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634-652 High Street, Penrith

Mixed Use Development Application

Operational Waste Management Plan

October 2021

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 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.

Table of Contents

1. Introduction

This Operational Waste Management Plan has been prepared by Waste Audit & Consultancy Services (Aust) Pty Ltd to accompany Toga's Development Application for the Toga Penrith development. The development application subject to these proceedings is amended by way of changes detailed below:

a. Podium - reduction in the scale of the podium from 5 storeys to 4 storeys in the middle section and 2 storeys at the northern and southern ends; decrease in the number of car parking spaces provided within the podium; increased 'sleeving' of car parking provided in the podium with apartments; and enhanced articulation.

b. Basement - increased basement car parking from 1 to 3 levels.

c. Ground level - enhanced activation of the ground floor through relocation of the through site pedestrian link, redistributing and enlarging commercial floorspace, providing stepped sitting edges to the western colonnade facing John Tipping Grove, and increased landscaping.

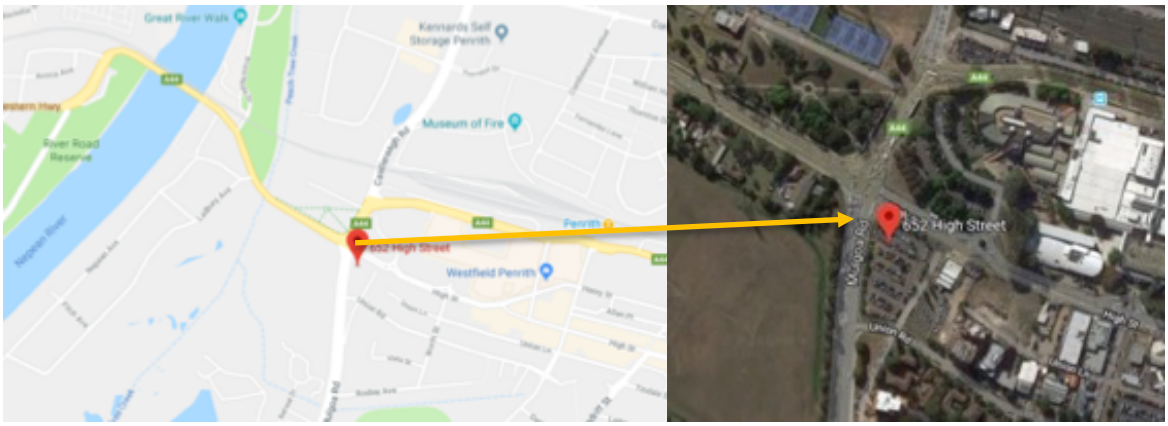
d. Levels 1 to 3 - increased activation and connection to ground level through additional apartments and enhanced design of communal open space area.

e. Towers - reduction in the height of Tower 2 from 37 to 35 storeys, reduction in height of Tower 1 from 14 storeys to 13 storeys, and redesign to increase building articulation.

The proposed development DA20/0148 seeks consent for a mixed-use development comprising two towers of 35 and 13 storeys, located above a part 4 and part 2 storey podium providing 357 residential dwellings with ground level commercial tenancies, 3 levels of basement car parking, a new public road and associated site works on the land at 634-638 High Street and 87-93 Union Road, Penrith NSW.

The location of the development is shown below.

Figure 1: Development Location



This Plan has been developed with reference to the following Penrith City Council documents:

- *Residential Flat Building Waste Management Guidelines*
- *Industrial, Commercial and Mixed-Use Waste Management Guidelines*
- *Commercial Waste Generation Rates Guideline*

2. Operational Waste & Recycling

2.1 Materials Streams

Based on the number of apartments and size of commercial premises, the development will produce the following operational waste streams:

- **Mixed recycling (paper, cardboard, glass, metal, and plastic)**
- **General waste (all other materials apart from bulky waste items)**

Penrith City Council will collect **residential** general waste and recycling, with **retail and commercial** general waste and recycling collected by private contractor. 1100-litre bins will be used for all storing all general waste and recycling.

Collection schedules are shown in Section 3 of this report.

Residents will also be able to take advantage of Council's bulky household waste collection program, which is an on-request service. Based on the number of residences, collections would probably take place on a quarterly basis.

2.2 Waste Volume Calculations

Calculations for the types and quantities of waste that will be generated are based on the rates provided in the Penrith City Council's documentation, as shown in Tables 1 and 2:

Residential waste generation is based on the number of dwellings per bin; commercial waste generation is based on litres per 100 square metres of floor area and varying formulas based on the tenancy type (take-away, café, restaurant, etc.).

