



WASTE MANAGEMENT PLAN

IVANHOE ESTATE

Mixed Use Development

STAGE 1

PREPARED FOR

FRASERS PROPERTY AUSTRALIA
MISSION AUSTRALIA HOUSING

9/12/2020

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ELEPHANTS FOOT WASTE COMPACTORS PTY LTD ABN 70 001 378 294

Sydney Head Office 44-46 Gibson Ave Padstow NSW 2211 | **PH:** +612 9780 3500 | **Fax:** +612 9707 2588

Website: www.elephantsfoot.com.au | **Email:** info@elephantsfoot.com.au

Offices in Victoria & Queensland – **Toll Free:** 1800 025 073



REVISIONS

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EXECUTIVE SUMMARY

This waste management plan covers the ongoing management of waste generated by the mixed use development located at Ivanhoe Estate – Stage 1.

Waste audit and management strategies are recommended for new developments to provide support for the building design and promote strong sustainability outcomes for the building. All recommended waste management plans will comply with council codes and any statutory requirements. The waste management plan has three key objectives:

- i. ***Ensure waste is managed to reduce the amount of waste and recyclables to land fill*** by assisting residents to segregate appropriate materials that can be recycled; displaying signage to remind and encourage recycling practices; and through placement of recycling and waste bins in the retail/community areas to reinforce these messages.
- ii. ***Recover, reuse and recycle*** generated waste wherever possible.
- iii. ***Compliance*** with all relevant codes and policies.

To assist in providing clean and well-segregated waste material, it is essential that this waste management plan is integral to the overall management of the building and clearly communicated to residents and tenants.

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GLOSSARY OF TERMS

TERM	DESCRIPTION
<i>Baler</i>	A device that compresses waste into a mould to form bales which may be self-supporting or retained in shape by wire ties and strapping
<i>Chute</i>	A ventilated, essentially 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)
<i>Collection Area/Point</i>	The position or area where waste or recyclables are actually loaded onto the collection vehicle
<i>Compactor</i>	A Machine for compressing waste into disposable or reusable containers
<i>Composter</i>	A container/machine used for composting specific food scraps
<i>Crate</i>	A plastic box used for the collection of recyclable materials
<i>Garbage</i>	All domestic waste (Except recyclables and green waste)
<i>Hopper</i>	A fitting into which waste is placed and from which it passes into a chute or directly into a waste container. It consists of a fixed frame and hood unit (the frame) and a hinged or pivoted combined door and receiving unit
<i>Recycling</i>	Glass bottles and jars – PET, HDPE and PVC plastics; aluminium aerosol and steel cans; milk and juice cartons; soft drink, milk and shampoo containers; paper, cardboard, junk mail, newspapers and magazines
<i>Green</i>	Garden organics such as small branches, leaves and grass clippings, tree and shrub pruning, plants and flowers, and weeds
<i>L</i>	Litre(s)
<i>Liquid Waste</i>	Non-hazardous liquid waste generated by commercial premises that is supposed to be connected to sewer or collected for treatment and disposal by a liquid waste contractor (including grease trap waste)
<i>Mobile Garbage Bin(s) (MGB)</i>	A waste container generally constructed of plastic with wheels with a capacity in litres of 120, 240, 660, 1000 or 1100
<i>Putrescible Waste</i>	Component of the waste stream liable to become putrid. Usually breaks down in a landfill to create landfill gases and leachate. Typically applies to food, animal and organic products.

INTRODUCTION

This report supports a Development Application for Stage 1 of the Ivanhoe Estate redevelopment, a State Significant Development (SSD) submitted to the Department of Planning and Environment (DPE) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). It has been prepared for Aspire Consortium on behalf of NSW Land and Housing Corporation.

BACKGROUND

In September 2015 the Ivanhoe Estate was rezoned by DPE as part of the Macquarie University Station (Herring Road) Priority Precinct, to transform the area into a vibrant centre that benefits from the available transport infrastructure and the precinct's proximity to jobs, retail and education opportunities within the Macquarie Park corridor.

The Ivanhoe Estate is currently owned by NSW Land and Housing Corporation and comprises 259 social housing dwellings. The redevelopment of the Ivanhoe Estate is part of the NSW Government Communities Plus program, which seeks to deliver new communities where social housing blends with private and affordable housing, with good access to transport, employment, improved community facilities and open space.

The Communities Plus program seeks to leverage the expertise and capacity of the private and non-government sectors. As part of this program, Aspire Consortium, comprising Frasers Property Australia and Mission Australia Housing, were selected as the successful proponent to develop the site in July 2017.

In September 2017, DPE issued the Secretary's Environmental Assessment Requirements for a comprehensive Masterplan application that will establish the framework for the staged redevelopment of the site. This Development Application for Stage 1 of the Ivanhoe Estate redevelopment represents the first stage of detailed works pursuant to the Ivanhoe Estate Masterplan.

SITE DESCRIPTION

The Ivanhoe Estate site is located in Macquarie Park near the corner of Epping Road and Herring Road within the Ryde Local Government Area (LGA). The site is approximately 8.2 hectares and currently accommodates 259 social housing dwellings, comprising a mix of townhouse and four storey apartment buildings set around a cul-de-sac street layout. An aerial photo of the site is provided at **Figure 1** below.

Immediately to the north of the site are a series of four storey residential apartment buildings. On the north-western boundary, the site fronts Herring Road and a lot that is currently occupied by four former student accommodation buildings and is likely to be subject to redevelopment. Epping Road runs along the south-western boundary of the site and Shrimptons Creek, an area of public open space, runs along the south-eastern boundary. Vehicle access to the site is via Herring Road.

Ivanhoe Estate comprised of 17 individual lots owned and managed by the NSW Land and Housing Corporation. The Masterplan site also incorporates adjoining land, being a portion of Shrimptons Creek and part of the commercial site at 2-4 Lyonpark Road. This land is included to facilitate a bridge crossing and road connection to Lyonpark Road.



 The Site

 To facilitate road extension to Lyonpark Road

Figure 1- Ivanhoe Estate site

OVERVIEW OF THE PROPOSED DEVELOPMENT

The proposed Stage 1 Development Application seeks consent for the first stage of detailed works within the Ivanhoe Estate, pursuant to the Ivanhoe Estate Masterplan under Section 4.22 of the EP&A Act. The Masterplan establishes the planning and development framework against which this Stage 1 Development Application will be assessed.

The Stage 1 Development Application seeks approval for:

- site preparation works, including tree removal, demolition of roads, services, and earthworks across the Ivanhoe Estate;
- the provision and augmentation of utilities and services infrastructure across the Ivanhoe Estate;
- the construction of all internal roads including public domain within the road reserves, and the bridge crossing and road connection to Lyonpark Road;

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Sydney Head Office 44-46 Gibson Ave Padstow NSW 2211 | PH: +612 9780 3500 | Fax: +612 9707 2588

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Offices in Victoria & Queensland – Toll Free: 1800 025 073

- the consolidation of existing lots and subdivision of the Ivanhoe Estate to reflect the revised road layout, open space, and provide superblocks corresponding to the Masterplan;
- the construction and use of Buildings A1 and C1 comprising residential uses (including social housing), a childcare centre, and retail / community spaces.

An image of the Masterplan, identifying Buildings A1 and C1 and illustrating the road network, is provided at **Figure 2** below.



Figure 2- Ivanhoe Estate Masterplan

CITY OF RYDE COUNCIL

The assessment of waste volumes is an estimate only and will be influenced by the development's management and occupant's attitude to waste disposal and recycling.

The residential waste and recycling will be guided by the services and acceptance criteria of the City of Ryde Council. The residential waste and recycling will be collected by council. The retail and commercial waste will be collected by private contractor.

All waste facilities and equipment are to be designed and constructed to be in compliance with the City of Ryde Council's DCP and Waste Management Strategy, Australian Standards and statutory requirements.

