WASTE MANAGEMENT PLAN

IVANHOE ESTATE

Mixed Use Development

MASTERPLAN

PREPARED FOR

FRASERS PROPERTY AUSTRALIA
MISSION AUSTRALIA HOUSING

11/09/2019

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EXECUTIVE SUMMARY

This waste management plan covers the ongoing management of waste generated by the mixed use development located at Ivanhoe Estate.

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.

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INTRODUCTION

The following waste management plan pertains to the mixed use development located at Ivanhoe Estate. 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:

- Approximately 3307 dwellings (subject to future Development Applications and design development)
    - Retail units covering a total GFA of approx. 960 m^2
    - Commercial offices covering a total GFA of approx. 500 m^2
    - Child care centre covering a total GFA of : 700 m^2
    - Community centre covering a total GFA of approx. 2000 m^2
    - A school covering a total GFA of 3500 m^2
    - Aged care facility

The school, child care centres, community centre and RACF will be the subject of future separate waste management reports by each of these operators once they are involved in the development and submit separate DAs. Basic waste generation calculations have been provided in an effort to accommodate these parts of the development with regards to servicing and waste areas.

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

CITY OF RYDE COUNCIL

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

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

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

OBJECTIVES

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

GENERATED WASTE VOLUMES

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

CONSTRUCTION AND DEVELOPMENT WASTE

The head contractor will be responsible for removing all construction-related waste offsite in a manner that meets all authority requirements. Construction waste management plans will be submitted with each stage Development Application. A letter from Bingo has been included in the Appendices of this report.

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.

WASTE GENERATION TOTALS

RESIDENTIAL

Table 1: *Development Total Waste Generation – Residential*

STAGE	Building / Core	Approx # Units	Waste Calculation (L/unit/week)	Generated Waste (L/week)	Recycling Calculation (L/unit/week)	Generated Recycling (L/week)	1100L MGB per week	1100L MGB per day	660L MGB per week)	660L MGB per day	Service Bins
1	A1	269	120	32280	80	21520	30	5.0	33	5.0	2
	C1	471	120	56520	80	37680	52	8.0	58	9.0	2
	TOTAL	**740**		**88800**		**59200**	**82**	11.5	**91**	12.8	
2	A2	101	120	12120	80	8080	12	2.0	13	2.0	2
	C3	167	120	20040	80	13360	19	3.0	21	3.0	2
	TOTAL	**268**		**32160**		**21440**	**31**	4.2	**34**	4.6	
3	A3	122	120	14640	80	9760	14	2.0	15	3.0	2
	D1	395	120	47400	80	31600	44	7.0	48	7.0	2
	TOTAL	**517**		**62040**		**41360**	**58**	8.1	**63**	9.0	
4	D2	191	120	22920	80	15280	21	3.0	24	4.0	2
	TOTAL	**191**		**22920**		**15280**	**21**	3.0	**24**	3.3	
5	D3	214	120	25680	80	17120	24	4.0	26	4.0	2
	TOTAL	**214**		**25680**		**17120**	**24**	3.3	**26**	3.7	
6	D4	478	120	57360	80	38240	53	8.0	58	9.0	2
	TOTAL	**478**		**57360**		**38240**	**53**	7.4	**58**	8.3	
7	B1	92	120	11040	80	7360	11	2.0	12	2.0	2
	B3	210	120	25200	80	16800	23	4.0	26	4.0	2
	TOTAL	**302**		**36240**		**24160**	**34**	4.7	**38**	5.2	
8	C4	501	120	60120	80	40080	55	8.0	61	9.0	2
	TOTAL	**501**		**60120**		**40080**	**55**	7.8	**61**	8.7	
Stage A	B1.3/4	96	120	11520	80	7680	11	2.0	12	2.0	2
OVERALL TOTAL		**3307**		**396840**		**264560**	**369**		**407**	57.3	**26**

