Wee Hur Student Accommodation
90-102 Regent Street
Redfern

Operational Waste Management Plan

February 2021

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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 the proposed development located at 90-102 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.

This OWMP should be read in conjunction with the separate *Construction Waste Management Plan* and *Demolition Waste Management Plan* prepared by Waste Audit to guide the management of waste across all phases of the proposed development.

2. Project Overview

The Wee Hur Student Accommodation project will consist of 17 levels of residential accommodation containing a total of 381 apartments with a total GFA of 9015 square metres, as well as 632 square metres of common area on Ground and Level 2, and 67 square metres of retail space on Ground Level.

The proposed development is classified as a State Significant Development and as such will be subject to SEPP planning controls, with the approving authority being the NSW Department of Planning & Environment. The site is located at Lots 1-3 in Section 2 of DP3954, Lot 1 in DP184335 and SP57425, zoned B4 Business Zone – Commercial Core under SEPP (State Significant Sites) 2005, and is shown below:

3. Reference Documents & Standards

The following documents have been used as references in compiling this OWMP:

- City of Sydney *Guidelines for Waste Minimisation in New Developments 2005*
- Resource NSW *Better Practice Guide to Waste Management in Multi-Unit Dwellings*
- Planning Secretary's *Environmental Assessment Requirements* dated 27/11/19

4. SEARs Requirements

The development is a State Significant Development (SSD), application number SSD-10382, and as such is subject to the Secretary's Environmental Assessment Requirements (SEARs) dated November 27, 2019.

This document requires the preparation of an EIS (Environmental Impact Statement) identifying the expected environmental impacts arising from the development, including the impacts of waste (Section 13 – Air Quality, Odour, and Wastes), as follows:

The EIS shall address the potential air quality, odour and waste impacts during the construction and operation of the development and appropriate mitigation measures.

5. General Waste & Recycling Generation

5.1 Resource Streams

Based on the development's estimated waste profile, the following resource streams will be generated during its operational phase. Organics and used cooking oil recycling may be required implemented depending on the type of retail tenancy (i.e. if cooking will take place on site).

Table 1: Expected Materials Streams

Material Stream	Residential	Communal	Retail
General Waste	✓		
Mixed Recycling	✓		
Organics Recycling		✓	✓
Used Cooking Oil Recycling			✓

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 following generation rates in litres per occupant for residential dwellings, which are based on the University of Sydney's standard weekly rates for student accommodation.

General Waste: 40 litres/occupant/week | Recycling: 40 litres/occupant/week

The following generation rates have been used in calculating total waste and recycling from the development's remaining areas:

Retail/Kitchen/Office:
General Waste: 50 litres/100 m^2/day | Recycling: 25 litres/100 m^2/day

Common Areas:
General Waste: 15 litres/100 m^2/day | Recycling: 10 litres/100 m^2/day

Laundry, Gym, Bathroom:
General Waste: 15 litres/100 m^2/day

Tables 2 and 3 show predicted general waste and recycling generation based on the number of occupants (beds), and common area and retail GFAs.

Table 2: General Waste & Recycling Generation - Apartments

Residential	Beds	Litres/Week
General Waste	408	16,320
Mixed Recycling	408	16,320
Total	**408**	**32,640**

Table 3: General Waste & Recycling Generation - Common Areas & Amenities

Common Areas & Amenities	m^2	Litres/Week
General Waste	632	1,008
Mixed Recycling	632	460
Total	**632**	**1,468**

Table 4: General Waste & Recycling Generation - Retail

Retail	m^2	Litres/Week
General Waste	67	235
Mixed Recycling	67	117
Food Organics Recycling	67	50
Used Oil Recycling	67	20
Total	**67**	**422**

A storage room with separate areas for residential and retail waste and recycling will be located on Basement Level. 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 recycling. Chutes will be accessed from each level by residents and will terminate in the storage room on Loading Level. To ensure that this system functions correctly, residents will be provided with information on proper segregation and disposal of general waste and recyclables.

Cleaning staff will be responsible for monitoring the chute room, ensuring that bins do not overflow, and replacing full bins with empty ones as required.

General waste and mixed recycling (paper, cardboard, glass, metal, and plastics) will be stored in separate 1100-litre Mobile Garbage Bins (MGBs) and collected weekly by Sydney City Council from the loading dock. Based on expected generation as detailed in Section 8, 16-17 bins of each of these material types will be generated each week.

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, and laundry will be managed by cleaning staff, and taken directly to the central storage room from the Ground Floor.

6.2 Bulky Wastes

A separate caged 8 m^2 area will be set aside 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 1100-litre MGBs.

These items will be collected by Sydney City Council, 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.

A vessel for collection of used cooking oil would also be located in this area, if required depending on the type of retail tenancy.

The tenant will bring their general waste and recycling 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 5 and 6 show recommended equipment, collection frequencies, and storage areas, based on 408 occupants, and current common area, amenity, and retail GFAs. For compaction of residential general waste, a 2:1 compaction ratio is assumed. In keeping with standard practices recyclable materials will not be subject to compaction. Compaction of retail waste will also not be required due to the small volumes that will be generated.