OBJECTIVES

- 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;
- Encourage techniques in demolition and construction which minimise waste generation, and which maximise the reuse and recycling of materials;
- Ensure appropriate, well-designed waste storage and collection facilities are provided and are accessible to occupants and service providers;
- Ensure wastes are handled and stored appropriately in order to minimise risk to health and safety associated with handling and disposing 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;
- Assist in achieving Federal and State Government waste minimisation targets in accordance with regional waste plans; and
- Minimise the overall environmental impacts of waste and foster the principles of ecologically sustainable development (ESD).

GENERATED WASTE VOLUMES

The assessment of projected waste volumes is a calculated estimate only and will be influenced by the development's management and occupant's waste disposal and recycling practices.

CONSTRUCTION AND DEVELOPMENT WASTE

The head contractor will be responsible for removing all construction-related waste offsite in a manner that meets all authority requirements. Construction waste management plans will be submitted with each stage Development Application. A letter from Bingo has been included in the Appendices of this report.

BUILDING MANAGER/WASTE CARETAKER

All waste equipment movements are to be managed by the building manager/cleaners at all times. No tenants or residents will be allowed to transport waste or recyclables from the waste room; tenants and residents will only transport their waste to the allocated bin room.

The building manager/cleaner duties include, but are not limited to, the following:

- general maintenance and cleaning of the chute doors on each level (Frequency dependent on waste generation and will be determined based upon building operation);
- organising, maintaining and cleaning the general and recycled waste holding areas (Frequency will depend on waste generation and will be determined based upon building operation);
- transporting of bins as required (to and from the temporary collection area until Stage 2 is operational);
- organising both garbage and recycled waste pick-ups as required;
- cleaning and exchanging all bins;
- ensure site safety for residents, children, visitors, staff and contractors;
- abide by all relevant OH&S legislation, regulations, and guidelines;
- assess any manual handling risks and prepare a manual handling control plan for waste and bin transfers; and
- provide to staff/contractors equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities

***NOTE:** It is the responsibility of the building manager to monitor the number of bins required for the development. As waste volumes may change according to the development's management and occupants' attitudes to waste disposal and recycling, bin numbers and sizes may need to be altered to suit the building operation.*

REPORTING

It is recommended that building management ensure that all waste service providers submit monthly reports on all equipment movements and weights of any waste and recycling products removed from the development. Regular reviews of servicing should take place to ensure operational and economic best practise and to assist with sustainability reporting.

EDUCATION

Building management is responsible for creating and managing the waste management education process.

Educational material encouraging correct separation of garbage and recycling items must be provided to each resident to ensure correct use of the waste chute. This should include the correct disposal process for bulky goods (old furniture, large discarded items, etc.) It is recommended that information is provided in multiple languages to support correct practises and minimise the possibility of chute blockages as well as contamination in the collective waste bins.

It is also recommended that the owners' corporation website contain information for residents to refer to regarding use of the chute. Information should include:

- Directions on using the chute doors;
- Recycling and garbage descriptions (council provides comprehensive information);
- How to dispose of bulky goods and any other items that are not garbage or recycling;
- Residents' obligations to WHS and 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 newspapers, 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, bricks or other building materials, furniture, etc. down the chute.

It is expected that leasing arrangements with retail/commercial operations contain direction on waste management services and expectations.

SIGNAGE

The building manager/caretaker is responsible for waste room signage including safety signage (see 0). Appropriate signage must be prominently displayed on walls and above all bins, clearly stating what type of waste or recyclables is to be placed in the bin underneath.

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

WASTE GENERATION TOTALS

RESIDENTIAL

Table 1: Waste and Recycling Generation Calculations – Residential Units of Building C1

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 C1- Core 1	130	120	15600	80	10400		
Building C1- Core 2	130	120	15600	80	10400		
Building C1- Core 3	129	120	15480	80	10320		
Building C1- Core 4	104	120	12480	80	8320		
TOTAL	493		59160		39440		
Bins and Collections		General Waste Bin Size (L)	1100	Recycling Bin Size (L)	660		
		General Waste Bins per Week	57	Recycling Bins per Week	61		
		General Waste Collections per Week	3	Recycling Collections per Week	2		
		Total General Waste Bins Required for Collection	19	Total Recycling Bins Required for Collection	31		
		Number of Waste Bins Per Day	Building C1- Core 1	2.03	Number of Recycling Bins Per Day	Building C1- Core 1	2.25
			Building C1- Core 2	2.03		Building C1- Core 2	2.25
			Building C1- Core 3	2.01		Building C1- Core 3	2.23
			Building C1- Core 4	1.62		Building C1- Core 4	1.80

Table 2: Waste and Recycling Generation Calculations – Residential Units of Building A1

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 A1	269	120	32280	80	21520
TOTAL	269		32280		21520
Bins and Collections		General Waste Bin Size (L)	1100	Recycling Bin Size (L)	660
		General Waste Bins per Week	29.3	Recycling Bins per Week	32.6
		General Waste Collections per Week	3	Recycling Collections per Week	2
		Total General Waste Bins Required for Collection	10	Total Recycling Bins Required for Collection	17

	Number of Waste Bins Per Day	4.2	Number of Recycling Bins Per Day	4.7
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RESIDENTIAL BIN SUMMARY

Based on the estimated waste generated by the residential component of this development, the recommended bin quantities and collection frequencies are as follows:

General Waste: 29 x 1100L MGBs collected **3 x weekly**

Recycling: 48 x 660L MGBs collected **2 x weekly**

Service Bins: 5x 1100L MGB and 5x 660L MGBs

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.

CHILDCARE

Table 3: Calculated Waste Generation – Childcare

Type	NLA (m ²)	Waste Calculation (L/100m ² /day)	Generated Waste (L/week)	Recycling Calculation (L/100m ² /day)	Generated Recycling (L/week)
Childcare	335	20	469	20	469
TOTAL	335		469		469

Table 4: Stage 1 Bin Summary – Childcare

Garbage			Recycling		
Bin Capacity (L)	Quantity	Collection Rate (times/week)	Bin Capacity (L)	Quantity	Collection Rate (times/week)
240	2	1	240	2	1

RETAIL/COMMUNITY

Table 5: Development Total Waste Generation – Retail/Community

Type	NLA (m ²)	Waste Calculation (L/100m ² /day)	Generated Waste (L/week)	Recycling Calculation (L/100m ² /day)	Generated Recycling (L/week)
Retail	490	50	1715	50	1715
TOTAL	490		1715		1715

Table 6: Stage 1 Bin Summary – Retail/Community

Garbage			Recycling		
Bin Capacity (L)	Quantity	Collection Rate (times/week)	Bin Capacity (L)	Quantity	Collection Rate (times/week)
1100	2	1	1100	2	1



WASTE MANAGEMENT

Dual chutes will be installed into each core of each building. Breakdown is as follows:

RESIDENTIAL

Each residential level will have two (2) chute doors installed for garbage and recycling disposal (see APPENDIX C.1).

Garbage discharge into 1100L MGBS and recycling discharge into 660L MGBs at the base of the chute system. There will also be two spare MGBs to be utilised during collection times, known as service bins. The discharge is located in the basement discharge room on the basement level of each.

Full bins will be transferred to one of multiple bin holding areas for collection.

WASTE HANDLING

WASTE

All residents of each building will be supplied with a collection area in each unit (generally in the kitchen, under bench or similar alternate area) to deposit garbage and collect recyclable material suitable for one days storage. Residents should wrap or bag their waste. Bagged waste should not exceed 3kg in weight or 35cm x 35cm x 35cm in dimension.

The caretaker/cleaner will be required to check the 240L MGB collecting waste from each chute, rotate full bins to the storage and collection area, and replace empty 240L MGB under each chute operation.

RECYCLING

Cardboard furniture boxes or large cardboard containers should not be included in the waste chute – a cardboard collection bin will be made available to residents to deposit flattened cardboard and will be managed by the waste caretaker. Bins will be located in the garbage and bulky goods area. This will be used for larger cardboard items such as packaging for televisions, pizza boxes, etc.

Recycling that travels via the recycling chute must not be bagged. It is recommended that residents use a crate or dedicated bin for collecting recyclables within the allocated residential space provided to ensure correct separation. Residents will then dispose of their recyclable materials in the recycling chute, one item at a time. Items should not be grouped in bags as this hinders the recycling recovery.