Whilst the ground floor area is currently classified for commercial use, provision has been provided for change of use to retail tenancies in the future. The operational waste and recycling volumes and bin requirements shown in Table 6 have been calculated based on the following tenancy mix:

- 33% specialty
- 33% café
- 33% restaurant

Table 1: Residential Waste Generation Rates (Dwellings per Bin)

Waste Stream	Dwellings per 1100-Litre Bin
General Waste	18
Recycling	18

Table 2: Commercial Waste Generation Rates (Litres/100m^2)

Waste Stream	Takeaway	Cafe	Restaurant
General Waste	150 litres/100 m^2	300 litres/100 m^2	600 litres/100 m^2
Recycling	150 litres/100 m^2	200 litres/100 m^2	200 litres/100 m^2

Tables 3a-3c show calculated weekly residential and commercial general waste and recycling based on the above waste generation rates:

Table 3a: Estimated Waste Generation - Building 1

Building 1	General Waste Litres/Week	Recyclables Litres/Week	Total Litres/Week
87 apartments	5,317	5,317	**10,634**
441 m^2 commercial tenancies)	9,261	4,851	**14,112**

Table 3b: Estimated Waste Generation - Building 2

Building 2	General Waste Litres/Week	Recyclables Litres/Week	Total Litres/Week
270 apartments	16,500	16,500	**33,000**
595 m^2 commercial tenancies	12,495	6,545	**19,040**

Table 3c: Estimated Waste Generation - Total Development

Total Development	General Waste Litres/Week	Recyclables Litres/Week	Total Litres/Week
357 apartments	21,817	21,817	**43,634**
1,036 m^2 commercial tenancies	21,756	11,396	**33,152**

Section 3 provides details of equipment and spatial requirements.

3. Waste & Recycling Storage Calculations

3.1 Residential

Table 4 shows bin requirements based on the calculations in Section 2.2 and **twice per week** collection of general waste, and a **once per week** collection frequency for recyclables:

Table 4: Residential Bin Requirements (1100-litre Bins)

Material Stream	Building 1 87 apartments	Building 2 270 apartments	Total 357 apartments
General Waste	5	16	21
Recycling	5	16	21
Service Bins (To remain in chute rooms)	2	2	4
Total	**12**	**34**	**46**

The 46 bins will be split between the main storage room located in Building 1 near the Loading Dock, which will hold both towers' residential general waste and recycling, and two chute discharge rooms located in Building 1 (Ground Level) and Building 2 (B1 Level), each of which will hold 2 service bins.

The site's cleaning staff will take full bins from both chute discharge rooms and move them to the main Building 1 storage room as described in Section 4.

Equipment and spatial requirements for both buildings shown in Tables 5a-5c are based on a separation distance of 0.2 m between bins, and sufficient vacant space for access and circulation. The bins that will remain sitting on the linear bin tracks have been included in area calculations.

Table 5a: Main Storage Room (Combined Buildings 1 & 2 Bins)

Equipment/Usage	No.	Footprint per Bin (m^2)	Total Footprint (m^2)
1100-litre General Waste Bins	21	1.86	35.34
1100-litre Recycling Bins	21	1.86	35.34
Vacant/Circulation Space (including bin wash area)			70.82
Total Bins	**42**		**70.68**
Room Area			**141.50**

Table 5b: Building 1 Chute Room

Equipment/Usage	No.	Footprint per item (m^2)	Total Footprint (m^2)
1100-litre General Waste Bins	3	1.86	Included in linear track area
1100-litre Recycling Bins	3	1.86	Included in linear track area
Linear Tracks (+3 bins/track)	2	12.48	24.96
Bin Tug Storage	1	1.24	1.24
Vacant/Circulation Space			18.10
Total Equipment			**26.20**
Room Area			**44.30**

Table 5c: Building 2 Chute & Storage Room

Equipment/Usage	No.	Footprint per item (m^2)	Total Footprint (m^2)
1100-litre General Waste Bins	17	1.86	31.62
1100-litre Recycling Bins	17	1.86	31.62
Linear Tracks (+4 bins/track)	2	16.16	32.32
Bin Tug Storage	1	1.24	1.24
Vacant/Circulation Space (including bin wash area)			79.00
Total Equipment			**96.80**
Room Area			**175.80**

For bulky waste, Council requires storage space calculated as follows:

Total number of dwellings (357) x 8.0 m^2 divided by 52 = **storage area of 54.9 m^2**.

The design and construction of the bulky waste storage room will comply with Council's specifications as listed in Section 4.5. The room's location and size are shown in Figure 6 on page 9.

3.2 Commercial

Table 4 shows bin requirements based on the calculations in Section 2.2 and **four times per week** collection of general waste, and **twice per week** collection frequency for recyclables. 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 0.2 m between bins for manoeuvring and access.

Table 6: Commercial Waste Storage - Equipment & Spatial Requirements

Equipment/Usage	No.	Footprint per Bin (m^2)	Total Footprint (m^2)
1100-litre General Waste Bins	6	1.86	11.16
1100-litre Recycling Bins	6	1.86	11.16
Vacant/Circulation Space			22.38
Total Bins	**12**		**22.32**
Room Area			**44.70**

4. Waste Management Systems

4.1 Residential

The following summarises the proposed residential general waste and recycling management systems that will be implemented for Buildings 1 and 2. To ensure that these systems are implemented, requirements will be specified in strata by-laws as well as within service contracts for the site's building maintenance and cleaning contractors.

The buildings will employ 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 Level) and Building 2 (B1 Level).

To ensure that general waste and recycling are managed correctly, residents will be provided with information on proper segregation and disposal and encouraged to separate general waste and mixed recyclables within their apartments.

