

Positively

PENRITH

Guidelines for Waste Infrastructure

February 2026



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CITY COUNCIL

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Glossary

The following are terms used within this document.

Term	Definition
Bin Carting Route	The path of travel of bin infrastructure from storage area/s to the designated point of collection.
Bulky Waste Collection Room (residential flat buildings, commercial, industrial)	The nominated central area integrated wholly within the development where residents place bulky household items (lounges, mattresses, whitegoods, etc) for collection. Resident/tenant access is provided through contact with the development's caretaker.
Collect and Return Service	On-site waste infrastructure (waste storage area and bulky goods collection area) is communal and accessible to all residents within a development. Council's collection contractors will enter the development, take the waste items to the truck and return empty bins/infrastructure.
Communal Bulky Waste Collection Area (multiple dwellings)	A communal storage area integrated wholly within the development's built form. The room provides an area for residents to place bulky household items (lounges, mattresses, whitegoods, etc) the night before a booked scheduled collection.
Communal Waste Storage Area (multiple dwellings)	A communal storage area integrated wholly within the development's built form to accommodate Council's bin infrastructure. Bins are permanently stored in the structure and all bins are shared by the residents within the development.
Heavy Rigid Vehicle	Heavy Rigid Vehicle is defined as per Australian Standard 2890.2.
Kerbside collection	Where presented bins are collected kerbside by Council's waste service.
Loading Bay	The allocated loading area integrated within the built form to permit a safe and efficient waste collection service for

Term	Definition
	Council's standard heavy rigid waste collection vehicle.
Nominated Waste Collection Point	Hard stand areas to accommodate Council's allocated waste collection bin infrastructure when presented for scheduled collections.
Route of Travel	The travel path for a waste collection vehicle when entering the site to access the on-site loading bay.
Swept Path Analysis	Simulation of a vehicle moving within a digit design to examine various movements and paths of travel to determine the space requirements for efficient vehicle manoeuvres within a development.
Waste Chute Room	The room in which the chute system terminates, and waste is collected in a bin.
Waste Chute System	Ventilated, vertical pipes passing through each floor of a multi-storey building with access on each residential level. Residents access the chute system through chute inlets located on each residential level.
Waste Collection Room (residential flat buildings, commercial, industrial)	The nominated central area within the development where the full bins from the chute room/s or similar are stored for collection.
Waste Cupboard	Storage cupboards located on each residential level containing the chute inlets of the various waste streams assigned to the development.
Waste Storage Area	Hard stand areas located behind the building line to store Council's allocated waste collection bin infrastructure.

1 Introduction

Penrith City Council (Council) is responsible for the collection and disposal of domestic waste within the Penrith Local Government Area (LGA).

Waste management practices of all proposed developments need to consider residents, public amenity and safety at all stages of the waste management process, including storage, transfer, and collection.

The following Guidelines for Waste Infrastructure (Guideline) contains operational specifications and requirements that support the controls in the Waste Management Chapter of Penrith Development Control Plan 2014 (Penrith DCP). This Guideline should be read in conjunction with Penrith DCP.

This Guideline comprises 5 Parts, including:

1. **Part A:** Residential subdivision, dwellings dual occupancies, semi-detached and attached housing
2. **Part B:** Multi-dwelling housing, manor houses, boarding houses, co-living housing and group homes
3. **Part C:** Residential flat buildings
4. **Part D:** Industrial and commercial
5. **Part E:** Automated waste collection systems

Part A Residential subdivision, dwellings, dual occupancies, semi-detached and attached housing

1 Introduction: Design Principles

1.1 Waste Management Considerations

Residential subdivisions and dwelling types captured by Part A of this Guideline need to be designed so that they can be serviced by Council's sustainable 3 bin service upon occupancy of each dwelling.

In relation to subdivision proposals, providing functional subdivision layouts is essential for Council to safely and efficiently service new developments and ensure future residents can access Council's sustainable service. Subdivisions providing smaller lot sizes and narrow lot widths can impact on the operation of Council's waste collection service and present on-going challenges for Council's waste collectors.

Development Applications (DA's) will need to consider:

- The waste management needs of the development and how it will be serviced by Council once the lots/dwellings are occupied by residents.
- Site planning of the development to ensure residential and other uses (such as Council's waste collection) amenity and safety at all stages of the waste management process.
- The need for temporary or interim waste infrastructure particularly for staged developments, such as but not limited to turning provisions.
- Suitability of cul-de-sacs, as they can cause issues for waste servicing, including but not limited to, restricted spaces to present bins, manoeuvring to gain access to bins with the sidearm, parking within the bulb leading to multiple reverse manoeuvres etc. Cul de sacs in residential subdivision are not desirable.

2 Service Classification

Part A of this Guideline applies to residential subdivisions and the dwelling types listed below. All waste collection infrastructure and service allocations must be provided in accordance with Part A.

Dwellings

- Dwelling house: a building containing only one dwelling
- Secondary dwelling: a self-contained dwelling that:
 - is established in conjunction with another dwelling (the principal dwelling), and
 - is on the same lot of land as the principal dwelling, and
 - is located within, or is attached to, or is separate from, the principal dwelling.

Dual Occupancies

- Dual occupancy (attached): 2 dwellings on one lot of land that are attached to each other, but does not include a secondary dwelling.
- Dual occupancy (detached): 2 detached dwellings on one lot of land, but does not include a secondary dwelling

Attached and Semi-Detached Housing

- Attached dwellings: a building containing 3 or more dwellings, where:
 - each dwelling is attached to another dwelling by a common wall, and
 - each of the dwellings is on its own lot of land, and
 - none of the dwellings is located above any part of another dwelling.
- Semi-detached dwellings: a dwelling that is on its own lot of land and is attached to only one other dwelling.

Information about collection frequencies, acceptable items and further educational material is available on Council's website:

<https://www.penrithcity.nsw.gov.au/waste-environment/waste>

3 Council's Sustainable Service

3.1 Understanding Council's Sustainable Service

Council's sustainable service is comprised of 3 waste streams, including:

- Yellow lidded Recycling bin
- Red lidded Residual bin
- Green lidded Food Organic Garden Organic bin

Dwellings will be serviced by Council's kerbside collection. This will require future residents to wheel garbage bins to a presentation area for kerbside collection. Sufficient space must be provided to ensure the placement and collection of bins meets the operational requirements of the standard heavy rigid vehicle. When placed kerbside for collection, each bin should be fronting the kerb, there should also be minimal or no disruption to the use of footpaths or other paths of travel and proximity to on-street parked cars should be minimised.

Inside each dwelling, space must be allocated for the storage of at least 2 days generation of waste material for all waste and recycling streams. There should also be space for a kitchen caddy or similar allocated in the kitchen for the separation of food waste or compostable material.

Further information on the three waste streams is available on Council's website at the following links:

- 3 Bin Sorting Guide
 - <https://www.penrithcity.nsw.gov.au/waste-environment/waste/bin-services>
- 3 Bin Service Options
 - <https://www.penrithcity.nsw.gov.au/waste-environment/waste/choosing-your-3-bin-service>

3.2 Bin Allocation

Council's sustainable bin allocation comprises the following:

- 1x 240L yellow lidded recycling bin per dwelling.
- 1x 240L green lidded food organic garden organics bin per dwelling.
- 1x 140L red lidded residual bin per dwelling.

Bin Size and Type	Height (mm)	Length (mm)	Width (mm)
240L	1100	740	600
140L	915	615	505

Table 1 Standard bin dimensions



Figure 1: typical food organics garden organics, recycling, and residual bins

4 Integrated Waste Infrastructure

4.1 Bin Storage Infrastructure

Each dwelling shall be provided with bin infrastructure in accordance with this Guideline.

Penrith DCP requires that architectural plans accommodate provisions for waste storage areas, collection points and paths of travel, as outlined in this Guideline, and as follows:

Waste Storage Area

For each dwelling:

- The waste storage area is to be a hardstand area of sufficient size to accommodate Council's full bin allocation
- The waste storage area is to be integrated within the built form and located behind the building line to permit accessible resident access to Council's waste streams
- Storage of bin infrastructure within the garage is not permitted.

Waste Collection Point

For each dwelling:

- The nominated kerbside waste collection point must be of sufficient size to accommodate Council's full bin allocation. The minimum dimensions required for each collection point is 2m by 0.8m deep.
- The waste collection point is to be a hard stand area and be appropriately

located to permit unobstructed access for Council's standard waste collection vehicle to perform scheduled weekly collections

- Consider tree canopy and the operational dimensions of standard heavy rigid vehicles. Consider surrounding context, such as pram access, signage, kerb side parking, etc.

Specifications for Council's standards waste collection vehicle are outlined in the following section 5.

