (2006/66/EC) (Ref. 11);
- European Union (Household Food Waste and Bio-waste) Regulations 2015 (Ref. 12);
- European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (Ref. 13);
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (Ref. 14);
- Waste Management (Collection Permit) Regulations 2007 (as amended) (Ref. 15);
- Waste Management (Facility Permit and Registration) Regulations 2007 (as amended) (Ref. 16);
- Waste Management (Licensing) Regulations 2004 (as amended) (Ref. 17);
- Waste Management (Packaging) Regulations 2014 (as amended) (Ref. 18);
- Waste Management (Planning) Regulations 1997 (Ref. 19);
- Waste Management (Landfill Levy) Regulations 2015 (Ref. 20);
- Waste Management (Food Waste) Regulations 2009 (as amended) (Ref. 21);
- Waste Management (Hazardous Waste) Regulations 1998 (as amended) (Ref. 22);
- Waste Management (Shipments of Waste) Regulations 2007 (as amended) (Ref. 23));
- Waste Management (Movement of Hazardous Waste) Regulations 1998 (Ref. 24);
- The Waste Management Act 1996 (as amended 2001) (Ref. 25)
- Environmental Protection Agency Act 1992 (Ref. 26);
- The Protection of the Environment Act 2003 (Ref. 27);
- Litter Pollution Act 1997 (Ref. 28); and
- Planning and Development Act (as amended 2020) (Ref. 29).

National Policy

A Resource Opportunity (2012)

4.2 A Resource Opportunity (Ref. 30) stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention. The document sets out a number of actions, including the following:

- A move away from landfill and replacement through prevention, reuse, recycling and recovery;
- A brown bin roll-out diverting organic waste towards more productive uses;
- Introduce a new regulatory regime for the existing side-by-side competition model within the household waste collection market;
- New Service Standards to ensure that consumers receive higher customer service standards from their operator;
- Placing responsibility on householders to prove that they use an authorised waste collection service;

- The establishment of a team of Waste Enforcement Officers for cases relating to serious criminal activity will be prioritised;
- Reducing red tape for industry to identify and reduce any unnecessary administrative burdens on the waste management industry;
- A review of the producer responsibility model will be initiated to assess and evaluate the operation of the model in Ireland; and
- Significant reduction of Waste Management Planning Regions from ten to three.

Waste Action Plan for a Circular Economy (2020)

4.3 The Waste Action Plan for a Circular Economy (Ref. 31) is Ireland's new roadmap for waste planning and management. This Plan shifts focus away from waste disposal and looks instead to how to preserve resources by creating a circular economy.

4.4 The previous national waste policy, A Resource Opportunity – Waste management policy in Ireland, drove delivery on national targets under EU legislation, but the Irish and international waste context has changed in the years since its launch. The Plan fulfils the Irish Government's commitment in the Programme for Government to publish and start implementing a new National Waste Action Plan. This new national waste policy will inform and give direction to waste planning and management in Ireland over the coming years

4.5 The Waste Action Plan for a Circular Economy sets out a range of aims and targets for the State and the measures by which these will be achieved, including increased regulation and measures across various waste areas such as Circular Economy, Municipal Waste, Consumer Protection and Citizen Engagement, Plastics and Packaging, Construction and Demolition, Textiles, Green Public Procurement and Waste Enforcement.

Whole of Government Circular Economy Strategy 2022 – 2023 'Living More, Using Less'

4.6 The Whole of Government Circular Economy Strategy (Ref. 32) is Ireland's first national circular economy strategy. The Strategy is a key addition to Government's drive to achieve a 51% reduction in overall greenhouse gas emissions by 2030 and to get on a path to reach net-zero emissions by no later than 2050, as per commitments in the Programme for Government and the Climate Act 2021.

4.7 The Strategy was a specific commitment in the Waste Action Plan for a Circular Economy (WAPCE). The purpose of this high-level, all-of-government strategy is to set a course for Ireland to transition across all sectors and at all levels of government toward circularity.

Regional Policy

EMR – Waste Management Plan 2015-2021 (2015)

4.8 The EMR Waste Management Plan 2015-2021 (Ref. 4) is the regional waste management plan for the DCC area. The regional plan sets out the following strategic targets for waste management in the region:

- *"A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;*
- *Achieve a recycling rate of 50% of managed municipal waste by 2020; and*
- *Eliminate the direct disposal of unprocessed residual municipal waste to landfill."*

Local Policy

Dublin City Development Plan 2022-2028

4.9 The Dublin City Development Plan 2022-2028 (Ref. 2) provides the agreed framework which gives spatial expression to the city's economic, social, housing and cultural development, as well as having a crucial

role in protecting the environment, heritage and amenities of the city and in mitigating against the impacts of climate change.

4.10 The Development Plan is set out over 16 chapters, with Chapter 9 focussing on 'Sustainable Environmental Infrastructure and Flood Risk', which sets out policy on waste management alongside energy, water and resource efficiency.

Table 1. Policies and Strategic Objectives within the Dublin City Development Plan relating to the Management of Waste and Recycling

Policy/Strategic Objective	Description
SI27	To support the principles of the circular economy, good waste management and the implementation of best practice in relation to waste management in order for Dublin City and the Region to become self-sufficient in terms of resource and waste management and to provide a waste management infrastructure that supports this objective. To support opportunities in the circular resource efficient economy in accordance with the National Policy Statement on Bioeconomy (2018).
SI28	To prevent and minimise waste generation and disposal, and to prioritise prevention, recycling, preparation for reuse and recovery in order to develop Dublin as a circular city and safeguard against environmental pollution.
SI29	To require new commercial and residential developments, to include adequate and easily accessible storage space that supports the separate collection of as many waste and recycling streams as possible, but at a minimum general domestic waste, dry recyclables and food waste as appropriate (for further guidance see Appendix 7).
SI30	To require that the storage and collection of mixed dry recyclables, organic and residual waste materials within proposed apartment schemes have regard to the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities 2018 (or and any future updated versions of these guidelines produced during the lifetime of this plan).
SI016	To support the implementation of the Eastern-Midlands Regional Waste Management Plan 2015–2021 and any subsequent plans in order to facilitate the transition from a waste management economy towards a circular economy.

4.11 Appendix 7 provides the guidelines for waste storage facilities. It recommends that waste storage issues should be considered at the initial apartment design and pre planning stage to ensure access for all (including people with disabilities) in a brightly lit, safe and well-signed area, spacious enough for easy manoeuvrability, good ventilation and ready access if required for the control of potential vermin.

DCC – Waste Management Bye-Laws (2018)

4.12 DCC's Waste Management Bye-Laws (2018) (Ref. 33) place legal obligations on the waste producer in terms of the way waste and recycling is stored and managed on a site/premises. Household kerbside waste should be segregated into residual household waste and recyclable household waste. Food waste should also be kept separate. Other key requirements under these bye-laws are:

- Other than the day before and the designated waste collection day, containers used for the presentation of kerbside waste shall be held within the curtilage of the premises where the waste is produced.
- Kerbside waste shall not be presented for collection earlier than 5pm on the day immediately preceding the designated waste collection day. All containers used for the presentation of kerbside wase shall be removed no later than 10am on the day following the designated waste collection day.

4.13 Household kerbside waste shall only be presented for collected in a prescribed place in an appropriate waste container.

5. The Proposed Development

5.1 Once complete, the Proposed Development will provide the following:

- 543 residential apartments;
- 564 m^2 Net Internal Area (NIA) of Creche land use;
- 143 m^2 NIA of retail land use;
- 245 m^2 NIA of artist workspaces and arts/cultural space; and
- 44 m^2 NIA of residential amenity space (Mobility Hub).

A conversion factor of 0.85 has been used to convert GIA to NIA.

5.2 A breakdown of the residential apartment mix has been provided within **Table 2**, and a breakdown on the commercial land use has been provided within **Table 3**.

