Consulting.™
an Elephants Foot Company

85-97 Waterloo Road, Macquarie Park NSW 2113

Mixed Use Development

OPERATIONAL WASTE MANAGEMENT PLAN

27/06/2024
Report No. 5127
Revision G

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REVISION REFERENCE

Revision	Date	Prepared by	Description
A	21/06/2023	D Trinder	Draft
B	24/08/2023	D Trinder	Final
C	05/09/2023	D Trinder	Amendment
D	11/06/2024	H Wilkes	Draft Amendment
E	25/06/2024	A Armstrong	Amendment
F	27/06/2024	J Parker	Amendment
G	27/06/2024	J Parker	Amendment

TABLE OF CONTENTS

TABLE OF FIGURES

LIST OF TABLES

GLOSSARY OF ABBREVIATIONS AND TERMS

TERM	DESCRIPTION
Baler	A device that compresses waste into a mould to form bales which may be self-supporting or retained in shape by strapping
Bin-carting Route	Travel route for transferring bins from the storage area to a nominated collection point
BTR Housing	Build-to-rent housing
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
Compactor	A machine for compressing waste into disposable or reusable containers
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
Service Bins	Bin set side to be placed under a chute while the remainder of the bins are being collected
SRV	Small Rigid Vehicle described by AS 2890.2-2002 Parking facilities – Off-street commercial vehicle facilities
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

1.0 ACKNOWLEDGEMENT OF COUNTRY

Elephants Foot Consulting acknowledges that every project we work on takes place on First Peoples Land. We recognise Aboriginal and Torres Strait Islander People as Traditional Custodians of this land. We pay respect to ancestors and Elders, past and present.

2.0 INTRODUCTION

Elephants Foot Consulting (EFC) has been engaged to prepare the following waste management plan for the operational management of waste generated by the state significant mixed use development located at 85-97 Waterloo Road, Macquarie Park NSW 2113.

Waste management strategies and audits are required for new developments in order to support the design and sustainable performance of the building. It is EFC'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.

2.1 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 has been provided separately by EFC.

2.2 REPORT CONDITIONS

The purpose of this report is to document an OWMP as part of a development application, which is supplied by EFC 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 EFC,
- 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 EFC will not be liable for plans or results that are not suitable for purpose due to incorrect or unsuitable information or otherwise,
- EFC 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,
- EFC cannot be held accountable for late changes to the design after the OWMP has been submitted to Council,
- EFC 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,
- EFC 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.

3.0 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:

- City of Ryde Development Control Plan 2014
- Ryde Local Environmental Plan 2014

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:

- City of Ryde Development Control Plan 2014 Part 7.2 Waste Minimisation and Management
- City of Ryde Development Control Plan 2014 Part 4.5 Macquarie Park Corridor
- Waterloo Road Masterplan
- 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

3.1 COUNCIL OBJECTIVES

The City of Ryde values proper planning for waste minimisation and management with respect to all developments. As such, Council aims to:

- Ensure new developments and changes to existing developments are designed to maximise resource recovery (through waste avoidance, source separation and recycling).
- Encourage source separation of waste, reuse, and recycling by ensuring appropriate storage and collection facilities for waste, and quality design of waste facilities.
- Ensure appropriate, well-designed waste storage and collection facilities are provided and are accessible to occupants and service providers.
- Ensure that wastes are handled and stored appropriately in order to minimise risk to health and safety associated with handling and disposal of waste and recycled material, and ensure optimum hygiene.
- Minimise adverse environmental and amenity impacts associated with waste management (including odour from waste and noise from collection activity).
- Discourage illegal dumping by providing on-site storage for waste awaiting collection by removal services.
- Ensure waste and recycling storage areas and handling systems for residential properties are designed to meet minimum requirements for Council's domestic waste collection services.

3.2 SEARS OBJECTIVES

The NSW Department of Planning and Environment have prepared an industry-specific Secretary's environmental assessment requirements (SEARs) under application SSD-52604208 dated 19 December 2022. Industry-specific SEARs provide clarify, consistency and certainty of what is required to prepare an EIS for the most common types of SSD. Below are the requirements to be met under this operational waste management plan.

- Identify, quantify and classify the likely waste streams to be generated during construction and operation.
- Provide the measures to be implemented to manage, reuse, recycle and safely dispose of this waste.
- Identify appropriate servicing arrangements for the site.

4.0 DEVELOPMENT OVERVIEW

The proposed development falls under the LGA of City of Ryde Council. This report has been prepared to accompany a State Significant Development Application (SSDA) for the site located as 85-97 Waterloo Road, Macquarie Park NSW 2113.

Specifically, consent is sought for the construction of seven buildings over two levels of basement. The mixed-use development will include BTR housing.

- 3,079m^2 non-residential floor area at ground, including commercial and retail uses
- 57,473m^2 build-to-rent housing
- 736 dwellings/apartments in total
- 4,581m^2 communal residential amenity facilities located throughout the building
- 670 parking spaces and 84 bicycle spaces
- No motorcycle spaces (not required under DCP)

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

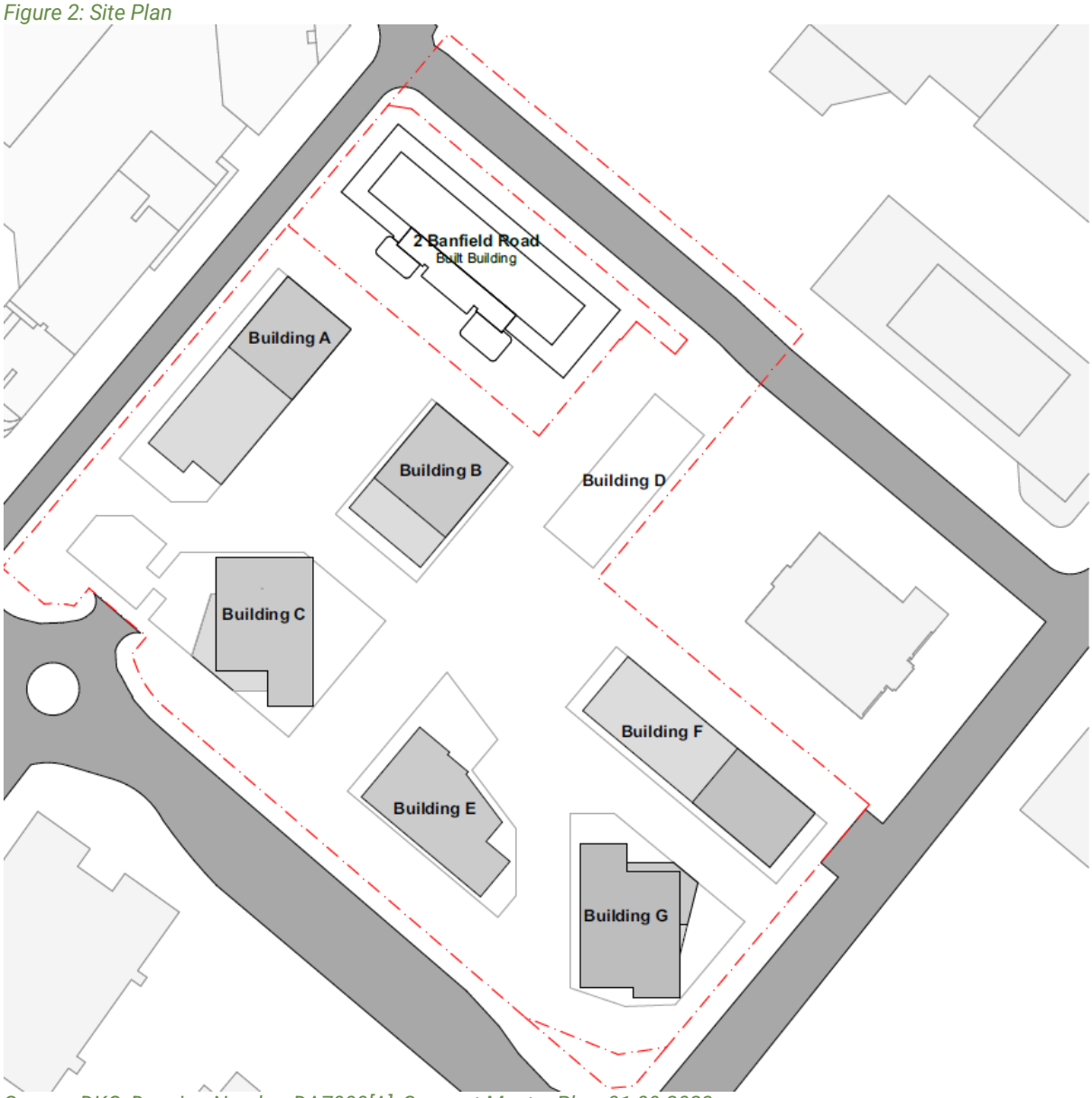
4.1 SITE LOCATION

The site is legally described as Lot 1 in DP 1259121 and Lot 2 in DP 1249920 and has a total approximate area of 21,730sqm. It is located at 85-97 Waterloo Road, Macquarie Park NSW 2113, as shown in Figure.1 (boundaries are indicative only). The site has frontages to Waterloo Road, Banda Road, and Khartoum Road. Vehicular access is via Banda and Khartoum Roads.