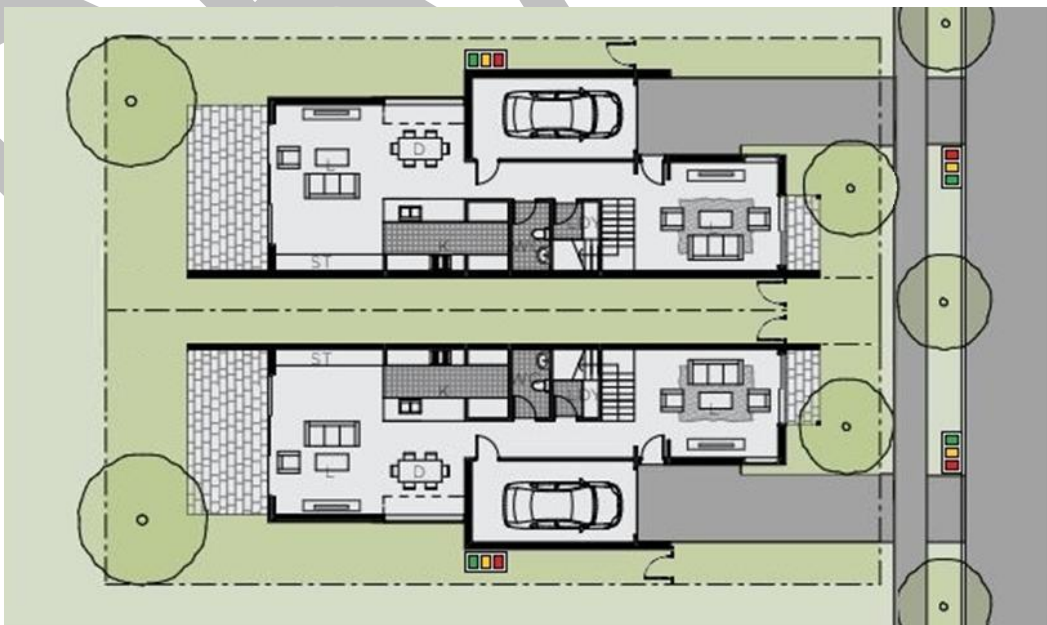
Path of Travel

For each dwelling:

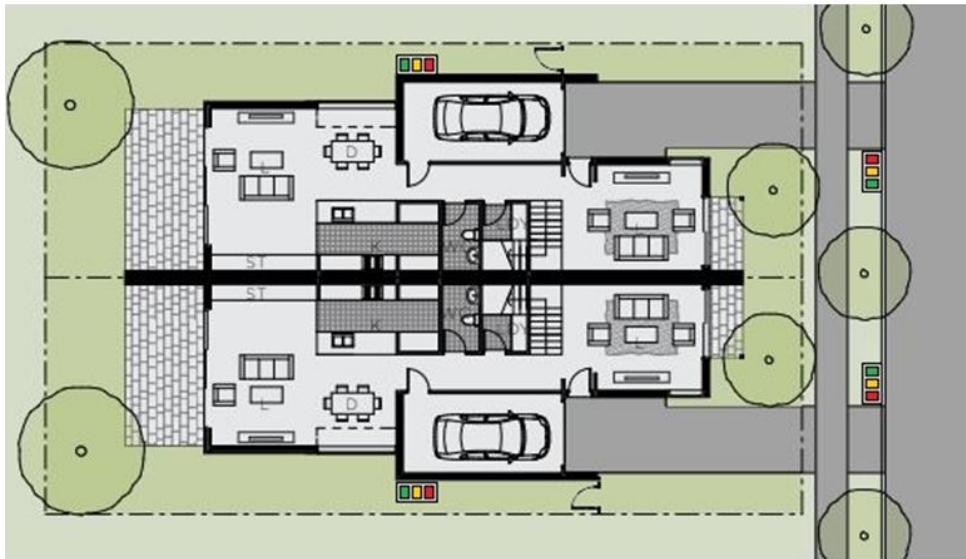
- The design of the built form is to permit the unobstructed movement of Council's full bin allocation from the Waste Storage Area to the Waste Collection Point and incorporate the following:
 - The path of travel of bin infrastructure is not permitted through the habitable component of the dwelling
 - Movement of bins over/through stairs and uneven ground is not permitted, and movement of bins over soft surfaces and vegetated areas is not desired
 - Minimum clearance of 900mm to be provided throughout all manoeuvres.

Indicative examples of bin infrastructure configurations for dwellings, dual occupancies and terraces are shown below and on the following pages.

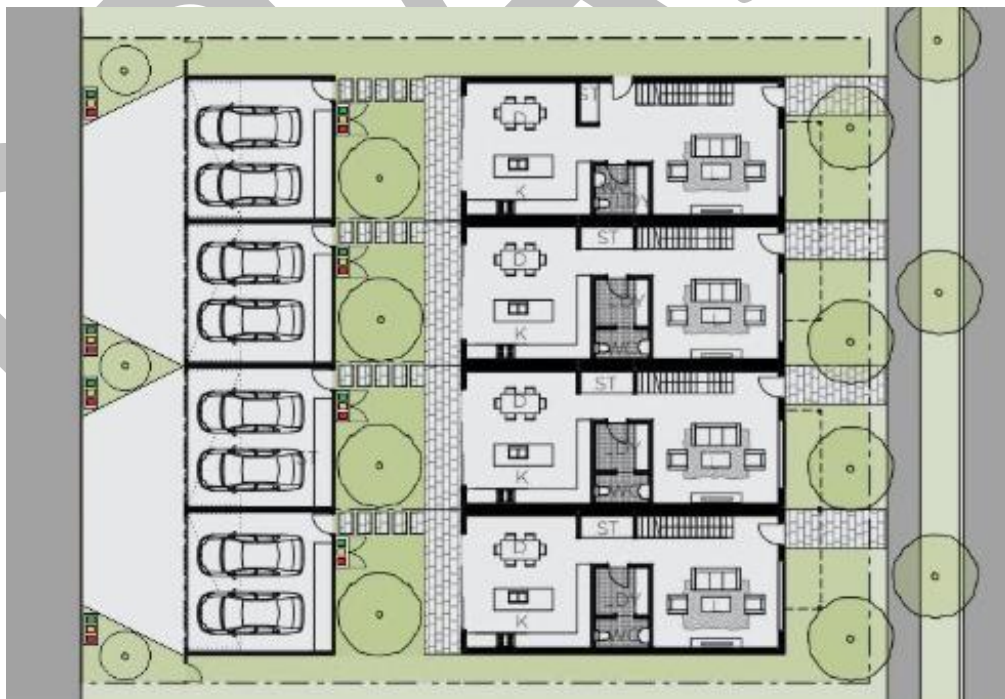
Concept for dwellings



Concept for dual occupancy



Concept for attached dwellings with rear lane access



5 Waste Collection Vehicle

This section should be read in conjunction with the Subdivision; and Transport, Access and Parking Chapters of Penrith DCP.

5.1 Vehicle Specifications

Council's standard waste vehicle to service residential subdivisions is a 12.5m heavy rigid side loading waste collection vehicle. The following dimensions are provided in accordance with Australian Standard 2890.2:

Vehicle Classification	Heavy Rigid Vehicle Dimensions
Overall 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
Roadway/ramp grade (max)	1:6.5 (15.4%)
Rate of change of grade (max)	1:16 (6.25%) in 7.0m of travel
Gross Weight (max tonnes)	28.0
Capacity (m ³)	24
Front Chassis Clearance	13°
Rear Chassis Clearance	16°

Table 2: Standard dimensions sourced from AS 2890.2 Parking Facilities: Off-Street Commercial Vehicle Facilities

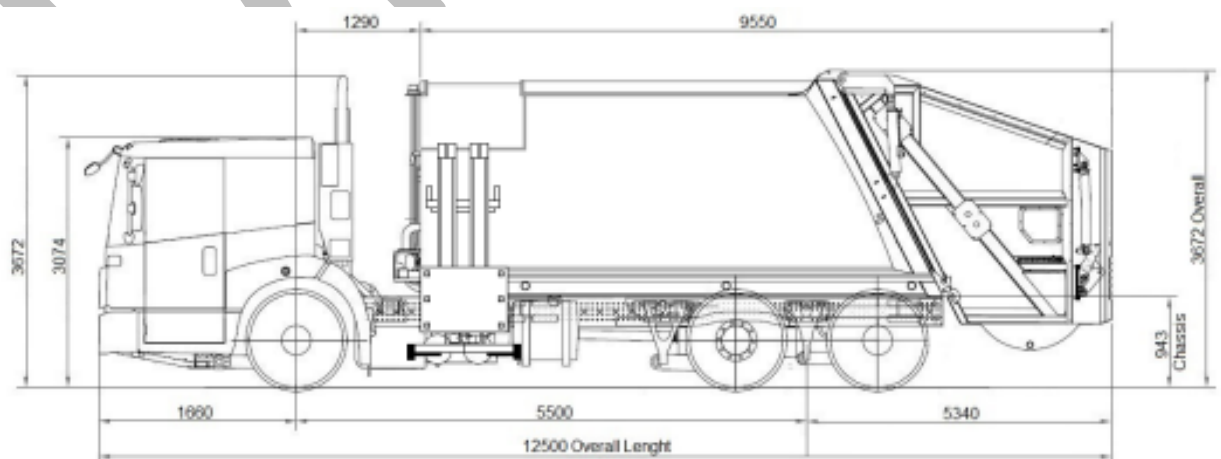


Figure 2: Council's standard 12.5m Heavy Rigid Waste Collection Vehicle specifications.

NOTE: Consideration of vehicle dimensions including rear operational requirements and overhead clearances are required when assessing collection points and route of travel for waste collection vehicles.

5.2 Waste Collection Vehicle Clearance Zones

Figure 3 represents the unobstructed clearance zone required for Council's 12.5m heavy rigid waste collection vehicle to perform a safe and efficient waste collection service.

