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104-116 Regent Street
Redfern

Operational Waste
Management Plan

May 2022

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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 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.*

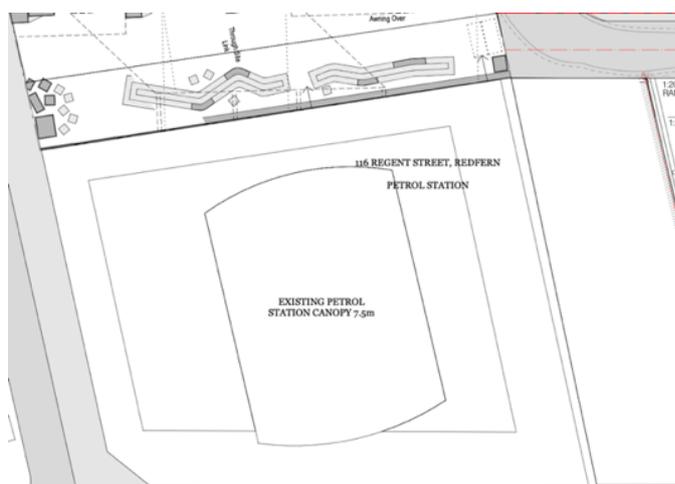
The intent of the OWMP is to ensure that waste management practices are consistent across all areas and tenancies of the development, with the maximum quantity of materials directed away from landfill to more environmentally beneficial outcomes.

2 Development Description

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

- Construction of an 18-storey building comprising a total of 9,542 m² 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 409 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 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 & City of Sydney 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's *Guidelines for Waste Management in New Developments 2018*

The City of Sydney's Request for Information dated 2/3/2022 (reference R/2020/17/A) has identified the below issues which have been addressed as follows:

Issue 1: *Clear and separate waste storage areas for the commercial and residential aspects of the development have not been provided. A separate bulky waste storage for the commercial tenancy is also lacking.*

Response: *These have now been provided and are shown on the revised architectural plans and in Appendix 1 of this report.*

Issue 2: *The City recommends that food waste must be stored within bins no larger than 240L. Larger bins will be too heavy to transfer, especially considering bins are proposed to be transferred to the neighbouring loading dock for collection.*

Response: *All food waste bins will be no larger than 240L capacity.*

Issue 3: *The proposed chutes do not comply with the chute room requirements and do not provide spare mobile garbage bins in case of chute failure. The City recommends that the proponent investigate chute rooms on all floors. If this cannot be rectified, the waste management plan must include procedures for managing bulk cardboard from residents as well as how the building will manage a chute failure as residents would not be able to access a waste area due to chute discharge.*

Response: *Section 8.4 of this report provides details of the proposed procedures for managing these issues should they arise.*

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*
- Council of the City of Sydney *Guidelines for Waste Management in New Developments 2018*
- Resource NSW *Better Practice Guide to Waste Management in Multi-Unit Dwellings*

5 General Waste & Recycling Generation

5.1 Resource Streams

The following generation rates are taken from the City of Sydney's *Guidelines for Waste Management in New Developments 2018*, page 33, and have been used to calculate the volumes of materials that will be produced from the development's ongoing operations:

Table 1: Materials Generation Factors for Student Accommodation

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 by applying the materials generation rates shown in Table 1 to the following floor areas:

Total Habitable Area (Student rooms only):	5,529 m²
Total Communal Area (Levels 1,2, and 4):	269 m²
Retail Tenancy:	72 m²

Only residential general waste will be compacted; a standard volume reduction factor of 2:1 has been used in calculations.

Table 2: Residential General Waste & Recycling

Material Stream	Generation Factor	Areas Applied To	m ²	Litres/Week
General Waste	30 litres/day/100 m ²	Habitable Area + Communal Area	5,799	12,178 uncompacted 6,090 compacted
Mixed Recycling	30 litres/day/100 m ²	Habitable Area + Communal Area	5,799	6,089
Food Waste	30 litres/day/100 m ²	Communal Area	270	567

Table 3: Retail General Waste & Recycling

Material Stream	Generation Factor	Area Applied To	m ²	Litres/Week
General Waste	65 litres/day/100 m ²	Retail Tenancy	72	328
Mixed Recycling	30 litres/day/100 m ²	Retail Tenancy	72	151
Food Waste	10 litres/day/100 m ²	Retail Tenancy	72	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 shows calculations of 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). Residents will access chutes from each level as detailed in Section 8.4. 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 monitor the bin/chute room to ensure bins do not overflow, and replace full bins with empty ones as required. The room will be locked and accessible only to authorised users. 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.