Figures 2 and 3 show typical chute locations on each residential floor:

Figure 2: Building 1

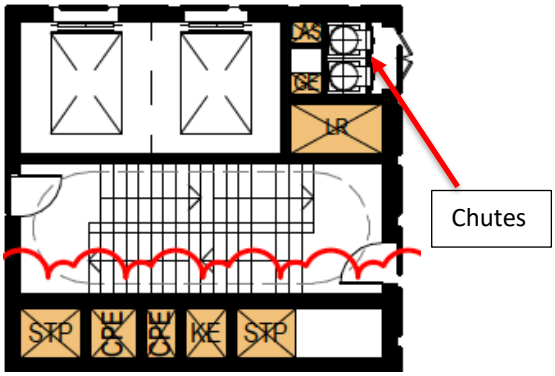
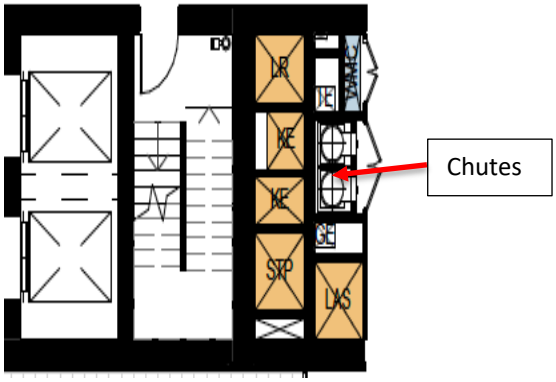


Figure 3: Building 2



General waste and commingled recyclables will be collected under each chute into 1100 litre bins located on linear tracks in order to minimise the changing over of bins.

Figures 4 and 5show details of Buildings 1 and 2 chute discharge rooms and linear track configurations:

Figure 4: Building 1

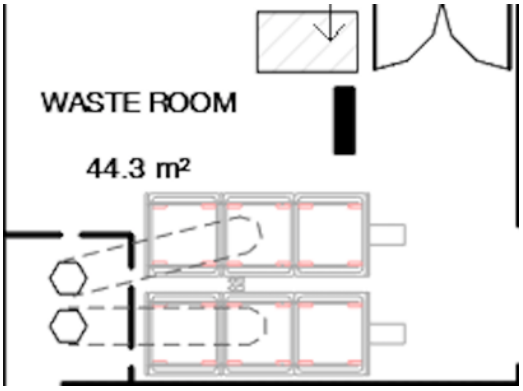
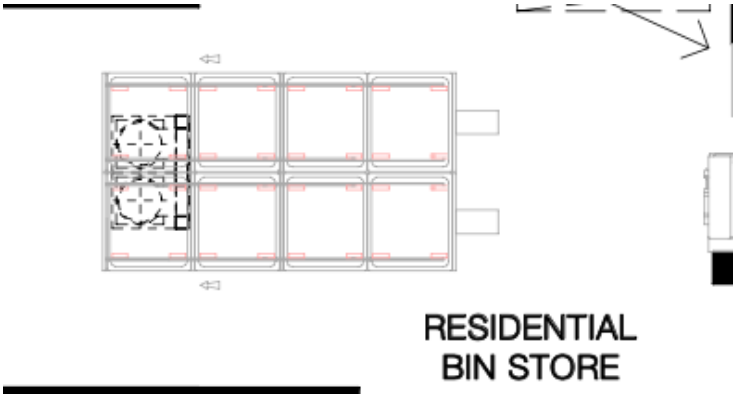


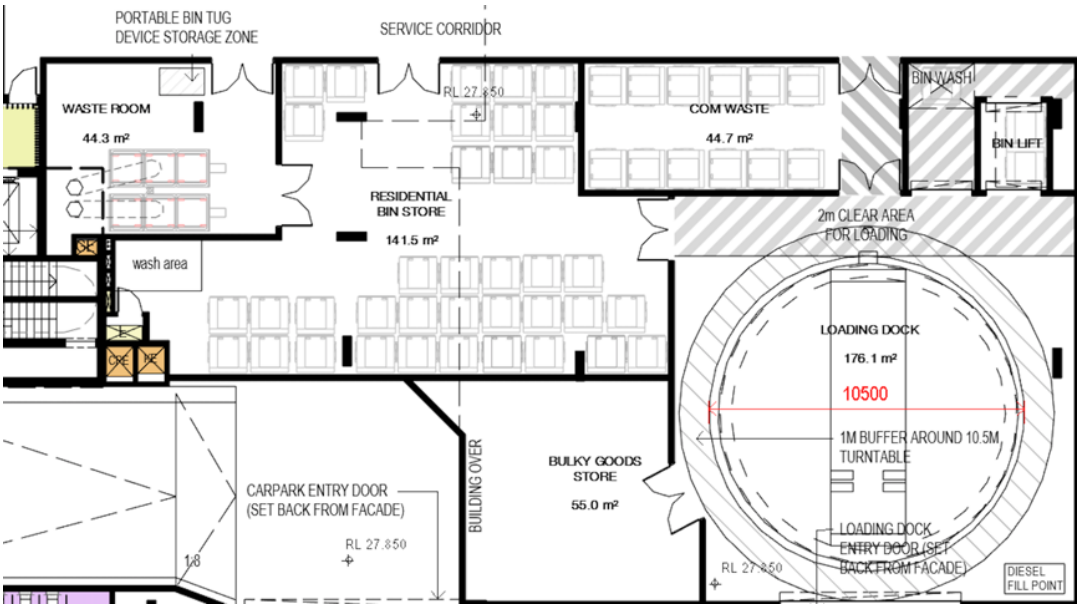
Figure 5: Building 2



All residential bins will be collected by Council from the main waste storage room on the ground level of Building 1 (Figure 6). A turntable will be provided, allowing the waste collection vehicle to service bins safely and efficiently within the designated collection area. The turntable will have a hydraulic override or similar assisted override system, allowing it to be rotated in the event of the system's malfunction.

