

WASTE MANAGEMENT PLAN

PREPARED FOR
CROWN INTERNATIONAL HOLDINGS GROUP

V BY CROWN
45-47 MACQUARIE STREET &
134-140 MARSDEN STREET
PARRAMATTA NSW

AMENDED AUGUST 2014



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ABOUT ELEPHANTS FOOT

Elephants Foot Recycling Solutions is a family owned Australian company whose philosophy is providing quality recycling and waste solutions through product innovation. We are Australia's leading supplier of garbage, recycling and laundry chute systems.

Our team of experts has been proudly assisting architects, builders and developers with advice on how best to solve waste management and odour issues in dwellings since 1976. We have a long history of completed projects within the Australian building environment.

If you require any further information please do not hesitate to call me on 1800 025 073.

Regards




Eddy Saidi
Director

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EXECUTIVE SUMMARY

This waste management plan covers the ongoing management of waste generated by the mixed development known as *V by Crown*, located at Macquarie Street, Parramatta NSW. (See Site Map p.5)

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 encouraging 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.

The residential waste and recycling will be guided by the services and acceptance criteria of Parramatta City Council.

PARRAMATTA 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 Parramatta 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 Parramatta City Council's *Development Control Plan 2011* and *Waste Avoidance and Resource Recovery Plan 2007*, NSW Office of Environment and Heritage's *Model Waste Not Development Control Plan Chapter 2008*, Australian Standards and statutory requirements.

OBJECTIVES

- encourage building design that will minimise waste generation over the lifetime of the building
- ensure that the disposal of waste generated by a building's occupants over its lifetime is managed appropriately and efficiently
- ensure that waste storage facilities are located appropriately and do not impact negatively on the streetscape
- ensure that waste can be effectively collected and managed
- assist in achieving Federal and State Government waste minimisation targets.

WASTE AVOIDANCE AND RESOURCE RECOVERY PRINCIPLES

WARR Principle 1: Council believes that the priority for waste management is to reduce consumption in the first place. In adopting this position, Council recognises that products and services will be consumed. As a result the second priority will be on managing the waste generated as a resource.

WARR Principle 2: Council believes that source separation is essential for any waste collection or treatment approach. In adopting this position, Council recognises that there is no one single solution to waste treatment and that a suite of techniques is required.

WARR Principle 3: Council believes that the disposal of waste is the direct responsibility of the individual or business that produced it. In adopting this position, Council recognises that currently it is difficult for individuals to reduce their waste. Council therefore will assist residents in managing their waste. Council also recognises that business, government and the community will need to work together to bring about continuous improvement in managing our waste.

WARR Principle 4: Council will work towards the concept of zero waste. In doing so it will develop short term targets and continually review and improve its actions as technology changes. In adopting this position, Council recognises that this is a long term goal and that Council only has a limited influence in total waste management.

WARR Principle 5: Council believes that it is important to prioritise different products and sectors in order to efficiently work towards zero waste. In adopting this position, Council recognises that some products or sectors may achieve this more readily than others.

GENERATED WASTE VOLUMES

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

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.

WASTE DEFINITION

Garbage:	all domestic waste (except recyclables and green waste)
Recycling:	glass bottles and jars – PET, HDPE and PVC plastics; aluminium, aerosol and steel cans; milk and just 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 prunings, plants and flowers, and weeds.
MGB:	Mobile Garbage Bin
L:	Litres

BUILDING MANAGER/ WASTE CARETAKER

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

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 will depend 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
- 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

Educational material encouraging correct separation of garbage and recycling items must be provided to each resident to ensure correct use of the recycling chute and to ensure an understanding of the chute's use. 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 contamination in the collection MGB as well as chute blockages.

It is also recommended that the development's website (if available) 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 place 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 commercial/retail operations contain direction on waste management services and expectations.

INTRODUCTION

The following waste management plan pertains to the complete mixed located at V by Crown, Macquarie Street, Parramatta NSW. This waste management plan is an operational waste management plan and will address the phases of the completed residential and make recommendations for the management of retail waste.

The plan outlines measures to achieve the following objectives:

- avoid the generation of unnecessary waste;
- minimise the quantities of wastes generated ending up as landfill;
- recover, reuse and recycle waste generated onsite where possible; and
- aim to achieve Federal and State Government waste minimisation targets in accordance with regional waste plans.

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

- one 29-level tower with residential units and basement car parking levels
- 593 residential units in total – see unit mix below
- 1917.5 sqm of retail space (includes interpretive centres)
- Residential amenities of 497.3sqm
- Conference facilities area – 665.8 sqm
- Common areas (lobbies) 484.8 sqm

UNIT MIX

Type	Studio	1Bed	1Bed+S	2Bed	2Bed+S	2BedDual	3Bed	3BedDual	Total
Res	85	113	195	142	33	4	12	9	593
Mix	14.3%	19.1%	32.9%	23.9%	5.6%	0.7%	2.0%	1.5%	100%

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

WASTE

This assessment of waste volumes is an estimate only and will be influenced by the development's management and occupants' attitude to waste disposal and recycling. We have based our calculations on a seven day operating week for residential.

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.

WASTE CARETAKER

It is assumed that building management will appoint a waste caretaker to manage required staffing and all management pertaining to the waste operations of the building. All equipment movements in the room are managed by the building manager/waste caretaker at all times. No residents will be allowed to transport waste or recyclables from the waste room; tenants will only transport their waste to the room allocated.

