WASTE MANAGEMENT PLAN

PREPARED FOR
YUHU GROUP

ON BEHALF OF
HRD ARCHITECTS

Mixed Use Development
144-186 Rowe Street
Eastwood

8/08/2016

EDDY SAIDI
Ph: 1800 025 073

REVISIONS

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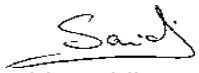
Authorised By: 

Eddy Saidi

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DISTRIBUTION LIST

Recipient Name	Company	Revision	Copy No.
E Saidi	Elephants Foot Recycling Solutions	B	1
L Krasnowski	HDR Architect	B	2

EXECUTIVE SUMMARY

This waste management plan covers the ongoing management of waste generated by the mixed use development located at Eastwood Centre, 144-186 Rowe Street, Eastwood.

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

i. ***Ensure waste is managed to reduce the amount of waste and recyclables to land fill*** by assisting residents to segregate appropriate materials that can be recycled; displaying signage to remind and encourage recycling practices; and through placement of recycling and waste bins in the retail precinct to reinforce these messages.

ii. ***Recover, reuse and recycle*** generated waste wherever possible.

iii. ***Compliance*** with all relevant codes and policies.

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

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GLOSSARY OF TERMS

TERM	DESCRIPTION
Baler	A device that compresses waste into a mould to form bales which may be self-supporting or retained in shape by wire ties and strapping
Chute	A ventilated, essentially vertical pipe passing from floor to floor of a building with openings as required to connect with hoppers and normally terminating at its lower end at the roof of the central waste room(s)
Collection Area/Point	The position or area where waste or recyclables are actually loaded onto the collection vehicle
Compactor	A Machine for compressing waste into disposable or reusable containers
Composter	A container/machine used for composting specific food scraps
Garbage	All domestic waste (Except recyclables and green waste)
Hopper	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
Recycling	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
Green	Garden organics such as small branches, leaves and grass clippings, tree and shrub pruning, plants and flowers, and weeds
L	Litre(s)
Liquid Waste	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)
Mobile Garbage Bin(s) (MGB)	A waste container generally constructed of plastic with wheels with a capacity in litres of 120, 240, 660, 1000 or 1100, 1500 or 2000

Putrescible Waste	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.

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INTRODUCTION

The following waste management plan pertains to the mixed use development located at Eastwood Centre, 144-186 Rowe Street, Eastwood. This waste management plan is an operational waste management plan and will address the phases of the completed development.

For the purpose of this report the proposed development will consist of:

- 4 buildings
  - 443 residential units in total (see Table 1 for Unit Breakdown Matrix)
  - 2,606.7 m^2 for total commercial units
  - 11,574.1 m^2 for total retail outlets
  - 686.8 m^2 for medical centre

Table 1: Unit Breakdown Matrix

Building	# Units	% Mix
1 Bedroom	167	37.70
2 Bedroom	255	57.56
3 Bedroom	21	4.74
Total	**443**	

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

CITY OF RYDE COUNCIL

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

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

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

OBJECTIVES

- To ensure new developments and changes to existing developments are designed to maximise resource recovery (through waste avoidance, source separation and recycling);
- encourage source separation of waste, reuse, and recycling by ensuring appropriate storage and collection facilities for waste, and quality design of waste facilities;
- encourage techniques in demolition and construction which minimise waste generation, and which maximise the reuse and recycling of materials;
- ensure appropriate, well-designed waste storage and collection facilities are provided and are accessible to occupants and service providers;
- ensure wastes are handled and stored appropriately in order to minimise risk to health and safety associated with handling and disposing of waste and recycled material, and ensure optimum hygiene;
- minimise adverse environmental and amenity impacts associated with waste management (including odour from waste and noise from collection activity);
- discourage illegal dumping by providing on-site storage for waste awaiting collection by removal services;
- ensure waste and recycling storage areas and handling systems for residential properties are designed to meet minimum requirements for Council's domestic waste collection services;
- assist in achieving Federal and State Government waste minimisation targets in accordance with regional waste plans; and
- minimise the overall environmental impacts of waste and foster the principles of ecologically sustainable development (ESD).

GENERATED WASTE VOLUMES

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

CONSTRUCTION AND DEVELOPMENT WASTE

The head contractor will be responsible for removing all construction-related waste offsite in a manner that meets all authority requirements. Please refer to the separate waste management plan submitted for construction waste as part of the Development Application.

BUILDING MANAGER/WASTE CARETAKER

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

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

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

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

REPORTING

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

EDUCATION

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

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

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

- directions on using the chute doors;
- recycling and garbage descriptions (Council provides comprehensive information);
- how to dispose of bulky goods and any other items that are not garbage or recycling;
- residents' obligations to WHS and building management; and
- how to prevent damage or blockages to the chute (example below).

To prevent damage or blockage to rubbish chute DO NOT dispose of any newspapers, umbrellas, bedding, cigarettes, cartons, coat hangers, brooms, mops, large plastic wrappings from furniture, white goods, any sharp objects, hot liquid or ashes, oil, unwrapped vacuum dust, syringes, paint and solvents, car parts, bike parts, chemicals, corrosive and flammable items, soil, timber, bricks or other building materials, furniture, etc. down the chute.

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

RESIDENTIAL WASTE PLAN

The *City of Ryde Development Control Plan 2014 – Part: 7.2 – Waste Minimisation and Management* has been referenced to calculate the total number of bins required for the residential units. Please note that calculations are based on generic figures; waste generation rates may differ according to the residents' waste management practice.

Table 2: *Calculated Waste Generation – Residential*

Building/ Core	**# Units**	**Waste Calculation** (L/unit/week)	**Generated Waste** (L/week)	**Compacted Waste** (2:1) (L/week)	**Recycling Calculation** (L/unit/week)	**Generated Recycling** (L/week)
Core AA	63	120	7560	3780	60	3780
Core BA	45	120	5400	2700	60	2700
Core BB	70	120	8400	4200	60	4200
Core CA	58	120	6960	3480	60	3480
Core CB	116	120	13920	6960	60	6960
Core DA	79	120	9480	4740	60	4740
Core DB	12	120	1440	720	60	720
TOTAL	**443**		**53160**	**26580**		**26580**

BIN SUMMARY

The following assumptions have been taken into consideration:

- garbage is compacted at the base of each chute;
- recycling bins are located in the waste compartment on each level;
- an additional garbage bin is to be made available at the base of each chute during collection times; and
- number of bins have been rounded up for best operational with outcome.

Using the assumptions stated, the required capacity and quantity of garbage and recycling bins have been calculated and tabulated respectively in the following tables:

Table 3: *Bin Summary – Residential*

	Garbage			Recycling		
Building/Waste Rooms	**Bin Capacity** (L)	**Quantity**	**Collection Rate** (times/week)	**Bin Capacity** (L)	**Quantity**	**Collection Rate** (times/week)
Core AA	1100	2	3	240	8	2
Core BA	1100	1	3	240	6	2
Core BB	1100	2	3	240	9	2
Core CA	1100	2	3	240	8	2
Core CB	1100	3	3	240	15	2
Core DA	1100	2	3	240	10	2
Core DB	1100	1	3	240	2	2
TOTAL	**1100**	**13**	**3**	**240**	**58**	**2**

NOTE: Subject to the stakeholders preference/capability (and as built constraints), bin sizes and quantities may be changed. As waste volumes may change according to the development's type, bin numbers and collection frequencies may be altered to suit the building operation.

WASTE MANAGEMENT

7 waste chutes will be supplied by Elephants Foot and installed. Breakdown is as follows:

Core AA:	single waste chute
Core BA:	single waste chute
Core BB:	single waste chute
Core CA:	single waste chute
Core CB:	single waste chute
Core DA:	single waste chute
Core DB:	Single waste chute

Garbage discharges into 1100L MGBs which is compacted. The discharge is located in the basement level waste rooms for each building. Recycling bins will be situated in the waste compartment on each residential level for collection of recyclable items. Full waste and recycling bins will be transferred to the collection area on the ground floor (see *Appendix A.1)* for servicing by Council. Suitable bin moving equipment should be used for the transportation of bulky bins.

WASTE HANDLING

WASTE

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

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

RECYCLING

Cardboard furniture boxes or large cardboard containers should not be included in the waste chute – a cardboard collection bin will be made available to residents to deposit flattened cardboard and will be managed by the waste caretaker. Bins will be located in the garbage and bulky goods area,

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.

