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Reduce. Reuse. Recycle

2 Zodiac Drive, Alkimos Proposed Residential Development

Waste Management Plan



Prepared for:
Seacrest Homes

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2 Zodiac Drive, Alkimos

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1 Introduction

This Waste Management Plan has been prepared by **Urbii** on behalf of **Seacrest Homes** with regards to the proposed residential development, located at 2 Zodiac Drive, Alkimos.

The subject site is situated at the corner of Zodiac Drive and Portside Promenade, as shown in Figure 1.

It is proposed to develop the site into a residential development, delivering 32 apartment dwellings.

The key issues that will be addressed in this WMP include calculation of the waste generation of the site, assessment of waste storage provisions and documentation of the waste collection arrangements.



Figure 1: Subject site



2 Objectives

The objectives of this WMP are adapted from WALGA:

- Ensure that the long-term waste management needs for the development are met in an efficient and sustainable manner.
- Minimise the impact of waste services and facilities on the streetscape and surrounds, in relation to both the footpath/public realm and the frontage of the development.
- Reduce the impact of waste collection services and facilities on the amenity of the locality particularly in terms of noise and odour.
- Maximise safety for both waste collection staff and the public.
- Minimise traffic and footpath obstruction.

3 Referenced documents

The documents referenced in preparing this WMP may include, but are not limited to:

- City of Melbourne *Guidelines for Waste Management Plans* 2021;
- City of Perth *Waste Guidelines for all Developments* 2019;
- WALGA *Multiple Dwelling Waste Management Plan Guidelines*;
- WALGA *Subdivision Waste Management Plan Guidelines*; and,
- Waste Authority WA *Waste Avoidance and Resource Recovery Strategy for 2030*.



4 Guiding concepts

Urbii adopts the guiding concepts of the State's Waste Strategy and encourages these concepts to be considered in all developments to the furthest extent feasible.

4.1 Waste hierarchy

The *Waste Avoidance and Resource Recovery Strategy 2030* applies the waste hierarchy (Figure 2), which is a widely accepted decision-making tool. The waste hierarchy ranks waste management options in order of their general environmental desirability. Waste avoidance is the most preferred option in the hierarchy.

