164-170 Croatia Avenue, Edmondson Park NSW

Mixed-Use Development

OPERATIONAL WASTE MANAGEMENT PLAN

24/02/2021
Report No. SO632
Revision B

Prepared for

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REVISION REFERENCE

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A	11/02/2021	W. Brunson	A. Armstrong	Draft
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GLOSSARY OF ABBREVIATIONS AND TERMS

TERM	DESCRIPTION
Bin-carting Route	Travel route for transferring bins from the storage area to a nominated collection point
Chute	A ventilated, vertical pipe passing from floor to floor of a building with openings as required to connect with hoppers and normally terminating at its lower end at the roof of the central waste room(s)
Chute Discharge	The point at which refuse exits from the refuse chute
Chute Discharge Room	A secure, enclosed area or room housing the discharge and associated equipment for the refuse chute
Collection Area/Point	The identified position or area where general waste or recyclables are loaded onto the collection vehicle
Composter	A container/machine used for composting specific food scraps
Crate	A plastic box used for the collection of recyclable materials
DA	Development Application
DCP	Development Control Plan
EPA	Environmental Protection Authority
HRV	Heavy Rigid Vehicle described by AS 2890.2-2002 Parking facilities – Off-street commercial vehicle facilities
L	Litre(s)
LEP	Local Environmental Plans guide planning decisions for local government areas
Liquid Waste	Non-hazardous liquid waste generated by commercial premises that must be connected to sewer or collected for treatment and disposal by a liquid waste contractor (including grease trap waste)
Mixed Use Development	A development comprised of two or more different uses
MUD	Multi-Unit Dwellings comprise of a development with more than one dwelling. This ranges from dual occupancies and attached dwellings to high-rise residential developments
Mobile Garbage Bin(s) (MGB)	A waste container generally constructed of plastic with wheels with a capacity in litres of 120, 240, 360, 660, 1000 or 1100
MRV	Medium Rigid Vehicle described by AS 2890.2-2002 Parking facilities – Off-street commercial vehicle facilities
Onsite Collection	When the collection vehicle enters the property and services the development within the property boundary from a designated loading area
Owners Corporation	An organisation or group of persons that is identified by a particular name and acts, or may act, as an entity
WHS	Workplace Health and Safety
Wheel-in wheel-out service	A type of waste collection service offered by local councils where the council waste collection personnel enter the premises to collect the bins and returns them to the property
SRV	Small Rigid Vehicle described by AS 2890.2-2002 Parking facilities – Off-street commercial vehicle facilities

1.0 INTRODUCTION

Elephants Foot Recycling Solutions (EFRS) has been engaged to prepare the following waste management plan for the operational management of waste generated by the mixed-use development located at 164-170 Croatia Avenue, Edmondson Park NSW.

Waste management strategies and audits are required for new developments in order to support the design and sustainable performance of the building. It is EFRS's belief that a successful waste management strategy contains three key objectives:

i. ***Promote responsible source separation*** to reduce the amount of waste that goes to landfill by implementing convenient and efficient waste management systems.

ii. ***Ensure adequate waste provisions and robust procedures*** that will cater for potential changes during the operational phase of the development.

iii. ***Comply*** with all relevant council codes, policies, and guidelines.

To achieve these objectives, this operational waste management plan (OWMP) identifies the different waste streams likely to be generated during the operational phase of the development, as well as how the waste will be handled and disposed, details of bin sizes/quantities and waste rooms, descriptions of the proposed waste management equipment used, and information on waste collection points and frequencies.

It is essential that this OWMP is integrated into the overall management of the building and is clearly communicated to all relevant stakeholders.

1.1 SCOPE OF REPORT

This operational waste management plan (OWMP) only applies to the **operational** phase of the proposed development; therefore, the requirements outlined in this OWMP must be implemented during the operational phase of the site and may be subject to review upon further expansion of, and/or changes to the development.

The waste management of the **construction** and **demolition** phases of the development are not addressed in this report. A construction and demolition WMP will need to be provided separately. EFRS can supply this if required.

1.2 REPORT CONDITIONS

The purpose of this report is to document an OWMP as part of a development application, which is supplied by EFRS with the following limitations:

- Drawings, estimates and information contained in this OWMP have been prepared by analysing the information, plans and documents supplied by the client and third parties including Council and other government agencies. The assumptions based on the information contained in the OWMP is outside the control of EFRS,
- The figures presented in the report are an estimate only – the actual amount of waste generated will be dependent on the occupancy rate of the building/s and waste generation intensity as well as the building management's approach to educating residents and tenants regarding waste management operations and responsibilities,
- The building manager will adjust waste management operations as required based on actual waste volumes (e.g. if waste is greater than estimated) and increase the number of bins and collections accordingly,
- The report will not be used to determine or forecast operational costs or prepare any feasibility study or to document any safety or operational procedures,
- The report has been prepared with all due care; however no assurance is made that the OWMP reflects the actual outcome of the proposed waste facilities, services, and operations, and EFRS will not be liable for plans or results that are not suitable for purpose due to incorrect or unsuitable information or otherwise,
- EFRS offer no warranty or representation of accuracy or reliability of the OWMP unless specifically stated,
- Any manual handling equipment recommended in this OWMP should be provided at the recommendation of the appropriate equipment provider who will assess the correct equipment for supply,
- Design of waste management chute equipment and systems must be approved by the supplier,
- EFRS cannot be held accountable for late changes to the design after the OWMP has been submitted to Council,
- EFRS will provide specifications and recommendations on bin access and travel paths within the OWMP, however it is the architect's responsibility to ensure the architectural drawings meet these provisions,
- EFRS are not required to provide information on collection vehicle swept paths, head heights, internal manoeuvring or loading requirements. It is assumed this information will be provided by a traffic consultant,
- Council are subject to changing waste and recycling policies and requirements at their own discretion.

This OWMP is only finalised once the Draft Watermark has been removed. If the Draft Watermark is present, the information in the OWMP is not confirmed.

2.0 LEGISLATION & GUIDANCE

Waste management and resource recovery regulation in Australia is administered by the Australian Constitution, Commonwealth laws, and international agreements. State and territory governments maintain primary responsibility for controlling development and regulating waste. The following legislation has been enacted in New South Wales and provides the lawful underpinnings of this OWMP.

- NSW Environmental Planning & Assessment Act 1979
- NSW Protection of the Environment Operations Act 1997
- NSW Waste Avoidance & Resource Recovery Act 2001

At the local level, councils or Local Government Areas (LGAs) require OWMPs to be included in new development applications. This OWMP is specifically required by:

- Liverpool Development Control Plan 2008
- Liverpool Local Environmental Plan 2008

The primary purpose of a development control plan (DCP) is to guide development according to the aims of the corresponding local environmental plan (LEP). The DCP must be read in conjunction with the provisions of the relevant LEP.

Information provided in this OWMP comes from a wide range of waste management guidance at the local, state, and federal levels. The primary sources of guidance include:

- Liverpool Development Control Plan 2008
- NSW Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012
- NSW Better practice guide for resource recovery in residential developments 2019
- NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014-2021
- NSW Waste Classification Guidelines 2014
- Australia's National Waste Policy 2018

2.1 COUNCIL OBJECTIVES

Liverpool City Council recognises the potential environmental and human health impacts associated with waste generation, storage, and disposal. To mitigate these impacts, Council aims to:

- Minimise disposal of waste to landfill and recover resources to minimise depletion of natural resources.
- Ensure waste management for the end use of the development is designed to provide satisfactory amenity for occupants and provide appropriately designed collection systems.
- Minimise ongoing waste to landfill and maximise recycling of ongoing waste.

