Waste Audit & Consultancy Services (Aust) Pty Ltd
Level 21, 133 Castlereagh Street
Sydney, NSW 2000
02 9199 4521
www.wasteaudit.com.au

104-116 Regent Street Redfern

Operational Waste Management Plan

December 2021

Table of Contents

1 Introduction

This Operational Waste Management Plan (OWMP) has been developed by Waste Audit & Consultancy Services (Aust) Pty Ltd ('Waste Audit') to provide advice and guidance to Wee Hur Redfern Trust for the proposed development located at 104-116 Regent Street, Redfern NSW regarding the effective management of operational general waste and recycling and compliance with current legislation and best practice standards.

The development of this OWMP has been based on the established principles of:

(a) The Waste Hierarchy: Ensuring all waste able materials are properly managed from generation to final reuse, recycling, treatment, or disposal;

(b) Source Segregation: Separating wastes and recyclables at the point of generation to minimise contamination and maximise resource recovery; and

(c) Due Diligence: Ensuring that all staff and contractors responsible for aspects of waste management do so in accord with all statutory and corporate responsibilities.

The intent of the OWMP is to ensure that waste management practices are consistent across all areas and tenancies of the development, with the maximum quantity of materials directed away from landfill to more environmentally beneficial outcomes.

2 Development Description

The proposal comprises the redevelopment of the site as summarised below:

- Construction of an 18-storey building comprising a total of 9,562m² gross floor area with a mix of land use activities including:
  - Level 1: 72 m² of retail floorspace, 490 m² of communal area for student accommodation, 102 bicycle parking spaces, loading and waste management facilities and ancillary services and facilities.
  - Upper levels: student accommodation providing a total of 411 beds, including ensuite rooms, studios and two-bedroom configurations, with indoor and outdoor communal spaces on Levels 2, 4 and 16 and additional indoor communal areas on Levels 2 and 4.
- Hard and soft landscaping within the outdoor communal terraces on the roof-top of the podium level and Levels 4 and 16.
- Public domain improvements including provision of a landscaped through-site link connecting William Lane to Margaret Street and associated improvements to the Regent Street and Margaret Street frontages, including awnings and footpath upgrades.

The proposed development is classified as a State Significant Development. The site is located at Lot 10 in DP 1026349, zoned E – Business Zone – Commercial Core under SEPP (State Significant Sites) 2005, and is shown below:

3 SEARs Requirements

The development is a State Significant Development (SSD), application number SSD-12618001, and is subject to the Secretary's Environmental Assessment Requirements (SEARs) dated 8/2/21, which requires assessment of potential waste impacts, specifically:

- Identify, quantify and classify the likely waste to be generated during construction and operation
- Describe measures to be implemented to minimise, reuse, recycle and safely dispose of waste
- Identify appropriate servicing arrangements
- Address the City of Sydney *Guidelines for Waste Management in New Developments*

4 Applicable Legislation, Standards & Guidelines

In addition to the SEARs requirements, the following have been referred to in compiling this report:

- NSW *Protection of the Environment Operations Act 1997*
- NSW *Protection of the Environment Operations (Waste) Regulation 2014, Part 11*
- NSW *Protection of the Environment (General) Operations Act 1998*
- NSW *Waste Avoidance and Resource Recovery Act 2001*
- NSW EPA *Waste Classification Guidelines* 2014

The City of Sydney has also provided the following input:

- Demonstrate adequate provision for servicing of the site in relation to loading demands, size of waste collection areas and methods of collection to/from and within the site
- Provide waste management plans for demolition and construction including material storage areas for reusable materials and recyclables during demolition and construction; vehicle access to material storage areas; estimation of quantities and types of materials to be reused, recycled or left over for removal from the site are required. A template is available at Appendix A and B of the City of Sydney *Guidelines for Waste Management in New Developments 2018*

We note that a demolition waste management plan dated 21/9/2020 has already been prepared by JBS&G Australia Pty Ltd.

5 General Waste & Recycling Generation

5.1 Resource Streams

The following generation rates have been used to calculate the volumes of materials that will be produced from the development's operations:

Table 1: Materials Generation Factors

Material Stream	Tenancy Type	Generation Factor
General Waste	Residential	30 litres/day/100 m^2
	Retail	65 litres/day/100 m^2
Mixed Recycling	Residential	30 litres/day/100 m^2
	Retail	30 litres/day/100 m^2
Food Waste	Residential	30 litres/day/100 m^2
	Retail	10 litres/day/100 m^2
Bulky Waste	Residential	Minimum 8 m^2 room area required

5.2 Total Materials Generated

Tables 2 and 3 show expected volumes of materials generated by the development in litres per week. These have been calculated using the materials generation rates shown in Table 1 and the following floor areas:

Total Habitable Area: **7,410 m^2**

Retail Tenancy: **72 m^2**

Table 2: Residential General Waste & Recycling

Material Stream	Generation Factor	Litres/Week (7 days)
General Waste	30 litres/day/100 m^2	15,561 uncompacted / 7,781 compacted
Mixed Recycling	30 litres/day/100 m^2	15,561
Food Waste	30 litres/day/100 m^2	15,561

Table 3: Retail General Waste & Recycling

Material Stream	Generation Factor	Litres/Week (7 days)
General Waste	65 litres/day/100 m^2	328
Mixed Recycling	30 litres/day/100 m^2	151
Food Waste	10 litres/day/100 m^2	50

A storage room with separate areas for residential and retail waste and recycling will be located on the Ground Floor, with an adjacent storage area for residents' bulky waste items.

Section 8 provides calculations showing storage area requirements, bin numbers, and collection frequencies.