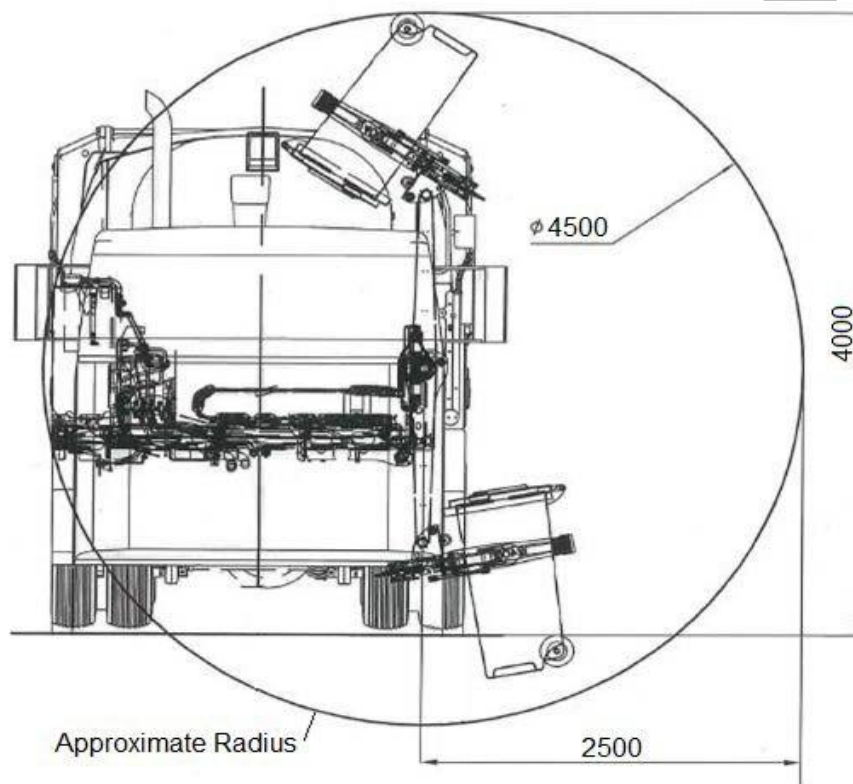


Figure 3: Operational clearances required to support unobstructed collection operation for Council's standard 12.5m Heavy Rigid Waste Collection Vehicle

5.3 Road width

To provide a safe and efficient waste collection service to all subdivisions, the following road dimensions will need to be implemented. The dimensions allow Council's standard waste collection fleet and emergency service vehicles to access and service residential dwellings within subdivisions. The required dimensions are illustrated in Figure 3.1:

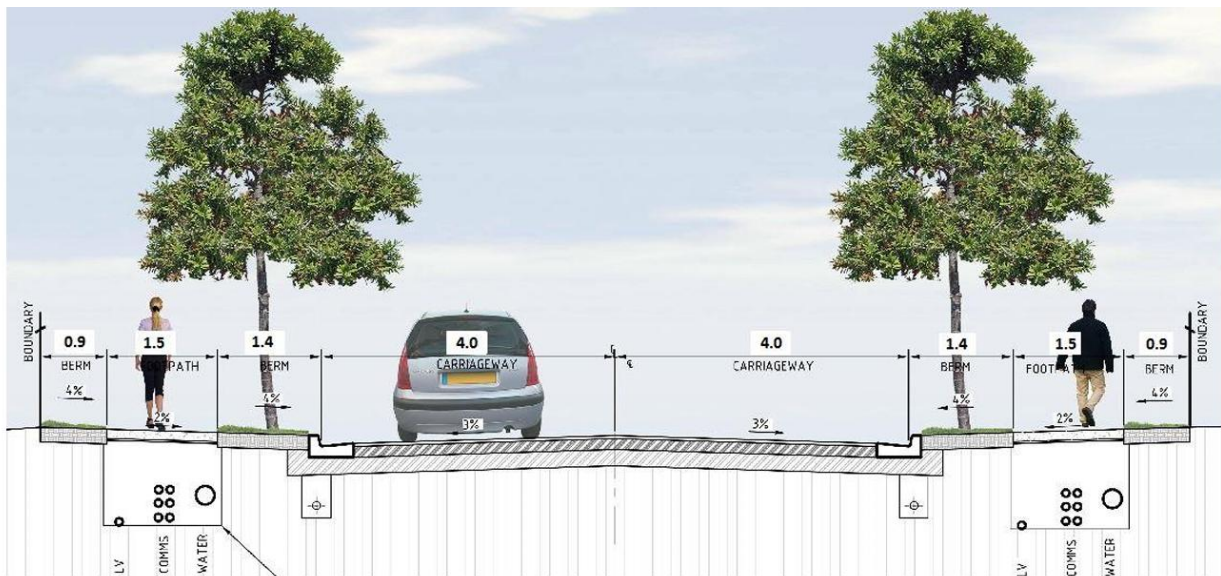


Figure 3.1: Road design specifications to allow service by Council's 12.5m Heavy Rigid Waste Collection Vehicle

Part B Multi-Dwelling housing, Manor houses, Boarding houses, Co-living and Group homes

1 Introduction: Design Principles

1.1 Waste Management Considerations

Multi-dwelling housing, manor houses, boarding houses, co-living housing and group homes are to be designed to be serviced by Council's Collect and Return Service. In assessing Development Applications (DA's) the following must be taken into consideration:

- Implement best practice waste and resource recovery technologies and processes that minimise waste generation and maximise re-use, recycling, and resource recovery across all stages of the development
- Where 5 or more dwellings are planned within the development, the development must integrate waste infrastructure within the development or in waste bays within setbacks, in accordance with Penrith DCP (Waste Management and/or Residential Development Chapters), and responsive to Council's Waste and Resource Recovery Strategy
- Implement innovative waste management and collection systems that are sustainable, efficient and enhance the amenity of occupants, adjoining users, and the public domain
- Ensure new development can be serviced safely and efficiently by Council's standard waste service and collection contractual provisions.

Providing functional and integrated infrastructure is essential for Council to safely and efficiently service new developments and ensure future residents can access Council's waste collection service.

2 Service Classification

Part B of this Guideline applies to the development types listed below. All waste collection infrastructure and service allocations must be provided in accordance with Part B.

Multi Dwelling Housing (MDH)

Three or more dwellings (whether attached or detached) on one lot of land, each with access at ground level, but does not include a residential flat building.

Manor Houses

Building containing three or four dwellings, where each dwelling is attached by a common wall or floor, and at least one dwelling is partially or wholly located above another, with the building not exceeding two storeys (excluding basements).

Boarding Houses

A building or place that provides affordable housing for at least 3 months. Features include shared facilities (e.g. laundry and kitchen) and rooms (some may be self-contained). If not carried out by or on behalf of the Land and Housing Corporation or other nominated government agency—managed by a registered community housing provider. Backpackers' accommodation, co-living housing, group homes, hotels/motels, seniors housing and serviced apartments are not classified as boarding houses.

Co-Living Housing

A building or place that provides affordable housing for at least 3 months and has at least 6 private rooms. Shared facilities, such as a living room and laundry, some or all of which may have private kitchen and bathroom facilities. Maintained by a managing agent.

Group Homes

Occupied as single dwelling. Two types:

- Permanent and temporary accommodation for persons with a disability, or otherwise disadvantaged or in rehabilitation.
- Transitional accommodation for persons with a disability, rehabilitating from substance abuse, or seeking refuge.

3 Council's Collect and Return Services

Understanding Council's Service

Council's 'Collect and Return' service is comprised of the following waste streams:

- Yellow lidded recycling bins (collected weekly)
- Red lidded residual bins (collected twice weekly)
- Bulky waste collection (on-call/scheduled collections)
- By 1 July 2030, the collection of Food Organics Garden Organics (FOGO) waste from residential developments will be mandatory under *The Protection of the*

Environment Legislation Amendment (FOGO) Recycling Act 2025. Prior to 1 July 2030, it is expected that new developments are designed to accommodate the provision of FOGO bins.

Further details for how to design for FOGO as well as concept communal storage layouts is provided in Section 5.3.

Inside each dwelling, space must be allocated for the storage of at least two days generation of waste material for all waste and recycling streams. There should also be space for a kitchen caddy or similar allocated in the kitchen for the separation of food waste or compostable material.

Bin Services

Council's 'Collect and Return' service involves the 10.5m heavy rigid waste collection vehicle parking parallel to kerbside. Council's collection contractors exit the vehicle and walk within the development to the Communal Waste Storage Area where the shared bins are permanently stored within the built form. The full bins are then wheeled to the back of vehicle for collection.

Once emptied, the bins are placed back within the storage area and the process is repeated until all the bins from the respective waste streams are emptied. This process removes the need for residents to handle bins and alleviates kerbside bin presentation during collection operations.

Additional information about collection frequencies, acceptable items and educational material is available through the following links on Council's website:

- Collect and Return Service:
<https://www.penrithcity.nsw.gov.au/waste-environment/waste/collect-return>

Bulky Waste Collections

Council's 'Collect and Return' service provides a Bulky Goods Collection for the disposal of various items that are bulky or too heavy to be collected within standard bins. Each year Council provides residents with an annual allocation of bookings.

Once a collection has been booked with Council, bulky waste items are placed within the communal collection area by residents the night before a scheduled collection.

On the day of the service, Council's collection contractors park the 10.5m heavy rigid waste collection vehicle along the kerbside and walk within the development to the Communal Bulky Waste Collection Area integrated within the built form. The items are then walked to the back of the vehicle for collection by the contractors. This process is repeated until all items are removed. This process alleviates kerbside presentation of bulky waste items during collection operations.

Additional information about collection frequencies, acceptable items and education

material are available through the following links on Council's website:

- Collect and Return Service:
<https://www.penrithcity.nsw.gov.au/waste-environment/waste/bulky-waste-collection>

4 Bin Allocation

4.1 Bin Infrastructure

Council's 'Collect and Return' service comprises of shared 240L bins located permanently within the communal waste collection area to service residual and recycling waste streams.

Bin Size and Type	Height (mm)	Length (mm)	Width (mm)
240L	1100	740	600

Table 3: Standard bin dimensions



Figure 4: Typical 240L bins used for residual, recycling and Food and Organic Waste streams

5 Waste Collection Infrastructure

In accordance with the Waste Management Chapter in Penrith DCP, all on-site waste collection infrastructure is to be:

- Integrated wholly within the built form as an enclosed waste room; or
- Located within the front setback area as a detached waste bay, and/or or within the side set back and adjoining the building if a corner lot.

Proposals must demonstrate how waste infrastructure cohesively enhances the design, amenity, streetscape, and public domain of the development. Permitting a safe and

efficient collect and return service in accordance with Council's waste collection contractual provisions and Waste and Resource Recovery Strategy.

5.1 Bulky Waste Calculations

Each development is required to provide a communal bulky waste collection area.

For developments with 16 dwellings or less, a minimum of 2.5m² is required to be provided for a communal bulky waste area.

For developments with more than 16 dwellings, the following calculations are to be used to determine the minimum area requirement for communal bulky waste collection areas.

