



Glebe Mid-Rise Project
31 Cowper St and 2A-2D Wentworth Park Rd Glebe
Residential Development
OPERATIONAL WASTE MANAGEMENT PLAN

15/05/2020
Report No. SO364
Revision E

Client

New South Wales Land and Housing Corporation

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SCOPE

This waste management plan (WMP) only applies to the **operational** phase of the proposed development; therefore the requirements outlined in this WMP must be implemented during the operational phase of the site and may be subject to review upon further expansion for, and/or changes to the development.

The waste management of the **construction** and **demolition** phases of the development are not addressed in this report. It is EFRS’s understanding that a construction and demolition WMP will be completed by a separate party appointed by the developer, and submitted separately to this report. Typically, the head contractor of the site will be responsible for removing all construction-related waste offsite in a manner that meets all authority requirements.

REVISION REFERENCE

Revision	Date	Prepared by	Reviewed by	Description	Signed
A	14/02/2020	H Wilkes	A Armstrong	Draft	
B	13/03/2020	H Wilkes	A Armstrong	Amendment	
C	25/04/2020	H Wilkes	A Armstrong	Amendment	
D	13/05/2020	H Wilkes	A Armstrong	Final for Planning Proposal	
E	15/05/2020	H Wilkes	A Armstrong	Amendment for Planning Proposal	

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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 strapping
<i>Chute</i>	A ventilated, vertical pipe passing from floor to floor of a building with openings as required to connect with hoppers and normally terminating at its lower end at the roof of the central waste room(s)
<i>Chute Discharge</i>	The point at which refuse exits from the refuse chute
<i>Chute Discharge Room</i>	A secure, enclosed area or room housing the discharge and associated equipment for the refuse chute
<i>Collection Area/Point</i>	The identified position or area where garbage 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>Green Waste</i>	All vegetated organic material such as small branches, leaves and grass clippings, tree and shrub pruning, plants and flowers
<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>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>LRV</i>	Large rigid vehicle described by AS 2890.2-2002 Parking facilities – Off-street commercial vehicle facilities as heavy rigid vehicle (HRV)
<i>Mobile Garbage Bin(s) (MGB)</i>	A waste container generally constructed of plastic with wheels with a capacity in litres of 120, 240, 360, 660, 1000 or 1100
<i>MRV</i>	Medium rigid vehicle
<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.
<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>SRV</i>	Small rigid vehicle as in AS 2890.2-2002 Parking facilities – Off-street commercial vehicle facilities, generally incorporating a body width of 2.33

INTRODUCTION

Elephants Foot Recycling Solutions (EFRS) has been engaged to prepare the following waste management plan for NSW Land and Housing Corporation for the operational management of waste generated by the development located at 31 Cowper St and 2A-2D Wentworth Park Rd Glebe. This report is for the planning proposal stage. The waste management strategy will be further refined in the development application stage.

Waste management strategies and auditing are a requirement for new developments to provide support for the building design, and promote strong sustainability outcomes for the building. It is EFRS's belief that a successful waste management strategy contains three key objectives:

- i. **Promote responsible source separation*** to reduce the amount of waste that goes to landfill, by implementing convenient and efficient waste management systems
- ii. **Ensure adequate waste provisions and robust procedures*** that will cater for potential changes during the operational phase of the development
- iii. **Compliance*** with all relevant council codes, policies, and guidelines.

To achieve these objectives, this WMP identifies the different waste streams likely to be generated during the operational phase of the development. Associated information includes: how the waste will be handled and disposed of, details of bin sizes/quantities and waste rooms, descriptions of the proposed waste management equipment used and information on waste collection points and frequencies.

It is essential that this waste management plan is integrated into the overall management of the building and clearly communicated to all relevant stakeholders.

REPORT CONDITIONS

The purpose of this report is to document a Waste Management Plan (WMP) as part of a development application and is supplied by EFRS with the following limitations:

- Drawings, estimates and information contained in this waste management plan have been prepared by analysing the information, plans and documents supplied by the client, and third parties including Council and government information. The assumptions based on the information contained in the WMP 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 managements approach to educating residents and tenants regarding waste management operations and responsibilities;
- The building manager will make adjustments as required based on actual waste volumes (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 or representation is made that the WMP reflects the actual outcome and EFRS will not be liable to you for plans or outcomes that are not suitable for your purpose, whether as a result of incorrect or unsuitable information or otherwise;
- EFRS offer no warranty or representation of accuracy or reliability of the WMP unless specifically stated;
- Any manual handling equipment recommended should be provided at the recommendation of the appropriate equipment provider who will assess the correct equipment for supply;
- Design of waste management chute equipment and systems must be approved by the supplier.
- EFRS cannot be held accountable for late changes to the design after the WMP has been submitted to Council.
- EFRS will provide specifications and recommendations on bin access and travel paths within the WMP, 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 head heights, internal manoeuvring and loading requirements. These variables are considered to be within the applicable Traffic Consultants domain.
- Council are subject to changing waste and recycling policies and requirements at their own discretion.

This WMP has only been finalised once the Draft Watermark has been removed. If the Draft Watermark is present, the information in the WMP is not confirmed.

DEVELOPMENT SUMMARY

The proposed development falls under the LGA of City of Sydney Council, and consists of:

- Two buildings
 - South Site is an 8-level building for private residences, and includes;
 - 34 residential units
 - 5 townhouses
 - North Site is an 8-level building for social housing, and includes;
 - 35 social housing dwellings
 - A hub of 200m²

