WASTE MANAGEMENT PLAN

Lot 3003,DP1184498

Mixed Use Development

PREPARED FOR

Thornton Operations Pty Ltd.

27/03/2017

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EXECUTIVE SUMMARY

This waste management plan covers the ongoing management of waste generated by the mixed use Lot 3003, DP1184498, Thornton Project, Penrith.

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
Crate	A plastic box used for the collection of recyclable materials
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
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.

LIST OF TABLES

INTRODUCTION

The following waste management plan pertains to the mixed use Lot 3003, DP1184498, Thornton Project, Penrith. 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:

- One building (*see appendix A.1 for site plan*)
  - 56 residential units in total (see Table 1 for Unit Breakdown Matrix)
  - 9 retail units
    - Total GFA of 656m^2
  - 1 commercial unit
    - Total GFA of 1395m^2
  - 1 childcare centre
    - Total GFA of 1490.4m^2
- Units for the tower above will be included in a separate submission but the waste rooms will be capable of servicing all units.

Table 1: Unit Breakdown Matrix

# Beds	# Units	% Mix
1 Bed	8	14.29
2 Bed	40	71.43
3 Bed	8	14.29
	56	

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

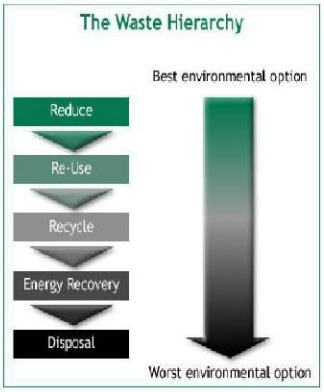
PENRITH CITY COUNCIL

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 Penrith City 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 Penrith City Council, Australian Standards and statutory requirements.

OBJECTIVES



- Facilitate sustainable waste management within the City of Penrith in accordance with the principles of Ecologically Sustainable Development
- Manage waste in accordance with the 'Waste Hierarchy' to:
    - avoid producing waste in the first place;
    - minimise the amount of waste produced;
    - re-use items as many times as possible to minimise waste;
    - recycling once re-use options have been exhausted; and
    - dispose of what is left, as a last resort, in a responsible way to appropriate waste disposal facilities
- Assist in achieving Federal and State Government waste minimisation targets as set out in the *Waste Avoidance and Resource Recovery Act 2001* and *NSW Waste Avoidance and Resource Recovery Strategy 2007*
- Minimise the overall environmental impacts of waste by:
    - encouraging development that facilitate ongoing waste avoidance and complements waste services offered by both Council and/or private contractors;
    - requiring on-site source separation and other design and siting standards which assist waste collection and management services;
    - encouraging building designs and construction techniques that minimise waste generation;
    - maximising opportunities to reuse and recycling building and construction materials as well as other wastes in the ongoing use of a premise; and
    - reducing the demand for waste disposal.

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 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 Penrith City Council waste generation rates have 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*

# 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)	Compacted Recycling (2:1) (L/week)
56	120	6720	3360	60	3360	1680

BIN SUMMARY

The following assumptions have been taken into consideration:

- garbage is not compacted at the base of each chute;
- recycling is not compacted at the base of each chute;
- four garbage bins will be situated on a carousel beneath the chute;
- two recycling bins will be situated on a linear track beneath the chute;
- full bins will be transported to the residential collection area where waste will be deposited into 17m³ Auger Compaction Units;
- both garbage and recycling will then be compacted at a ratio of 2:1.

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

COMPACTION UNIT REQUIREMENT

Generated Waste (L/week)	Generated Waste (m3/week)	Generated Recycling (L/week)	Generated Recycling (m3/week)	Collection Frequency (times/week)	Req'd Waste Compactors (10m3)	Req'd Recycling Compactors (10m3)
3360	3	1680	2	1	1	1

Garbage

- 4 x 1100L MGBs

Recycling

- 2 x 1100L MGBs

Service Bins

- 2 x 1100L MGBs

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

1 dual chute system will be installed with access provided on all residential levels of each core. One chute will be for garbage and the other for recycling.

Garbage discharges into 1100L MGBs placed on a carousel system and recycling (comingled) into 1100L MGBs placed on a linear system. Neither waste stream is to be compacted at the base of the chute. The discharge is located in the waste room on basement level 1.

Full waste and recycling bins will be transferred to the collection area on the ground level where they are to be deposited into 17m³ Auger Compaction Units (see *APPENDIX A.5 - LOADING/COLLECTION AREA*). The building manager will be responsible for doing this on a daily basis or as required. The compaction units will be collected by Council on a weekly basis using a hook-lift truck (see *APPENDIX B.3 - TYPICAL COLLECTION VEHICLE INFORMATION*).

WASTE HANDLING

WASTE

Residents 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 bins collecting waste from each chute, rotate full bins to the storage and collection area, and replace empty bins under each chute.

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 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.

The caretaker/cleaner will exchange/empty recycling bins and store full bins in the bin holding room located on the ground level for collection.

TEMPORARY STORAGE OF BULKY GOODS

A room of 45m² has been allocated for the storage of discarded residential bulky items and is located on the ground floor close to the collection area. This is considered to be ample space for bulky goods storage, with Council requiring a minimum of 9m² for a development of 56 units.

It is envisaged that bulky goods will be managed by the appointed waste caretaker/s. Residents will be required to liaise with building management regarding all bulky goods movements.

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.

COMPOSTING

Council suggests that a space for composting and worm farming is to be available for all residents in a communal facility or in small private courtyards (*see APPENDIX C.7 for Typical Worm Farm Specifications*). Composting facilities are to be sited on an unpaved area with soil depth of at least 300mm. Residents may also choose to purchase and install apartment style compost bin where practical and self-manage these systems (*see APPENDIX C.8 and APPENDIX C.9 for Typical Compost Bins)*. Two systems have been included for consideration however there are a variety of compost systems available at hardware stores.

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 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

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 level of the residential building 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 3:** Equipment Summary*

Component	Part	Quantity	Notes
Chutes	Galvanised Steel / LLDPE Polyethylene Plastic	2	(*See APPENDIX C for Typical Chute Section*)
Equipment A	*Garbage* Carousel system for 1100L MGBs without compaction	1	(*See APPENDIX C.3 for Typical Carousel*)
Equipment B	*Recycling* Linear track system for 1100L MGBs without compaction	1	(*See APPENDIX C.2 for Typical Linear System*)
Equipment C	Suitable Bin Moving Equipment	N/A	Optional (*See APPENDIX C.4 for Typical Bin Mover*)
Equipment D	17m³ Auger Compactor	2	(*See APPENDIX C.5 for Typical Compactor*)
Equipment E	Bin Lifter	2	(*See APPENDIX C.6 for Typical Bin Lifter*)

RETAIL WASTE PLAN

The *Better Practice Guide for Waste Management and Recycling in Multi-unit Dwellings* 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 4: *Calculated Waste Generation – Retail*

Unit	Type	NLA (m^2)	Waste Calculation (L/100m^2/day)	Generated Waste (L/week)	Recycling Calculation (L/100m^2/day)	Generated Recycling (L/week)
Retail 1	**Non-Food (<100m^2)**	69	50	242	25	121
Retail 2	**Non-Food (<100m^2)**	86	50	301	25	151
Retail 3	**Non-Food (<100m^2)**	66	50	231	25	116
Retail 4	**Non-Food (>100m^2)**	117	50	410	50	410
Retail 5	**Non-Food (>100m^2)**	109	50	382	50	382
Retail 6	**Non-Food (<100m^2)**	47	50	165	25	82
Retail 7	**Non-Food (<100m^2)**	46	50	161	25	81
Retail 8	**Non-Food (<100m^2)**	58	50	203	25	102
Retail 9	**Non-Food (<100m^2)**	58	50	203	25	102
TOTAL		**656**		**2296**		**1544**

BIN SUMMARY

Garbage

- 3 x 1100L MGBs collected **weekly**

Recycling

- 2 x 1100L MGBs collected **weekly**

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

Retail tenants will be required to be responsible for their own storage of waste and recycling back of house (BOH).

Food handling for food cooked or prepared, served and consumed on site will produce a typical waste composition of food scraps from plates, packaging waste and some plastics. Café or restaurant staff will be responsible for their own waste management.

Cardboard is a major component of the waste generated by cafes/restaurants. All cardboard should be flattened (to save bin space), placed in and collected from bulk bins. Whilst cardboard is bulky, it is generally lightweight however it can be contaminated with food or liquid which makes it unsuitable for recycling.