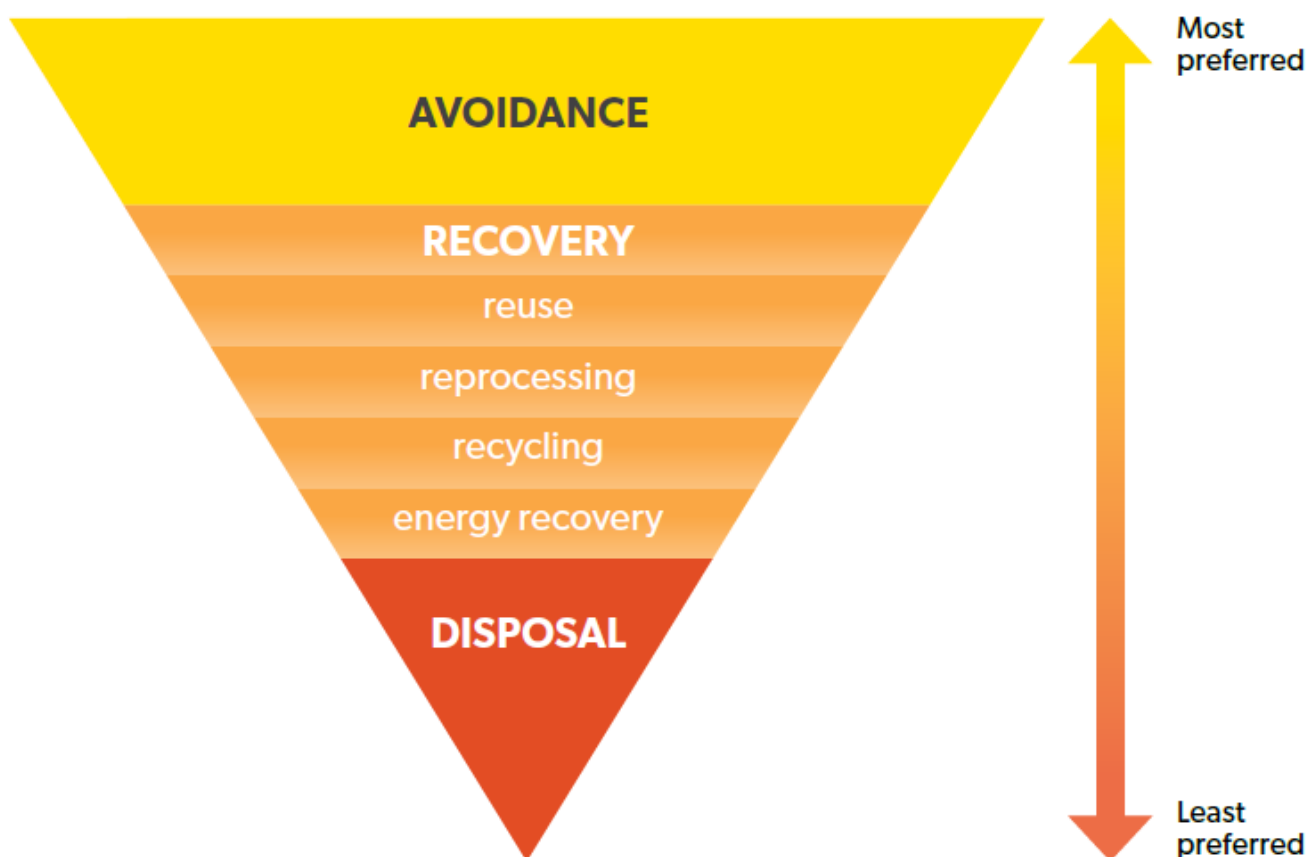


Figure 2: Waste hierarchy

Source: Waste Authority WA *Waste Avoidance and Resource Recovery Strategy for 2030*.

Resource recovery options recover value from materials, thereby offsetting the environmental impacts of extracting and processing raw materials. Energy recovery is the least preferred recovery option. Disposal is the least preferred option. Disposal generally recovers the least value from materials and delivers the least environmental benefit.

4.2 Circular economy

A circular economy (Figure 3) makes use of established sustainability concepts, including life cycle thinking and resource efficiency. A circular economy should consider the flow of both materials and energy. It moves away from the linear 'take, make, use and dispose' model, to one which keeps materials and energy circulating in the economy for as long as possible.

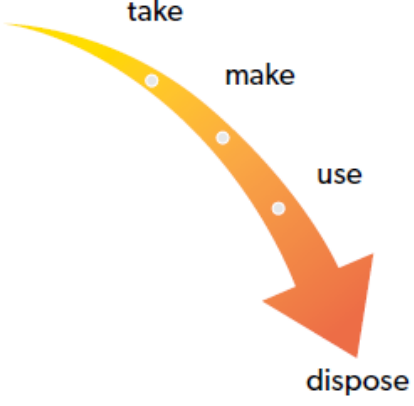

Current approach	Circular economy
 <p>A linear flow diagram showing a downward-sloping arrow with four stages: 'take', 'make', 'use', and 'dispose'.</p>	 <p>A circular diagram with seven segments: 'raw materials' (red), 'design' (purple), 'production remanufacturing' (blue), 'distribution' (teal), 'consumption, use, reuse, repair' (green), 'collection' (yellow), and 'recycling' (orange). A central white circle is surrounded by a dark brown arrow pointing clockwise.</p>
Linear flow of materials – 'take, make, use and dispose' model.	Circular flow of materials – materials sorted and retained in the economy for as long as possible.
Limited use of renewable materials and energy.	Preference for renewable materials and energy.
Significant volumes of materials disposed of and lost to the economy. Loss of embodied materials, energy and water.	Materials recovered as high up the waste hierarchy as possible. Embodied materials, energy and water retained in the economy. Organic materials re-enter and regenerate the environment safely (for example, as compost).
Materials managed locally and globally.	Preference to manage materials locally to reduce the costs and impacts of transport, and to provide local employment and investment opportunities.
Economic value of materials, employment and investment not fully accounted for.	Economic value of materials, employment and investment accounted for.
Limited focus on life cycle thinking.	Products designed and manufactured to minimise environmental impact through whole of life.