Table 2. Breakdown of the Residential Apartment Mix (Number of Apartments)

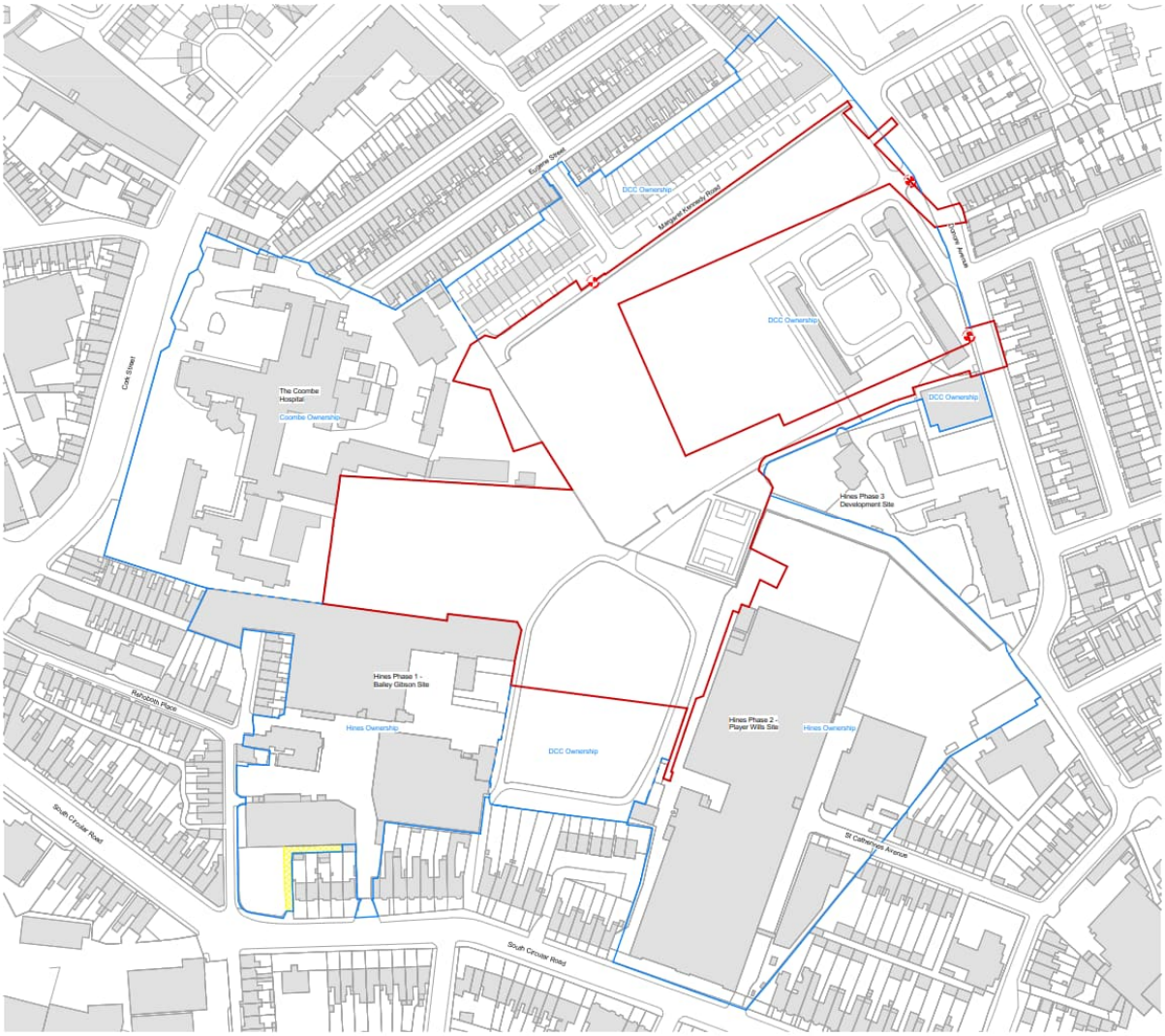
Dwelling Type	DCC1	DCC3	DCC5	DCC6	Total
1 Bedroom 1 Person	0	13	9	14	36
1 Bedroom 2 Person	33	124	32	0	189
2 Bedroom 3 Person	7	13	19	13	52
2 Bedroom 4 Person	60	78	58	26	222
3 Bedroom 5 Person	11	19	14	0	44
Total	***111***	***247***	***132***	***53***	***543***

Table 3. Breakdown of Commercial Land Uses (m^2 NIA)

Land Use	DCC1 (m^2 NIA)	DCC3 (m^2 NIA)	DCC5 (m^2 NIA)	Total (m^2 NIA)
Creche	0	0	564	564
Retail	0	143	0	143
Residential Amenity (Mobility Hub)	0	44	0	44
Artists Workspaces & Arts/Cultural Space	0	109	136	245
Total	0	296	700	996

5.3 A red line boundary of the Proposed Development is shown in **Figure 3** below.

Figure 3. Red Line Boundary of the Proposed Development



6. Methodology

Residential Waste

6.1 As DCC does not have any guidance to calculate residential waste and recycling storage requirements, estimated volumes of residential waste and recycling arisings (including Mixed Dry Recyclables (MDR), Residual waste (non-recyclable/general waste), Glass and Food waste) from the operational phase of the Proposed Development have been calculated based on the guidance listed in British Standards (BS) 5906:2005 (Ref. 3).

6.2 BS 5906:2005 guidance recommends calculating the required waste and recycling capacity based on the following formula:

$$Number\ of\ dwellings\ x\ ((70\ L\ x\ average\ number\ of\ bedrooms) + 30)$$

6.3 Based on trends seen in National Waste Reports published by the Environmental Protection Agency (EPA), the assumed split between MDR, Food, Glass and Residual waste is a ratio of 45 : 10 : 5 : 40 respectively. Bin storage requirements advised in this Strategy provide the capacity to facilitate a 60% recycling rate for residential apartments. In order to achieve wider recycling rates (65% of municipal waste, as stated in the EU WFD), bin composition should be monitored and allocated as recycling rates change.

Commercial Waste

6.4 DCC also does not provide guidance for the calculation and storage of commercial waste and recycling arisings, therefore reference to BS 5906:2005 has been made in order to calculate the waste and recycling arisings and storage requirements for the creche, retail and residential amenity spaces.

6.5 **Table 4** sets out the methodology adopted to determine the waste and recycling arising from the creche, retail, residential amenity and artist workshops and arts/cultural spaces. Bin storage requirements advised in this Strategy would provide the capacity to facilitate between 50% and 80% recycling rates for commercial land uses. In order to achieve wider recycling rates (65% of municipal waste, as stated in the EU WFD), bin composition should be monitored and allocated as recycling rates change.

Table 4. Methodology to Calculate Commercial Waste and Recycling Arisings

Land Use	Waste Storage Requirements	Waste Stream Ratios
Creche	5 L per m^2 NIA.	45 : 5 : 50 MDR : Glass : Residual
Retail	10 L per m^2 Sales Floor Area (SFA)*.	45 : 30 : 5 : 20 MDR : Food : Glass : Residual
Residential Amenity	5 L per m^2 NIA.	45 : 5 : 50 MDR : Glass : Residual
Artist Workspaces & Arts/Cultural Space	5 L per m^2 NIA.	45 : 5 : 50 MDR : Glass : Residual

**SFA is 2/3 of the NIA.*

Waste Growth Rates

6.6 Estimates of future waste generation rates vary widely, therefore inflationary waste growth predictions have not been applied to the waste calculation estimates for the Proposed Development. Data from National Waste Statistics published by the Environmental Protection Agency (EPA) for the years from 2010 to 2016 show that household waste arisings in Ireland have remained relatively stable at around 2.5 million tonnes per year, with periods of slight increase and decline (Ref. 34). Overall, the total waste collected has increased slightly by 137,863 tonnes from 2010 to 2016, however waste per person has decreased from 621 kg to 581 kg per person from 2014 to 2018 respectively (Ref.35).

6.7 Whilst the long-term impacts of the COVID-19 pandemic are unknown, it may be that a reduction in paper usage has been further sped up via a prioritisation of reduced hand and personal contact. Improvements in data security and storage with increasing reliance on information technology is also likely to lead to a reduction in the long-term; a conservative estimate based on household consumption behaviours suggest that this could equate to a 20% reduction in use of newspapers, magazines and other papers (Ref. 36). However, the total tonnage of household waste is predicted to have increased by around 13% due to an increase in the number of meals eaten at home, and an increased focus on activities such as DIY, gardening and decluttering (Ref. 37).

6.8 Waste prevention efforts in commerce and industry may also reduce rates of waste generated per employee. In particular, with increasing servitisation (the replacement of purchasing goods by hiring them instead, for example the rental of reusable coffee cups via 'CupClub' instead of purchasing single use coffee cups), goods may be leased by customers, and subsequently returned to producers for re-manufacturing, rather than entering the waste stream. Reductions from circular economy initiatives have indicated that a high uptake of urban analytic systems, leased assets, and exchange/sharing platforms could significantly reduce commercial and industrial waste production by up to 45% by 2031 (Ref. 38).

6.9 It is therefore likely that in the future, the Proposed Development will see a decline in waste growth due to reduction and prevention measures. Combining this with future policy instruments in the area of circular economy, it is likely that there will be a long-term reduction in the production of waste from the Proposed Development. Based on future waste arising patterns, it is likely that the current waste production and storage requirements represent a reasonable worst-case scenario and have therefore formed the basis for the calculation of the long-term waste management and storage provisions for the Proposed Development.

7. Operational Waste and Recycling Management Strategy

Residential Waste Arisings

7.1 Based on the methodology provided in paragraph 6.2 above, and based on a weekly collection frequency, the estimated waste and recycling arisings for the residential elements of the Proposed Development are provided in **Table 5**.