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 will be dependent upon waste generation and will be determined based upon building operation)
- Organising, maintaining and cleaning the general and recycled waste holding areas (Frequency will be dependent upon waste generation and will be determined based upon building operation)
- Educating and updating all tenants on sorting methods for recycled waste into appropriate receptacles, ensuring all waste drop-off points safe and accessible to tenants at all times
- Supplying instructional signage in each waste compartment
- Organising both garbage and recycled waste pick-ups as required
- Cleaning and exchanging all bins

LOCATION, EQUIPMENT AND SYSTEMS USED FOR MANAGING WASTE

The waste management system is summarised as follows:

- Apartment receptacles (under bench kitchen bins for garbage and recycling)
- Retail receptacles (BOH, for work/amenity areas)
- Residential waste compartments (located at every residential level)
- Garbage chute with recycling eDiverter for each building (with residential level intakes and bin store discharge)
- Residential and retail bins stores (located at ground level)
- All collection bins (stored within above bin areas)

RESIDENTIAL UNITS

Council references the NSW Office of Environment and Heritage, *Model Waste Not Development Control Plan Chapter 2008* for waste generation rates. Using these rates, the total waste generated by the development can be calculated as follows:

Waste: 80 litres (L) per unit/week
 Recycling: 40 litres (L) per unit/week

Table 1 – Residential waste generation

Units	Waste (L)	Compaction 2:1	Recycling (L)	Waste MGB	Recycling MGB
593	47,440L	23,720L	23,720	22 x 1100L	22 x 1100L

Table 2 – Residential bin summary

Collections →	5 x weekly	4 x weekly	3 x weekly	2 x weekly
Garbage	5 x 1100L	6 x 1100L	8 x 1100L	11 x 1100L
Recycle	5 x 1100L	6 x 1100L	8 x 1100L	11 x 1100L

The above assumptions have been taken into consideration for the calculation of these figures:

- Garbage is compacted 2:1 at the base of each chute;
- Recycling is not compacted;
- Number of bins have been rounded up for best operational outcome; and
- *Garbage and recycling bin numbers based on various collection cycles weekly (See Residential bin summary above)

*NB: Council does not collect dumpster/bulk bins. Private waste collection will need to be arranged if this service is proposed.

COMPOSTING

Composting at this site is considered impractical with minimal requirement for onsite compost however residents may choose to purchase apartment style compost bins to self-manage. (See Appendix 1 – Waste Management Equipment).

RESIDENTIAL WASTE MANAGEMENT SYSTEM

All residents will be supplied with a collection area in each unit (generally in the kitchen, under bench) to deposit waste and collect recyclable material suitable for one days storage. Residents should wrap or bag their waste.

Recycling must not be bagged. It is recommend that residents use a crate or dedicated bin for collecting recyclables within the allocated residential space provided to ensure correct separation before using the chute system.

Once putrescible and recyclable waste streams are separated, the resident will carry these to the waste compartment housing the chute door and deposit bagged waste and loose recyclables.

Residents will select a recycling or waste function button located on each chute door. Direction on using the diversion system will be prominently displayed on each chute door. (See Appendix 5 - Typical Waste Chute Outlet)

The selection button moves a mechanism that guides either the waste or recycling into the correct collection bin, located in the waste room below. If residents on other levels select the same disposal function, they are able to deposit the same waste at the same time i.e. waste system – all doors will open.

If commingled recycling is chosen during a waste disposal operation, the resident will be required to wait for the diverter to move from the waste bin to the recycling bin function. A wait time of three to ten seconds is the maximum time delay.

The Elephants Foot eDiverter will divert and discharge waste into the 1100 MGB fitted with a carousel compactor and recycling into the 1100 MGB beneath the bottom chute (Note: recycling will not be compacted.)

Note: if a power outage is experienced, the operation will default to the waste MGB.

Council requires maximum storage area for each waste service compartment and doors are required to open outwards.

This project will be collected by private waste service provider, thus 5 x weekly collection for both types will be recommended to reduce odours and the number of bins stored on site.

As per the drawings, there is one waste chute servicing each residential level with waste and recycling discharging into collection bins located in each waste room located on ground level. Full waste and recycling bins will be stored in the same room ready for collection on the same level.

The caretaker/cleaner will be required to check the 1100L MGB collecting waste and recycling from each chute and diverter, rotate full bins to the storage and collection area, and replace empty 1100L MGB under each operation.

RETAIL

As per the drawings, there is 1917.5 sqm of retail space (includes interpretive centres) allocated at ground and level 26. Conference facilities have been added to the generation rates below. A mix of non-food and retail food operations has been assumed in the following waste generation rates as the mix of retailers has not been confirmed:

NON FOOD

Waste: Shop < 100m2 floor area - 50L/100m2 floor area/day

Recycling: Shop < 100m2 floor area - 25L/100m2 floor area/day

Waste: Shop > 100m2 floor area - 50L/100m2 floor area/day

Recycling: Shop > 100m2 floor area - 50L/100m2 floor area/day

FOOD

Waste: 10L/1.5 sqm floor area/day

Recycling: 2L/1.5 sqm floor area/day

OFFICE (assumed for interpretive centre/conference facilities)

Waste: 10L/100m2 floor area/day

Recycling: 10L/100m2 floor area/day

Table 3 – Retail waste generation

Retail Type	NSA	Waste Generation- 7 day cycle	Non recyclable	Recyclable
Int. Centre	451.5	10ltrs/100m2/day – waste 10ltrs/100m2/day – recycle	316.0	316.0
Int. Centre 2	27.0	10ltrs/100m2/day – waste 10ltrs/100m2/day - recycle	18.9	18.9
R01	312.7	50ltrs/100m2/day – waste 50ltrs/100m2/day - recycle	1094.45	1094.45
R02	299.6	50ltrs/100m2/day – waste 50ltrs/100m2/day - recycle	1048.6	1048.6
R03	84.1	50ltrs/100m2/day – waste 25ltrs/100m2/day - recycle	294.35	147.17
R04	311.3	50ltrs/100m2/day – waste 50ltrs/100m2/day - recycle	1089.55	1089.55
R05	92.3	50ltrs/100m2/day – waste 25ltrs/100m2/day - recycle	323.0	161.5
R26	339.0	10L/1.5m2/ floor area/day -waste 2L/1.5m2/ floor area/day -recycle	15,820	3164
Conference	665.8	10ltrs/100m2/day – waste 10ltrs/100m2/day – recycle	466.0	466.0
TOTAL	2583.3		20,470.8L	7506.17L