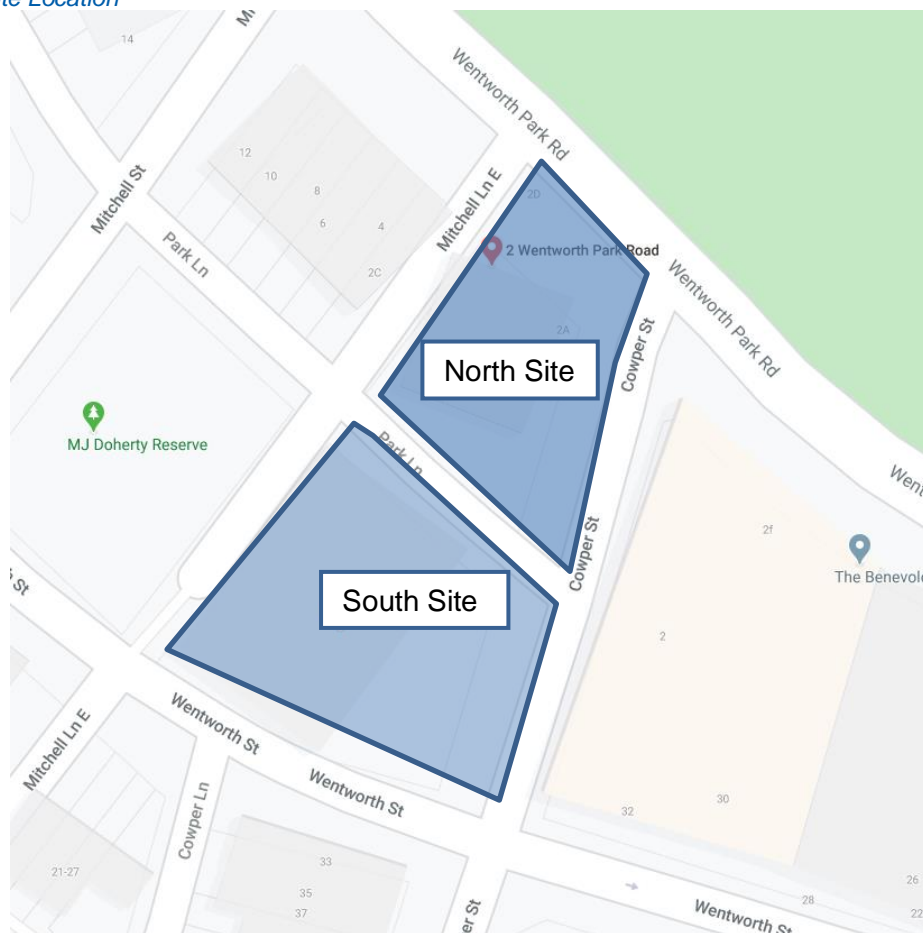
Please note: This report is for the planning proposal submission. Further refinement of the waste management strategy will be conducted in the Development Application stage.

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

SITE LOCATION

The site is located at 31 Cowper St and 2A-2D Wentworth Park Rd Glebe, as shown in Figure.1. The site has frontages to Wentworth Park Rd, Cowper St, Park Ln and Wentworth St. The South Site has vehicle access via Wentworth St.

Figure 1 - Site Location



CITY OF SYDNEY COUNCIL

The garbage and recycling will be guided by the services and acceptance criteria of the City of Sydney Council. All waste facilities and equipment are to be designed and constructed to be in compliance with the *Sydney Development Control Plan 2012*, *City of Sydney Council's Guidelines for Waste Management in New Developments 2018*, Council Advices, Australian Standards and statutory requirements.

COUNCIL OBJECTIVES

Space – to allocate sufficient areas within developments for the efficient access, storage and collection of waste and recycling.

Access – to ensure waste systems are easy to use and collection vehicles are able to access buildings to remove waste safely and efficiently;

Safety – to ensure safe practises for storage, handling and collection of waste and recycling;

Services – to provide guidance on the Council's expectations for delivering effective waste services including bin handling and collection points, and managing bulky, problem waste and stripout waste.

Management – to ensure clarify regarding the roles providing waste management systems for developments and to demarcate service provision.

STAKEHOLDER ROLES AND RESPONSIBILITIES

The following table demonstrates the primary roles and responsibilities of the respective stakeholders:

Table 1: Stakeholder Roles and Responsibilities

Roles	Responsibilities
Strata/Management	<ul style="list-style-type: none"> Ensuring that all waste service providers submit monthly reports on all equipment movements and waste quantities/weights; Organising internal waste audits/visual assessments on a regular basis; and Manage any non-compliances/complaints reported through waste audits.
Building Manager or Waste Caretaker	<ul style="list-style-type: none"> Ensuring effective signage, communication and education is provided to occupants, tenants and cleaners; Providing staff/contractors with equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities; Ensuring site safety for residents, children, visitors, staff and contractors; Abiding by all relevant OH&S legislation, regulations, and guidelines; Assessing any manual handling risks and prepare a manual handling control plan for waste and bin transfers; Preventing storm water pollution by taking necessary precautions (securing bin rooms, preventing overfilling of bins) General maintenance and cleaning of chute doors on each level; Cleaning and transporting of bins as required; Organising, maintaining and cleaning the general and recycled waste holding area; Organising both garbage and recycled waste pick-ups as required; Organising replacement or maintenance requirements for bins; Organising bulky goods collection when required; and Investigating and ensuring prompt clean-up of illegally dumped waste materials.
Residents and Social Housing Tenants	<ul style="list-style-type: none"> Dispose of all garbage and recycling in the allocated waste chutes and/or MGBs provided; Ensure adequate separation of garbage and recycling; and Compliance with the provisions of Council and the WMP.
Waste Contractor	<ul style="list-style-type: none"> Provide a reliable and appropriate waste collection service; Provide feedback to building managers/residents in regards to contamination of recyclables; and Work with building managers to customise waste systems where possible.
Gardening/Landscaping Contractor	<ul style="list-style-type: none"> Removal of all garden organic waste generated during gardening maintenance activities for recycling at an offsite location.
Building Contractors	<ul style="list-style-type: none"> Removing all construction related waste offsite in a manner that meets all authority requirements.

EDUCATION

Educational material encouraging correct separation of garbage and recycling items must be provided to each resident and tenancy by building management regarding the relevant waste management procedures. This should include. How to correctly use the chute (if applicable), the correct disposal process for bulky goods (old furniture, large discarded items, etc.), and other appropriate materials (electronic, chemical waste, etc.). It is recommended that the building caretaker provides information 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 health and safety as well as building management; and
- How to prevent damage or blockages to the chute (example below).

To prevent damage or blockage to rubbish chute DO NOT dispose of any 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.

SIGNAGE

The building manager is responsible for all waste management signage throughout the building including safety signage (see *APPENDIX B.2*). Appropriate signage must be prominently displayed on doors, walls and above all bins, clearly stating where waste and recycling will be placed.