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

TEMPORARY STORAGE OF BULKY GOODS

For developments comprising 30 or more dwellings, a separate room or undercover caged area of a minimum 5m² must be provided for the temporary storage of bulky discarded items such as furniture and white goods. This area should be located adjacent to waste storage areas and must be sign marked appropriately.

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

OTHER WASTE STREAMS

Disposal or recycling of electronic, liquid waste and home detox (paint/chemicals etc.) will be organised with the assistance of the building caretaker. These items must not be placed in waste or recycling bins due to safety and environmental factors.

Residents should be directed to Councils comprehensive website for further information.

COMPOSTING

Composting areas are encouraged to be considered in the design of residential developments comprising of 1 or 2 dwellings or multi dwelling housing developments and residential flat buildings of up to 3 storeys.

Consideration should be given to providing space for individual home unit worm farms or small compost bins on the balconies (*see APPENDIX C.88, APPENDIX C.99 and APPENDIX C.1010 for Typical Worm Farm Specifications, and Electric and Non-Electric Compost Bin Specifications*).

COMMON AREAS

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

WASHROOM FACILITIES

Washroom facilities in retail and staff areas should be supplied with collection bins for paper towels (if used). Sanitary bins for female restroom facilities must also be arranged with an appropriate contractor.

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

GREEN WASTE

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

WASTE CHUTES

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

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

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

EQUIPMENT SUMMARY

Table 4: *Equipment Summary*

Component	Part	Quantity	Notes
Chutes	Galvanised Steel / LLDPE Polyethylene Plastic	7	Chute Diameter (*See APPENDIX C.1 for Typical Chute Section*)
Equipment A	*Garbage* 1100L MGB with compaction	7	(*See APPENDIX C.2 for Typical Compactor)*
Equipment B	Suitable Bin Moving Equipment	1	Recommended (*See APPENDIX C.3 for Typical Bin Mover*)

RETAIL & COMMERCIAL WASTE PLAN

The *Ryde Council Control Plans – 7.2 Waste Minimisation and Management* and *Better Practice Guide for Waste Management and Recycling in Commercial and Industrial Facilities* document has been referenced to calculate the total number of bins required for the retail areas. Please note that calculations are based on generic figures; waste generation rates may differ according to the tenants' waste management practice. Please note that if food tenants are placed, the waste generation rates will require adjustment. A seven day operating week has been assumed.

Table 5: *Calculated Waste Generation – Retail*

Type	NLA (m^2)	Waste Calculation ($L/100m^2/day$)	Generated Waste (L/week)	Recycling Calculation ($L/100m^2/day$)	Generated Recycling (L/week)
Commercial Office	2606.7	10	1824.69	10	1824.69
Gym	355.9	10	249.13	10	249.13
Fast Food	311.9	175	3820.775	685	14955.605
Kiosks (Non-Food)	39.9	50	139.65	25	69.825
Kiosks (Food)	39.9	180	502.74	135	377.055
Pharmacy	301	185	3897.95	60	1264.2
Food	1913.1	180	24105.06	135	18078.795
Non-Food (>100m^2)	1269.4	50	4442.9	50	4442.9
Non-Food (<100m^2)	354.1	50	1239.35	25	619.675
TOTAL	**7191.9**		**40222.245**		**41881.875**

Retail (Garbage) Eco Weighing Compactor Calculation
40222.25L = 40.22 m^3
40.22 (1:5 compaction ratio) = 8.04m^3

Western Australia Waste Authority conversion rate (tonnes) for Putrescible (mixed) compacted waste = 0.425

8.04m^3 x 0.425 = **3.42 tonnes**

RETAIL & COMMERCIAL WASTE MANAGEMENT

GARBAGE (PUTRESCIBLE)

All putrescible waste generated from the retail tenancies will be collected in 240L MGBs stored back of house (BOH). Once full, nominated staff/cleaners will deposit the waste into the compactor, located adjacent to the waste room areas on the ground level.

Portable Eco Weighing Compactor

Waste will be deposited into the portable eco weighing compactor (14m^3 container) fitted with a suitable caged bin lifter (*see APPENDIX C.3 & C.4 for Eco Weighing Compactor and Bin Lifter Specifications)*.

The portable ECO compactor is the optimum technology for compacting general waste in a multi-user environment. The ECO @Internet database management system is designed to collect all information from each user who disposes of waste in the ECO compactor.

Each tenant is supplied with their own pre-programmed security swipe card. When a tenant approaches the unit, they are required to follow the on-screen instructions. The tenant will instantly get the weight of their waste displayed on the screen of the ECO compactor. This system will make the tenant more conscious about recycling, and accountable for their waste disposal habits.

Operations are as follows:

1. Swipe the card
2. Place the waste in the hopper when the door automatically opens. (The door cannot be opened unless the card swiped is programmed to be accepted by the ECO compactor)
3. The tenant places the waste inside and pressed the start button. Should the tenant fail to press the start button, after 60 seconds the door will close and the compactor will compact and register the waste to the last swipe card user.
4. Waste is weighed and displayed on the screen for the tenant. The information is sent via GPS to the ECO @Internet database management system.

The ECO @Internet system can be accessed by anyone who holds the password.

Figure 1: *Portable ECO Compactor*

RECYCLING

Tenants will be responsible for their own storage of recyclables BOH. On completion of each trading day or when required, nominated staff/cleaners will transfer their accumulated recyclables to the retail/commercial waste room. Cardboard/paper recyclables must be disposed of separately to comingle recycling in the allocated 1100L MGBs provided.

CARDBOARD

Cardboard is a major component of the waste generated by retail. All cardboard packaging generated by the retail operations will be fed into a vertical baler producing a 200kg baler by the nominated cleaners only (*see APPENDIX C.5 for Vertical Baler Specifications*). The vertical baler will be located in the retail/commercial waste room. Bales will be placed on pallets awaiting scheduled collection from the retail waste room weekly or as required. A minimum of 4 bales is required per collection. Some recyclers may collect bales at no cost and supply baling equipment.

USED COOKING OIL

Retail management will make arrangements for the storage and collection of used cooking oil in a collection container which will be serviced by the appointed contractor on an as required basis. (*See Appendix C.6 for Typical Cooking Oil Storage Tank*)

COMINGLE RECYCLING

Any staff tea points will be supplied with a dedicated commingled MGB for the collection of all recyclable glass, aluminium, steel and plastic items. Staff will be responsible for sorting this material and allocating recyclables into the correct collection facility.

WASHROOMS

Washroom facilities should be supplied with collection bins for paper towels (if used). Sanitary bins for female restroom facilities must also be arranged with an appropriate contractor.

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

RETAIL EQUIPMENT SUMMARY

Table 6: *Retail Equipment Summary*

Component	Part	Quantity	Notes
Equipment	Portable Eco Weighing Compactor	1	*(See APPENDIX C.3 for Portable Eco Weighing Compactor Specs)*
	Bin Lifter	1	*(See APPENDIX C.4 for Typical Bin Lifter)*
	Vertical Baler	1	*Recommended See APPENDIX C.5 for Vertical Baler Specs)*
	Suitable Bin Moving Equipment	1	Recommended (*See APPENDIX C.7 for Typical Bin Mover*)
	Cooking Oil Storage Tank	1	Optional (*See APPENDIX C.6 for Typical Cooking Oil Storage Tank)*

RETAIL & COMMERCIAL BIN SUMMARY

Table 7: *Stage 1 Bin Summary – Retail & Commercial*

Waste Stream	Bin Quantity & Size	Collection Frequency
Garbage	Portable Eco Weighing Compactor ($14m^3$) x 1	1 x weekly (Can be adjusted according to retailer needs)
Recycling (comingle)	5 x 1100L MGBs	4 x weekly
Recycling (cardboard/paper)	6 x 1100L MGBs	4 x weekly

SUPERMARKET

Supermarket retail areas total 6988.90m² (including BOH operations, associated liquor outlet and mini-major retail).

Waste streams from the supermarket and liquor outlet will be detailed in a separate waste management plan supplied by the tenant for approval. It is envisaged that waste and cardboard recycling will be collected by a nationally appointed private waste contractors with supermarket cardboard waste being baled. The baler will be located BOH and operated by appointed supermarket staff. The liquor store will be provided with appropriate collection bins for garbage and recycling; cardboard which will be the main waste stream generated.