6 Residential & Common Area General Waste & Recycling

6.1 General Waste & Mixed Recycling

A dual chute system will be implemented for general waste and mixed recycling (paper, cardboard, glass, metal, and plastics). Chutes will be accessed from each level by residents and will terminate in the storage room on the Ground Floor. To ensure that this system functions correctly, residents will be provided with information on proper segregation and disposal of general waste and recyclables into the chutes.

Cleaning staff will be responsible for monitoring the bin/chute room, ensuring that bins do not overflow, and replacing full bins with empty ones as required. The room will be locked and accessible only to authorised users.

All materials will be stored in separate 1100-litre Mobile Garbage Bins (MGBs), wheeled to the next door building 90-102 Regent Street, and collected by private waste contractor from the loading dock. Based on the expected generation and collection frequencies shown in Table 4, a total of 18 bins will be required.

Although these volumes may decrease during vacation periods, the system has been designed to cater for generation during normal operations, that is, academic terms.

General waste and mixed recycling from common areas, bathrooms, gym/multipurpose room, and offices/meeting area will be taken directly to the central storage room by cleaning staff.

6.2 Food Waste Recycling

A food waste recycling system (which can also include paper towel and garden waste, plant cuttings, flowers, etc.) will also be implemented. Residents will be encouraged to separate food waste in their apartments and bring the material to the Level 2 communal area for depositing in the correct receptacles. Examples of suitable receptacles are shown in Appendix 5.

To facilitate separation of the designated recycling streams, we recommend 3 sets of bins for the common area, located in the kitchenette, lounge, and study areas. The development's cleaning staff will empty these receptacles daily and deposit the contents in the correct bins in the storage room on the Ground Floor.

6.3 Bulky Wastes

A separate 8 m^2 area has been allocated in the Loading Level storage room for bulky wastes (furniture, household goods, mattresses, etc.) and other items that are too large for disposal in the site's 1100-litre MGBs.

These items will be collected by The City of Sydney, by prior arrangement, as part of their hard waste collection service provided to all residential dwellings in the municipality.

7 Retail General Waste & Recycling

Systems for general waste and mixed recycling will be implemented, as well as for food organics and used cooking oil if cooking is to take place on site. Bins and equipment for all streams will be located in the Loading Level storage room, separately from residential bins, with appropriate signage installed to delineate the different streams collected on site.

The tenant will bring their general waste and recycling directly to the storage area to coincide with the site's regular collection schedule, for collection by private contractor twice per week.

8 Storage Facilities

8.1 Room Sizing & Equipment

Tables 4 and 5 show recommended equipment, collection frequencies, and storage areas, based on residential and retail floor areas. For compaction of residential general waste, a 2:1 volume reduction is expected; in keeping with standard practices, recyclable materials will not be subject to compaction. Compaction of retail materials will also not be required due to the small volumes generated and the required practice of keeping residential and retail materials separate.

Table 4: Residential & Common Area Bins & Storage

Material Stream	Bin Size	No. of Bins	Litres/ Week	Compacted/ Uncompacted	Collection Frequency	Floor Area Required[1]
General Waste	1100	4	7,781	Compacted	2 x per week	8.2
Mixed Recycling	1100	7	15,561	Uncompacted	3 x per week	14.3
Food Waste	1100	7	15,561	Uncompacted	3 x per week	14.3
Chute Discharge/Linear Track Area[3]						0.0
Bin Washing Area						2.0
Total		**18**	**38,903**			**38.8 m^2**

1 A 20% allowance has been made for space between bins and circulation within the bin room
2 The empty bins will sit on linear tracks, so no additional floorspace will be required

Table 5: Retail Bins & Storage

Material Stream	Bin Size	No. of Bins	Litres/ Week	Compacted/ Uncompacted	Collection Frequency	Floor Area Required
General Waste	240	2	328	Uncompacted	1 x per week	1.0
Mixed Recycling	240	1	151	Uncompacted	1 x per week	0.5
Food Waste	240	1	50	Uncompacted	1 x per week	0.5
Total		**4**	**529**			**2.0 m²**

The total storage area required, based on the above calculations, is **40.8 m²**. The Ground Floor storage area allows adequate storage space for all bins and equipment, including bin washing and bulky waste storage areas, and space between bins for staff access and bin movement.

8.2 Waste Storage Area, Access, & Bin Loading

Appendix 1 shows the Ground Floor waste storage area. On collection days, building staff will wheel the bins along the pathway shown to 90-102 Regent Street's loading dock, from where they will be collected by the development's private waste contractor.

Waste collection trucks will access the loading dock area from William Lane, driving forward onto the turntable, which will rotate until the rear of the truck is facing the bin storage room. The site's staff will operate the turntable. Waste contractor staff will then load the bin contents into the truck, and site staff will then return bins to the 104-116 Regent Street storage room for cleaning and returning to their positions underneath the chute outlets in the Ground Floor storage area.

Once all waste/recycling bins have been emptied into the truck, it will drive out in in a forward motion, having first ensured that all bins have been collected and the empty bins rearranged in an orderly manner.

Collections for both general waste and recycling will take place during the early morning and will conform with The City of Sydney's time restrictions for waste collection.

8.3 Waste Chutes & Compaction Units

Waste and recycling chute access points will be located on all residential floors as shown in Appendix 1. Also shown is a recommended design for an access point, with signage indicating correct disposal procedures, and a typical chute discharge area, with dual 1100-litre bins for general waste and recycling.

Appendix 2 provides details of the dual chute system and compaction equipment. If a compaction system is to be installed, it is critical to discuss this with the development's private waste company beforehand, to confirm that they have the operational capability to collect compacted materials, and to establish agreed collection costs for compacted general waste collection. As already noted in Section 8.1 recyclable waste, will not be compacted.

The development's private waste contractor will need to confirm that it can provide reinforced bins that are able to withstand the pressure of waste compaction, as standard bins are not designed for this. Usually, this reinforcement consists of a metal plate on the underside of the bin.