Table 5: Residential & Common Area Bins & Storage

Material Stream	Bin Size	No. of Bins	Weekly Capacity	Weekly Generation	Compacted/ Uncompacted	Floor Area Required[2]
General Waste	1100	8	17,600	17,553	Compacted	10.6
Mixed Recycling	1100	16	17,600	17,016	Uncompacted	21.2
Chute Discharge/Linear Track Area[1]						0.0
Bulky Waste Storage						8.0
Bin Washing Area						2.5
Total		**24**	**35,200**	**34,569**		**42.3m²**

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

Table 6: Retail Bins & Storage

Material Stream	Bin Size	No. of Bins	Weekly Capacity	Weekly Generation	Collections/ Week	Floor Area Required
General Waste	240	1	480	263	2	0.4
Mixed Recycling	240	1	240	131	1	0.4
Organics Recycling	May be required depending on type of tenancy					0.3
Cooking Oil Recycling						1.5
Total		**2**	**720**	**394**		**2.6 m²**

The total storage area required, based on the above calculations, is **44.9 m²**. The total area of the Ground Floor storage area is **60.0 m²** (52 m² bin storage room + 8 m² bulky waste storage) which provides adequate storage space for all bins and equipment, including bin washing and bulky waste storage areas, and space between bins and in the middle of the room for staff access and bin movement.

8.2 Waste Storage Area, Access, & Bin Loading

Appendix 1 shows the Loading Level waste storage area and its proximity to the loading dock and truck turntable.

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 access the bin room and load the bin contents into the truck. Site staff will then return the bins to the storage room for cleaning and returning to their positions underneath the chute outlets.

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 Council's time restrictions for waste collection. These processes will apply for both City of Sydney and private collection vehicles.

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 there 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 3 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 chosen private waste contractor will firstly need to confirm that it can provide reinforced bins that are able to withstand the pressure of waste compaction, as standard MGBs are not designed for this. Generally, this reinforcement would consist 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.

It will then need to be confirmed with the contractor that their staff will be able to wheel the full bins, with net compacted weights of potentially over 200 kg, from the Ground Floor storage room down the 1:12 gradient ramp to the Through Site Link for loading into their collection vehicle (Section 8.4), a distance of around 15-20 metres.

8.4 City of Sydney Waste Storage Area Requirements

The following requirements are taken from the City of Sydney's *Guidelines for Waste Minimisation in New Developments 2018* and apply to general waste and recycling storage areas for all residential developments:

- 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.

This should be repeated on a regular basis throughout the academic year for the benefit of residents, to promote and reinforce correct practices. The site's management team will be responsible for guiding this initiative.

Examples of typical signage are shown in Appendix 5.

11. Waste and Recycling Contractor Requirements

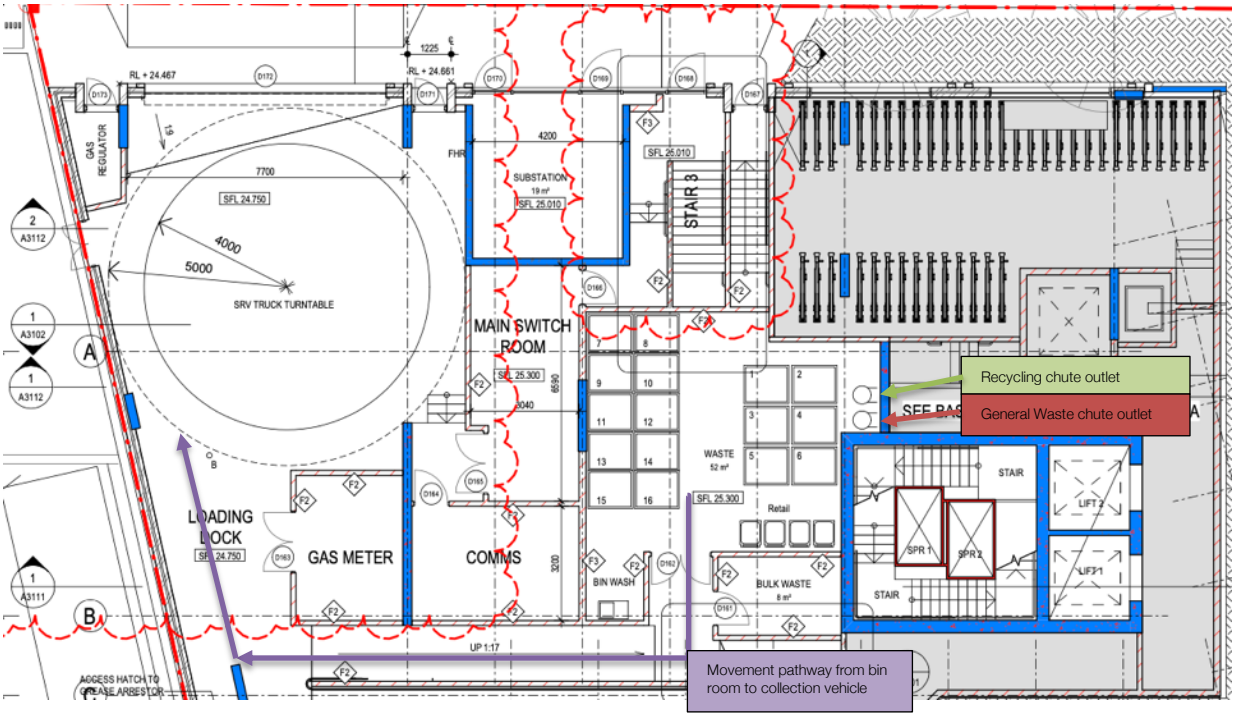
To achieve and maintain best practice, the site's waste and recycling contractor(s) will be required to comply with the following requirements:

- 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

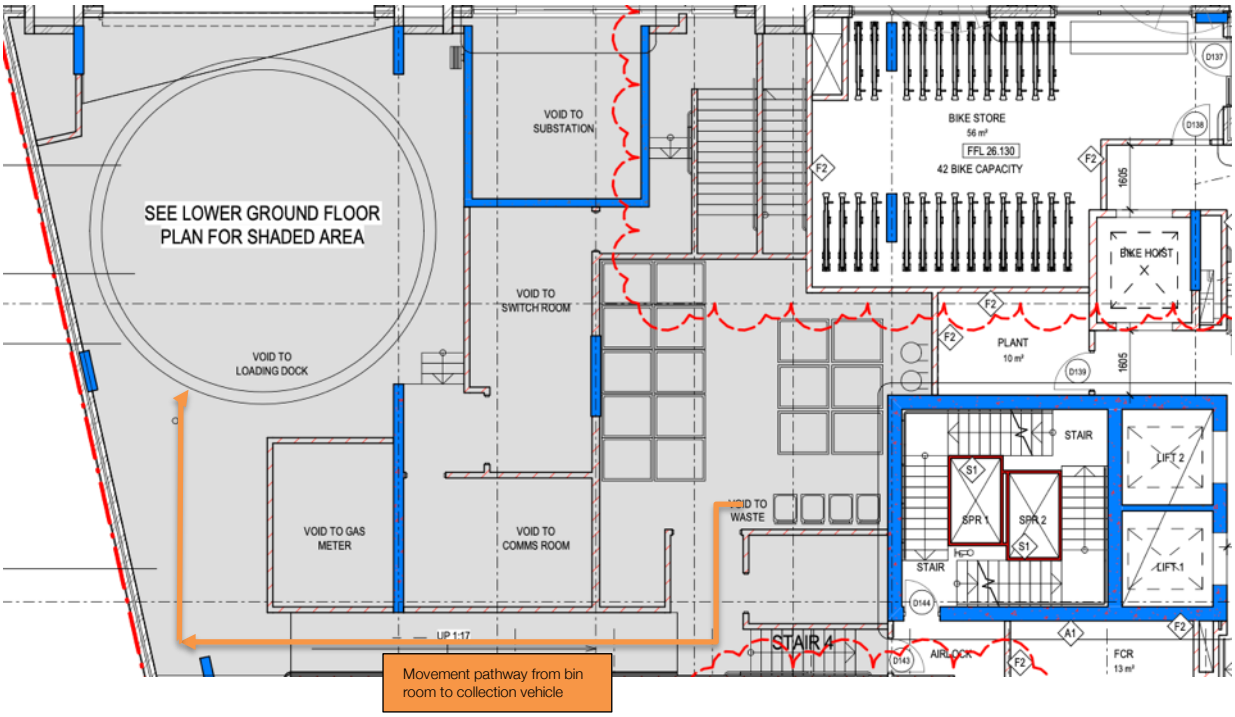
The site's waste and recycling contractor should be able to provide an accurate and reliable process for measuring and reporting all materials streams by weight, either directly, using truck mounted scales, or indirectly through volume to weight conversion. These processes should be supported by an annual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

Appendix 1: Waste Storage Areas & Chute Access Points

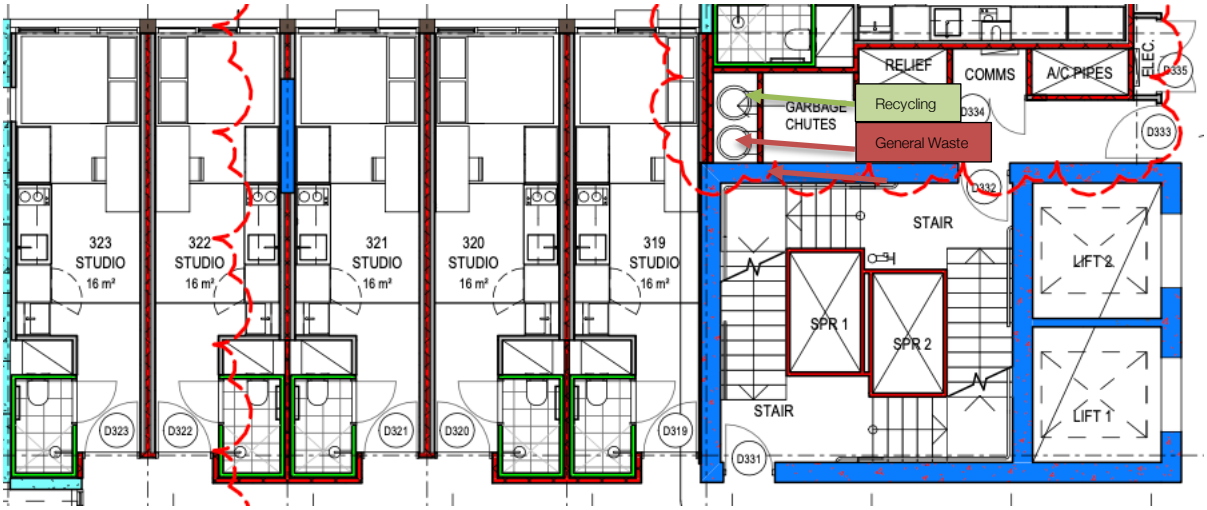
Residential Waste & Recycling - Movement Pathway