SOUTH SITE - PRIVATE RESIDENTIAL WASTE MANAGEMENT

The City of Sydney Council's *Guidelines for Waste Management in New Developments 2018* has been referenced to calculate the total number of bins required. Calculations are based on generic figures; waste generation rates may differ according to the residents' waste management practice.

ESTIMATED WASTE VOLUMES AND PROVISIONS

The following table shows the estimated volume (L) of garbage and recycling generated by the residential component in the South Site.

Table 2: Calculated Waste Generation – South Site Private Residential Units

# Units		Garbage Generation Rate (L/unit/week)	Generated Garbage (L/week)
34		120	4080
TOTAL	34		4080
Collections	Garbage Bin Size (L)		1100
	Garbage Bins per Week		3.71
	Garbage Collections per Week		1
	Total Garbage Bins Required		4
Equipment	Number of Waste Bins Per Day		0.53
	Chute Equipment		Single Waste Chute

*Note: An additional 1100L MGB should be provided for each chute discharge for use during collection periods. These bins are not included in the above figures.

Table 3: Calculated Recycling Generation – South Site Private Residential Units

Level	Units	Recycling Generation Rate (L/unit/week)	Generated Recycling (L/week)	Recycling Bins per Week	Recycling Collection Per Week	Total Recycling Bins Required
Level 1	4	120	480	2	1	2
Level 2	5	120	600	3	1	3
Level 3	5	120	600	3	1	3
Level 4	5	120	600	3	1	3
Level 5	5	120	600	3	1	3
Level 6	5	120	600	3	1	3
Level 7	5	120	600	3	1	3
TOTAL	34		4080	20		20

During operation, it is the responsibility of the building manager to monitor the number of bins required for the residential component. 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.

Table 4: South Site Private Residential Townhouses – Bin Numbers

Townhouses	Garbage Generation Rate (L/townhouse/week)	Generated Garbage (L/week)	Recycling Generation Rate (L/townhouse/week)	Generated Recycling (L/week)
5	120	600	120	600
TOTAL		600		600
Collections	Garbage Bin Size (L)		Recycling Bin Size (L)	
	120		120	
	Garbage Bins per Week		Recycling Bins per Week	
	5.00		5.00	
Garbage Collections per Week		Recycling Collections per Week		
1		1		
Total Garbage Bins Required		Total Recycling Bins Required		
5		5		

HOUSEHOLD WASTE MANAGEMENT PROCEDURE – UNITS

The units of the South Site will be provided with a single waste chute with 240L recycling bins on each residential level. The residents of the units in the South Site will be responsible for walking their waste and recycling to the disposal point on their level and placing the waste into the chute and recycling into the bin.

Garbage discharges into 1100L MGBs placed on linear tracks. The linear track system will allow the chute discharge room to have three days' worth of capacity without manual input

The 240L recycling bins will be situated in the waste compartment on each residential level for collection of recyclable items. The building manager or cleaner is responsible for monitoring the capacity of recycling bin and exchanging, with empty bins as required.

Full and spare garbage and recycling bins will be kept in the Residential Bin Holding Room.

HOUSEHOLD WASTE MANAGEMENT PROCEDURE – TOWNHOUSES

The waste management strategy for the townhouses will be determined at the Development Application stage.

SOCIAL HOUSING RESIDENTIAL WASTE MANAGEMENT

The City of Sydney Council’s *Guidelines for Waste Management in New Developments 2018* has been referenced to calculate the total number of bins required. Calculations are based on generic figures; waste generation rates may differ according to the residents’ waste management practice.

ESTIMATED WASTE VOLUMES AND PROVISIONS

The following table shows the estimated volume (L) of garbage and recycling generated by the social housing residential dwellings in the North Site.

Table 5: Calculated Waste and Recycling Generation – North Site Social Housing Residential

# Units	Garbage Generation Rate (L/unit/week)	Generated Garbage (L/week)	Recycling Generation Rate (L/unit/week)	Generated Recycling (L/week)
35	120	4200	120	4200
TOTAL	35	4200		4200
Collections	Garbage Bin Size (L)	240	Recycling Bin Size (L)	240
	Garbage Bins per Week	17.50	Recycling Bins per Week	17.50
	Garbage Collections per Week	1	Recycling Collections per Week	1
	Total Garbage Bins Required	18	Total Recycling Bins Required	18
Waste Rooms		Communal Waste Room		

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.

SOCIAL HOUSING HOUSEHOLD WASTE MANAGEMENT PROCEDURES

The residents of the social housing will be provided with a communal waste room which will contain 240L MGBs for waste and 240L MGBs for recycling. The residents will be responsible for walking their waste and recycling down to the waste room and placing their waste and recycling into the correct bins.

COMMON AREAS

The common areas of the social housing building including the hub, lobbies, amenities and circulation areas will be supplied with suitably branded waste and recycling receptacles where considered appropriate. The building manager will be responsible for monitoring the fullness of the receptacles and for emptying them into the bins in the communal waste room as required.

SOURCE SEPARATION

GENERAL WASTE (GARBAGE)

Residents will be supplied with a collection area in each unit to deposit garbage and collect recyclable material suitable for one day's storage. This is typically located generally in the kitchen, under bench or similar alternate area. Residents should wrap or bag their garbage; bagged garbage should not exceed 3kg in weight or 35cm x 35cm x 35cm in dimension.

RECYCLING

Recycling 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.

Cardboard furniture boxes or large cardboard containers should not be included in the garbage chute – cardboard can be placed directly into the 240L recycling bins.

GREEN WASTE

Green waste is not typically generated from multi-unit dwellings other than from surrounding building landscaped areas and is removed by the designated maintenance contractor. In the event that green waste is produced i.e trimming of indoor or balcony plants then this may be disposed of via coordination with the building caretaker or cleaner. Very small quantities may be disposed of via the general waste stream.

BULKY GOODS – RESIDENTIAL

A room or caged area will be made available for the storage of discarded residential bulky items (e.g. whitegoods, furniture, etc.). This room should be located within close proximity of the garbage and recycling bin collection room and must have a minimum doorway width of 1.5m to allow for easy movement of large waste items in and out of the room. The bulky goods area will also include an additional caged off area for the storage of gas bottles.

City of Sydney Council requires developments with 21-40 unit City of Sydney require the bulky goods room to be provided at a rate of a minimum of 4m² plus 1m² for every 10 units above 20 units.