Table 4 - Retail bin summary

Collections →	Weekly	5 x weekly	4 x weekly	3 x weekly	2 x weekly	Daily
Garbage MGB	19 x 1100L	4 x 1100L	5 x 1100L	7 x 1100L	10 x 1100L	3 x 1100L
Recycling MGB	12 x 660L	3 x 660L	3 x 1100L	4 x 1100L	6 x 1100L	2 x 1100L

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

It is recommended that:

- All waste bins should be bagged and waste bins should be plastic lined
- Bagging of recyclables is not permitted
- All waste collections located BOH during operations and waste and recycling removed to the retail bin room at the end of each trading day;
- Collection services will be contracted to private recycling and waste service providers and collected from the retail bin collection area by arrangement and a schedule to suit the waste generated;
- Bin movements by retail staff/cleaners and collection arrangements are not to impact on any residential 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 cooking oil in a bunded area and for its collection by a recycler;
- The operator will organise grease interceptor trap/s and servicing;
- *Subject to the stakeholders preference/capability (and as built constraints), bin sizes and quantities can be changed. Also, recyclable can either commingled or split into bins for separate recycling streams
- Additional collections of retail bins may be required to reduce odour therefore more frequent collections may be required. The operator shall choose a private waste collection provider, negotiate a service agreement, and pay for these services.
- 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.
- Paper towels (if used) from washroom facilities should be emptied by cleaners on a daily basis.

GREEN WASTE

There will be green waste generated by the building's landscaping. Any green waste will be collected and removed from site by the maintenance contractor.

COMMON AREAS

The retail and common areas, circulation areas, offices and residents amenities will be supplied with suitably branded waste and recycling receptacles. Building management will monitor use and ensure bins are exchanged and cleaned. (See Appendix 1 – Waste Management Equipment)

OTHER WASTE STREAMS

A room or caged area must be allocated for the storage of discarded bulky items and recyclable electronic goods and sign marked appropriately. The allocated space must be a minimum of 8m³. Recyclable electronic goods include batteries, equipment containing printed circuit boards, computers, televisions, fluorescent tubes and smoke detectors.

Building management will work to identify opportunities to expand the range of material collected and opportunities for recycling e.g. toner cartridges, mobile phones, fluorescent lamps and electronic waste and arrange for regular clearance to suit the amounts collected.

Residents should be updated by building management regarding any recycling system upgrades e.g. new materials that can be recycled so continuing and improving recycling and disposal streams can be addressed.

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. (See Useful Contacts)

WASTE ROOM AREAS

Separate waste storage areas must be provided for residential and business uses in mixed use developments.

Each garbage room will need to hold all bins generated weekly, and allow enough room to clean and safely manoeuvre bins as well as accommodate the eDiverter system and carousel compactor in the residential waste room. The recommended space for each garbage room (*not including any equipment*) is as per the below table. An assumption of 5 x weekly collections has been made for residential and daily collections for retail.

Table 5 – Storage areas (sqm)

Waste room	Raw bin space	Total area recommended*
Residential	16	26
Retail	8	18

*Includes 10sqm for manoeuvrability

WASTE CHUTES

The waste chutes for the residential building are supplied per the following specifications:

- Either 600mm galvanised steel or 600mm recycled LLDPE polyethylene plastic with 2-hour fire rated doors
- Galvanised steel chutes or plastic chutes are fully wrapped with 50mm poly-wool R1.3 noise insulation foil to assist in noise reduction
- Chutes are fixed to each slab level with galvanised steel brackets and Dynabolts
- 30 mm Embleton Neoprene rubber isolation mounts under brackets on all levels
- Mounting brackets are site specific to accommodate penetrations or building shafts
- penetrations on each building level at vertically perpendicular points with minimum penetration dimensions of 700mm x 700mm for galvanised steel (square or round) are required to accommodate the chute installation
- Chute is supplied with a vent exiting at the top of each chute, openings for placement of fire sprinklers on every second level and wash down system.
- Council and supplier require that all chutes are installed without offsets to achieve best practise operationally for the building
- Two hour fire-rated (AS1530.4-2005) stainless steel refuse chute doors and throat assemblies are fitted at each required service level. All doors are fitted with a bottom hinged, self-closing mechanism, electronic lock out solenoid, connecting controls ready for wiring to diverter control box

EDIVERTER

The residential waste room will be supplied with an Elephants Foot eDiverter waste and recycling diversion system. Bottom chutes will direct product into dual linear systems for garbage and recycling MGB. The garbage will be compacted 2:1 however recycling will not be compacted. (See Appendix 3 – eDiverter)

eDiverter specifications:

- Split system body 5mm plate with two bottom out lets
- Steel impact hopper for garbage and recycling products
- Hopper bin feeds and containments which flow waste and recyclables directly into collection bins
- Shut out door with manual over ride to close off chute fitted with fusible link
- Internal diverter plate 5mm activated by a hydraulic cylinder
- Hydraulic power pack with single phase 0.55kw motor and all associated connections
- PLC control box in garbage room, programmed to operate diverter and lock out doors
- 12 core 24 volt cables mounted to the external of chute pipes
- Doors fitted with electronic lock out normally closed solenoid
- At each level above every chute door, four bottom operating switch board
- Electric connections at each station
- System connections and operation from every level - test and commission
- Additional power supply is to be fitted on every 10th level
- Access hatches will be supplied for every 10 levels

CAROUSEL & LINEAR SYSTEMS

The eDiverter system will divert garbage and recycling into 1100L MGB collection bins on a carousel and linear track system which will move full bins forward and replace an empty bin under the diversion discharge.

Carousel track

- Manufactured with 9.53mm pipes
- Trays 3mm galvanised steel
- Motor and gear box, 0.375kw, 415 volt motor on 100:1 reduction gear box
- 1 full turn per minute
- Ring gear 240 teeth
- Torque 2.5 tonnes
- Floor mounted

The bin compactor is designed to fit over standard plastic bins: 240, 660 and 1100L MGB. Compaction ratio is 2:1.