The standard density of uncompacted general waste is around 70 kg per cubic metre (1000 litres). A full 1100-litre general waste bin would therefore contain 77 kg; adding the weight of the reinforced bin (65 kg), the total weight of bin + contents would be 142 kg.

Compacting the waste materials will increase their density by a factor of 2:1, resulting in a net weight per bin of 154+65 kg = 209 kg. Please note that if heavier types of waste materials, for example food waste, are placed in the bins, this figure will increase.

8.4 Chute Operations & Maintenance

The development's staff will be responsible for the day-to-day management of all bins within the chute discharge room, including removing full bins from the linear track system and placing empty bins under the chute outlets. Other tasks will include periodic cleaning of the bins and keeping the room tidy and free of litter. An odour neutraliser will be installed in the bin room and mechanical exhausts will be installed in each chute access room on residential floors, in addition to the separate exhausts to each chute.

For maintaining the chute access rooms, the following systems will be implemented to ensure efficient uninterrupted operations:

- Residents will be required under house policy to not leave waste or recycling outside the hopper door if the chute is blocked; they will be required to take the materials back to their room and wait until the blockage has been fixed. CCTV will be installed in each access room to enforce this requirement and identify any residents that are not complying.
- Management will utilise the fully automated waste chute detection system to identify any fault in the system and take action. The BMS system will notify management of any fault so that the issue can be rectified quickly.
- We consider the above measures to be sufficient to maintain efficient operation of the chute system and we believe having spare bins within the chute access rooms will encourage residents to use the bins rather than using the chute itself.

The site will also enter into a maintenance contract for the chutes and associated infrastructure, details of which are provided in Appendix 3.

8.5 City of Sydney Waste Storage Area Requirements

The development will comply with the following requirements of the City of Sydney's *Guidelines for Waste Minimisation in New Developments 2018*:

- The floors, walls and ceilings of waste and recycling storage areas and chute room(s) are to be finished with a rigid, smooth-faced impermeable material capable of being easily cleaned.
- The floors of waste and recycling storage areas are to be graded and drained to a Sydney Water approved drainage fitting. The floor is to be provided with a ramp to the doorway where necessary.
- A close-fitting and self-closing door or gate operable from within the room is to be fitted to all waste and recycling storage areas.
- Doors/gates to the waste and recycling storage rooms are to provide a minimum clearance width of 900 mm.
- At least one door or gate to the waste and recycling storage area is to have sufficient dimensions to allow the entry and exit of waste containers of a capacity nominated for the development.
- Lightweight roller shutter-type doors or grilles should be considered for access to waste and recycling storage areas, as these do not impact on the available storage space. If these types of doors or grilles are used, the requirement for a close-fitting and self-closing door remains, so that waste collectors can access the waste and recycling storage area other than through the roller door or grille.
- The design shall restrict the entry of trespassers, vermin or other animals into the area.
- The waste and recycling storage area is to be provided with an adequate supply of water for cleaning purposes with a hose cock. This does not include within chute rooms.
- The waste and recycling storage area is to be adequately ventilated by either:
  - Natural ventilation openings to external air. The dimension of the openings are not to be less than 5 per cent of the bin bay or bin room floor area.
  - A mechanical exhaust ventilation system in accordance with relevant Australian standards.

- Waste and recycling areas are to be provided with artificial light controlled by switches located both outside and inside the storage area.
- Any compactors or mechanical devices, if permitted for the mechanical handling and storage of waste and recycling, are to be fitted with safety operating and cut-off systems.
- Any facet of the waste and recycling management system that is visible from outside the building is to be in keeping with the dominant design of the remainder of the development.

9 Waste Management Principles

The following waste hierarchy has been used to guide this OWMP:

Avoid/Reduce

Purchase materials that have minimal packaging requiring recycling, treatment, or disposal

Reuse

Ensure that wherever possible, materials are reused either on site or offsite:

- Identify and put systems in place to separate and store materials that can be reused onsite
- Identify the potential applications for reuse offsite and facilitate this process

Recycle/Recover

Identify all recyclable waste products to be produced on site:

- Provide clear signage to ensure recyclable materials are separated
- Process the material for recycling either onsite or offsite

Treat/Dispose

Waste products which cannot be reused or recycled will be removed and treated/disposed of at appropriately licensed facilities, ensuring the following:

- Chosen private waste contractor complies with all legislative requirements
- Bins to be collected on an efficient schedule minimising transport

10 Site User Education

All site users (residents, retail tenants, facilities staff, and cleaning contractors) will be provided with detailed information on recycling and waste management, as part of general building induction and orientation, to promote and reinforce correct practices. The site's management team will be responsible for guiding this initiative.

Appendix 7 shows examples of typical signage.