Retail Waste & Recycling - Movement Pathway

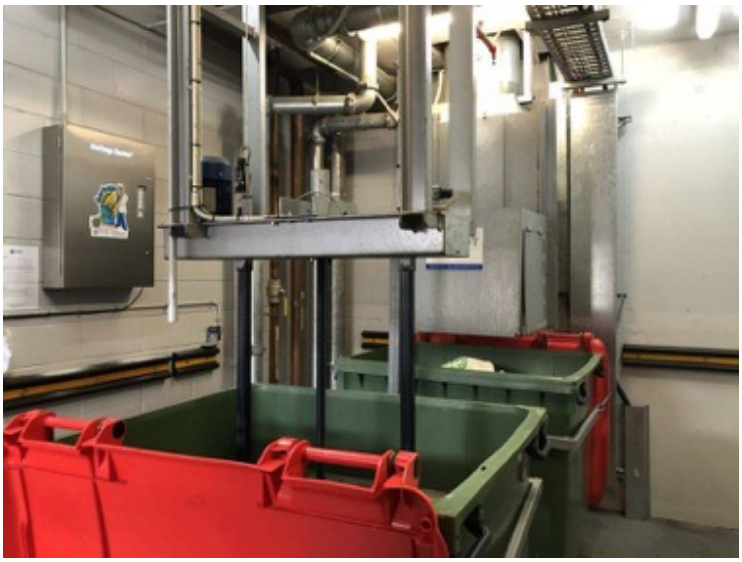


Typical Floor (Level 2 & Above) Showing Chute Access Points

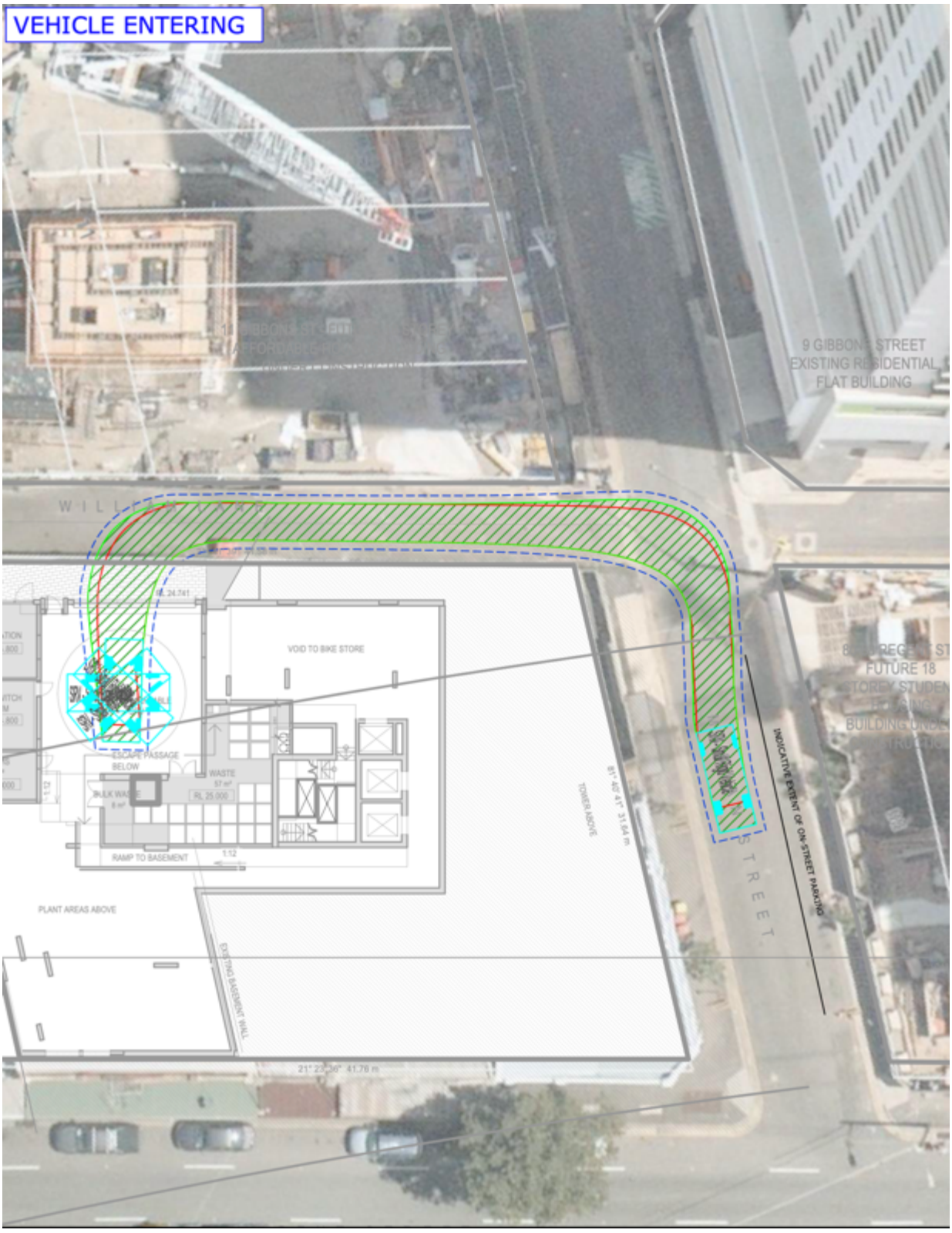


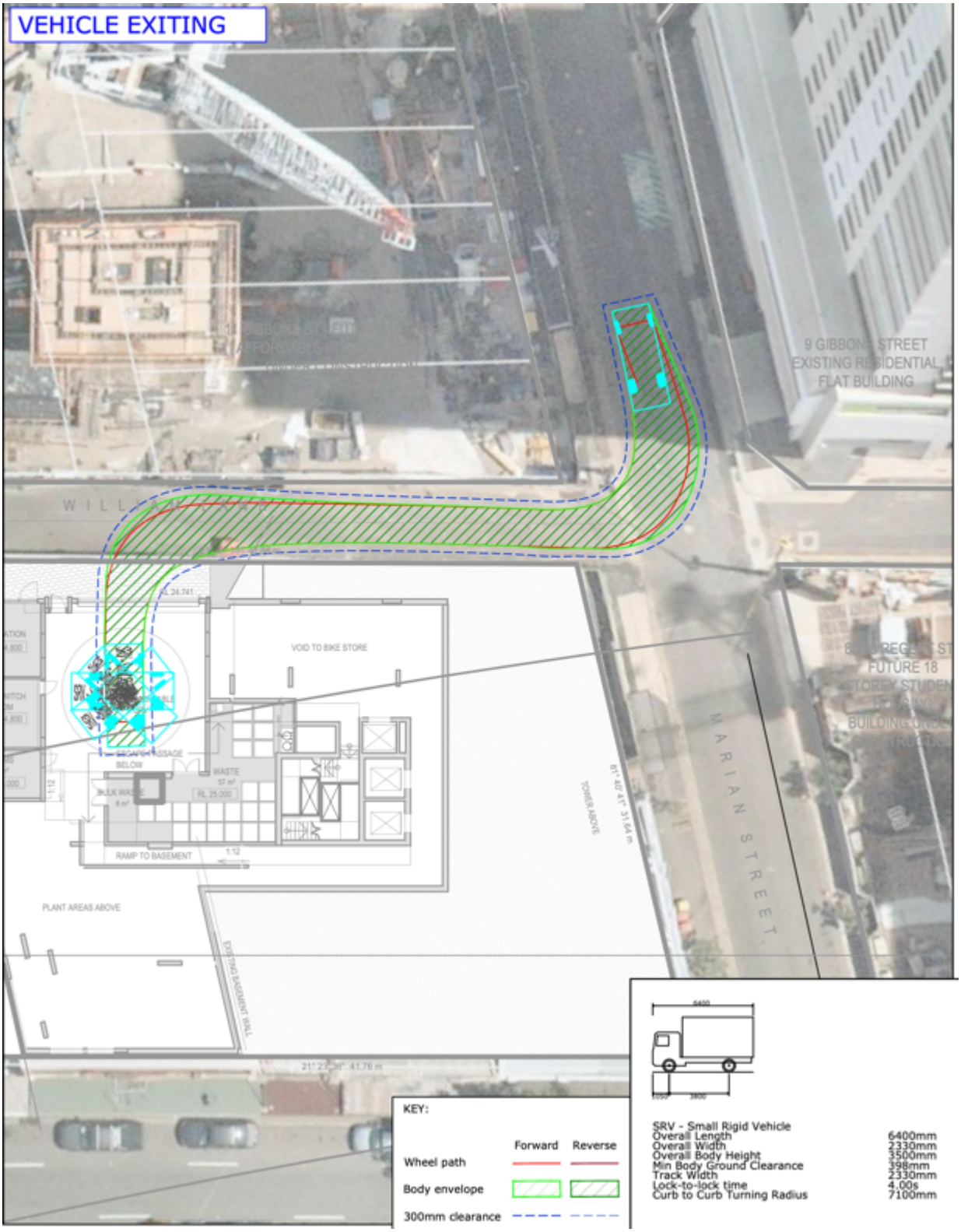
Chute Access Point Signage Example

Basement Chute Discharge Area Example

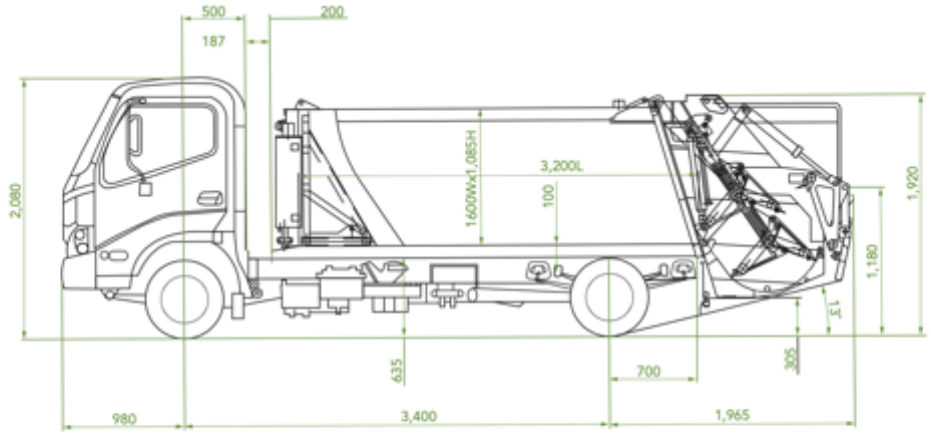