Figure 1: Site Location

Source: Google Maps

Figure 2: Site Plan



Source: DKO, Drawing Number DA7000[A], Concept Master Plan, 01.09.2023

5.0 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.

5.1 RESIDENTIAL WASTE GENERATION ESTIMATES

Ryde Council's *Development Control Plan 2014, Part 7.2 Waste Minimisation and Management* has been referenced to calculate the total number of waste and recycling bins required for the residential units.

The NSW EPA's *Better Practice Guide for Resource Recovery in Residential Developments* (2019) has been referenced to calculate the total number of Food Organics and Garden Organics (FOGO) bins required for the residential units.

Calculations are based on generic waste and recycling rates. Actual volumes of waste, recycling and FOGO generated in operation differ according to the residents' actual waste management practices.

The following table shows the estimated volume (L) of general waste, recyclables and FOGO generated by the residential component of the development.
Note: At the time of writing, Council do not have an active FOGO collection service. Provision for FOGO bins at this development have been included to account for a future FOGO collection service.

Table 1: Estimated Waste and Recycling Volumes – Building A, B & C

Building/ Core	**# Units**	**General Waste Generation Rate** (L/unit/week)	**Generated General Waste** (L/week)	**Recycling Generation Rate** (L/unit/week)	**Generated Recycling** (L/week)
Building A - Core 1	64	120	7680	120	7680
Building A - Core 2	58	120	6960	120	6960
Building B	76	120	9120	120	9120
Building C	145	120	17400	120	17400
TOTAL	**343**		**41160**		**41160**
Bins and Collections		General Waste Bin Size (L)	1100	Recycling Bin Size (L)	660
		General Waste Bins per Week	37.4	Recycling Bins per Week	62.4
		General Waste Collections per Week	3	Recycling Collections per Week	2
		Total General Waste Bins Required for Collection	**13**	Total Recycling Bins Required for Collection	**32**
	Bins Per Day	Building E	1.0	Bins Per Day – Building E	1.7
		Building F - Core 1	0.9	Building F - Core 1	1.5
		Building F - Core 2	1.2	Building F - Core 2	2.0
		Building G	2.3	Building G	3.8

Table 2: Estimated Recycling Bin Each Residential Level – Buildings A, B & C

Level	Units	Residential Levels per Building
Building A - Core 1	64	14
Building A - Core 2	58	12
Building B	76	10
Building C	145	19
TOTAL	**343**	**55**

Table 3: Estimated Residential FOGO Volumes – Building A, B & C

Building/ Core	# Units	FOGO Waste Generation Rate (L/unit/week)	Generated FOGO Waste (L/week)
Building A	122	25	3050
Building B	76	25	1900
Building C	145	25	3625
TOTAL	**343**		**8575**
Bins and Collections		FOGO Bin Size (L)	240
		FOGO Bins per Week	36
		FOGO Collections per Week	1
		Total FOGO Bins Required for Collection	**36**

Table 4: Estimated Waste and Recycling Volumes – Building E, F & G

Building/ Core	# Units	General Waste Generation Rate (L/unit/week)	Generated General Waste (L/week)	Recycling Generation Rate (L/unit/week)	Generated Recycling (L/week)
Building E	124	120	14880	120	14880
Building F - Core 1	71	120	8520	120	8520
Building F - Core 2	72	120	8640	120	8640
Building G	126	120	15120	120	15120
TOTAL	**393**		**47160**		**47160**

Bins and Collections		General Waste Bin Size (L)	1100	Recycling Bin Size (L)	660
		General Waste Bins per Week	42.9	Recycling Bins per Week	71.5
		General Waste Collections per Week	3	Recycling Collections per Week	2
		Total General Waste Bins Required for Collection	**15**	Total Recycling Bins Required for Collection	**36**
	Bins Per Day	Building E	1.9	Bins Per Day – Building E	3.2
		Building F - Core 1	1.1	Building F - Core 1	1.8
		Building F - Core 2	1.1	Building F - Core 2	1.9
		Building G	2.0	Building G	3.3

Table 5: Estimated Recycling Bin Each Residential Level – Buildings E, F & G

Level	Units	Residential Levels per Building
Building E	124	19
Building F - Core 1	71	12
Building F - Core 2	72	14
Building G	129	18
TOTAL	**396**	**63**

Table 6: Estimated Residential FOGO Volumes – Building E, F & G

Building/ Core	# Units	FOGO Waste Generation Rate (L/unit/week)	Generated FOGO Waste (L/week)
Building E	124	25	3100
Building F	143	25	3575
Building G	126	25	3150
TOTAL	**393**		**6675**
Bins and Collections		FOGO Bin Size (L)	240
		FOGO Bins per Week	28
		FOGO Collections per Week	1
		Total FOGO Bins Required for Collection	**28**

RESIDENTIAL BIN SUMMARY

Based on the estimated waste, recycling and FOGO generated by the residential component of this development, the recommended bin quantities and collection frequencies as detailed in the following sections.

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.

5.1.1 BIN SUMMARY OVERALL – BUILDINGS A, B & C

General Waste:
Operational/ Collection Bins: 13 x 1100L MGBs collected **3 x weekly**
Service Bins: 4 x 1100L MGBs

Recycling:
Operational Bins: 55 x 240L MGBs
Collection Bins: 32 x 660L MGBs collected **2 x weekly**

FOGO:
Operational Bins: 36 x 240L MGBs

5.1.2 BIN SUMMARY OVERALL – BUILDINGS E, F & G

General Waste:
Operational/ Collection Bins: 15 x 1100L MGBs collected **3 x weekly**
Service Bins: 4 x 1100L MGBs

Recycling:
Operational Bins: 63 x 240L MGBs
Collection Bins: 36 x 660L MGBs collected **2 x weekly**

FOGO:
Operational Bins: 28 x 240L MGBs

5.1.3 EQUIPMENT SUMMARY PER CORE

It is strongly recommended that the bins and equipment at the base of each chute allows for at least 1 days' worth of general waste generation. Based on the estimated general waste volumes generated by each building/core, the following equipment is recommended:

Table 7: Equipment Summary – Buildings A, B & C

Building/ Core	Generated General Waste (L/week)	# 1100L Bins Required for 1 days' Capacity	Recommended Chute Discharge Equipment
Building A - Core 1	7680	0.997	2-Bin Linear System
Building A - Core 2	6960	0.904	2-Bin Linear System
Building B	9120	1.184	2-Bin Linear System
Building C	17400	2.260	3-Bin Linear System

Table 8: Equipment Summary – Buildings E, F & G

Building/ Core	Generated General Waste (L/week)	# 1100L Bins Required for 1 days' Capacity	Recommended Chute Discharge Equipment
Building E	14880	1.932	2-Bin Linear System
Building F - Core 1	8520	1.106	2-Bin Linear System
Building F - Core 2	8640	1.122	2-Bin Linear System
Building G	15120	1.964	2-Bin Linear System

The above is a recommendation only and equivalent volume handling equipment may be used subject to equipment supplier's recommendation/review.

5.2 RESIDENTIAL WASTE DISPOSAL PROCEDURES

All residents will have access to a storage area within their own unit capable of holding separate receptacles for general waste, recycling and FOGO. This is typically located within kitchen areas beneath the workbench. This space should be sized to accommodate 40L receptacles (minimum) to account for 2 days' worth of general waste, recycling and 20L for FOGO storage.

5.2.1 RESIDENTIAL GENERAL WASTE AND RECYCLING DISPOSAL PROCEDURES

Single general waste chutes will be installed in each building and building core with access provided to all residents on each residential level. Separate 240L recycling bins will be provided in a compartment adjacent to the general waste chute for the storage of recycling.

Residents will be responsible for walking their general waste and recycling to their allocated disposal point and placing their general waste into the general waste chute and recycling into the 240L recycling bin.

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. Residents will be responsible for loosely placing their recycling into the 240L bins. Recycling should be clean and must not be bagged as soft plastics contaminate recycling.

The general waste will discharge from the chute into 1100L bins on linear tracks systems, within Chute Discharge Rooms. The building manager will monitor bins under the general waste chutes and exchange full bins with empty bins on the track systems when required.

Recycling bins on each level will also be monitored by the building caretaker. When full, or as required, the Building Manager will transport the 240L bins to the corresponding Residential Bin Holding Room, where they will be decanted into the 660L recycling bins. A bin lifter is required for decanting the 240L bins into the 660L bins. The building manager will then return the 240L bins to the residential levels.