11 Waste and Recycling Contractor Requirements

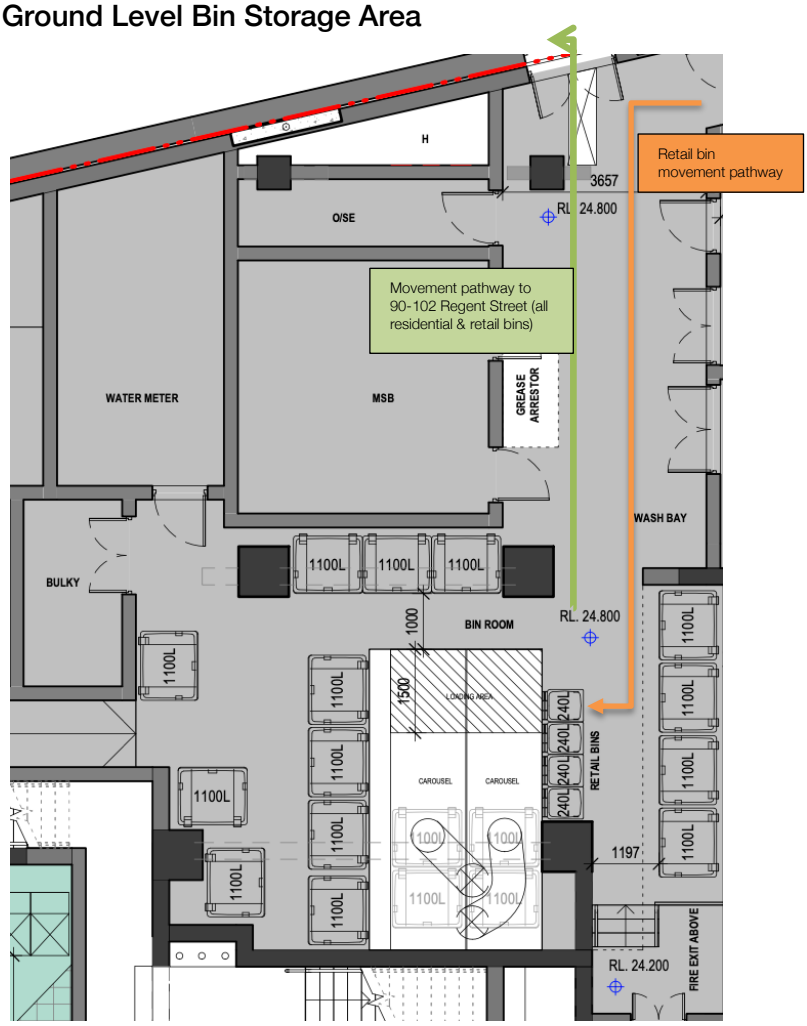
To achieve and maintain best practice, the site's waste and recycling contractor(s) will be required to comply with the following requirements:

- Reliable and efficient servicing, and meeting all agreed schedules
- Having collection vehicles fitted with suitable weighing technology
- Maintaining accurate and comprehensive tracking systems for all materials collected, and current details of processing facilities used
- Working with the site to improve materials diversion rates
- Providing detailed monthly and annual reports on diversion and financial outcomes

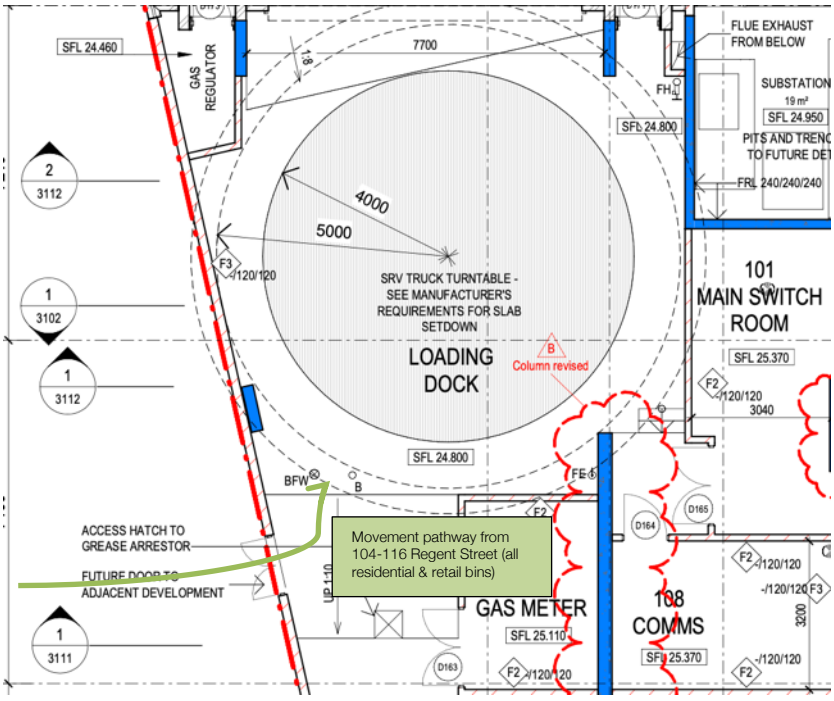
The site's waste and recycling contractor should be able to provide an accurate and reliable process for measuring and reporting all materials streams by weight, either directly, using truck mounted scales, or indirectly through volume to weight conversion. These processes should be supported by an annual audit conducted by a qualified independent third party.