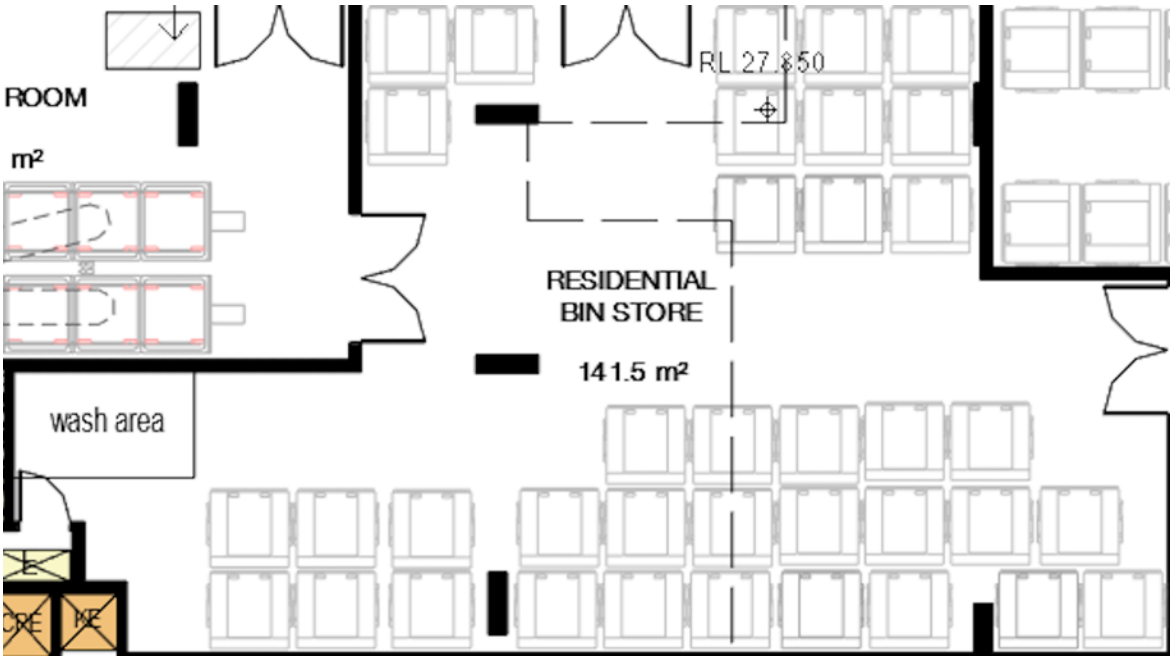
Appendix D provides additional information on turntable specifications.

Figure 6: Loading Dock Area



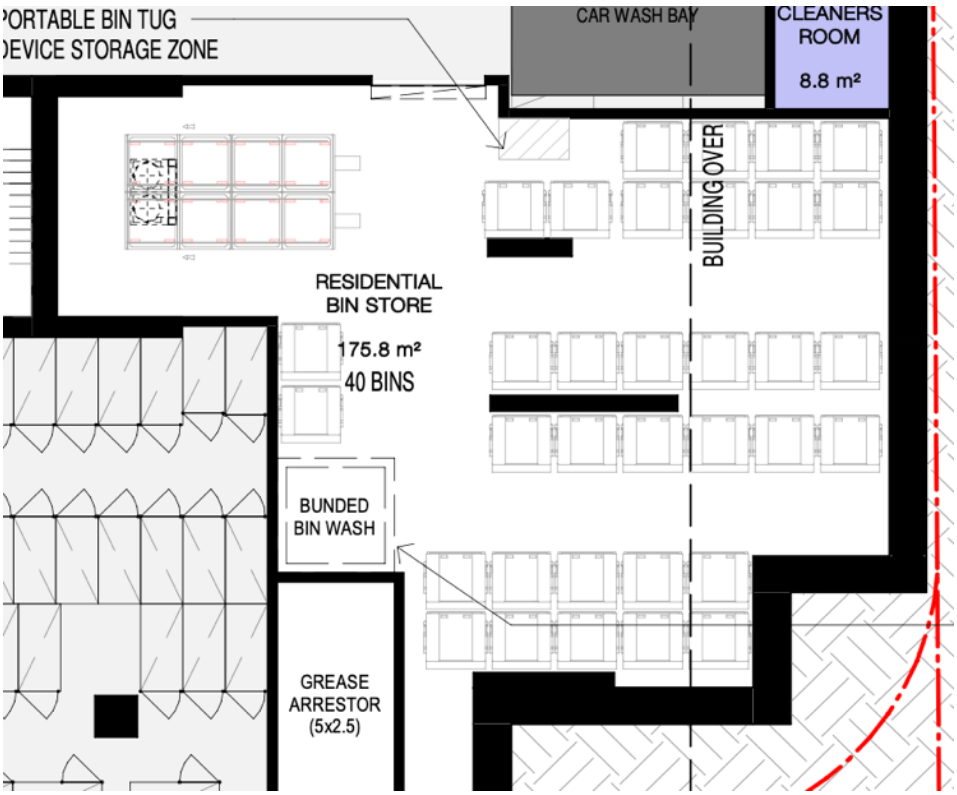
For collection purposes all bins from Buildings 1 and 2 will be stored in the Building 1 main storage room (Figure 7) excluding the two service bins for each building, which will remain beneath chutes to collect waste and recyclables disposed of during collections. Site cleaning staff will ensure all bins are placed in this room prior to collection by Council and returned to their designated areas following collection.