Note: The area calculations for the bulky waste collection areas outlined below are to be rounded to next whole number. (i.e. an area of 4.2m² is rounded to 5.0m²)

Multi-dwelling houses and manor houses

$$\begin{array}{l} \text{Bulky} \\ \text{Waste} \\ \text{Area} \\ (\text{m}^2) \end{array} = \left(\begin{array}{l} \text{Number} \\ \text{of Units} \end{array} \times 0.16 \right)$$

Boarding house, co-living housing and group homes

$$\begin{array}{l} \text{Bulky} \\ \text{Waste} \\ \text{Area} \\ (\text{m}^2) \end{array} = \left(\begin{array}{l} \text{Number} \\ \text{of Units} \end{array} \times 0.20 \right)$$

5.2 Waste Bin Calculations

The following calculations are used to determine the bin allocations for each waste stream stored with the developments communal waste storage area.

Note: Calculations for waste streams (residual & recycling) are each rounded to the next whole number. (i.e. the allocation of 4.2 bins is rounded to 5 bins)

Multi dwelling housing and manor houses

$$\begin{array}{l} \text{Red Lidded} \\ \text{Residual} \\ \text{(240L bins)} \end{array} = \left(\begin{array}{l} \text{Number} \\ \text{of Units} \end{array} \times 0.50 \right)$$

$$\begin{array}{l} \text{Yellow} \\ \text{Lidded} \\ \text{Recycling} \\ \text{(240L bins)} \end{array} = \left(\begin{array}{l} \text{Number} \\ \text{of Units} \end{array} \times 0.50 \right)$$

$$\begin{array}{l} \text{Green} \\ \text{Lidded} \\ \text{FOGO} \\ \text{(240L bins)} \end{array} = \left(\begin{array}{l} \text{Number} \\ \text{of Units} \end{array} \times 0.30 \right)$$

Boarding houses, co-living housing and group homes

$$\begin{array}{l} \text{Red Lidded} \\ \text{Residual} \\ \text{(240L bins)} \end{array} = \left(\begin{array}{l} \text{Number} \\ \text{of Units*} \end{array} \times 0.38 \right)$$

$$\begin{array}{l} \text{Yellow} \\ \text{Lidded} \\ \text{Recycling} \\ \text{(240L bins)} \end{array} = \left(\begin{array}{l} \text{Number} \\ \text{of Units*} \end{array} \times 0.38 \right)$$

$$\begin{array}{l} \text{Green} \\ \text{Lidded} \\ \text{FOGO} \\ \text{(240L bins)} \end{array} = \left(\begin{array}{l} \text{Number} \\ \text{of Units*} \end{array} \times 0.30 \right)$$

5.3 Communal Waste Storage Area

All Multi Dwelling Housing, Manor Houses, Boarding Houses, Co-Living Housing and Group Homes with 5 or more dwellings per lot are required to provide a communal waste and recycling storage and collection area and bulky goods collection area in accordance with Penrith DCP.

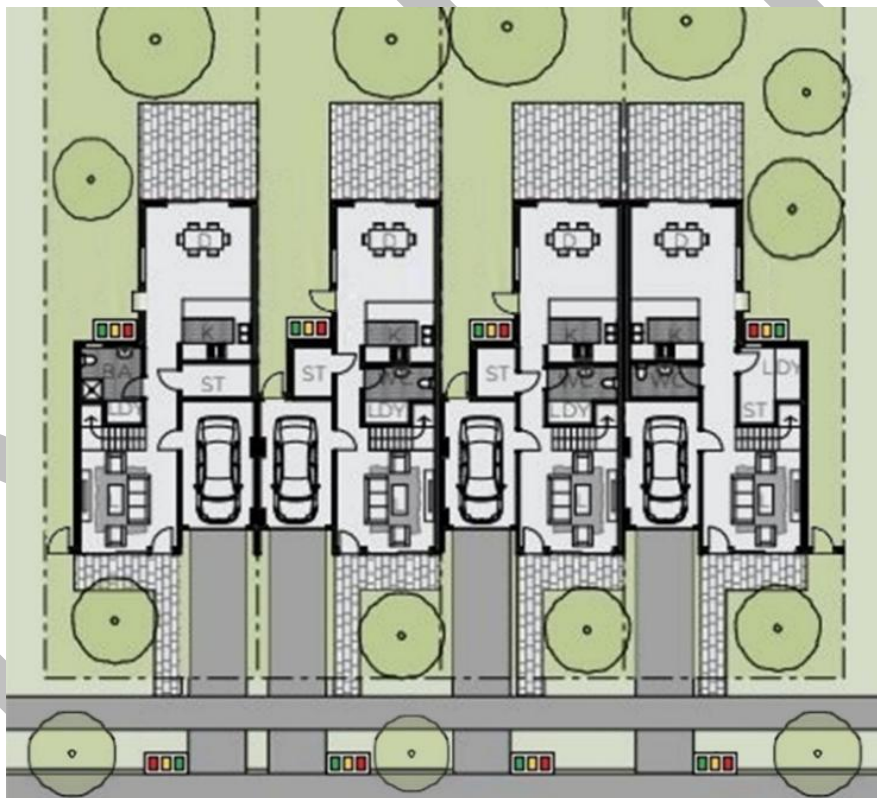
Proposals should accommodate the following provisions for the development:

- The structure to be large enough to accommodate the bin allocation outlined in accordance with section 5. Examples of waste infrastructure configurations are shown below.
- Accessed through Council's Abloy key system outlined in the following section 4.5.

- The structure to include the following utility components:
 - Floor graded to a central drainage point connected to the sewer
 - Floor waterproofed across all intersections and extend a minimum 1200mm high on each wall
 - Service path leading to the structure to remain parallel to the contour at all points with a maximum gradient of 1:24
 - Enclosed, walled and separate for the bulky waste collection area
 - Bins permanently stored parallel to the walls

Indicative examples of bin infrastructure configurations in multi dwelling housing, manor and boarding houses are shown below:

Concept for Terraces



Concept for Multi Dwelling Housing



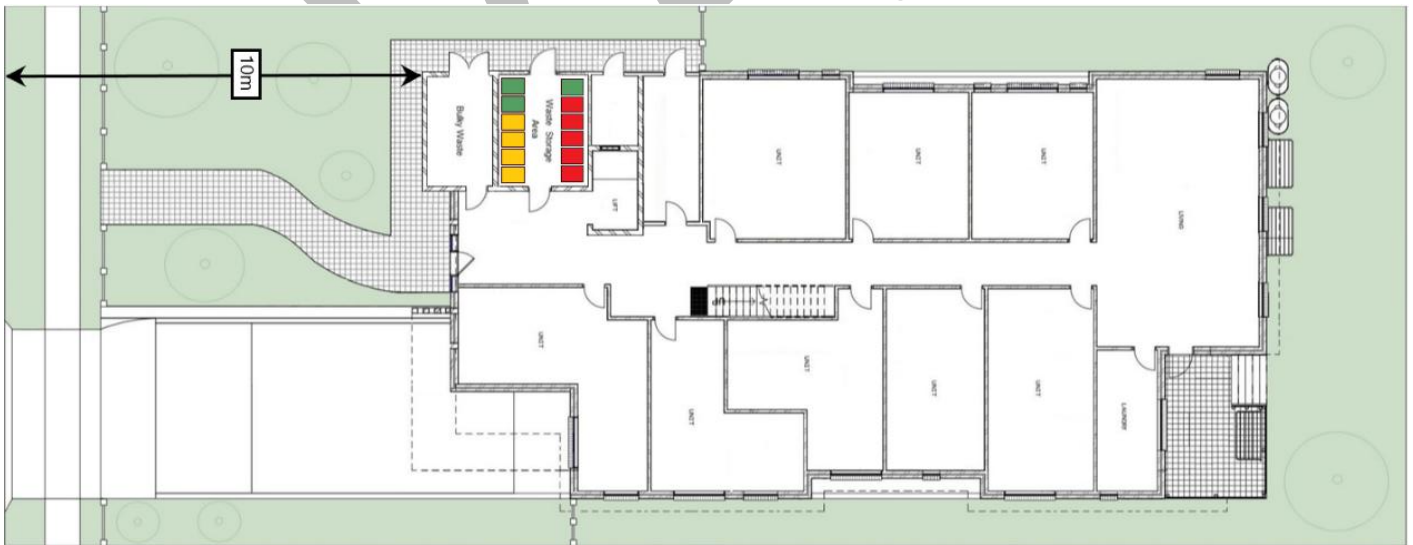
Concept for Manor House with 3 Dwellings



Concept for Manor House with 4 Dwellings



Concept for Boarding House



Examples of dimensions and waste storage room configurations for waste storage areas are provided below:

Double Sided Communal Storage Area

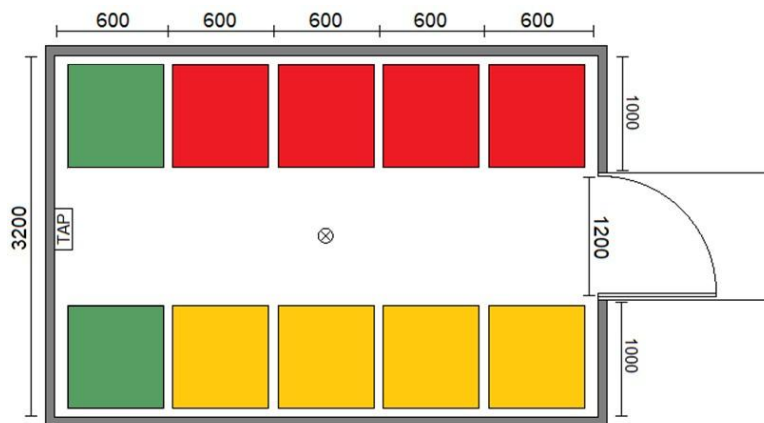


Figure 5: Concept double sided communal waste storage area

Single Side Communal Waste Storage Area

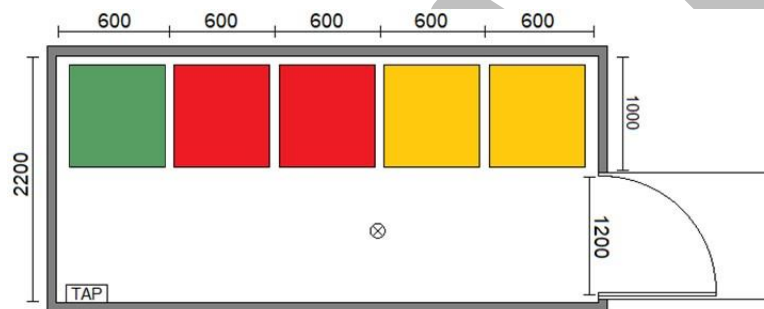


Figure 6: Concept single sided communal waste storage area

Constrained Communal Waste Storage Area

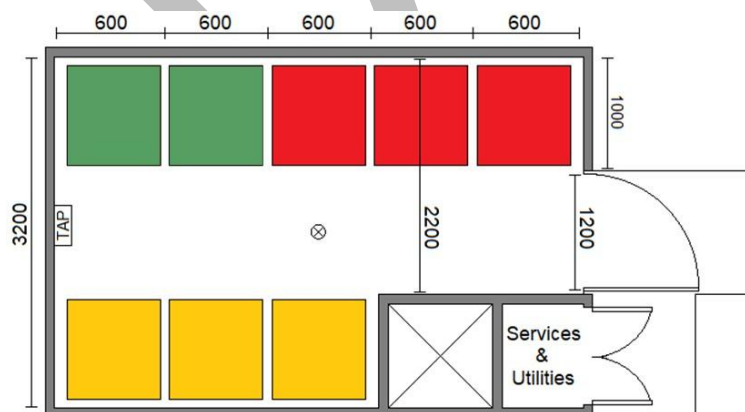


Figure 7: Concept constrained communal waste storage area

5.4 Communal Bulky Waste Collection Area

The following provisions are required for the development:

- The structure is to be large enough to accommodate the minimum area requirements outlined in accordance with previous pages.
 - Concept structures with respective dimensions are outlined below and on the following page.
- Accessed through Council's Abloy key system outlined in the following pages.
- The structure is to include the following infrastructure and design components:
 - Floor graded to a central drainage point connected to the sewer
 - Floor waterproofed across all intersections and extend a minimum 1200mm high on each wall
 - Service path leading to the structure to be remain parallel to the contour at all points with a maximum gradient of 1:24

Examples of dimensions and communal bulky waste collection area configurations are provided below and on the following page.

Minimum area for Bulky Waste Collection area (<16 dwellings)

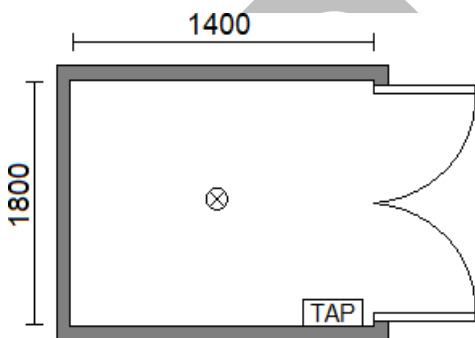


Figure 8: Concept communal bulky waste collection area

Typical Bulky Waste Collection Area (>16 dwellings)

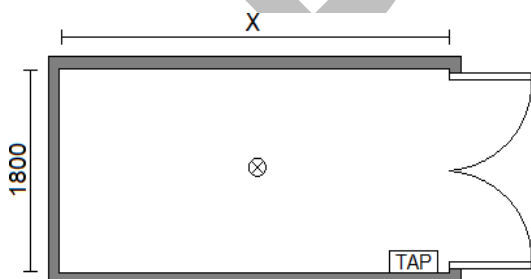


Figure 9: Concept communal bulky waste collection area (>16 dwellings)

Constrained Bulky Waste Collection Area (>16 dwellings)

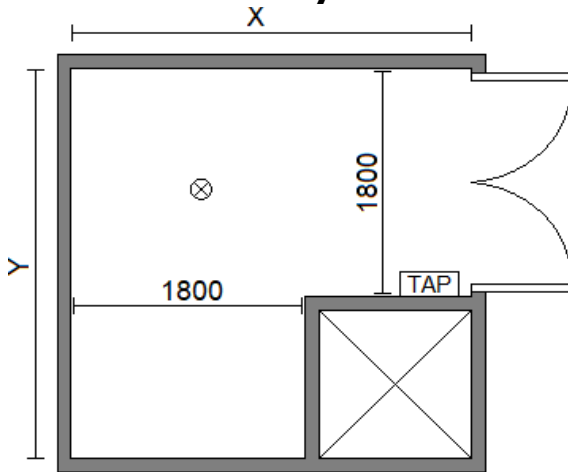


Figure 10: Concept constrained communal bulky waste collection area (>16 dwellings)

6 Abloy Key System

All on-site waste collection infrastructure outlined to be locked through Council's Abloy System. The system to be organised through Olympic Lock Smith using the following information:

- Lock System Number: 5OL092
- Address: Unit 28/56 Buffalo Road, Gladesville NSW 2111
- Phone: 1300 303 045.

7 Indemnity Agreement

7.1 Communal Bulky Waste Collection Area

Prior to the issue of any Occupation Certificate, all Multi Dwelling Houses, Manor Houses, Boarding Houses, Co-Living and Group Homes are required to enter a formal agreement with Penrith City Council for the utilisation of Council's Waste Collection Service.

By entering into an agreement with Penrith City Council for waste collection, the development will be required to operate in full compliance with Council's Waste collection and Processing Contracts for Standard Waste Collection. The provision of Council's waste collection service will not commence until formalisation of the agreement.

Link to Council's Website: <https://www.penrithcity.nsw.gov.au/building-development/planning-zoning/planning-controls/development-control-plans>

8 Waste Collection Vehicles

8.1 Council's Standard 10.5m heavy rigid vehicle

Council's standard waste vehicle to service residential subdivisions is a 10.5m heavy rigid side loading waste collection vehicle. The following dimensions are provided in accordance with Australian Standard 2890.2:

Vehicle Classifications	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
Roadway/ramp grade (max)	1:6.5 (15.4%)
Rate of change of grade (max)	1:16 (6.25%) in 7.0m of travel
Gross Weight (max tonnes)	28.0
Front Chassis Clearance	13°
Rear Chassis Clearance	16°

Table 4: Operational specifications of Council's standard 10.5m Heavy Rigid Waste Collection Vehicle

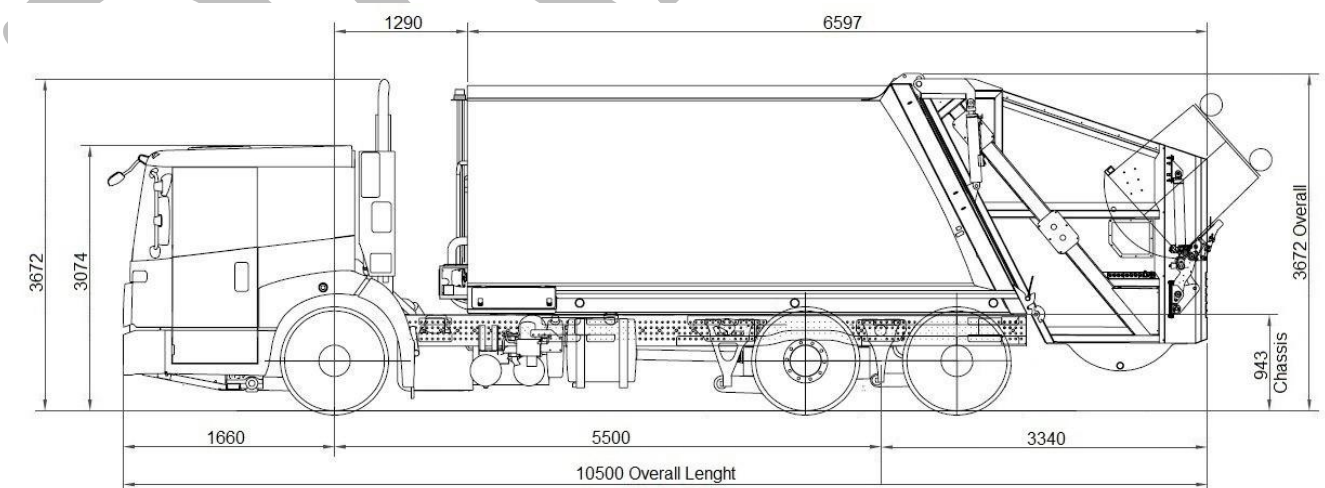


Figure 11: Council's standard 10.5m Heavy Rigid Waste Collection Vehicle specifications

Part C Residential Flat Buildings

1 Introduction: Design Principles

Chapter C5 Waste Management in the Penrith DCP 2014 provides controls for waste infrastructure for Residential Flat Buildings, inclusive of Shop Top Housing (Section 9).

1.1 Waste Management Considerations

Residential Flat Building developments need to be designed to be serviced by Council's Collect and Return Service. In assessing Development Applications (DA's) the following must be taken into consideration:

- Implement best practice waste and resource recovery technologies and processes that minimise waste generation and maximise re-use, recycling, and resource recovery across all stages of the development
- Provide integrated waste collection infrastructure within the development responsive to Council's Waste and Resource Recovery Strategy
- Implement innovative waste management and collection systems that are sustainable, efficient and enhance the amenity of occupants, adjoining users, and the public domain
- Ensure new development can be serviced safely and efficiently by Council's standard waste service and collection contractual provisions

Providing functional and integrated infrastructure is essential for Council to safely and efficiently service new developments and ensure future residents can access Council's waste collection service.

2 Service Classification

The waste collection infrastructure and service allocation outlined in Part C applies to the following dwelling types:

Residential Flat Buildings (RFB's)

A building containing three or more dwellings, but does not include an attached dwelling or multi dwelling housing

Shop Top Housing

One or more dwellings located above the ground floor of a building, where at least the ground floor is used for commercial premises or health services facilities.

Mixed Use Development (residential component)

A building or place comprising two or more different land uses.