Appendix 1: Waste Storage Areas & Chute Access Points

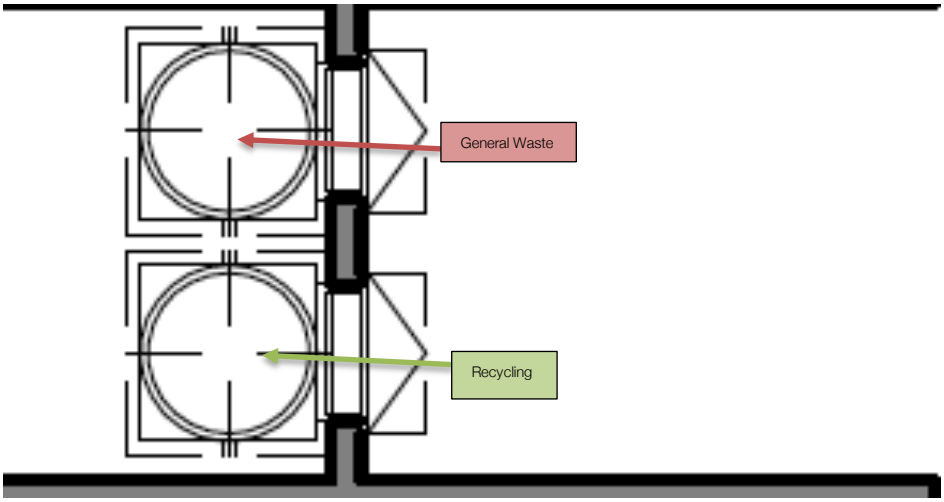
Ground Level Bin Storage Area



Bin Movement Pathway

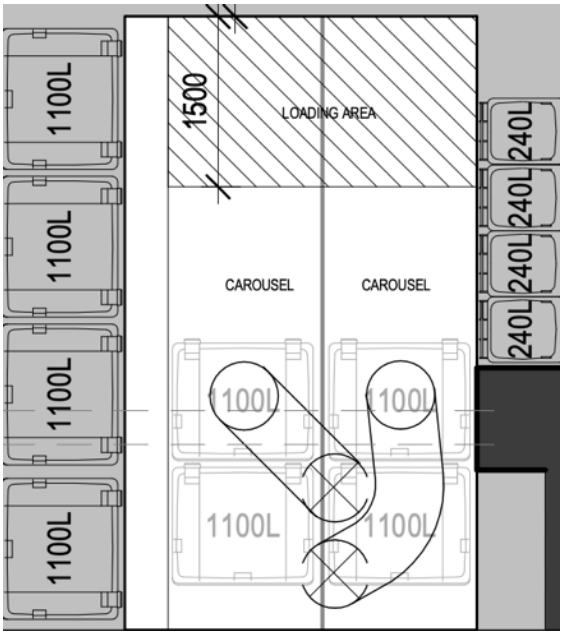


Typical Floor (Level 2 & Above) Showing Chute Access Points



Chute Access Point Signage Example

Basement Chute Discharge Area



Appendix 2: Linear Track System Details

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 1100 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 / 20A / 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

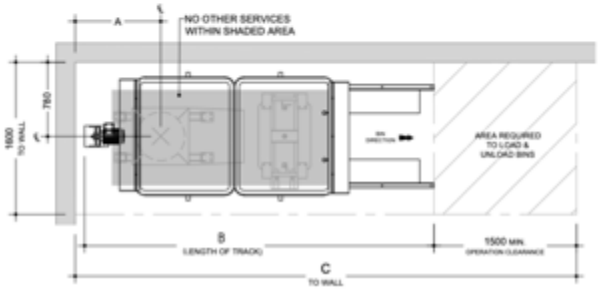
- Compaction unit – Please refer to the bin compactor product information sheet for details and specifications
- Enhanced safety add on's – Interlocking barriers, occupancy sensors or safety light curtains (presence sensing light barriers)
- Full bin SMS and email notification
- CMMS and BMS integration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

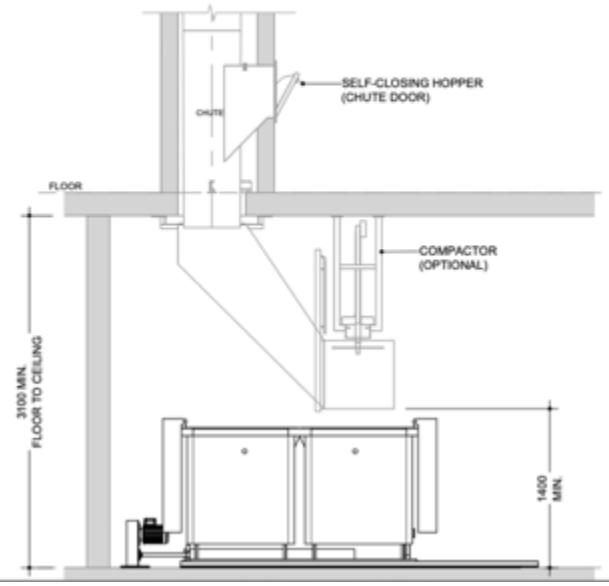
STANDARD FEATURES & BENEFITS

- 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 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





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:

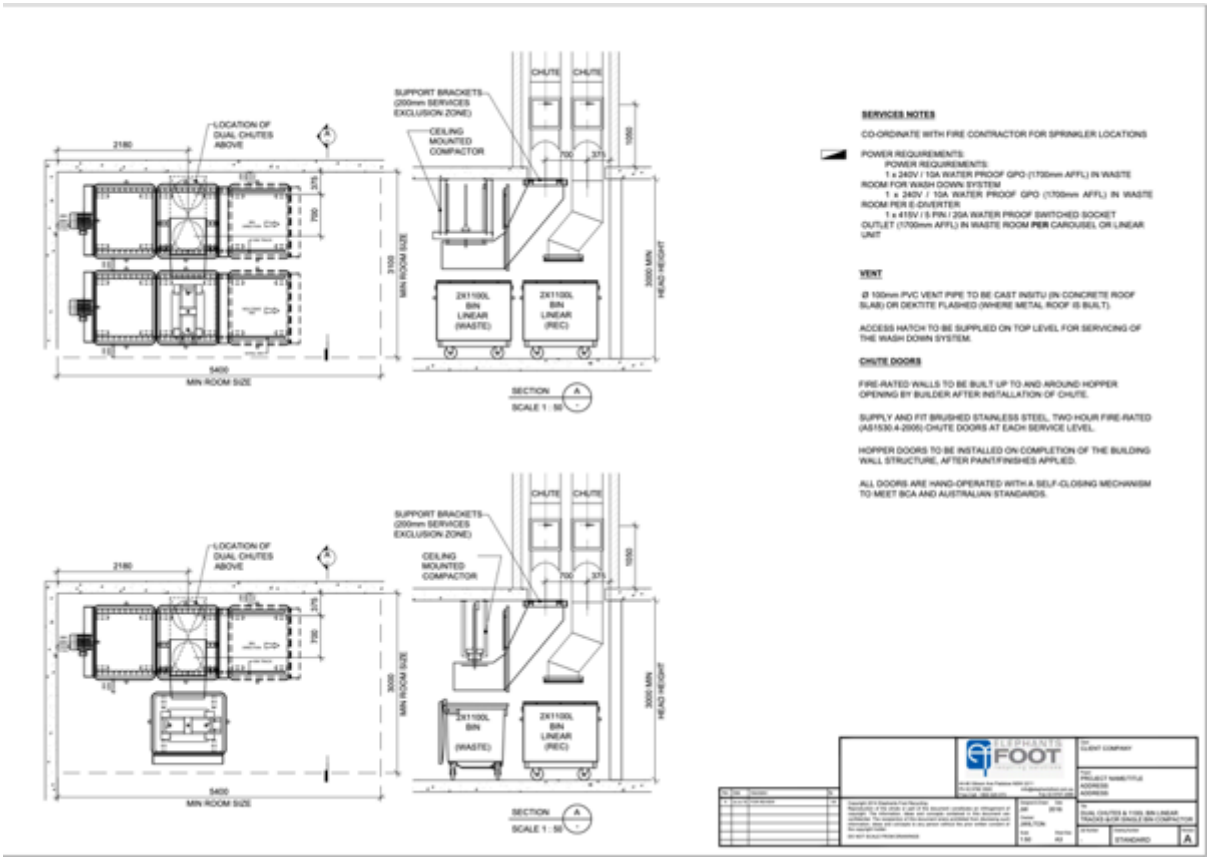
Bins not provided by Elephants Foot

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

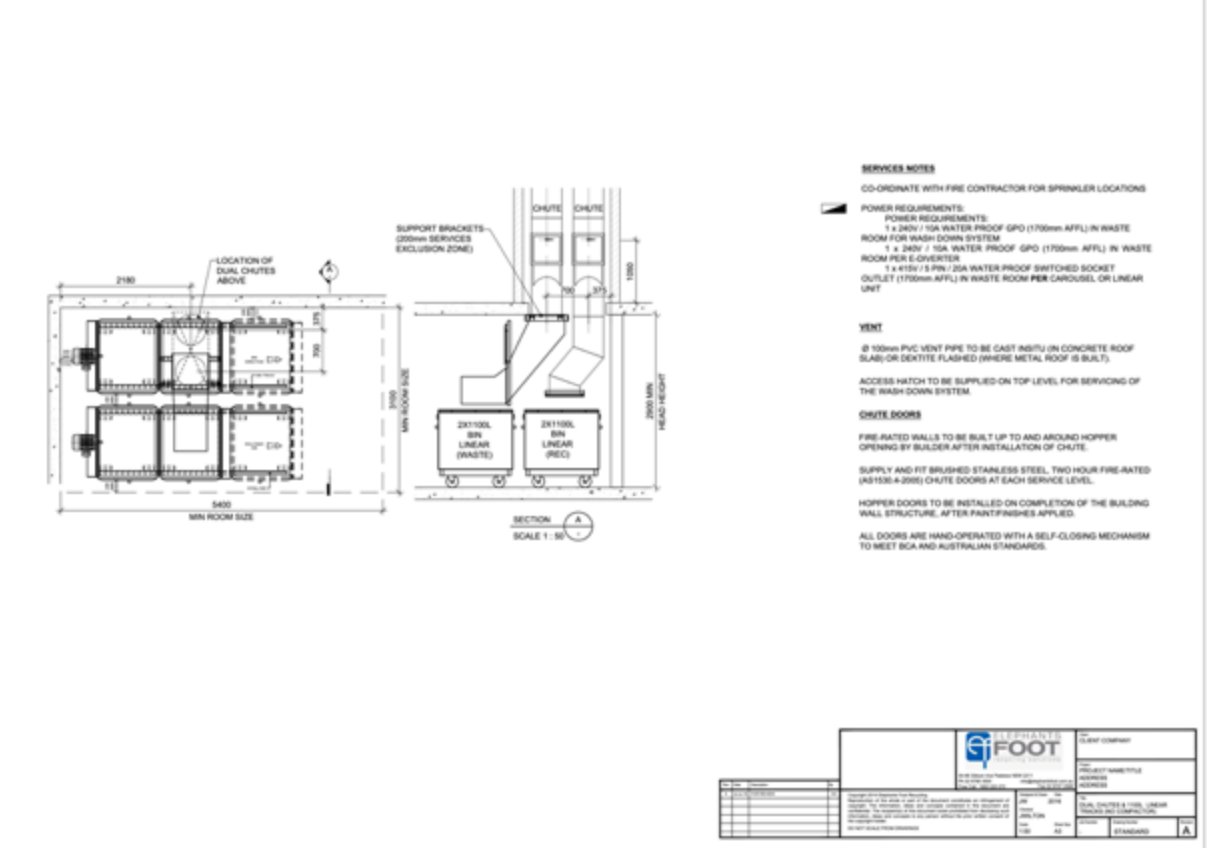
These drawings are not intended for site specific use or for construction. Each project is unique and will be designed to suit.

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

Detailed Specifications – Linear Track System With Compactor



Detailed Specifications – Linear Track System Without Compactor



Appendix 3: Chute Operations & Maintenance

The development will enter into the service and maintenance contract shown below:

Service & Care.™
an Elephants Foot Company

SCHEDULE OF SERVICES:

SERVICE TYPE	FREQUENCY	COST	Select (Tick)
Garbage Chute Cleaning	Quarterly or 6 Monthly	**Building** $55 + GST per level	☐ Quarterly ☐6 Monthly ☐ Yearly
Waste Equipment Preventative Maintenance	Quarterly or 6 Monthly	$250 + GST (Per system) **TYPE:**	☐ Quarterly ☐ 6 Monthly ☐ Yearly
Waste Chute Door Inspection	6 Monthly	$110 + GST (Per hour + Call out)	☐ 6 monthly ☐ Annually
efNeutraliser (Odour Control)	Monthly	$89.95 + GST (Per Unit) ☐ Units	☐ Monthly

WH Comment: Weekly Wash Down of the Chute by Building management Team. Professional Chute Cleaning Yearly by External Contractor

WH Comment: Visual Inspection 6 Monthly Full Inspection Yearly

WH Comment: Yearly

WH Comment: We would install Automatic Odour Control System in the Chute Area as required.