The caretaker/cleaner's duty is responsible for exchanging or emptying recyclable bins and storing them in the main bin storage room located on lower ground level, ready for collection.

TEMPORARY STORAGE OF BULKY GOODS

A room will be allocated in each of the residential buildings for the storage of discarded residential bulky items. These areas will be made available close to or within the bin holding room for each building. Each area will be a minimum of 5m². It is envisaged that bulky goods will be managed by the building manager/waste caretaker. Residents will be required to liaise with building management regarding all bulky goods movements.

It is recommended that donations to charitable organisations be encouraged. Clean, sound furniture and household goods etc. are highly sought after to provide for the disadvantaged. Donations will be arranged with the assistance of the building manager/caretaker.

RETAIL/COMMUNITY

The tenants will be required to be responsible for their own storage of waste and recycling back of house (BOH). On completion of each trading day or as required, nominated staff/cleaners will transport their waste and recycling to the allocated retail/community waste area and place waste and recycling into the appropriate collection bins.

Food handling for food cooked or prepared, served and consumed on site will produce a typical waste composition of food scraps from plates, packaging waste and some plastics. Café or restaurant staff will be responsible for their waste management.

Tenants will be directed to transport empty milk/bread plastic crates to the BOH waste room for storage prior to collection by the supplier. All retail agreements with milk/bread vendors must include regular removal of redundant plastic crates to prevent build-up of material on site. Stacked crates can cause a safety hazard.

Cardboard is a major component of the waste generated by cafes/restaurants. All cardboard should be flattened (to save bin space), placed in and collected from bulk bins. Whilst cardboard is bulky, it is generally lightweight however it can be contaminated with food or liquid which makes it unsuitable for recycling.

On completion of each trading day or as required, nominated retail staff/cleaners will transport their waste and recycling, using the access corridor, to the retail/community waste room and place waste and recycling into the appropriate collection bins.

It is recommended that:

- all waste should be bagged and waste bins should be plastic lined;
- bagging of recyclables is not permitted;
- all waste collections located BOH during operations;
- individual recycling programs are recommended for retailers to ensure commingled recycling is separated correctly;
- any food and beverage tenant will make arrangements for storing used and unused cooking oil in a bunded storage area;
- the operator will organise grease interceptor trap servicing;

- a suitable storage area needs to be provided and affectively banded for chemicals, pesticides and cleaning products;
- dry basket arresters need to be provided to the floor wastes in the food preparation and waste storage areas;
- washroom facilities should be supplied with collection bins for paper towels (if used);
- all flattened cardboard will be collected and removed to the waste room recycling MGB;
- restaurant and café tenant/s are supplied with waste and recycling collection receptacles back of house (BOH) to be transported by restaurant/cafe staff, building management/ cleaners to the collection area daily

NOTE: Subject to the stakeholders preference/capability (and as built constraints), bin sizes and quantities may be changed.

CHILDCARE CENTRE

It is expected that the contract cleaners appointed by the childcare centre will remove bagged waste and separated recycling from the allocated collection points and deposit it into the appropriate bins.

The child care centre may also appoint its own private waste services provider for garbage and recycling services. Alternately, building management will transport bins to the bin collection area and return empty bins to the child care centre.

Most recycling generated by child care centres include soiled nappies, wipes and change sheets. Dedicated waste bins are to be allocated for sorting and storage of general waste and disposable nappies. A recycling service for soiled disposable nappies should be investigated.

Secure destruction bins will be operated on a wheel in wheel out basis by the appointed contractor/s if required.

It is recommended that all amenities and work station areas be furnished with suitable recycling and waste collection receptacles.

Washroom facilities should be supplied with collection bins for paper towels (if used).

All staff will be responsible for management of their general waste and storage of same.

Staff tea points and food preparation areas will be supplied with a dedicated commingled collection receptacle for the collection of all recyclable glass and plastic items. Staff will be responsible for sorting this material and allocating recyclables into the correct collection facility.



WASHROOMS

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.

Please note that all collection receptacles and bins should be branded with the appropriate stickers and the use of the Mobius loop or similar identifying recycling equipment.

OTHER RETAIL/COMMERCIAL WASTE

Tenants usually make their own arrangements for the disposal and recycling of toner cartridges and batteries. Disposal of hard, electronic, liquid waste and any detox (paint/chemicals) shall be organised with the assistance of the building management/cleaners.

GREEN WASTE

There will be green waste generated by the buildings landscaped areas. Any green waste will be collected and removed from site by the maintenance contractor during scheduled or arranged servicing of these areas.

Residents with gardens will be provided access to a green bin store on lower ground level of Building C1 which will house green bins.

OTHER WASTE STREAMS

Disposal or recycling of electronic, liquid waste and home detox (paint/chemicals) etc. shall be organised with the assistance of the building caretaker, where required. Recyclable electronic goods include batteries, equipment containing printed circuit boards, computers, televisions, fluorescent tubes and smoke detectors. These items may not be disposed in waste or recycling bins for safety and environmental reasons. Residents should be directed to Councils website for further information.

WASHROOM FACILITIES

Washroom facilities in retail and staff areas 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.

Building management will monitor use and ensure waste bins are exchanged and cleaned.

COMMON AREAS

The lobbies, retail amenities and circulation areas will be supplied with suitably branded waste and recycling bins, where considered appropriate. Building management will monitor use and ensure bins are exchanged and cleaned (*see APPENDIX C for Waste Management Equipment*). These areas generate negligible waste however garbage and recycling receptacles should be placed in convenient locations.

USED COOKING OIL

Grease arrestors have been provided in both buildings for retail and childcare.

WASTE CHUTES

Waste chutes for each level of the residential building are supplied per the following specifications:

- either 510mm galvanised steel or 510mm recycled LLDPE polyethylene plastic;
- galvanised steel chute hoppers are wrapped with 50mm poly-wool R1.3 noise insulation foil to assist in noise reduction;
- penetrations on each building level at vertically perpendicular points with minimum penetration dimensions of 600mm x 600mm (square or round) are required to accommodate the chute installation;
- a wash down system and vent should also be included as part of the chute system;
- council and supplier require that all chutes are installed without offsets to achieve best practise operationally for the building; and
- two hour fire-rated (AS1530.4-2005) stainless steel refuse chute doors at each service level. All doors are to be fitted with a self-closing mechanism to meet BSA fire standards.

***NOTE:** Chute doors are installed after walls rendered, painted or when required. Information stickers will be placed on each chute door at each residential level.*

EQUIPMENT SUMMARY

Table 7: Development Equipment Summary

Component	Part	Quantity	Notes
Chutes	Galvanised Steel / LLDPE Polyethylene Plastic	10	(See APPENDIX C for Typical Chute Section)
Equipment A	Suitable Bin Moving Equipment		
Equipment B	Volume handling equipment (5 x 2-bin 1100L linear track) (5 x 2-bin 660L linear track)	10	

WASTE ROOM AREAS

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 8: Waste Room Areas

Level	Waste Room Type	Equipment
B3	Chute Discharge Room – Building C1 Core 1	<i>Minimum</i> 1x 2-bin linear for 1100L MGBs (waste) 1x 2-bin linear for 660L MGBs (recycling) 1x 1100L MGB (service bin) 1x 660L MGB (service bin)
B3	Chute Discharge Room – Building C1 Core 2	<i>Minimum</i> 1x 2-bin linear for 1100L MGBs (waste) 1x 2-bin linear for 660L MGBs (recycling) 1x 1100L MGB (service bin) 1x 660L MGB (service bin)
B3	Chute Discharge Room – Building C1 Core 3	<i>Minimum</i> 1x 2-bin linear for 1100L MGBs (waste) 1x 2-bin linear for 660L MGBs (recycling) 1x 1100L MGB (service bin) 1x 660L MGB (service bin)
B3	Chute Discharge Room – Building C1 Core 4	<i>Minimum</i> 1x 2-bin linear for 1100L MGBs (waste) 1x 2-bin linear for 660L MGBs (recycling) 1x 1100L MGB (service bin) 1x 660L MGB (service bin)
B3	Chute Discharge Room – Building A1	<i>Minimum</i> 1x 2-bin linear for 1100L MGBs (waste) 1x 2-bin linear for 660L MGBs (recycling) 1x 1100L MGB (service bin) 1x 660L MGB (service bin)
LG	Residential Bin Holding Room – Building C1 (collection area)	19x 1100L MGBs (waste) 31x 660L MGBs (recycling)
	Residential Bin Holding Room – Building A1 (collection area)	10x 1100L MGBs (waste) 17x 660L MGBs (recycling)
LG	Bulky Goods Waste Storage Room – each building	Minimum 5m ² per building
LG	Retail/Community Waste Room	2x 1100L MGBs (waste) 2x 1100L MGBs (recycling)
LG	Childcare	2x 240L MGBs (waste) 2x 240L MGBs (recycling)

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.