Full and spare bins will be kept in the Residential Bin Holding Room for each grouping of buildings.

5.2.2 RESIDENTIAL FOGO DISPOSAL PROCEDURES

The majority of organics waste generated from multi-unit residential developments comprises of food waste as opposed to garden waste. As such, calculations and management recommendations provided in this report considers that FOGO bins will primarily comprise or food organics.

The residents of each unit will be provided with a kitchen caddy for the separation of FOGO. Food organics must be contained in accordance with Ryde Council's future FOGO collection service procedures (for example a compostable liner). Any clippings from residential units can also be disposed of with the FOGO.

Each building will be provided with a Communal FOGO Bin Room which contains 240L bins for FOGO. The residents will be responsible for walking their own FOGO down to the Communal FOGO Bin Room and placing it into the bins.

The Buildings Manager will monitor the fullness of the bins in each of the FOGO bins in each level and rotate with empty bins as required.

Building management is responsible for ensuring that the Communal FOGO Bin Room and FOGO bins are washed down frequently to ensure that hygiene and odour is managed.

5.2.3 RESIDENTIAL 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. General waste and recycling receptacles should be placed in convenient locations. The building manager will monitor the fullness of these bins and empty into the main collection bins as required.

5.2.4 LANDSCAPED AREAS AND GARDEN ORGANICS

Garden organics generated from surrounding landscaped areas and indoor foliage typically consists of lawn clippings, cuttings, leaves and branches.

Garden organics generated from surrounding landscaped areas will be managed and removed from the site by the designated landscaping contractors as they carry out scheduled landscaping maintenance works.

Garden organics generated from foliage within each residential unit will be managed by the residents and should be disposed of into the FOGO bins.

5.3 RESIDENTIAL WASTE COLLECTION PROCEDURES

Council will be engaged to collect the residential waste and recycling in accordance with Council's collection schedule. This report assumes waste will be collected three times weekly, recycling twice weekly and FOGO once weekly.

On the nominated collection days, the building caretaker will be responsible for transporting the 1100L bins for waste, the 660L bins for recycling and 240L bins for FOGO to the waste collection areas (see APPENDIX A.1 and A.2). It is recommended that extra 1100L service bins are placed under the chute to collect waste while the other bins are being serviced.

To service the bins, a Council collection vehicle will enter the site from Banda Road and park in the loading bay at the base of Building B (see APPENDIX A.1). Once the bins are serviced, the collection vehicle will continue to the loading bay at the base of Building E. Once the bins are serviced, the collection vehicle will return via the same path and exit the site onto Banda Road in a forward direction. The building caretaker will facilitate collection by providing the driver with access to the waste rooms.

All collection vehicle access and clearances must be able to accommodate a 12.5m long HRV per AS2890.2-2002.

It is the responsibility of the caretaker to ensure that the loading area is clear of any vehicles or obstructions prior to waste collection. When waste collection is complete, the building caretaker will return the bins to resume operational use.

5.4 RESIDENTIAL BULKY WASTE PROCEDURES

An area will be made available for the storage of discarded residential bulky items (e.g. whitegoods, furniture, etc.). This room should be located within proximity to the waste collection room and must have a minimum doorway width of 1.5m to allow for easy movement of large waste items in and out of the room.

Council has advised that developments over 300 units require 14m^2 for the first 100 units and 2m^2 per additional 50 units thereafter. To align with the current strategy of two loading bays, the calculation has been split between the two.

Bulky Waste Room Size - Buildings A, B & C

(Total number of units - 100) / 50*2+14 = m^2 of bulky waste room
=(331-100)/50*2 + 14
=231/50*2 + 14
=4.62*2+14
=9.24 +14
= 23.2
bulky waste storage area: minimum 24m^2

Bulky Waste Room Size – E, F & G

(Total number of units - 100) / 50*2+14 = m^2 of bulky waste room
=(369-100)/50*2 + 14
=269/50*2 + 14
=5.38*2+14
=10.76 +14
= 24.76
bulky waste storage area: minimum 25m^2

Residents will need to liaise with building management regarding the transportation of bulky items and the availability of the bulky waste rooms on Basement 1 and Basement 2 (see APPENDIX A.1 and A.2). It is the caretaker's responsibility to arrange collection dates with Council and then coordinate with the residents.

On the day of collection, a Council vehicle will enter the site from Banda Road and park in the loading bay at the base of Building B (see APPENDIX A.1). Once the items have been loaded, the collection vehicle will continue to the loading bay at the base of Building E. Once the items have been loaded, the collection vehicle will return via the same path and exit the site onto Banda Road in a forward direction. The building caretaker will facilitate collection by providing the driver with access to the bulky waste rooms.

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

6.0 COMMERCIAL AND RETAIL WASTE MANAGEMENT

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

6.1 COMMERCIAL AND RETAIL WASTE GENERATION ESTIMATES

Council's *Development Control Plan 2014, Part 7.2 Waste Minimisation and Management* and the NSW EPA's *Better practice guide for resource recovery in residential developments 2019* has been referenced to calculate the total number of bins required for the anticipated tenants. Calculations are based on generic figures, and waste generation rates may differ according to the tenants' actual waste management practice. The waste and recycling generation rates from Council's *Development Control Plan 2014, Part 7.2 Waste Minimisation and Management* have been adapted to reflect litres per 100m^2 per day.

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

The following estimates are based on a five-day operating week for commercial and a seven-day operating week for retail.

Table 9: Estimated Waste and Recycling Volumes – Commercial and Retail

Building	Tenancy	Generation Rate Type	NLA (m^2)	General Waste Generation Rates (L/100m2/day)	Generated Garbage (L/week)	Recycling Generation Rate (L/100m^2/day)	Generated Paper/ Cardboard (L/week)	Generated Commingled Recycling (L/week)
A	Amenity	Cultural & Recreational	492.8	5	172.48	10	229.7	114.9
	Amenity	Cultural & Recreational	317.3	5	111.055	10	147.9	74.0
	Amenity	Cultural & Recreational	79.5	5	27.825	10	37.1	18.5
	Amenity	Cultural & Recreational	53	5	18.55	10	24.7	12.4
B	Retail	Shop more than 100m2 floor area	189	50	661.5	50	440.6	220.3
	Retail	Shop more than 100m2 floor area	112	50	392	50	261.1	130.5
	Retail	Shop more than 100m2 floor area	110	50	385	50	256.4	128.2
	Amenity	Cultural & Recreational	360.4	5	126.14	10	168.0	84.0
	Amenity	Cultural & Recreational	152.2	5	53.27	10	71.0	35.5
C	Showroom	Showroom	250	40	700	10	116.6	58.3
	Amenity	Cultural & Recreational	194	5	67.9	5	45.2	22.6
	Showroom	Showroom	213	40	596.4	10	99.3	49.7
	Showroom	Showroom	118	40	330.4	10	55.0	27.5
	Retail	Shop more than 100m2 floor area	129	50	451.5	50	300.7	150.3
	Medical	Medical	210	20	294	10	97.9	49.0
	Amenity	Cultural & Recreational	154.3	5	54.005	10	71.9	36.0
	Amenity	Cultural & Recreational	95.6	5	33.46	10	44.6	22.3
	Amenity	Cultural & Recreational	147.1	5	51.485	10	68.6	34.3
	Amenity	Cultural & Recreational	113.4	5	39.69	10	52.9	26.4
D	Gym	Gymnasiums	292	20	292	15	145.9	72.9
	Amenity	Cultural & Recreational	248	5	62	5	1498.5	749.3
	Amenity	Cultural & Recreational	292	5	73	10	2997.0	1498.5
	Amenity	Cultural & Recreational	78	5	27.3	10	36.4	18.2
		TOTAL	**4401**		**5020.96**		**7266.8**	**3633.4**
Equipment and Collections			Bin Size (L)		1100	Bin Size (L)	1100	1100
			Bins/Week		5	Bins/ Week	7	4
			Collections/Week		3	Collections/Week	3	2
			Total Bins Required		2	TotalBins Required	3	2