3.0 DEVELOPMENT OVERVIEW

The proposed development falls under the LGA of Liverpool City Council, and consists of residential and retail components including:

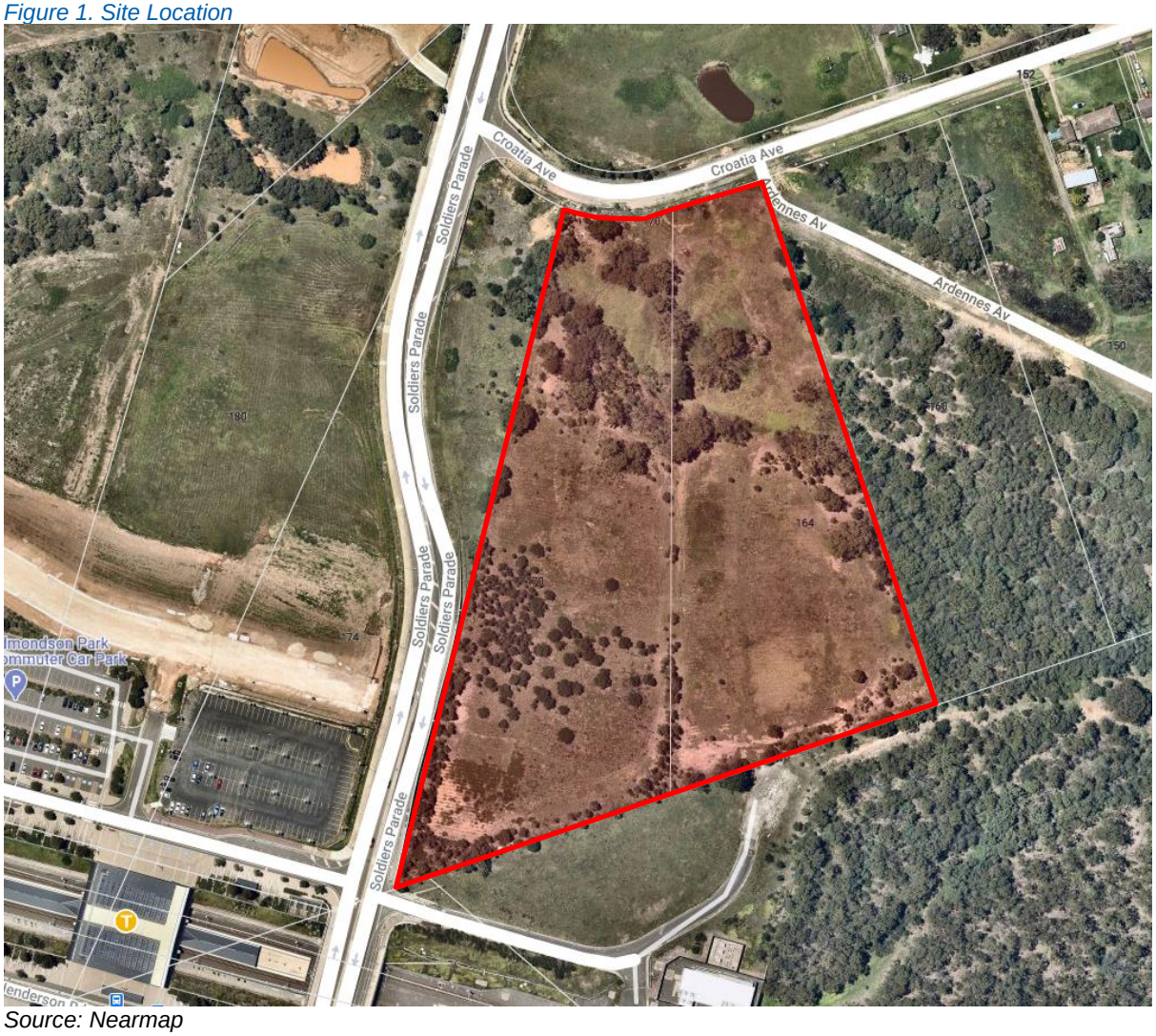
- 8 buildings with 1-2 cores
- 6-7 levels for each building
- Appx. 2100sqm of retail area

All figures and calculations are based on area schedules as advised by our client and shown on architectural drawings.

3.1 SITE LOCATION

The site is located at 164-170 Croatia Avenue, Edmondson Park NSW as shown in Figure 1. The site will have frontage to Soldier's Parade and local roads, with vehicle entryway access via Soldier's Parade and the proposed local roads.

Figure 1. Site Location



Source: Nearmap

4.0 RESIDENTIAL WASTE MANAGEMENT

The following section outlines best practice waste management for the residential component of the development, including waste generation estimates, and waste disposal and collection procedures.

4.1 WASTE GENERATION ESTIMATES

The Liverpool DCP has been referenced to calculate the total number of bins required for the residential units. Calculations are based on generic figures, and waste generation rates may differ according to the residents' actual waste management practice.

During operation, it is the responsibility of the building manager to monitor the number of bins required for the residential component. Waste and recycling volumes may change according to residents' attitudes to waste disposal and recycling, building occupancy levels or development's management. Any requirements for adjusting the capacity of the waste facilities can be achieved by changing the number of bins, the bin sizes or collection frequencies. Building management will be required to negotiate any changes to bins or collections with the collection service provider.

The following tables shows the estimated volume (L) of general waste and recyclables that will be generated by the residents of the buildings when it becomes operational. Note that an additional 660L MGB should be provided for the chute discharge for use during collection periods and is not included in the figures below.

4.1.1 BUILDING A

Table 1. Estimated Waste and Recycling Volumes – Bldg. A Residents

Core	# Units	Waste Generation Rate (L/unit/week)		Generated Waste (L/week)	Recycling Generation Rate (L/unit/week)		Generated Recyclables (L/week)
1	50	110		5500	110		5500
2	54	110		5940	110		5940
TOTAL	**104**			**11440**			**11440**
Collections		Waste Bin Size (L)		660	Recycling Bin Size (L)		660
		Waste Collections/Week		2	Recycling Collections/Week		2
		Bins Per Day	Waste Room A1	1.2	Bins Per Day	Waste Room A1	1.2
			Waste Room A2	1.3		Waste Room A2	1.3
		Bins Per Collection	Waste Room A1	**5**	Bins Per Collection	Waste Room A1	**5**
			Waste Room A2	**5**		Waste Room A2	**5**

BIN SUMMARY

Based on the estimated waste generated by the residents in the proposed development, recommended bin quantities and collection frequencies are as follows:

General Waste: 10 x 660L MGBs collected **2 x weekly**

Commingled Recyclables: 10 x 660L MGBs collected **2 x weekly**

4.1.2 BUILDING B

Table 2. Estimated Waste and Recycling Volumes – Bldg. B Residents

Core	# Units	Waste Generation Rate (L/unit/week)		Generated Waste (L/week)	Recycling Generation Rate (L/unit/week)		Generated Recyclables (L/week)
1	50	110		5500	110		5500
2	39	110		4290	110		4290
TOTAL	**89**			**9790**			**9790**
Collections		Waste Bin Size (L)		660	Recycling Bin Size (L)		660
		Waste Collections/Week		2	Recycling Collections/Week		2
		Bins Per Day	Waste Room B1	1.2	Bins Per Day	Waste Room B1	1.2
			Waste Room B2	0.9		Waste Room B2	0.9
		Bins Per Collection	Waste Room B1	**5**	Bins Per Collection	Waste Room B1	**5**
			Waste Room B2	**4**		Waste Room B2	**4**

BIN SUMMARY

Based on the estimated waste generated by the residents in the proposed development, recommended bin quantities and collection frequencies are as follows:

General Waste: 9 x 660L MGBs collected **2 x weekly**

Commingled Recyclables: 9 x 660L MGBs collected **2 x weekly**

4.1.3 BUILDING C

Table 3. Estimated Waste and Recycling Volumes – Bldg. C Residents

Core	# Units	Waste Generation Rate (L/unit/week)		Generated Waste (L/week)	Recycling Generation Rate (L/unit/week)		Generated Recyclables (L/week)
1	49	110		5390	110		5390
2	27	110		2970	110		2970
TOTAL	**76**			**8360**			**8360**
Collections		Waste Bin Size (L)		660	Recycling Bin Size (L)		660
		Waste Collections/Week		2	Recycling Collections/Week		2
		Bins Per Day	Waste Room C1	1.2	Bins Per Day	Waste Room C1	1.2
			Waste Room C2	0.6		Waste Room C2	0.6
		Bins Per Collection	Waste Room C1	**5**	Bins Per Collection	Waste Room C1	**5**
			Waste Room C2	**3**		Waste Room C2	**3**

BIN SUMMARY

Based on the estimated waste generated by the residents in the proposed development, recommended bin quantities and collection frequencies are as follows:

General Waste: 8 x 660L MGBs collected **2 x weekly**

Commingled Recyclables: 8 x 660L MGBs collected **2 x weekly**

4.1.4 BUILDING D

Table 4. Estimated Waste and Recycling Volumes – Bldg. D Residents

Core	# Units	Waste Generation Rate (L/unit/week)		Generated Waste (L/week)	Recycling Generation Rate (L/unit/week)		Generated Recyclables (L/week)
1	54	110		5940	110		5940
2	29	110		3190	110		3190
TOTAL	**83**			**9130**			**9130**
Collections		Waste Bin Size (L)		660	Recycling Bin Size (L)		660
		Waste Collections/Week		2	Recycling Collections/Week		2
		Bins Per Day	Waste Room D1	1.3	Bins Per Day	Waste Room D1	1.3
			Waste Room D2	0.7		Waste Room D2	0.7
		Bins Per Collection	Waste Room D1	**5**	Bins Per Collection	Waste Room D1	**5**
			Waste Room D2	**3**		Waste Room D2	**3**