240L MGB for organic waste will be utilised by the supermarket. Number of bins required TBA by the supermarket. Bins will be located BOH and full bins stored in cool rooms prior to collection.

All waste management for the supermarket will be handled in the loading dock area and removed from the loading dock by their appointed waste services provider.

HEALTH WASTE

The health centres will have dedicated medical waste bins supplied as per the medical waste contractor's recommendations for the site. Waste from out-of-date and partly used medicines, infectious medical wastes, hazardous wastes and radioactive wastes must be stored and disposed of according to specific industry-based regulations. Correct segregation and containment of all wastes is required under the Waste Act.

Medical waste bins will be collected by the appointed contractor on a wheel in/wheel out basis and replacement bins provided on a scheduled collection frequency - compatible key for the Health Services waste storage area may need to be provided to the waste service provider.

Storage and collection requirements for any medical waste:

Area	Location
Storage	An EPA licence may be required to store Hazardous Wastes. Storage areas are to be free from odour and must discourage the harbourage of vermin. Health Care Facilities must provide an enclosed structure such as a shed, garage, cage, fenced area or separate loading bay to store waste. The holding area should be located away from food and clean storage areas, it must not be accessible to the public, have a lockable door and rigid impervious flooring. Clean up facilities, spills kits, appropriate drainage and bunding should be provided. Where wastes are stored in bins the bin must be locked and a specific area, with adequate drainage, for washing equipment should be designated
Containers	All containers of medical waste to be stored in a secure location. Loads contained in MGBs and trolleys should be less than 55kgs and bins must be colour coded and marked in accordance with the Waste Management Guidelines for Health Care Facilities
Spillage	Ensure all necessary equipment required to clean and disinfect the area in case of accidental spillage is easily available and accessible. It is essential that personnel involved in spill management receive education and training in emergency procedures and handling requirements. Spill kits that have been used should be disposed of with the type of waste that has been cleaned up, e.g. used cytotoxic spill kits should be disposed of with cytotoxic waste
Mixed waste	Any waste mixed with medical waste must be treated as medical waste
Sharps	Needles, syringes and surgical instruments must be handled so the disposal of these items does not incorporate cutting, bending or any other manipulation that could generate aerosols or splatter contaminated fluids. All sharps containers should be assessed for compliance with the current NSW Health Infection Control Policy and the relevant Australian Standard
Collections	Medical waste shall remain within the storage areas and only be moved during collections. Collections will be performed by a transporter licensed by the EPA to collect and transport

NOTE: Chutes MUST NOT be installed or used for the transport of Health Service wastes.

Table 8: Required Provisions for Health Waste

Size/Type of Practice	Generated Waste (# 240L Bins)	Collection	Comments
2-3 Doctors	1	Weekly	**Medical waste requires locked 240L MGBs** Sharps bins supplied to each doctor and the treatment room. Full sharps containers are placed in the 240L MGBs Replacement sharps containers provided by the medical waste service provider
4-6 Doctors	2	Weekly	
7-12 Doctors	3	Weekly	
Day Surgery	2	Twice Weekly	Day Surgeries typically produce more waste and require more frequent collections to reduce odour issues

Table 9: Calculated Waste Generation – Health

Type	NLA (m^2)	Waste Calculation ($L/100m^2/day$)	Generated Waste (L/week)	Recycling Calculation ($L/100m^2/day$)	Generated Recycling (L/week)
Health Care Service	673.81	10	471.667	10	471.667
TOTAL	**673.81**		**471.667**		**471.667**

BIN SUMMARY

Garbage			Recycling		
Bin Capacity (L)	**Quantity**	**Collection Rate** (times/week)	**Bin Capacity** (L)	**Quantity**	**Collection Rate** (times/week)
660	1	1	660	1	1

Health Waste		
Bin Capacity (L)	**Quantity**	**Collection Rate** (times/week)
240	3	2

NOTE: Subject to the stakeholders preference/capability (and as built constraints), bin sizes and quantities may be changed. As waste volumes may change according to the development's type, bin numbers and collection frequencies may be altered to suit the building operation.

The Health Waste Generation has been calculated to account for possible worst case scenario.

WASTE ROOM AREAS

The waste storage area must be as close as practicable to the collection point and be within 15 metres from the street kerb.

Each garbage room will need to hold all the bins generated weekly, and allow enough room to clean and safely manoeuvre bins (stacking of bins is not permitted). The minimum recommended space for each garbage room is as per the below table.

The areas allocated for residential waste rooms, commercial/retail bin store, health waste rooms, bulky goods areas and collection areas are detailed in Table 10 below. The areas provided are considered suitable for purpose.

Table 10: *Waste Room Areas*

Location	Waste Room Type	Required Area (m^2)
Ground Floor	Residential Waste Holding & Collection Area	61.1
Basement Level 4	Core AA Waste Room	19.12
Basement Level 4	Core BA Waste Room	13.31
Basement Level 4	Core BB Waste Room	18.18
Basement Level 4	Core CA Waste Room	15.78
Basement Level 4	Core CB Waste Room	15.20
Basement Level 4	Core DA Waste Room	14.40
Basement Level 4	Core DB Waste Room	17.83
-	Bulky Goods Storage	25.9
Ground Floor	Retail & Commercial Waste Room	28.7
-	Health Waste Room	7.5
-	Medical Waste Room	6.5

COLLECTION OF WASTE

The path for wheeling bins between the waste and recycling storage room/area and the vehicle collection point must be free of steps and kerbs and, in the case of residential development, of a gradient of less than 14:1, and for all other development types, of a grade to the satisfaction of Council. All passageways must be at least 1 metre wide to permit easy access for servicing.

All access and egress details including a swept path analysis for all vehicle movements on site will be provided by the traffic consultant's report.

Where collection vehicles are required to drive into a property to collect waste and recycling, adequate access must be provided for the users, waste collection staff and collection vehicles, and:

- The site must be designed to allow collection vehicles to enter and exit the property in a forward direction, with minimal need for reversing and to be operated with adequate clearances; and
- The access and manoeuvring space are to be suitable for the collection vehicle in terms of pavement strength, spatial design, access width and clearances. Appendix C Collection Vehicles and Appendix D Vehicle access/Turning Circles under the *Better Practice Guide for Waste Management in Multi-Unit Dwellings*, DECC 2008 are to be used as a guide.

RESIDENTIAL

The garbage and recycling will be collected by Council, from the ground floor collection area. Garbage will be collected 3 times-a-week and recycling will be collected twice-a-week. The building manager/caretaker will be responsible for transporting all of the full garbage and recycling bins to the residential garbage area, adjacent to the loading area, prior to the period of collection, suitable bin moving equipment should be used for transportation of the 1100L bins.

RETAIL & COMMERCIAL

Private waste contractors will be engaged to service the portable eco weighted compactor and the 1100L MGBs on an agreed schedule which can be adjusted according to retailer need.

The collection vehicles will enter the site via West Parade and access the turntable. 1100L comingle recycling MGBs will be collected directly from the retail/commercial waste room via a walk-in/walk out arrangement.

The compactor will be serviced by a roll on/roll off hooklift collection vehicle. At all times, the compactor must be stored directly adjacent to the loading area, with the hook loop facing the centre.

HEALTH

It is recommended that a health waste service provider is appointed who supplies a complete service for all waste streams generated by the medical facility; medical waste, general waste and recyclable waste.

Medical waste shall remain within the storage areas and only be moved during collections. Collections will be performed by a transporter licensed by the EPA to collect and transport.

All waste generated by the healthcare facilities will be collected on a wheel-in, wheel-out basis by an appropriate private contractor. The medical waste will be collected twice weekly, the general waste and recyclable waste will be collected once-a-week from the loading area.

COLLECTION AREA

The collection areas will need to be reviewed by a traffic consultant to confirm that these (and other trucks if required) can enter and exit the building in a forward direction. The final number of truck movements will depend on management of waste contract; final configuration of waste and recycling arrangements therefore number of bin lifts and additional irregular truck movements for hard waste.

It is our understanding that a traffic consultant is preparing drawings to confirm the swept paths for waste collections, access and egress, internal manoeuvring to assume parked position for loading and to exit, load requirements as well as collection vehicle dimensions. This information and supporting drawings will be provided separate to this report.

