



**634-652 High Street, Penrith**

**Mixed Use Development**

**Revised Operational Waste  
Management Plan**

**November 2018**

This report contains confidential information. It has been compiled by Waste Audit and Consultancy Services (Aust) Pty Ltd for the 634-652 High Street Penrith Development.

This Waste Management Plan is not a substitute for legal advice on the relevant environmental legislation, which applies to the Toga, its contractors or other bodies. Accordingly, Waste Audit and Consultancy Services (Aust) Pty Ltd will not be liable for any loss or damage that may arise out of this project, other than loss or damage caused as a direct result of Waste Audit and Consultancy Services (Aust) Pty Ltd's negligence.

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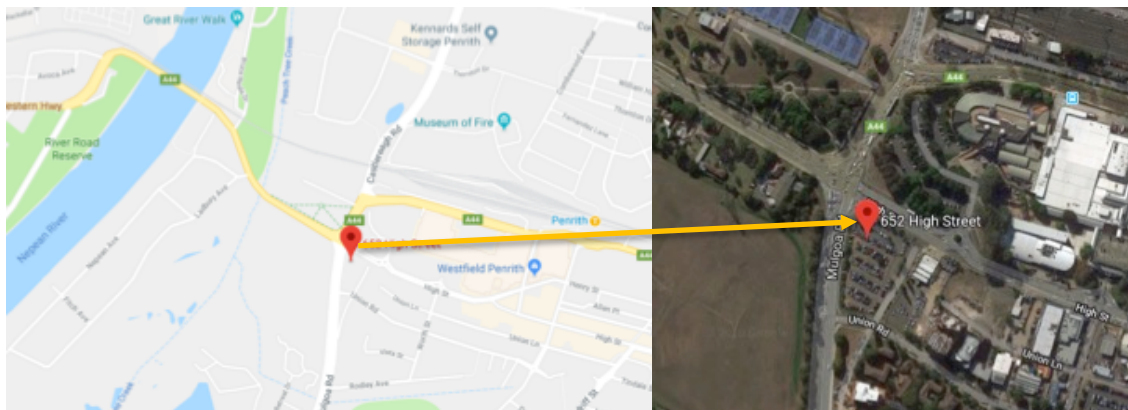
# 1. Introduction

This revised Waste Management Plan (WMP) has been prepared to accompany a Development Application for the 634-652 High Street Penrith development.

This development essentially consists of two residential buildings, commercial premises and associated infrastructure, as indicated below:

- **Building 1 contains 81 apartments and commercial areas of 219 m<sup>2</sup>**
- **Building 2 contains 106 apartments and commercial areas of 850 m<sup>2</sup>**

The following provides the location of the development.



Waste 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:

1. **Ensure waste is managed to reduce the amount of waste and recyclables to landfill** by assisting staff and visitors to the buildings to segregate appropriate materials that can be recycled; displaying signage to remind and encourage recycling practices; and through placement of recycling and waste bins to reinforce these messages.
2. **Recover, reuse and recycle** generated waste wherever possible.
3. **Compliance** with all relevant codes and policies.

This Plan has been developed with reference to the Penrith City Council's *Development Control Plan 2014: Section C5 Waste Management* (including Residential Flat Building Waste Management Guidelines), and *Appendix F5 Technical Information*.

## 2. Waste & Recycling Generation

### 2.1 Materials Streams

Based on the number of apartments and size of commercial premises for this development, the following are the main waste streams that are expected on a regular basis:

- Paper/cardboard recycling;
- Commingled recycling (glass, metal, and plastic containers); and
- General waste.

Residential paper, cardboard, and commingled recycling will be consolidated into a single 'mixed recycling' stream and collected in 1100-litre bins by Council.

Other less regularly generated waste types would be materials such as furniture, e-waste, soft plastics, polystyrene and other materials. Space will be provided for recycling of these other streams as required. In addition, residents will also be able to take advantage of Council's bulky household waste collection service, which is an on-request service. Based on the number of residences these collections would probably take place between 2-4 times annually.

### 2.2 Waste Generation Estimates

Calculations for the types and quantities of waste that will be generated are based on the estimates provided in the City of Penrith's *Development Control Plan 2014: Appendix F5 Technical Information*.

The following tables show the estimated waste generated for the development (residential and commercial) based on waste management requirements as specified by the City of Penrith.