Appendix 2: Vehicle Swept Paths & Specifications

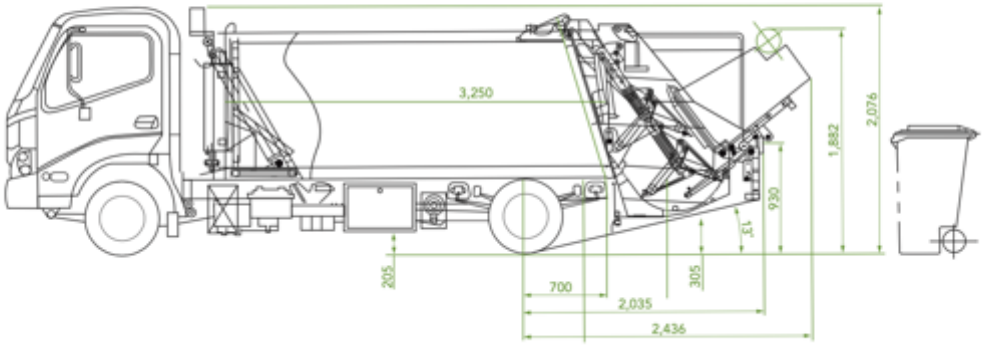




Vehicle Dimensions

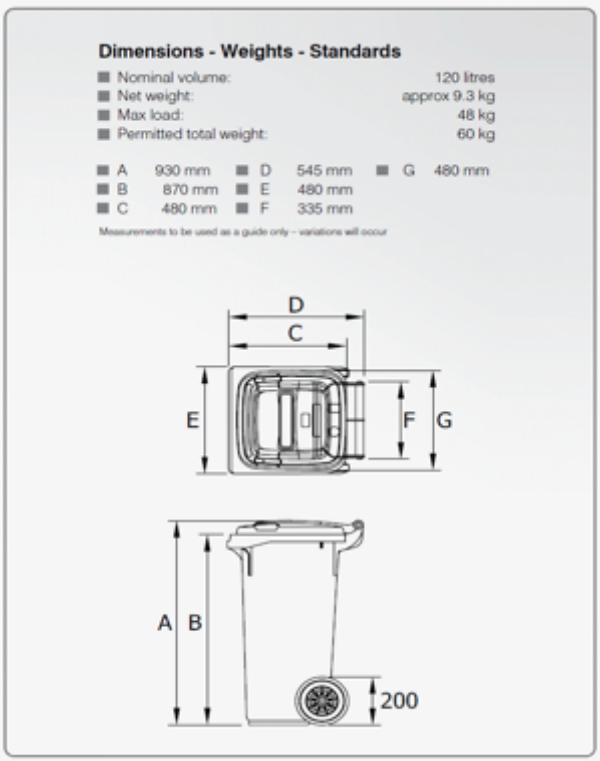


Truck Bin Lift Capabilities

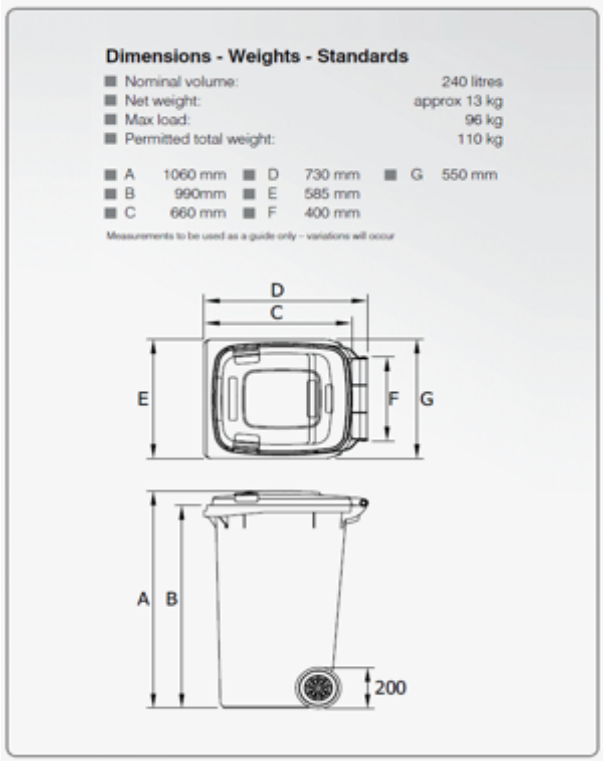


Appendix 3: Bin Specifications

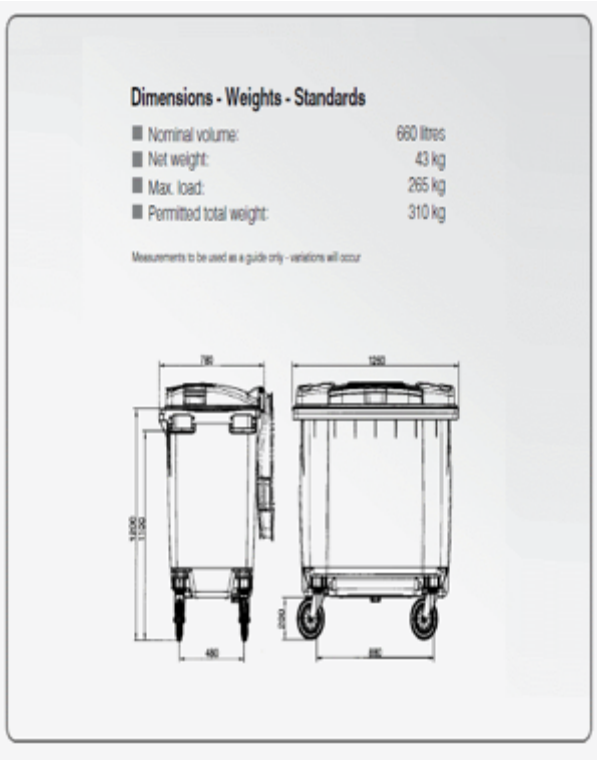
120-litre MGB