GARBAGE ROOMS

CONSTRUCTION REQUIREMENTS

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

- waste room floor to be sealed with a two pack epoxy;
- waste room walls and floor surface concrete rendered to a flat, smooth and even surface;
- walls to be constructed of brickwork, concrete block work or similar solid material at least 1100mm high and be designed to screen the bins from the street;
- all corners coved and sealed 100mm up, this is to eliminate build-up of dirt;
- for residential: a hot and cold water facility with mixing facility and hose cock must be provided for washing the bins;
- for retail/commercial: a cold water facility with hose cock must be provided for washing the bins;
- any waste water discharge from bin washing must be drained to sewer and fitted with an in-floor dry basket arrestor in accordance with Sydney Water Corporation;
- tap height of 1.6m;
- storm water access preventatives (grate);
- all walls painted with light colour and washable paint;
- equipment electric outlets to be installed 1700mm above floor levels;
- the room must be mechanically ventilated;
- light switch installed at height of 1.6m;
- waste rooms must be well lit with artificial light controllable by switches outside and inside the room (sensor lighting recommended);
- optional automatic odour and pest control system installed to eliminate all pest types and assist with odour reduction – this process generally takes place at building handover – building management make the decision to install;
- all personnel doors are hinged and self-closing;
- entry to the bin storage area must not include any gates;
- waste collection area must hold all bins – bin movements should be with ease of access;
- conform to the Building Code of Australia, Australian Standards and local laws; and
- childproofing and public/operator safety shall be assessed and ensured

SIGNAGE

The building manager/caretaker is responsible for waste room signage including safety signage (*see APPENDIX B.2*). Appropriate signage must be prominently displayed on walls and above all bins, clearly stating what type of waste or recyclables is to be placed in the bin underneath.

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

VENTILATION

Waste and recycling rooms must have their own exhaust ventilation system either;

- Mechanically - exhausting at a rate of 5L/m² floor area, with a minimum rate of 100L/s minimum; or
- Naturally - permanent, unobstructed, and opening direct to the external air, not less than one-twentieth (1/20) of the floor area

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

STORM WATER PREVENTION & LITTER REDUCTION

Building management shall be responsible for the following to minimise dispersion of site litter and prevent stormwater pollution to avoid impact to the environment and local amenity:

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

ADDITIONAL INFORMATION

Transfer of waste and all bin movements require minimal manual handling therefore the operator must assess manual handling risks and provide any relevant documentation to building management. If required, a bin-tug, trailer or tractor consultant should be contacted to provide equipment recommendations. Hitches may require installation to move multiple bins to the collection area. Council must be informed of any hitch attachments required to be installed on bins.

LIMITATIONS

The purpose of this report is to document a Waste Management Plan as part of a development application and is supplied with the following conditions:

- drawings, estimates and information contained in this waste management plan have been prepared by analysing the information, plans and documents supplied by you 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.

USEFUL CONTACTS

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

City of Ryde Council Customer Service
Phone: 02 9952 8222 Email: cityofryde@ryde.nsw.gov.au

SULO MGB (MGB, Public Place Bins, Tugs and Bin Hitches)
Phone: 1300 364 388

CLOSED LOOP (Organic Dehydrator)
Phone: 02 9339 9801

ELECTRODRIVE (Bin Mover)
Phone: 1800 333 002 Email: sales@electrodrive.com.au

RUD (Public Place Bins, Recycling Bins)
Phone: 07 3712 8000 Email: Info@rud.com.au

CAPITAL CITY WASTE SERVICES
Phone: 02 9359 9999

RELIVIT
Phone: 1300 247 732 Email: mailto:info@relivit.com.au

REMONDIS (Private Waste Services Provider)
Phone: 13 73 73

SITA ENVIRONMENTAL (Private Waste Services Provider)
Phone: 13 13 35

NATIONAL ASSOCIATION OF CHARITABLE RECYCLING ORGANISATIONS INC. (NACRO)
Phone: 03 9429 9884 Email: information@nacro.org.au

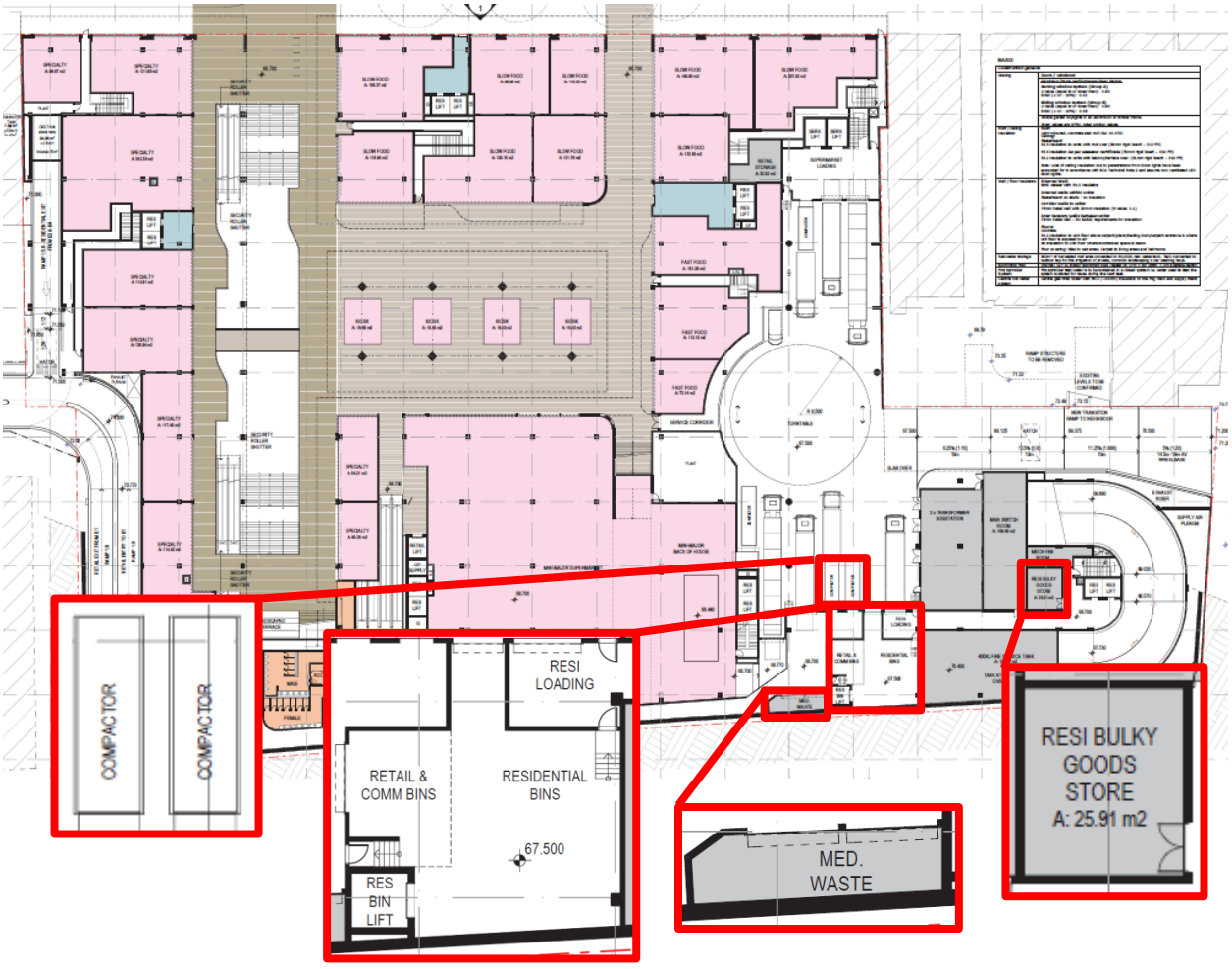
PURIFYING SOLUTIONS (Odour Control)
Phone: 1300 636 877 Email: sales@purifyingsolutions.com.au

Elephants Foot Recycling Solutions (Chutes, Compactors and eDiverter Systems)
44 – 46 Gibson Avenue
Padstow NSW 2211
Free call: 1800 025 073 Email: natalie@elephantsfoot.com.au