COLLECTION OPTIONS AND BIN QUANTITIES

Garbage collected twice weekly = 185 x 1100L MGBs

Recycling collected twice weekly = 204 x 660L MGBs

Garbage collected three times weekly = 123 x 1100L MGBs

Recycling collected twice weekly = 204 x 660L MGBs

RETAIL/COMMUNITY

Table 2: *Development Total Waste Generation – Retail*

Type	NLA (m^2)	Waste Calculation (L/100m^2/day)	Generated Waste (L/week)	Recycling Calculation (L/100m^2/day)	Generated Recycling (L/week)
Retail	960	50	3360	50	3360
Office	500	10	350	10	350
TOTAL	**1460**		**3710**		**3710**

Table 3: *Stage 1 Bin Summary – Retail*

Garbage			Recycling		
Bin Capacity (L)	Quantity	Collection Rate (times/week)	Bin Capacity (L)	Quantity	Collection Rate (times/week)
1100	2	2	1100	2	2

CHILDCARE

Table 4: *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)
Childcare	700	20	980	20	980
TOTAL	**700**		**980**		**980**

Table 14: *Stage 1 Bin Summary – Childcare*

Garbage			Recycling		
Bin Capacity (L)	Quantity	Collection Rate (times/week)	Bin Capacity (L)	Quantity	Collection Rate (times/week)
1100	1	1	1100	1	1

COMMUNITY CENTRE

Table 5: *Development Total Waste Generation – Community Centre*

Type	NLA (m^2)	Waste Calculation (L/100m^2/day)	Generated Waste (L/week)	Recycling Calculation (L/100m^2/day)	Generated Recycling (L/week)
CC	2000	20	2800	20	2800
TOTAL	**2000**		**2800**		**2800**

Table 14: *Stage 1 Bin Summary – Community Centre*

	Garbage			Recycling		
Building/Waste Rooms	Bin Capacity (L)	Quantity	Collection Rate (times/week)	Bin Capacity (L)	Quantity	Collection Rate (times/week)
RACF	1100	2	2	1100	2	2

RACF

Table 6: *Calculated Waste Generation – RACF*

	# Units	Waste Calculation (L/unit/week)	Generated Waste (L/week)	Recycling Calculation (L/unit/week)	Generated Recycling (L/week)
RACF	120	60	7200	60	7200
TOTAL	**120**		**7200**		**7200**

Table 14: *Stage 1 Bin Summary – RACF*

	Garbage			Recycling		
Building/Waste Rooms	Bin Capacity (L)	Quantity	Collection Rate (times/week)	Bin Capacity (L)	Quantity	Collection Rate (times/week)
RACF	1100	3	3	1100	4	2

SCHOOL

Table 7: *Calculated Waste Generation – School*

Type	NLA (m^2)	Waste Calculation (L/100m^2/day)	Generated Waste (L/week)	Recycling Calculation (L/100m^2/day)	Generated Recycling (L/week)
School	3500	20	4900	20	4900
TOTAL	**3500**		**4900**		**4900**

Table 14: *Stage 1 Bin Summary – School*

Garbage			Recycling		
Bin Capacity (L)	Quantity	Collection Rate (times/week)	Bin Capacity (L)	Quantity	Collection Rate (times/week)
1100	2	3	1100	3	2

WASTE MANAGEMENT

Dual chutes will be installed into each core. Breakdown is as follows:

RESIDENTIAL

Each residential level will have two (2) chute doors installed for garbage and recycling disposal (*see APPENDIX C.1*).

Garbage and recycling discharge into 1100L and 660L MGBs at the base of the chute system. There will also be two spare MGBs to be utilised during collection times. The discharge is located in the basement discharge room on the basement level of each.

Full bins will be transferred to one of multiple bin holding areas for collection.

WASTE HANDLING

WASTE

All residents of each building will be supplied with a collection area in each unit (generally in the kitchen, under bench or similar alternate area) to deposit garbage and collect recyclable material suitable for one days storage. Residents should wrap or bag their waste. Bagged waste should not exceed 3kg in weight or 35cm x 35cm x 35cm in dimension.
The caretaker/cleaner will be required to check the MGB collecting waste from each chute, rotate full bins to the storage and collection area, and replace empty MGB under each chute operation.