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 9: Waste Room Requirements

Waste Room Type	Waste Room Requirements
Chute Discharge Room	<ul style="list-style-type: none"> • 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 (subject to penetration location) • 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 40 degrees (Subject to number of consecutive offset and/pr up to 1500mm) • Where two sets of volume management equipment is placed under the chutes, a 200mm clearance is required between the equipment.
Residential Bin Holding Room and/or Bin Collection Area	<ul style="list-style-type: none"> • Bins must not be stacked in rows that are more than two bins deep
Bulky Goods Waste Storage Room	<ul style="list-style-type: none"> • 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 Waste Room	<ul style="list-style-type: none"> • In order to ensure staff safety, all bins should be arranged so they can be accessed without moving another bin

RESIDENTIAL

All basement discharge waste rooms must each accommodate dual chute outlets and the appropriate volume handling equipment.

Each building will have a bulky goods area of at least 5sqm.

RETAIL/COMMUNITY

All waste rooms must be able to hold all the designated waste bins with enough room to clean and safely manoeuvre bins. A bin wash down area is provided in this area.

BIN MOVING PATHS

The building manager 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 recommended to aid the movement of full bins. The developer is responsible for supplying 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 will be responsible for maintaining, repairing and replacing waste management equipment.

Bins may have to be fitted with hitches 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.



COLLECTION OF WASTE

RESIDENTIAL

The garbage and recycling for this site will be collected by Council from the residential bin holding areas located in each building. This report assumes waste will be collected three times weekly and recycling twice weekly

Prior to collection day, the building manager will transport the bins from the Chute Discharge Rooms to the Residential Bin Holding Area on Ground Level to await collection. It is recommended that service bins are placed under the chute while servicing is occurring. Suitable bin moving equipment is also recommended to aid the movement of bins.

The collection vehicle will enter the site and park in the respective loading bays adjacent to the Residential Bin Holding Rooms. The waste collection staff will collect the bins directly from the Residential Bin Holding Rooms.

After servicing has been completed, the building manager is responsible for returning the bins to their operational locations.

RETAIL/COMMUNITY AND CHILDCARE

A private contractor will be engaged to collect the waste and recycling to agreed schedule. This report assumes waste and recycling will be collected a minimum of once weekly.

The collection vehicle will park in the closest loading bay to the respective waste room. The waste collection staff will collect the bins directly from the retail/community waste room and the childcare waste room.

GARBAGE ROOMS - CONSTRUCTION REQUIREMENTS

The garbage room will be required to contain the following facilities to minimise odours, deter vermin, protect surrounding areas, and make it a user-friendly and safe area:

- waste room floor to be sealed with a two pack epoxy;
- waste room walls and floor surface is flat and even;
- all corners coved and sealed 100mm up, this is to eliminate build-up of dirt;
- for residential: a hot and cold water facility with mixing facility and hose cock must be provided for washing the bins;
- for retail/commercial: a cold water facility with hose cock must be provided for washing the bins;
- any waste water discharge from bin washing must be drained to sewer in accordance with the relevant water board. (Sydney Water);
- tap 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 floor levels;
- the room must be mechanically ventilated;
- light switch installed at height of 1.6m;
- waste rooms must be well lit (sensor lighting recommended);
- optional automatic odour and pest control system installed to eliminate all pest types and assist with odour reduction – this process generally takes place at building handover – building management make the decision to install;
- all personnel doors are hinged and self-closing;
- waste collection area must hold all bins – bin movements should be with ease of access;
- conform to the Building Code of Australia, Australian Standards and local laws; and
- childproofing and public/operator safety shall be assessed and ensured

VENTILATION

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; or
- Naturally - permanent, unobstructed, and opening direct to the external air, not less than one-twentieth (1/20) of the floor area

Mechanical exhaust systems shall comply with AS1668 and not cause any inconvenience, noise or odour problem.

STORM WATER PREVENTION & LITTER REDUCTION

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:

- promote adequate waste disposal into the bins;
- secure all bin rooms (whilst affording access to staff/contractors);
- prevent overfilling of bins, keep all bin lids closed and bungs leak-free;
- take action to prevent dumping or unauthorised use of waste areas; and
- ensure collection contractors clean-up any spillage that may occur when clearing bins

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 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.



USEFUL CONTACTS

Elephants Foot Recycling Solutions does not warrant or make representation for goods or services provided by suppliers.

City of Ryde Council Customer Service

Phone: 02 9952 8222

Email: cityofryde@ryde.nsw.gov.au

SULO MGB (MGB, Public Place Bins, Tugs and Bin Hitches)

Phone: 1300 364 388

CLOSED LOOP (Organic Dehydrator)

Phone: 02 9339 9801

ELECTRODRIVE (Bin Mover)

Phone: 1800 333 002

Email: sales@electrodrive.com.au

RUD (Public Place Bins, Recycling Bins)

Phone: 07 3712 8000

Email: info@rud.com.au

CAPITAL CITY WASTE SERVICES

Phone: 02 9359 9999

REMONDIS (Private Waste Services Provider)

Phone: 13 73 73

SITA ENVIRONMENTAL (Private Waste Services Provider)

Phone: 13 13 35

NATIONAL ASSOCIATION OF CHARITABLE RECYCLING ORGANISATIONS INC. (NACRO)

Phone: 03 9429 9884

Email: information@nacro.org.au

PURIFYING SOLUTIONS (Odour Control)

Phone: 1300 636 877

Email: sales@purifyingsolutions.com.au

Elephants Foot Recycling Solutions (Chutes, Compactors and eDiverter Systems)

44 – 46 Gibson Avenue

Padstow NSW 2211

Free call: 1800 025 073

ELEPHANTS FOOT WASTE COMPACTORS PTY LTD ABN 70 001 378 294

Sydney Head Office 44-46 Gibson Ave Padstow NSW 2211 | PH: +612 9780 3500 | Fax: +612 9707 2588