Based on this rate, this development will require the following space for the bulky goods area:

South Site

Total dwellings 34–20 = 14

14/10 = 1.4

1.4 * 1m² = 1.4

4m² + 1.4m² = 5.4m²

Minimum Bulky goods room: 6m²

North Site

Total dwellings 35–20 = 15

15/10 = 1.5

1.5 * 1m² = 1.5

4m² + 1.5m² = 5.5m²

Minimum Bulky goods room: 6m²

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These areas are crucial to prevent residents from illegally dumping bulky waste on the footpath outside Councils scheduled collection times. Regular illegal dumping can attract other dumped waste, generate litter, detract significantly from the quality and appearance of the development and reduce amenity of the street.

Residents will be required to liaise with building management regarding the transportation and disposal of bulky goods. Ideally, bulky waste should be collected on a regular schedule so that the storage area does not become overfull and so that residents know when to place items in there for collection. Councils may arrange for more frequent collections of bulky waste for MUDs, however collection frequencies vary among different local government areas.

Donations to charitable organisations should be encouraged. Clean, sound furniture and household goods etc. are highly sought after to provide for the disadvantaged. Donations can be arranged with the assistance of the building manager/waste caretaker.

CHEMICAL WASTE

Chemical wastes (e.g. cleaning chemicals, paints, oils solvents) pose detrimental effects to human health and the environment if not disposed of correctly. Chemical wastes should be disposed of at a suitable licensed disposal facility. No liquid wastes or wash down waters should be disposed of via the storm water drainage system.

Residents will need to liaise with the building manager when disposing of their chemical wastes. The building manager will be responsible for arranging the correct disposal of chemical waste. Household Chemical CleanOut events are held at various locations throughout NSW on specified dates throughout the year. Locations and dates are subject to change. It is recommended that the building caretaker confirm these details with their local Council.

FOOD WASTE

For the purpose of calculating the number of bins and sizing the waste room, this report has consolidated the food waste generation rate and the general waste generation rate for boarding houses as detailed in City of Sydney Council's *Guidelines for Waste Management in New Developments 2018*.

In operation, if the private residential building or the social housing building chooses to introduce food waste separation and collection, this can be done by introducing 2x 240L MGBs for food waste into the waste area. As food waste separation will reduce the volume of general waste, it is assumed that the number of general waste bins would go down by the corresponding number of food waste bins.

If food waste management is introduced, the building management would be responsible for setting up and maintaining the food waste management procedures. This may include supplying the required bins, organising appropriate collection service to collect and recycle the food waste and providing appropriate education to boarding house residents. .

NON-RESIDENTIAL WASTE MANAGEMENT

The City of Sydney Council’s *Guidelines for Waste Management in New Developments 2018* has been referenced to calculate the total number of bins required for the non-residential areas. Calculations are based on generic figures; waste generation rates may differ according to the tenants’ waste management practice.

ESTIMATED WASTE VOLUMES AND PROVISIONS

The following table shows the estimated volume (L) of garbage and recycling generated by the non-residential component of the development. A seven day operating week has been assumed. Please note, for the purpose of the calculations, the food waste generation arate has been integrated into the garbage waste generation rate.

Table 6: Calculated Waste and Recycling Generation – North Site Non-Residential Operations

Type	NLA (m ²)	Garbage Generation Rate (L/100m ² /day)	Generated Garbage (L/week)	Recycling Generation Rate (L/100m ² /day)	Generated Recycling (L/week)
General (Community)	200	25	350	50	700
TOTAL	200		350		700
Collections & Equipment	Bin Size (L)		660	Bin Size (L)	
	Garbage Bins Per Week		1	Recycling Bins Per Week	
	Collections per Week		1	Collections per Week	
	Total Waste Bins Required		1	Total Recycling Bins Required	

Table 7: Calculated Waste and Recycling Generation – South Site Non-Residential Operations

Type	NLA (m ²)	Garbage Generation Rate (L/100m ² /day)	Generated Garbage (L/week)	Recycling Generation Rate (L/100m ² /day)	Generated Recycling (L/week)
General Retailing	40	30	84	200	560
TOTAL	40		84		560
Collections & Equipment	Bin Size (L)		240	Bin Size (L)	
	Garbage Bins Per Week		1	Recycling Bins Per Week	
	Collections per Week		1	Collections per Week	
	Total Waste Bins Required		1	Total Recycling Bins Required	

It is the responsibility of the building manager to monitor the number of bins required for the non-residential components. Waste volumes may change according to the development’s management, customer base and tenancy attitudes to waste disposal and recycling. The bin numbers, sizes and collection frequencies may need to be altered to suit the building operation. Seasonal peak periods i.e. public and school holidays should also be considered.

NON-RESIDENTIAL WASTE MANAGEMENT PROCEDURES

Each non-residential component will be provided with their own waste room and bins. It is understood this waste room will be within the non-residential footprint.

The non-residential components will be responsible for their daily back of house waste management. At the end of the day cleaners or nominated staff will transport the waste and recycling to the allocated waste room and will place the waste and recycling directly into the appropriate bins.

NON-RESIDENTIAL BULKY WASTE AND PROBLEM WASTE

A room or caged area will be made available for the storage of discarded bulky items and special waste for recycling, such as e-waste and chemical waste from the non-residential components. This room should have a minimum doorway width of 1.5m to allow for easy movement of large waste items in and out of the room. Based on the City of Sydney requirements, it is recommended that the bulky waste room is at least 4m² for this development.

MANAGEMENT OF SPECIALITY WASTE STREAMS

The building manager is responsible for making arrangements for the disposal and recycling of specialised waste streams with an appropriate contractor. Specialised wastes cannot be placed in general waste as they can have adverse impacts to human health and the environment if disposed of in landfill. Retail and Commercial tenants will need to liaise with the building manager when disposing of specialised waste streams.

Specialised waste streams include:

- Chemical Waste
- Liquid wastes
- Toner cartridges
- Lightbulbs
- eWaste
- Batteries

COLLECTION OF WASTE

RESIDENTIAL UNITS

The waste and recycling of the residential units in the South Site will be collected by Council in accordance with Council's collection schedule. This report assumes that waste and recycling will be collected weekly.