All general waste and mixed recycling 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.

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 take the material to one of the communal areas (Levels 1, 2, and 4) to deposit in the correct receptacles.

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. Examples of suitable bins are shown in Appendix 6.

6.3 Bulky Wastes

A separate 8 m² area has been allocated in the Level 1 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. Please note that the development will supply residents with mattresses and all furniture so the amount of bulky waste will be significantly reduced compared with a standard residential development.

These items will be collected from the bulky waste storage room by private contractor as needed.

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 Level 1 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. As noted in Section 5.2 for compaction of residential general waste, a 2:1 volume reduction is expected; 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 requirement to keep residential and retail materials in separate self-contained areas.

Bin totals include 1 spare bin per stream to allow for missed collections by the waste contractor.

Table 4: Residential & Common Area Bins & Storage

Material Stream	Bin Size	No. of Bins	Litres/Week	Compacted/Uncompacted	Collection Frequency	Floor Area Required*
General Waste	1100	5	6,089	Compacted	2 x per week	8.0
Mixed Recycling	1100	8	12,178	Uncompacted	2 x per week	12.7
Food Waste	240	5	567	Uncompacted	1 x per week	2.4
Chute Discharge/Linear Track/Loading Area						13.3
Bin Washing Area						2.0
Total		18	18,834			38.4 m²

* A 20% allowance has been made for space between bins and circulation within the bin room

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 Level 1 residential and retail storage areas as designed provide 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.

Retail bins will be stored in a completely separate area from residential bins; retail staff and other unauthorised users will be prevented from accessing the residential bin room by a locked gate.

8.2 Waste Storage Area, Access, & Bin Loading

Appendix 1 shows the Level 1 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 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. Appendix 2 provides details of the dual chute system and compaction equipment. As already noted, recyclables will not be compacted. The development's private waste contractor has confirmed that it can provide reinforced bins that can withstand the pressure of waste compaction.

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 bulky cardboard items that are too large to fit into chutes, residents will contact management to make arrangements for these to be collected and brought to the Level 1 storage room.

For maintaining the chute access rooms on each residential floor, 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.
- In the event of prolonged chute failure, 240L mobile garbage bins (MGBs) will be provided in each chute access room.
- 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 with minimal packaging requiring processing 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 receive 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.