On completion of each trading day or as required, nominated retail staff/cleaners will transport their waste and recycling, using the access corridor, to the retail waste room on lower ground level and place waste and recycling into the appropriate collection bins (s*ee Appendix A.4 - Ground Level Waste Rooms*).

It is recommended that:

- all waste should be bagged and waste bins should be plastic lined;
- bagging of recyclables is not permitted;
- all waste collections located BOH during operations;
- individual recycling programs are recommended for retailers to ensure commingled recycling is separated correctly;
- any food and beverage tenant will make arrangements for storing used and unused cooking oil in a bunded storage area;
- the operator will organise grease interceptor trap servicing;
- a suitable storage area needs to be provided and affectively bunded for chemicals, pesticides and cleaning products;
- dry basket arresters need to be provided to the floor wastes in the food preparation and waste storage areas;
- washroom facilities should be supplied with collection bins for paper towels (if used); and
- all flattened cardboard will be collected and removed to the waste room recycling MGB

NOTE: Subject to the stakeholders preference/capability (and as built constraints), bin sizes and quantities may be changed.

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.

SUPERMARKET

Supermarket retail areas total 1991m² (including BOH operations).

Waste streams from the supermarket 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.

COMMERCIAL WASTE PLAN

The *Better Practice Guide for Waste Management and Recycling in Multi-unit Dwellings* has been referenced to calculate the total number of bins required for the commercial areas. Please note that calculations are based on generic figures; waste generation rates may differ according to office practice. A seven day operating week has been assumed.

Table 5: *Calculated Waste Generation – Commercial*

Type	NLA (m^2)	Waste Calculation (L/100m^2/day)	Generated Waste (L/week)	Recycling Calculation (L/100m^2/day)	Generated Recycling (L/week)
Office	1395	10	976.5	10	976.5

BIN SUMMARY

Garbage

- 1 x 1100L MGB collected **weekly**

Recycling

- 1 x 1100L MGB collected **weekly**

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

Typically, one or more bins for paper or waste are positioned next to each workers desk or work station. One or both of these bins are emptied by contract cleaners. The cleaners circulate around the workplace after normal office hours and also perform other cleaning tasks. Generally vacuuming and cleaning toilets. Bins for general waste and recyclables are also located centrally in each office, generally in the kitchen area and printer room.

Cleaners empty the bins into bags which they transport around the office/s in a cart which is also used to store cleaning products, spare bags, PPE and consumables.

Bags of waste and/or recycling are placed in a central location by the cleaners (often outside the goods lift/s) and transported to the collection bins by another cleaner.

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.

WASHROOM FACILITIES

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.

OTHER RETAIL/COMMERCIAL WASTE

Tenants usually make their own arrangements for the disposal and recycling of toner cartridges and batteries. Disposal of hard, electronic, liquid waste and any detox (paint/chemicals) shall be organised with the assistance of the building management/cleaners.

Please note that calculations are based on generic figures; waste generation rates may differ according to waste management practice. A seven day operating week has been assumed.

Table 6: *Calculated Waste Generation – Childcare*

Type	NLA (m^2)	Waste Calculation (L/100m^2/day)	Generated Waste (L/week)	Recycling Calculation (L/100m^2/day)	Generated Recycling (L/week)
Indoor Childcare	685.9	10	480.1	10	480.1
Outdoor Childcare	804.5	10	563.2	10	563.2
TOTAL	**1490.4**		**1043.3**		**1043.3**

BIN SUMMARY

Garbage

- 1 x 1100L MGB collected **weekly**

Recycling

- 1 x 1100L MGB collected **weekly**

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

It is expected that the contract cleaners appointed by the childcare centre will remove bagged waste and separated recycling from the allocated collection points and deposit it into the appropriate bins.

The child care centre may also appoint its own private waste services provider for garbage and recycling services. Alternately, building management will transport bins to the bin collection area on the ground level and return empty bins to the child care centre.

Most recycling generated by child care centres include soiled nappies, wipes and change sheets. Dedicated waste bins are to be allocated for sorting and storage of general waste and disposable nappies. A recycling service for soiled disposable nappies should be investigated.

Secure destruction bins will be operated on a wheel in wheel out basis by the appointed contractor/s if required.

It is recommended that all amenities and work station areas be furnished with suitable recycling and waste collection receptacles.

Washroom facilities should be supplied with collection bins for paper towels (if used).

All staff will be responsible for management of their general waste and storage of same.

Staff tea points and food preparation areas will be supplied with a dedicated commingled collection receptacle for the collection of all recyclable glass and plastic items. Staff will be responsible for sorting this material and allocating recyclables into the correct collection facility.

WASTE ROOM AREAS

The areas allocated for residential waste rooms, commercial/retail bin store, bulky goods and collection areas are detailed in Table 7 below. The areas provided are considered suitable for the units included in this report and also those for the tower above.

Table 7: *Waste Room Areas*

Location	Waste Room Type	Equipment	Allocated Area (m^2)
Basement 01	Residential Waste Discharge Room	4 x 1100L MGBs (Garbage) 2 x 1100L MGBs (Recycling) 2 x 1100L MGBs (Service Bins) 1 x 4-Bin 1100L Carousel (Garbage) 1 x 2-Bin 1100L Linear Track (Recycling)	85
Ground Level	Residential Waste Collection Area	1 x 17m³ Compactor (Garbage) 1 x 1100L Bin Lifter (Garbage) 1 x 17m³ Compactor (Recycling) 1 x 1100L Bin Lifter (Recycling)	85
	Bulky Waste Room	N/A	45
	Retail/Commercial Waste Room	4 x 1100L MGBs (Garbage) 3 x 1100L MGBs (Recycling)	24
	Childcare Waste Room	1 x 1100L MGBs (Garbage) 1 x 1100L MGBs (Recycling)	8

TOTAL BINS REQUIRED FOR DEVELOPMENT

17 x 1100L MGBs

COLLECTION OF WASTE

RESIDENTIAL

Residential waste will be collected by Council with a hook-lift truck removing and replacing the 17m³ Auger Compactors on a weekly basis.

Council's waste collection vehicle will pull into the loading dock and utilise the vehicle turntable to enable servicing to take place.

The building manager/waste caretaker will be responsible for ensuring all full bins have been deposited into the compactors in the collection room on the ground level via the bin lift.

Once all bins have been serviced, Council's waste collection vehicle will leave the site in a forward-facing direction. The building manager/waste caretaker will be responsible for returning bins to their respective waste room to continue operational use.

RETAIL & COMMERCIAL

Both retail and commercial waste (including that for the childcare centre) will be serviced by Private Contractor to an agreed schedule. For the purpose of this report, weekly collections have been assumed for all non-residential waste streams.

On the agreed collection days, the Private Contractor's waste collection vehicle will pull into the loading dock and utilise the vehicle turntable to enable servicing to take place as close to the waste rooms as possible.

The building manager/waste caretaker will be responsible for ensuring that all bins are arranged neatly for servicing.

Once all bins have been serviced, the Private Contractor's waste collection vehicle will leave the site in a forward-facing direction. The building manager/waste caretaker will then be responsible for ensuring bins are neatly organised within their respective waste rooms to continue operational use.

COLLECTION AREA

It is Elephant Foot's understanding that the collection areas have been reviewed by a traffic consultant (or equivalent) 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. It must be ensured that that the collection vehicle (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.

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 is flat and even;
- 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 in accordance with the relevant water board. (Sydney Water);
- 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 (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;
- 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 (WMP) as part of a development application and is supplied by Elephants Foot Recycling Solutions (EFRS) 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.