#### Estimated Waste Generation - Residential & Commercial

Building 1	General Waste Litres/Week	Recyclables Litres/Week	Total Litres/Week
81 apartments	4,950	4,950	<b>9,900</b>
219 m <sup>2</sup> commercial tenancies	110	110	<b>220</b>

Building 2	General Waste Litres/Week	Recyclables Litres/Week	Total Litres/Week
106 apartments	6,478	6,478	<b>12,956</b>
850 m <sup>2</sup> commercial tenancies	425	425	<b>850</b>

Total Development	General Waste Litres/Week	Recyclables Litres/Week	Total Litres/Week
187 apartments	11,428	11,428	<b>22,856</b>
1,069 m <sup>2</sup> commercial tenancies	535	535	<b>1,070</b>

## 3. Waste Storage Calculations

### 3.1 Residential General Waste & Recycling

The following tables show the recommended waste storage requirements (based on 1100 litre mobile garbage bins). This is based on Council's requirements for:

- **General Waste – 1 x 1100 litre MGB per 18 apartments**
- **Recycling – 1 x 1100 litre MGB per 18 apartments**

Based on Council's bin requirements, the following summarises the number of 1100 litre MGBs required per building, based on a **twice per week** collection frequency for general waste, and a **once per week** collection frequency for commingled recyclables:

#### Bin Requirements

Material Stream	Building 1	Building 2
General Waste	5	6
Recycling	5	6
Service Bins (To remain in chute rooms)	2	2
<b>Total</b>	<b>12</b>	<b>14</b>

These bins will be split between a permanent waste storage room, located in Building 1, which will hold waste towers' residential waste and be utilised for collection, and two chute rooms located in Building 1 (Ground Level) and Building 2 (B1 Level).

Equipment and spatial requirements for both buildings are as follows. Please note that the bin footprint calculations shown below are based on a separation distance of 0.2m between bins for manoeuvring and access as required by Council.

In addition, there will be a similar allowance for bin manoeuvring and access within each chute room, and space allocated for a bin tug and bin washing area in the Building 2 chute room (Building 1's bins will be washed in the central bin washing area located in the Main Loading Dock).

#### Building 1 - Equipment & Spatial Requirements (Combined Buildings 1 & 2 Bins)

Equipment	No.	Footprint per Bin (m <sup>2</sup> )	Total Footprint
1100L MGBs	22	1.86	40.87
<b>Total</b>			<b>40.87</b>

#### Building 1 Chute Room - Equipment & Spatial Requirements

Equipment	No.	Footprint per item (m <sup>2</sup> )	Total Footprint
Linear Tracks	2	6.0	12.0
Service Bins	2	1.86	3.72
<b>Total</b>			<b>15.72</b>

#### Building 2 Chute Room - Equipment & Spatial Requirements

Equipment	No.	Footprint per item (m <sup>2</sup> )	Total Footprint
Linear Tracks	2	6.0	12.0
Service Bins	2	1.86	3.72
Bin Tug	1	2.0	2.0
Bin Wash Area	1	4.0	4.0
<b>Total</b>			<b>21.72</b>

Based on the above bin and equipment requirements, the minimum space required for each the development's waste storage room and each building's chute room are as follows:

**Main Waste Storage Room: 41 M<sup>2</sup>**

**Building 1 Chute Room: 16 M<sup>2</sup>**

**Building 2 Chute Room: 22 m<sup>2</sup>**

With regard to storage space for bulky waste, Council requires space based on the total number of dwellings x 8.0m<sup>2</sup> divided by 52, resulting in a bulky waste space requirement of **28.8 m<sup>2</sup>**.

The size of the bulky waste storage room as currently shown on the Ground Floor Plan is **29.1 m<sup>2</sup>**.

## 3.2 Commercial

The following table shows the bins and spatial requirements for the development's commercial waste storage, based upon the generation estimates outlined in Section 2.2. Figures are for Buildings 1 and 2 commercial tenancies combined. Please note that the bin footprint calculations shown below are based on a separation distance of 0.2m between bins for manoeuvring and access.