Table 5. Anticipated Residential Waste and Recycling Arisings based on a Weekly Collection Frequency

Block	Dwelling Type	No. Apartments	No. Bedrooms	MDR (L)	Food (L)	Glass (L)	Residual (L)	Total (L)
DCC1	1 Bedroom 1 Person	0	1	-	-	-	-	-
	1 Bedroom 2 Person	33	1	1,485	330	165	1,320	3,300
	2 Bedroom 3 Person	7	2	536	119	60	476	1,190
	2 Bedroom 4 Person	60	2	4,590	1,020	510	4,080	10,200
	3 Bedroom 5 Person	11	3	1,188	264	132	1,056	2,640
	Total	***111***	***-***	***7,799***	***1,733***	***867***	***6,932***	***17,330***
DCC2	1 Bedroom 1 Person	13	1	585	130	65	520	1,300
	1 Bedroom 2 Person	124	1	5,580	1,240	620	4,960	12,400
	2 Bedroom 3 Person	13	2	995	221	111	884	2,210
	2 Bedroom 4 Person	78	2	5,967	1,326	663	5,304	13,260
	3 Bedroom 5 Person	19	3	2,052	456	228	1,824	4,560
	Total	***247***	***-***	***15,179***	***3,373***	***1,687***	***13,492***	***33,730***
DCC5	1 Bedroom 1 Person	9	1	405	90	45	360	900
	1 Bedroom 2 Person	32	1	1,440	320	160	1,280	3,200
	2 Bedroom 3 Person	19	2	1,454	323	162	1,292	3,230
	2 Bedroom 4 Person	58	2	4,437	986	493	3,944	9,860
	3 Bedroom 5 Person	14	3	1,512	336	168	1,344	3,360
	Total	***132***	***-***	***9,248***	***2,055***	***1,028***	***8,220***	***20,550***
DCC6	1 Bedroom 1 Person	14	1	630	140	70	560	1,400
	1 Bedroom 2 Person	0	1	-	-	-	-	-
	2 Bedroom 3 Person	13	2	995	221	111	884	2,210
	2 Bedroom 4 Person	26	2	1,989	442	221	1,768	4,420
	3 Bedroom 5 Person	0	3	-	-	-	-	-
	Total	***53***	***-***	***3,614***	***803***	***402***	***3,212***	***8,030***
Overall Residential Arisings		***543***	***-***	***35,838***	***7,964***	***3,982***	***31,856***	***79,640***

Commercial Waste Arisings

7.2 Based on the methodology provided in **Table 4**, and based on a weekly collection frequency, the estimated waste and recycling arisings for the commercial elements of the Proposed Development are provided in **Table 6**.

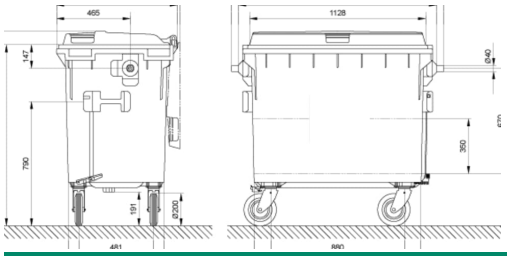
Table 6. Anticipated Commercial Waste and Recycling Arisings based on a Weekly Collection Frequency

Land Use	NIA (m^2)	Working Area	MDR (L)	Food (L)	Glass (L)	Residual (L)	Total (L)
Creche	564		1,270		141	1,411	2,822
Artist Workspace	136		306		34	340	680
Retail	143	134	603	402	67	268	1,340
Residential Amenity (Mobility Hub)	44		99		11	111	221
Arts/Cultural Space	109		245		27	272	544
Total Commercial Arisings	***996***		***2,523***	***402***	***280***	***2,402***	***5,607***

Storage Containers

7.3 The waste and recycling arising from the Proposed Development will be stored within 1,100 L, 660 L and 240 L containers, similar to the examples provided in **Table 7**. These will be colour coded depending on the material stream: MDR, food, glass or residual waste.

Table 7. Example Bin Dimensions

1,100 L	
	Capacity (L): 1,100
	Height (mm): 1,380*
	Depth (mm): 1,000*
	Width (mm): 1,270*
660 L	
	Capacity (L): 660
	Height (mm): 1,215
	Depth (mm): 784
	Width (mm): 1,370
240 L	
	Capacity (L): 240
	Height (mm): 1,065*
	Depth (mm): 735*
	Width (mm): 580*

**Please note that dimensions may vary between manufacturers*

7.4 The waste and recycling arising from the residential elements of the Proposed Development once it is operational will be stored in:

- 1,100 L Eurobins for MDR waste;
- 240 L wheeled bins for food waste;
- 240 L wheeled bins for glass; and

- 1,100 L Eurobins for residual waste.

7.5 The waste and recycling arising from the commercial elements of the Proposed Development once it is operational will be stored in:

- 1,100 L Eurobins and 660 L wheeled bins for MDR waste (1,100 L for DCC5 and 660 L bins for DCC3);
- 240 L wheeled bins for food waste
- 240 L wheeled bins for glass waste; and
- 1,100 L Eurobins and 660 L wheeled bins for residual waste (1,100 L for DCC5 and 660 L bins for DCC3).

660 L bins are proposed for MDR and residual waste for DCC3 (retail, mobility hub and arts/cultural space) to minimise the spare capacity in the bins and therefore provide a more efficient use of the space available for bin storage.

Regional Waste Management Service Providers and Facilities

7.6 The waste producer is responsible for waste from the time it is generated through until its legal disposal (including its method of disposal). Waste contractors will be employed to physically transport waste to the final waste disposal/recovery site.

7.7 It is therefore critical that the residents and the proposed management company undertake on-site management of waste in accordance with all legal requirements and employ suitably permitted/licensed contractors to undertake off-site management of 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.

7.8 A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the Waste Management (Facility Permit and Registration) Regulations 2007 (as amended) or a waste or IED (Industrial Emissions Directive) license granted by the EPA. The COR/permit/license held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

7.9 Various contractors offer waste collection services for the residential and commercial sector in Dublin City Council. Details of waste collection permits (granted, pending and withdrawn) for the region are available from the NWCPO.

Residential Waste and Recycling Storage Requirements

7.10 Based on the residential waste and recycling arisings presented in **Table 5**, and based on a weekly collection frequency, the subsequent storage requirements for the residential elements of the Proposed Development are provided in **Table 8**.

Table 8. Residual Waste and Recycling Storage Requirements: Based on Weekly Collection Frequency

Block	Core Area	No. Apartments	MDR		Food		Glass		Residual		TOTAL	
			No. Bins	Bin capacity (L)	No. Bins	Bin capacity (L)	No. Bins	Bin capacity (L)	No. bins	Bin capacity (L)	240 L bins	1,100 L bins
DCC1	1a	58	4	1,100	4	240	2	240	4	1,100	6	8
	1b	53	4	1,100	4	240	2	240	3	1,100	6	7
DCC3	3a	112	7	1,100	7	240	4	240	6	1,100	11	13
	3b	52	4	1,100	4	240	2	240	3	1,100	6	7
	3c	50	4	1,100	4	240	2	240	3	1,100	6	7
	3d	33	2	1,100	2	240	1	240	2	1,100	3	4
DCC5	5a	63	5	1,100	5	240	3	240	4	1,100	8	9
	5b	69	5	1,100	5	240	3	240	4	1,100	8	9
DCC6	6a	53	4	1,100	4	240	2	240	3	1,100	6	7
TOTAL		***543***	***39***		***39***		***21***		***32***		**60**	**71**

Residential Waste and Recycling Management

Storage Locations

7.11 Each residential block has been divided into core areas (D1a-D1b, D3a-D3d, D5a-D5b and D6a) and each core area will be provided with individual residential bin stores (totalling 9 bin stores) for mixed dry recyclables (MDR), residual wastes, glass waste and food waste at ground level (shown on the architect's Lower Ground Floor Plans). The location and layout of the bins is shown in Appendix A.

7.12 It should be noted that for DCC1, the provision for 1,100 L bins for core area 1b is one less than required at 6, whilst the provision of the same bins for 1a is one more than required at 9 no. bins. Overall, provision of 1,100 L bins for DCC1 Is as per the requirement (i.e. 15 no.).

7.13 It is also noted that the provision of 240 litre bins for core area 3d is one more than the requirement – 4 are allocated rather than the required 3.

Waste Movement & Collection

7.14 Each block DCC1, DCC3, DCC5 and DCC6 will have designated bin presentation areas (4 bin presentation areas in total). The bins will be moved to and from the bin presentation areas by the building management team to facilitate the weekly collections, using a tug. Bins will only be stored temporarily in these locations prior to each collection. Space allocation for bin presentation areas assumes collections on a weekly basis, but on separate days: MDR and glass bins one day, with residual and food bins on another day. Bin presentation areas will be located in close proximity to service roads to allow easy access for Refuse Collection Vehicles (RCVs) and kerbs will be lowered appropriately to allow ease of movement between bin storage areas and the RCVs. The bin presentation areas are shown in Appendix C.

7.15 For DCC1, the bin presentation area will be located to the northwest of the block, adjacent to the access to the car parking area. It is anticipated that an RCV will be able approach the north west corner along the service road in a forward direction, before turning and then parking along the service road in close proximity to the presentation area. This will keep reversing distances under the required maximum of 12m for the RCV.

7.16 For DCC3, the bin presentation area will be adjacent to the north wall of the block and a bay will be provided along the service road adjacent to the presentation area to allow the RCV to park during collection.

7.17 For DCC5, the bin presentation area will be adjacent to the north wall of the block and a bay will be provided along the service road adjacent to the presentation area to allow the RCV to park during collection.