Website: www.elephantsfoot.com.au | Email: info@elephantsfoot.com.au

Offices in Victoria & Queensland – Toll Free: 1800 025 073

APPENDICES

APPENDIX A DRAWING EXCERPTS

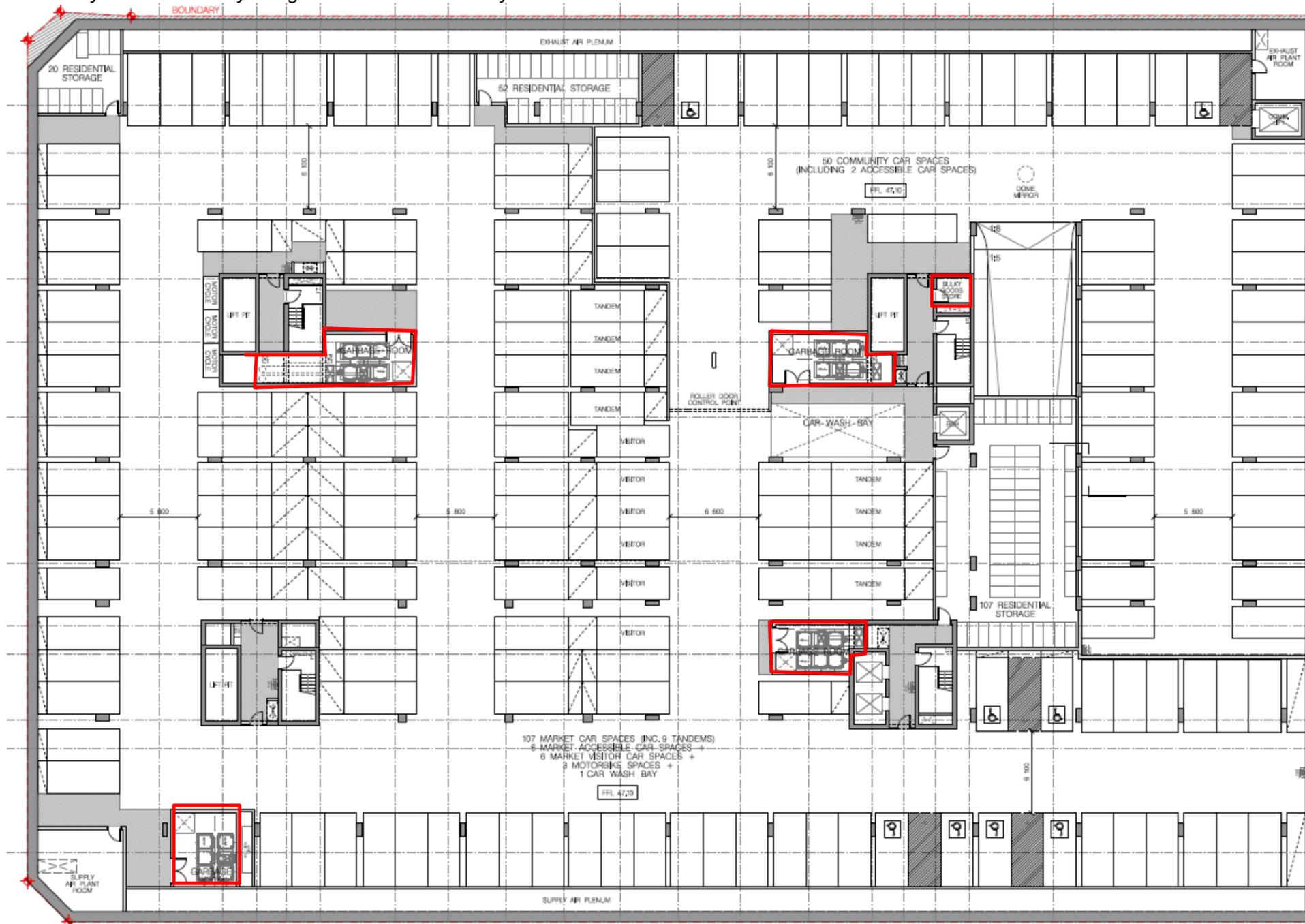
APPENDIX A.1 STAGING PLAN



Source: Bates Smart – Staging Plan 2018

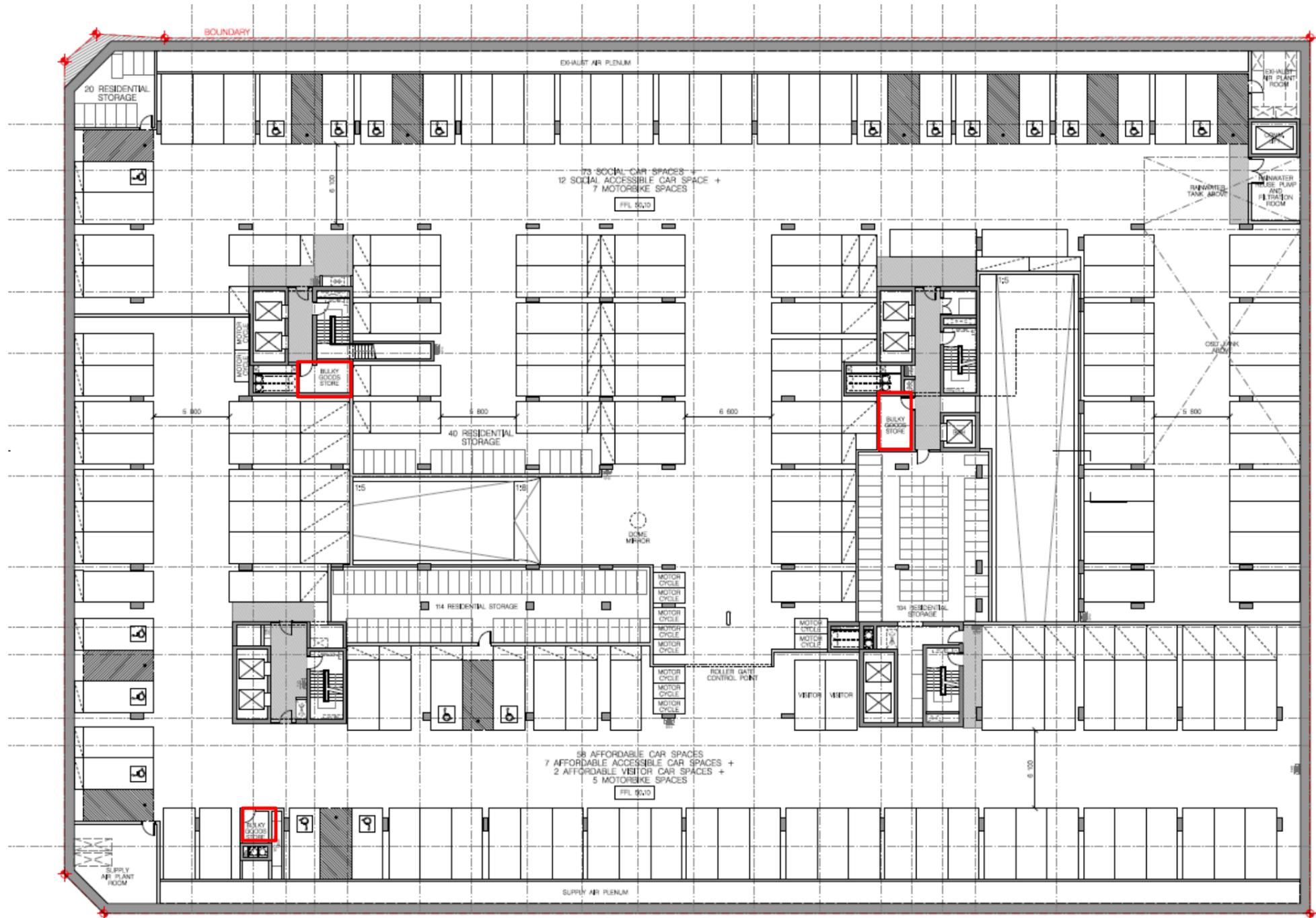
APPENDIX A.2 C1 BASEMENT LEVEL 3 – WASTE FACILITIES

Please note: The chute offsets has yet to be reviewed by an engineer to confirm feasibility