Figure 7 - Main Residential Bin Storage Room



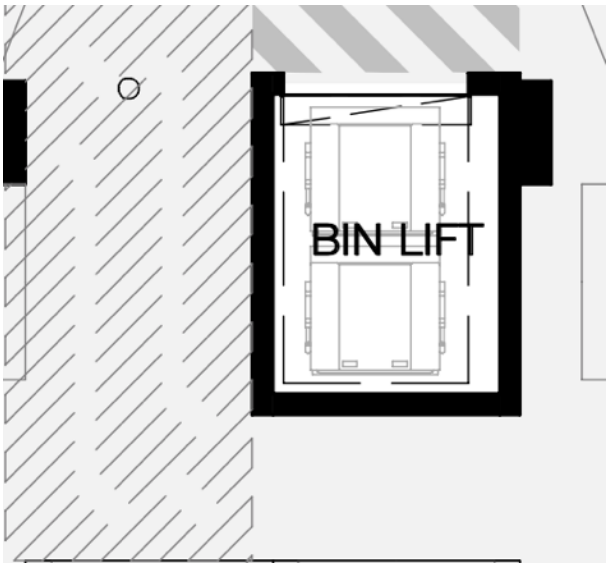
Bins from the chute room in Basement 1 of Building 2 (Figure 8) will be transported via motorised tug to a dedicated bin service lift (Figure 9) which will be used to bring bins to the main Building 1 ground level storage room. Appendix A provides additional information on tug specifications and operation.

Figure 8 - Building 2 Chute Discharge/Residential Bin Storage Room



The bin service lift will be of sufficient size to transport a minimum of two 1100-litre bins in one trip, as per Council's specifications:

Figure 9 - Bin Service Lift



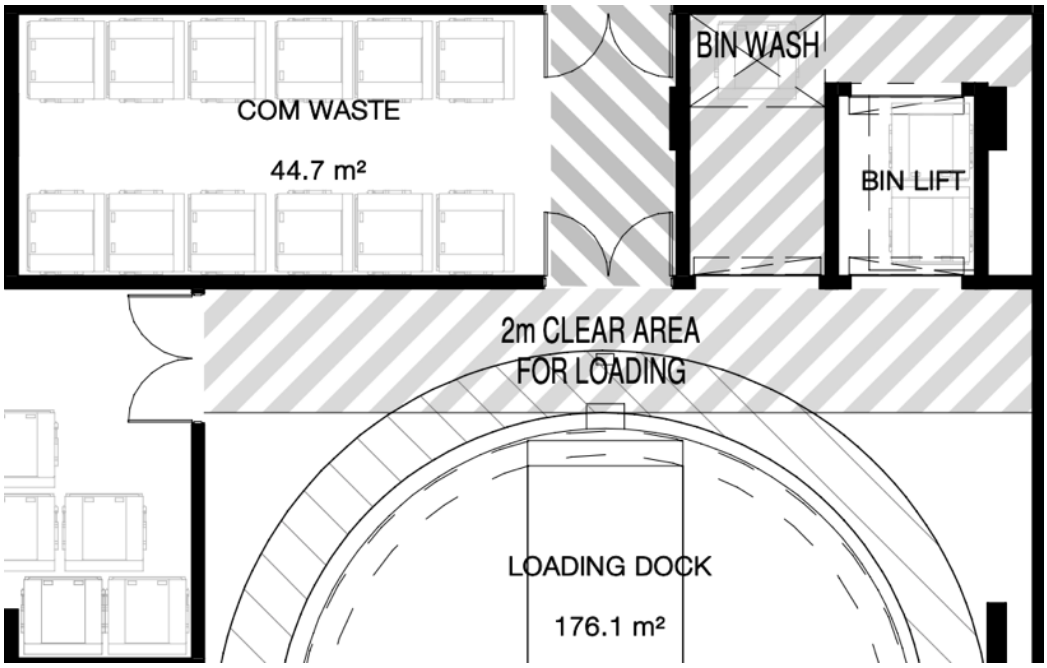
All on-site waste collection infrastructure (including the Chute Room, Waste Collection Room, Bulky Household Goods Bay, Commercial Waste and Loading Bay Infrastructure) will be locked through Council's Abloy Key System (lock system number is 5OL092).

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, where separate bins for general waste and recyclables will be located.

A private waste contractor will collect all 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 in Figure 10. A bin wash facility is also located in this area.

Figure 10 - Commercial Bin Storage



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 and incorporating the following features, as required by Penrith City 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
- 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 City Council's Waste Management Guidelines:

- Incorporation of linear tracks under each individual chute
- Minimum 0.9 m 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
- 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.