7.18 For DCC6, the bin presentation area will be to the south, along the southern boundary. The RCV will reverse into the access road to park during collection. Again, reversing distance will be less than the maximum recommended 12m.

Commercial Waste and Recycling Storage Requirements

7.19 Based on the commercial waste and recycling arisings presented in Table 6, and based on a weekly collection frequency, the subsequent storage requirements for the commercial elements of the Proposed Development are provided in Table 8.

Table 8. Anticipated Commercial Waste and Recycling Storage Requirements based on a Weekly Collection Frequency

Block	Land Use	NIA (m2)	Working Area (m2)	MDR		Food	Glass	Residual		TOTAL No. Bins		
				No. Bins (1,100 L)	No. Bins (660 L)	No. Bins (240 L)	No. Bins (240 L)	No. Bins (1,100 L)	No Bins (660 L)	240 L	660 L	1,100 L
DCC5	Creche & Artist Workspaces	700		2	-	-	1	2	-	1	-	4
DCC3	Retail (café), Residential Amenity (mobility hub) & Arts/Cultural Space	296	134 (retail)	-	2	2	1	-	1	3	3	-
	TOTAL:	**996**		**2**	**2**	**2**	**2**	**2**	**1**	**4**	**3**	**4**

Note. Conversion factor of 0.85 used to convert GIA to NIA

Commercial Waste and Recycling Management

Storage Locations

7.20 Separate commercial bin stores will be provided to serve the proposed commercial activities in two of the blocks. These will comprise of two shared bin stores serving the creche and artist workspaces in DCC5 and two shared bin stores serving the retail unit, mobility hub and arts/cultural space in DCC3. It is anticipated that users Locations of the bin collection stores are shown in Appendix B.

7.21 The provision of 660 litre and 240 litre bins for DCC3 are both one more than the requirement – 4 are allocated rather than the required 3 for each bin type.

Waste Movement and Collection

7.22 It is anticipated that commercial waste will be managed in the same way as residential wastes (see 7.13 to 7.17 above). Bins will be collected by the building management team and moved to designated bin presentation areas, where they will be stored temporarily pending collection.

Bulky Waste

7.23 Bulky waste will be managed using DCC's bulky waste collection service – no designated space is to be provided. Details of the service will be communicated to residents.

Maintenance and Fit Out

7.24 In addition to the general bin stores and waste management areas, sufficient space will be provided within the Proposed Development for the storage of waste and recycling for future maintenance and fit-out activities. It is recommended that skips should never be placed against a building and should normally be a minimum of 6 m away from any part of the premises. Best practice also states that the location of skips should have easy vehicle access for set down and collection and should be in a secure location to prevent disturbance to or from members of the public. It is anticipated that a visitor car parking space would be temporarily used for placing skips.

Unique Waste

7.25 There is likely to be a small component of the overall waste and recycling arisings from the Proposed Development that will comprise of other waste streams, such as waste electrical and electronic equipment (WEEE), printer and toner cartridges and florescent light tubes. Building maintenance will also give rise to materials such as paints and waste lubricating oils that will require separate storage in dedicated sealed containers.

7.26 This type of waste is termed "unique" as it will not be produced on a regular basis and therefore its management will be on special arrangement with a registered waste handler for the specific waste that is produced. Hazardous waste is required to be kept separate from general and bulky waste. Separate arrangements will be made for the safe disposal of these waste streams, as covered by Waste Management (Hazardous Waste) Regulations 1998, Waste Management (Movement of Hazardous Waste) Regulations 1998 and the Directive on Waste Electrical and Electronic Equipment (WEEE Directive 2012/19/EU). All waste management will have to comply with the Waste Management Act 1996 (as amended 2001) and the Environmental Protection Agency Act 1992. Although unique waste is unlikely to be produced on a regular basis, should the residents generate any unique waste, it is envisioned that the internal management team will engage with the residents to help them dispose of it with a suitable private waste contractor.

8. Waste and Recycling Storage and Collection Provision

8.1 The following guidance documents provide standard requirements that the Proposed Development will comply with when considering storage and collection of waste and recycling arising from the operational activities within the buildings:

- DCC, Dublin City Development Plan 2022-2028;
- DCC, (2018); Waste Management (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws 2018;
- DHPLG, (2018); Sustainable Urban Housing: Design Standards for New Apartments.

8.2 In addition, the following guidance document provides additional best practice requirements that the Proposed Development will comply with:

- BS 5906:2005.

DCC – Dublin City Development Plan 2022-2028

- The requirements set out in the Dublin City Council Waste Management (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws 2018 (or any subsequent revision) must be adhered to and, in particular, the requirement in the Bye-Laws to segregate waste to facilitate the collection of dry recyclables, organic kitchen/garden waste and residual waste in line with the Waste Management (Food Waste) Amendment Regulations 2015 (S.I. 190 of 2015) and the European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. 19 of 2015), the Waste Management (Food Waste) Regulations 2009 (S.I. 508/2009) and the Eastern Midlands Regional Waste Management Plan 2015 – 2021.
- Waste storage issues should be considered at the initial design and pre planning stage of all residential developments to ensure access for all (including people with disabilities), in a brightly lit, safe and well-signed area, spacious enough for easy manoeuvrability, with good ventilation and ready access if required for the control of potential vermin.
- Where storage is provided in a basement area, sufficient access and egress must be provided to enable receptacles to be moved easily from the storage area to an appropriate collection point on the public street nearby.
- Provision shall also be made for the storage and collection of waste materials in apartment schemes in accordance with the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities 2018.
- The following are also requirements:
  - Receptacles that are designed for reuse, with the exception of a specific area designated by a local authority as being only suitable for the collection of non-reusable receptacles such as bags, ideally of 1,100 litre capacity, must be used.
  - To provide a three-bin collection system for residents in communal collection schemes, for each type of waste: general waste, dry recyclables and organic food/garden waste.
  - A proposal on the three bin system including bin quantity, type and frequency of collection must be submitted in writing to the Waste Regulation Unit in Dublin City Council for agreement.
  - Suitable wastewater drainage points should be installed in the bin storage area for cleaning and disinfecting purposes.
  - Waste storage areas should not present any safety risks to users and should be well-lit. • Adequate ventilation of waste storage areas so as to minimise odours and potential nuisance from vermin/flies.

  - Sufficient space must be provided to accommodate the collection of dry recyclables and organic kitchen waste/ garden waste.
  - Suitable wastewater drainage points should be installed in the receptacle bin storage area for cleaning and disinfecting purposes.
- In addition , in relation to commercial/industrial developments, the following requirements are stated:
  - Adequate storage space for a minimum of one No. 1,100Litre receptacle. •
  - Sufficient space must be provided to accommodate the collection of dry recyclables and organic kitchen waste/ garden waste.
  - Adequate space and height for a standard refuse collection vehicle (RCV) to access site.
  - Sufficient access and egress must be provided to enable receptacles to be moved easily from the storage area to an appropriate collection point on the public street nearby.
  - Receptacle storage areas must not be on a public street nor be visible or accessible from there.
  - The receptacle storage areas should be designed so that each bin within the storage area is accessible to occupants/ employees of the development (including people with disabilities).
  - Suitable wastewater drainage points should be installed in the bin storage area for cleaning and disinfecting purposes.
  - Waste storage areas should not present any safety risks to users and should be well-lit.
  - Adequate ventilation of waste storage areas so as to minimise odours and potential nuisance from vermin/flies.

DCC – Waste Management (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2018)

- Household kerbside waste and recycling that arises from the premises where such waste and recycling is produced will not be presented to any person other than to an authorised waste collector.
- Containers used for the presentation of kerbside waste and recycling will be maintained in such condition and state of repair that the waste and recycling placed therein will not be a source of nuisance or litter. Waste and recycling will not be presented in a container where the wheels or lid have been removed or damaged to such an extent that it is not able to contain the waste without spillage, is otherwise unfit for the purpose for which it was designed or is not capable of being conveniently emptied.
- Other than on the day before and the designated waste collection day, containers used for the presentation of kerbside waste and recycling will be held within the curtilage of the premises where the waste and recycling is produced. They will not be stored on a roadway, footway, footpath or any other public place unless the location has been expressly authorised in writing by an authorised person.
- Household kerbside waste and recycling will only be presented for collection in a prescribed place in an appropriate container. The container will not be over-loaded and the lid will be securely closed. No waste or recycling will be presented on the top of the lid or adjacent to the container.
- Kerbside waste and recycling presented for collection will not be presented for collection earlier than 5.00 pm on the day immediately preceding the designated collection day.
- All containers used for the presentation of kerbside waste and recycling and any uncollected waste or recycling will be removed from any roadway, footway, footpath or any other public place no later than 10:00am on the day following the designated collection day.
- Household waste and recycling that comprises hazardous waste or waste electrical and electronic equipment will not be placed in an appropriate container for kerbside collection (i.e. hazardous waste or waste electrical and electronic waste are prohibited wastes for kerbside collection).