RECYCLING

Cardboard furniture boxes or large cardboard containers should not be included in the waste chute – a cardboard collection bin will be made available to residents to deposit flattened cardboard and will be managed by the waste caretaker. Bins will be located in the garbage and bulky goods area. This will be used for larger cardboard items such as packaging for televisions, pizza boxes, etc.

Recycling that travels via the recycling chute 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. Residents will then dispose of their recyclable materials in the recycling chute, one item at a time. Items should not be grouped in bags as this hinders the recycling recovery.

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

TEMPORARY STORAGE OF BULKY GOODS

A room will be allocated in each of the residential buildings for the storage of discarded residential bulky items. These areas will be made available close to or within the bin holding room for each building. Each area will be a minimum of $5m^2$. It is envisaged that bulky goods will be managed by the building manager/waste caretaker. 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.

RETAIL/COMMUNITY

The tenants will be required to be responsible for their own storage of waste and recycling back of house (BOH). On completion of each trading day or as required, nominated staff/cleaners will transport their waste and recycling to the allocated retail waste area and place waste and recycling into the appropriate collection bins.

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 waste management.

Tenants will be directed to transport empty milk/bread plastic crates to the BOH waste room for storage prior to collection by the supplier. All retail agreements with milk/bread vendors must include regular removal of redundant plastic crates to prevent build-up of material on site. Stacked crates can cause a safety hazard.

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 and place waste and recycling into the appropriate collection bins.

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);
- all flattened cardboard will be collected and removed to the waste room recycling MGB;
- restaurant and café tenant/s are supplied with waste and recycling collection receptacles back of house (BOH) to be transported by restaurant/cafe staff, building management/ cleaners to the collection area daily

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

CHILDCARE CENTRE

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 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.

WASHROOMS

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

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

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.

GREEN WASTE

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

OTHER WASTE STREAMS

Disposal or recycling of electronic, liquid waste and home detox (paint/chemicals) etc. shall be organised with the assistance of the building caretaker, where required. Recyclable electronic goods include batteries, equipment containing printed circuit boards, computers, televisions, fluorescent tubes and smoke detectors. These items may not be disposed in waste or recycling bins for safety and environmental reasons. Residents should be directed to Councils website for further information.

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.

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 (*see APPENDIX C for Waste Management Equipment*). These areas generate negligible waste however garbage and recycling receptacles should be placed in convenient locations.

USED COOKING OIL

The operator will make arrangements for storing used cooking oil prior to collection or pumping by the appropriate recycler. The operator will arrange for oil recycling services generated by the site on a monthly servicing basis. Tenancies participating in this service will be responsible for draining oil and safely transporting to the recycling storage area. The nominated oil recycler will provide the necessary training to building management and participating tenants.

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 8: *Development Equipment Summary*

Component	Part	Quantity	Notes
Chutes	Galvanised Steel / LLDPE Polyethylene Plastic	54	(*See APPENDIX C for Typical Chute Section*)
Equipment A	Suitable Bin Moving Equipment		Optional (*See APPENDIX C.5 for Typical Bin Mover*)
Equipment B	Volume handling equipment	See Table 10	

WASTE ROOM AREAS

RESIDENTIAL

All basement discharge waste rooms must each accommodate dual chute outlets and the appropriate volume handling equipment.

RETAIL/COMMUNITY

All waste rooms must be able to hold all the designated waste bins with enough room to clean and safely manoeuvre bins. A bin wash down area is provided in this area.

COLLECTION OF WASTE

RESIDENTIAL

The garbage and recycling for this site will be collected by Council from multiple bin holding areas located throughout.

On a daily basis, the building manager will transport all of the full bins from their respective basement discharge rooms to their respective bin holding area using suitable bin moving equipment.

RETAIL/COMMUNITY

A private contractor will be engaged to collect the waste and recycling.

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.

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

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

CLOSED LOOP (Organic Dehydrator)
Phone: 02 9339 9801

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

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

CAPITAL CITY WASTE SERVICES
Phone: 02 9359 9999

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 BINGO SUPPORTING LETTER

Bingo Waste Services Pty Ltd
ABN: 43 162 988 823

PO Box 7, Enfield NSW 2136
T: 02 9737 0308 F: 02 9737 0351
enquiries@bingoindustries.com.au
www.bingoindustries.com.au

03/11/2016

To whom it may concern,

Bingo Industries will support and work closely with Frasers Property Australia to try and ensure the correct recyclable materials are placed into the bins, so that we can achieve a maximum of 1% construction waste to landfill through recycling.