### Commercial Waste Storage - Equipment & Spatial Requirements (1)

Stream	Bin Type	No.	Clearances/ Week	Litres/ Week		Footprint/Bin (m <sup>2</sup> )	Total Bin Footprint
				Capacity	Projected		
General Waste	1100 MGB	1	1	1,100	535	1.46	1.46
Recycling	1100 MGB	1	1	1,100	535	1.46	1.46
Total		2		2,200	1,070		2.92

*With 0.2m space between bins*

Whilst the ground floor area is currently classified for commercial use, provision has been provided in the waste area for change of use to retail tenancies in the future. The projected volumes and bin requirements shown below are based on a mix of 33% specialty, 33% cafe, and 33% restaurant.

### Commercial Waste Storage - Equipment & Spatial Requirements (2)

Stream	Bin Type	No.	Clearances/ Week	Litres/ Week		Footprint/Bin (m <sup>2</sup> )*	Total Bin Footprint
				Capacity	Projected		
General Waste	1100 MGB	8	5	44,000	21,594	1.70	13.60
Recycling	1100 MGB	4	3	13,200	9,621	1.70	6.80
Total		12		57,200	31,215		20.40

*With 0.2m space between bins*

Based on the tenancy mixture as detailed above, estimated waste generation, and the number of bins required and collection schedule, the minimum spatial requirement for the commercial waste storage room will be **20.4 m<sup>2</sup>**.

The size of this room as currently shown on the Ground Floor Plan is **24.7 m<sup>2</sup>**.

## 4. Waste Management Systems

### 4.1 Residential

The following summarises the recommended residential general waste and recycling management systems that will be implemented for Buildings 1 and 2. These recommendations are based on the City of Penrith requirements and systems implemented for similar developments (and tenants).

To ensure that the proposed management actions occur management requirements will be contained within the Strata By-laws as well as within the service contracts for the site's building maintenance and cleaning contractors.

Each residential tower will be fitted with a chute room to accommodate the equipment outlined in Section 3.1, while Building 1 will have a central waste storage room adjoining the loading dock, for easy access by Council's collection vehicles.

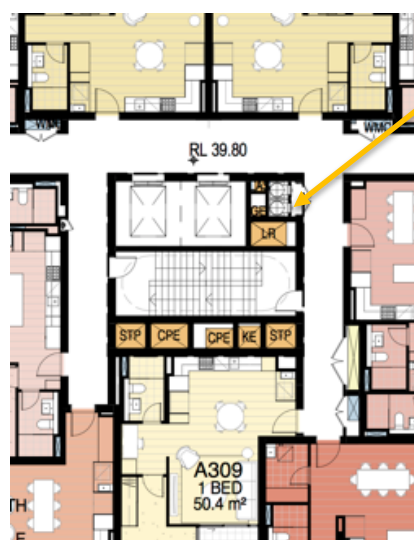
The buildings will utilise a dual chute system, one for general waste and one for recycling, which will be accessed from each level by residents, and will terminate in the respective chute rooms in Building 1 (Ground Floor) and Building 2 (Basement 1).

To ensure that general waste and recycling are managed correctly, properly segregated, and deposited into the correct containers and accessed only by authorised personnel, the following measures should be implemented:

- Residents/tenants will be provided with information on the proper disposal of wastes and recyclables – that is correct segregation requirements
- Residents/tenants will be encouraged to maximise the separation of general waste and mixed recyclables to aid the proper disposal of all materials
- Swept Paths will be provided by a qualified traffic consultant in order to demonstrate that a Council-approved HRV waste collection vehicle can make the turns required to service both residential and commercial waste and recyclables

The following drawings show examples of the chute access provided on each level of both buildings:

**Building 1**



**Building 2**







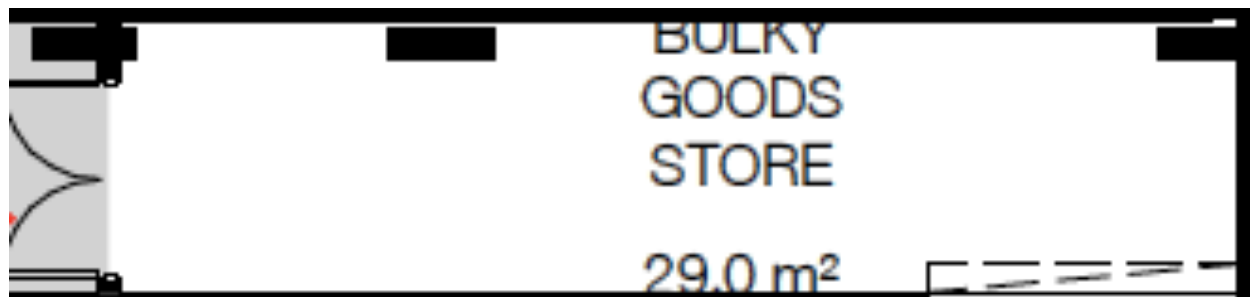
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Floor plan of the first floor showing the following areas and dimensions:

- Lobby:** 28.150
- Waste Room:** 2000
- Bunded Bin Wash:** 2000
- Staircase:** Located in the center of the plan.