Table 10: Estimated Waste and Recycling Volumes – Commercial and Retail

Building	Tenancy	Generation Rate Type	NLA (m^2)	General Waste Generation Rates (L/100m2/day)	Garbage Compacted (3:1)	Recycling Generation Rate (L/100m^2/day)	Generated Paper/ Cardboard (L/week)	Generated Commingled Recycling (L/week)
E	F&B	Restaurant, Café	277	667	4311.0	133	1717.5	858.8
	F&B	Restaurant, Café	280	667	4357.7	133	1736.1	868.1
	Amenity	Cultural & Recreational	176.2	5	20.6	10	82.1	41.1
	Amenity	Cultural & Recreational	85.2	5	9.9	10	39.7	19.9
	Showroom	Showroom	115	40	107.3	10	53.6	26.8
	Amenity	Cultural & Recreational	151	5	17.6	10	70.4	35.2
	Amenity	Cultural & Recreational	83	5	9.7	10	38.7	19.3
	Amenity	Cultural & Recreational	113	5	13.2	10	52.7	26.3
F	F&B	Restaurant, Café	149	667	2318.9	133	923.9	461.9
	Childcare	Childcare	665	5	77.6	5	1498.5	749.3
	Amenity	Cultural & Recreational	271	5	31.6	5	1498.5	749.3
	Amenity	Cultural & Recreational	100	5	11.7	5	1498.5	749.3
	Amenity	Cultural & Recreational	46	5	750.0	10	21.4	10.7
G	Amenity	Cultural & Recreational	240	5	28.0	10	111.9	55.9
	Showroom	Showroom	304	40	283.7	10	141.7	70.9
	Showroom	Showroom	177	40	165.2	10	82.5	41.3
	Amenity	Cultural & Recreational	117	5	13.7	10	54.5	27.3
	Amenity	Cultural & Recreational	122	5	14.2	10	56.9	28.4
	Amenity	Cultural & Recreational	88	5	10.3	10	41.0	20.5
		TOTAL	**3559**		**12552.0**		**9720.3**	**4860.1**
Equipment and Collections			Bin Size (L)		1100	Bin Size (L)	1100	1100
			Bins Per Week		11.4	Bins Per Week	9	5
			Collections per Week		3	Collections per Week	2	2
			Total Bins Required		4	TotalBins Required	5	3

**Childcare is based on maximum capacity of 90 children for high density areas*

6.2 COMMERCIAL AND RETAIL BIN SUMMARY

Based on the estimated waste generated by the retail and commercial tenancies, the recommended bin quantities and collection frequencies are as follows:

BUILDING A, B, C, D:

General Waste: 2 x 1100L bins collected **3 x weekly**

Cardboard/Paper Recyclables: 3 x 1100L bins collected **3 x weekly**

Commingled Recyclables: 2 x 1100L bins collected **2 x weekly**

BUILDING E, F, G:

General Waste: 4 x 1100L bins collected **3 x weekly**

Cardboard/Paper Recyclables: 5 x 1100L bins collected **2 x weekly**

Commingled Recyclables: 3 x 1100L bins collected **2 x weekly**

Bin sizes, quantities, and/or collection frequencies may be modified by the building manager once the proposed development is operational. Building management will be required to negotiate any changes to bins or collections with the collection service provider. Seasonal peak periods such as public and school holidays should also be considered.

6.3 COMMERCIAL AND RETAIL WASTE DISPOSAL PROCEDURES

On completion of each trading day or as required, nominated staff or contracted cleaners will transport all general waste and recyclables to the waste collection area and place into the appropriate collection bins (see APPENDIX A.1). Waste for buildings E, F, and G will be compacted. All other waste will not be compacted, and recyclables are not baled.

6.4 COMMERCIAL AND RETAIL WASTE COLLECTION PROCEDURES

A private waste collection contractor will be engaged to service the retail waste and recycling bins per an agreed schedule.

On the day of service, a private waste collection vehicle will enter the site from Banda Road and park in the loading bay at the base of Building B. Once the bins are serviced, the collection vehicle will continue to the loading bay at the base of Building E. Once the bins are serviced, the collection vehicle will return the way it came and exit the site onto Banda Road in a forward direction. To facilitate collections, the building caretaker will provide the driver with access to the commercial/retail waste rooms.

Please note that the collection of commercial/retail bins should occur on separate days from the collection of residential bins to ensure proper segregation of waste streams.

6.5 OTHER COMMERCIAL AND RETAIL WASTE MANAGEMENT CONSIDERATIONS

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

6.5.1 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.

6.5.2 FOOD WASTE

During daily operations staff will be responsible for the collection of food waste back of house. At the end of the day, nominated staff or cleaners will bring the food waste bins to the central food waste area for collection. The building management will be responsible for providing either an on-site food waste processing system or food waste bins and collection service through a private contractor.

If food waste bins are supplied, any premises where more than 50L of seafood, poultry or meat waste is generated per day, the waste must be stored in a refrigerated room until collected or have that waste collected daily.

6.5.3 BULKY WASTE

Space will be provided back of house for the storage of re-usable commercial items such as crates, pallets, kegs and strip out waste. The building manager will be responsible for ensuring that storage of these items in public places is completely avoided. This room should have a minimum doorway width of 1.5m to allow for easy movement of large waste items in and out of the room.

6.5.4 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.

6.5.5 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

7.0 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, Body Corporate or Management	• Ensure all waste service providers submit monthly reports on all equipment movements and waste quantities/weights; • Organise internal waste audits/visual assessments on a regular basis • Purchase any on-going waste management equipment or maintenance of equipment once building is operational; and • Manage any non-compliances/complaints reported through waste audits.
Building Manager or Waste Caretaker	• Maintain and clean chute doors on each level; • Co-ordinate general waste, recycling and FOGO collections • Clean and transport bins as required; • Organise replacement or maintenance requirements for bins; • Organise, maintain and clean the waste holding area; • Organise bulky waste collection when required • Investigate and ensure prompt clean-up of illegally dumped waste materials. • Prevent storm water pollution by taking necessary precautions (secure bin rooms, prevent overfilling of bins) • Abide by all relevant WH&S legislation, regulations, and guidelines; • Provide staff/contractors with equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management; • Assess any manual handling risks and prepare a manual handling control plan for waste and bin transfers; • Ensure site safety for residents, children, visitors, staff and contractors; and • Ensure effective signage, communication and education is provided to occupants, tenants, maintenance staff, and cleaning contractors.
Residents	• Dispose of all general waste, recycling and FOGO in the allocated chutes and/or bins provided. • Ensure adequate separation of general waste, recycling and FOGO; and • Comply with the provisions of Council and the OWMP.
Retail/Commercial Tenants	• Manage the back of house storage of generated waste and recycling during daily operation. • Correctly separate waste and recycling streams; bag general waste and ensure recyclables are not bagged. • Flatten cardboard within the recycling bin. • If required, arrange for storing used and unused cooking oil in a bunded area, • Organise grease interceptor trap servicing, • Ensure dry basket arrestors are provided to the floor wastes in the food preparation, and • Ensure the suitable storage for chemicals, pesticides and cleaning products waste back of house.
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	• Remove all garden organic waste generated during gardening maintenance activities for recycling at an offsite location.
Developer	• Purchase all equipment required to implement this OWMP prior to the occupation of the building to be provided to the strata or Body Corporate.

8.0 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.
Recycling	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). Also included cardboard and paper products.	Resource Recovery Centre	Recycling must not be bagged, and instead should be placed loosely in the designated recycling bins. Bulky cardboard must not be placed in any chute. Cardboard should be flattened before placing in the designated recycling bin.
Garden Organics	Garden organics consists of unwanted organic materials that are easily biodegradable and/or compostable (e.g. lawn clippings, branches)	Resource Recovery Centre	Landscape Maintenance Contractors will remove the garden organics from site during scheduled maintenance.
FOGO	FOGO consists of unwanted or uneaten kitchen scraps that are easily compostable/biodegradable (e.g. vegetable peels, fruit rinds, coffee grounds) and garden organics including lawn clippings, leaves, pruning's and branches.	Composting Facility	FOGO should be bagged in compostable liners when deposited into the chute/s or bins and will be collected by Council.
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 in Bulky Waste Rooms. Building manager arranges with Council for removal. Commercial tenants are responsible for removal of their bulky items.
Sanitary Waste	Feminine hygiene waste generated from female bathrooms.	Incineration or Landfill	Sanitary bins are serviced by sanitary waste contractor.
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.

9.0 EDUCATION

Educational materials encouraging correct separation of general waste and recyclables must be provided to each resident and commercial/retail 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 regularly to encourage behaviour change and account for transient building personnel such as new residents, tenants, or cleaning staff. 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' 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.

9.1 SIGNAGE

Signage and education are essential 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. 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.

9.2 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

10.0 BIN MOVEMENTS

The building caretaker is responsible for the transportation of bins as required from their designated operational locations to the bin holding room as required and returning them once emptied to resume operational use.

Transfer of bins should minimise manual handling where possible, as bins become heavy when full. The building manager must assess manual handling risks and provide any relevant documentation to key personal.

The routes along the bin moving path should;

- Allow for a continuous route that is wholly within the property boundary.
- Be free from obstruction and obstacles such as steps and kerbs.
- Be constructed of solid materials with a non-slip surface
- Be A minimum of 300mm wider than the largest bin used onsite.
- If bins are moved manually, the route must not exceed a grade of 1:14.
- If a bin moving device is used, the route cannot exceed the maximum operating grade of the device. This is typically a grade of 1:4, however this will vary depending on the model of bin moving device acquired for the site.