11 Waste and Recycling Contractor Requirements

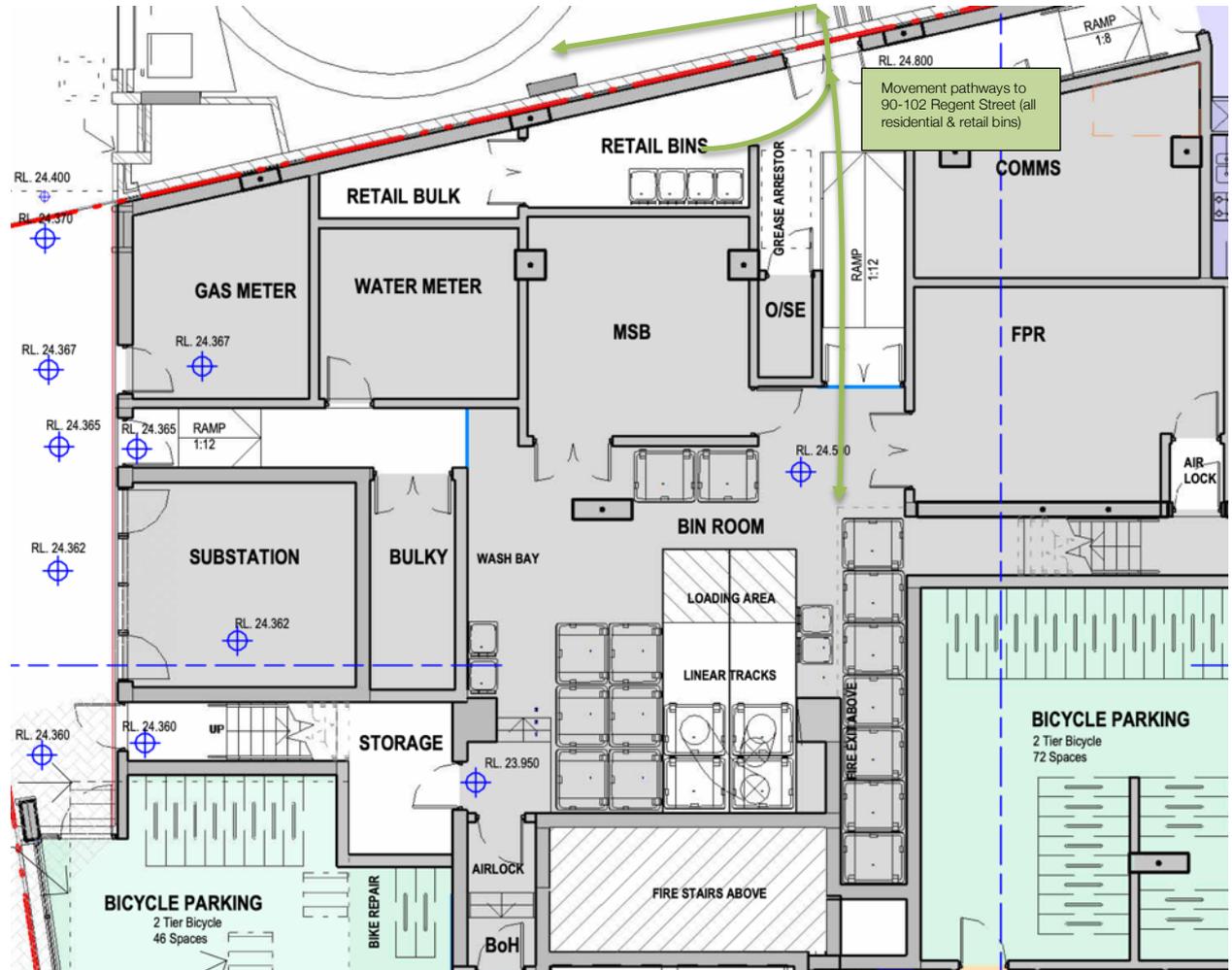
To achieve and maintain best practice, the site's waste and recycling contractor(s) will be required to comply with the following requirements:

- 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

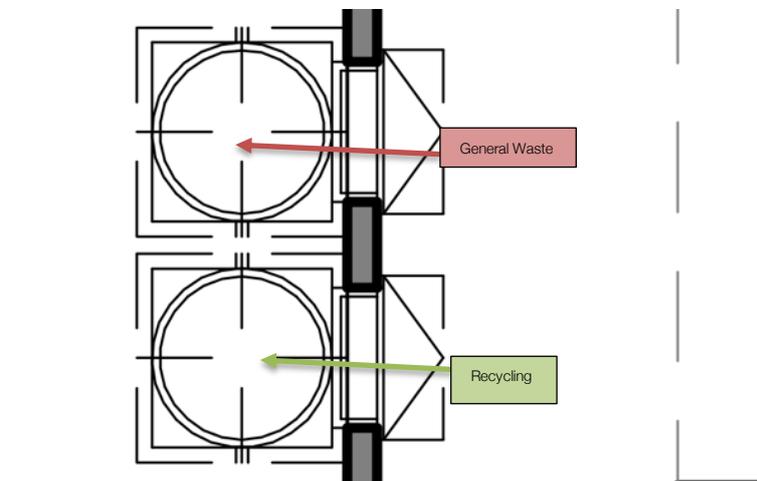
The site's waste and recycling contractor should be able to provide an accurate and reliable process for measuring and reporting all materials streams by weight, either directly, using truck mounted scales, or indirectly through volume to weight conversion. These processes should be supported by an annual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