3 Council's Collect and Return Service

Understanding Council's Service

Council's 'Collect and Return' service is comprised of the following waste streams:

- Red lidded Residual bins (collected twice weekly)
- Yellow lidded Recycling bins (collected weekly)
- Bulky waste collection (collected weekly)

By 1 July 2030, the collection of Food Organics Garden Organics (FOGO) waste from residential developments will be mandated under *The Protection of the Environment Legislation Amendment (FOGO) Recycling Act 2025*. It is recommended that new residential flat buildings, shop top housing and residential component of mixed use developments be designed to accommodate the provision of FOGO bins. Further details for designing for FOGO is provided below.

Collection Operations

Internal Management of Waste Infrastructure

For residential flat buildings of 3 and greater storeys, a waste chute system is required for each residential level.

The waste chute system for residual (red) and recycling (yellow) waste should be located in an enclosed waste disposal area or bin room to ensure a high level of resident amenity, accessibility, and meet cleaning and maintenance requirements and the like.

It is recommended that waste disposal areas be designed to accommodate Food Organics and Garden Organics (green) service bins, co-located with the waste chute systems and bulk recycling (yellow) service bins within an integrated cupboard or room. Residents should be able to use this area or room and the chute systems 24/7 for the safe disposal of household items.

Applicants are encouraged to contact Council's Waste and Resource Recovery department to discuss FOGO provisions.

Waste infrastructure is to be located on each residential level and in proximity to the central elevator core.

Penrith DCP stipulates that the waste disposal area on each level is:

- Mechanically ventilated and have lighting

- Connected to sewer utilities (i.e. drain in floor)
- Of sufficient size to enable storage and manoeuvrability of bulky recycling and Food Organics and Garden Organics service bins and unimpeded access to residual and recycling waste chute system.

These areas or rooms should also be waterproofed and floored with slip-resistant tiles.

The Food Organics and Garden Organics and bulky recycling service bins on each residential level will be routinely removed and replaced by caretakers.

For items placed within the respective chutes, they are collected in bins at the base of the chute system. Bins are located on a track system that automatically rotates the bins as they become full. Once all bins on the respective track are full, the caretaker will replace the bins with empty bins. This involves the movement of full bins from the chute room to the waste collection via a bin tug device.

The night before the scheduled day of collection all respective bins for the waste stream being collected are placed within the waste collection room to permit collection by Council's waste collection contractors.

Additionally, for bulky general waste or waste too large to be serviced by bins or the chute system, Council provides a bulky waste collection service. To access the room, residents are to contact the strata/caretaker to organise access and placement of various items within the room (furniture, mattress, white goods, etc).

Inside individual dwellings, space must also be allocated for the storage of at least two days generation of waste material for all waste and recycling streams. There should also be space for a kitchen caddy or similar allocated in the kitchen for the separation of food waste or compostable material.

External Management of Waste Infrastructure

On the day of collection Council's collection contractors will enter the site by use of Council's Abloy key. This involves Council's standard waste collection vehicle entering the property and parking within the integrated on-site loading bay traditionally located within the basement.

Once parked in the enclosed loading bay Council's collection contractors will access the respective waste collection rooms (waste collection or bulky waste) via Council's Abloy to perform collection. When all items have been collected and all infrastructure is placed back within respective rooms the collection contractors will leave the site to continue collections.

4 Integrated On-site Service Provisions

4.1 On-site Collection

All residential flat building developments and mixed use developments shall be designed to accommodate on-site waste collection by Council's domestic waste service. The on-site loading bay to be integrated wholly within the built form.

4.2 Design for Council Collection Vehicles

Council's standard waste collection vehicles used to service residential flat buildings are outlined below:

- 9.7m Heavy Rigid Waste Collection Vehicle
- 10.5m Heavy Rigid Waste Collection Vehicle
- 9.3m Hook Lift Waste Collection Vehicle

Vehicle and operational specifications are outlined in the following section, including side arm clearance requirements.

4.3 On-site Service Infrastructure

Site Access

Council's standard heavy rigid waste collection vehicle must be able to safely and efficiently access the site and nominated integrated on-site loading bay in a forward direction with little or no need to reverse.

Internal reverse manoeuvres will only be considered for loading bay access free from all active carriageways and pedestrians' paths of travel.

Architectural Plans

In accordance with Penrith DCP, architectural plans must be prepared to accommodate provisions for waste storage areas and collection. It is important plans illustrate the following, to allow a detailed assessment of integrated on-site collection configuration and service infrastructure:

- Elevations and cross sections of all on-site collection vehicle manoeuvres proposed
- For residential flat buildings with up to and including 4 individual dwellings:
 - Location of waste storage and collection infrastructure, as per the options available in Penrith DCP
- For residential flat buildings for 3 and greater storeys:

- Waste disposal areas or bin rooms on each residential level in proximity to the central elevator core, with integrated chute systems
- For residential flat buildings with 5 or more individual dwellings:
 - Waste collection and bulky waste room in basements
 - Bin infrastructure displayed
- Floor plans and cross sections showing chute inlets on each level.

Loading Bays

Depending on the number of dwellings in the development, loading bays on-site are to be integrated wholly within the development's built form.

It is required that loading bays are free from active carriageways and adhere to the following infrastructure specifications:

- Access via an automated restricted opening
- Provide sensor lighting
- Mechanical ventilation responsive to collection vehicle specifications
- Acoustic attenuation in accordance with the Building Code of Australia
- Located within close proximity to the central elevator core.

Service Clearances

Council's standard waste collection vehicles require a minimum 2,000mm unobstructed clearance zone at the rear of the vehicle to support collection operations of 660L and 1100L bins. The clearance zone to be measured as an addition to the vehicle's overall length.

A 700mm clearance zone to be provided on the driver's side (right hand side) of the waste collection vehicle to permit driver access from the vehicle and unobstructed path of travel to the waste collection infrastructure (waste collection and bulky waste collection rooms).

Multi-use Loading Bays

The integrated on-site loading bay to be designed to facilitate use by removalists and other service vehicles when not utilised by Council's waste collection vehicle.

Priority access to be managed by the strata/caretaker to ensure unobstructed access for Council's collection vehicles is provided during scheduled collection operations.

Maximum Potential Weight

All vehicle manoeuvres proposed for Council's standard waste collection vehicle to be

supported by on-site infrastructure (ramps, slabs, clearances, etc) to accommodate a waste collection vehicle's maximum operational weight of 28 tonnes.

Turntables

Turntables proposed to permit on-site vehicle operations shall incorporate a hydraulic override or similar assisted override system. This system is to allow Council's waste collection vehicle to operate within the loading bay in the event of a systems outage.

Specifications of this feature to be included within submitted Waste Management Plan.

Mixed Use Operations

Mixed use developments with commercial and industrial uses to incorporate additional on-site waste collection infrastructure in accordance with specifications outlined Part D, Commercial, Industrial and Mixed-Use Dwellings.

Alternative Solutions

In accordance with the Waste Management Chapter in Penrith DCP, alternative solutions for waste collection arrangements may be discussed with Council prior to and/or after a pre- lodgement meeting.

The plans to be submitted to Council need to allow a detailed assessment to be conducted by Waste Services and the respective DA Planner. The assessment is undertaken to determine the viability of the proposal in accordance with Council's Development Application policy provisions, Council's Waste and Resource Recovery Strategy and Collection Contract Service Provisions.

5 Service Infrastructure

5.1 Bin Infrastructure

In Residential Flat Buildings and Shop Top Housing, service bins and chute inlets (for developments of 3 storeys and greater), are located on each residential level within enclosed waste disposal areas or bin rooms.

Bins are permanently located under the respective chutes (residual or recycling) to collect the various household items. Specifications of red and yellow bin infrastructure are outlined in the table below:

Bin Size and Type	Length (mm)	Width (mm)	Height (mm)
1100L	1240	1090	1330

Table 5: Standard Bin Size and Dimensions



Figure 12: Typical 1100L bin

5.2 Bin Allocations

The following calculations are used to determine the bin allocation for each waste stream within the development's waste collection area.

Note: Calculations for Council's waste streams (residual and recycling) are each rounded to the next whole number. (i.e. the allocation of 4.2 bins is rounded to 5 bins)

5.3 Bulky Waste Area Calculations

The following calculations are used to determine the minimum area requirements for the bulky waste collection room for development.

Note: The area calculations for the bulky waste collection room be rounded to next whole number. (i.e. an area of 4.2m² is rounded to 5m²)

$$\text{Bulky Waste Area (m}^2\text{)} = \left(\text{Number of Units} \times 0.16 \right)$$

6 Integrated Waste Collection Infrastructure on Residential Levels

6.1 Waste Disposal Area on Residential Levels

$$\begin{aligned} \text{Red Lidded Residual (1100L bins)} &= \left(\text{Number of Units} \times 0.06 \right) \\ \text{Yellow Lidded Recycling (1100L bins)} &= \left(\text{Number of Units} \times 0.06 \right) \\ \text{Green Lidded FOGO (140L bins)} &= \left(\text{Number of Units} \times 0.30 \right) \end{aligned}$$

In preparation for the FOGO mandate it is recommended that developments provide for an additional green and yellow service bin to be stored on each residential level.

For developments of 3 and greater storeys, there should be an enclosed waste disposal area on each residential level that can adequately provide:

- Storage, manoeuvrability and unobstructed access to a 140L lidded Food Organics and Garden Organics (green) bin and 240L lidded bulky recycling (yellow) bin
- An integrated waste chute system with the residual (red) and recycling (yellow) waste chutes

The following provisions are also required for these areas or rooms:

- Waterproofed and tiled to permit scheduled cleaning
- Accessed by self-closing single doors that permit accessible resident access
- Mechanical ventilated with lighting (sensor preferred)

An example of possible dimension, organisation and positioning of an enclosed waste disposal area on a residential level is provided in the following figure.