Bingo has 6 state of the art waste recovery facilities strategically located around Sydney. They are based in Auburn, Banksmeadow, Minto, Mortdale, St Marys & Smithfield. Bingo Recycling Centres have an outstanding reputation in the waste industry. We have spent several million dollars in the last few years on recycling equipment and machinery, evolving into the best group of recycling facilities in Australia.

Our unique approach to recycling and sustainability has earned us an exclusive partnership with Planet Ark and put us at the forefront of the recycling industry.

Should you have any questions or require further information please feel free to contact me.

Kind Regards,

Nick Saad
Sales Manager – Skip Bins
0424 174 577

APPENDIX A.2 SITE PLAN

Source: Bates Smart – Masterplan

APPENDIX B BETTER PRACTICE GUIDE SPECIFICATIONS

APPENDIX B.1 BIN DIMENSIONS

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

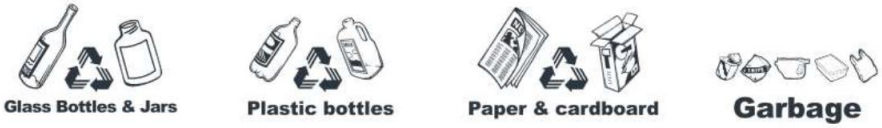
APPENDIX B.2 SIGNAGE FOR WASTE & RECYCLING BINS

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 RETAIL COLLECTION VEHICLE INFORMATION