BIN SUMMARY

Based on the estimated waste generated by the residents in the proposed development, recommended bin quantities and collection frequencies are as follows:

General Waste: 8 x 660L MGBs collected **2 x weekly**

Commingled Recyclables: 8 x 660L MGBs collected **2 x weekly**

4.1.5 BUILDING E

Table 5. Estimated Waste and Recycling Volumes – Bldg. E Residents

Core	# Units	Waste Generation Rate (L/unit/week)		Generated Waste (L/week)	Recycling Generation Rate (L/unit/week)		Generated Recyclables (L/week)
1	63	110		6930	110		6930
2	56	110		6160	110		6160
TOTAL	**119**			**13090**			**13090**
Collections		Waste Bin Size (L)		660	Recycling Bin Size (L)		660
		Waste Collections/Week		2	Recycling Collections/Week		2
		Bins Per Day	Waste Room E1	1.5	Bins Per Day	Waste Room E1	1.5
			Waste Room E2	1.3		Waste Room E2	1.3
		Bins Per Collection	Waste Room E1	**6**	Bins Per Collection	Waste Room E1	**6**
			Waste Room E2	**5**		Waste Room E2	**5**

BIN SUMMARY

Based on the estimated waste generated by the residents in the proposed development, recommended bin quantities and collection frequencies are as follows:

General Waste: 11 x 660L MGBs collected **2 x weekly**

Commingled Recyclables: 11 x 660L MGBs collected **2 x weekly**

4.1.6 BUILDING F

Table 6. Estimated Waste and Recycling Volumes – Bldg. F Residents

Core	# Units	Waste Generation Rate (L/unit/week)		Generated Waste (L/week)	Recycling Generation Rate (L/unit/week)		Generated Recyclables (L/week)
1	26	110		2860	110		2860
2	70	110		7700	110		7700
TOTAL	**96**			**10560**			**10560**
Collections		Waste Bin Size (L)		660	Recycling Bin Size (L)		660
		Waste Collections/Week		2	Recycling Collections/Week		2
		Bins Per Day	Waste Room F1	0.6	Bins Per Day	Waste Room F1	0.6
			Waste Room F2	1.7		Waste Room F2	1.7
		Bins Per Collection	Waste Room F1	**3**	Bins Per Collection	Waste Room F1	**3**
			Waste Room F2	**6**		Waste Room F2	**6**

BIN SUMMARY

Based on the estimated waste generated by the residents in the proposed development, recommended bin quantities and collection frequencies are as follows:

General Waste: 9 x 660L MGBs collected **2 x weekly**

Commingled Recyclables: 9 x 660L MGBs collected **2 x weekly**

4.1.7 BUILDING G

Table 7. Estimated Waste and Recycling Volumes – Bldg. G Residents

Core	# Units	Waste Generation Rate (L/unit/week)		Generated Waste (L/week)	Recycling Generation Rate (L/unit/week)		Generated Recyclables (L/week)
1	63	110		6930	110		6930
TOTAL	**63**			**6930**			**6930**
Collections		Waste Bin Size (L)		660	Recycling Bin Size (L)		660
		Waste Collections/Week		2	Recycling Collections/Week		2
		Bins Per Day	Waste Room G	**2**	Bins Per Day	Waste Room A	**2**
		Bins Per Collection	Waste Room G	**6**	Bins Per Collection	Waste Room A	**6**

BIN SUMMARY

Based on the estimated waste generated by the residents in the proposed development, recommended bin quantities and collection frequencies are as follows:

General Waste: 8 x 660L MGBs collected **2 x weekly**

Commingled Recyclables: 8 x 660L MGBs collected **2 x weekly**

4.1.8 BUILDING H

Table 8. Estimated Waste and Recycling Volumes – Bldg. H Residents

Core	# Units	Waste Generation Rate (L/unit/week)		Generated Waste (L/week)	Recycling Generation Rate (L/unit/week)		Generated Recyclables (L/week)
1	46	110		5060	110		5060
TOTAL	**46**			**5060**			**5060**
Collections		Waste Bin Size (L)		660	Recycling Bin Size (L)		660
		Waste Collections/Week		2	Recycling Collections/Week		2
		Bins Per Day	Waste Room H	**2**	Bins Per Day	Waste Room A	**2**
		Bins Per Collection	Waste Room H	**4**	Bins Per Collection	Waste Room A	**4**

BIN SUMMARY

Based on the estimated waste generated by the residents in the proposed development, recommended bin quantities and collection frequencies are as follows:

General Waste: 6 x 660L MGBs collected **2 x weekly**

Commingled Recyclables: 6 x 660L MGBs collected **2 x weekly**

4.2 WASTE DISPOSAL PROCEDURES

One single waste chute will be installed in the core of the building with residential access on each level. Residents will wrap or bag their general waste before placing in the chute. Bagged waste should not exceed 3kg in weight, or 35cm x 35cm x 35cm.

The general waste will discharge from the chute into 660L MGBs on a linear track system in Basement 2 (see APPENDIX A.1). General waste is not compacted.

Residents will be able to deposit their commingled recyclables into the 240L MGBs provided in the chute room on each level. Recyclables must not be bagged, and should be placed loosely in the designated bins. Residents' pathway to the chute and recycling bins is a maximum of 15m.

When filled, the building caretaker is responsible for transporting the 240L recycling bins to the chute discharge rooms on Basement 1 via the lift, and decanting into the 660L MGBs with a bin lifter. The 240L MGBs will then be returned to their respective floor to resume operational use.

4.3 WASTE COLLECTION PROCEDURES

Council will nominate a day for the twice weekly collection of general waste and twice weekly collection of recyclables. Prior to collection, the building caretaker will be responsible for transporting the 660L general waste and recycling bins from the chute discharge rooms to the dedicated waste collection rooms using a bin mover. The 660L service bin should be placed under the chute while the other general waste bins are being serviced.

On collection day, a Council collection vehicle will enter the site via the local roads and park in the designated loading bays on Basement 1. The driver will be able to access the bins from the residential waste rooms and decant them into the truck with the vehicle's rear-load mechanism. Once the bins are serviced, the driver will be able to reverse and exit the site in a forward direction onto the local roads.

It is the caretaker's responsibility to return the bins to the chute discharge rooms to resume operational use.

The caretaker will also ensure that the loading area is clear of any vehicles or obstructions prior to waste collection.

4.4 BULKY WASTE PROCEDURES

Residents will need to liaise with building management regarding the transportation of bulky items and the availability of the bulky waste storage areas. It is the caretaker's responsibility to arrange collection dates with Council and then coordinate with the residents.

On collection day, a Council collection vehicle will enter the site via the local roads and park in the designated loading bays on Basement 1. The driver will be able to access the bulky goods rooms and load the items into the vehicle. When complete, the driver will be able to reverse and exit the site in a forward direction onto the local roads.

The collection of bulky waste should occur on a different day from bin collections.

Refer to Council's website for acceptable items and other information regarding bulky waste collection.

4.5 COMMON AREAS

Residential common areas such as lobbies, amenities and circulation areas will be supplied with suitably branded waste and recycling bins where considered appropriate. These areas generate minimal waste, however general waste and recycling receptacles should be placed in convenient locations. Cleaning staff will be responsible for transporting the waste from these areas to the nearest chute discharge room via the lifts.

5.0 COMMERCIAL/RETAIL WASTE MANAGEMENT

The following section outlines best practice waste management for the commercial/retail components of the proposed development, including waste generation estimates, and waste disposal and collection procedures.

5.1 WASTE GENERATION ESTIMATES

The waste generation rates used in the following table are advised by the NSW *Better practice guide for resource recovery in residential developments 2019* and are used as a guideline to estimate the total bins required for the anticipated tenants.

Bin sizes, quantities, collection frequencies, and/or equipment must be reviewed and updated to manage the actual waste volumes generated by the tenancies when the development becomes operational.

Since the commercial/retail tenants are not known at this stage, the café waste and recycling generation rates have been applied since they represent moderate values. In addition, the estimated volumes are based on a 7-day operating week.

The following tables show the estimated volume (L) of general waste and recyclables that will be generated by the commercial and retail tenants.