- Household kerbside waste and recycling will be segregated into residual household kerbside waste and recyclable household kerbside waste, with these fractions being stored separately.
- Where an occupier of a dwelling is not participating in a household kerbside collection service, that person will ensure that recyclable household kerbside waste segregated in compliance with bye-law is taken to an authorised waste facility and is deposited there in a manner that allows it to be recycled or otherwise recovered.
- A management company, or another person if there is no such company, who exercises control and supervision of mixed-use developments will ensure that:
  - separate receptacles of adequate size and number are provided for the proper segregation, storage and collection of recyclable household kerbside waste and residual household kerbside waste;
  - additional receptacles are provided for the segregation, storage and collection of food waste where this practice is a requirement of the national legislation on food waste;
  - the receptacles referred to in the above bullet point are located both within any individual apartment and at the place where waste is stored prior to its collection;
  - any place where waste or recycling is to be stored prior to collection is secure, accessible at all times by tenants and other occupiers and is not accessible by any other person other than an authorised waste collector;
  - written information is provided to each tenant or other occupier about the arrangements for waste separation, segregation, storage and presentation prior to collection;
  - an authorised waste collector is engaged to service the receptacles referred to in this section with documentary evidence, such as receipts, statements or other proof of payment, demonstrating the existence of this engagement being retained for a period of no less than two years.

DHPLG – Sustainable Urban Housing: Design Standards for New Apartments (2018)

- Provision shall be made for the storage and collection of waste materials in apartment schemes.
- Refuse facilities shall be accessible to each apartment stair/ lift core and designed with regard to the projected level of waste generation and types and quantities of receptacles required. Within apartments, there should be adequate provision for the temporary storage of segregated materials prior to deposition in communal waste storage and in-sink macerators are discouraged as they place a burden on drainage systems.
- The following general design considerations should be taken into account in the provision of refuse storage facilities:
  - Sufficient communal storage area to satisfy the three-bin system for the collection of mixed dry recyclables, organic waste and residual waste;
  - In larger apartment schemes, consideration should also be given to the provision of separate collection facilities for other recyclables such as glass and plastics;
  - Waste storage areas must be adequately ventilated so as to minimise odours and potential nuisance from vermin/flies and taking account the avoidance of nuisance for habitable rooms nearby;
  - Provision in the layout for sufficient access for waste collectors, proximity of, or ease of access to, waste storage areas from individual apartments, including access by disabled people;
  - Waste storage areas should not present any safety risks to users and should be well-lit;
  - Waste storage areas should not be on the public street and should not be visible to or accessible by the general public. Appropriate visual screening should be provided, particularly in the vicinity of apartment buildings;

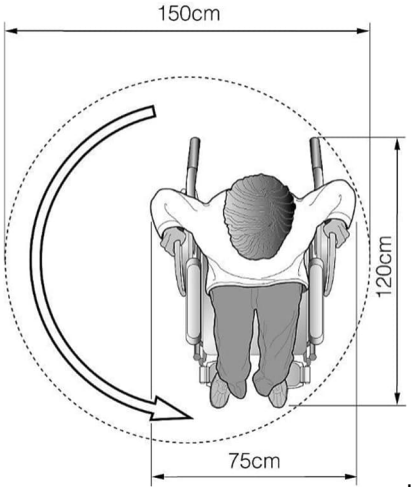
  - Waste storage areas in basement car parks should be avoided where possible, but where provided, must ensure adequate manoeuvring space for collection vehicles;
  - The capacity for washing down waste storage areas, with wastewater discharging to the sewer.

BS 5906:2005 (Guidance)

- Household and commercial waste and recycling will be stored in separate storage areas.
- Waste and recycling storage areas will be located at vehicle access level. Basement level storage will have adequate provision to move waste and recycling to the ground floor for collection e.g. dedicated lift.
- Waste and recycling storage areas will be away from the main entrance to the building.
- The collector will not be required to carry individual containers or move two wheeled containers for a distance more than 15m, nor to manoeuvre four wheeled storage containers from storage points to collecting vehicles more than 10m.
- Residents will be made aware of the fire risk from waste and recycling storage. This will be done using signage and displaying the dangers when waste and recycling materials are stored carelessly.
- Developments producing household and commercial or industrial waste and recycling will have clearly identifiable different containers.
- All roads will be clearly marked and controlled to prevent unauthorised parking.
- External and internal facilities for buildings are designed for older persons and persons with disabilities as set out by the Disability and Discrimination Act (DDA), as specified in the BS 8300:2001 (Ref. 39).
- BS 8300:2001 details that space allowance is needed for wheelchair access; slip resistant requirements on flooring and reach ranges which enrapture all individuals for the use of facilities such as disposal or recycling units.
- Waste and recycling storage areas will provide a clear turning circle with a minimum diameter of 1,500 mm for wheelchair users, as specified in Part M of the Building Regulations (Ref. 40) and shown in **Figure 4**.
- There will not be steps and projections at the entrance of a waste and recycling storage area.
- The waste and recycling storage area will either be external to the building or capable of being isolated from the main building. This will ensure access to the main building will not be used through the waste and recycling storage area.
- Roads will be a minimum width of 5m.
- Paths between container storage areas and collecting vehicles will be free from kerbs or steps and inclines with a gradient more than 1:12, be non-slip and a minimum of 2m wide.
- Roads will be arranged so that collecting vehicles can continue mainly in a forward direction. If reversing, the distance will not exceed 12m.
- Vehicles operating in service areas will enter and leave in a forward-facing direction.
- Loading bays will have headroom appropriate to the method of waste collection.
- The walls and roofs of the waste and recycling storage area will be formed of non-combustible robust and secure materials with a smooth finish suitable of washing down. The floor of the waste and recycling storage area will be no less than 100mm thick.
- The door of the waste and recycling storage area will be capable of being opened from the inside as well as the outside for reasons of safety.
- A universal lock and key system can be used to secure waste and recycling storage areas. The standard Fire Brigade (FB) mortise lock and key would be the preferred option by the collection agent. Electronic entry systems may also be used.

- The walls and roofs of the waste and recycling storage area will have a fire resistance of one hour when tested in accordance with BS 476-21 (Ref. 41). The door of the storage area will be made of steel or have a fire resistance of 30 minutes when tested in accordance with BS 476-22 (Ref. 42).
- Permanent ventilators will be provided giving a total ventilation area of not less than 0.2m^2. Passive ventilators will be fly and vermin proof and located as near the ceiling and floor of the waste and recycling storage area as possible but away from windows and dwellings.
- Electrical lighting will consist of sealed bulkhead fittings with houses related to IP65 in BS EN 60529: 1992 (Ref. 43) for the purposed of cleaning down with hoses and inevitable splashing.
- Luminaires will be low energy light fittings or low energy lamp bulbs, controlled by proximity detection or a time delay button to prevent lights being left on.
- Arrangements will be made for cleaning of the waste and recycling storage area with water. A hose union tap will be provided in agreement with the local water authority and the Environment Agency.
- The floor of the storage area will have suitable fall towards the drainage point. Gullies will be positioned not to be in the track of container wheels and will incorporate a trap, which maintains a seal, even during prolonged periods of disuse.

Figure 4. Example Wheelchair Turning Circle



9. Further Consideration

BREEAM Research Establishment Environmental Assessment Method

9.1 Building Research Establishment Environmental Assessment Method (BREEAM) provides assessment criteria for newly constructed and refurbished developments, such as the Proposed Development, for a range of environmental factors, including waste. These assessment criteria are described within the BREEAM New Construction Non-Domestic Buildings Technical Manual (Ref. 44). With regards to waste and recycling arisings generated during the operational phase of the Proposed Development, one credit is available for meeting requirements of Wst 03 Operational.

9.2 In order to meet Wst 03 Operational, the following criteria must be complied with:

- Provision of dedicated storage space to cater for the segregation and storage of operational MDR waste volumes generated by the Proposed Development, its occupants and activities;
- The dedicated space must be:
  - Clearly labelled, to assist with segregation, storage and collection of MDR waste stream;
  - Accessible to occupants/facilities operators (i.e. management teams) for the deposit of materials and collections by waste management contractors; and
  - Of a capacity appropriate to the building type, size and number of units (if relevant) and predicted volume of waste and recycling that will arise from daily/weekly operational activities and occupancy rates.

9.3 Providing the waste and recycling storage requirements specified within this Strategy are adhered to, it is considered that the Proposed Development will meet the Wst 03 Operational criteria.

10. Conclusion

10.1 Once operational, the Proposed Development is anticipated to produce approximately 85,247 litres (L) of (un-compacted) waste and recycling per week. Of this, approximately 79,640 L will arise from residential uses per week and approximately 5,607 L will arise from commercial uses per week. Waste and recycling arisings per week will equate to approximately 11,914 tonnes of waste and recycling per year (i.e. based on the following approximate densities: Mixed Dry Recyclables (MDR) – 62 kg/m^3 (Kilograms per meters cubed), Food waste – 667 kg/m^3, Glass – 277 kg/m^3 and Residual waste – 81 kg/m^3 (Ref. 1)).

10.2 In keeping with national, regional and local policy, this Strategy demonstrates how the Proposed Development will promote sustainable waste management methods for waste and recycling. The Strategy displays the prospective space requirements for waste and recycling management and demonstrates best practice segregation of residual waste, food waste, glass waste and mixed dry recyclables. Bin storage requirements are based on the weekly collection of MDR, Food, Glass and Residual waste, split across separate days.