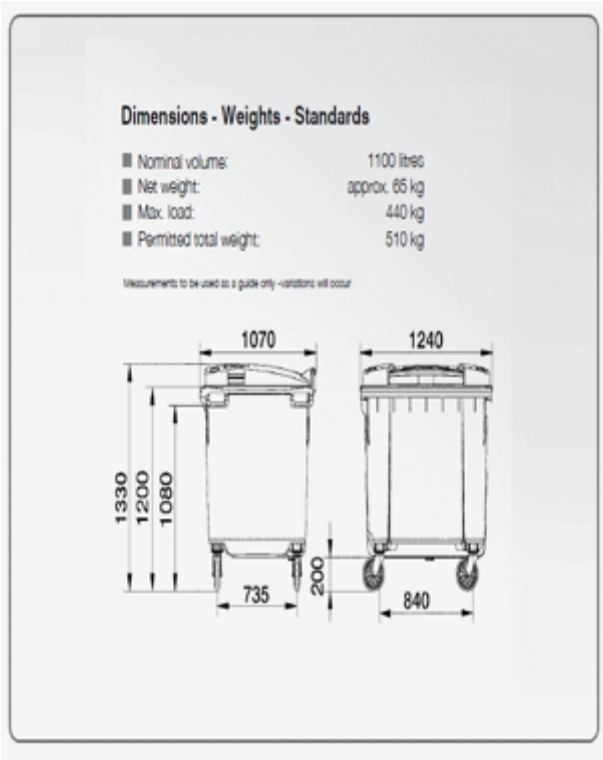
240-litre MGB



660-litre MGB



1100-litre MGB



Appendix 4: 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

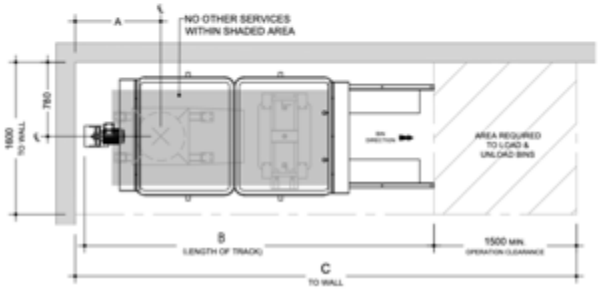
- Compaction unit – Please refer to the bin compactor product information sheet for details and specifications