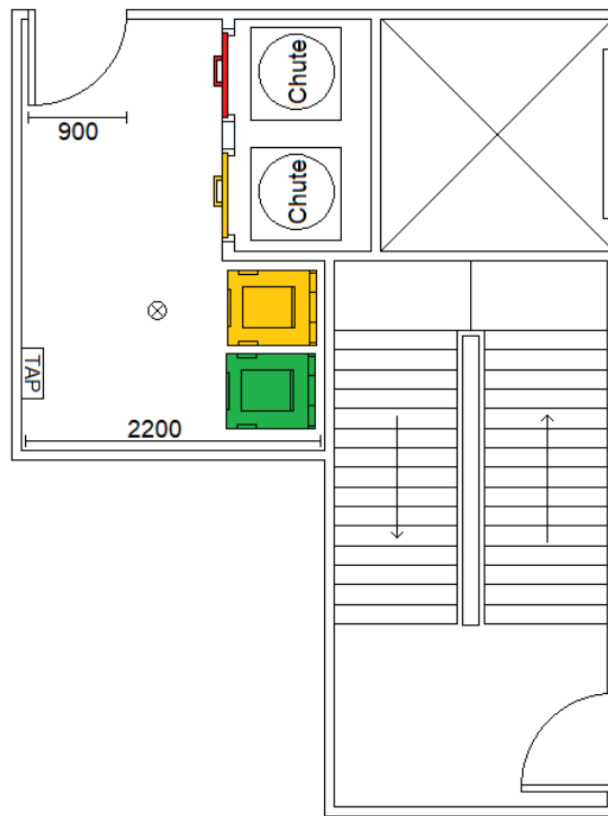


Figure 13: Example of waste disposal area on residential level, for developments of 3 and greater storeys

6.2 Chute System

All residential flat buildings are required to install a dual chute system to service the residual and recyclable waste streams.

The chutes to terminate and be serviced by bin infrastructure within the basement's waste chute room. Resident access to the chute system is through waste cupboards containing the chute inlets of the respective waste streams.

The Waste Management of Penrith DCP sets controls for chute cupboards, dual chute systems and waste chute room in Residential Flat Buildings and Shop Top Housing). The operations of the chute system are outlined in the following section.

6.3 Dual Chute System

The following provisions are required for the chute system:

1. A dual chute system to be installed to permit separate collection of each waste stream (residual and recycling)
2. Chute inlets to be self-closing, sealed, self-cleaning.

7 Integrated Waste Infrastructure in Basement

7.1 Waste Chute Room

The following provisions are required for the waste chute room:

- The chute system to terminate in the basement
- A track system to be installed under each individual chute to accommodate the following minimum bin infrastructure volumes:
 - < 150 Units: 2200L for each waste stream (residual and recycling)
 - > 150 Units: 3300L for each waste stream (residual and recycling)
- Track system to incorporate the following clearances
- 900mm side clearances (three sides)
- 1800mm for the loading of bins (remaining side)
- Room accessed by dual, 180 degree, outwards opening, self-closing doors with a minimum opening of 1800mm
- Room to accommodate the storage of two 1100L service bins . Calculations were outlined in a previous section.
- A separate room within the waste chute room to store the required number of green lidded servicing bins and yellow lidded bins used for waste collection on each residential level. The number of stored bins should equal the number of bins positioned on the levels of the development. For example, a 6 storey development with 1 green lidded FOGO bin and 1 yellow lidded bulky recycling bin on each level would need space within this room for 12 servicing bins.
- A bin wash bay has access to hot and cold water to permit scheduled cleaning of bin infrastructure
- The structure to include the following infrastructure and design components:
- Floor graded to a central drainage point connected to the sewer
- Floor waterproofed across all intersections and extend a minimum 1200mm high on each wall.

Linear Track System

The following page outlines the specifications of the linear track systems for 2200L and 3300L waste volumes.



Figure 14: Linear track system configuration

2200L Waste Volumes – Model Linear Track Specifications (<150 units)

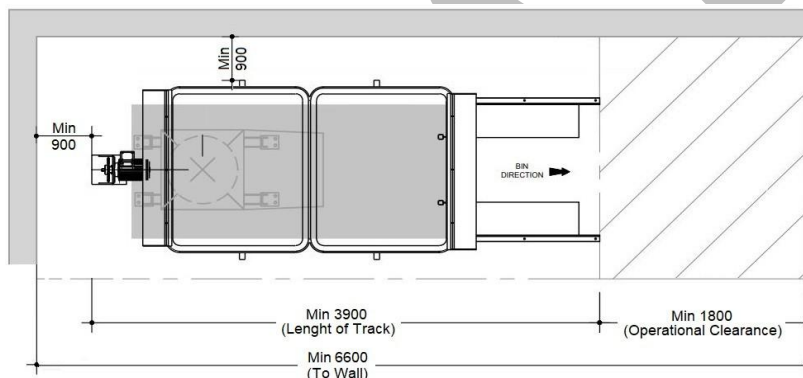


Figure 15: Linear track system operational clearances for 2200L waste volumes

3300L Waste Volumes – Model Linear Track Specifications (>150 UNITS)

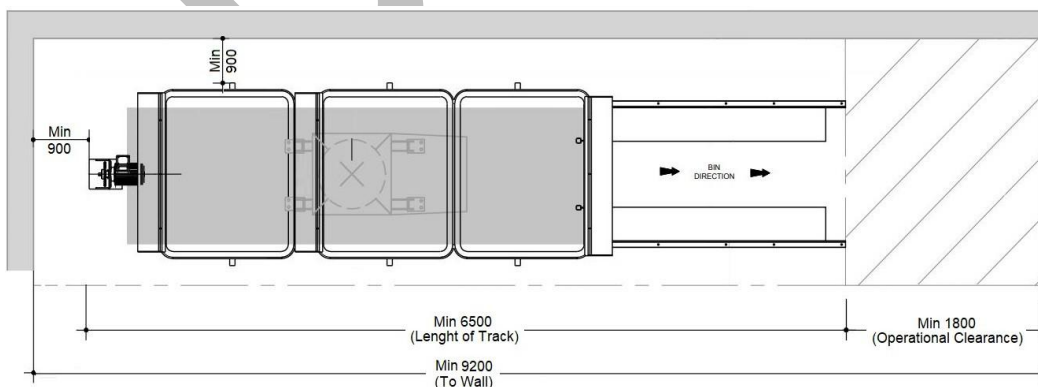


Figure 16: Linear track system operational clearances for 3300L waste volumes

Model Chute System Cross-section

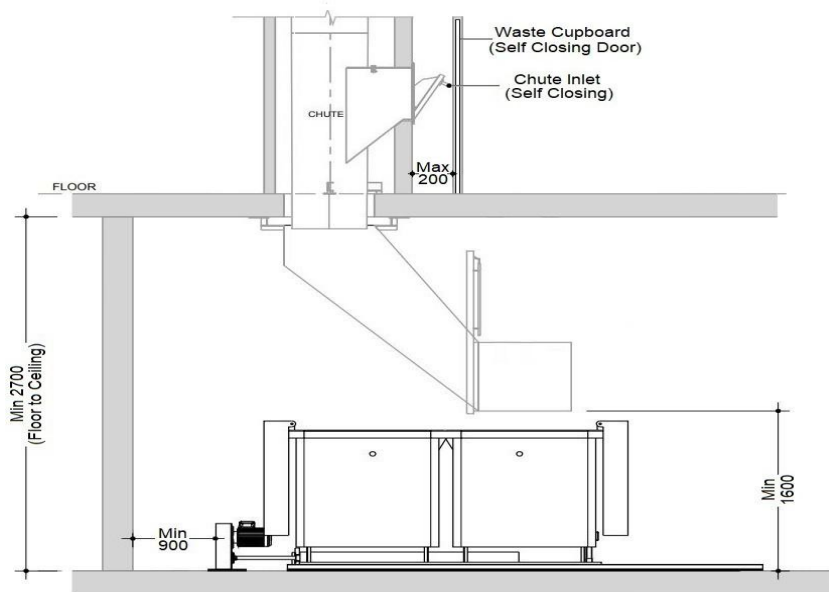


Figure 17: Linear track system operational clearances

The following concept configurations are indicative only – intended to demonstrate potential chute room dimensions and configurations. It is expected that proposals will prepare waste infrastructure solution/s suited to their unique developments.

Concept Chute Room with Linear Track (<150 DWELLINGS)

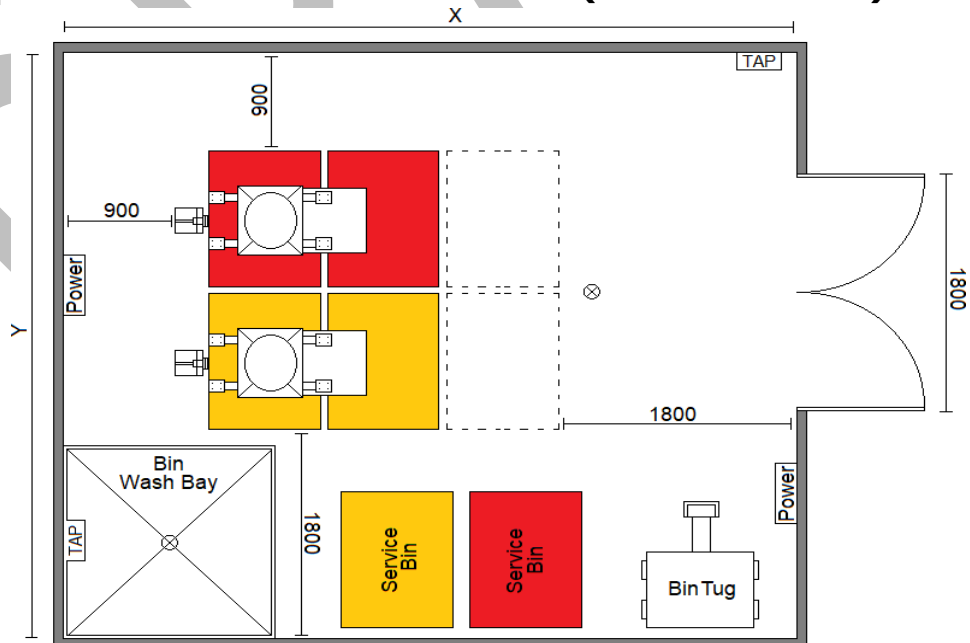


Figure 18: Concept chute room configuration (<150 dwellings) located within the basement