As the distance of the bin moving paths exceed 10m, a bin moving device is required to aid the movement of full bins. The developer is responsible for suppling all equipment required for moving bins this includes any bin lifters, bin moving devices and waste transfer bins. This equipment must be new and appropriate for the site. The developer should contact a bin-tug, trailer or tractor consultant to provide equipment recommendations.

Once the site is operational (and the developers is no longer involved) the building proprietors/strata/body corporate will be responsible for maintaining, repairing and replacing waste management equipment.

Bins may have to be fitted with hitch es to enable the simultaneous transportation of multiple bins to the collection area. Council must be informed of any hitch attachments required to be installed on bins.

11.0 EQUIPMENT SUMMARY

Table 13: Equipment Summary – Buildings A,B, C & D

	Part	Qty	Notes
Chutes	Please refer to supplier's information	4	(See Appendix B.1 Typical Single Chute Layout)
Chute Equipment	Waste 2-bin 1100L bin Linear Track System	3	(See Appendix B.2 for Typical Linear System)
	Waste 3-bin 1100L bin Linear Track System	1	
Other Equipment	Bin Lifter for 240L bins	1	(See Appendix B.4 for Example Bin Lifter)
	Suitable Bin Moving Equipment	1	(See APPENDIX C.4 for Typical Bin Movers)

Table 14: Equipment Summary – Buildings E, F & G

	Part	Qty	Notes
Chutes	Please refer to supplier's information	4	(See Appendix B.1 Typical Single Chute Layout)
Chute Equipment	Waste 2-bin 1100L bin Linear Track System	4	(See Appendix B.2 for Typical Linear System)
Other Equipment	Bin Lifter for 240L bins	1	(See Appendix B.4 for Example Bin Lifter)
	Suitable Bin Moving Equipment	1	(See APPENDIX C.4 for Typical Bin Movers)

12.0 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 15: Waste Room Areas – Buildings A, B & D

Building & Core	Level	Waste Room Type	Equipment	Estimated Area Required (m^2)
A – Cores 1 & 2	B1	Chute Discharge Room	1x 2-bin 1100L linear track system – Core A 1x 2-bin 1100L linear track system – Core B 4 x 1100L bins (general waste) 2 x 1100L bins (service bin)	>52
A	B2	Communal FOGO Bin Room – Building A	*Minimum* 5x 240L bins (FOGO)	>5
B	B1	Chute Discharge Room	1 x 2-bin 1100L linear track system 3 x 1100L bins (general waste) 1 x 1100L bin (service bin)	>30
B	B2	Communal FOGO Bin Room – Building B	*Minimum* 5x 240L bins (FOGO)	>5
C	B1	Chute Discharge Room	1 x 3-bin 1100L linear track system 6 x 1100L bins (general waste) 1 x 1100L bin (service bin)	>46
C	B2	Communal FOGO Bin Room – Building C	*Minimum* 5x 240L bins (FOGO)	>5
A, B, C	B1	Residential Collection Room	Bin Lifter 13 x 1100L bins (general waste) 32 x 660L bins (recycling) 36x 240L bins (FOGO)	>143
A, B, C	B1	Bulky Waste Room		>24
A, B, C, D	B1	Retail/ Commercial Waste Room	2 x 1100L bins (general waste) 3 x 1100L bins (paper/cardboard recycling) 2 x 1100L bins (commingled recycling)	>23

Table 16: Waste Room Areas – Buildings E,F & G

Building & Core	Level	Waste Room Type	Equipment	Estimated Area Required (m^2)
E	B1	Chute Discharge Room – Building E	1x 2-bin 1100L linear track system 5 x 1100L bins (general waste) 1 x 1100L bins (service bins)	>36
E	B1	Communal FOGO Bin Room – Building E	*Minimum* 5x 240L bins (FOGO)	>5
F1	B1	Chute Discharge Room – Building F Core 1	1 x 2-bin 1100L linear track system 2 x 1100L bins (general waste) 1 x 1100L bin (service bin)	>26
F2	B1	Chute Discharge Room– Building F Core 2	1 x 2-bin 1100L linear track system 2 x 1100L bins (general waste) 1 x 1100L bin (service bin)	>26
F	B1	Communal FOGO Bin Room – Building F	*Minimum* 5x 240L bins (FOGO)	>5
G	B1	Communal FOGO Bin Room – Building G	*Minimum* 5x 240L bins (FOGO)	>5
E, F, G	B1	Residential Bin Holding Room & Chute Discharge Room - Building G	Bin Lifter for 240L bins 12 x 1100L bins (general waste) 38 x 660L bins (recycling) 28x 240L bins (FOGO) *Chute Discharge – Caged Off* 1 x 2-bin 1100L linear track system 1 x 1100L bins (service bins)	>168
E, F, G	B1	Bulky Waste Room		>25
E, F, G	B1	Retail/ Commercial Bin Room	4 x 1100L bins (general waste) 5 x 1100L bins (paper/cardboard recycling) 3 x 1100L bins (commingled recycling)	>42

The “estimated area required” in the table above have been calculated based on equipment requirements and/or bin dimensions with an additional 90% of bin GFA factored in for manoeuvrability. Other factors such as the shape of the room, position of the chutes, configuration of the equipment, access needs and position of the door may impact the size of the room required. Thus a smaller or larger room size may also be suitable for purpose, as long as the room can accommodate the required equipment with adequate access.

In addition, all doorways and passageways facilitating the movement of bins and/or bulky waste items must be at least 1500mm wide.

The following table provides further waste room requirements.

Table 17: Waste Room Requirements

Waste Room Type	Waste Room Requirements
Chute Discharge Room	• Ceiling clearance height must be a minimum of 3000mm (subject to penetration location) • 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 track system equipment • Where a chute offset is required, the angle of the offset must not exceed 40 degrees (subject to number of consecutive offset and/or up to 1500mm) • Where the chute discharge room also acts as the collection point, the chute discharge and any equipment underneath the chute should be caged off to ensure the safety of personnel accessing the room.
Residential Bin Holding Room and/or Bin Collection Area	• Bins must not be stacked in rows that are more than two bins deep
Communal FOGO Rooms	• Bins should be arranged so that all bins are accessible. Bins are not to be placed in front of one another or in such a way as to restrict access to the other bins for use. • Rooms must be well ventilated either naturally or mechanically in accordance with AS1668.4.2012 • Cleaning facilities such as hose hock and drainage for odour and hygiene control must be provided. • It is recommended a dustpan and broom is provided in this room for residents to clean up unexpected spillages when using bins.
Bulky Waste 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. • Doorway should be a minimum of 1500mm wide
Retail/Commercial Bin Room	• In order to ensure staff safety, all bins should be arranged so they can be accessed without moving another bin

13.0 CONSTRUCTION REQUIREMENTS

Waste room construction must comply with the minimum standards as outlined in the City of Ryde Development Control Plan 2014, 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.

12.1 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;
- 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.

13.0 USEFUL CONTACTS

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

LOCAL COUNCIL

City of Ryde Customer Service	Ph: (02) 9952 8222	E: cityofryde@ryde.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

EF Neutralizer	Ph: 1300 435 374	E: info@elephantsfoot.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