Prior to collection, the building manager will move the full waste bins from the chute discharge room and the recycling bins from the residential level to the bin holding area (collection area) on ground level. Service bins will remain under the chute during servicing.

The waste collection vehicle will park on Park Lane and collect the bins directly from the waste room. The building manager will be responsible for returning the bins to their operational locations after servicing has been completed.

RESIDENTIAL TOWNHOUSES

The waste collection strategy for the townhouses will be determined at the Development Application stage.

SOCIAL HOUSING

The waste and recycling of the residential social housing in the North Site will be collected by Council in accordance with Council's collection schedule. This report assumes that waste and recycling will be collected weekly. The waste collection vehicle will park on Park Lane and collect the bins directly from the waste room.

NON – RESIDENTIAL

A private contractor will be engaged to collect the non-residential waste and recycling to an agreed schedule. The waste collection vehicle will park on the street adjacent to the non-residential waste rooms and the waste collection staff will collect the bins directly from the non-residential waste rooms.

COLLECTION AREA

It is Elephant Foot's understanding that the collection areas have been reviewed by a traffic consultant to confirm the swept paths, load requirements and clearances for waste collections. It must be ensured that the collection vehicle (and other trucks if required) can conduct collections from the nominated locations.

WASTE ROOM AREAS

In the chute discharge rooms, Chute discharge requires a minimum of 3000mm distance from floor to ceiling and needs to be free of service pipes and other overhead obstacles within the immediate space around the chute discharge. Access to waste discharge rooms should be provided to the building manager/waste caretaker **only**. Under no circumstances should access be provided to any residents, or waste collection staff.

In the communal waste room, all the bins should be arranged so that all bins can be accessed without moving any other bins. This is to ensure the safety of residents accessing the waste room to disposed of waste and recycling.

The areas allocated for waste storage and collection areas are detailed in Table 8 and Table 9 below. The areas provided are estimates only. Final areas will depend upon room and bin layouts.

OPERATIONAL WASTE MANAGEMENT PLAN
Table 8: Waste Room Areas – South Site Private Residential

Level	Waste Room Type	Equipment	Estimated Area (m ²)
G	Bin compartment for townhouse	<i>To be determine in DA</i>	<i>To be determine in DA</i>
G	South Site – chute discharge room	<i>Minimum</i> 1x 2-bin linear for 1100L MGBs 1x 1100L MGBs (service bin)	>12
G	South Site – unit bin holding room (collection area)	4x 1100 MGBs (waste) 20x 240 MGBs (recycling)	>27
G	Residential Bulky Goods Waste Storage Room – South Site		Minimum 9
<i>To be determine in DA</i>	Non residential Bin room	1x 240L MGB (waste) 1x 240L MGBs (recycling)	<i>To be determine in DA</i>
<i>To be determine in DA</i>	Non-residential bulky goods room		Minimum 4

Table 9: Waste Room Areas – North Site Social Housing Residential

Level	Waste Room Type	Equipment	Estimated Area (m ²)
G	North Site – Communal Waste Room (collection area)	18x 240L MGBs (waste) 18x 240L MGBs (recycling)	>26
G	Residential Bulky Goods Waste Storage Room – North Site		Minimum 6
<i>To be determine in DA</i>	Non residential Bin room	1x 660L MGB (waste) 2x 660L MGBs (recycling)	<i>To be determine in DA</i>
<i>To be determine in DA</i>	Non-residential bulky goods room		Minimum 4

EQUIPMENT SUMMARY

Table 10: Equipment Summary

Component	Part	Qty	Notes
Chutes	South Site - Please refer to supplier's information	1	(See APPENDIX C for Typical Chute Section)
Equipment A	Garbage – South Site 2-bin 1100L MGB Linear Track System	1	(See APPENDIX C.2 for Typical Linear System)

CONSTRUCTION REQUIREMENTS

Waste rooms construction must comply with the minimum standards as outlined in the *Sydney Development Control Plan 2012* in order to minimise odours, deter vermin, protect surrounding areas, and make it a user-friendly and safe area.

The *NSW Better practice guide for resource recovery in residential developments (2019)* also states that better practice bin storage areas should achieve more than the minimum compliance requirements, which are as follows:

- Ensuring BCA compliance, including ventilation. Where required, ventilation system must comply with *AS1668.4-2012 The use of ventilation and air conditioning in buildings*.
- Ensuring storage areas are well lit (sensor lighting preferred) and have lighting available 24 hours a day.
- Provision of bin washing facilities, including taps for hot and cold water provided through a centralised mixing valve. The taps must be protected from bins and be located where they can be easily accessed even when the area is at bin capacity.
- Floor constructed of concrete at least 75mm thick.
- Floor graded so that any water is directed to a sewer authority approved drainage connection to ensure washing bins and/or waste storage areas do not discharge flow into the stormwater drain.
- Provision of smooth, cleanable and durable floor and wall surfaces that extend up the wall to a height equivalent to any bins held in the area.
- Ensuring ceilings are finished with a smooth-faced non-absorbent material capable of being cleaned.
- All surfaces (walls, ceiling and floors) finished in a light colour.

ADDITIONAL CONSIDERATIONS

- Waste room floor to be sealed with a two pack epoxy;
- All corners coved and sealed 100mm up, this is to eliminate build-up of dirt;
- Tap height and light switch height of 1.6m;
- Storm water access preventatives (grate);
- All walls painted with light colour and washable paint;
- Equipment electric outlets to be installed 1700mm above floor levels;
- The room must be mechanically ventilated;
- Optional automatic odour and pest control system installed
- If 660L or 1100L bins are utilised, 2 x 820mm (minimum) double-doors should be used;
- All personnel doors are hinged, lockable and self-closing;
- Conform to the building code of Australia, Australian standards and local laws; and
- Childproofing and public/operator safety shall be assessed and ensured

VENTILATION

Bin enclosures 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.