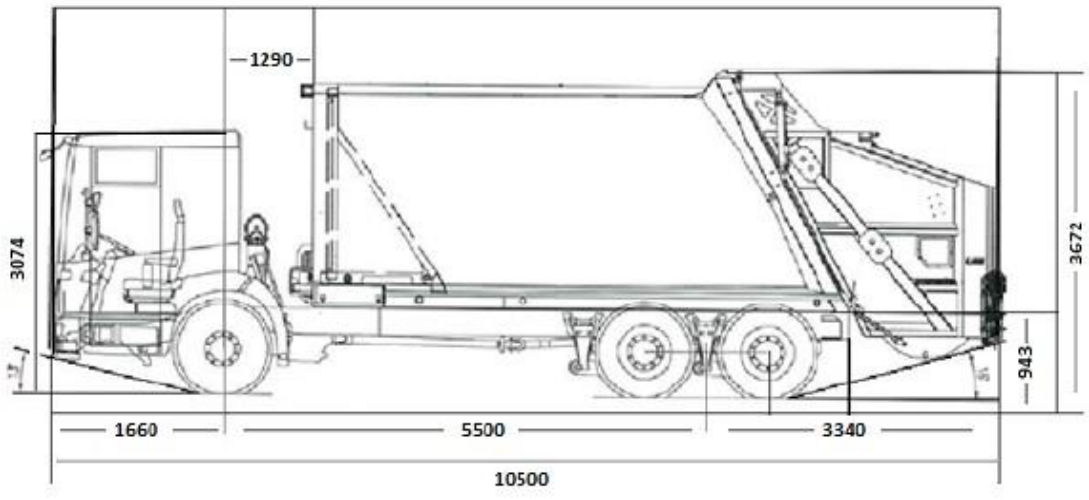
DESIGN SPECIFICATIONS REAR LOADED WASTE COLLECTION VEHICLES

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

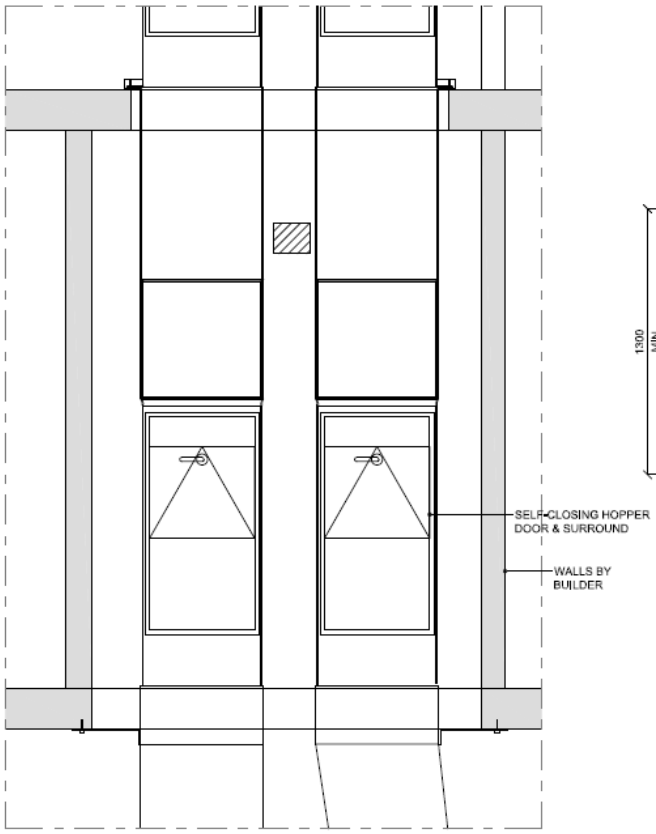
Standard dimensions sourced from AS 2890.2 Parking Facilities: Off-Street Commercial Vehicle Facilities



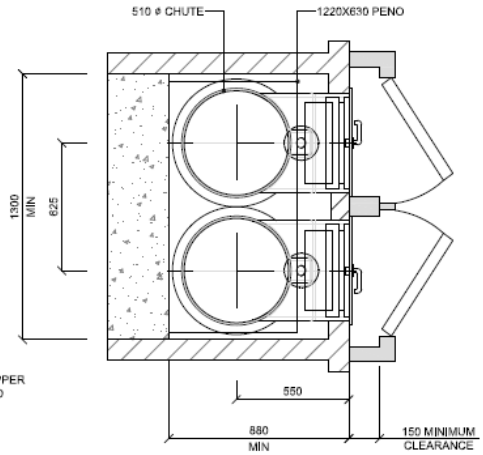
10.5m Heavy Rigid Waste Collection Vehicle specifications