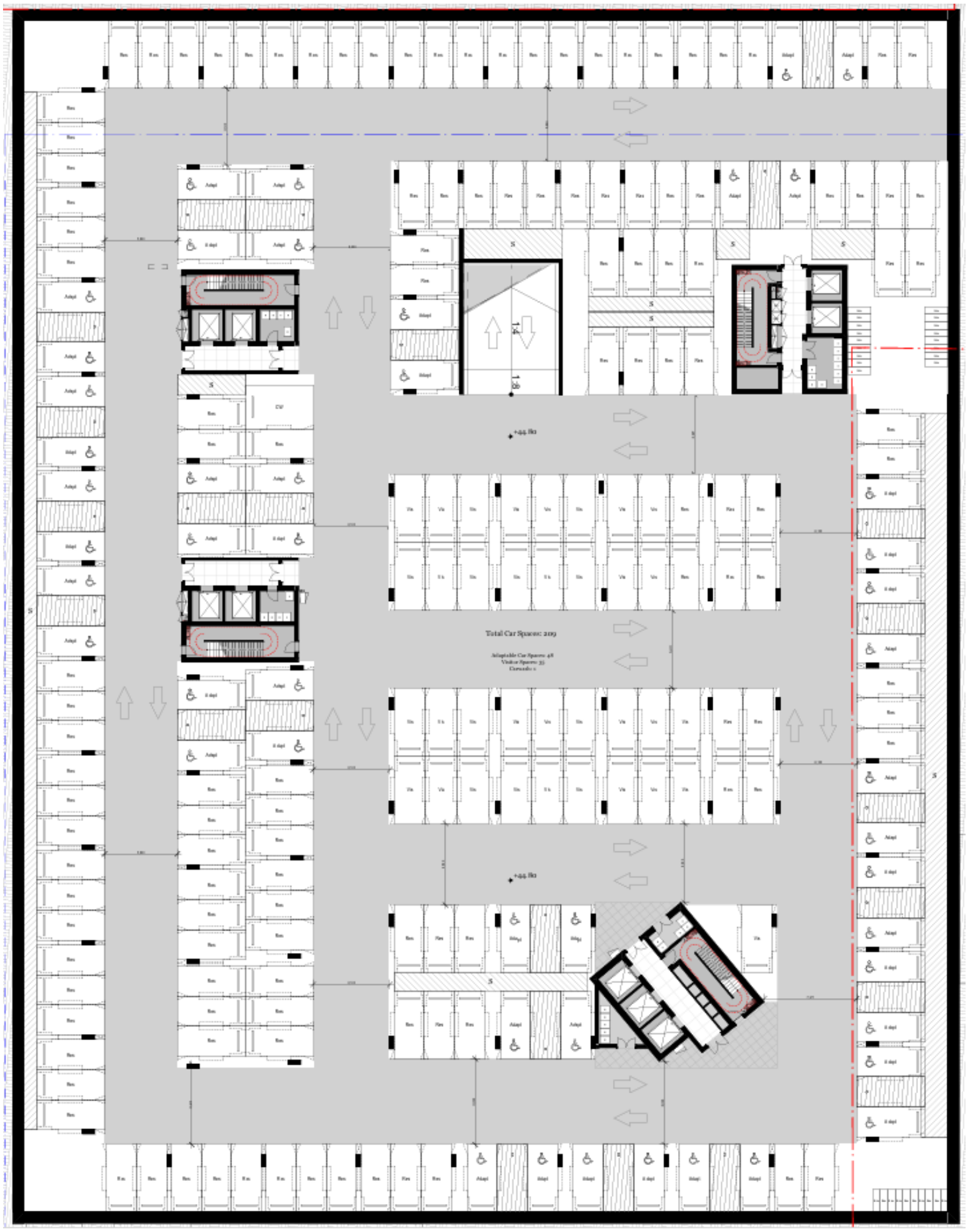
SULO	Ph: 1300 364 388	E: sales@sulo.com.au
OTTO Australia	Ph: 02 9153 6999	

CHUTES, COMPACTORS AND EDIVERTER SYSTEMS

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

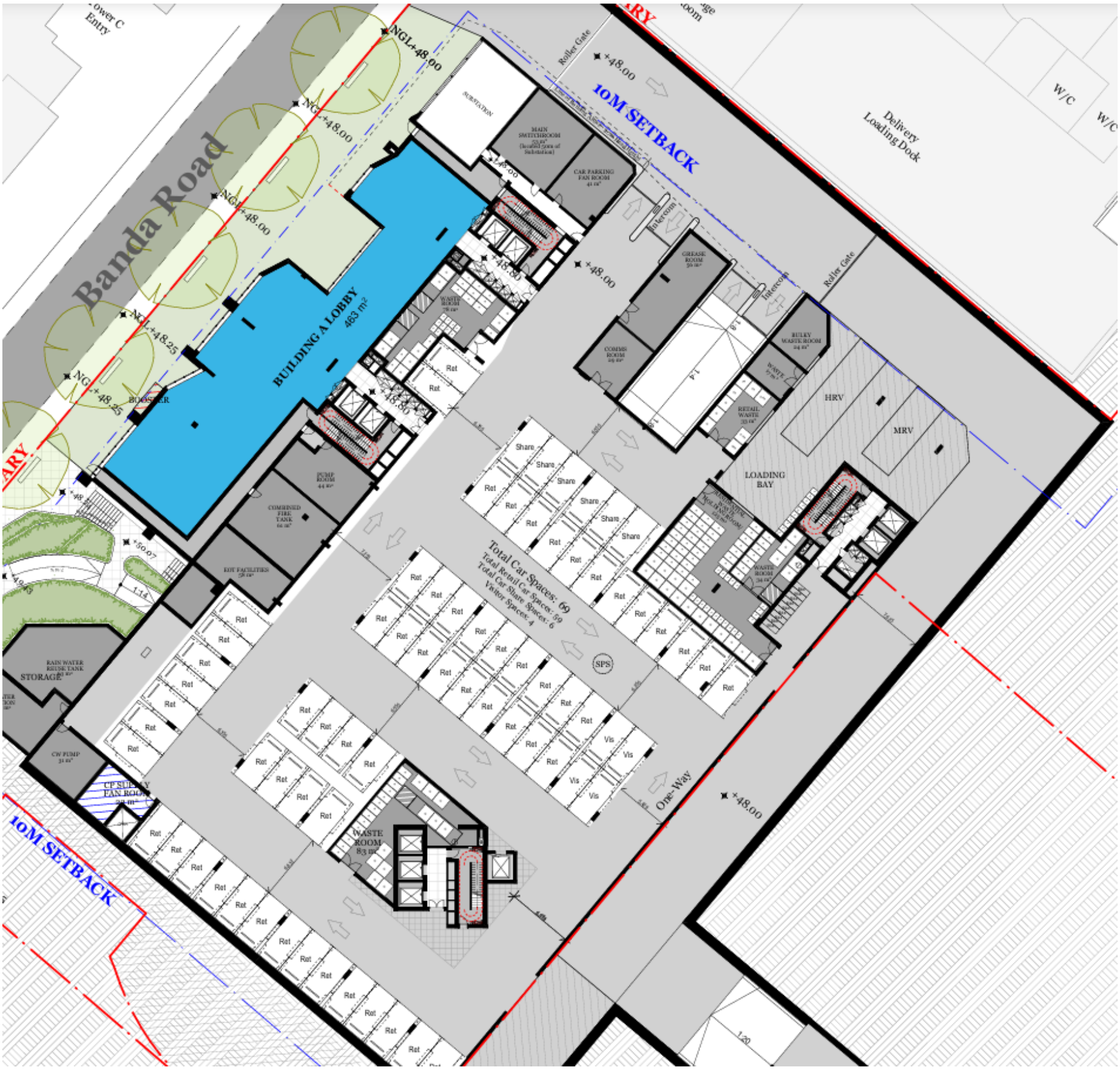
APPENDIX A: ARCHITECTURAL PLANS

APPENDIX: A.1 BUILDING A, B & C - BASEMENT 2 FLOOR PLAN



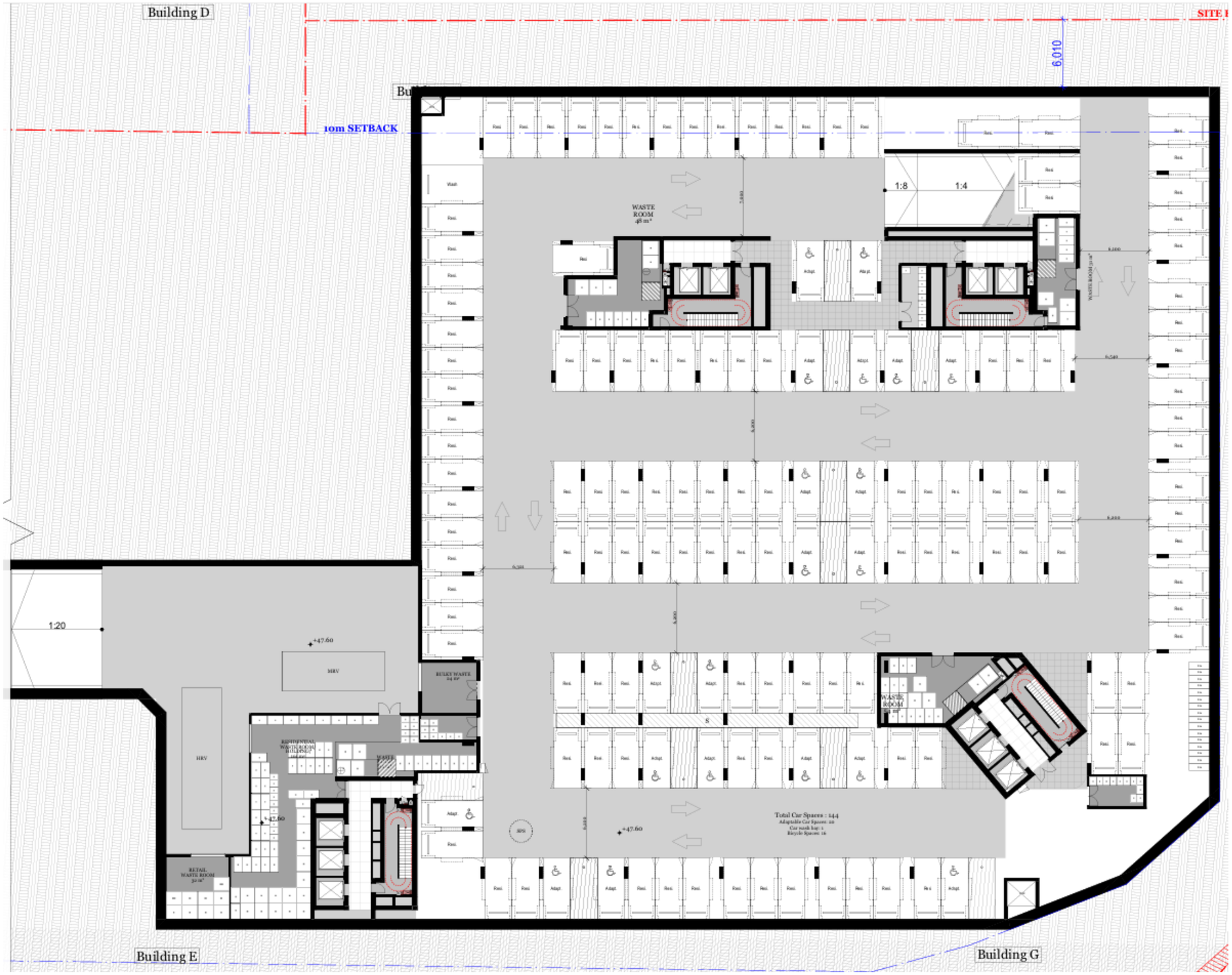
Source: DKO Architecture (NSW) Pty Ltd, Drawing Number DA2100, Rev B, May2024 - Basement Plan 2