Appendix 1: Waste Storage Areas & Chute Access Points

Level 1 Bin Storage & Movement Pathways



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



Appendix 2: Linear Track System Details



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

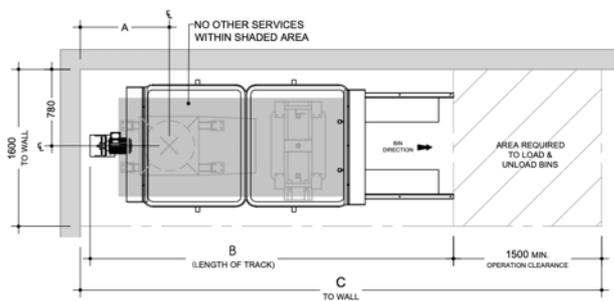
- Compaction unit – Please refer to the bin compactor product information sheet for details and specifications
- Enhanced safety add on's – Interlocking barriers, occupancy sensors or safety light curtains (presence sensing light barriers)
- Full bin SMS and email notification
- CMMS and BMS integration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

STANDARD FEATURES & BENEFITS

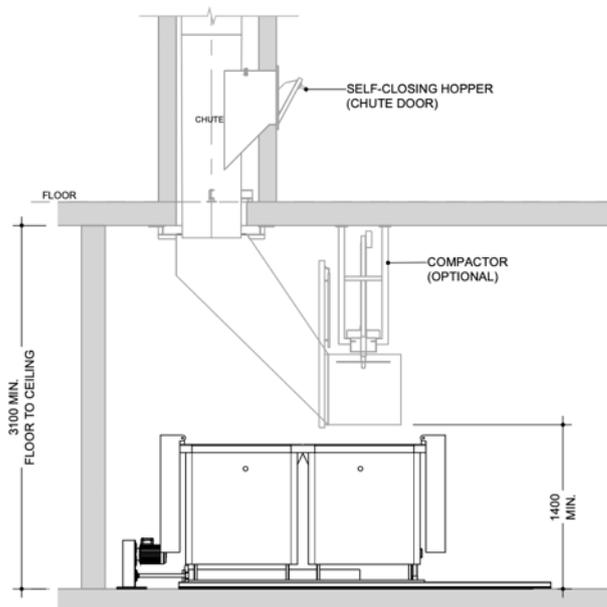
- Simple operation with user friendly controls
- Increased waste servicing efficiency for the development.
- Automatic system control with manual override
- Robust unit construction for long performance life
- Low service and maintain costs
- Rotating flashing beacon (activated during operation)
- Quiet 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

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

Appendix 3: Chute Operations & Maintenance

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



SCHEDULE OF SERVICES:

SERVICE TYPE	FREQUENCY	COST	Select (Tick)
Garbage Chute Cleaning	Quarterly or 6 Monthly	Building	<input type="checkbox"/> Quarterly
		\$55 + GST per level	<input type="checkbox"/> 6 Monthly <input type="checkbox"/> Yearly
Waste Equipment Preventative Maintenance	Quarterly or 6 Monthly	\$250 + GST (Per system)	<input type="checkbox"/> Quarterly
		TYPE:	<input type="checkbox"/> 6 Monthly <input type="checkbox"/> Yearly
Waste Chute Door Inspection	6 Monthly	\$110 + GST (Per hour + Call out)	<input type="checkbox"/> 6 monthly <input type="checkbox"/> Annually
efNeutraliser (Odour Control)	Monthly	\$89.95 + GST (Per Unit) <input type="text"/> Units	<input type="checkbox"/> Monthly

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)

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:

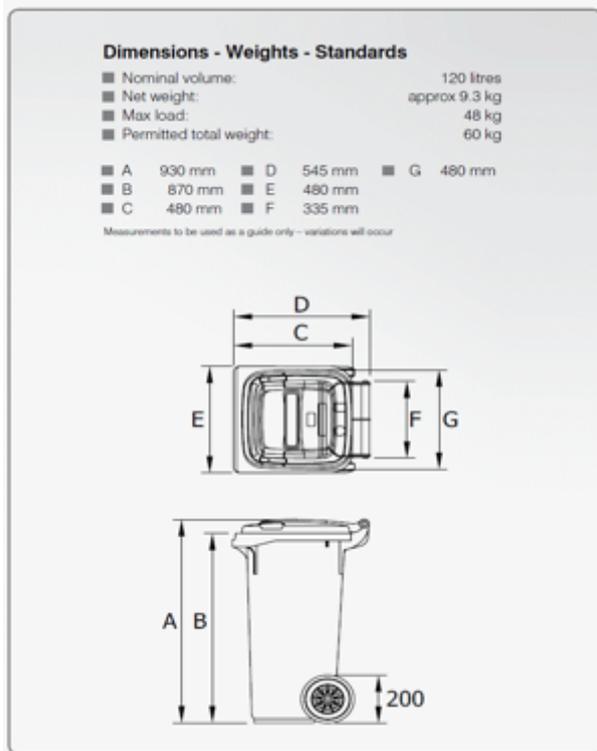
Frequency	Activity
Scheduled Maintenance	Check/Clean and/or adjust photo sensor & reflector
	Check and clean all limit switches (if applicable)
	Check power pack (if applicable)
	Check & grease diverter bearings
	Check electrical actuator & controls
	Check PLC functions & all wiring
	Check all electronic 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