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 which can 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.

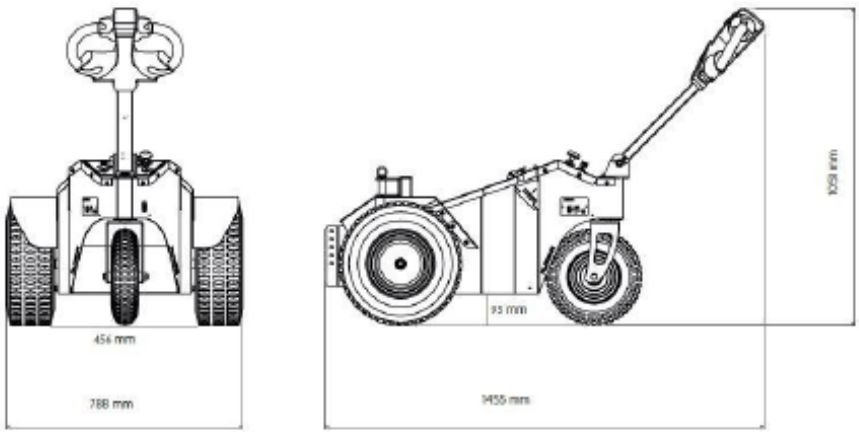
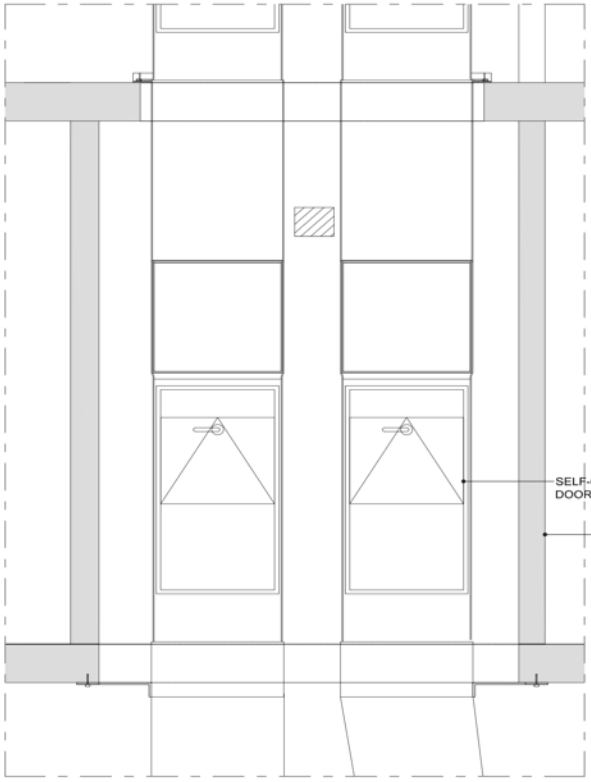
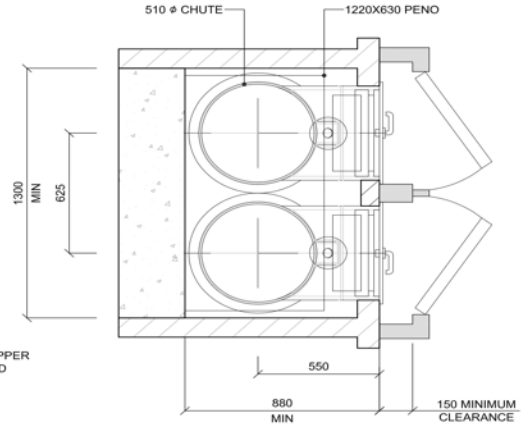