APPENDIX: A.2 BUILDING A, B & C – BASEMENT 1 FLOOR PLAN



Source: DKO Architecture (NSW) Pty Ltd, Drawing Number DA2001, Rev B, May2024 - Basement Plan 1

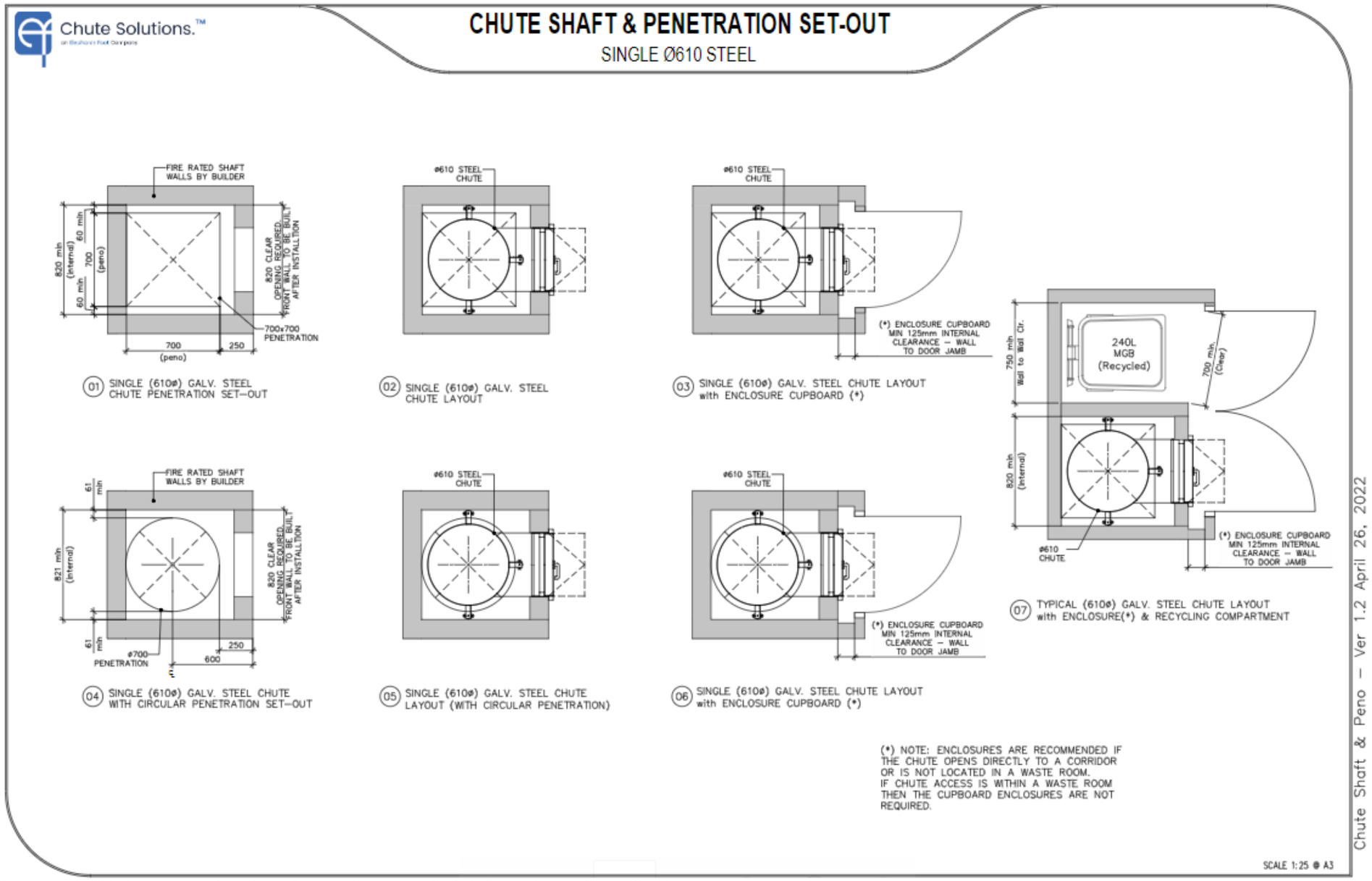
APPENDIX: A.3 BUILDING E, F & G – BASEMENT 1 FLOOR PLAN



Source: DKO Architecture (NSW) Pty Ltd, Drawing Number DA2200, Rev B, May2024 - Basement Plan 1

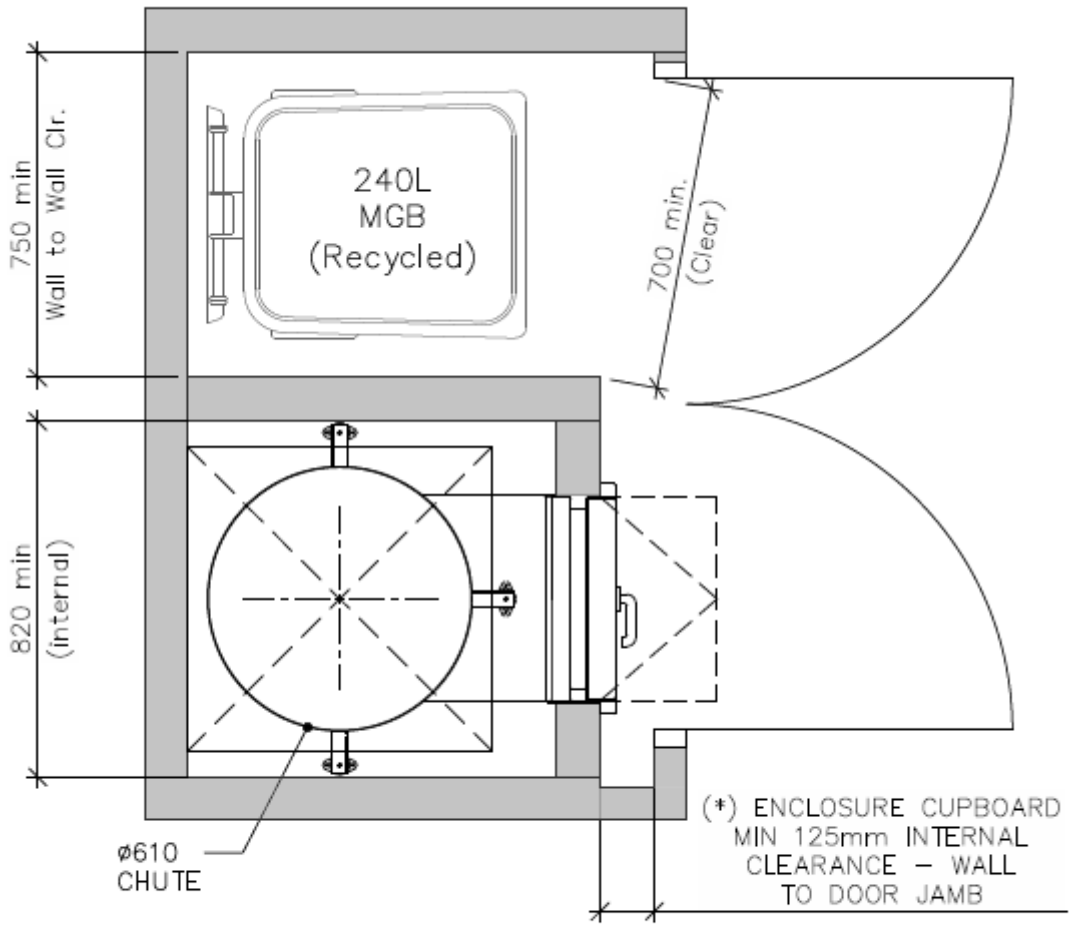
APPENDIX B: INSTALLATION EQUIPMENT

APPENDIX: B.1 TYPICAL SINGLE CHUTE SHAFT & PENETRATION LAYOUT



Please Note: This is an example only – please refer to supplier's information and specification.