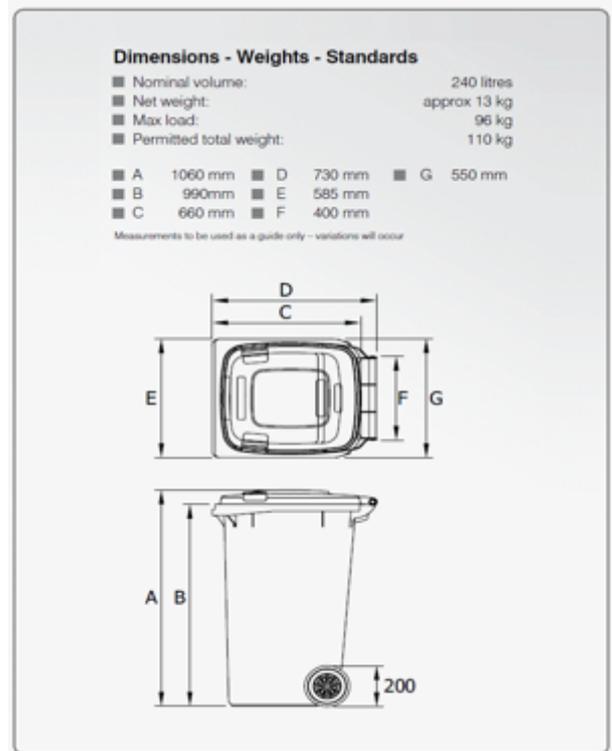
Frequency	Activity
Scheduled Maintenance	Ensure the plastic floor tray is clean
	Clean the machine
	Check and grease the ram screw rod and nut
	Check drive chain tension
	Check gearbox mount bolts
	Check the plastic floor tray and centre runners
	Check and grease carousel ring gear and motor pinion,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

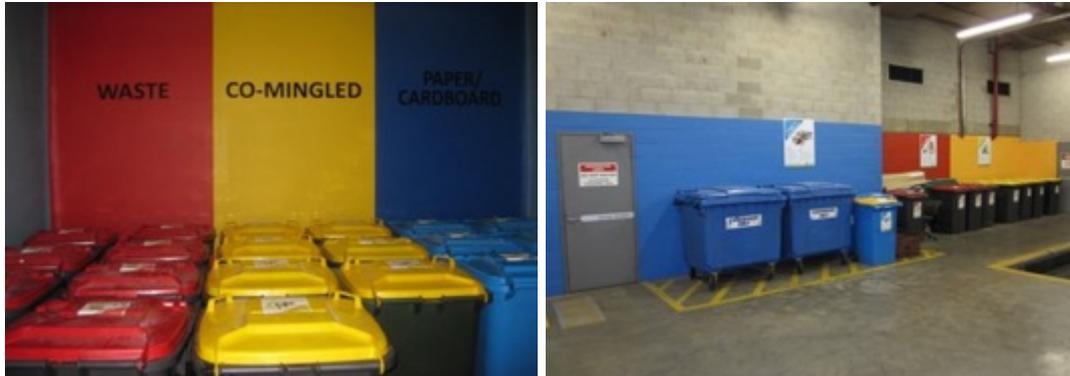


For the kitchenette area, pull-out bins such as those shown below can save floorspace and facilitate recycling through careful design and consistent colour-coding to match the site's waste and recycling streams.



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.