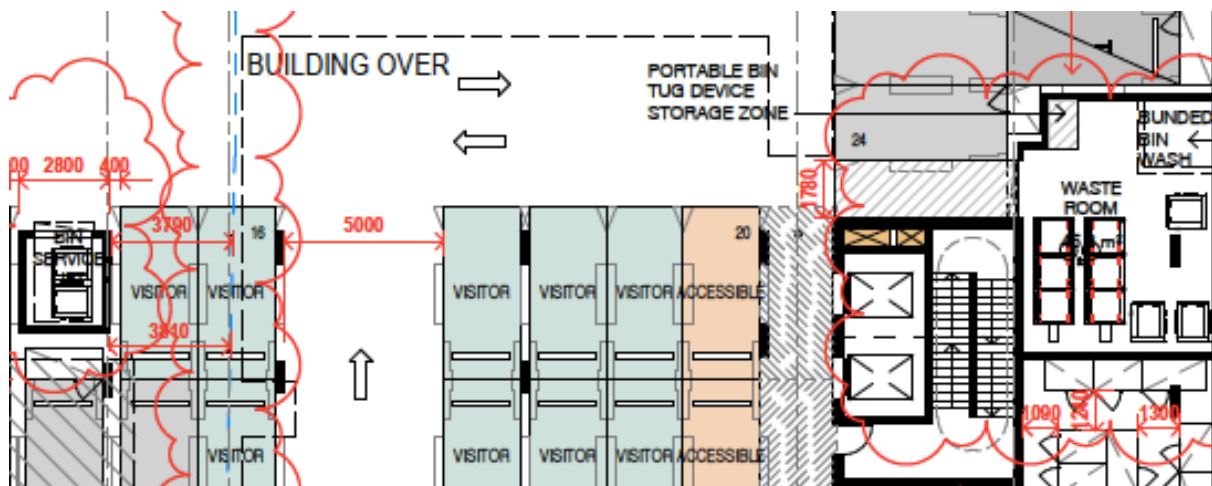
A red line indicates a path from the Bunded Bin Wash to the Waste Room.

### Bulky Waste Storage Area



The following diagram shows the location of the chute room and bin service lift in Basement 1 of Building 2:

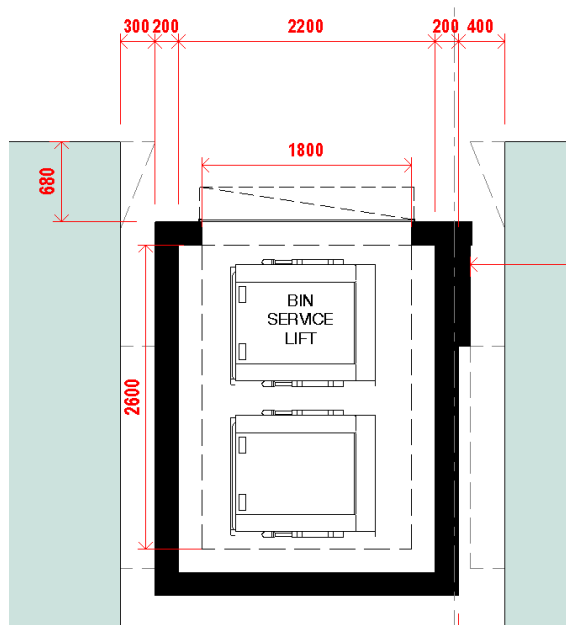
### Basement 1



### Building 2 Chute Room



### Bin Service Lift



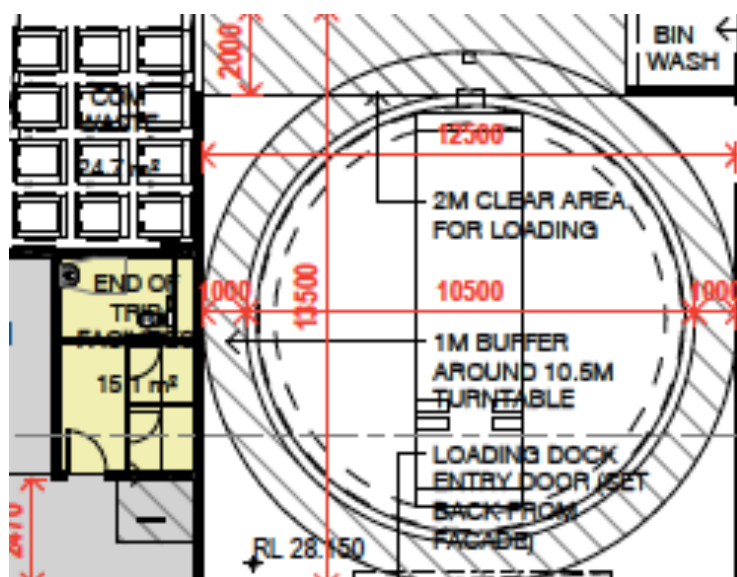
## 4.2 Commercial Tenancies

Commercial tenants or their cleaning staff will be responsible for transporting general waste and recyclables to the dedicated storage room located on the Ground Level of Building 1.

In addition commercial tenancies will also be provided with separate bins for waste and recyclables and the size of these will also ensure that there is capacity for a minimum 2 days' generation.

A private waste contractor will then be engaged to service both commercial general waste and recycling. Collections will take place via the main waste service area and commercial waste storage area located on the Ground Level of Building 1 as shown below. A bin wash facility for both commercial and residential bins is also located in this area.

### Commercial Waste Storage & Loading Area



### 4.3 General Waste & Recycling Storage Rooms

There will be two central bin storage rooms, for residential and commercial waste and recycling respectively, both located adjacent to the proposed loading bay.

The storage rooms will incorporate the following features, as required by Penrith Council's Waste Management Guidelines:

- Storage space for the entire fleet of bins, plus 0.2 m between bins to allow adequate manoeuvrability room
- 1.8 m unobstructed clearance zone between the stored bins and the entrance, for access and manoeuvrability
- Suitable door access for the service of bins with a minimum width of 1.8 m, and accessed by a 1.8m unobstructed access corridor
- Should a roller door be provided an additional 0.9 m service door is required inclusive of an abloy key system
- The room will be fully enclosed and walled with separate unobstructed access, and not allow through access to other on-site waste infrastructure
- The room will be partitioned and enclosed with a minimum internal room height in accordance with the Building Code of Australia 2016 (BCA)
- The room will incorporate adequate lighting and natural or mechanical ventilation to meet Building Code of Australia 2016 requirements.
- The room will be provided with an adequate supply of water through a centralised mixing valve with hose cock
- The floor will be finished so that it is non-slip and has a smooth and even surface covered at all intersections
- The floor will be graded to a central drainage point connected to the sewer, enabling all waste to be contained and safely disposed of

General waste and recycling will be clearly differentiated through appropriate signage and colour coding to Australia Standards to reflect the materials contained.

Occupational Health and Safety issues such as slippery floors in waste rooms and the weight of the waste and recycling receptacles will need to be monitored. Cleaners will monitor the bin storage area and all spills will be attended to immediately by cleaners.

A similar design will be incorporated into the chute rooms located on each floor of each building.

### 4.4 Chute Rooms

The chute rooms will incorporate the following features, as required by Penrith Council's Waste Management Guidelines:

- Incorporation of linear or circular carousel device under each individual chute
- Minimum 0.9m clearance around the linear or circular carousel system to allow for maneuverability and system maintenance
- 1.8m unobstructed clearance zone between the linear/circular track system and the entrance for access and manoeuvrability
- Suitable door access for the service of bins with a minimum width of 1.8m, and accessed by a 1.8m unobstructed access corridor.
- Should a roller door be provided an additional 0.9m service door is required inclusive of an abloy key system

- Accommodate two additional 1,100L service bins in each chute room with a minimum access clearance of 1.8m wide for the loading of 1100L bins onto the track system.
- The room is to be fully enclosed, walled and not permit through access to other on-site waste infrastructure. Separate unobstructed access is required.
- The floor must be finished so it is non-slip and has a smooth and even surface covered at all intersections.
- Floor graded to a central drainage point connected to the sewer, enabling all waste to be contained and safely disposed of.
- Partitioned and enclosed with a minimum internal room height in accordance with the Building Code of Australia 2016 (BCA).
- The room is to be provided with an adequate supply of water through a centralised mixing valve with hose cock.
- Incorporation of adequate lighting and naturally/mechanical ventilation to meet Building Code of Australia 2016 requirements.