Penrith Council Customer Service
Phone: 02 4732 7777 Email: council@penrithcity.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 999

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

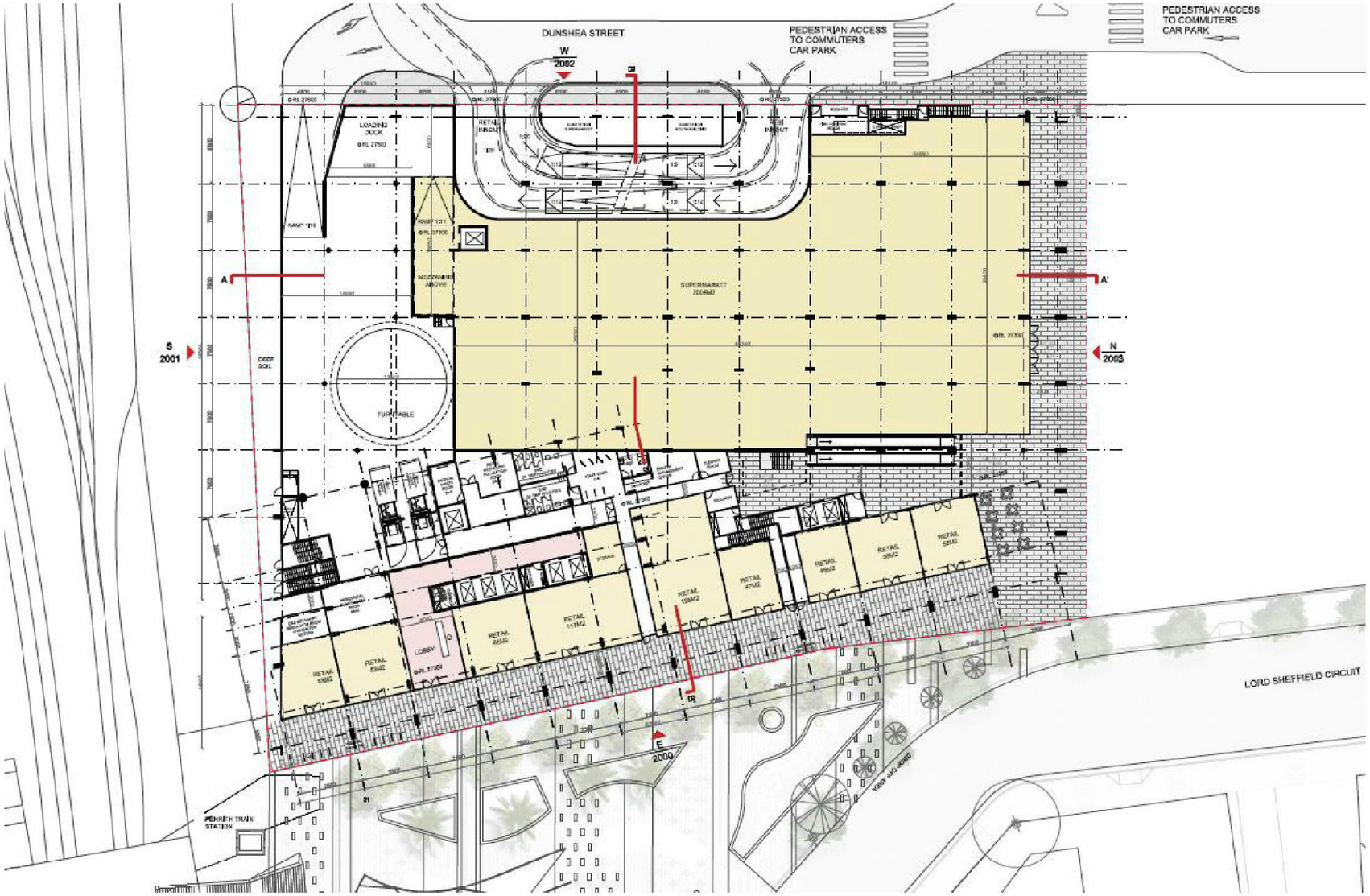
PURIFYING SOLUTIONS (Odour Control)
Phone: 1300 636 877 Email: sales@purifyingsolutions.com.au