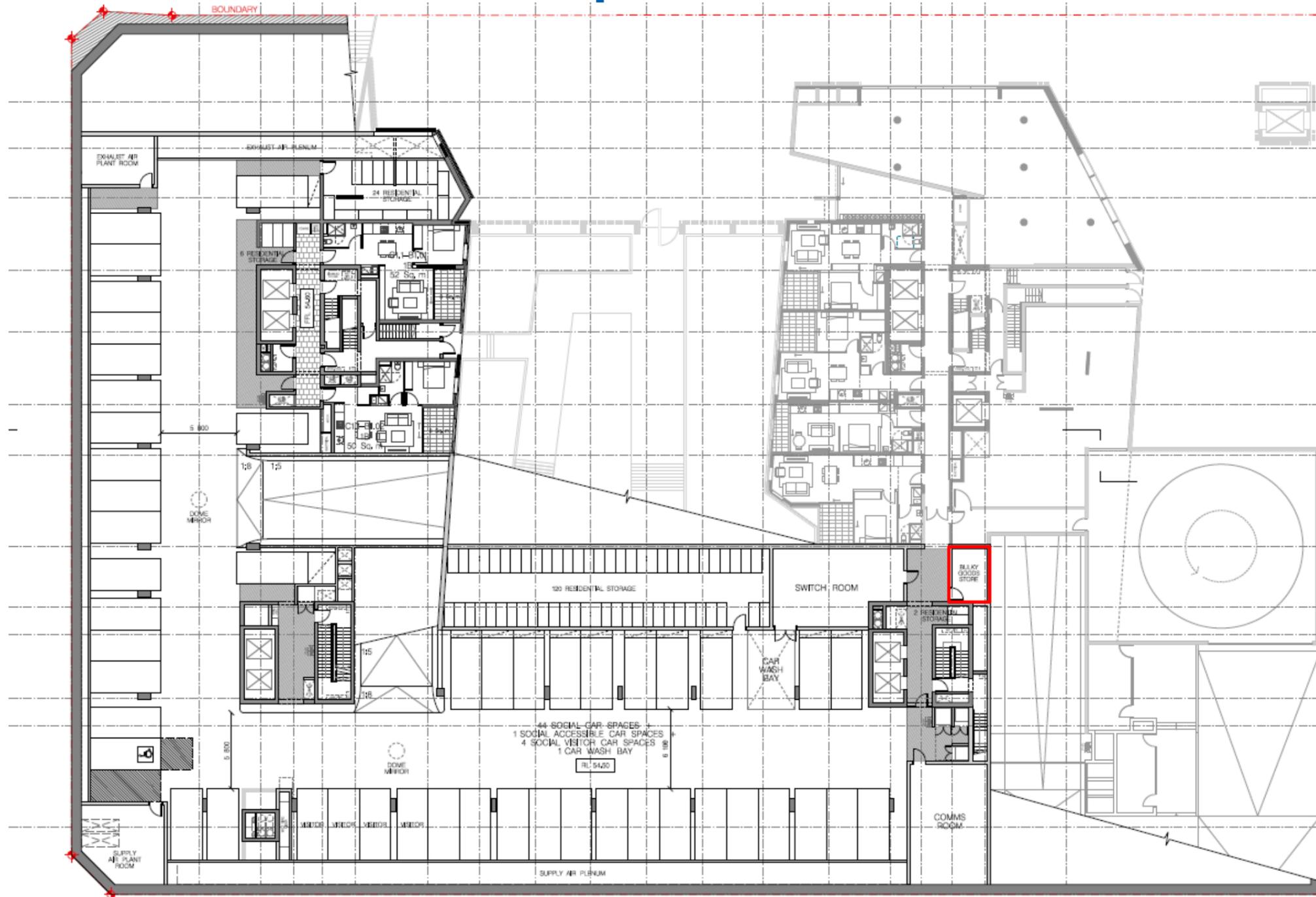


Source: Candalepas Associates, Drawing No. S4.55-1102, Rev A, Dec2020– Basement 3 Floor Plan

APPENDIX A.3 C1 BASEMENT LEVEL 1 & 2 – BULKY GOODS ROOMS



Source: Candalepas Associates, Drawing No. S4.55-1103, Rev A, Dec2020– Basement 2 Floor Plan



Source: Candalepas Associates, Drawing No. S4.55-1104, Rev A, Dec2020– Basement 1 Floor Plan

APPENDIX A.4 BUILDING C1 LOWER GROUND LEVEL – BUILDING C1 WASTE FACILITIES AND COLLECTION AREA

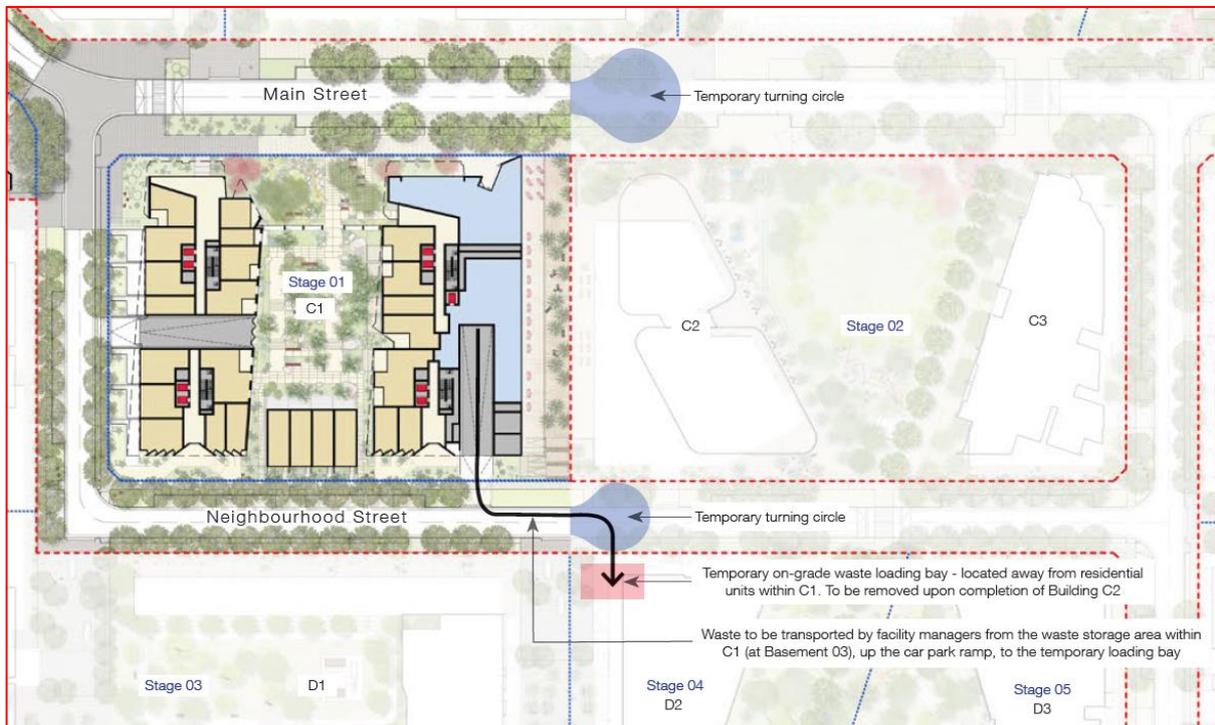
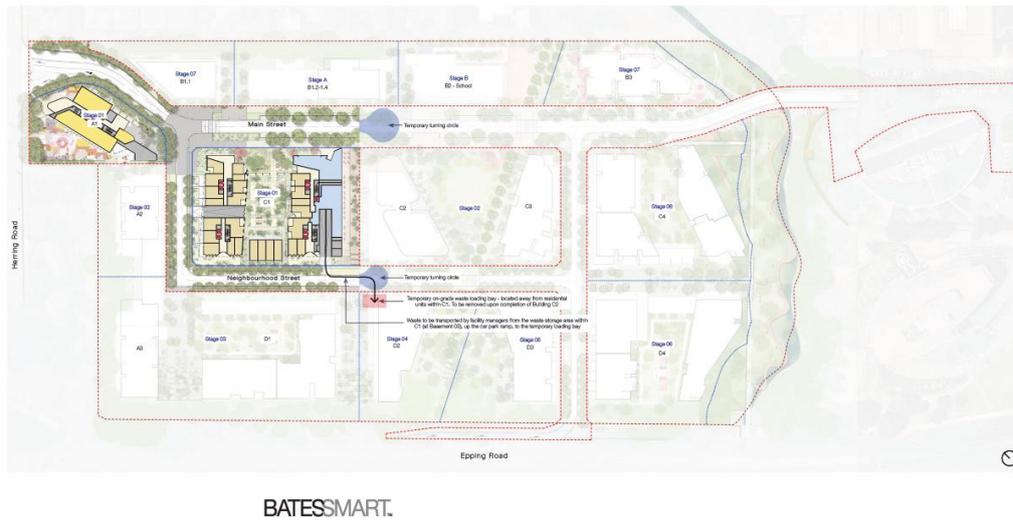


Source: Candalepas Associates, Drawing No. S4.55-1105 , Iss.A, Dec2020– Lower Ground Floor Plan

APPENDIX A.5 C1 TEMPORARY COLLECTION AREA

PHASE 02 - INITIAL ROAD CONSTRUCTION

Partial road construction only.
Temporary turning circles and on-grade waste loading for C1 (within Stage 04 / Lot D2)



APPENDIX A.6 BINGO SUPPORTING LETTER



Bingo Waste Services Pty Ltd
ABN: 43 162 988 823

PO Box 7, Enfield NSW 2136
T: 02 9737 0308 F: 02 9737 0351
enquiries@bingoindustries.com.au
www.bingoindustries.com.au

03/11/2016

To whom it may concern,

Bingo Industries will support and work closely with Frasers Property Australia to try and ensure the correct recyclable materials are placed into the bins, so that we can achieve a maximum of 1% construction waste to landfill through recycling.