Figure 19: Schematic of a typical Portable Bin Tug Device

Appendix B – Example Signage

Appendix C – Chute Design Specifications

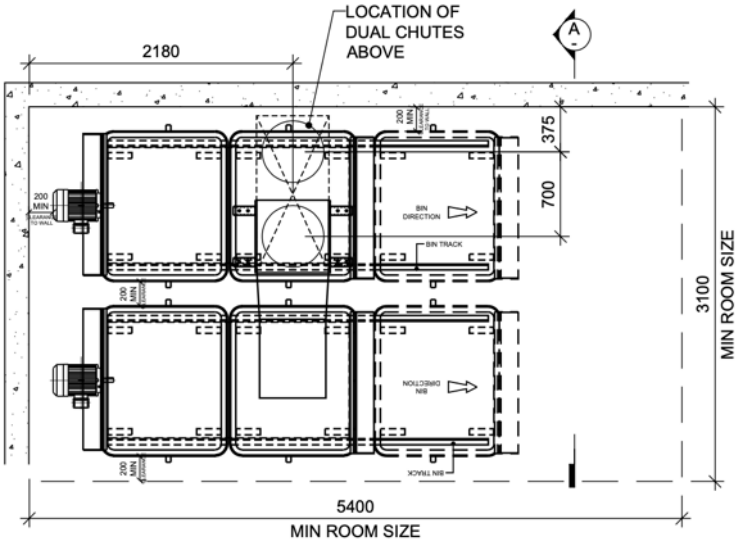


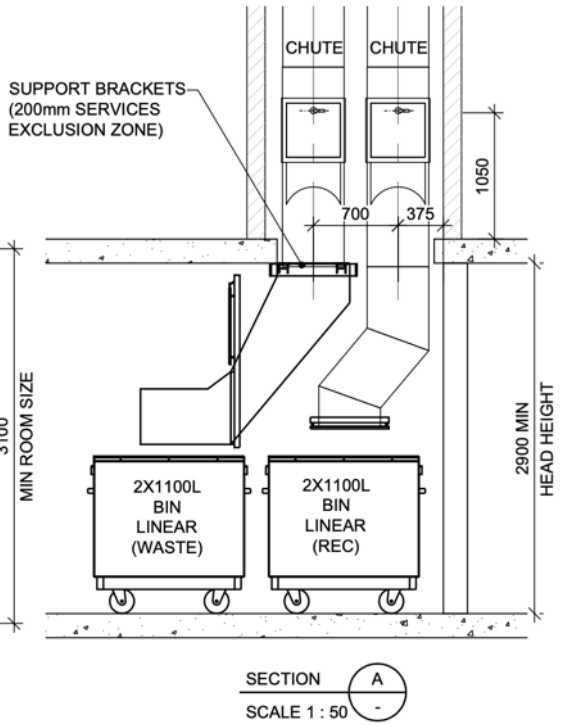


TYPICAL LLDPE PLASTIC TWIN CHUTE LAYOUT
w/ADDED ENCLOSURE (510Ø) (STEEL SIMILAR)
SCALE 1:20

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

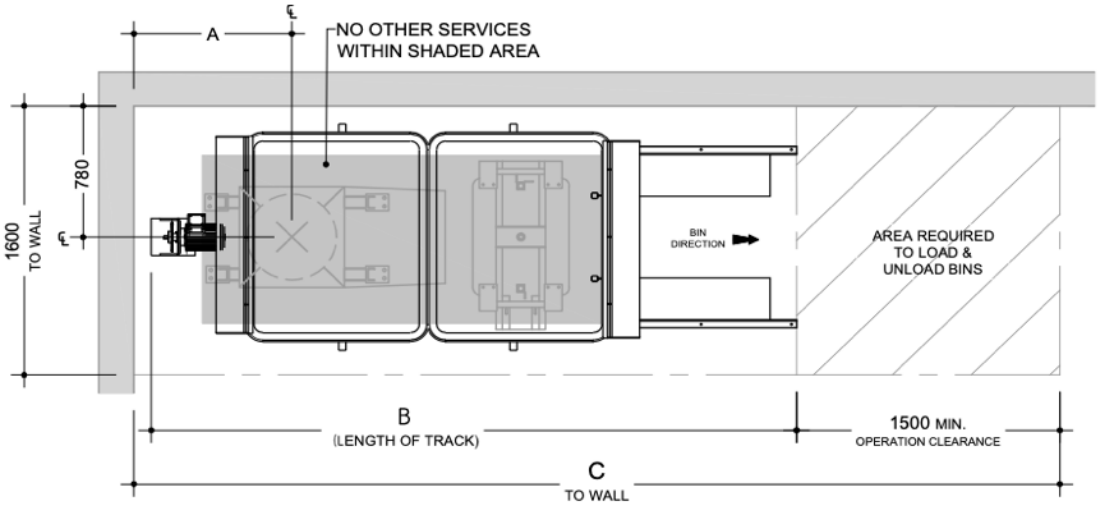
TYPICAL DUAL CHUTE LAYOUT
(510Ø)
SCALE 1:20