APPENDIX C WASTE MANAGEMENT EQUIPMENT SPECIFICATIONS

APPENDIX C.1 TYPICAL WASTE CHUTE SPECIFICATIONS



TYPICAL DUAL CHUTE LAYOUT (510Ø)
SCALE 1:20



TYPICAL LLDPE PLASTIC TWIN CHUTE LAYOUT w/ADDED ENCLOSURE (510Ø) (STEEL SIMILAR)
SCALE 1:20

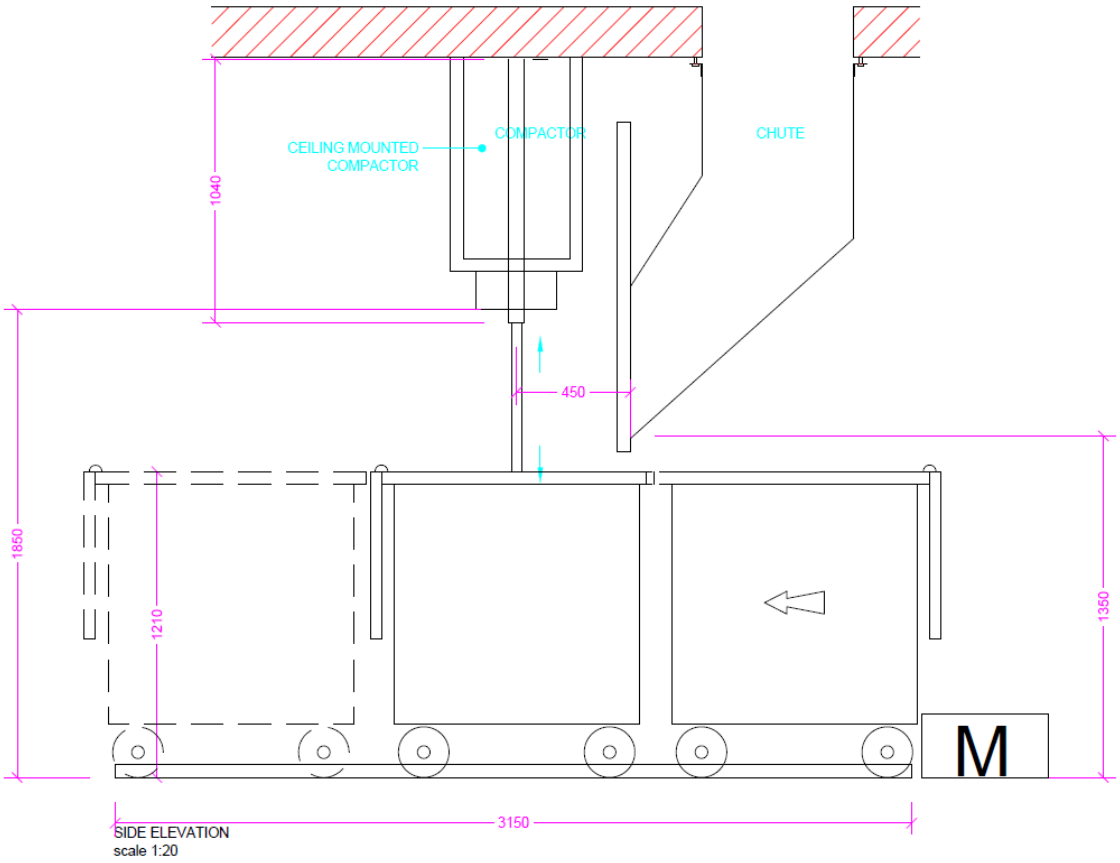
NOTE: ENCLOSURES ARE REQUIRED IF THE CHUTE OPENS DIRECTLY TO A CORRIDOR OR IS NOT LOCATED IN A WASTE ROOM.

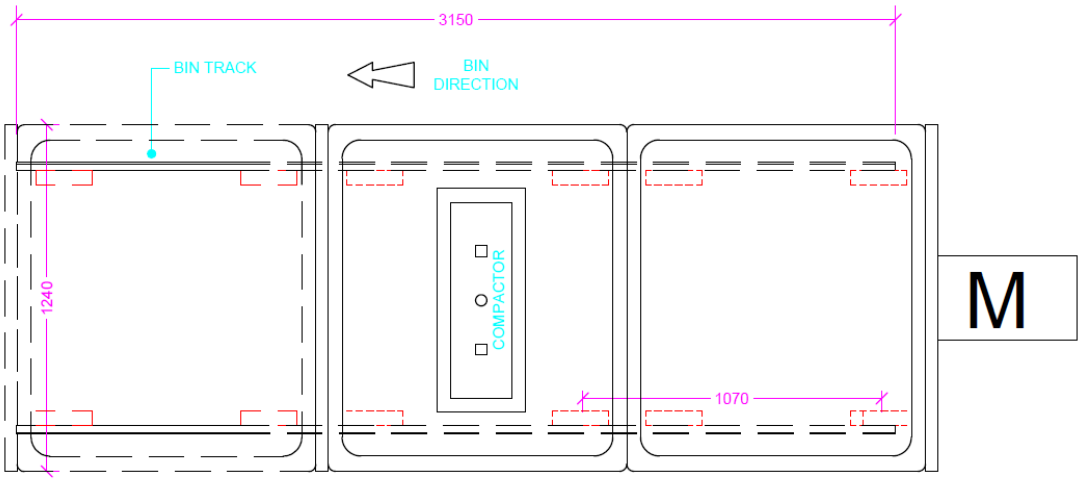
Waste chutes are supplied per the following specifications:

- 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 TRACKS FOR 1100L MGBs





7.5.5 Bin Lifter Specifications

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

Table 15: Operational specifications for the operation of 1100L bin lifters

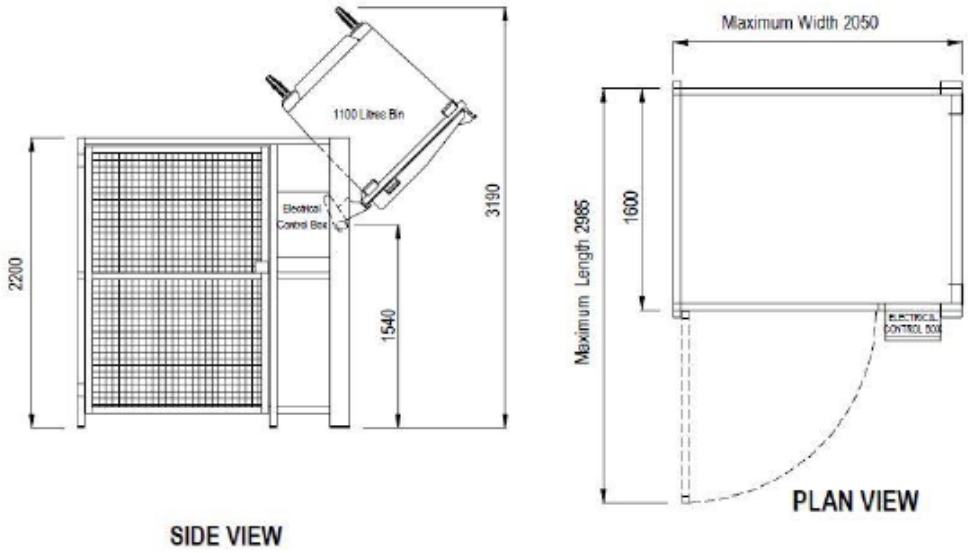


Figure 39: 1100L bin lifter schematic side and plan view

APPENDIX C.4 BOTTLECYCLER

BOTTLECYCLER

BottleCycler Machine	
Unit dimensions:	Height 150 cm, width 50 cm, depth 65 cm
Unit weight:	90 kg
Noise level:	68 dB (approx.. speaking voice level)
Processing speed:	Approximately 60 wine bottles or 80 beer bottles per minute

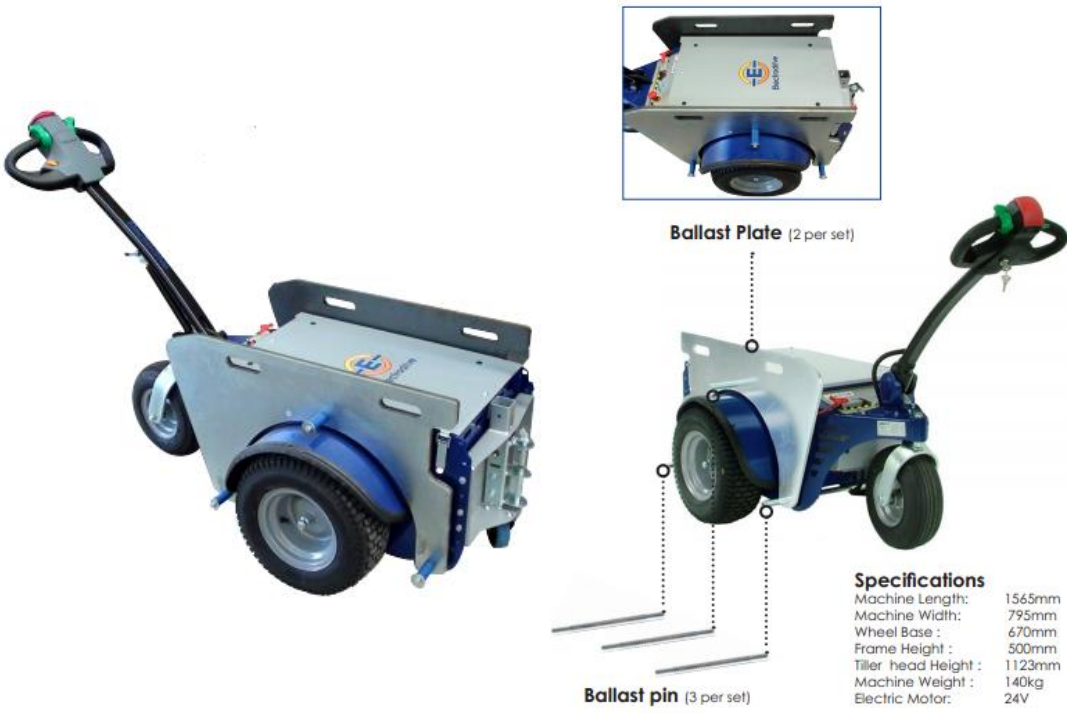
BottleCycler Bin	
Bin dimensions:	Height 60 cm, width 48 cm, depth 52 cm
Full bin weight:	65 kg rolling weight
Holding capacity:	Approximately 300 crushed beer bottles or 200 crushed wine bottles
Volume reduction:	2 x 120 litre bins = Approximately 1 x small 60 litre BottleCycler bin 10 x bar bins = Approximately 1 x small 60 litre BottleCycler bin