Figure 3: Transitioning to a circular economy



5 Proposed development

The proposal for the subject site is for a multiple dwelling residential development, comprising:

- 4 x 1-Bed dwellings
- 17 x 2-Bed dwellings;
- 11 x 3+-Bed dwellings;
- 54 car parking bays allocated to residents;
- A bicycle storage room with an estimated parking capacity of 19 bicycles;
- Parking for 2 motorcycles/scooters; and,
- Bin storage.

Vehicle access to the site is proposed via one crossover on Spray Lane. Waste will be collected via private waste collection from the rear laneway.

People walking and cycling will access the development from the external path network near the site.

The proposed development plans are included for reference in Appendix A.

6 Waste generation

6.1 Waste generation rates

The waste generation rates for general waste and recyclables are sourced from the WALGA Guidelines. Residential waste generation rates for different multiple dwelling sizes are detailed in Table 1.

Table 1: Residential waste generation rates

Description	General waste generation rate	Recyclables generation rate
1 Bedroom MUD	80L/week	40L/fortnight
2 Bedroom MUD	160L/week	80L/fortnight
3 + Bedroom MUD	240L/week	240L/fortnight

6.2 Waste generation calculations

The waste generation calculations are detailed in Appendix D. The estimated waste generation for the development is:

- General Waste: around 5,680L per week.
- Recyclables: around 2,080L per week.



7 Waste systems

7.1 Internal waste storage

Designers should aim to incorporate sufficient space within the kitchen, laundry room or other convenient location within each dwelling for the temporary storage of accumulated waste and recycling. Space should be sufficient to allow for the separate storage of recyclables and general waste. Possible ways to encourage recycling and minimise contamination include:

- Provision of adequate internal storage space within dwellings (kitchen or laundry) to accommodate the temporary storage of at least 2 days' worth of general waste, organics (where applicable) and recycling. This should comprise:
 - A minimum 30L general waste bin
 - A minimum 30L comingled recyclables bin
- Provision of reusable, robust containers to residents to assist them in transporting recyclable materials from their dwelling to recycling bins without resorting to plastic garbage bags e.g., reusable, washable tote-bags
- Posting signage in public areas of the building (including the bin store) to educate residents/tenants about the location and use of the waste management system, including what materials are suitable for recycling and composting.
- Providing information in Strata and/or sales documents, to educate residents/tenants about the location and use of the waste management system, including what materials are suitable for recycling and general waste.

7.2 External bin storage areas

Bin storage areas at this development must be adequate to contain all waste and recycled material generated on the premises for the proposed waste collection frequency.

7.2.1 Bin size, quantity and colour

The City of Wanneroo presently offers 240L bins and the standard residential collection frequency (once per week for general waste and once per fortnight for recycling). Using the Local Government service at this time is impractical for this development, with too many bins required.

This WMP proposes the interim use of private waste collection for this site, until additional services suitable for apartments are available from the City.

It is proposed to provide the following bins in a centralized bin store:

- 5 x 660L General waste (red lid bin).
- 2 x 660L Co-mingled recycling (yellow lid bin).

The number of bins required for the development is detailed in Appendix D.

7.2.2 Bin storage area size

As detailed in Table 2, each 660L bin has a footprint area of 1.16m². A 50mm gap is allowed between the bins to allow easy pull movement, and suitable clearance allowed between opposite bins and in walkways to maintain convenient walking access. The proposed bin storage area size is sufficient to accommodate the required bins. An indicative bin layout plan is shown in Appendix B.

Table 2: Standard Mobile Garbage Bin (MGB) dimensions

Bin capacity	660L	770L	1100L	1300L	1700L
Height (mm)	1250	1425	1470	1408	1470
Depth (mm)	850	1100	1245	1250	1250
With (mm)	1370	1370	1370	1770	1770
Approximate Footprint (m ²)	1.16	1.5	1.7	1.21	1.27

Source: WALGA

7.2.3 Bin storage area design

Urbii has checked the proposed bin storage locations and confirmed that required clearances are provided. A bin storage plan is included in Appendix B. The following is a list of generic advice offered for consideration at subsequent detailed design stages of the project:

- **Ventilation and odour:** For enclosed storage and service areas, the air flowing from any storage areas should not exit close to residences. Ventilation openings should be protected against flies and vermin and located as near the ceiling and floor as possible, but away from the windows of dwellings. If a forced ventilation or air conditioning system is used (for enclosed storage areas), It should be in accordance with the ventilation requirements of the Building Code of Australia and *Australian Standard AS 1668.2 The use of Ventilation and Air Conditioning in Buildings*. It should not be connected to the same ventilation system supplying air to the units.
- **Lighting:** Artificial light controlled by switches should be located near the bin store entrance.
- **Noise:** Bins will be collected from the waste collection presentation point on the road.
- **Aesthetics:** The bin store should be consistent with the overall aesthetics of the development.
- **Vermin:** Self-closing doors can be considered to eliminate access to vermin.
- **Washing bins and waste storage area:** If there is no space for bin washing outdoors then the internal bin stores will have bin-washing facilities including an adequate supply of hot and cold water mixed through a centralised mixing valve with hose cock and have floor drainage installed. The building caretaker will be responsible for washing bins (or contracting a provider to wash bins) and for maintenance of the bin store.



7.3 Access to bins

Residents will access the bin store through an access door from the car park. The site caretaker will access the bin store to wheel bins to the verge on waste collection days.

It is proposed to transfer bins from the basement level bin store to the bin pad on the ground level adjacent to the rear laneway. The bins will be transferred up the car park ramp which is steeper than 1:14 in grade.

A motorised Tug will be kept in the car park and used to transfer bins up the steep car park ramp. Based on information available at <https://www.electrodrive.com.au/> the slope is 'severe'. An example application for severe bin slopes is car park ramps under high rise buildings, like in the proposed development.

The reference motorised tug (Figure 4) is rated to tow 1,000kg up a maximum 15-degree slope. Some further information on bin tugs is provided in Appendix C.

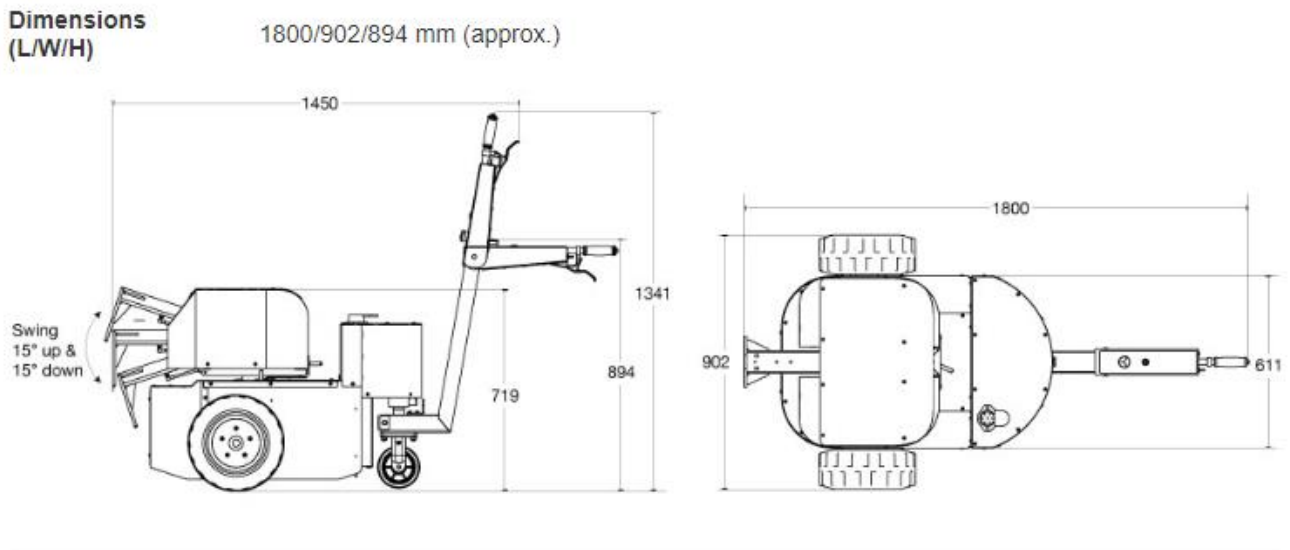


Figure 4: Electrodrive 'Tug Rise' example bin tug

8 Waste collection

8.1 Waste vehicle types

Waste collection will be serviced through private service. A rear loader waste truck will be used for waste collection from the laneway.