Compactor specification

- Motor 0.55kw, 415 volts, 6 poles
- Body 5mm EFWC design
- Main drive sprocket 17 teeth x 3/8 pitch
- Rod drive sprocket 57 teeth 3/8 pitch
- Ram thrust force 1 tonne
- Driving rod 1 1/8 UNC threaded bar
- Ceiling and floor mounting (subject to design of room)

Linear tracks specifications

- Main tray manufactured from 3mm galvanised steel
- Drive motor 0.55 kw, 415 volts, 4 pole
- Drive rod 1 1/8 UNC threaded bar
- Speed 3m per minute
- Carry weight 1.5 tonnes
- Floor mounted

ACOUSTIC

It is recommended that the walls of the shaft area surrounding the chutes and the chute hopper system construction be built to an Rw 50 construction.

This is required to ensure acoustic compliance with typically recommended noise levels. Please note that noise from garbage chutes is not regulated by the BCA.

The following are acoustic criteria that are typically recommended as a satisfactory internal noise level in apartments during the use of chute systems:

Space Type	Allowable Maximum Level dB(A)L max
Bedrooms	30
Living Room	35

(Source: Acoustic Logic)

RESIDENTIAL CHUTE SUMMARY

Galvanised steel or recycled LLDPE polyethylene plastic chutes, as supplied by Elephants Foot Recycling Solutions (or similar): One required with eDiverter system and one (1) carousel compactor system (waste) and linear system (recycling) both suitable for 1100L MGB.

Optional: bin tug and/or bin lifting equipment (See Useful Contacts)

COLLECTION OF WASTE

All bins will be stored in the waste bin room located on ground level and collected from the loading bay located on the same level. Bins will be moved to the loading bay when full with collections by contractor/s on an allocated schedule.

Residential bins:

- Prior to the scheduled collection/s, the bins will be transferred to the loading area and returned into the building once the collection is completed
- The waste collections will be carried out by side and rear lift vehicles (*See Appendix 7 – Typical Collection Vehicle Specifications*)

Retail bins:

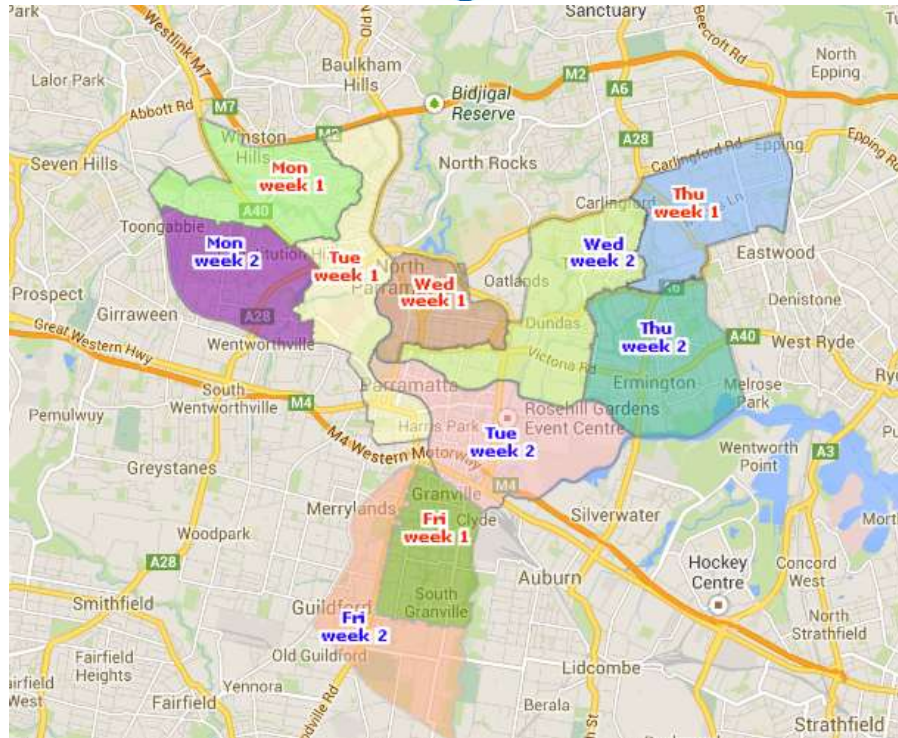
- A private contractor will collect waste and recycling from the loading area during off-peak traffic periods on a scheduled basis
- The waste collections will be carried out by side and rear lift vehicles *See Appendix 7 – Typical Collection Vehicle Specifications*)
- Bins will be removed from the retail bin storage room by the appointed contractor and returned to the room once the collection is completed

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

As a private waste collection vehicle be required to enter a property, access driveways and internal roads must be designed to provide adequate clearance and manoeuvring space to allow the waste collection vehicle to enter and exit in a forward direction without impeding upon general access to, from or within the site.

Where bulk bins are proposed, access is to be provided from the street level without the need for manual handling with sufficient space for the collection vehicle to drive to the collection point, empty the bin safely and exit without traffic interference or any height restrictions. This service is generally not provided by Council's waste contractor and arrangements will need to be made for private collections.

Please ensure bins are placed out the evening prior to collection as collection can occur at any time between 6am and 5pm.



Source: Parramatta City Council website

Further information on garbage and recycling collection areas and days is available via the Council website www.parracity.nsw.gov.au

WASTE ROOMS AND AREAS

There is one residential waste room fitted with an eDiverter by Elephants Foot® , 1 x carousel compactor system and 1 x linear system both suitable for four 1100L MGB located under the chute.