5.1.1 BUILDINGS C&D

Table 9. Estimated Waste and Recycling Volumes – Bldgs. C&D Retail

Tenancy Type	Bldg	NLA m²	Waste Generation Rate (L/100m²/Day)	Generated Waste (L/Week)	Recycling Generation Rate (L/100m²/Day)	Generated Recyclables (L/Week)
Café	C&D	1011.5	100	7080.5	120	8496.6
TOTALS		**1012**		**7081**		**8497**
Collections			Bin Size (L)	1100	Bin Size (L)	1100
			Bins/Day	0.9	Bins/Day	1.1
			Collections/Wk	2	Collections/Wk	2
			Total Bins	**3.2**	Total Bins	**3.9**

BIN SUMMARY

Based on the estimated waste generated by the residents in the proposed development, recommended bin quantities and collection frequencies are as follows:

General Waste: 4 x 1100L MGBs collected **2 x weekly**

Paper/Cardboard Recycling: 3 x 1100L MGBs collected **2 x weekly**

Commingled Recyclables: 2 x 660L MGBs collected **2 x weekly**

5.1.2 BUILDINGS G&H

Table 10. Estimated Waste and Recycling Volumes – Bldgs. G&H Retail

Tenancy Type	Bldg	NLA m^2	Waste Generation Rate (L/100m^2/Day)	Generated Waste (L/Week)	Recycling Generation Rate (L/100m^2/Day)	Generated Recyclables (L/Week)
Café	G&H	1093.3	100	7653.1	120	9183.7
TOTALS		**1093**		**7653**		**9184**
Collections			Bin Size (L)	1100	Bin Size (L)	1100
			Bins/Day	1.0	Bins/Day	1.2
			Collections/Wk	2	Collections/Wk	2
			Total Bins	**3.5**	Total Bins	**4.2**

BIN SUMMARY

Based on the estimated waste generated by the residents in the proposed development, recommended bin quantities and collection frequencies are as follows:

General Waste: 4 x 1100L MGBs collected **2 x weekly**

Paper/Cardboard Recycling: 3 x 1100L MGBs collected **2 x weekly**

Commingled Recyclables: 2 x 660L MGBs collected **2 x weekly**

5.2 WASTE DISPOSAL PROCEDURES

Commercial and retail tenants will be responsible for storing their waste and recyclables back of house on a daily basis. General waste and recycling receptacles should be paired next to each other in convenient locations such as kitchens, desks, or dining areas.

On completion of each trading day or as required, nominated staff or contracted cleaners will use the lift to transport all general waste and recyclables to the Commercial/Retail Waste Room on Basement 1, and place into the appropriate receptacles (see APPENDIX A.1). Neither waste nor recyclables will be compacted.

5.3 WASTE COLLECTION PROCEDURES

A private waste collection contractor will be engaged to collect the commercial and retail general waste and recyclables on a regular basis. Prior to collection of Building C&D retail bins. The building caretaker will be responsible for transporting them to the loading area for collection. A bin moving device may be used.

On collection day, a private collection vehicle will enter the site via the local roads and park in the designated loading bays on Basement 1. The driver will be able to access the Building C&D bins from the loading area, and the Building G&H bins from the retail/commercial waste room. Once the bins are serviced, the driver will be able to reverse and exit the site in a forward direction onto the local roads.

5.4 OTHER WASTE MANAGEMENT CONSIDERATIONS

Based on the types of tenancies anticipated for this development, the following waste management practices are recommended.

5.4.1 KITCHEN, OFFICE TEA ROOMS AND FOOD PREPARATION AREAS

Any food preparation area, including kitchens and office tea rooms will be provided with dedicated source separation bins including a general waste bin, paper recycling bin, and commingled recycling bin. Cleaners or nominated staff will be responsible for monitoring these bins and emptying them as required.

5.4.2 BATHROOMS

Washroom facilities should be supplied with collection bins for paper towels (if used). Sanitary bins for female restroom facilities must also be arranged with an appropriate contractor.

5.4.3 PRINTING & PHOTOCOPYING ROOMS

It is recommended that printing rooms and photocopying rooms are supplied with bins for the collection of paper, as well as separate receptacles for ink toner cartridges for recycling. The cleaners or nominated staff are responsible for monitoring these bins and ensuring the items are collected and recycled by an appropriate contractor.

5.4.4 LIQUID WASTE

Liquid wastes such cleaning products, chemicals, paints, and cooking oil, etc., will be stored in a secure space that is bunded and drained to a grease trap in accordance with State government authorities and legislation.

5.4.5 PROBLEM WASTE

The building manager is responsible for making arrangements for the disposal and recycling of problem waste streams with an appropriate contractor. Problem wastes cannot be placed in general waste as they can have adverse impacts to human health and the environment if disposed of in landfill. Retail and commercial tenants will need to liaise with the building manager when disposing of problem waste streams.

Problem waste streams include:

- Chemical Waste
- Liquid wastes
- Toner cartridges
- Lightbulbs
- eWaste
- Batteries

6.0 STAKEHOLDER ROLES & RESPONSIBILITIES

The following table demonstrates the primary roles and responsibilities of the respective stakeholders:

Table 11. Stakeholder Roles and Responsibilities

Roles	Responsibilities
Strata or Management	• Ensuring that all waste service providers submit monthly reports on all equipment movements and waste quantities/weights; • Organising internal waste audits/visual assessments on a regular basis; and • Managing any non-compliances/complaints reported through waste audits.
Building Manager or Waste Caretaker	• Maintaining and cleaning chute doors on each level; • Coordinating general waste and recycling collections; • Cleaning and transporting bins as required; • Organising replacement or maintenance requirements for bins; • Organising, maintaining and cleaning the waste holding area; • Organising bulky goods collection when required • Investigating and ensuring prompt clean-up of illegally dumped waste materials. • Preventing storm water pollution by taking necessary precautions (securing bin rooms, preventing overfilling of bins) • Abiding by all relevant WH&S legislation, regulations, and guidelines; • Providing staff/contractors with equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management; • Assessing any manual handling risks and preparing a manual handling control plan for waste and bin transfers; • Ensuring site safety for residents, children, visitors, staff and contractors; and • Ensuring effective signage, communication and education is provided to occupants, tenants, maintenance staff, and cleaning contractors.
Residents	• Dispose of all general waste and recycling in the allocated waste chutes; • Ensure adequate separation of general waste and recycling; and • Compliance with the provisions of Council and the OWMP.
Waste Collection Contractor	• Provide a reliable and appropriate waste collection service; • Provide feedback to building managers/residents regarding contamination of recyclables; and • Work with building managers to customise waste systems where possible.
Gardening/Landscaping Contractor	• Removal of all garden organic waste generated during gardening maintenance activities for recycling at an offsite location.
Building Contractors	• Removing all construction related waste offsite in a manner that meets all authority requirements.

7.0 SOURCE SEPARATION

Better practice waste management includes the avoidance, reuse, and recovery of unwanted items, which can be achieved through source separation. The table below outlines what is typically included in various waste streams and how they can be managed. Refer to your local council for a list of accepted materials. Planet Ark can be accessed online to find other facilities that recover unwanted items.

Table 12. Operational Waste Streams

Waste Stream	Description	Typical Destination	Waste Stream Management
General Waste	The remaining portion of the waste stream that is not recovered for re-use, processing, or recycling. May include soft plastics, food scraps, polystyrene, etc.	Landfill	Waste should be bagged before placing in chutes, or in designated waste bins.
Paper and Cardboard Recyclables	Cardboard and paper products are recyclable materials that can be re-processed into new products.	Resource Recovery Centre	Cardboard should be flattened before placing in the designated recycling bin.
Commingled Recyclables	A mixture of items that are commonly recycled usually segregated through a MRF. Typically include food and beverage containers (e.g. aluminium, glass, steel, hard plastics, cartons).	Materials Recovery Facility (MRF)	Commingled recyclables must not be bagged, and instead should be placed loosely in the chute.
Green Waste	Green waste consists of unwanted organic materials that are easily biodegradable and/or compostable (e.g. lawn clippings, branches)	Resource Recovery Centre	Green waste will be collected by a private contractor and removed from site.
Food Waste	Food waste consists of unwanted or uneaten kitchen scraps that are easily compostable/biodegradable (e.g. vegetable peels, fruit rinds, coffee grounds).	Composting facility or Landfill	Food waste can be composted on-site, off-site, or else included in the general waste stream.
Electronic Waste	Discarded e-waste, electronic components and materials such as computers, mobile phones, keyboards, etc.	Resource Recovery Centre	Building manager arranges collection for e-waste recycling as needed by residents.
Bulky Items	Items that are to too large to place into general rubbish collection. This includes disused and/or broken furniture, mattresses, white goods, etc.	Resource Recovery Centre or Landfill	Residents liaise with building manager to store large unwanted items in Bulky Waste Room. Building manager arranges with Council for removal. Tenants arrange for removal of their bulky waste with assistance from caretaker.
Other	Other recyclable items that require special recovery may include ink cartridges, batteries, chemical waste, fluorescent tubes, etc.	Resource Recovery Facility	Building manager arranges collection by appropriate recycling services when required.