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

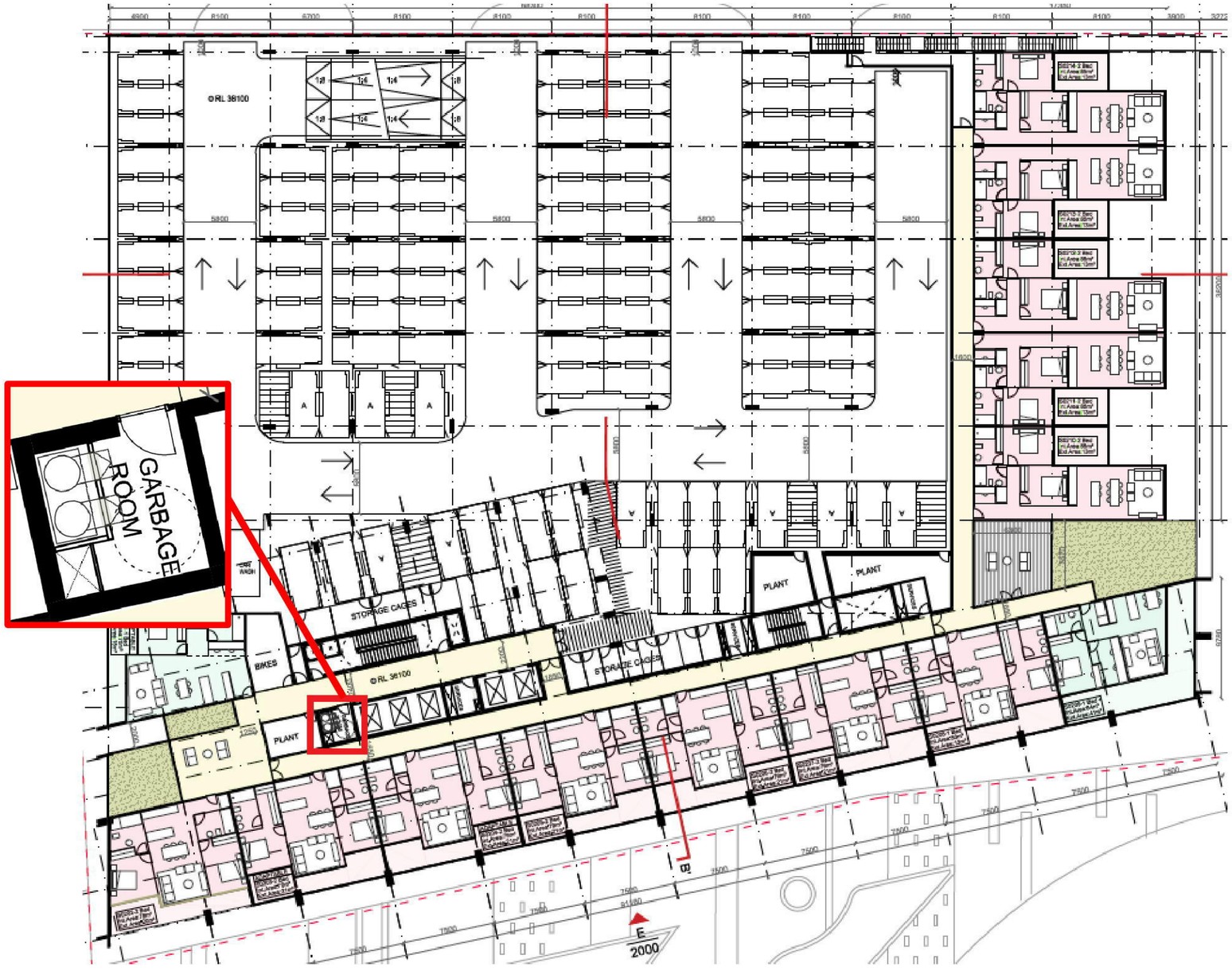
APPENDIX A DRAWING EXERPTS

APPENDIX A.1 SITE PLAN

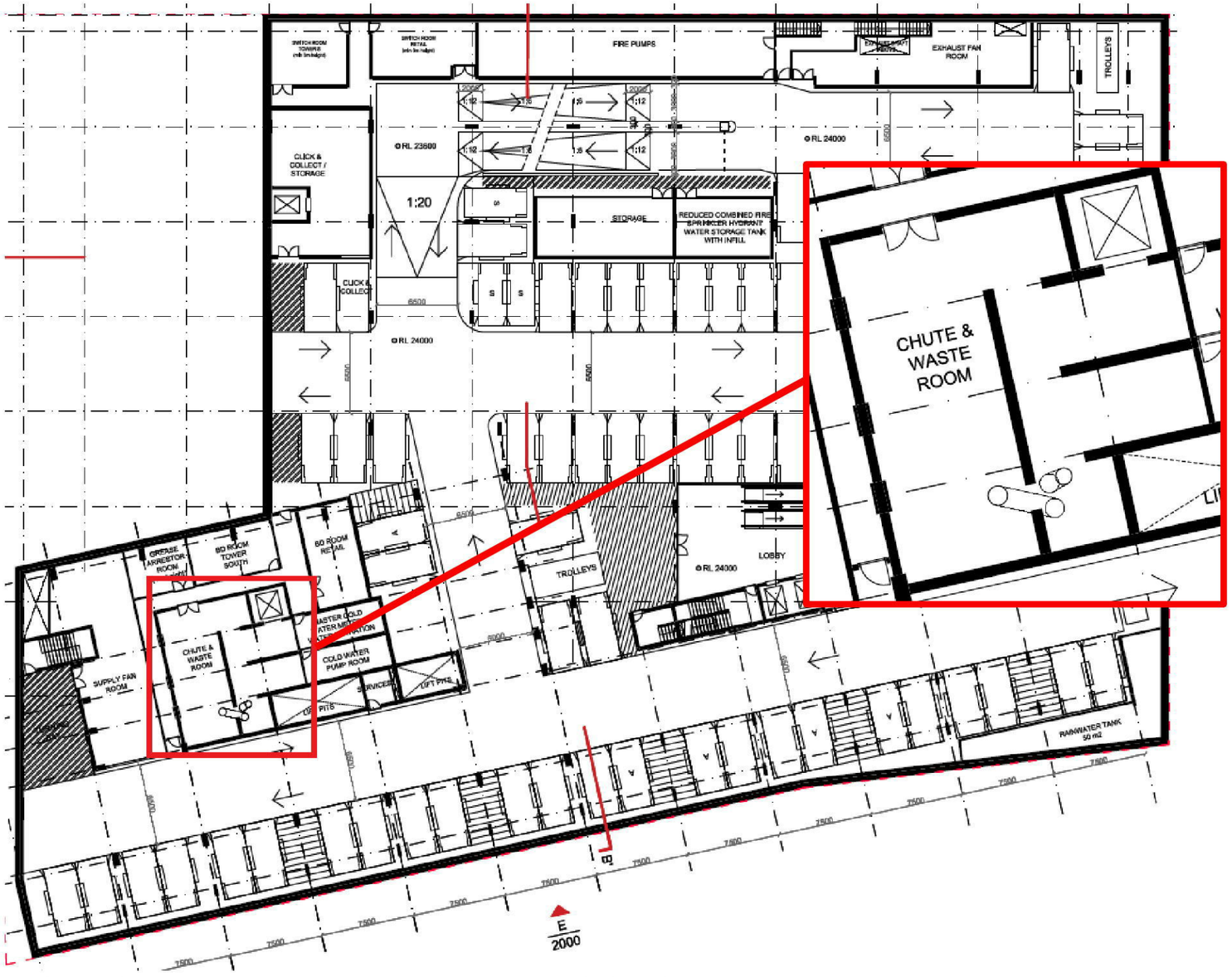


Source: Crone Architects, Drawing No. 1100, RevA, Dated 27/03/17 – GA Plan Ground Floor

APPENDIX A.2 TYPICAL CHUTE LOCATION

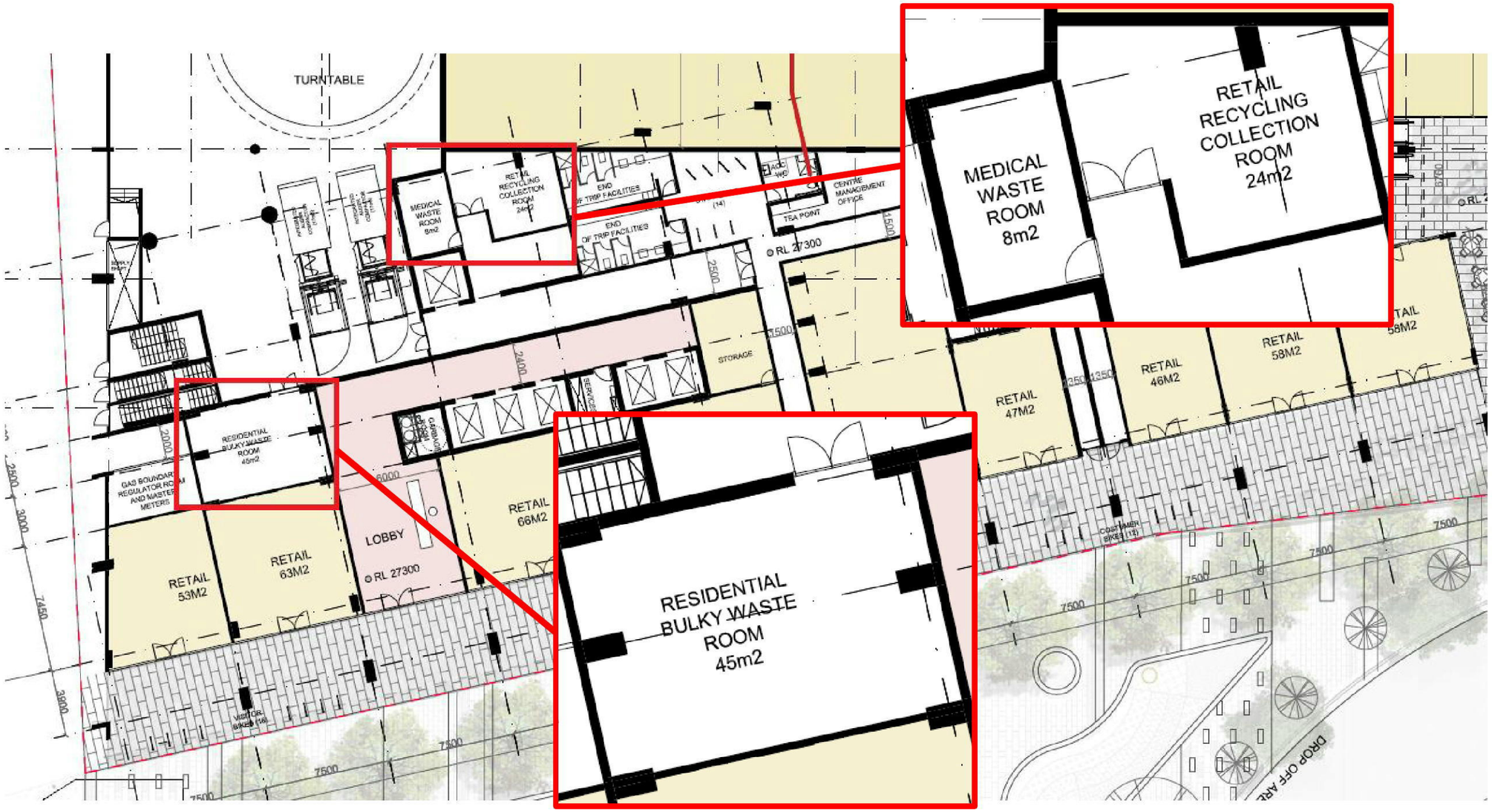


Source: Crone Architects, Drawing No. 1102, RevA, Dated 27/03/17 – GA Plan Level 02



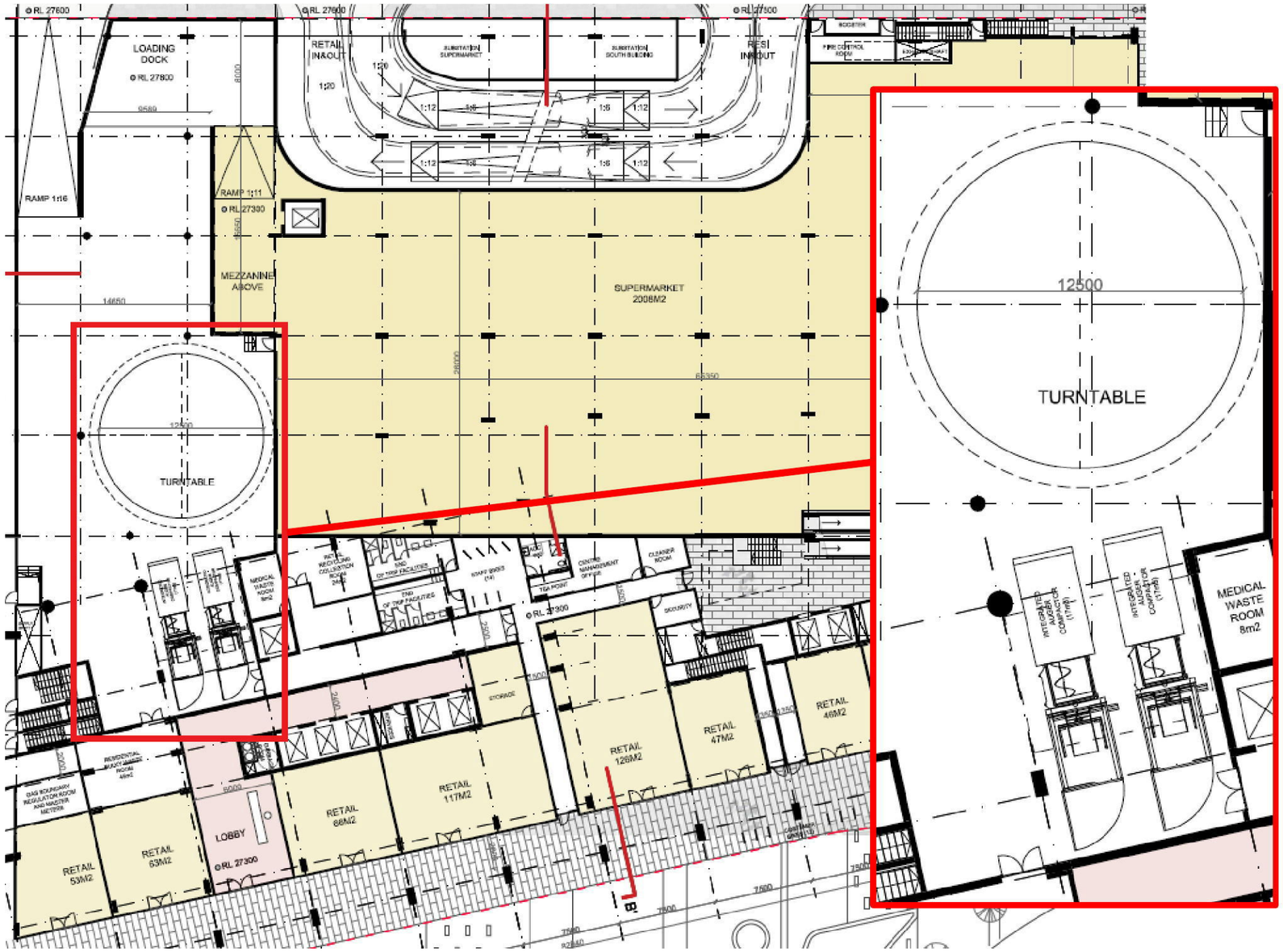
Source: Crone Architects, Drawing No. 1099, RevA, Dated 27/03/17 – GA Plan Basement 01