GARBAGE ROOMS CONSTRUCTION AND REQUIREMENTS

The garbage room will be required to contain the following facilities to minimise odours, 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 floor surface is flat and even
- All corners coved and sealed 100 mm 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 (Sensor lighting recommended)
- Waste rooms must be well lit
- Optional automatic odour and pest control system installed to eliminate all pest types. This process generally takes place at building handover – building management will contract their system and supplier. Please note that odour systems spraying product directly onto galvanised steel surfaces may cause corrosion. (*See Useful Contacts*)
- All personnel doors are hinged and self-closing
- Appropriate signage prominently displayed on walls and above all bins clearly stating what type of waste or recyclable is to be placed in the bin underneath
- Building management/caretaker is responsible for waste room signage and further education after building handover
- Waste collection area must hold all bins – bin movements should be with ease of access
- Following waste collection activities, bins shall be returned to the storeroom areas as quickly as practicable.
- Design and construction of waste facilities will conform to the Building Code of Australia, Australian Standards and local laws
- Childproofing and public/operator safety shall be assessed and ensured
- Signage directing chute operations regarding waste and recycling will be posted on each chute door
- All waste bins hidden from external view and stored in the designated onsite areas

- 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.
- All chute doors on all levels will be labelled with signs encouraging occupants to recycle and minimise their waste.
- Separate signage instructing residents on how and where to place recycling will also be placed on each level by building management.

SIGNAGE

The building manager/caretaker is responsible for waste room signage. 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 levels will be labelled with directions on use. Separate signage will direct chute operations and encouraging occupants to recycle and minimise their waste.

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
- 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 and information supplied by the project architect
- 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 waste management.
- 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.
- Any manual handling equipment should be provided at the recommendation of the appropriate equipment provider who will assess the correct equipment for supply.



USEFUL CONTACTS

Parramatta City Council
PO Box 32
Parramatta NSW 2124
Customer Service: 02 9265 9333 (Monday to Friday 8:30am – 4:30pm)
Email: council@parracity.nsw.gov.au

Capital City Waste Services (Waste services & secure documentation provider)
Phone: 02 9599 9999

Remondis (Waste services & secure documentation provider)
Phone: 13 73 73

SULO MGB (MGB, Public Place bins, tugs and bin hitches)
Phone: 1300 364 388

RUD (Public place bins, recycling bins)
Phone: 07 3712 8000
Info@rud.com.au

ELECTRODRIVE (Bin movers)
Phone: 1800 333 002

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 (1300 ODOURS)
sales@purifyingsolutions.com.au

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

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

APPENDIX 1 – WASTE MANAGEMENT EQUIPMENT

COUNCIL BIN TYPES

	Type	Size / Load Capacity	Lid Colour	Frequency of collection	Upsize availability
	Garbage Bin	140L / 70kg	Red or Green	Weekly	Yes (SUD only)
	Comments Upsize is available to Single Unit Dwellings (SUDs) at an additional cost. Bin lids are slowly being replaced with red lids. Please do not be alarmed if they are still green.				
	Recycling Bin	240L / 70kg	Yellow	Fortnightly	No
	Comments Multi Unit Dwellings (MUDs) generally share one between two households.				
	Garden Bin	240L / 70kg	Lime Green or Dark Green	Fortnightly	No
	Comments Multi Unit Dwellings (MUDs) generally do not have these bins, unless requested by the Body Corp and/or Strata Management. Bin lids are slowly being replaced with lime green lids. Please do not be alarmed if they are still dark green.				

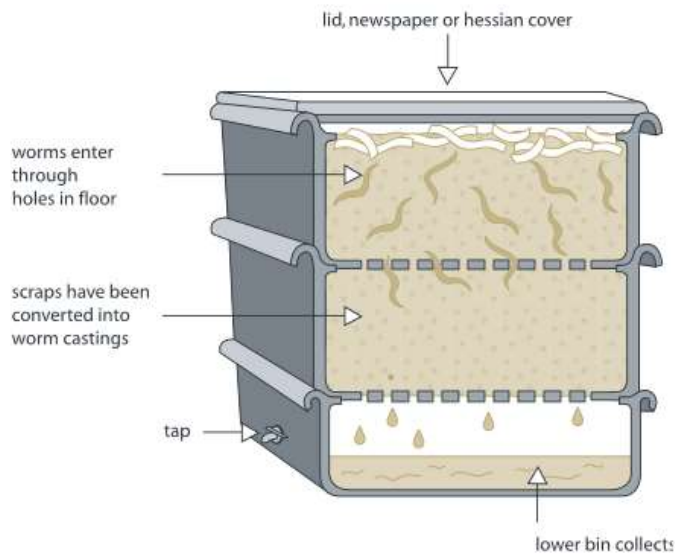
INDICATIVE BIN SIZES

The below sizes are indicative only and is to be used as a guide only. Sizes may differ according to manufacturer, if bins have flat or dome lids and if lifting devices are used.

Bin Type	Height (mm)	Depth (mm)	Width (mm)
80L	870	530	450
120L	940	560	485
140L	1065	540	500
240L	1080	735	580
660L*	1250	850	1370
1100L*	1470	1245	1370

*not collected by Council.

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*

COMPOST BINS AND PILES



The footprint area requirement for a typical compost pile is 1000m x 1000m.

A variety of compost bins are available from manufacturers or through many local councils.

There are many compost bin and compost pile 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*



Typical Apartment Compost bin

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 2 – SIGNAGE FOR WASTE AND RECYCLING BINS

WASTE SIGNS

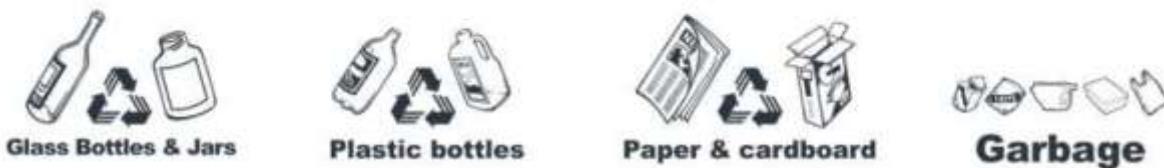
Signs for garbage, recycling and organics bins should comply with the standard signs promoted by the Department of Environment and Heritage.

The Parramatta City Council offers free waste education resources, including stickers for bins and signs for bin rooms, and brochures.

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.