APPENDICES

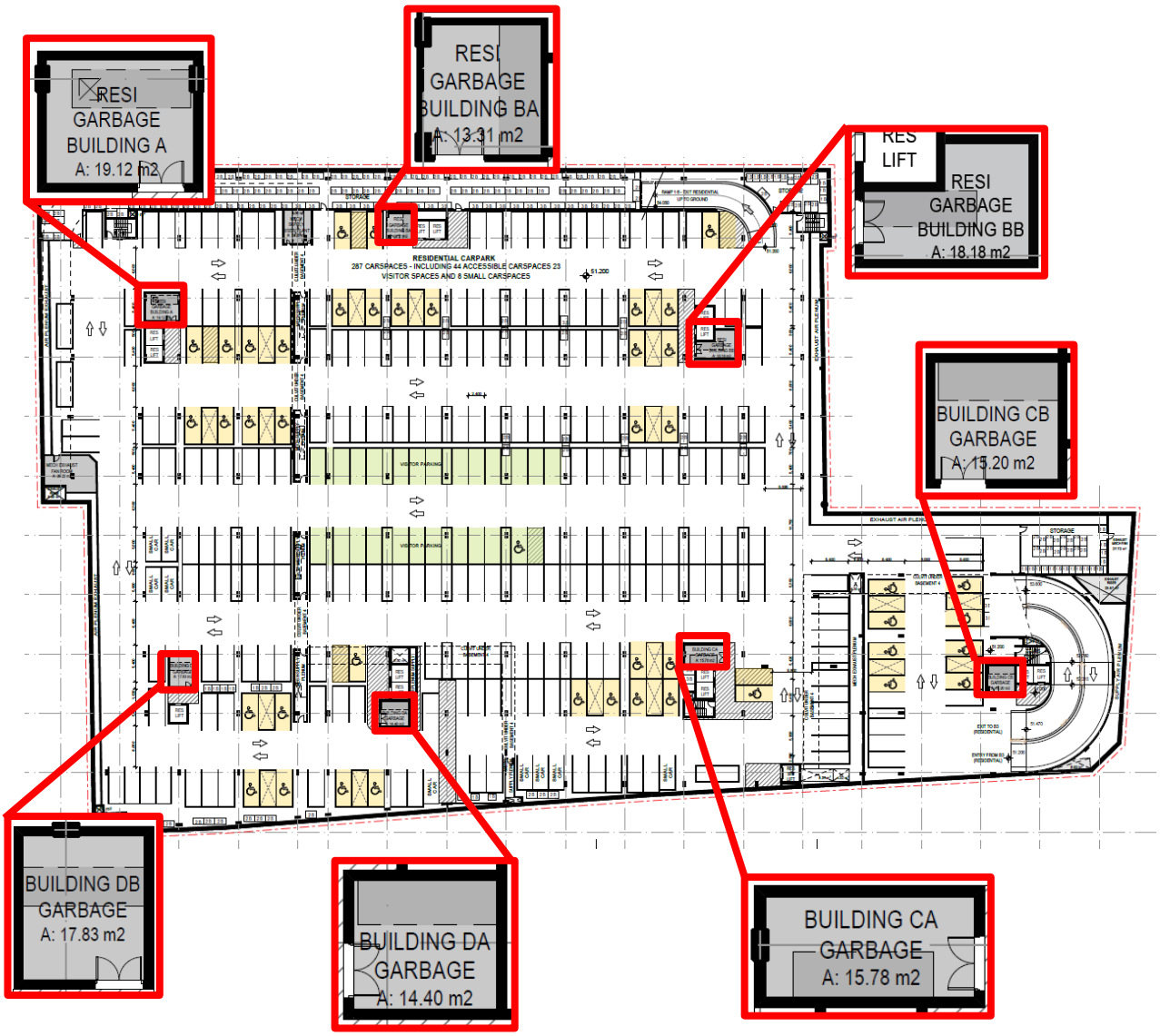
APPENDIX A DRAWING EXERPTS

APPENDIX A.1 GROUND FLOOR WASTE AREAS



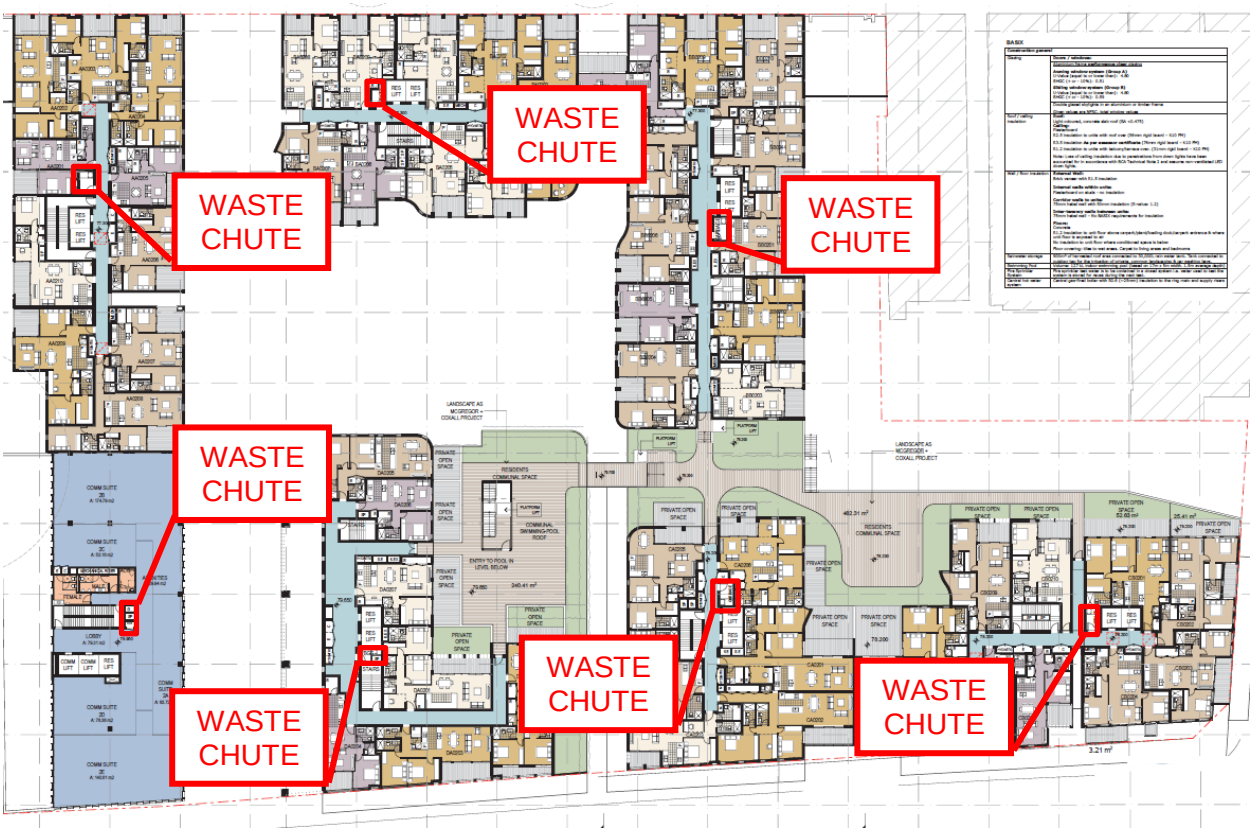
SOURCE: HDR Architects, Ground Plan – Rowe Street, Drawing No. A 1201, Issue: 01

APPENDIX A.2 BASEMENT LEVEL 4 WASTE AREAS



SOURCE: HDR Architects, Basement Level 4, Drawing No. A 1104, Issue: 01

APPENDIX A.3 TYPICAL CHUTE LOCATION

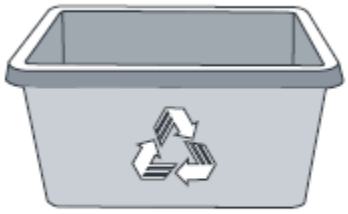


SOURCE: HDR Architects, Level 2, Drawing No. A 1302, Issue: 01

APPENDIX B BETTER PRACTICE GUIDE FOR WASTE MANAGEMENT SPECIFICATIONS

APPENDIX B.1 BIN DIMENSIONS

Crates



Crate size	50L Crate	70L Crate	90L Crate
Height	320 mm	395 mm	420 mm
Length	575 mm	575 mm	450 mm
Width	445 mm	445 mm	450 mm

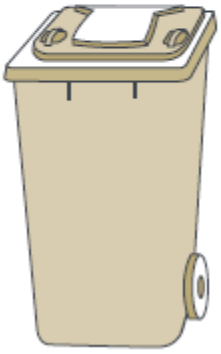
The above dimensions are indicative only of common crate sizes

Mobile garbage bins (MGBs)

MGBs with capacities up to 1700L should comply with the Australian Standard for Mobile Waste Containers (AS 4123). AS 4123 specifies standard sizes and sets out the colour designations for bodies and lids of mobile waste containers that relate to the type of materials they will be used for.