Bingo has 6 state of the art waste recovery facilities strategically located around Sydney. They are based in Auburn, Banksmeadow, Minto, Mortdale, St Marys & Smithfield. Bingo Recycling Centres have an outstanding reputation in the waste industry. We have spent several million dollars in the last few years on recycling equipment and machinery, evolving into the best group of recycling facilities in Australia.

Our unique approach to recycling and sustainability has earned us an exclusive partnership with Planet Ark and put us at the forefront of the recycling industry.

Should you have any questions or require further information please feel free to contact me.

Kind Regards,

Nick Saad
Sales Manager – Skip Bins
0424 174 577



APPENDIX B BETTER PRACTICE GUIDE SPECIFICATIONS

APPENDIX B.1 BIN DIMENSIONS

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



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

Wheelie bin

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



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

Dome or flat lid container

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

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

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 B.3 TYPICAL RETAIL COLLECTION VEHICLE INFORMATION

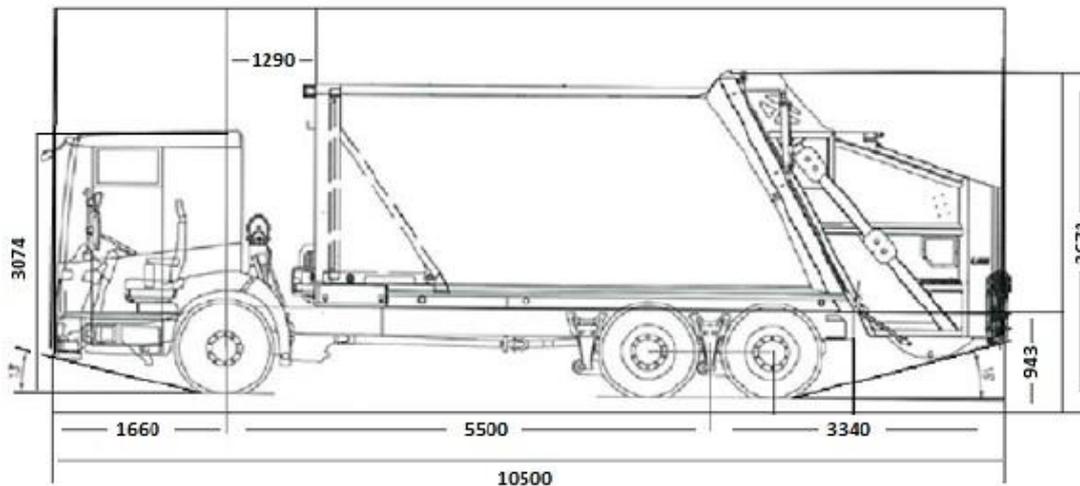
DESIGN SPECIFICATIONS REAR LOADED WASTE COLLECTION VEHICLES

NOTE: Small Residential Flat Buildings outlined in section 4.3 do not require on site waste allocation therefore no vehicle specifications have been provided of the 12.5m heavy Rigid Collection Vehicle.

The following dimensions are provided for a standard heavy rigid vehicle as identified in Australian Standard 2890.2:

Vehicle Class:	Heavy Rigid Vehicle Dimensions
Overall Length (m)	10.5
Operational Length (m)	12.5
Design Width (m)	2.8
Design Height (m)	3.7
Swept Circle (m)	22.5
Clearance (travel height) (m)	4.5
Weight Fully Loaded (tonnes)	22.5
Capacity (m ³)	24
Front Chassis Clearance	13 ⁰
Rear Chassis Clearance	16 ⁰

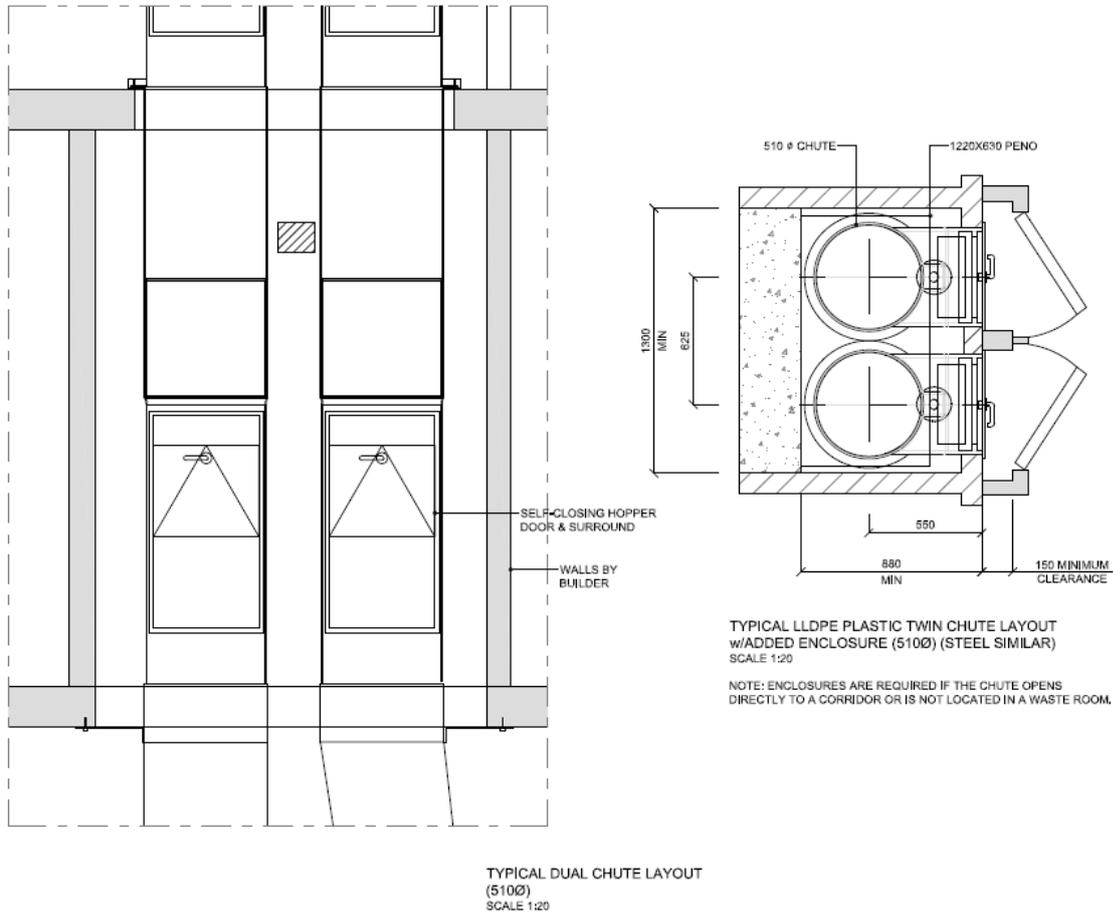
Standard dimensions sourced from AS 2890.2 Parking Facilities: Off-Street Commercial Vehicle Facilities



10.5m Heavy Rigid Waste Collection Vehicle specifications

APPENDIX C WASTE MANAGEMENT EQUIPMENT SPECIFICATIONS

APPENDIX C.1 TYPICAL WASTE CHUTE SPECIFICATIONS



Waste chutes are supplied per the following specifications:

- Either 510mm galvanised steel or 510mm recycled LLDPE polyethylene plastic;
- Galvanised steel chute hoppers are wrapped with 50mm poly-wool R1.3 noise insulation foil to assist in noise reduction;
- Penetrations on each building level at vertically perpendicular points with minimum penetration dimensions of 600mm x 600mm (square or round) are required to accommodate the chute installation;
- A wash down system and vent should also be included as part of the chute system;
- Council and supplier require that all chutes are installed without offsets to achieve best practise operationally for the building; and
- Two hour fire-rated (AS1530.4-2005) stainless steel refuse chute doors at each service level. All doors are to be fitted with a self-closing mechanism to meet BSA fire standards.