Technical Requirements	
Power:	Standard 240 V, single phase, 10 amp 3-phase can be supplied on request
Installation:	Freestanding or built-in joinery Allow 30 cm space on top to insert bottles
Ventilation space:	Free flow underneath The unit is on feet and is partly adjustable
Drip tray:	Unit has a rubber protection iris, which can be removed and cleaned easily
Glass colour separation:	In Australia no separation is required, as BottleCycler provides a glass collection service in all metropolitan areas. The glass collected is then recycled.

Preferred Location On Site	
Close to basin:	For emptying liquids out of bottles Although the machine will accept liquids, the machine will become dirty faster with residue
Close to the serving area:	In order to eliminate double-handling

Optional Extras	
Chute:	Machine can be installed in the cellar with only the top box being in the bar area
Wheels:	Wheels under the unit, which add 40 mm on each side and 10 mm in height

APPENDIX C.5 TYPICAL BIN MOVERS



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)*

3.6.1 Electric Ride On Tug Device

Figure 10: Typical Electric Ride On Tug Device used by the caretaker for the movement of 660L & 1100L bins within the development

Note: All Electric Rid On Tug Devices must utilise a Gel Battery operating system. Council does not support the use of Lead Acid Battery's due fire and maintenance hazards.

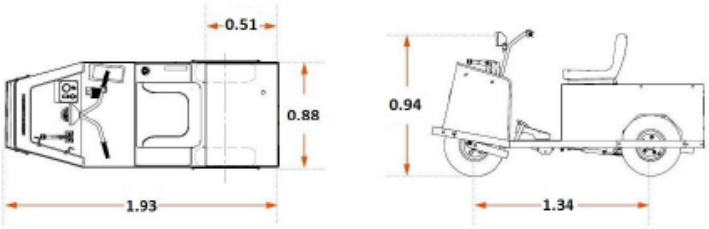


Figure 11: Schematic of a Typical Electric Ride On Tug Device

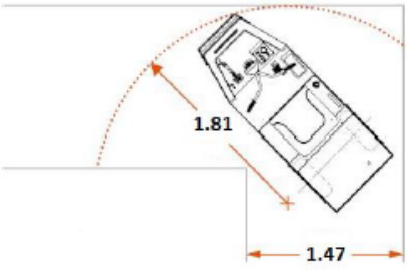


Figure 12: Swept path model for a Typical Electric Ride On Tug Device

Vehicle Classification	Dimensions
Length (m)	1.93
Width (m)	0.88
Height (m)	0.94
Wheelbase (m)	1.34
Powertrain	36-Volt
Seating Capacity (kg)	1 Person
Unit Weight (kg)	426
Aisle Clearance (m)	1.80
Towing Capacity (kg)	3,629
Speed (km/h)	9.6

Table 6: Typical Electric Tug Device unit specifications

To facilitate bin movements (660L & 1100L bins) via an Electric Ride On Tug Device two configurations can be utalised. These include a Universal Towing Device (section 3.6.1.1) and an Aluminium Trailer (section 3.6.1.2):

APPENDIX C.6 TYPICAL PUBLIC PLACE WASTE BINS

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

SOURCE: *SULO Environmental Technology*