APPENDIX: B.2 EXAMPLE RESIDENTIAL LEVEL RECYCLING BIN LAYOUT



07 TYPICAL (610ø) GALV. STEEL CHUTE LAYOUT
with ENCLOSURE(*) & RECYCLING COMPARTMENT

Please Note: This is an example only – please refer to supplier's information and specification

APPENDIX: B.3 TYPICAL LINEAR TRACK SYSTEM FOR 1100L BINS

ELEPHANTS FOOT recycling solutions

ELEPHANTS FOOT RECYCLING SOLUTIONS
44-46 GIBSON AVE, PADSTOW NSW 2211
E info@elephantsfoot.com.au W elephantsfoot.com.au
Free Call: 1300 4 ELEPHANT (1300 435 374)

1100 LITRE LINEAR TRACK SYSTEM

PRODUCT INFORMATION

Elephants Foot 1100 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 the standard 2 bin option. Our 3 Bin option is available as a special order.

SPECIFICATIONS

System Control	Electric PLC
Power Supply	415 V AC / 10A / 5 PIN
Motor Size (kW)	1.1
Maximum bin load	440 kg
Noise (dBA)	<85
Bin Size (L)	1100
Cycle time (sec)	60
Bin Quantity options	2 or 3

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

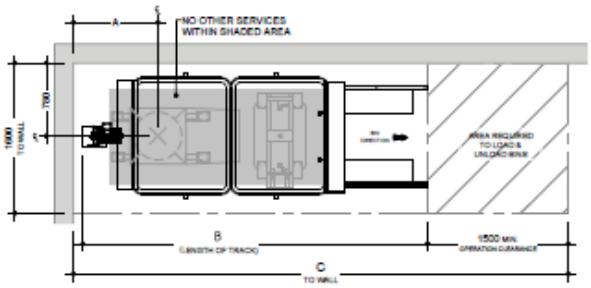
Chute Solutions.™
an Elephants Foot Company

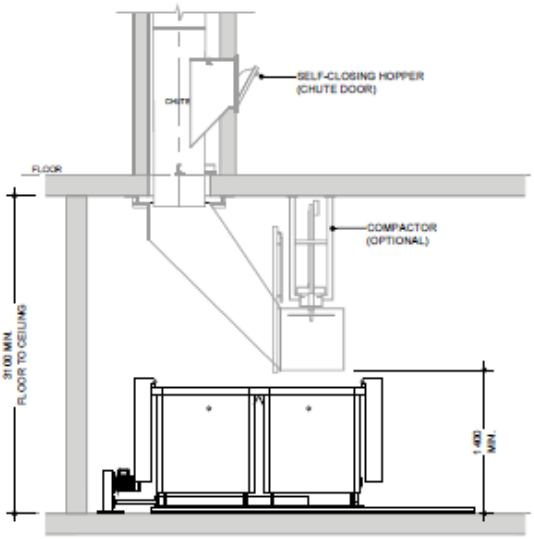
ELEPHANTS FOOT

1,100 LITRE LINEAR TRACK SYSTEM

No. of Bins	Reference (mm)		
	A	B	C
2	900	3700	5300
3	2100	5940	7550

Available with or without compaction unit, our standard 1100 litre bin Linear Track System is available in the standard 2 bin option. Our 3 Bin option is available as a special order.





Notes:
Bins not provided by Elephants Foot

Drawings shown are for general information purposes only and provide minimum equipment spacial requirements for waste room design.

These drawings are not intended for site specific use or for construction. Each project is unique and will be designed to suit.

Additional equipment options, systems and configurations are available. For design assessment, information and advice, please contact an Elephants Foot design consultant on 1300 435 374

Please Note: This is an example only – please refer to supplier's information and specification

APPENDIX: B.4 EXAMPLE BIN LIFTER FOR 240L BINS

versatip

Versatip Bin Tipper – 1500mm Tip

Specifications

Product Code	69121009
Product Name	1500mm Tip – Battery Powered
Capacity (kg)	250
Height (mm)	2085
Length (mm)	1330
Power Source	Battery Powered
Tipping Height (mm)	1500
Width (mm)	990

Please Note: This is an example only – please contact supplier for specific recommendations.

Source: Elephants Foot Equipment - www.elephantsfoot.com.au/equipment/

APPENDIX C: PRIMARY WASTE MANAGEMENT PROVISIONS

APPENDIX: C.1 TYPICAL BIN SPECIFICATIONS

Schedule 1 INDICATIVE BIN SIZES AND DIMENSIONS

BIN TYPE	HEIGHT	DEPTH	WIDTH
80 Litre Bin	870mm	530mm	450mm
120 Litre Bin	940mm	560mm	485mm
140 Litre Bin	930mm	615mm	535mm
240 Litre Bin	1080mm	735mm	580mm
660 Litre Bin	1180mm	770mm	1360mm
1100 Litre Bin	1460mm	1230mm	1370mm
3000 Litre Bin	1450mm	1842mm	1995mm

Figure S.01 Indicative Dimensions for bins used in the City of Ryde

Note: These dimensions are only a guide. Dimensions can vary according to manufacturer, i.e. if bins have flat or dome lids and are used with different lifting devices.

Source: City of Ryde Development Control Plan 2014

APPENDIX: C.2 SIGNAGE FOR WASTE AND 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

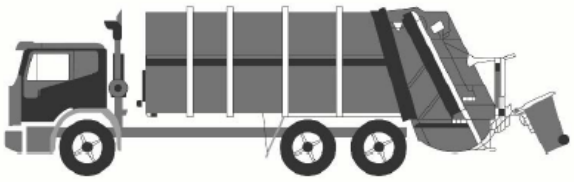
Vehicle type	Rear-loading	Side-loading*	Front-lift-loading	Hook truck	Crane truck
Length overall (m)	10.5	9.6	11.8	10.0	10.0
Width overall (m)	2.5	2.5	2.5	3.0	2.5
Travel height (m)	3.9	3.6	4.8	4.7	3.8
Operational height for loading (m)	3.9	4.2	6.5	3.0	8.75
Vehicle tare weight (t)	13.1	11.8	16.7	13.0	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

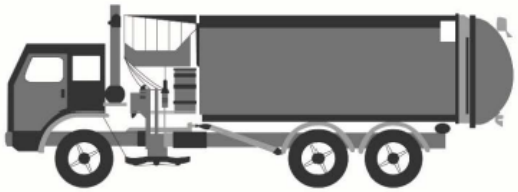
These vehicles are commonly used for domestic waste collections from MUDs and RFBs and sometimes for recycling. They can be used to collect waste stored in mobile bins or bulk bins, particularly where bins are not presented at the kerbside. They are also used for collecting bulky waste.



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 EXAMPLE BIN MOVER

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

APPENDIX: C.5 EXAMPLE SEATED BIN MOVERS

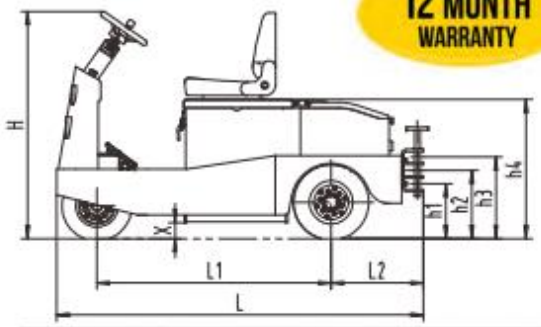
SITECRAFT
MATERIALS HANDLING EQUIPMENT

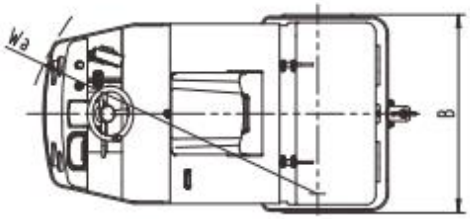
17 Macquarie Drive, Thomastown, VIC 3074
Phone: 1300 363 152 Fax: 1300 722 383
E: sales@sitecraft.com.au ABN: 36 423 328 526

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

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

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/

APPENDIX D: SECONDARY WASTE MANAGEMENT PROVISIONS

APPENDIX: D.1 TYPICAL COOKING OIL CONTAINERS

Drums 205L

Pour in Bulk Tank

View Brochure

Oil Kaddy System

View Brochure

Eco Systems

Direct-Connect to Fryer

Source: http://www.auscol.com/services/collection-systems/

APPENDIX: D.2 TYPICAL SOURCE SEPARATION BINS

Source: https://www.sourceseparationsystems.com.au/