USEFUL CONTACTS

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

CITY OF SYDNEY COUNCIL CUSTOMER SERVICE

Phone: (02) 9265 9333

Email: council@cityofsydney.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 (Private Waste Services Provider)

Phone: 02 9399 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

MOVEXX (Bin Movers)

Phone: 1300 763 444

AUSCOL (Recycling Oils & Animal Fats)

Phone: 1800 629 476

ELEPHANTS FOOT RECYCLING SOLUTIONS (Chutes, Compactors and eDiverter Systems)

44 – 46 Gibson Avenue

Padstow NSW 2211

Free call: 1800 025 073

Email: info@elephantsfoot.com.au

APPENDICES

APPENDIX A ARCHITECTURAL DRAWING EXCERPTS

APPENDIX A.1 GROUND LEVEL – WASTE FACILITIES AND COLLECTION AREAS

Please note: the details of the waste management facilities will be further refined in the Development Application.



1177

Source: Johnson Pilton Walker, Glebe Mid-Rise Development, Drawing No A-1010 Rev00, Planning Proposal – General Arrangement Plan Ground Level

APPENDIX B PRIMARY WASTE MANAGEMENT PROVISIONS
APPENDIX B.1 CITY OF SYDNEY TYPICAL BIN SPECIFICATIONS

Australian standard sizes for mobile garbage bins (MGBs)

Standard measurements

Bin type	120L MGB	240L MGB	660L MGB	1100L MGB
Height	940 mm	1080 mm	1250 mm	1470 mm
Length	560 mm	735 mm	850 mm	1245 mm
Width	485 mm	580 mm	1370 mm	1370 mm



SOURCE: City of Sydney Waste Management Guidelines for New Developments 2018

APPENDIX B.2 SIGNAGE FOR WASTE & RECYCLING BINS

Waste Signs

Signs for garbage, recycling and organics bins should comply with the standard signs promoted by the EPA (Environmental Protection Authority).

Examples of waste wall posters (EPA supplied)



Examples of bin lid stickers (EPA supplied)



Problem Waste Signs

The EPA has also produced a range of images and signs that can be used for problem wastes, such as fluoro globes and tubes, household and car batteries, e-waste and smoke detectors. To access these resources, contact the NSW EPA. Some examples are shown below.



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.

Example safety signs



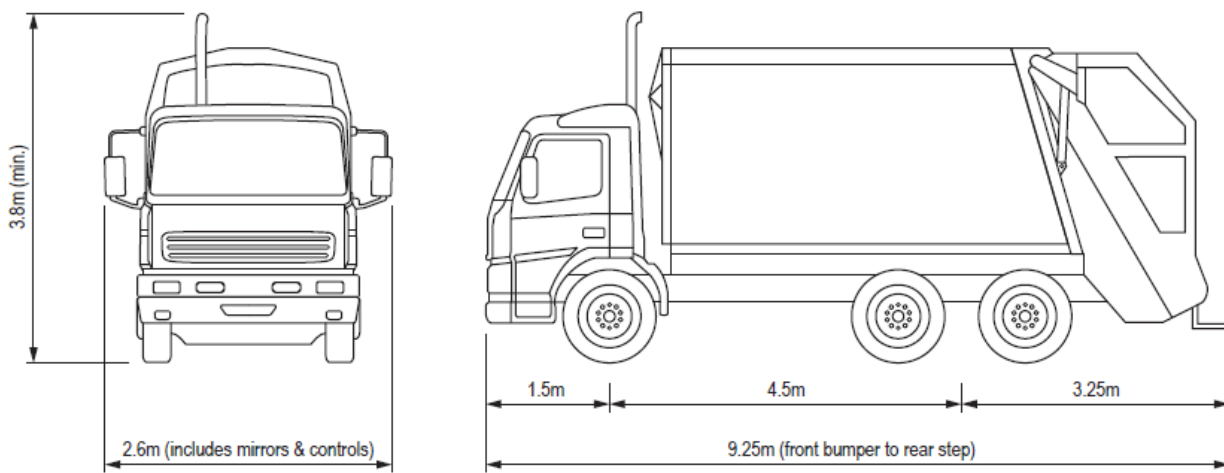
Source: New South Wales Environmental Protection Authority *Better Practice Guide for Resource Recovery* (2019)

APPENDIX B.3 CITY OF SYDNEY COLLECTION VEHICLE INFORMATION

Waste collection vehicles may be side loading, rear loading or front-end loading. The size of vehicle varies according to the collection service. Council and its waste contractors use rear-loading, compacting collection vehicles of various capacities to 20 m³ for collecting waste and recycling.

Council and its waste contractors use rear-loading, compacting collection vehicles of various capacities to 20 m³ for collecting waste and recycling.

The following characteristics represent the typical rear-end loading collection vehicle for guidance only.



Dimensions of typical collection vehicle (rear loader)

Vehicle dimensions and design parameters for swept path analysis

The following dimensions are of a typical rear loading collection vehicle and should be used as the design parameters for a swept path analysis.

Rear loading vehicle	dimensions
Length overall (m)	9.25
Width overall (m)	2.6
Travel height (m)	3.8
Minimum vertical clearance required (m)	4.0
Maximum weight (t)	26
Turning circle radius – wall to wall (m)	10.5
Lock to lock time (sec)	6
Minimum clearance on both sides of the wheel path (mm)	600
Vehicle turning speed (km/hr)	5-10

Vehicle access and turning requirements

A turning path analysis should be used to check that the paths of vehicles travelling in the forward direction when negotiating access driveways and circulation roadways, can be accommodated within the proposed location. Turning path analysis should also be used to check the movement out of a loading dock to establish that sufficient width is provided for the vehicle swept path, including maneuvering clearances. In providing turning path analysis, the following should be provided:

- Details of road geometry (details dimension of the driveway, width of the road (carriage way), footpath, kerb and gutter, median and on-street parking where applicable.)
- Dimension details of the design vehicle
- Turning radius and operable speed
- Lock to lock time. It is recommended that a value between three and six seconds is reasonable for most conventional vehicles. It should come through a vehicle data sheet, however, if not a six seconds should be chosen.
- Three clear swept paths line namely wheel path, vehicle body path and 0.6m clearance path

The parameter of the design vehicle for swept path analysis should be obtained from the manufacturer specification (with reference) or the parameters in the vehicle dimension table can be used.

Best design practice for access and egress from a development calls for a separate entrance and exit to allow the collection vehicle to travel in a forward direction at all times. Where there is a requirement for collection vehicles to turn at a cul-de-sac head within a development, the design is to incorporate either a bowl or 'T' or 'Y'-shaped arrangement.