10.3 Alongside helping to achieve local policy aims, a successful waste and recycling management strategy for the Proposed Development can help achieve wider regional goals, such as reaching recycling targets (65% of municipal waste) alongside providing adequate, flexible and easily accessible bin stores to support recyclables and food waste as set by DCC Bye-Laws.

10.4 This Strategy has reviewed policy alongside best practice to provide guidance and recommendations for a sustainable waste and recycling management strategy for the Proposed Development, helping achieve the BREEAM Wst 03 (Operational Waste) Credit.

11. References

Ref 1 Waste and Resources Action Programme (WRAP) Business Waste Weights Calculator [accessed on 23/03/2020] http://www.wrap.org.uk/sites/files/wrap/Business%20waste%20weights%20calculator_businesses%20v1_0.xlsx

Ref 2 DCC, Dublin City Development Plan 2022-2028.

Ref 3 British Standards Institute (BSI), (2005); BS 5906:2005, Waste Management in Buildings – Code of Practice.

Ref 4 Eastern-Midlands Waste Region (EMWR), (2015); Eastern-Midlands Region Waste Management Plan 2015-2021.

Ref 5 Department of Housing, Planning and Local Government (DHPLG), (2018); Sustainable Urban Housing: Design Standards for New Apartments.

Ref 6 OLIO [accessed online 05/07/2021] https://olioex.com/

Ref 7 Globechain [accessed online 05/07/2021] https://globechain.com/about-us

Ref 8 LOOP [accessed online 05/07/2021] https://loopstore.co.uk/

Ref 9 Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.

Ref 10 Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE).

Ref 11 Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and repealing certain Directive 91/157/EEC.

Ref 12 European Union (Household Food Waste and Bio-waste) Regulations 2015.

Ref 13 European Union (Properties of Waste which Render it Hazardous) Regulations 2015.

Ref 14 European Communities (Transfrontier Shipment of Waste) Regulations 1994.

Ref 15 Waste Management (Collection Permit) Regulations 2007 (as amended).

Ref 16 Waste Management (Facility Permit and Registration) Regulations 2007 (as amended).

Ref 17 Waste Management (Licensing) Regulations 2004 (as amended).

Ref 18 Waste Management (Packaging) Regulations 2014 (as amended).

Ref 19 Waste Management (Planning) Regulations 1997.

Ref 20 Waste Management (Landfill Levy) Regulations 2015.

Ref 21 Waste Management (Food Waste) Regulations 2009 (as amended).

Ref 22 Waste Management (Hazardous Waste) Regulations 1998 (as amended).

Ref 23 Waste Management (Shipments of Waste) Regulations 2007 (as amended).

Ref 24 Waste Management (Movement of Hazardous Waste) Regulations 1998.

Ref 25 The Waste Management Act 1996 (as amended 2001).

Ref 26 Environmental Protection Agency Act 1992.

Ref 27 Protection of the Environment Act 2003.

Ref 28 Litter Pollution Act 1997.

Ref 29 Planning and Development Act (as amended 2020).

Ref 30 DoELG, (2012); A Resource Opportunity – Waste Management Policy in Ireland.

Ref 31 Government of Ireland, A Waste Action Plan for a Circular Economy, Irelands National Waste Policy 2020-2025.

Ref 32 Government of Ireland, Whole of Government Circular Economy Strategy 2022-2023, Living More, Using Less.

Ref 33 DCC, (2018); Waste Management (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws 2018.

Ref 34 Environmental Protection Agency (EPA), (2018); Municipal Waste Statistic for Ireland [accessed on 05/07/2021] http://www.epa.ie/mobile/nationalwastestatistics/municipal/

Ref 35 EPA, (2019); Ireland's Environmental Indicators [accessed on 05/07/2021] http://www.epa.ie/mobile/nationalwastestatistics/nationalindicators/

Ref 36 GLA, (2017); SLR Consulting – London Plan Waste Forecasts and Apportionments.

Ref 37 Tolvik Consulting, (2020); Briefing: COVID-19 and the UK Waste Sector.

Ref 38 London Waste and Recycling Board (LWARB), (2017); Circular Economy Effects on Waste Production in London.

Ref 39 BSI, (2009); BS 8300:2001, Design of Buildings and their Approaches to Meet the Needs of Disabled People.

Ref 40 OFDM, (2010); Building Regulations – Approved Document M – Access to and Use of Buildings (2015) (Amendment 2016).

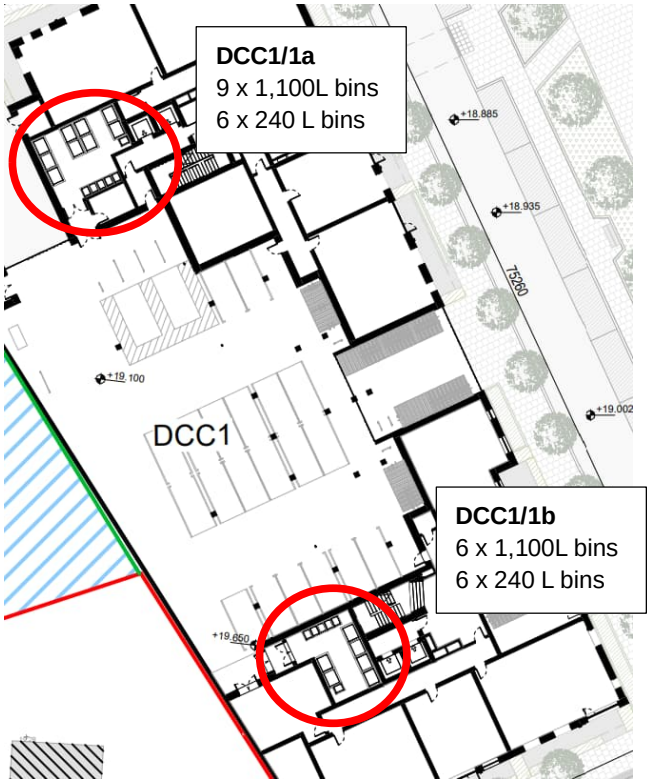
Ref 41 BSI, (1987); BS 476-21, Fire tests on building materials and structures: Part 21.

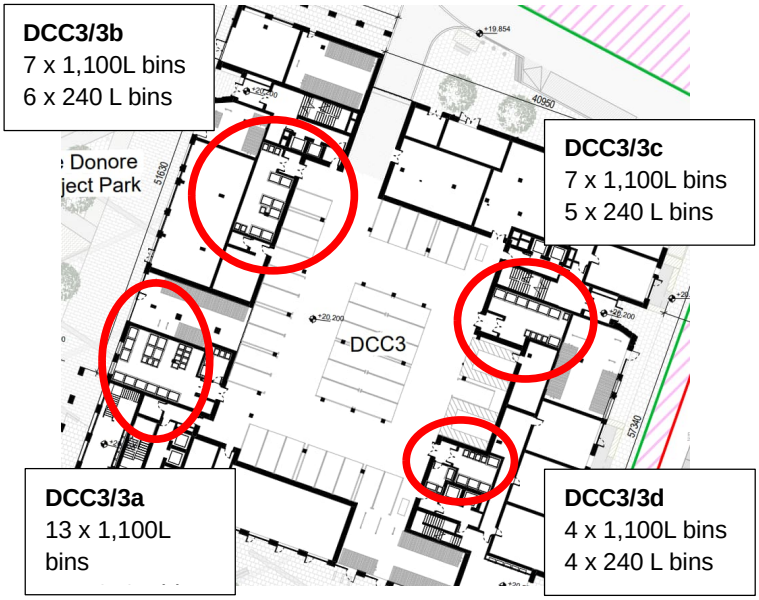
Ref 42 BSI, (1987); BS 476-22, Fire tests on building materials and structures: Part 22.

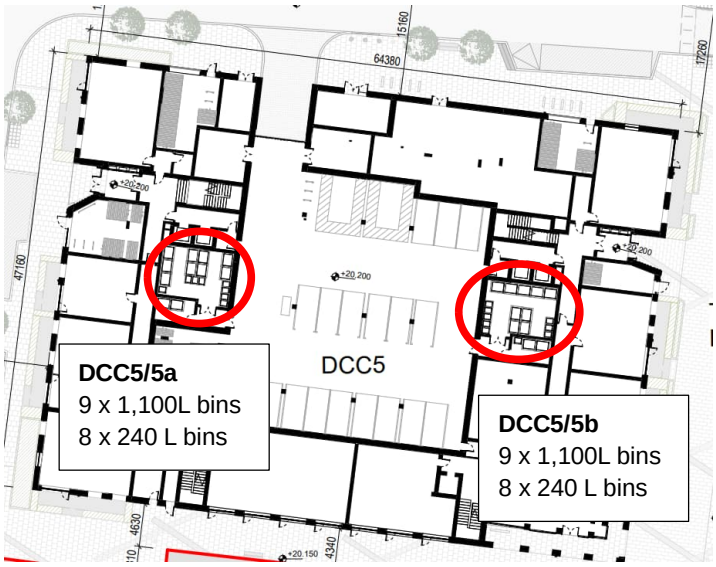
Ref 43 BSI, (1992); BS EN 60529:1992, Specifications or Degrees of Protection Provided by Enclosures (IP Code).