## 4.5 Bulky Waste Storage Room

As mandated by Council, this room will be located adjacent to the Loading Dock and has been sized according to Council requirements (please refer to Section 3.1).

This room will also incorporate the following features in its final design:

- Room dimensions are to be designed to ensure items can be placed and manoeuvred within the room, with a minimum width of 1.8m.
- Suitable door access for the service of bins with a minimum width of 1.8m, and accessed by a 1.8m unobstructed access corridor.
- Minimum room width of 1.8m to all internal walls
- A room is to be located in close proximity to the on-site loading bay.
- The room is to be fully enclosed, walled and not permit through access to other on-site waste infrastructure. Separate unobstructed access is required.
- The floor must be finished so that it is non-slip and has a smooth and even surface covered at all intersections.
- Floor graded to a central drainage point connected to the sewer, enabling all waste to be contained and safely disposed of.
- Partitioned and enclosed with a minimum internal room height in accordance with the Building Code of Australia 2016 (BCA).
- The room is to be provided with an adequate supply of water through a centralised mixing valve with hose cock.
- Incorporation of adequate lighting and natural/mechanical ventilation to meet Building Code of Australia 2016 requirements.

## 4.6 Bin Requirements

Appendix A contains illustrations of bins (and other waste management equipment) that could be used within the buildings. The pictures provide examples of the different options for equipment such as MGB, bins placed within the office areas, tugs for transporting bins, trolley unit and a wheelie-safe trolley.

Containers located within the development for waste and recycling should be consistent. The following table outlines the colour coding that has been developed by Standards Australia.

**Standards Australia waste/recycling container colour coding**

Waste Stream	Bin Body Colour	Lid Colour
Commingled Recycling	Green	Yellow
Food Organics	Burgundy	Burgundy
General Waste	Green	Red

## 5. Education

All tenants and cleaning staff will receive information regarding the waste collection systems including how to use the system, which items are appropriate for each stream and collection regimes.

Signage will be a crucial element of the waste management system. Appendix B contains examples of signage. These are the type of signs that should be used throughout the buildings and waste storage area. Other signs can be accessed from the NSW EPA website at: <http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm>.

Large and clear signage will be provided within all waste rooms room and other areas of the development (eg., lobby and on each floor), educating residents on how to recycle – this will be accompanied by a brochure located within each apartment. Appropriate signage and updated information will also be provided.

All waste receptacles will be appropriately signed and additional room signage is usually provided from most waste contractors during implementation of the waste contract. Examples of signage are included in Appendix B.

It is recommended that all signs should:

- Clearly identify the waste/recycling stream;
- Use correct waste/recycling stream colour coding;
- Identify what can and cannot be disposed of in the receptacle; and
- Include highly visual elements to accommodate for individuals with inadequate English literacy.
- As part of the staff induction process, a waste and recycling toolkit will be provided. This toolkit will include the details of each of the systems in place; acceptance criteria for each stream and how each stream is managed.

On a quarterly basis waste and recycling performance reports will be reported back to tenants so that they are aware of their performance and areas for improvement. An active waste monitoring program will be employed. The waste and cleaning contracts will ensure that contractors actively participate in the waste reduction program for the site and meet monthly to identify performance and new opportunities for diversion and avoidance.