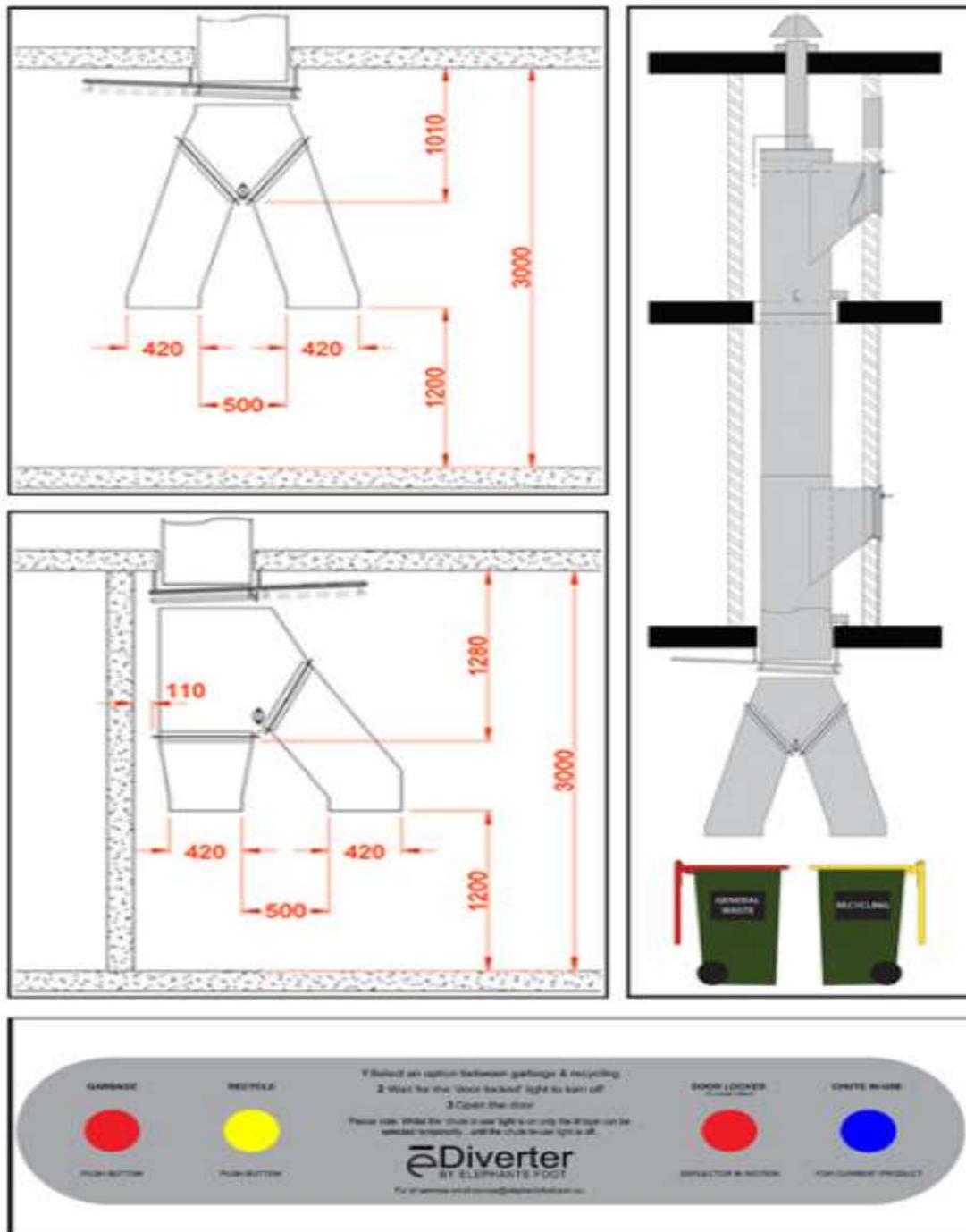
Examples of Australian Standards:



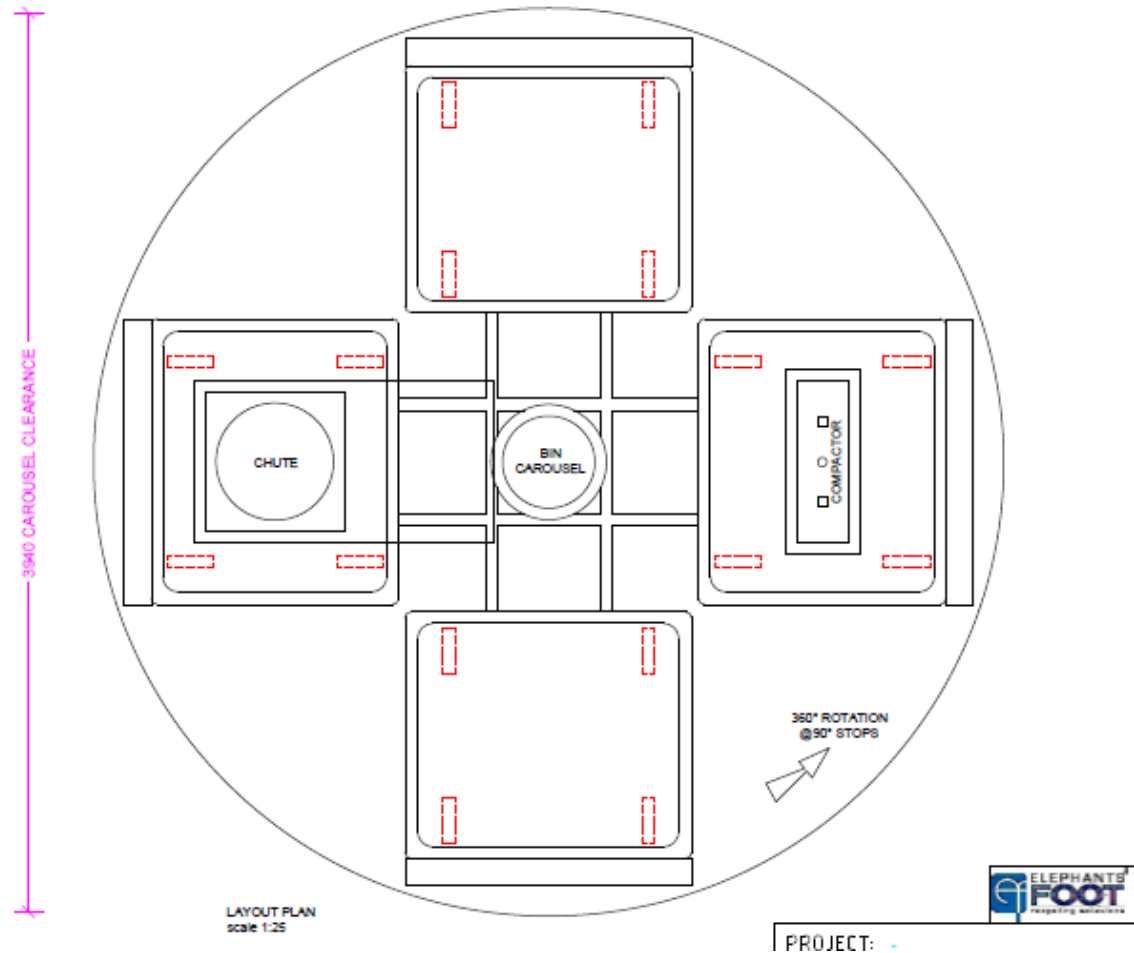
Australian Standards are available from the SAI Global Limited website (www.saiglobal.com).