The design aspects to be taken into account include:

- Placement of waste and recycling bins outside each home, or in a common collection area
- The presence of parked cars on access roads
- Trucks are to only be expected to make a three-point turn to complete a U-turn
- Allowing for collection vehicle overhang and possible interference with bins and road furniture.

Road geometry

The design parameters are to comply with the following road geometry:

- A maximum desirable gradient of 10 per cent for turning heads
- Vehicle access for collection and loading will provide for a maximum grade of 1:20 for the first 6 metres from the street, then a maximum of 1:8 with a transition of 1:12 for 4 metres at the lower end
- A maximum longitudinal road gradient of 15 per cent
- A minimum kerb radius of 8.5 metres at the outside of the turn where there is to be on-site collection
- A minimum kerb radius of 10 metres at the outside of the turn where there is to be kerbside collection
- A minimum pavement width of 6.5 metres if 25 or more parking spaces for cars are required (use of passing bays is acceptable)
- An industrial-type strength pavement designed for a maximum wheel loading of 7 tonnes per axle in order to accommodate waste and recycling collection trucks (the standard road pavement design specifications for an individual driveway entry on public land is 150 mm thick concrete, 20 MPa concrete with F82 mesh).

Collection from enclosures

Collection vehicles may enter building basements for the collection of waste and/or recyclables provided the following requirements are met:

- The gradient of the ramp access to basement is not to exceed 1:8
- The height of the structural members and upper floor ceiling are to allow for a typical collection vehicle travel height/operational height consistent with the type of vehicle employed
- The provision of space is to be adequate to allow the typical three-point turn of collection vehicles
- The basement floor is to be of industrial-type strength pavement and designed for a maximum wheel loading of 7 tonnes per axle in order to accommodate waste and recycling collection trucks (the standard road pavement design specifications for an industrial driveway entry on public land is 150 mm thick concrete, 20 MPa concrete with F82 mesh).

SOURCE: City of Sydney Waste Management Guidelines for New Developments 2018

APPENDIX B.4 TYPICAL MOTORISED BIN TUG



Typical applications:

- Move trolleys, waste bin trailers and 660/1100L bins up and down a ramp incline.
- Quiet, smooth operation with zero emissions and simple to use, no driver's licence required
- Suitable for:
 - High rise building & apartment basements
 - Large factories & warehouse with sloped ground
 - Caravan parks & other large outdoor areas

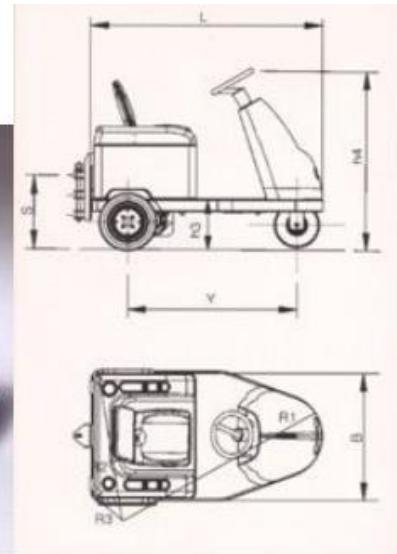
Features:

- 1 tonne tow capacity of inclines up to 8 degrees
- 500kg tow capacity if inclines up to 14 degrees
- CE Compliant
- 4.5 km/h max speed
- 2 x 80amp batteries – includes charger
- Powerful transaxle
- Hitch to suit 660L bins

Safety Features:

- Intuitive paddle lever control
- Stops and repels the unit if activated when reversing.
- Site assessment recommended to assess ramp incline steepness (*See Useful Contacts*)