UNSCHEDULED SERVICE RATES:

PERIOD	CALL OUT FEE	HOURLY RATE
Normal Working Hours (8.30am – 4.30pm)	$160 + GST	$110 + GST
After Hours	$540 + GST* (3 hours including travel)	$165 + GST (Any time thereafter)

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an Elephants Foot Company

CHUTE AND DIVERTER DOORS:

Frequency	Activity
Scheduled Maintenance	Inspection of chute doors – including piston, closing, latch, handle, fire seal & sensor. Report on repairs required (if any)
	Check light operation on diverter doors

DIVERTER / GARBAGE ROOM:

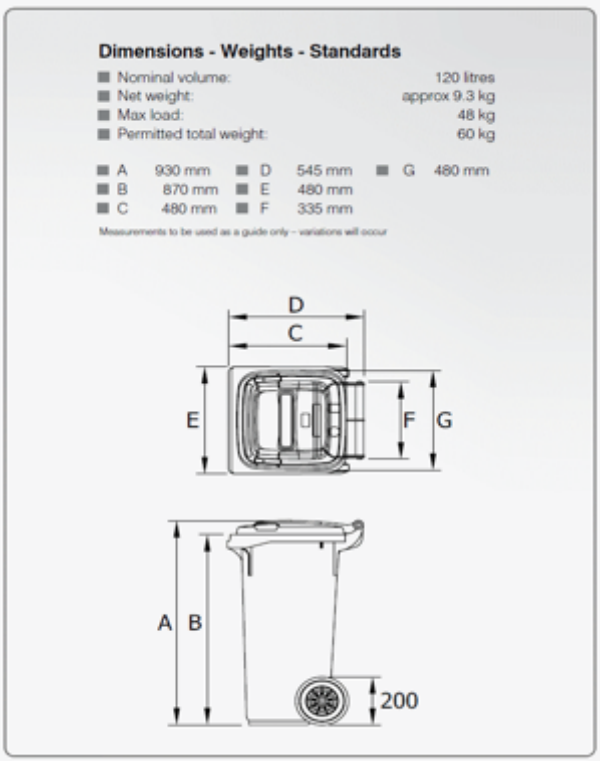
Frequency	Activity
Scheduled Maintenance	Check/Clean and/or adjust photo sensor & reflector
	Check and clean all limit switches (if applicable)
	Check power pack (if applicable)
	Check & grease diverter bearings
	Check electrical actuator & controls
	Check PLC functions & all wiring
	Check all electronic sequencing
	Check and adjust the stopping position (if applicable)
	Check safety controls
	Check hopper sliding door, slides, cable condition and fusible link
	Check turn buckle on hopper
	Test operations of entire system
	Report on steel welds & structure
	Report on housekeeping of garbage room

CAROUSELS & LINEARS: ADDITIONAL TO THE ABOVE

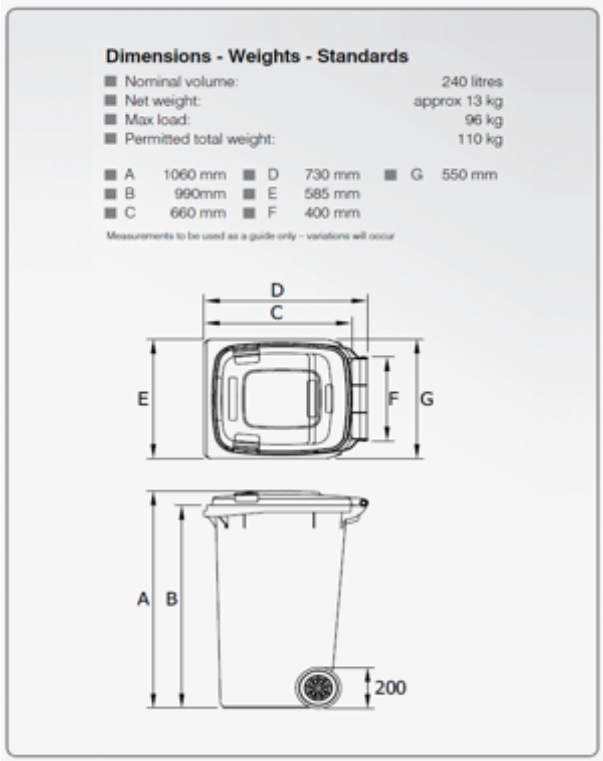
Frequency	Activity
Scheduled Maintenance	Ensure the plastic floor tray is clean
	Clean the machine
	Check and grease the ram screw rod and nut
	Check drive chain tension
	Check gearbox mount bolts
	Check the plastic floor tray and centre runners
	Check and grease carousel ring gear and motor pinion, adjust tension if necessary
	Check & grease conveyor track and screw drive