8.0 EDUCATION

Educational materials encouraging correct separation of general waste and recyclables must be provided to each resident and tenant. This should include the correct disposal process for bulky waste such as old furniture, large discarded items, and other materials including electronic and chemical wastes. It is recommended that the building caretaker provides information in multiple languages to support correct behaviours, and to minimise the possibility of chute blockages and contamination in communal waste bins.

Education and communication must be provided consistently on a regular basis to encourage behaviour change and account for transient building personnel such as new residents, building staff, or contracted cleaners. It is also recommended that the owners' corporation website contain information for residents' referral regarding use of the chute. Information should include:

- Directions on using the chute doors;
- Descriptions of items accepted in the recycling and general waste streams (refer to Council guidance);
- How to dispose of bulky goods and any other items that are not general waste or recycling (refer to Council guidance);
- Residents' & tenants' obligations to health and safety as well as building management; and
- How to prevent damage or blockages to the chute (example below).

To prevent damage or blockage to rubbish chute DO NOT dispose of any umbrellas, bedding, cigarettes, cartons, coat hangers, brooms, mops, large plastic wrappings from furniture, white goods, any sharp objects, hot liquid or ashes, oil, unwrapped vacuum dust, syringes, paint and solvents, car parts, bike parts, chemicals, corrosive and flammable items, soil, timber, furniture, bricks or other building materials down the chute.

8.1 SIGNAGE

Signage and education are essential components to support best practice waste management including resource recovery, source separation, and diversion of waste from landfill.

Signage should include:

- Clear and correctly labelled waste and recycling bins,
- Instructions for separating and disposing of waste items. Different languages should be considered,
- Locations of, and directions to, the waste storage areas with directional signs, arrows, or lines,
- The identification of all hazards or potential dangers associated with the waste facilities, and
- Emergency contact information should there be issues with the waste systems or services in the building.

The building manager is responsible for waste room signage including safety signage (see APPENDIX C.2). Appropriate signage must be prominently displayed on doors, walls and above all bins, clearly stating what type of waste or recyclables is to be placed in each bin.

All chute doors on all residential levels will be labelled with signs directing chute operations and use of chute door.

All signage should conform to the relevant Australian Standards.

8.2 POLLUTION PREVENTION

Building management shall be responsible for the following to minimise dispersion of site litter and prevent stormwater pollution to avoid impact to the environment and local amenity:

- Promoting adequate waste disposal into the bins
- Securing all bin rooms (whilst affording access to staff/contractors)
- Prevent overfilling of bins, keep all bin lids closed and bungs leak-free
- Taking action to prevent dumping or unauthorised use of waste areas
- Require collection contractor/s to clean up any spillage when clearing bins

9.0 EQUIPMENT SUMMARY

Table 13. Equipment Summary

Component	Part	Qty	Notes
Chutes	Single waste chute	14	See APPENDIX B.1
Equipment A	2-bin 660L linear track system	14	See APPENDIX B.2
Equipment B	Bin lifter	14	See APPENDIX B.3
Equipment C	Suitable Bin Moving Equipment	5	See APPENDIX C.4

10.0 WASTE ROOMS

The areas allocated for waste storage and collection areas are detailed in the table below and are estimates only. Final areas will depend on room and bin layouts.

Table 14. Residential Waste Room Areas

Bldg.	Waste Room Type	Equipment	Bins	Estimated Area Required (m^2)	Actual Area Provided (m^2)
A	Core 1 Chute Room	2-bin 660L Linear Track Bin lifter	5 x 660L MGBs for general waste 5 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	35	35.4
	Core 2 Chute Room	2-bin 660L Linear Track Bin lifter	5 x 660L MGBs for general waste 5 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	35	37.3
	Bldg A&B Waste Collection Room	Bin mover	19 x 660L MGBs for general waste 19 x 660L MGBs for commingled recyclables	65	66
	Bldg A&B Bulky Goods Room	NA	Bulky cardboard bins as needed	73	73.4
B	Core 1 Chute Room	2-bin 660L Linear Track Bin lifter	5 x 660L MGBs for general waste 5 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	35	35.9
	Core 2 Chute Room	2-bin 660L Linear Track Bin lifter	4 x 660L MGBs for general waste 4 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	30	30.5
C	Core 1 Chute Room	2-bin 660L Linear Track Bin lifter	5 x 660L MGBs for general waste 5 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	35	35.4
	Core 2 Chute Room	2-bin 660L Linear Track Bin lifter	3 x 660L MGBs for general waste 3 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	25	25.2
D	Core 1 Chute Room	2-bin 660L Linear Track Bin lifter	5 x 660L MGBs for general waste 5 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	35	27.2

	Core 2 Chute Room	2-bin 660L Linear Track Bin lifter	3 x 660L MGBs for general waste 3 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	25	27.8
	Bldg C&D Waste Collection Room	Bin Mover	16 x 660L MGBs for general waste 16 x 660L MGBs for commingled recyclables	55	55.1
	Bldg C&D Bulky Goods Room	NA	Bulky cardboard bins as needed	59	59.3
E	Core 1 Chute Room	2-bin 660L Linear Track Bin lifter	6 x 660L MGBs for general waste 6 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	40	49.4
	Core 2 Chute Room	2-bin 660L Linear Track Bin lifter	5 x 660L MGBs for general waste 5 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	35	35
	Waste Collection Room	Bin mover	11 x 660L MGBs for general waste 11 x 660L MGBs for commingled recyclables	38	38.5
	Bulky Goods	NA	Bulky cardboard bins as needed	43	52.3
F	Core 1 Chute Room	2-bin 660L Linear Track Bin lifter	3 x 660L MGBs for general waste 3 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	25	39.7
	Core 2 Chute Room	2-bin 660L Linear Track Bin lifter	6 x 660L MGBs for general waste 6 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	40	40.3
	Waste Collection Room	Bin mover	9 x 660L MGBs for general waste 9 x 660L MGBs for commingled recyclables	30	36.4
	Bulky Goods	NA	Bulky cardboard bins as needed	34	35.4
G	Core 1 Chute Room	2-bin 660L Linear Track Bin lifter	6 x 660L MGBs for general waste 6 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	40	41
	Bldg G&H Waste Collection Room	Bin mover	10 x 660L MGBs for general waste 10 x 660L MGBs for commingled recyclables	35	50.4
	Bldg G&H Bulky Goods Room	NA	Bulky cardboard bins as needed	39	39.3
H	Core 1 Chute Room	2-bin 660L Linear Track Bin lifter	4 x 660L MGBs for general waste 4 x 660L MGBs for commingled recyclables 1 x 660L MGB chute service bin	30	41.8

Table 15. Commercial/Retail Waste Room Areas

Bldg.	Level	Waste Room Type	Bins/Equipment	Estimated Area Required (m^2)	Actual Area Provided (m^2)
C&D	B1	Retail Waste Room	4 x 1100L MGBs for general waste 3 x 1100L MGBs for commingled recyclables	25	25
G&H	B1	Retail Waste Room	4 x 1100L MGBs for general waste 3 x 1100L MGBs for commingled recyclables	25	59.4

EFRS recommends these bins/sizes/collection frequencies and/or equipment for best practice waste management at this site, however EFRS also acknowledges there are a range of other suitable options that may alter waste room requirements (e.g., floor area, accessibility, head height, etc.).

The waste room areas have been calculated based on equipment requirements and/or bin dimensions with an additional 70% of bin GFA factored in for manoeuvrability. The Waste Collection Area is calculated based on equipment requirements and/or bin dimensions with an additional 30% of bin GFA factored in for manoeuvrability, per the Better Practice Guidelines.

All doorways and passageways must be wide enough to easily facilitate the movement of bins and/or bulky waste items (e.g., 1500mm). The following table provides further waste room requirements.