APPENDIX A.4 GROUND LEVEL WASTE ROOMS



Source: Crone Architects, Drawing No. 1100, RevA, Dated 27/03/17 – GA Plan Ground Floor

APPENDIX A.5 LOADING/COLLECTION AREA

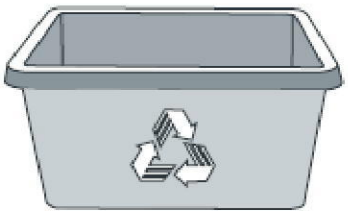


Source: Crone Architects, Drawing No. 1100, RevA, Dated 27/03/17 – GA Plan Ground Floor

APPENDIX B BETTER PRACTICE GUIDE 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

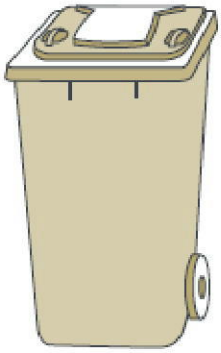
The above dimensions are indicative only of common crate sizes

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.

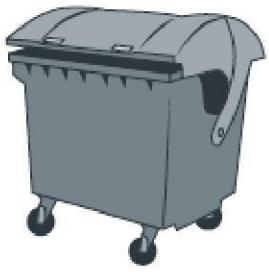
Indicative sizes only for common MGB sizes are provided below. Note that not all MGB sizes are shown; the dimensions are only a guide and differ slightly according to manufacturer, if bins have flat or dome lids and are used with different lifting devices. Refer to AS 4123 for further detail.

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

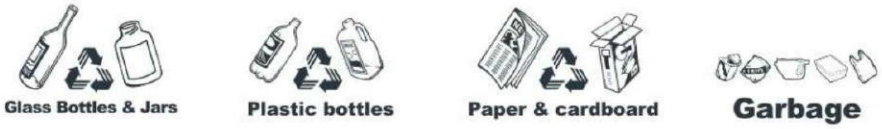
APPENDIX B.2 SIGNAGE FOR WASTE & RECYCLING BINS

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

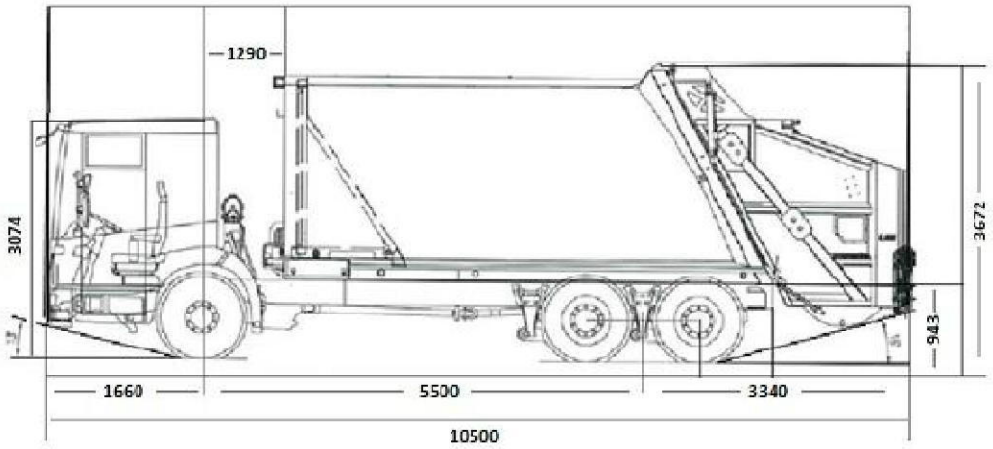
DESIGN SPECIFICATIONS REAR LOADED WASTE COLLECTION VEHICLES

NOTE: Small Residential Flat Buildings outlined in section 4.3 do not require on site waste allocation therefore no vehicle specifications have been provided of the 12.5m heavy Rigid Collection Vehicle.

The following dimensions are provided for a standard heavy rigid vehicle as identified in Australian Standard 2890.2:

Vehicle Class:	Heavy Rigid Vehicle Dimensions
Overall Length (m)	10.5
Operational Length (m)	12.5
Design Width (m)	2.8
Design Height (m)	3.7
Swept Circle (m)	22.5
Clearance (travel height) (m)	4.5
Weight Fully Loaded (tonnes)	22.5
Capacity (m^3)	24
Front Chassis Clearance	13^0
Rear Chassis Clearance	16^0

Standard dimensions sourced from AS 2890.2 Parking Facilities: Off-Street Commercial Vehicle Facilities



10.5m Heavy Rigid Waste Collection Vehicle specifications

7.3.1 Hook Lift Collection Vehicle Specifications

Vehicle Class:	Heavy Rigid Vehicle Dimensions
Overall Length (m)	8.3
Design Width (m)	2.8
Clearance Travel Height (m)	4.5
Container Max Length (m)	6.3
Container Min Length (m)	3.5
Front Chassis Clearance (m)	0.4
Loading Operational Height (m)	3.0
Integrated Auger Compactor Length (m)	6.0
Auger Capacity (m^3)	17

Table 10: Standard dimensions sourced from manufacture specifications

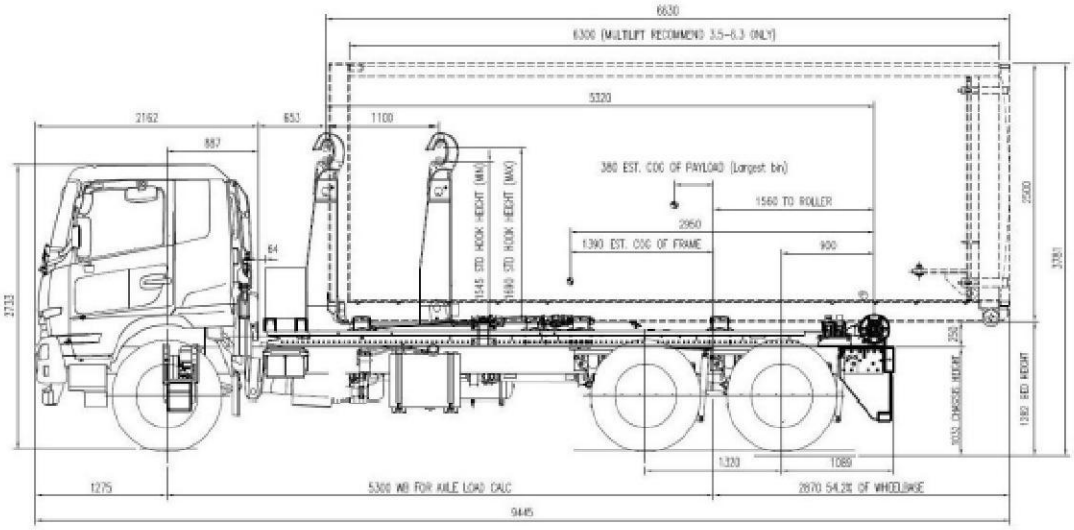


Figure 24: 8.3m Hook Lift Waste Collection Vehicle specifications

NOTE: Consideration of vehicle dimensions including rear operational requirements and overhead clearances are required when assessing collection points and route of travel for waste collection vehicles.