- Enhanced safety add on's – Interlocking barriers, occupancy sensors or safety light curtains (presence sensing light barriers)
- Full bin SMS and email notification
- CMMS and BMS integration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

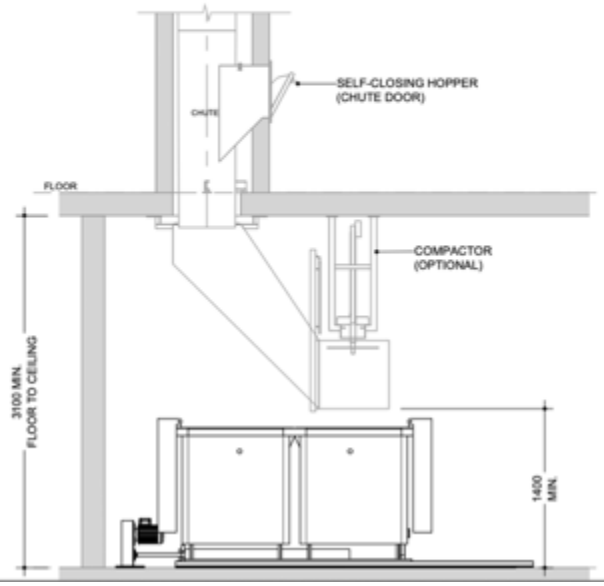
STANDARD FEATURES & BENEFITS

- 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:

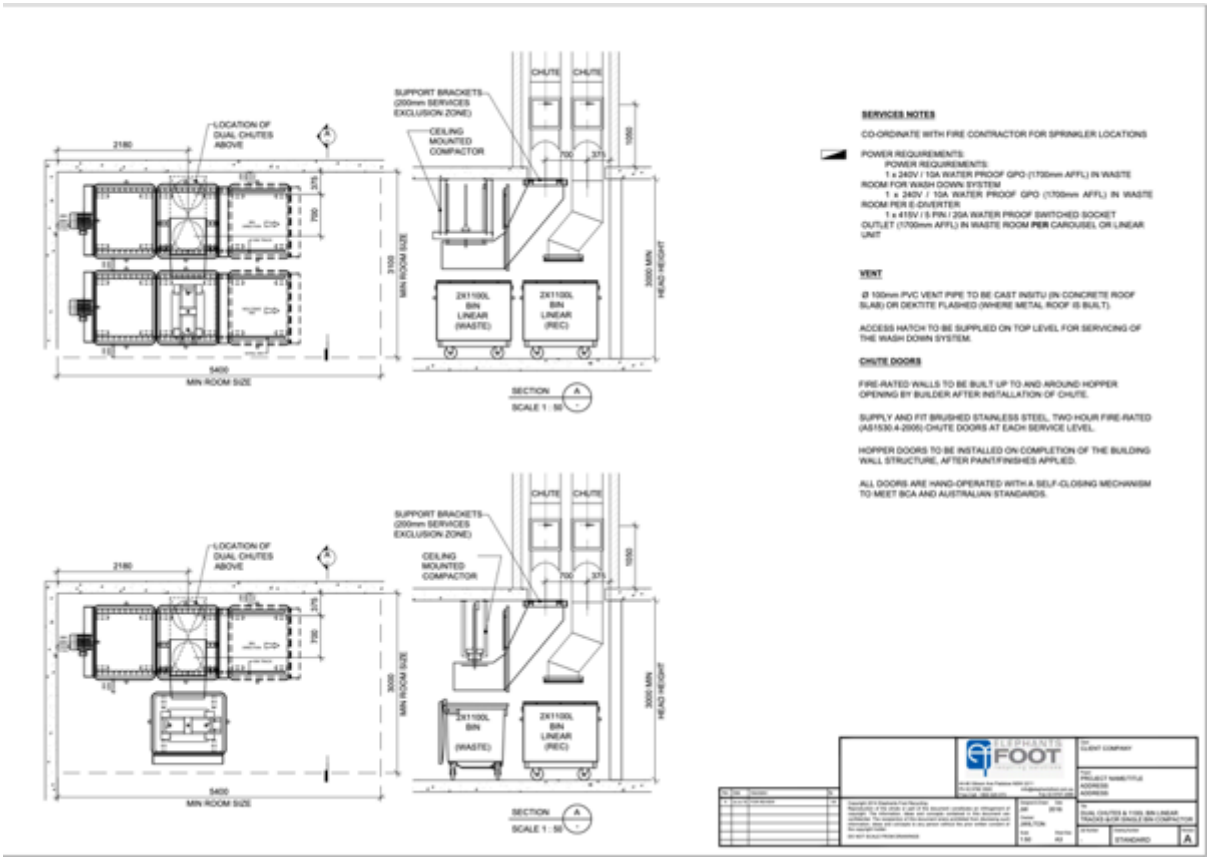
Bins not provided by Elephants Foot

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

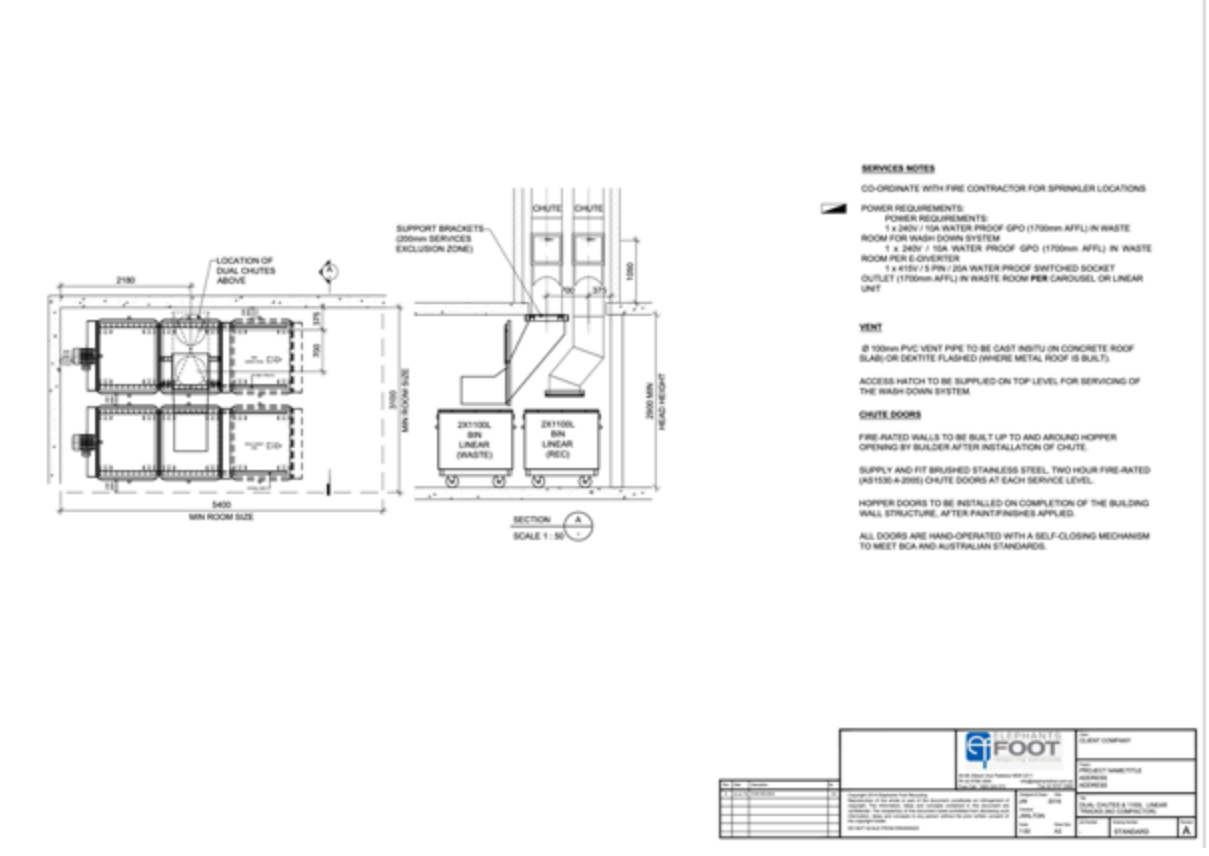
These drawings are not intended for site specific use or for construction. Each project is unique and will be designed to suit.

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 5: 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.