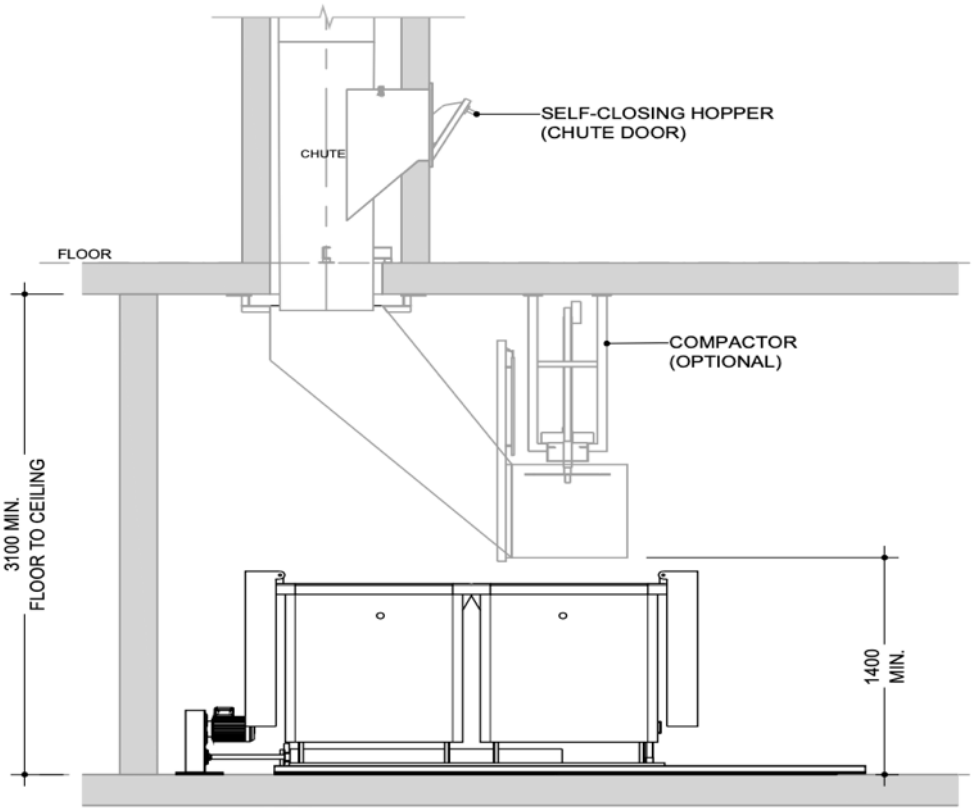




SECTION A
SCALE 1 : 50

LINEAR TRACK SYSTEM





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 is revolves.

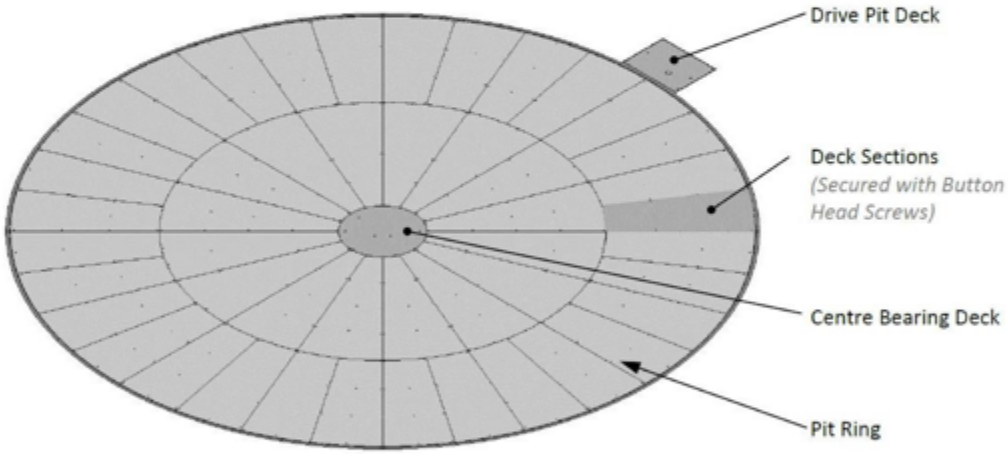


Figure 2: Turn Table reference diagram depicting key components and terminology

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 maneouvres.

2.4.2.1 Vehicle Entry Alignment

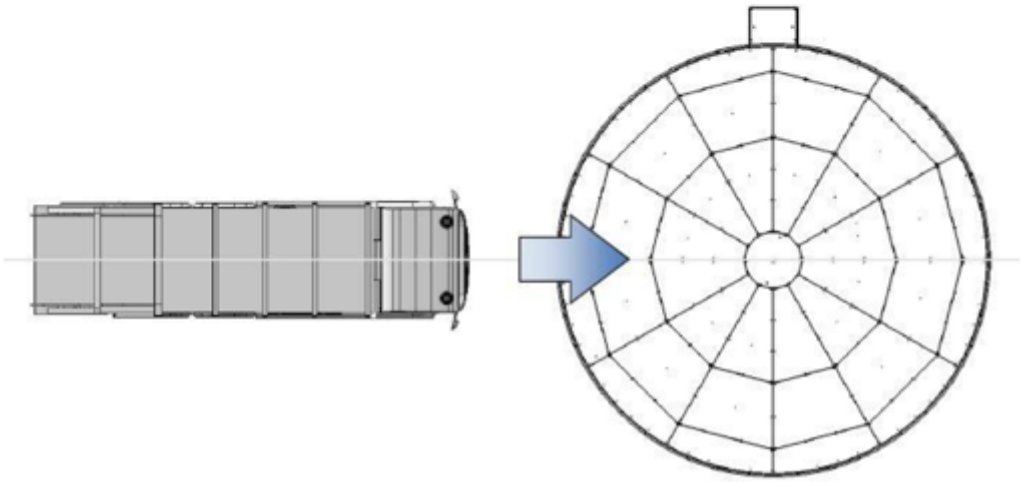


Figure 3: Central alignment of a heavy rigid collection vehicle onto the turn table

2.4.2.2 Vehicle Loading Alignment

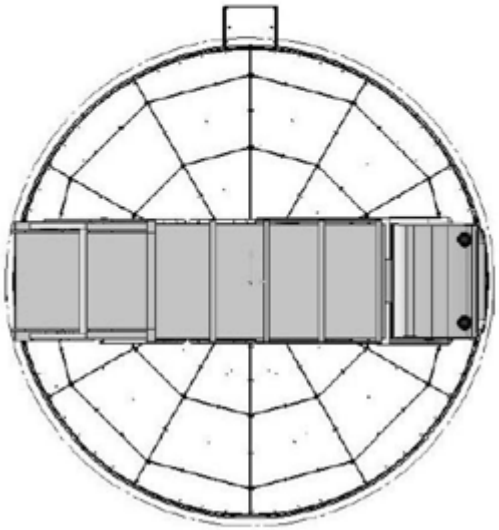


Figure 4: Vehicle positioned centrally on the turn table with no overhang

Appendix E – Collection Vehicle Swept Paths