Indicative sizes only for common MGB sizes are provided below. Note that not all MGB sizes are shown; the dimensions are only a guide and differ slightly according to manufacturer, if bins have flat or dome lids and are used with different lifting devices. Refer to AS 4123 for further detail.

Mobile containers with a capacity from 80L to 360L with two wheels



Bin Type	80 Litre MGB	120 Litre MGB	140 Litre MGB	240 Litre MGB	360 Litre MGB
Height	870 mm	940 mm	1065 mm	1080 mm	1100 mm
Depth	530 mm	560 mm	540 mm	735 mm	885 mm
Width	450 mm	485 mm	500 mm	580 mm	600 mm

Mobile containers with a capacity from 500L to 1700L with four wheels

Dome or flat lid containers

Bin Type	660 Litre MGB	770 Litre MGB	1100 Litre MGB	1300 Litre MGB	1700 Litre MGB
Height	1250	1425	1470	1480	1470
Depth	850	1100	1245	1250	1250
Width	1370	1370	1370	1770	1770

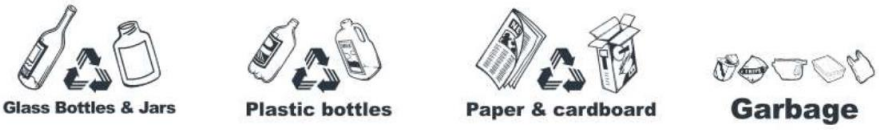
APPENDIX B.2 SIGNAGE FOR WASTE & RECYCLING BINS

WASTE SIGNS

Signs for garbage, recycling and organics bins should comply with the standard signs promoted by the Department of Environment and Heritage.

Example wall posters

Example bin lid stickers



SAFETY SIGNS

The design and use of safety signs for waste rooms and enclosures should comply with AS1319 Safety Signs for Occupational Environment. Safety signs should be used to regulate and control safety behaviour, warn of hazards and provide emergency information, including fire protection information. Below are some examples. Each development will need to decide which signs are relevant for its set of circumstances and service provided.

Examples of Australian Standards:

Australian Standards are available from the SAI Global Limited website (www.saiglobal.com).

Source: Better Practice Guide to Waste Management in Multi-Unit Dwellings, 2008, DECC

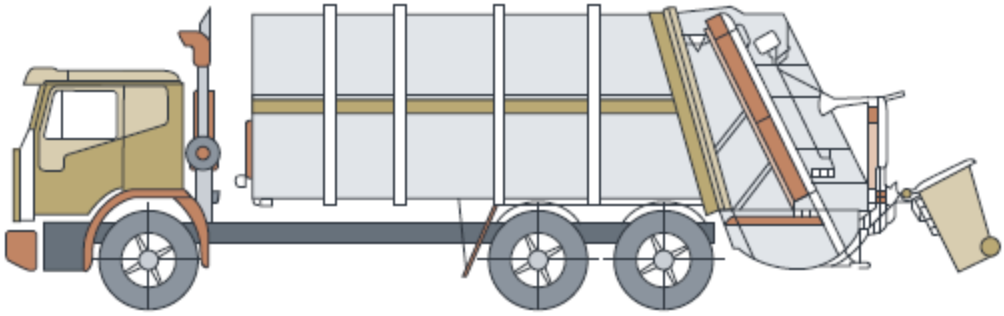
APPENDIX B.3 TYPICAL COLLECTION VEHICLE INFORMATION

Collection vehicles

Waste collection vehicles may be side loading, rear-end loading, front-end loading or crane trucks. The size of vehicle varies according to the collection service. Thus it is impossible to specify what constitutes the definitive garbage vehicle. Developers should consult the local council and/or relevant contractors regarding the type of vehicle used in that area.

The following characteristics represent the typical collection vehicle, however, these are only for guidance.

It may be possible to engage a collection service provider to use smaller collection vehicles to service developments with narrow roadways and laneways, or for on-site collections. However, as the availability of smaller vehicles to make services varies between councils and private contractors, wherever possible the development should be designed to accommodate vehicles of a similar size to that reported below.

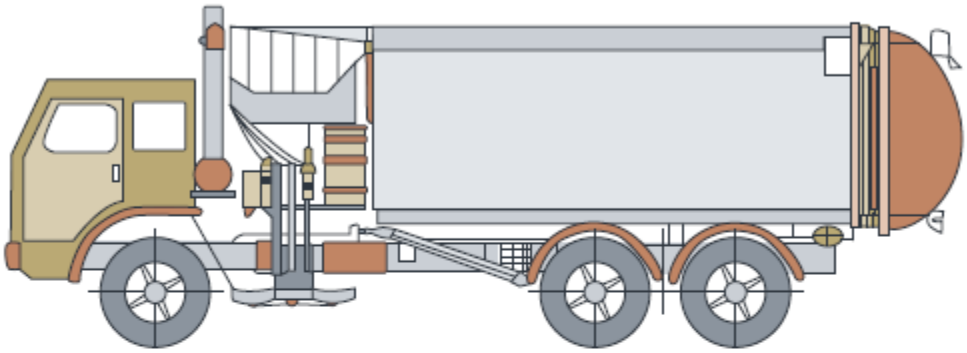


Rear loading collection vehicle

This is commonly used for domestic garbage and recycling collections from MUDs. It can be used to collect waste stored in MGBs or bulk bins, particularly where bins are not presented on the kerbside.

Rear loading collection vehicle	
Length overall	10.24m
Width overall	2.5m
Operational height	3.5m
Travel height	3.5m
Weight (vehicle only)	12.4 tonnes
Weight (payload)	9.5 tonnes
Turning circle	18.0m

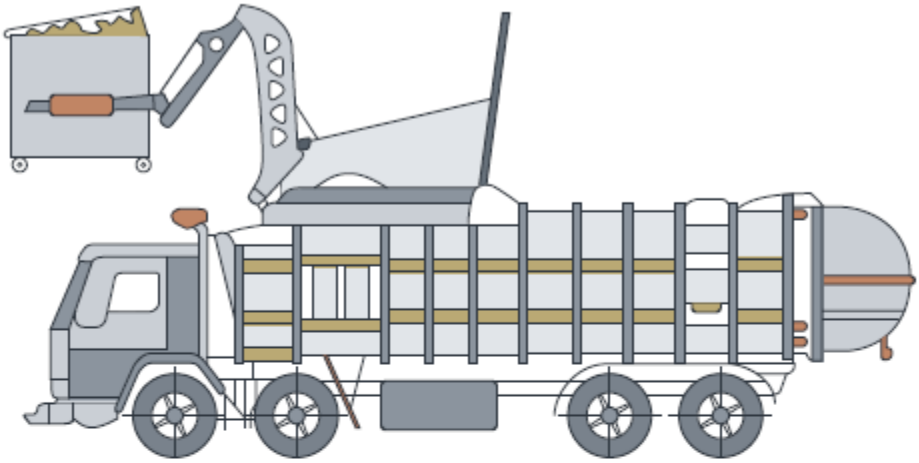
Side-loading collection vehicle



Side-loading collection vehicle	
Length overall	9.64m
Front overhang	1.51m
Wheelbase	5.20m
Rear overhang	2.93m
Turning circle kerb to kerb	17.86m
Turning circle wall to wall	20.56m
Front of vehicle to collection arm	3.8m
Maximum reach of side arm	3.0m
Travel height	3.63m
Clearance height for loading	3.9m

This is the most commonly used vehicle for domestic garbage and recycling collections. It is only suitable for collecting MGBs up to 360 litres in size.