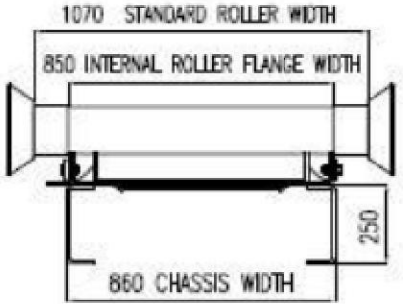
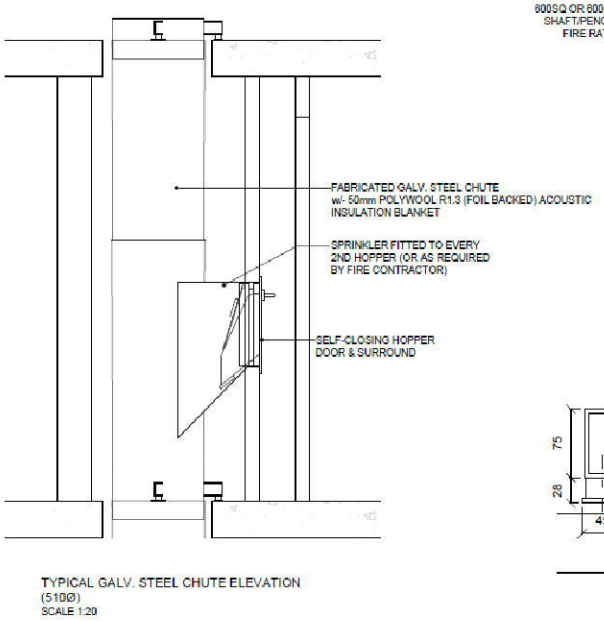


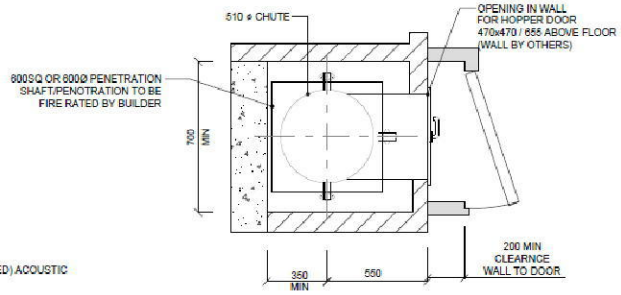
Figure 25: 9.5m Hook Lift Waste Collection Vehicle tray specifications

APPENDIX C WASTE MANAGEMENT EQUIPMENT SPECIFICATIONS

APPENDIX C.1 TYPICAL WASTE CHUTE SPECIFICATIONS

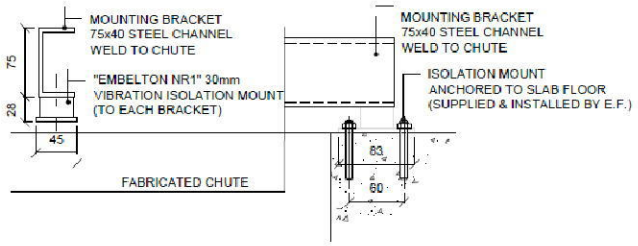


TYPICAL GALV. STEEL CHUTE ELEVATION
(510Ø)
SCALE 1:20



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.



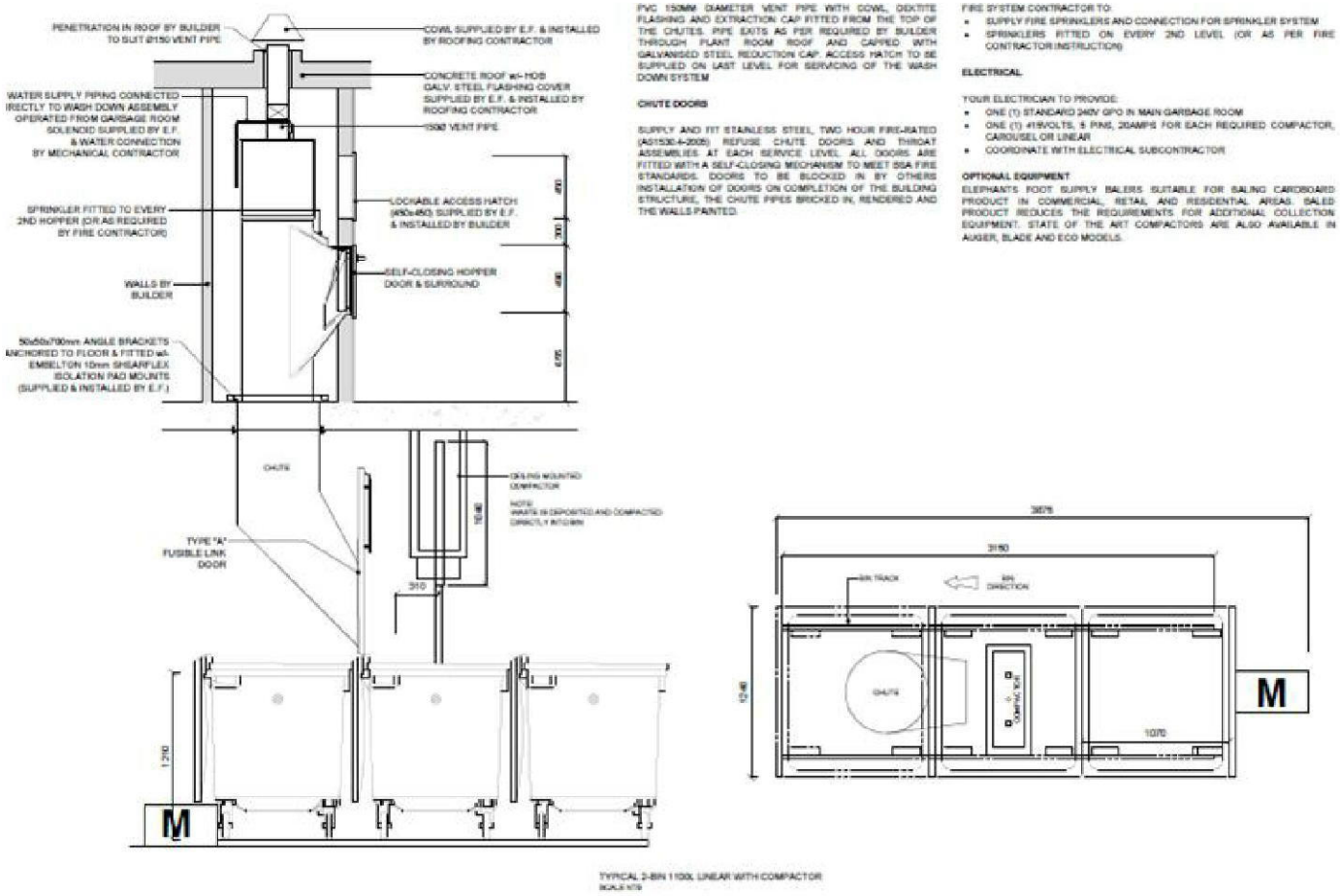
MOUNTING DETAIL
SCALE 1:5

Waste chutes 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.