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

APPENDIX 3 – EDIVERTER



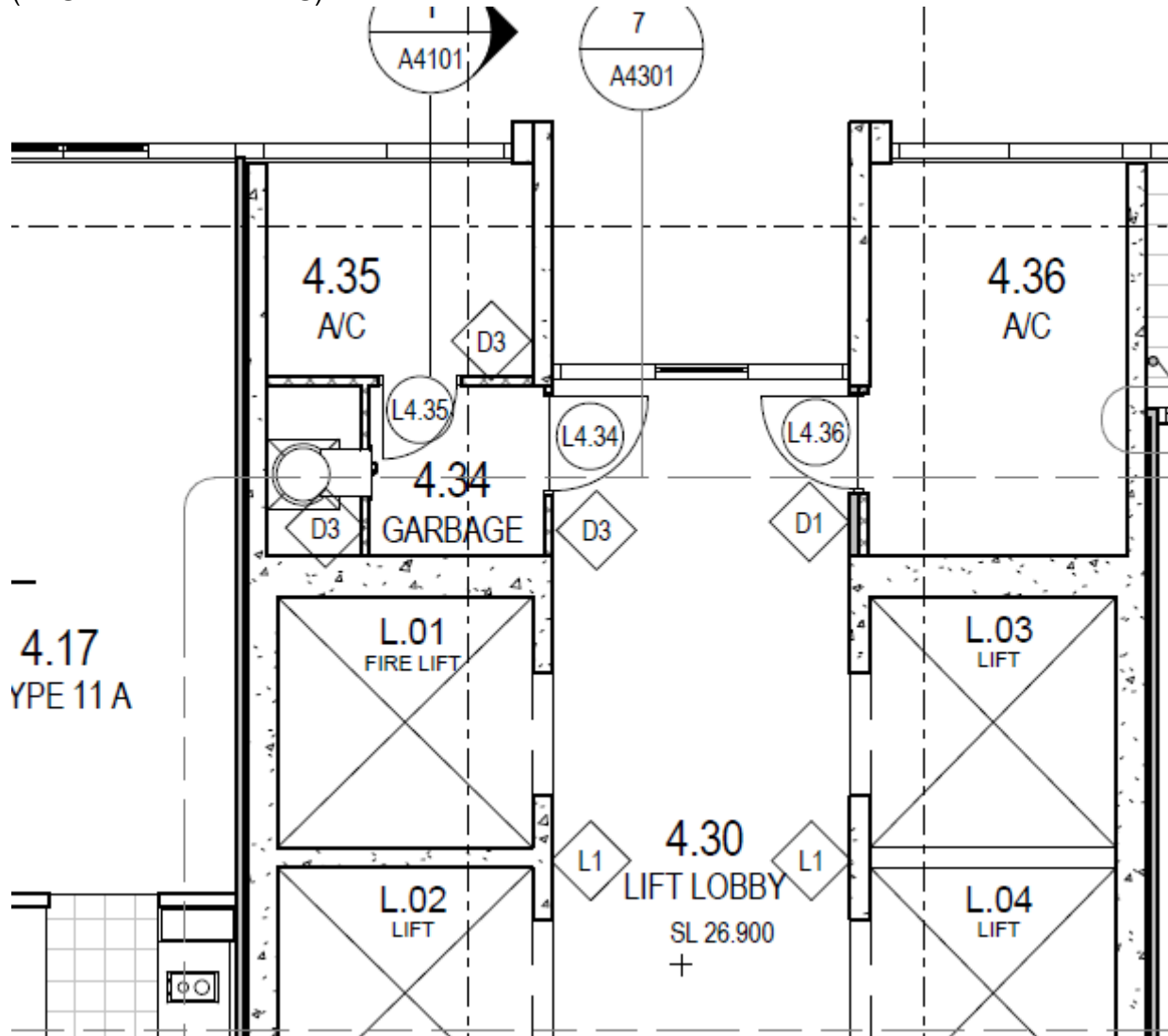
APPENDIX 4 – TYPICAL CAROUSEL SYSTEM



BENEFITS:

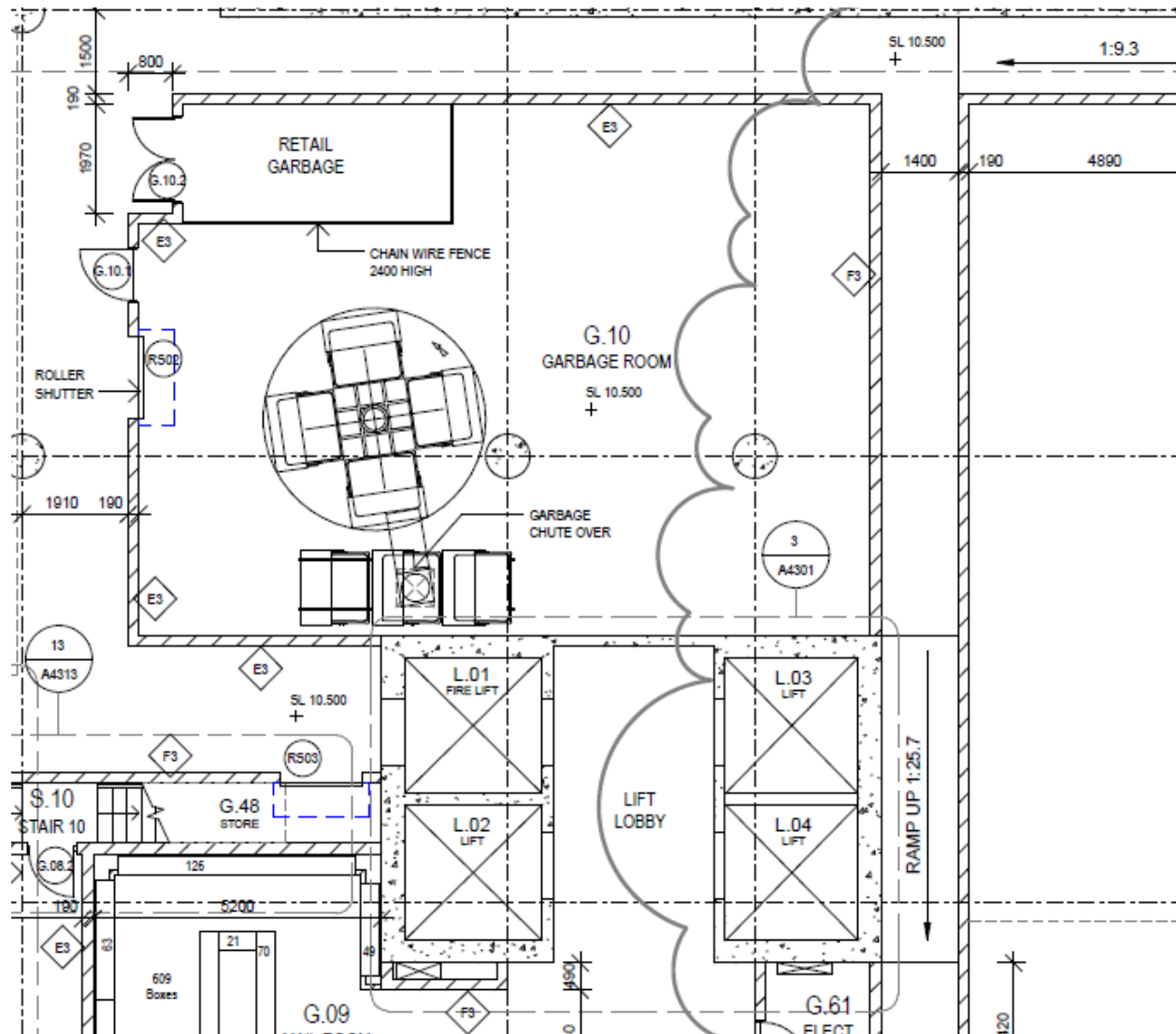
- Built for under chute systems in high rise buildings
- Waste falls directly into bins
- Compacts directly into the 1100L MGBs
- Fully automatic compaction (2:1 ratio)
- Minimise strata costs
- Low cost maintenance

APPENDIX 5 – TYPICAL WASTE CHUTE OUTLET (RESIDENTIAL LEVELS)



APPENDIX 6 – WASTE ROOMS GROUND FLOOR

RESIDENTIAL - INCLUDES RETAIL BIN STORE



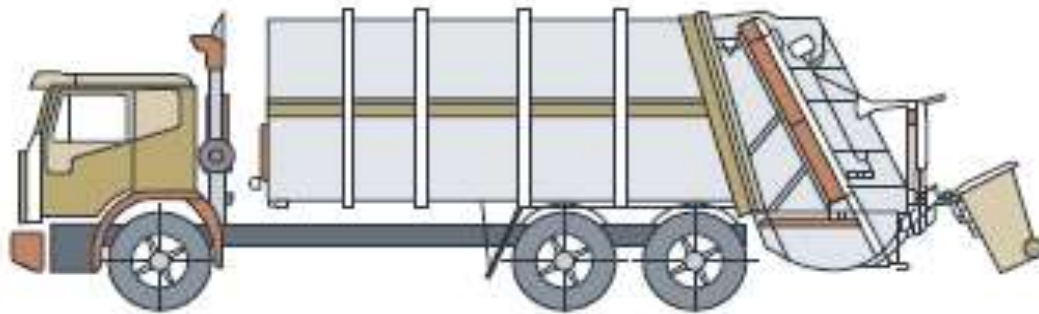
APPENDIX 7 – TYPICAL COLLECTION VEHICLE SPECIFICATIONS

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

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

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.

Vehicle access/Turning circles

General

Appropriate heavy vehicle standards should be incorporated into the development design including those specified in Acts, regulations, guidelines, and codes administered by Austroads, Standards Australia, the NSW Roads and Traffic Authority, NSW WorkCover and any local traffic requirements.

Designers are encouraged to consult with council and other relevant authorities prior to the design of roads and access points to ascertain specific requirements for the proposed development.

Road and driveway construction and geometry

Roads and driveways must be designed and constructed in accordance with the relevant authority requirements to allow the safe passage of a laden collection vehicle in all seasons.

Factors to be considered in design include:

- gradients for turning heads;
- longitudinal road gradients;
- horizontal alignments;
- vertical curves;
- cross-falls;
- carriageway width;
- verges;
- pavement widths;
- turning areas (see below);
- local area traffic management requirements (for example speed humps);
- sight distance requirements;
- clearance heights (for example a vertical clearance of 6.5m is required to load front-lift vehicles);
- manoeuvring clearance; and
- road strength (Industrial-type strength pavement required, designed for a maximum wheel loading of seven tonnes per axle to accommodate garbage and recycling collection vehicles).