Table 16. Waste Room Requirements

Waste Room Type	Waste Room Requirements
Chute Discharge Room	• Ceiling clearance height must be a minimum of 3000mm • The chute penetration must have a minimum 500mm clearance of any service pipes or other overhead obstacles • All waste discharge points should be caged off to ensure the safety of any personnel accessing the waste room • 200mm clearance is required around compaction equipment • Where a chute offset is required, the angle of the offset must not exceed 45 degrees
Bulky Goods Waste Storage Room	• May be a dedicated room or screened area within another waste room • Must be in close proximity to the collection area • Area must also be allocated for the segregation of e-waste, gas bottles, cardboard, etc.
Retail/Commercial Waste Room	• In order to ensure staff safety, all bins should be arranged so they can be accessed without moving another bin

10.1 CONSTRUCTION REQUIREMENTS

Waste room construction must comply with the minimum standards as outlined in the Council's DCP, in order to minimise odours, deter vermin, protect surrounding areas, and make it a user-friendly and safe area.

The *NSW Better practice guide for resource recovery in residential developments (2019)* also states that better practice bin storage areas should achieve more than the minimum compliance requirements, which are as follows:

- Ensuring BCA compliance, including ventilation. Where required, ventilation system must comply with AS1668.4-2012 The use of ventilation and air conditioning in buildings.
- Ensuring storage areas are well lit (sensor lighting preferred) and have lighting available 24 hours a day.
- Provision of bin washing facilities, including taps for hot and cold water provided through a centralised mixing valve. The taps must be protected from bins and be located where they can be easily accessed even when the area is at bin capacity.
- Floor constructed of concrete at least 75mm thick.
- Floor graded so that any water is directed to a sewer authority approved drainage connection to ensure washing bins and/or waste storage areas do not discharge flow into the stormwater drain.
- Provision of smooth, cleanable and durable floor and wall surfaces that extend up the wall to a height equivalent to any bins held in the area.
- Ensuring ceilings are finished with a smooth-faced non-absorbent material capable of being cleaned.
- All surfaces (walls, ceiling and floors) finished in a light colour.

ADDITIONAL CONSIDERATIONS

- Waste room floor to be sealed with a two-pack epoxy;
- All corners coved and sealed 100mm up, this is to eliminate build-up of dirt;
- Tap height and light switch height of 1.6m;
- Storm water access preventatives (grate);
- All walls painted with light colour and washable paint;
- Equipment electric outlets to be installed 1700mm above finished floor level;
- The room must be mechanically ventilated;
- Optional automatic odour and pest control system installed
- If 660L or 1100L bins are utilised, 2 x 820mm (minimum) double-doors must be used;
- All personnel doors are hinged, lockable and self-closing;
- Conform to the Building Code of Australia, Australian standards and local laws; and
- Childproofing and public/operator safety shall be assessed and ensured
- Waste and recycling rooms must have their own exhaust ventilation system either;
    - Mechanically - exhausting at a rate of 5L/m² floor area, with a minimum rate of 100L/s minimum. Mechanical exhaust systems shall comply with AS1668.4.2012 and not cause any inconvenience, noise or odour problem. Or,
    - Naturally - permanent, unobstructed, and opening direct to the external air, not less than one-twentieth (1/20) of the floor area.

USEFUL CONTACTS

EFRS does not warrant or make representation for goods or services provided by suppliers.

LOCAL COUNCIL

Council Customer Service	Ph: (02) 8711 7000	E: lcc@liverpool.nsw.gov.au

PRIVATE WASTE COLLECTION PROVIDER

Capital City Waste Services	Ph: 02 9599 9999	E: service@ccws.net.au
Remondis	Ph: 02 9032 7100	
Suez Environmental	Ph: 13 13 35	
Wastewise NSW	Ph: 1300 550 408	E: admin@wastewise.com.au

BIN MOVING DEVICE SUPPLIERS

Electrodrive	Ph: 1800 333 002	E: sales@electrodrive.com.au
Sitecraft	Ph: 1300 363 152	E: sales@sitecraft.com.au
Spacepac	Ph: 1300 763 444	

ORGANIC DIGESTERS AND DEHYDRATORS

Closed Loop	Ph: 1300 762 166	
Orca		E: contact.australia@feedtheorca.com
Soil Food	Ph: 1300 556 628	
Waste Master	Ph: 1800 614 272	E: hello@wastemasterpacific.com.au

COOKING OIL CONTAINERS AND DISPOSAL

Auscol	Ph: 1800 629 476	E: sales@auscol.com

ODOUR CONTROL

Purifying Solutions	Ph: 1300 636 877	E: sales@purifyingsolutions.com.au

SOURCE SPERATION BINS

Source Separation Systems	Ph: 1300 739 913	E: info@sourceseparationsystems.com.au

MOBILE GARBAGE BINS, BULK BINS AND BIN EQUIPMENT

SULO	Ph: 1300 364 388	E: sales@sulo.com.au
OTTO Australia	Ph: 02 9153 6999	

CHUTES, COMPACTORS AND EDIVERTER SYSTEMS

Elephants Foot Recycling Solutions	Ph: 1800 025 073	E: info@elephantsfoot.com.au

APPENDIX A: ARCHITECTURAL PLANS

APPENDIX A.1 BASEMENT 1

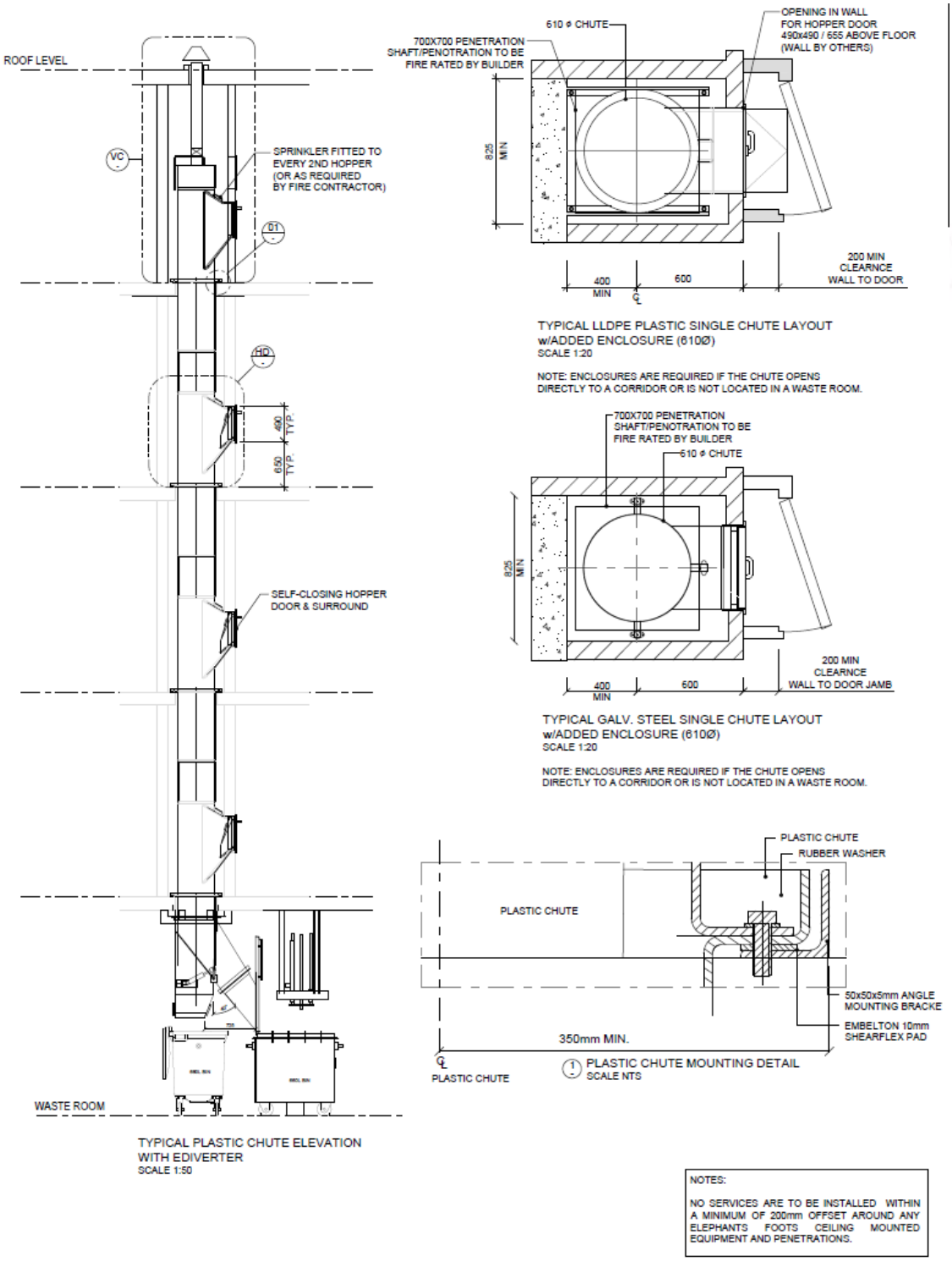
Dwg No. CP002, Rev. C, Issued Feb 2021

APPENDIX A.2 GROUND LEVEL

Dwg No. CP003, Rev E, Feb 2021

APPENDIX B: INSTALLATION EQUIPMENT

APPENDIX B.1 TYPICAL CHUTE SPECIFICATIONS



Example only. Refer to supplier's information and specification.