APPENDIX B.5 TYPICAL SEATED BIN MOVER

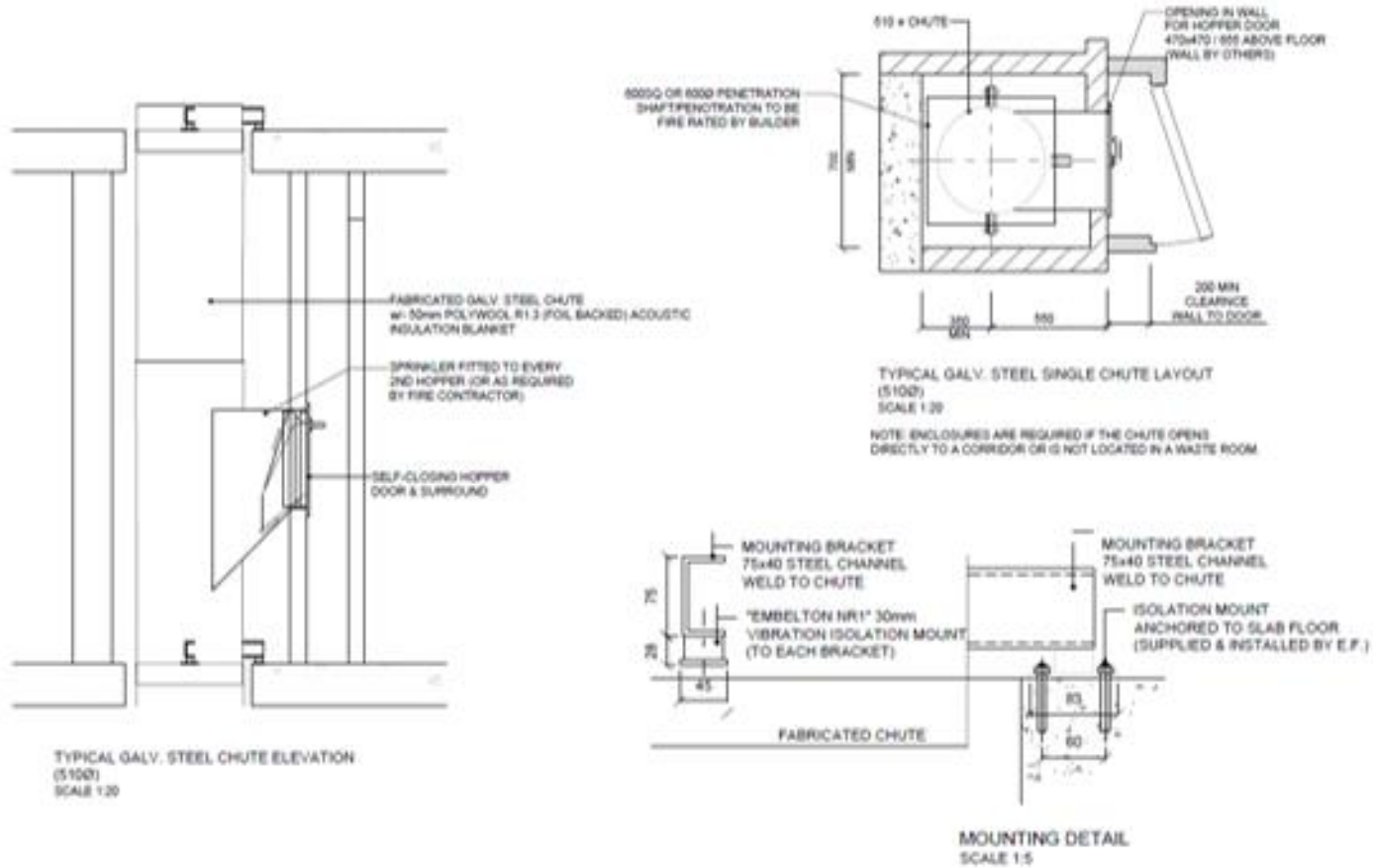


		UNIT M.	BULL 2	BULL 4
Manufacturer	DEC			
Model	BULL			
Platform loading cap.	Nominal capacity	kg	-----	-----
Pull capacity	Pull nominal capacity	kg	2000	4000
Power type	Electric - endothermic		electric	electric
Control type	Standing / seated thiller / steer		seated / steer	seated / steer
Tyres	Pn=pneum. Se=superelastic		Pn	Pn
Wheels	N. front/rear - x drive	n.	1/2X	1/2X
Platform dimensions	L x B (length x width)	mm	-----	-----
Platform height	h6 = unload clearance	mm	-----	-----
Overall dimensions	L = length	mm	1500	1600
	B = width	mm	900	930
	h1 = foot leve	mm	1820	1960
	h3 = Seat height	mm	310	340
	h4 = Steer height	mm	1250	1330
Turning radius	R1 = front min. external	mm	1400	1500
	R2 = rear min. external	mm	1000	1000
	R3 = front min. internal	mm	400	400
Aisle width	A = 180° turn	mm	2200	2300
Tow hook height	s = center from ground	mm	220-350-490	240-380-520

OPERATIONAL WASTE MANAGEMENT PLAN

APPENDIX C INSTALLATION EQUIPMENT

APPENDIX C.1 TYPICAL SINGLE WASTE CHUTE SPECIFICATIONS



1184

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

APPENDIX C.2 TYPICAL LINEAR TRACK SYSTEM

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

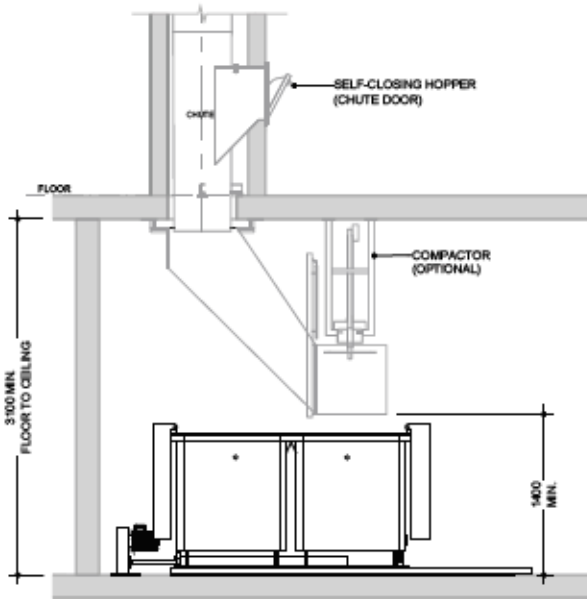
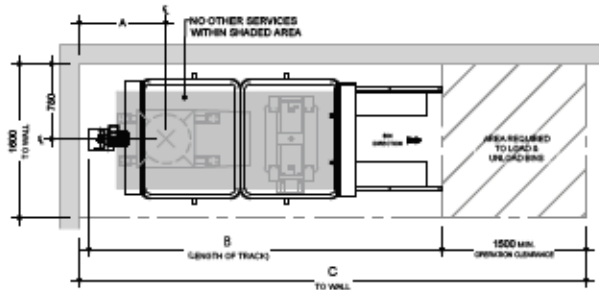
OPTIONAL EXTRAS

- 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

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.

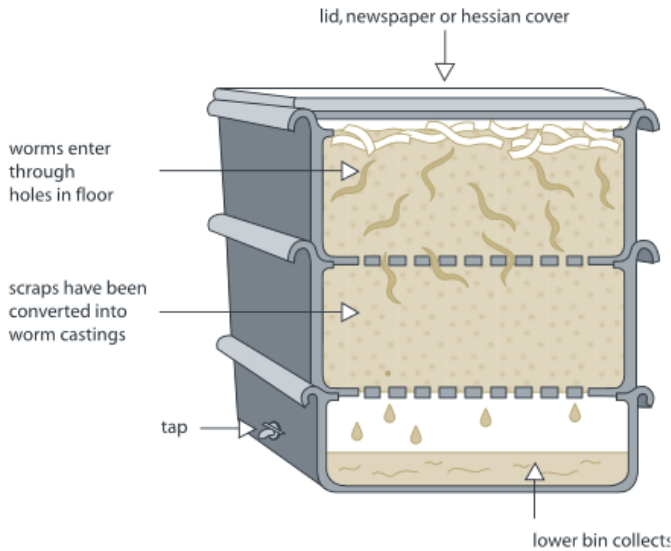
Additional equipment options, systems and configurations are available. For design assessment, information and advice, please contact an Elephants Foot design consultant on 1300 435 374

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

APPENDIX D SECONDARY WASTE MANAGEMENT PROVISIONS

APPENDIX D.1 TYPICAL WORM FARM SPECIFICATIONS

Worm farms



Space requirements for a typical worm farm for an average household:

Height – 300mm per level

Width – 600mm

Length – 900mm

There are many worm farm arrangements. The above dimensions are indicative only.

SOURCE: Department of Environment and Climate Change NSW 2008, Better Practice Guide for Waste Management in Multi-Unit Dwellings