## Appendix A – Waste Management Equipment

Figure 1: Images of typical 240L, 660L, and 1100L bins



Figure 2: Portable bin tugs



Figure 18: Typical Portable Bin Tug Device

**Note:** All Electric Portable Bin 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.

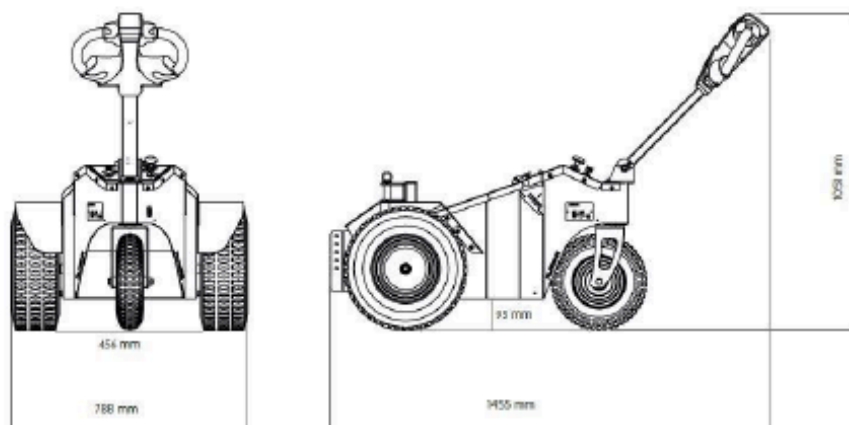


Figure 19: Schematic of a typical Portable Bin Tug Device



## Appendix B – Example Signage



Example wall posters



Example bin lid stickers



## Appendix C – Indicative Chute Design

Get a higher star rating for your projects with the new **eChute**

Interlocked Recycling Hopper

Fire door

Diverter

Recycling Ready Busy Waste

Hopper inlet door

GENERA WASTE

RECYCLE

THE WAY INTO THE FUTURE!

LINEAR NO COMPACTOR
Built to minimise strata cost
Can be fitted with 240, 660 or 1100 litre bins
Fully automatic
Designed for building where no compaction required
Minimises bin movement
Low maintenance
415 Volts - 10Amp

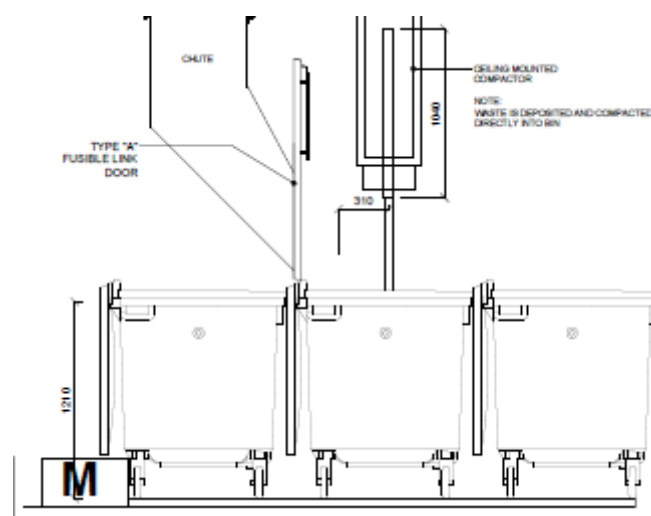
240 LITRE

660 LITRE

1100 LITRE

BIN COMPACTOR + CAROUSEL OR LINEAR
Built for under chutes systems in high rise building
Waste falls directly into bins
Fits over carousel or linear system
Compacts into, 240, 660, 1100 standard bins
Fully automatic, compaction ratio 2:1
Minimise strata cost
Low cost maintenance
415 Volts - 10Amp

LINEAR



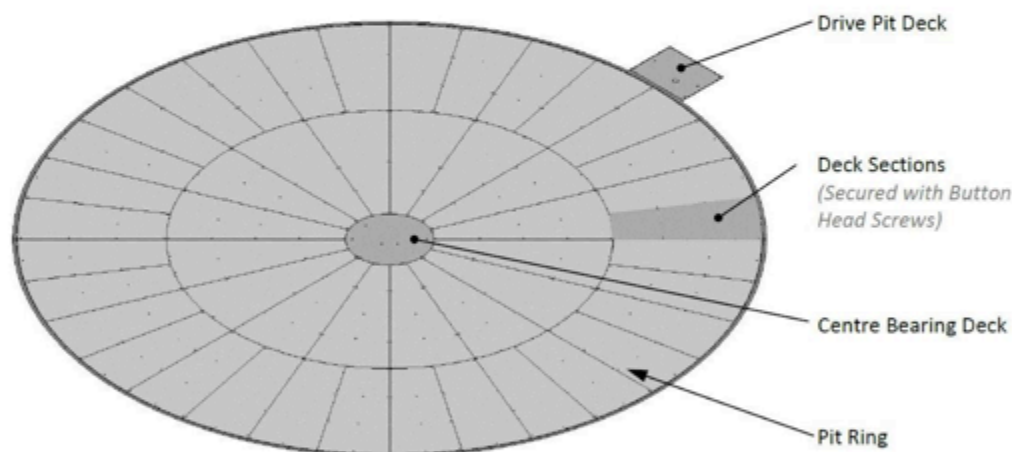
## Appendix D – Turntable Specifications