APPENDIX B.2 TYPICAL LINEAR TRACK SYSTEM

660 LITRE LINEAR TRACK SYSTEM

PRODUCT INFORMATION

Elephants Foot 660 Litre bin Linear Track System is a versatile waste handling solution for many types of multi-storey or multi-level developments. The Linear Track System collects waste or recycling being disposed from the floors above through the chute system, discharging the material via a hopper that feeds the bins. Electromechanically driven with automated operation, the system utilises linear motion to automatically change over full bins. Once all the bins are filled, an indicator light will illuminate signifying that the bins are ready for withdrawal and collection. Available with or without compaction unit, our standard 660 litre bin Linear Track System is available in standard 2 or 3. Our 4 Bin option is available as a special order.

SPECIFICATIONS

System Control	Electric PLC
Power Supply	415 V AC / 10A / 5 PIN
Motor Size (kW)	0.55
Maximum bin load	265 kg
Noise (dBA)	<85
Bin Size (L)	660
Cycle time (sec)	60
Bin Quantity options	2, 3, or 4

OPTIONAL EXTRAS

- Compaction unit – Please refer to the bin compactor product information sheet for details and specifications
- Enhanced safety add on's – Interlocking barriers, occupancy sensors or safety light curtains (presence sensing light barriers)
- Full bin SMS and email notification
- CMMS and BMS integration
- Extend warranty – Terms and conditions apply

STANDARD FEATURES & BENEFITS

- Simple operation with user friendly controls
- Increased waste servicing efficiency for the development
- Automatic system control with manual override
- Robust unit construction for long performance life
- Low service and maintain costs
- Rotating flashing beacon (activated during operation)
- Quiet and efficient system operation
- Maximise safety for residents, caretakers and collectors
- Restrained design with minimal moving parts
- Can suit low ceiling clearances
- Floor contact components fully galvanised steel
- Retro fitting options to suit other chutes systems
- Compliant with relevant Building Codes and Standards
- Standard 12 month warranty

Example only. Refer to supplier's information and specification.

APPENDIX B.3 EXAMPLE BIN LIFTER

120-240 Litre Binlifter

The single bin lifter is designed to safely empty wheelie bins into large dumpsters and compactors. With easy operating push button instructions, the bin lifter is complemented by a safety cage.

Features	120-240 litre bin lifter
Lifting capacity	140 kg
Bin compatibility	120 & 240 litre bins
Operation method	Automatic
Hydraulic	yes
Dimensions	850mm (W) x 1800mm (L)
Safety	Safety cage & control box
Emergency stop	yes
Tipping height	1350mm variable
Clearance	2650mm
Suitability in tipping into	bins , dumpsters and compactors
Power	240 volt, 10amp
Can it be customised?	yes
Weighing & data capture	no

Example only. Refer to supplier's information and specification.

APPENDIX C: PRIMARY WASTE MANAGEMENT PROVISIONS

APPENDIX C.1 TYPICAL BIN SPECIFICATIONS

Mobile bins

Mobile bins come in a variety of sizes and are designed for lifting and emptying by purpose-built equipment.

Mobile bins with capacities of up to 1700L must comply with *AS4123.6-2006 Mobile waste containers* which specifies standard sizes and sets out the colour designations for the bodies and lids of mobile waste containers indicating the type of materials they are used to collect.

The most common bin sizes are provided below, although not all sizes are shown. The dimensions are a guide only and differ slightly between manufacturers. Some bins have flat or domed lids and are used with different lifting devices. Refer to *AS4123.6-2006* for further details.

Table G1.1: Average dimension ranges for two-wheel mobile bins

Wheelie bin

Bin capacity	80L	120L		140L		240L	360L
Height (mm)	870	940	1065	1080	1100		
Depth (mm)	530	530		540		735	820
Width (mm)	450	485		500		580	600
Approximate footprint (m^2)	0.24	0.26–0.33		0.27-0.33		0.41–0.43	0.49
Approximate weight (kg)	8.5	9.5		10.4		15.5	23
Approximate maximum load (kg)	32	48		56		96	Not known

Sources include Sulo, Single Waste, Cleanaway, SUEZ, just wheelie bins and Perth Waste for two-wheel mobile bins

Table G1.2: Average dimension ranges for four-wheel bulk bins

Dome or flat lid container

Bin capacity	660L	770L	1100L	1300L	1700L
Height (mm)	1250	1425	1470	1480	1470
Depth (mm)	850	1100	1245	1250	1250
Width (mm)	1370	1370	1370	1770	1770
Approx footprint (m^2)	0.86–1.16	1.51	1.33–1.74	2.21	2.21
Approx weight (kg)	45	Not known	65	Not known	Not known
Approx maximum load (kg)	310	Not known	440	Not known	Not known

Sources include Sulo, Signal Waste, Cleanaway, SUEZ, Just Wheelie Bins and Perth Waste

SOURCE: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

APPENDIX C.2 SIGNAGE FOR WASTE & RECYCLING BINS

Waste signs

Signs and educational materials perform several functions including:

- informing residents why it is important to recover resources and protect the environment
- providing clear instructions on how to use the bins and services provided
- alerting people to any dangers or hazards within the bin storage areas.

All waste, recycling and organic bins should be Australian Standard colours and clearly and correctly labelled, such as by a sticker on the lid and/or the body of the bin.

Communal bin storage areas should be clearly signposted with signs outlining how to correctly separate waste into the bins provided. The local council responsible for waste services may be a good source of signs and posters and can advise on what signs are suitable.

Information on who to contact to find out more about the recycling and/or other resource recovery services in the building should also be displayed in communal areas, such as on a noticeboard.

The Planet Ark website also has resources available free of charge for use by businesses and councils. These signs can be found at businessrecycling.com.au/research/signage.cfm

Figure I1.1: Examples of waste wall posters (EPA supplied)

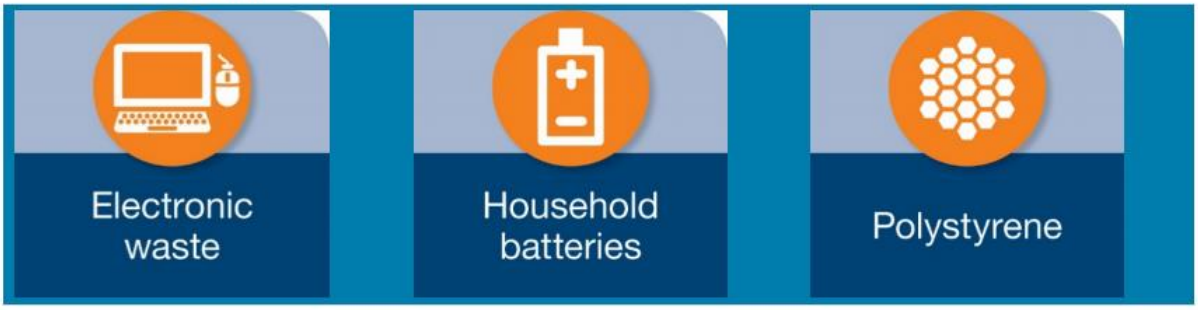
Figure I1.2: Examples of bin lid stickers (EPA supplied)

SOURCE: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

Problem waste signs

The EPA has also produced a range of images and signs that can be used for problem wastes, such as fluoro globes and tubes, household and car batteries, e-waste and smoke detectors. To access these resources, contact the NSW EPA. Some examples are shown below.

Figure I2.1: Problem waste signs



Safety signs

The use of safety signs for waste resource recovery rooms must comply with *AS1319 Safety signs for occupational environments*. Safety signs must be used to regulate and control safety related to behaviour, warn of hazards and provide emergency information, including fire protection information. Suitable signs should be decided for each development as required.

Figure I3.1: Example safety signs

SOURCE: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

APPENDIX C.3 TYPICAL COLLECTION VEHICLE INFORMATION

General

Appropriate heavy rigid vehicle standards should be incorporated into the road and street designs in new developments where onsite collections are proposed. Road and street designs must comply with relevant Acts, regulations, guidelines, and codes administered by Austroads, Standards Australia, NSW Roads and Maritime Services, WorkSafe NSW and any local council traffic requirements.

Applicants and building designers should consult with councils and other relevant authorities before designing new roads or streets and access points for waste collection vehicles to establish specific design requirements.