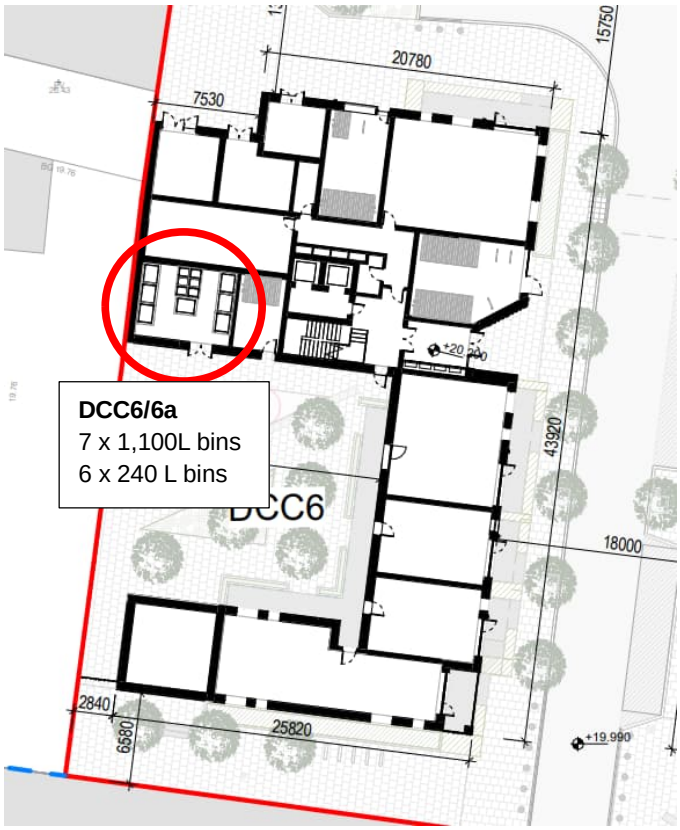
Ref 44 Building Research Establishment Environmental Assessment Method (BREEAM), (2011); BREEAM New Construction Non-Domestic Buildings Technical Manual.

Appendix A Residential Bin Store Provision



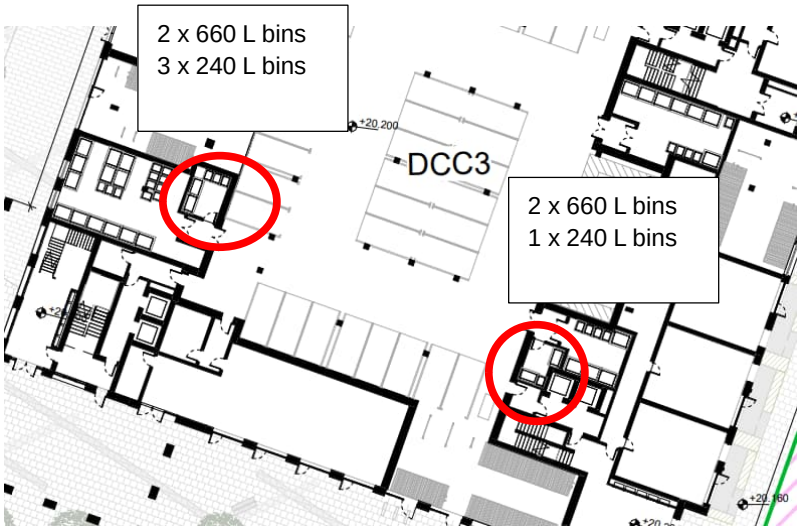



64380
15160
17260
47160
DCC5
DCC5/5a
9 x 1,100L bins
8 x 240 L bins
DCC5/5b
9 x 1,100L bins
8 x 240 L bins

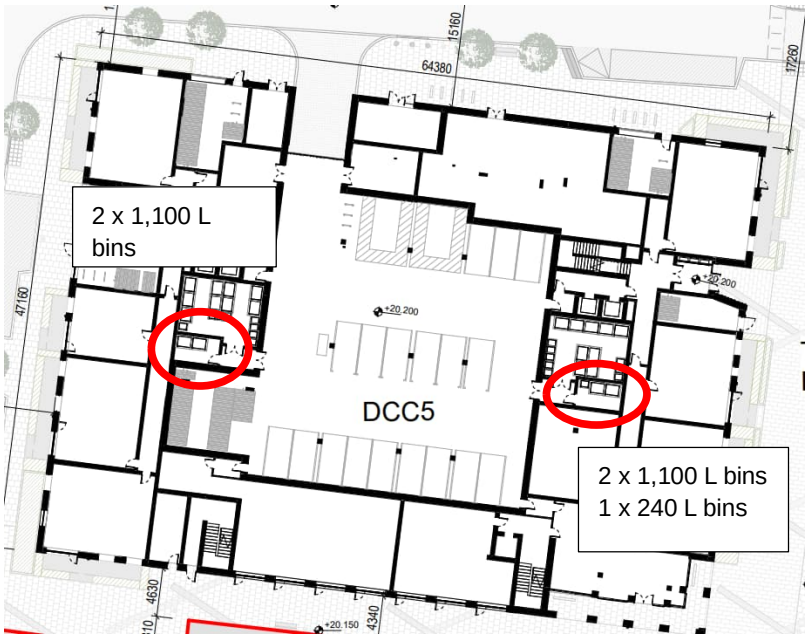

20780
15750
7530
DCC6/6a
7 x 1,100L bins
6 x 240 L bins
43920
18000
2840
6580
25820
+19.990