NOTE: Chute doors are installed after walls rendered, painted or when required. Information stickers will be placed on each chute door at each residential level.



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

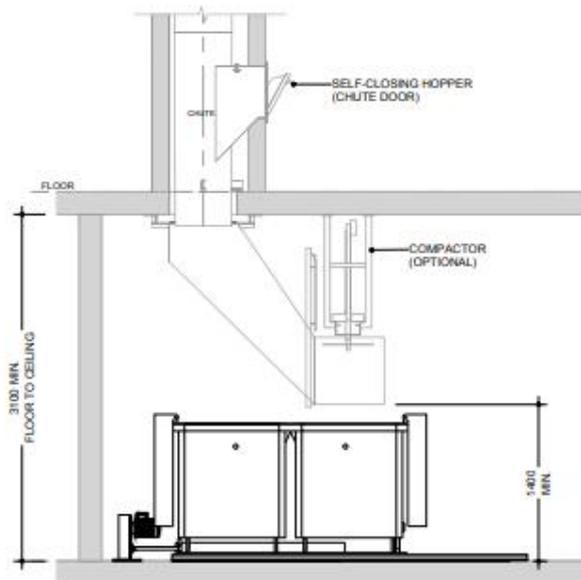
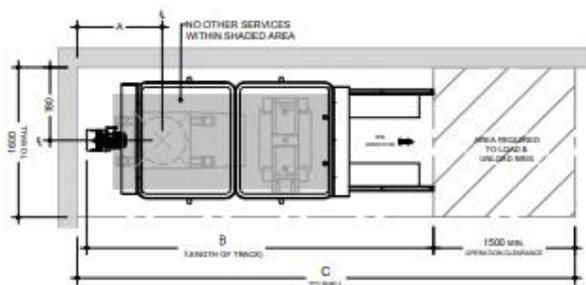
ELEPHANTS FOOT WASTE COMPACTORS PTY LTD ABN 70 001 378 294

Sydney Head Office 44-46 Gibson Ave Padstow NSW 2211 | **PH:** +612 9780 3500 | **Fax:** +612 9707 2588

Website: www.elephantsfoot.com.au | **Email:** info@elephantsfoot.com.au

Offices in Victoria & Queensland – **Toll Free:** 1800 025 073

LINEAR TRACK SYSTEM



1100 LITRE BIN

1100 LITRE BIN LINEAR TRACK SYSTEM			
No. of Bins	Reference (mm)		
	A	B	C
2	900	3700	5300
3	2100	5940	7550

Notes:

Bins not provided by Elephants Foot

Drawings shown are for general information purposes only and provide minimum equipment spatial 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

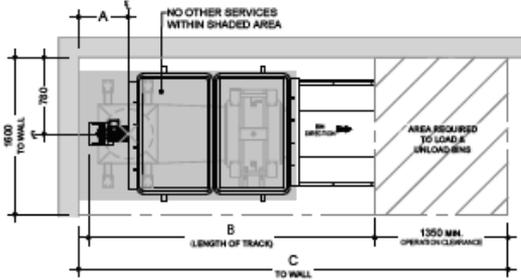
Please note: this is an example only – please refer to supplier's information and specification.



**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)

LINEAR TRACK SYSTEM



NO OTHER SERVICES WITHIN SHADED AREA

1600 TO WALL

700

AREA REQUIRED TO LOAD & UNLOAD BINS

1250 MIN OPERATING CLEARANCE

A

B (LENGTH OF TRACK)

C TO WALL

660 LITRE BIN

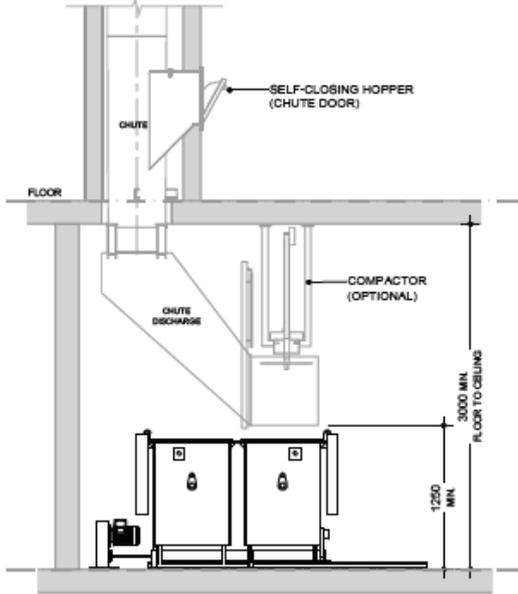
660 LITRE BIN LINEAR TRACK SYSTEM			
No. of Bins	Reference (mm)		
	A	B	C
2	500	2950	4350
3	1450	4650	6050
4	2300	6300	7750

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.

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SELF-CLOSING HOPPER (CHUTE DOOR)

CHUTE

FLOOR

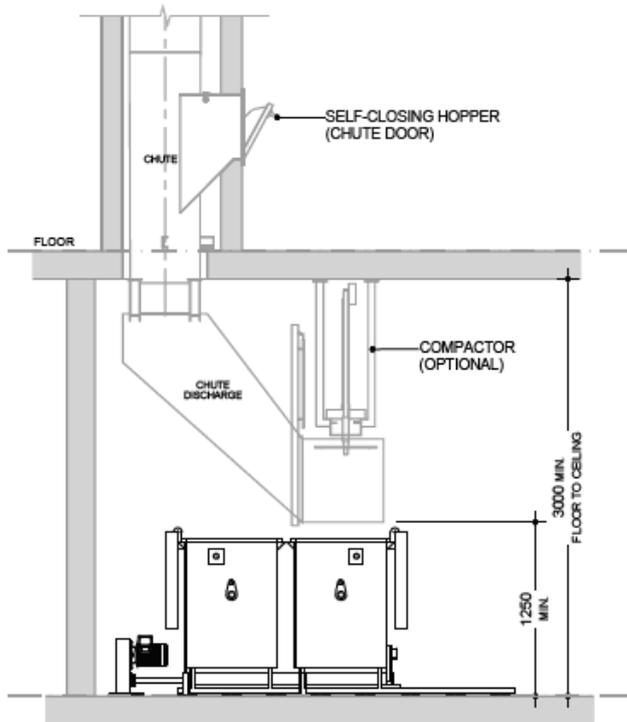
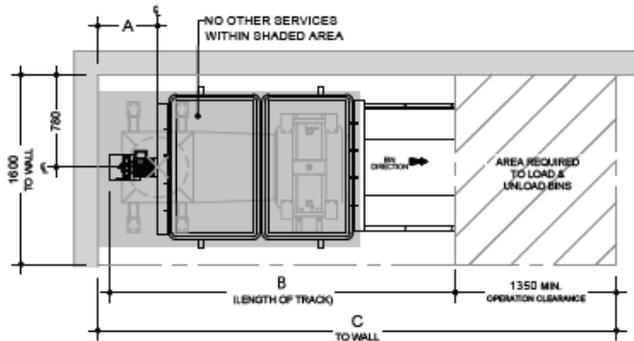
CHUTE DISCHARGE

COMPACTOR (OPTIONAL)

1250 MIN

3000 MIN FLOOR TO CEILING

LINEAR TRACK SYSTEM



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

660 LITRE BIN

660 LITRE BIN LINEAR TRACK SYSTEM			
No. of Bins	Reference (mm)		
	A	B	C
2	500	2950	4350
3	1450	4850	6050
4	2300	6300	7750

Notes:

Bins not provided by Elephants Foot

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Sydney Head Office 44-46 Gibson Ave Padstow NSW 2211 | **PH:** +612 9780 3500 | **Fax:** +612 9707 2588

Website: www.elephantsfoot.com.au | **Email:** info@elephantsfoot.com.au

Offices in Victoria & Queensland – **Toll Free:** 1800 025 073