8.2 Waste collection frequency

General waste and recycling will be collected twice per week.

8.3 Waste collection method and presentation points

Bins are proposed to be wheeled out from the bin store to a bin presentation pad adjacent to the rear laneway, on scheduled collection days.

A bin presentation plan is included in Appendix B.

8.4 Vehicle access and maneuvering

Waste collection will be facilitated in the laneway. Therefore, no internal waste truck access or circulation needs to be allowed for.



9 Additional waste requirements

9.1 Bulk waste

Bulk waste can be temporarily stored in the bin store, or individual store rooms until it is removed by private service.

9.2 E-Waste

Storage space for E-waste will be accommodated in storage areas or individual dwellings. E-waste will be disposed of in a suitable manner, such as bulk drop-off to the tip or using public battery recycling boxes.

9.3 Garden organics

The site caretaker will manage garden organic waste associated with landscape maintenance. Garden waste can be placed in bins if there is space or can be removed by trailer to be disposed offsite in a suitable location.

10 Waste management

The building caretakers or contracted staff will be responsible for:

- Arranging for the bins to be cleaned and sanitised;
- Coordinating the cleaning of the bins and bin storage areas every two (2) to three (3) weeks;
- Dealing promptly with any issues or complaints relating to hygiene, noise, odour or other inconvenience; and,
- Providing adequate training for relevant staff regarding waste management.

Residents should comply with the City's waste sorting requirements and only place permitted waste in each respective bin type. Waste that does not belong in any bin should be disposed of through on-demand services or another appropriate method.

A copy of the Waste Management Plan will be maintained within the premises and strata plan for reference and records.



11 Signage and education

Ongoing education, to support the waste management service, is one of the most important factors in encouraging residents to continue to utilise services and systems as originally intended. The following recommendations have been adapted from the WALGA Guidelines.

“Educational signage should:

- Clearly identify what items are and are not accepted in the general waste and recycling systems. If signage within the bin store is not possible due to space or other restrictions, bin stickers may be appropriate.*
- Outline appropriate waste management behaviour i.e. placing refuse/recyclables inside as opposed to adjacent to bins, placing mixed recyclables into the bin loose (not in a plastic bag), closing bin lids etc.*
- Where the strata body/building management holds tenants’ induction schemes, these should include the use of waste and recycling facilities. The strata body/building management, in conjunction with the Local Government, should issue a leaflet on the correct use of the waste and recycling facilities and the materials recycled. Tenants’ handbooks should include a section on the correct use of general waste and recycling facilities.*
- Ensuring education is ‘ongoing’ is beneficial because it tackles the transient nature of residents and differences between different Local Government services. All waste and recycling bins or receptacles should be clearly and correctly labelled and signage should be erected in bin storage areas to instructing residents as to the correct separation of recyclables from general waste.*
- Any hazards or potential dangers associated with the waste facilities, including those from the use of any waste handling equipment, should also be clearly identified. It is recommended that building managers post information in communal areas which clearly identified the relevant points of contact regarding recycling and/or other services within the development. As part of the ongoing education program, welcome packs should be produced and provided to all new residents. These packs should contain information outlining the developments waste management system, required actions and appropriate waste management behaviours.”*

12 Conclusion

As demonstrated within this Waste Management Plan, the proposed residential development provides sufficient bin storage and adequate bins to service the site for general waste and recyclables.

Furthermore, the servicing of the bins by private collection can be adequately achieved without having an adverse impact on the site and the local street network.