Appendix B Commercial Bin Store Provision

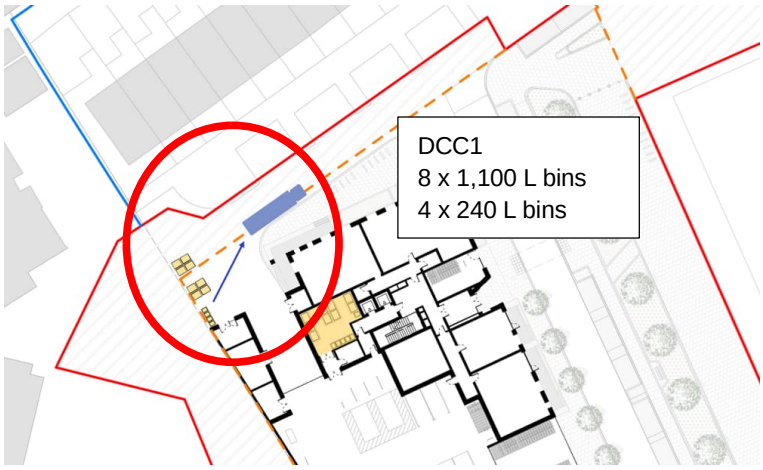
DCC3

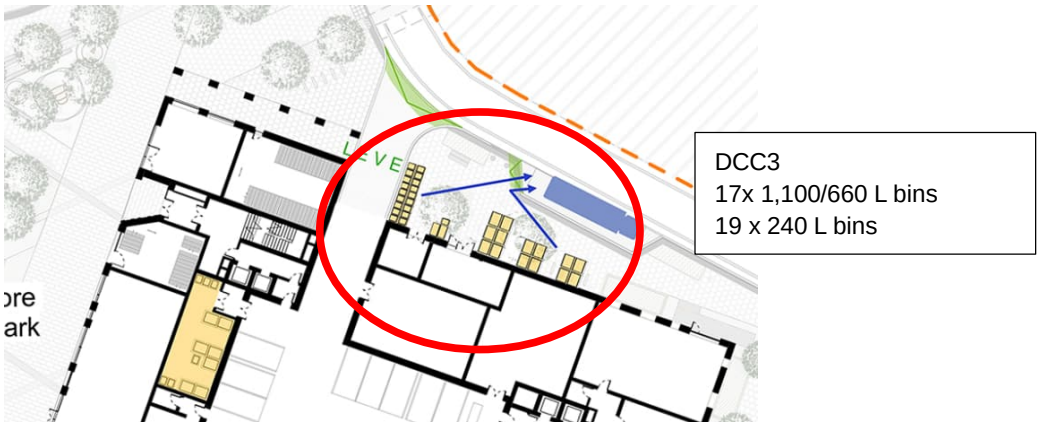


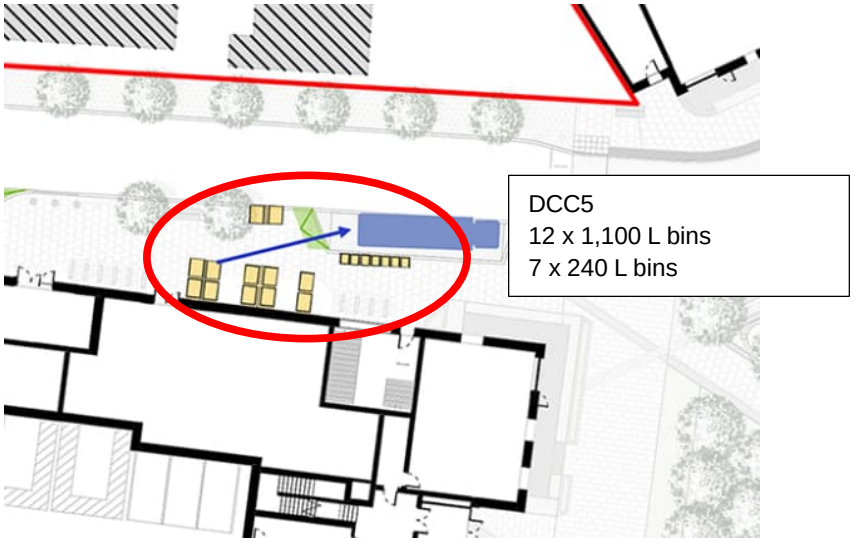
DCC5

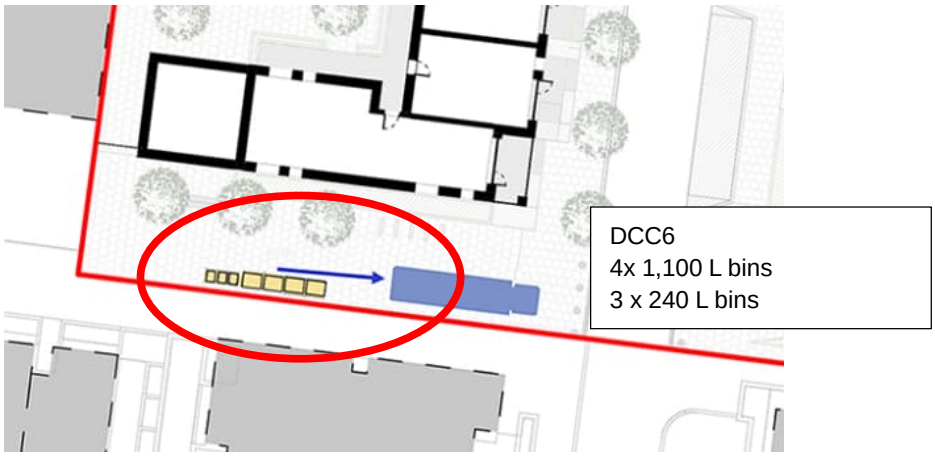


Appendix C Bin Presentation Areas



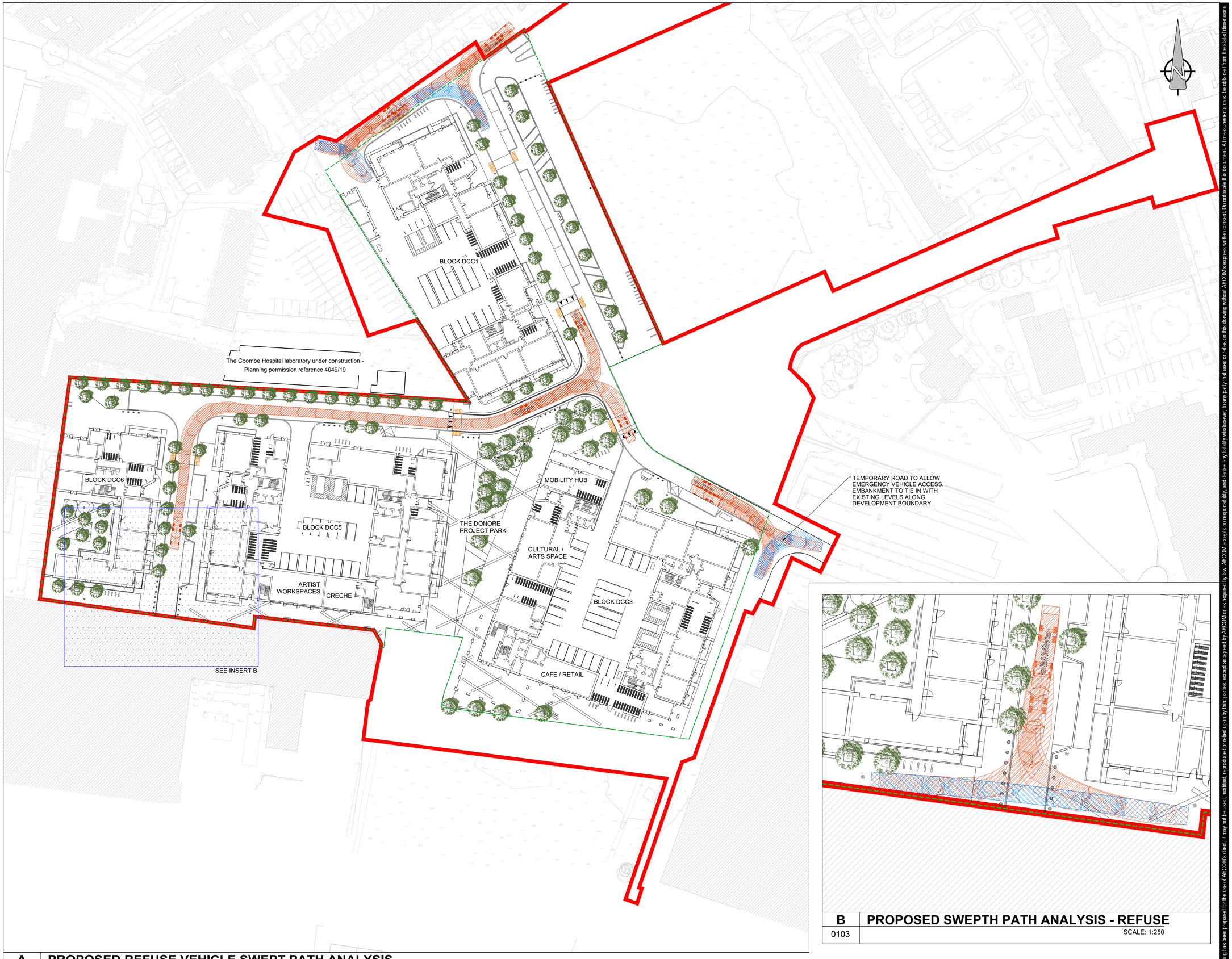





DCC6
4x 1,100 L bins
3 x 240 L bins

Appendix D RCV Tracking

ISO A1 594mm x 841mm
Project Management Initials: Drawn by: KM Checked: MI Approved: LS
Last saved by: KARL.MULLIGAN (2022-11-16) Last Plotted: 2022-11-17
Filename: L:\LEGACY\IEDBL2FP001\DATA\DCS\PROJECTS\BP\60648061_LDA_STG_TERESAS\900_CAD_GIS\904_CE\01_WIP\02_SHEETS\STAGE 1B - STANDALONE APPLICATION\STG-AEC-S1B-00-00-DR-C-0000102_SWEPTPATHANALYSIS.DWG
Printed on ___% Post-Consumer Recycled Content Paper



A | **PROPOSED REFUSE VEHICLE SWEPT PATH ANALYSIS**
0103 | Scale: 1:500

B | **PROPOSED SWEPTH PATH ANALYSIS - REFUSE**
0103 | SCALE: 1:250

ORDNANCE SURVEY IRELAND LICENCE NO **CYAL50217544**
©ORDNANCE SURVEY IRELAND / GOVERNMENT OF IRELAND

AECOM

PROJECT

DONORE PROJECT, DONORE AVENUE, DUBLIN 8

CLIENT

THE LAND DEVELOPMENT AGENCY (LDA)

CONSULTANT

AECOM
4th Floor Adelphi Plaza,
George's Street Upper,
Dun Laoghaire,
Co Dublin
Tel:+353 (0)1 696-6220
www.aecom.com

NOTES

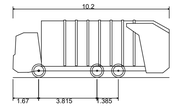
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS, ANY DISCREPANCIES, ERRORS OR OMISSIONS TO BE BROUGHT TO THE ATTENTION OF THE DESIGNER.
2. ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR ON SITE PRIOR TO COMMENCEMENT OF WORKS.
3. AECOM LIMITED TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF WORKS ON SITE.
4. DIMENSIONS OF ALL BOUNDARIES AND ADJOINING ROADS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
5. THIS DESIGN DRAWING HAS BEEN DEVELOPED USING THE FOLLOWWING TOPOGRAPHICAL SURVEYS; LDA SURVEY (MSL39995 REV1 21.05.2021) AND HINES' SURVEY (MSL35430 REV2 24.06.2020).

SWEPT PATH ANALYSIS

SWEPT PATH FORWARDS MOVEMENT
SWEPT PATH BACKWARDS MOVEMENT

SWEPT PATH ANALYSIS VEHICLE

Phoenix 2 Duo (P2-12W with Elite 6x4 chassis)



Overall Length	10.200m
Overall Width	2.530m
Overall Body Height	3.751m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.800m

LEGEND:

SITE BOUNDARY.....

NET DEVELOPABLE AREA BOUNDARY.....

AECOM PLANNING

ISSUE/REVISION

0	18.11.2022	ISSUED FOR PLANNING
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60648061

SHEET TITLE

PROPOSED REFUSE VEHICLE SWEPT PATH ANALYSIS

SHEET NUMBER

STG-AEC-S1b-00-00-DR-C-0000103

This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.

aecom.com