Appendix 4: Bin Specifications

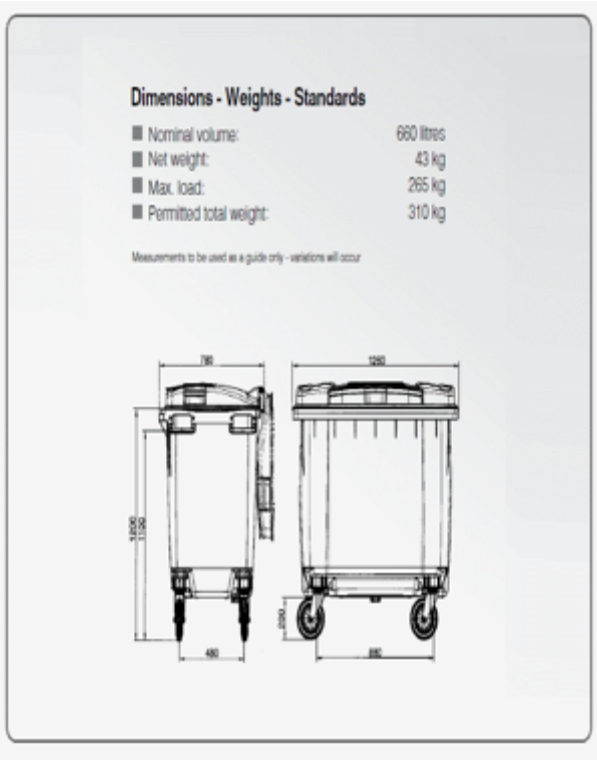
120-litre MGB



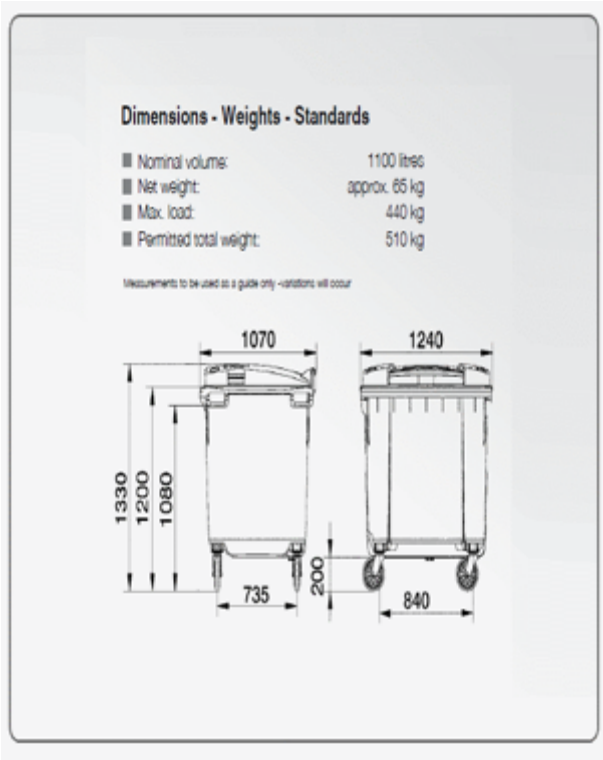
240-litre MGB



660-litre MGB

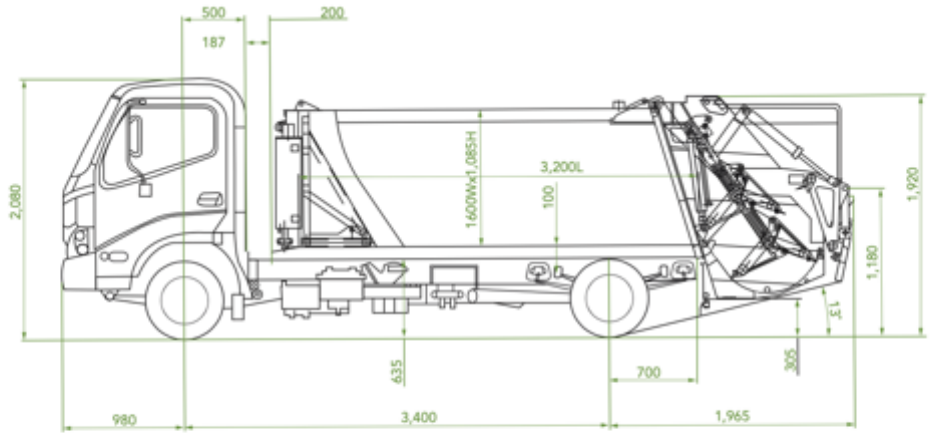


1100-litre MGB

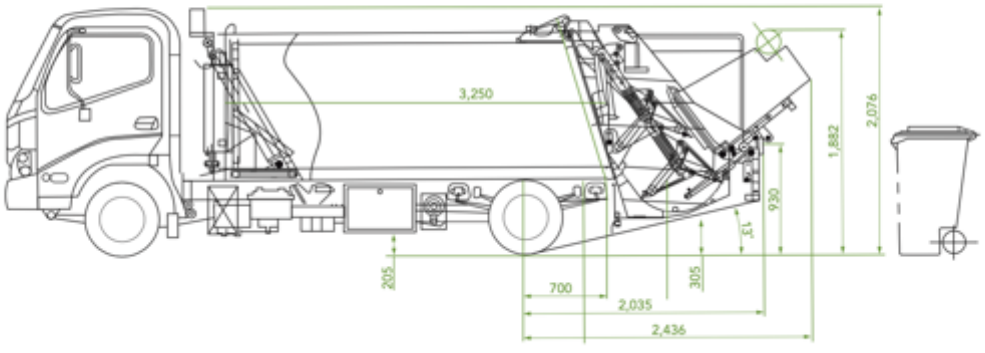


Appendix 5: Vehicle Specifications

Vehicle Dimensions



Truck Bin Lift Capabilities



Appendix 6: Common Area Recycling Receptacles

The following photo shows an example of a 4-bin configuration. Colour-coded translucent bin liners are recommended to enable cleaning staff to distinguish recycling from general waste and identify contamination prior to final disposal in the bins in the central storage room.

For the kitchenette area, pull-out bins such as those shown below can save floorspace and facilitate recycling through careful design and consistent colour-coding to match the site's waste and recycling streams.

Appendix 7: Storage Area Design & Signage

The photographs below show examples of best practice in storage area design and layout:

The signage examples below are for illustration purposes only. Actual signage should include suitable site-specific branding.