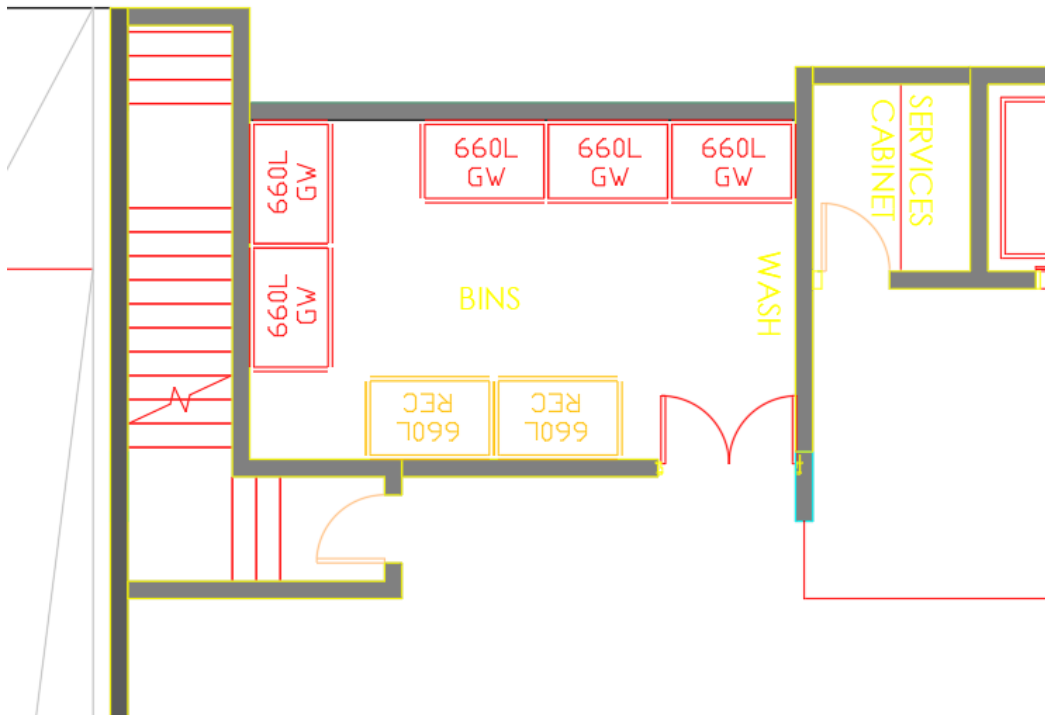


Appendices

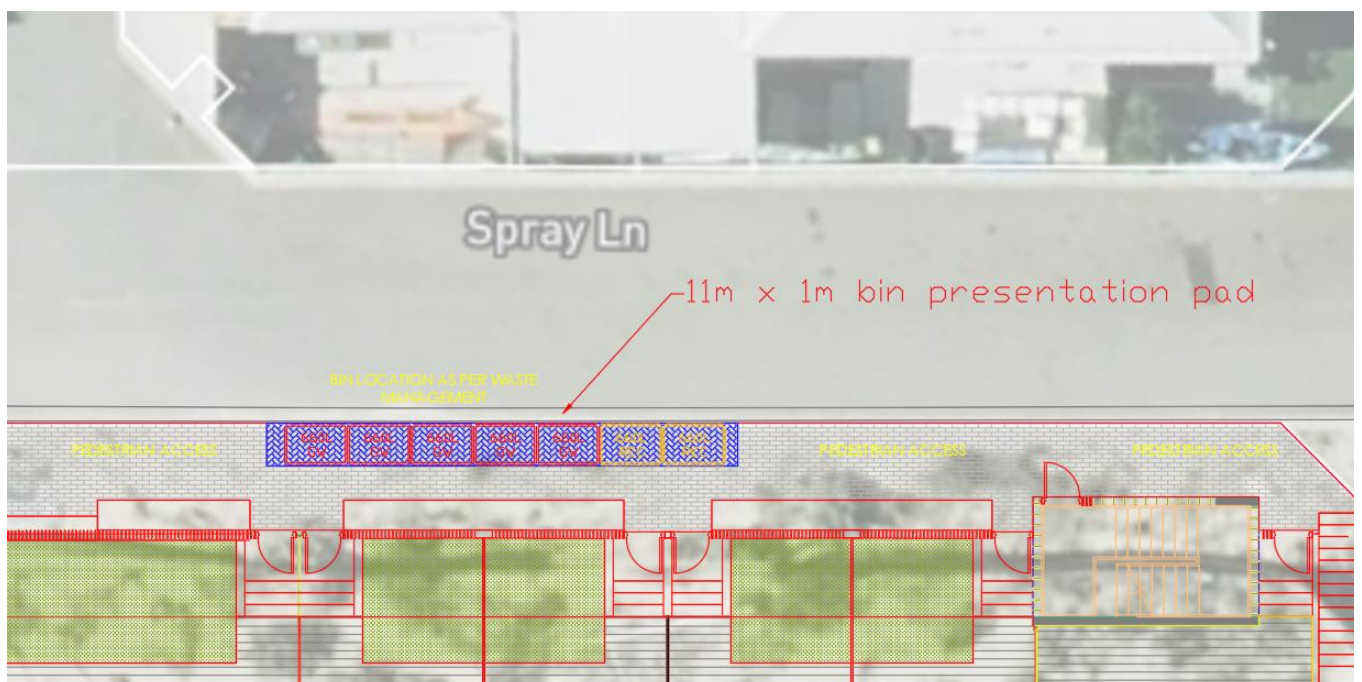
Appendix A: Proposed development plans

Appendix B: Bin storage and presentation plans

Bin storage:



Bin presentation:



Appendix C: Example bin tug flyer



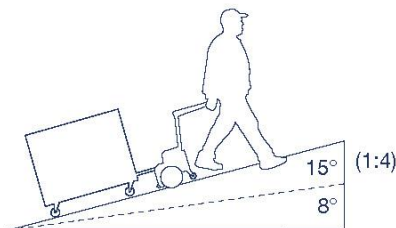
Tug Rise POWERED TUG



The Tug Rise pedestrian operated electric tug has been designed to tow on slopes or ramps, and is capable of towing up to 1 tonne on a 15 degree ramp with ease, or up to 5 tonne on a flat surface.

The Tug Rise is the ideal solution for moving 660 litre and 1100 litre bins on ramps with an incline of 1:4. Universal towing devices (to suit 660 and 1100 litre bins) are also available, as well as directional lock mechanisms for swivel castors to help improve your waste management.

The Tug Rise is designed to improve safety and efficiency, whilst reducing the risk of accidents that can occur when manually moving very heavy loads.



Typical applications

Suitable for moving heavy bins or trolleys on sloped driveways/ ramps, around high-rise building basements, or caravan parks.

Features

Tow capacity	1000 kg up a 15 degree incline, (or up to 5,000 kg on a flat surface).
Max. speed	Up to 4 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	<ul style="list-style-type: none"> • Ergonomic design with folding tiller handle. • Turret with turret lock for easy reversing. • Heavy duty high-traction wheels (black). • Park brake release—to enable manual operation in the event of a flat battery. • Low maintenance
Hitching	<ul style="list-style-type: none"> • Wide variety of hitches available. • Universal towing device to suit 660 litre and 1100 litre bins available.
Towing options	<ul style="list-style-type: none"> • Can tow multiple bins. • Move 660 litre and 1100 litre bins on a 15 degree ramp or incline. • Directional lock mechanism for swivel castors is available.
Dimensions (L/W/H)	1800/902/894 mm (approx.)
Battery	Two 12V-70Ah rechargeable batteries (deep cycle, long lasting, maintenance-free) with 24V smart charger. <i>Optional upgrade: 100Ah batteries.</i>

Safety features

- Emergency stop button; Emergency back-off button;
- Electromechanical park brake.

	ORDER CODES
Tug Rise 1 Tonne (no hitch)	TUGRISE1TNH
Pin hitch (19 mm)	EDHT1316
Pin hitch (29 mm) standard for 660/1100L bins	EDHT1810-052
Auto-latching hitch	EDHT1810-024

Appendix D: Waste calculations



Table 3: Weekly waste generation and collection – Residential 2 bin system

Land use	Description	Units	General waste generation rate	Recyclables generation rate	General waste daily generation (L)	Recyclables daily generation (L)
Multiple Dwelling	1 Bedroom MUD	4	80L/week	40L/fortnight	45.71428571	11.42857143
Multiple Dwelling	2 Bedroom MUD	17	160L/week	80L/fortnight	388.5714286	97.14285714
Multiple Dwelling	3 + Bedroom MUD	11	240L/week	240L/fortnight	377.1428571	188.5714286
Total		32			811.4285714	297.1428571

Waste type	Daily generation (L)	Days in operation (per week)	Weekly waste generation (L)	Weekly collection frequency
General waste	811.4285714	7	5680	2
Recyclables	297.1428571	7	2080	2

General Waste Bins

Bin Size (L)	Number of bins	Weekly capacity
660	5	6600
Total weekly capacity (L)		6600

Recycle Waste Bins

Bin Size (L)	Number of bins	Weekly capacity
660	2	2640
Total weekly capacity (L)		2640