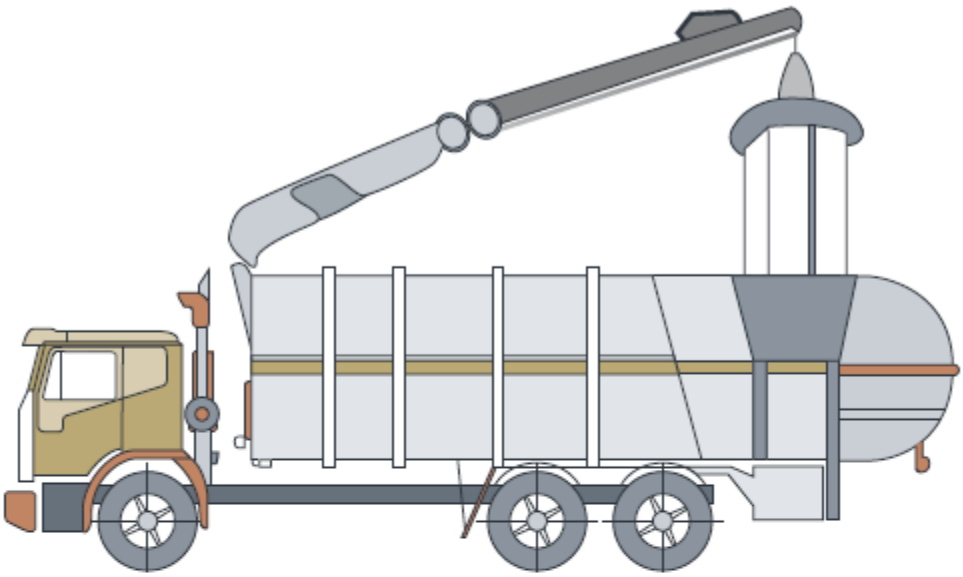
Front-lift loading collection vehicle



Front-lift loading collection vehicle	
Length overall	10.52m
Front overhang	1.51m
Wheelbase	5.84m
Rear overhang	3.17m
Turning circle kerb to kerb	22.10m
Turning circle wall to wall	23.66m
Travel height	3.82m
Clearance height for loading	6.1m

This is mainly used for collecting commercial and industrial waste, and is only suitable for bulk bins with front lift pockets (not MGBs).

Crane trucks

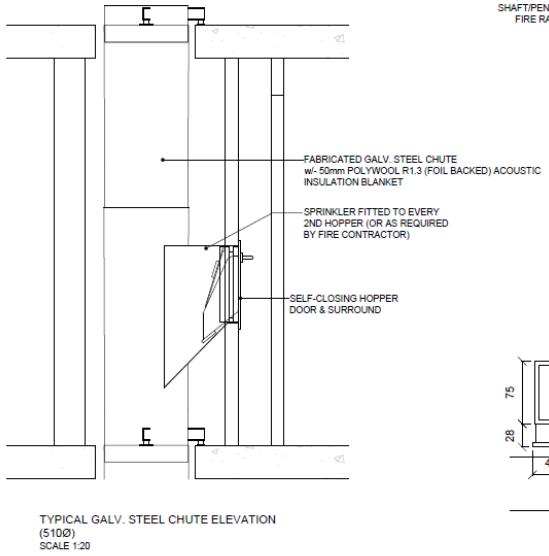


Crane truck collection vehicle	
Length overall	10.0m
Width overall	2.5m
Weight (vehicle only)	13.0t
Weight (payload)	9.5t
Turning circle	18m
Travel height	3.8m
Clearance height for loading	8.75m

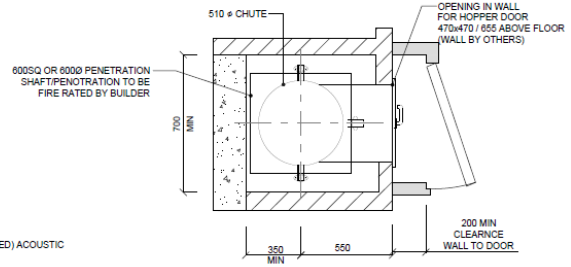
This type of truck is used to collect underground bins.

APPENDIX C WASTE MANAGEMENT EQUIPMENT SPECIFICATIONS

APPENDIX C.1 TYPICAL CHUTE PLAN & ELEVATION

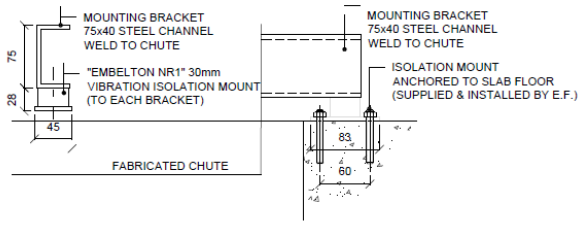


TYPICAL GALV. STEEL CHUTE ELEVATION
(510Ø)
SCALE 1:20

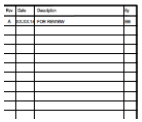


TYPICAL GALV. STEEL SINGLE CHUTE LAYOUT
(510Ø)
SCALE 1:20

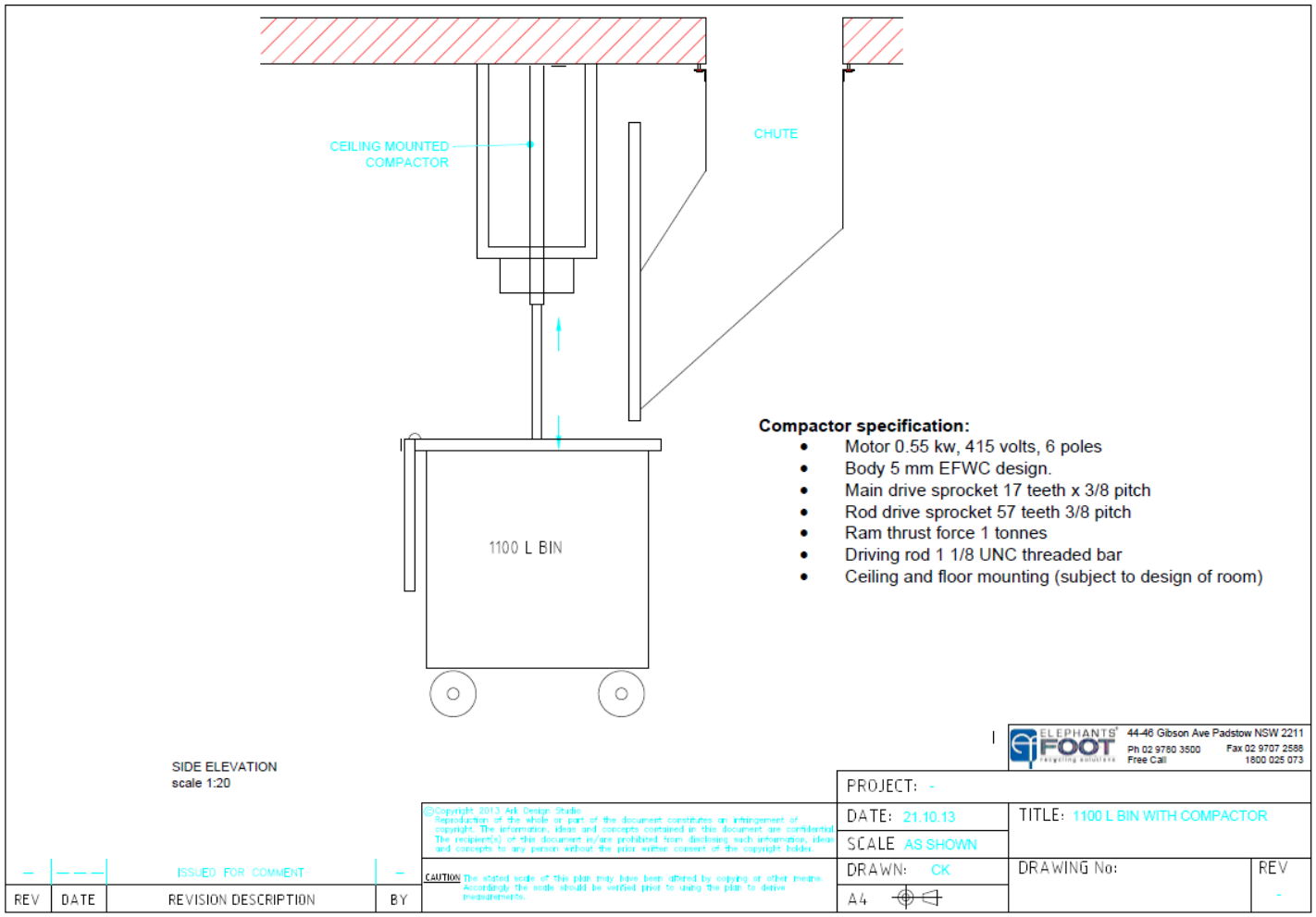
NOTE: ENCLOSURES ARE REQUIRED IF THE CHUTE OPENS
DIRECTLY TO A CORRIDOR OR IS NOT LOCATED IN A WASTE ROOM.