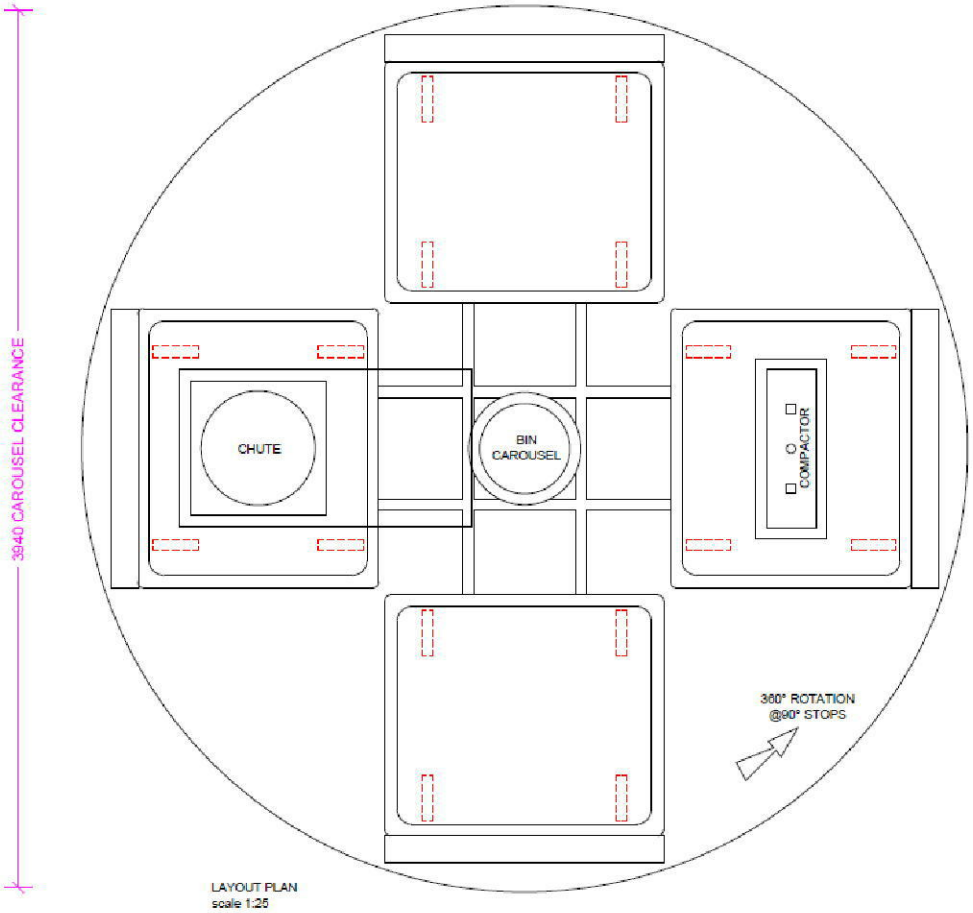
NOTE: Chute doors are installed after walls rendered, painted or when required. Information stickers will be placed on each chute door at each residential level.

APPENDIX C.2 TYPICAL LINEAR SYSTEM TO SUIT 1100L MGB



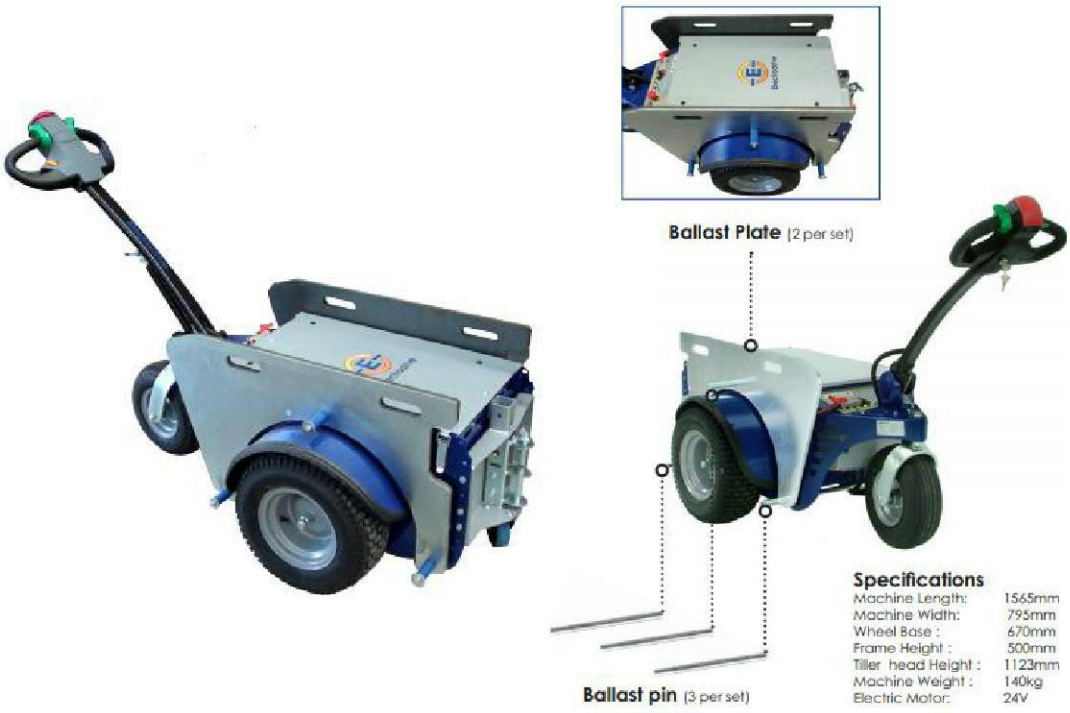
ELEPHANTS FOOT WASTE COMPACTORS PTY LTD **ABN** 70 001 378 294
Sydney Head Office 44-46 Gibson Ave Padstow NSW 2211 | **PH**: +612 9780 3500 | **Fax**: +612 9707 2588
Website: www.elephantsfoot.com.au | **Email**: info@elephantsfoot.com.au
Offices in Victoria & Queensland – **Toll Free**: 1800 025 073

APPENDIX C.3 TYPICAL CAROUSEL TO SUIT 1100L MGB



ELEPHANTS FOOT WASTE COMPACTORS PTY LTD **ABN** 70 001 378 294
Sydney Head Office 44-46 Gibson Ave Padstow NSW 2211 | **PH**: +612 9780 3500 | **Fax**: +612 9707 2588
Website: www.elephantsfoot.com.au | **Email**: info@elephantsfoot.com.au
Offices in Victoria & Queensland – **Toll Free**: 1800 025 073

APPENDIX C.4 TYPICAL BIN MOVER



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)*

7.3.2 Integrated Auger Compactor Electrical Specifications

Electrical Requirements:	Description
Electrical Outlet	5 Pin, 415 Volt, 32 Amp Outlet
Phase	3 Phase, 1 Neutral and 1 Earth
Location	Electrical located within 1m of the unit
Circuit Breaker	D Curve Circuit Breaker - Large enough to start and run 10kw electric motor - Breaker size to be confirmed with breaker supplier

Table 11: Electrical requirements for the operation of integrated auger compactors