Table H4.1: Australian Standards for turning circles for medium and heavy rigid class vehicles

Vehicle class	Overall length (m)	Design width (m)	Design turning radius (m)	Swept circle (m)	Clearance (travel) height (m)
Medium rigid vehicle	8.80	2.5	10.0	21.6	4.5
Heavy rigid vehicle	12.5	2.5	12.5	27.8	4.5

SOURCE: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

Large collection vehicles

Waste collection vehicles may be side-loading, rear-loading, front-lift-loading, hook or crane lift trucks. Vehicle dimensions vary by collection service, manufacturer, make and model. It is not possible to provide definitive dimensions, so architects and developers should consult with the local council and/or contractors.

The following characteristics represent typical collection vehicles and are provided for guidance only. Reference to *AS2890.2 Parking facilities: off-street commercial vehicle facilities* for detailed requirements, including vehicle dimensions, is recommended.

Table B2.1: Collection vehicle dimensions

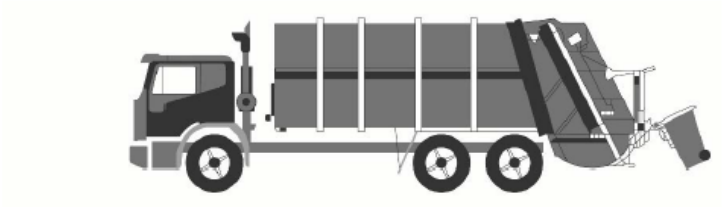
Vehicle type	Rear-loading	Side-loading*	Front-lift-loading	Hook truck	Crane truck
Length overall (m)	10.5	9.6	11.8	10.0	10.0
Width overall (m)	2.5	2.5	2.5	3.0	2.5
Travel height (m)	3.9	3.6	4.8	4.7	3.8
Operational height for loading (m)	3.9	4.2	6.5	3.0	8.75
Vehicle tare weight (t)	13.1	11.8	16.7	13.0	13.0
Maximum payload (t)	10.0	10.8	11.0	14.5	9.5
Turning circle (m)	25.0	21.4	25.0	25.0	18

* The maximum reach of a side arm is 3 m.

Sources: JJ Richards, SUEZ, MacDonald Johnson, Cleanaway, Garwood, Ros Roca, Bingo and Edbro. Figures shown represent the maximum dimensions for each vehicle type.

Rear-loading collection vehicles

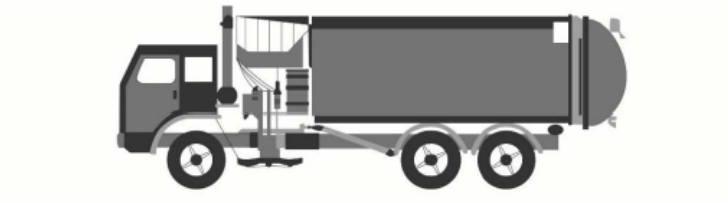
These vehicles are commonly used for domestic waste collections from MUDs and RFBs and sometimes for recycling. They can be used to collect waste stored in mobile bins or bulk bins, particularly where bins are not presented at the kerbside. They are also used for collecting bulky waste.



Rear-loading waste collection vehicle

Side-loading collection vehicles

This is the most commonly used vehicle for domestic waste, recycling and organics collections. It is only suitable for collecting mobile bins up to 360L in capacity.



Side-loading waste collection vehicle

Front-lift-loading collection vehicles

These vehicles are commonly used for collecting commercial and industrial waste. They can only collect specially designed front-lift bulk bins and not mobile bins.

Front-lift-loading waste collection vehicle

Small collection vehicles

Typically, councils and their contractors operate with large collection vehicles (heavy rigid class vehicles) because they carry greater payloads and allow for more cost-effective collection services. Some councils, or their contractors, may have smaller collection vehicles in their fleet. Early discussion with the council is important to confirm this, but it should not be assumed that the council will have access to small collection vehicles.

The waste management systems and the location of the collection point should always be designed so that the council can provide the standard domestic waste service.

SOURCE: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

APPENDIX C.4 TYPICAL BIN MOVERS

Battery powered tug with a 1 or 2 tonne tow capacity

Features at a glance

One tonne (Evo 1T) or two tonne (Evo 2T) tow capacity
Auto latching hitch
Three speed motor with emergency stop

Typical applications

The Tug Evo is suitable for airports, factories, warehouses, apartment buildings or large facilities. This powered tug is also suitable for transporting medical carts around hospitals or moving heavy specialist equipment.

Features:

- 1 or 2 tonne tow capacity of inclines up to 6 degrees
- 500kg tow capacity if inclines up to 14 degrees
- CE Compliant
- 5 km/h max speed
- 2 x 12V 42Ah MK-gel batteries with 24V smart charger.
- Powerful transaxle

Safety Features:

- Intuitive control with standard automatic safety brake, forward and reverse drive.
- Emergency stop button.

Emergency back-off button

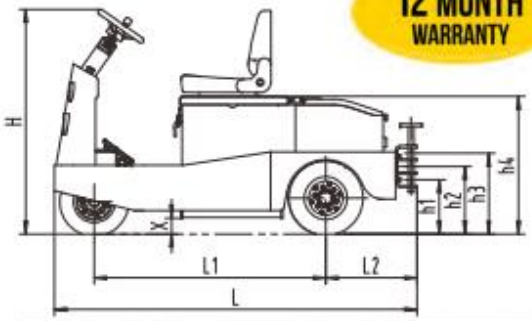
Source: http://electrodrive.com.au/products/tugs/tug-evo.aspx

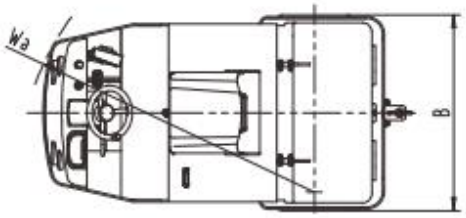
SITECRAFT
MATERIALS HANDLING EQUIPMENT
17 Macquarie Drive, Thomastown, VIC 3074
Phone: 1300 363 152 Fax: 1300 722 383
E: sales@sitecraft.com.au ABN: 36 423 328 526

SITECRAFT HEAVY DUTY ELECTRIC TOW TRACTOR

- Towing capacities from 2000 kg to 6,000 kg
- **Full AC electric system** has a brake-releasing function, making the unit easy and effortless to operate; The maintenance-free motor completely solves the issues of DC motor carbon brush.
- Batteries located in the lowest part of frame ensures excellent stability
- Quick open back service cover for easy maintenance and part replacement
- CANbus technology reduces wiring complexity and increases reliability
- H type axle design provides excellent stability
- New high-range steering design; light steering and easy to maintain.
- New large-screen instrument display provides information clearly and directly to the operator.

12 MONTH WARRANTY





Model		ST-2000AC	ST-3000AC	ST-5000AC	ST-6000AC
Towing Capacity	Kg	2000	3000	5000	6000
Drawbar Centre Height	h1/h2/h3 mm	280/350/420	280/350/420	280/350/420	280/350/420
Motor	Kw / V	3Kw / 36V	3Kw / 36V	5Kw / 48V	5Kw / 48V
Total Size	L x B x H mm	1720 x 968 x 1270	1720 x 968 x 1270	1975 x 1100 x 1270	1975 x 1100 x 1270
Total Weight (With Batteries)	Kg	740	780	1240	1280
Wheel Size	Solid Rubber	15*4-8	15*4-8	15*4-8	15*4-8
Wheelbase	L1 mm	1055	1055	1280	1280
Rear Hanging Distance	L2 mm	382	382	500	500
Seat Height	h4 mm	910	910	910	910
Ground Clearance	X mm	90	90	90	90
Turning Radius	Wa mm	1500	1500	1650	1650
Maximum Speed	Km/h	10	8	14	12
Battery	V/Ah	36/200	36/250	48/360	48/400
Battery Weight	Kg	200	250	610	650
Charger	On-board V/Ah	36/30	36/30	48/50	48/50

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SITECRAFT HEAVY DUTY ELECTRIC TOW TRACTOR

Sitecraft ST3000-AC tow tug moving 660 & 1100 litre bins

Sitecraft ST3000-AC tow tug moving 660 & 1100 litre bins

ST3000-AC tow tug complete with 6 x 250AH heavy duty batteries

Optional steel / aluminium trailers for moving waste bins, linen trolleys, food trolleys, delivery boxes, etc ...

Source: https://www.sitecraft.net.au/materials-handling/tow-tugs-powered-vehicles/electric-tow-vehicles/