MOUNTING DETAIL
SCALE 1:5



APPENDIX C.2 SINGLE COMPACTOR TO SUIT 1100L MGB



APPENDIX C.3 PORTABLE ECO WEIGHING COMPACTOR

Portable Eco Weighing Compactor

The portable ECO compactor is the optimum technology for compacting general waste in a multi-user environment. The ECO @Internet database management system is designed to collect all information from each user who disposes of waste in the ECO compactor.

Each tenant is supplied with their own pre-programmed security swipe card. When a tenant approaches the unit, they are required to follow the on-screen instructions. The tenant will instantly get the weight of their waste displayed on the screen of the ECO compactor. This system will make the tenant more conscious about recycling, and accountable for their waste disposal habits.

Specifications
Length of compactor (14m³) – 5800mm
Width and height – 2050mm x 2350mm
Height of feed opening – 1270mm from ground level
Filling opening volume – 600L
Stroke – 1287mm
Motor – 5.5kw
Weight – 4450kg
Compacting pressure – 25 tonnes
The compaction ratio is 5:1 (compaction blade system)
Scale is EU Calibrated – 0.1g precisely/ from 1 – 100kg/ class III
Schematics included (Appendix B)
Front and rear wheels
415 volts, 3 phase, 5 pin, D type circuit breaker, 16Amp

APPENDIX C.4 TYPICAL BIN LIFT

120-240 Litre Binlifter

The single bin lifter is designed to safely empty wheelie bins into large dumpsters and compactors. With easy operating push button instructions, the bin lifter is complemented by a safety cage.

Features	120-240 litre bin lifter
Lifting capacity	140 kg
Bin compatibility	120 & 240 litre bins
Operation method	Automatic
Hydraulic	yes
Dimensions	850mm (W) x 1800mm (L)
Safety	Safety cage & control box
Emergency stop	yes
Tipping height	1350mm variable
Clearance	2650mm
Suitability in tipping into	bins , dumpsters and compactors
Power	240 volt, 10amp
Can it be customised?	yes
Weighing & data capture	no

APPENDIX C.5 VERTICAL BALER SPECIFICATIONS

EF100VX Vertical Baler

The EF100VX ia a low height baler making it easy to install with no onsite assembly required. It is a low noise baler with a fast cycle time and front loading ropes. This unit requires 3 phase power.

EF100VX produces bales of cardboard up to 90kg. It can be used to bale a range of materials including plastic film, shredded paper, PET and cardboard.

Description	Specification
Machine Dimensions H x W x D (mm)	1945x1265x835
Machine Weight (kg):	650
Feed Opening H x W (mm):	670×800
Bale Size H x W x D (mm):	800x600x600
Bale Weight (cardboard):	Up to 90 kg
Compaction Force:	10 Tonnes
Motor:	4kW
Electric Supply:	400/230 volt
Cycle Time (sec):	18
Type of Tie/No. of ties:	9mm Tape/ 2 off
Type/No. of Retaining Claws Front:	Serrated edge / 2 off
Type/No. of Retaining Claws Rear:	Serrated edge / 2 off
Method of Removing Bales:	Mechanical Ejection
Depth of Chamber Below Feed Opening (mm):	700
Access for Forklift/Pallet Truck:	Yes, Side
Electric Rating Standard:	IP55
Electric Rating Optional:	IP65
Sound Level:	60 dBA

APPENDIX C.6 TYPICAL COOKING OIL STORAGE TANK

The VTS 700Lt ECO VACUUM TANK

This Auscol tank comprises a 700L used cooking oil storage tank with versatile system arrangements and on board transfer pump.

The tank is placed on a stand that has adjustable feet for stability on uneven surfaces, allows cleaning access below the tank and a nozzle holder for the hose pipe.

These tanks can be installed indoors within a commercial kitchen, in a back of house location or alternatively they can be stored outdoors in a corral under shelter.

For larger installations a series of tanks can be installed, at one or multiple locations, at your premises in order to efficiently and safely store and remove you're used cooking oil.

VTS 700Lt ECO VACUUM TANK Dimensions

Width 83cm x Height 197 cm (incl. Stand)
Oil Storage Capacity: 700 Litres
Weight Empty: 90kg
Weight Full: 727kg (Estimated)
Weight Stand: 30kg
Power Supply: 10Amp

Optional Extras;

- **Mobile Oil Kaddy**
- **Bund**
- **Pail Stand**

APPENDIX C.7 TYPICAL BIN MOVER

Typical applications:

- Move trolleys, waste bin trailers and 660litre/1100 litre bins up and down a ramp incline. Ideal for Apartment Buildings (to move waste bins located at a basement level to road level).
- Quiet, smooth operation with zero emissions and simple to use, no driver's licence required

Features:

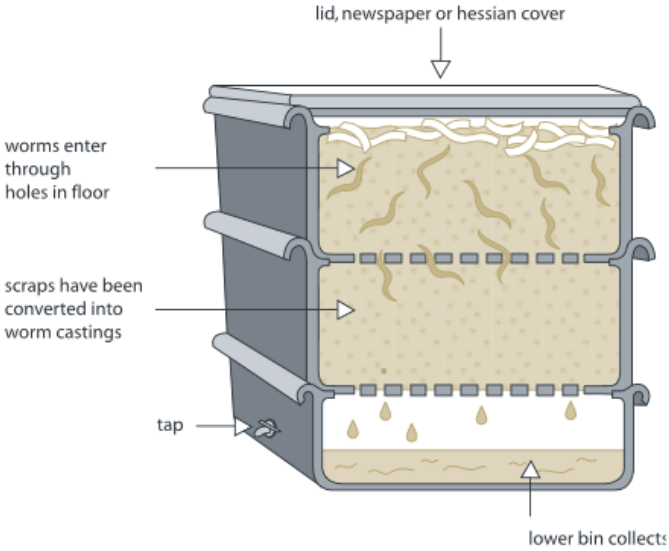
- Up to 1 Tonne on a ramp surface (depending on ballast and incline)
- Anti-rollback system on slopes
- Foot print: 1548L x 795W x 1104H (handle in the drive position)
- Pin Hitch is standard however alternate hitching options may be available to suit your specific application (e.g. tow ball)

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 C.8 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*

APPENDIX C.9 TYPICAL APARTMENT STYLE COMPOST BINS

Apartment Style Compost bin – available from hardware stores

Suitable for:

- Vegetables
- Coffee grounds and filters
- Tea and tea bags
- Crushed eggshells (but not eggs)
- Nutshells
- Houseplants
- Leaves
- Cardboard rolls, cereal
- Boxes, brown paper bags
- Clean paper
- Shredded newspaper
- Fireplace ashes
- Wood chips, sawdust,
- Toothpicks, burnt matches
- Cotton and wool rags
- Dryer and vacuum cleaner lint
- Hair and fur
- Hay and straw

APPENDIX C.10 ELECTRIC ORGANIC COMPOST BIN

CLOSED LOOP
LOVE WHAT YOU DO

CLO'ey

Product Specifications

Decomposition Method	Fermentation by microorganisms
Decomposition Capacity	2 metric tonnes per year* (4 kg per day*)
Rating	220–240 V 50/60 Hz – 1.1 A
Decomposition Time	24 hrs
Operating Temperature	0C and 40C.**
Deodorisation Method	Nano-Filter system
Maximum Power	210 W
Power Usage	Average 1 kwh per day
Weight	21 kgs
External Dimensions	w 400 mm d 400 mm h 780 mm

* Food Waste Handling Capacity – based on an optimal operating environment.
** Ambient temperature range of area where unit may be installed.

SOURCE: *Closed Loop Domestic Composter – See Useful Contacts*

APPENDIX C.11 TYPICAL PUBLIC PLACE WASTE BINS

** Products and specifications may change according to manufacturer.*

SOURCE: *SULO Environmental Technology*