7.3.3 Integrated Auger Compactor Schematics (6m)

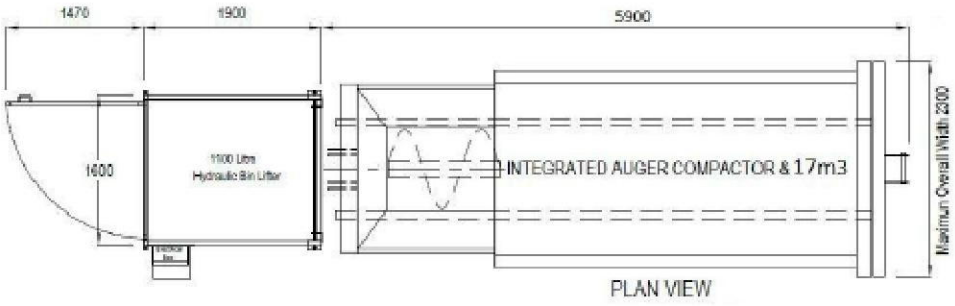


Figure 26: 6.0m Integrated Auger schematic with rear loading bin lifter

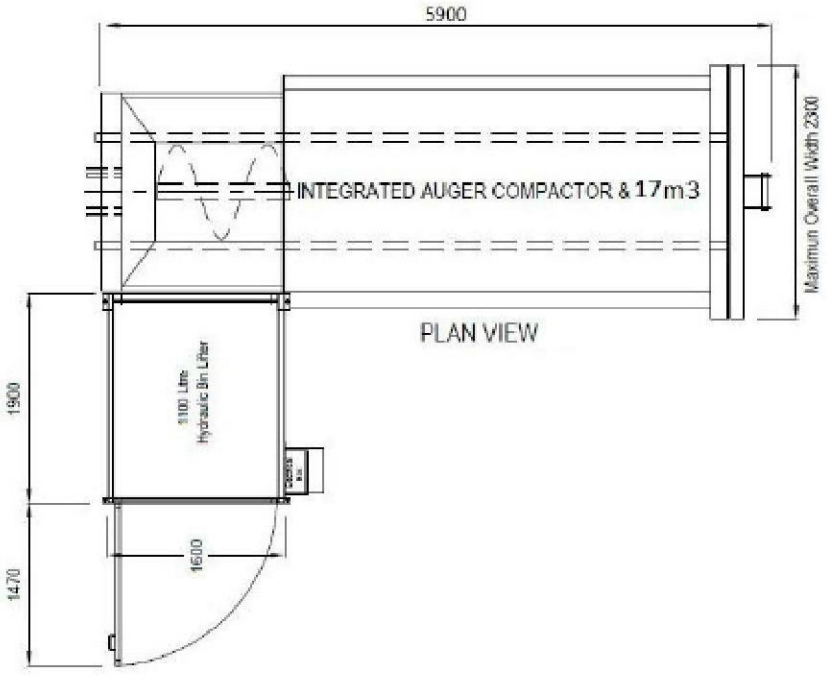


Figure 27: 6.0m Integrated Auger schematic with side loading bin lifter

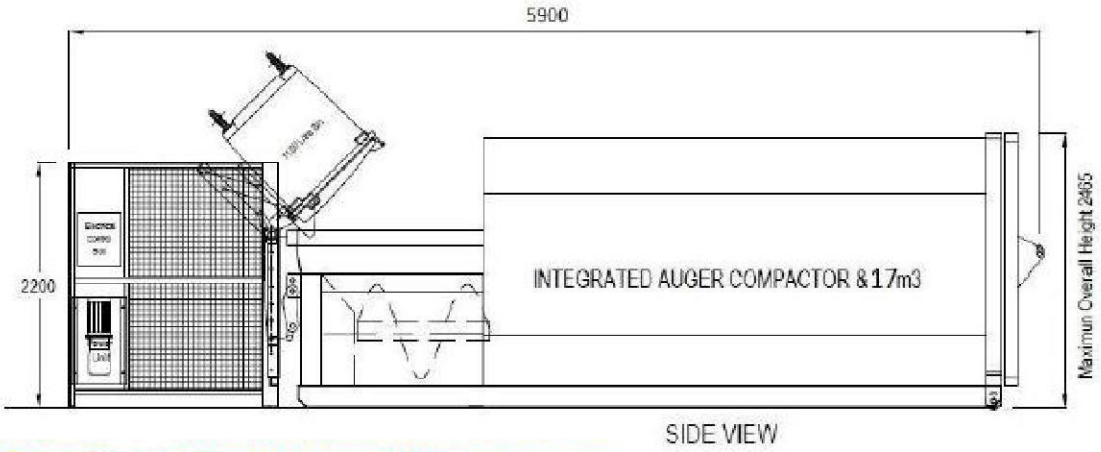
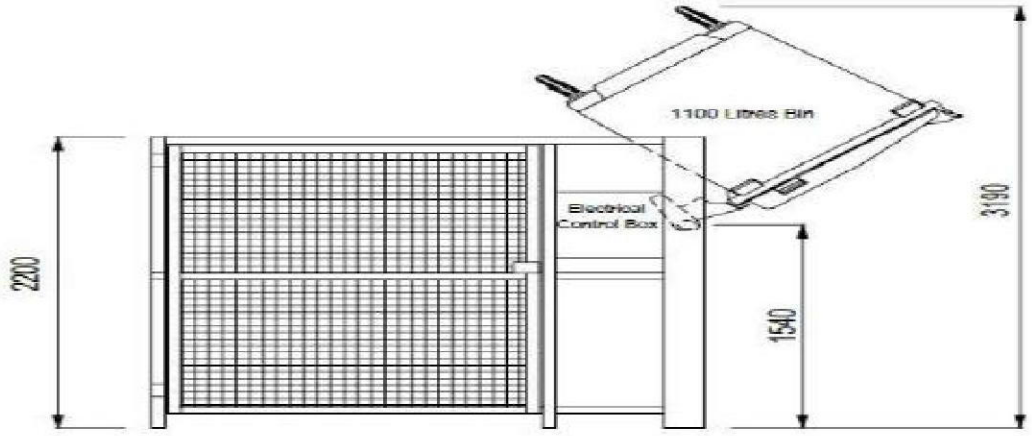


Figure 28: 6.0m Integrated Auger schematic side view

7.3.4 Guide Rail Specifications



SIDE VIEW

Figure 29: Integrated Auger Guide rails plan view

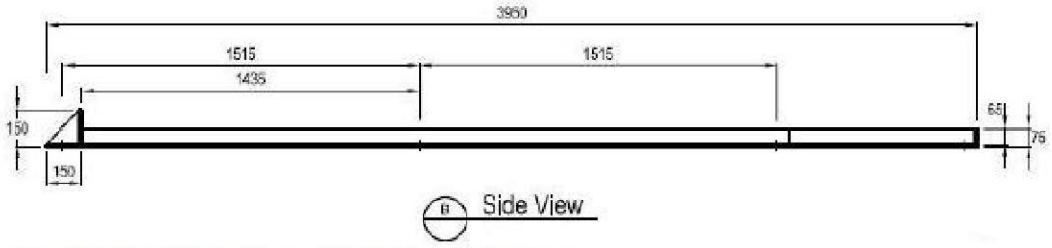


Figure 30: Integrated Auger Guide rails side view

7.3.5 Bin Lifter Specifications

Description	Specifications
Bin Capacity	1100L Bin
Lifter Capacity	350kg
Electric Motor	3kw
Power Supply	412V, 3 phase, 10amp, 5 pin

Table 12: Operational specifications for the operation of 1100L bin lifters

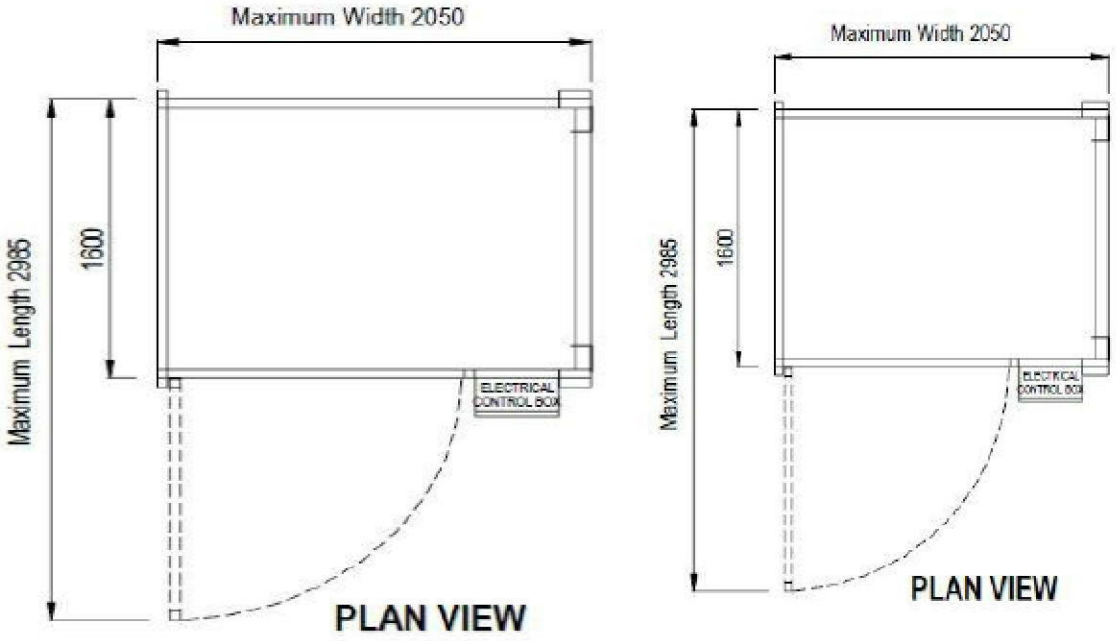
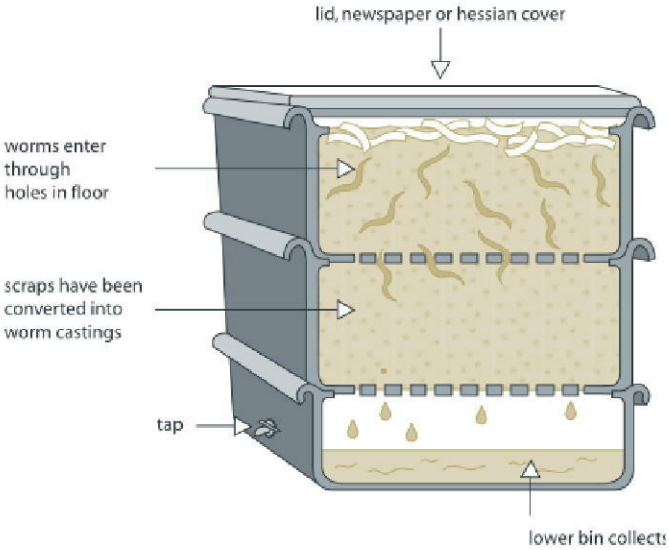


Figure 31: 1100L bin lifter schematic side and plan view

APPENDIX C.7 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.8 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.9 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.10 TYPICAL PUBLIC PLACE WASTE BINS

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

SOURCE: *SULO Environmental Technology*