### 2.4 TURN TABLE SPECIFICATIONS

#### 2.4.1 Turntable Overview

Turn tables are typically characterised into the following:

- a) **400mm Thick Truck Turntables:** Consist of support wheels arrayed in circular rings about the centre point. The support wheels are fixed to the concrete pit and the turntable structure revolves on the wheels.
- b) **250mm Thick Truck Turntables:** Consist of support wheels arrayed in circular rings about the centre point. The Support Wheels are fixed to the turntable structure and they move with the turntable as it revolves.



**Figure 2: Turn Table reference diagram depicting key components and terminology**

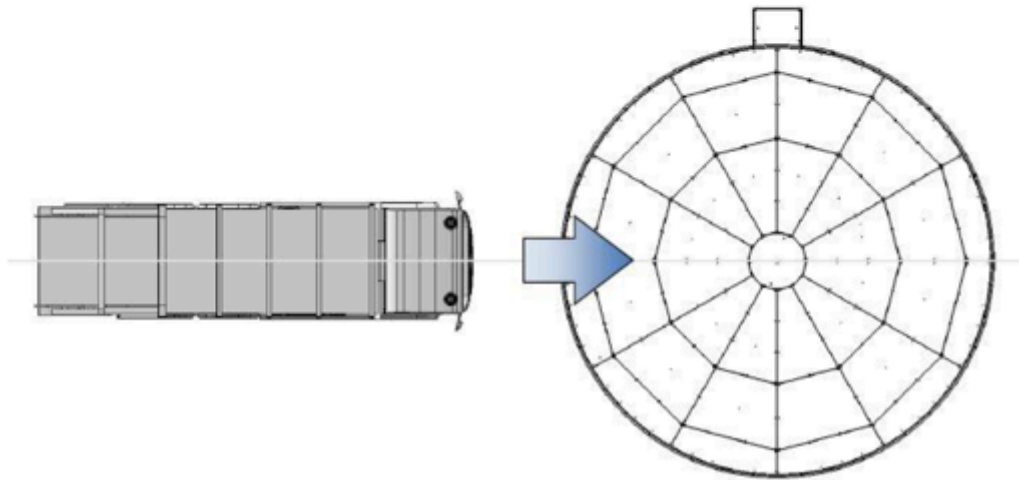
Turn tables are fitted with hatches and decks to provide access for inspection and maintenance including:

- **Dive Pit Deck:** Provides access to the Drive Wheels and Motors
- **Centre Bearing Deck:** Provides access to the Centre Bearing
- **Inspection Deck:** Provides access to the support wheels

## 2.4.2 Vehicle Alignment

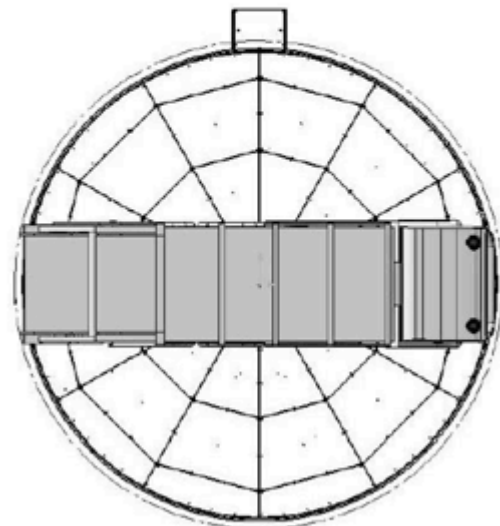
Approach the turntable at a safe speed and align the vehicle so that the centreline of the vehicle aligns with the centreline of the turntable. Where permissible, all turning manoeuvres are completed prior to driving onto the turntable. The vehicle stops when all wheels are fully on the turntable, the vehicle is positioned centrally and the handbrake is applied. No overhang is permitted during turntable manoeuvres.

### 2.4.2.1 Vehicle Entry Alignment



**Figure 3: Central alignment of a heavy rigid collection vehicle onto the turn table**

### 2.4.2.2 Vehicle Loading Alignment



**Figure 4: Vehicle positioned centrally on the turn table with no overhang**