Concept Chute Room with Linear Track (>150 DWELLINGS)

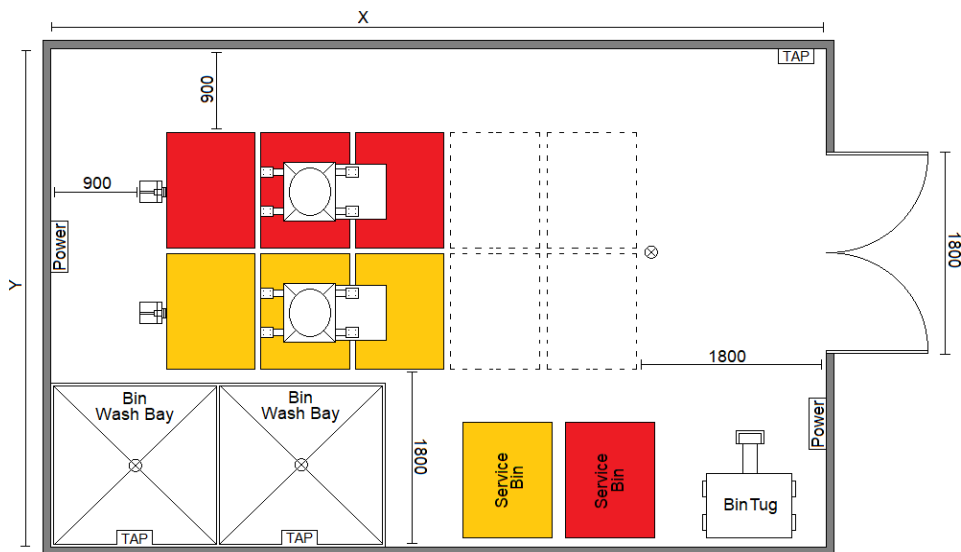


Figure 19: Concept chute room configuration (>150 dwellings) located within the basement

Circular Carousel System

The following pages outline the specifications of a circular carousel system.



Figure 20: Circular carousel system configuration

Model Circular Carousel System (>150 UNITS)

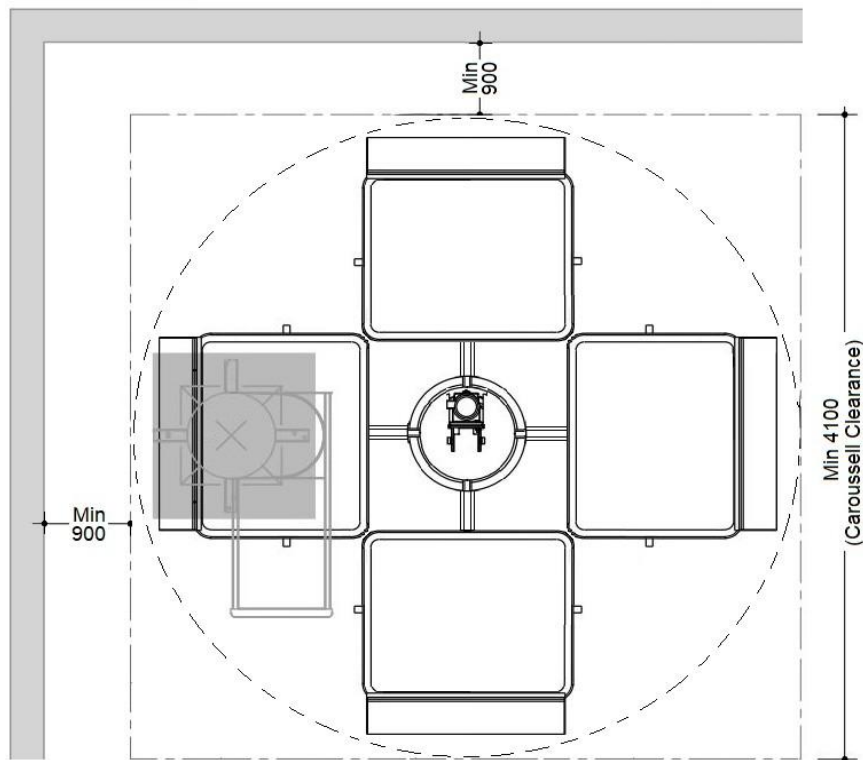


Figure 21: Circular carousel system operational clearances

Model Chute System Cross-Section

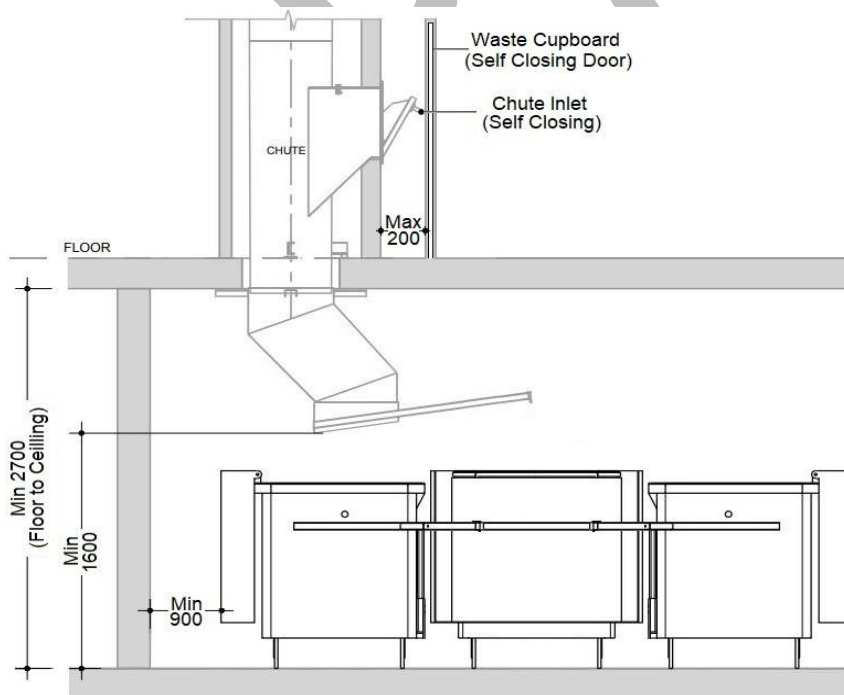


Figure 22: Circular carousel system operational clearances

The following concept configuration is indicative only - intended to demonstrate a potential chute room. It is expected that proposals will prepare waste infrastructure solution/s suited to their unique developments.

Concept Circular Carousel Chute Room (>150 DWELLINGS)

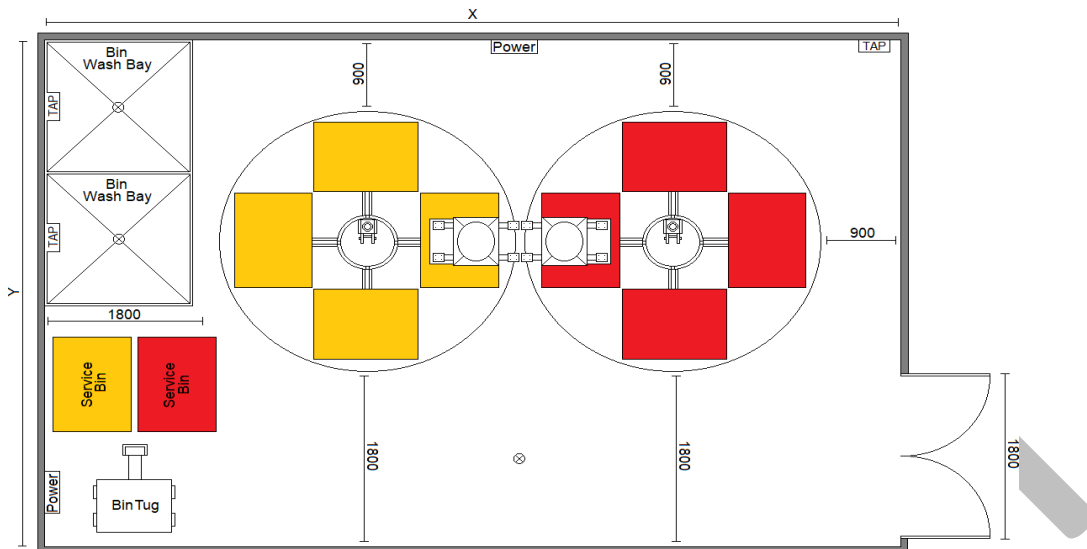


Figure 23: Concept chute room configuration (>150 dwellings) located within the basement.

8 Waste Collection

All residential flat buildings will include a waste collection room for the storage of the developments bin infrastructure for each waste stream (residual, recycling and Food Organics and Garden Organics). The room is not accessible to residents and managed by the on- site manager/caretaker.

8.1 Waste Collection Room

The following provisions are to be met for the waste collection room:

- The room to be large enough to accommodate the entire suite of bins
 - 200mm clearance provided between each bin for manoeuvrability
 - Bin allocation outlined in section 4
 - FOGO partitioned area to be 2200mm wide x 600mm for each bin.
- An 1800mm unobstructed clearance zone to be provided between the stored bins and the access doorway
- Room accessed by dual, 180 degree, outwards opening, self-closing doors with a minimum opening of 1800mm

- The structure to include the following infrastructure and design components:
 - Floor graded to a central drainage point connected to the sewer
 - Floor waterproofed across all intersections and extend a minimum 1200mm high on each wall
 - Hot and cold water taps
 - Incorporate mechanical ventilation
 - Sensor lights in the structure and adjacent access pathways
 - Minimum unobstructed internal height clearance of 2700mm.

The following concept configuration is indicative only - intended to demonstrate potential dimensions and configurations of a waste collection room in the basement. It is expected that proposals will prepare waste infrastructure solution/s suited to their unique developments.

Concept Waste Collection Room

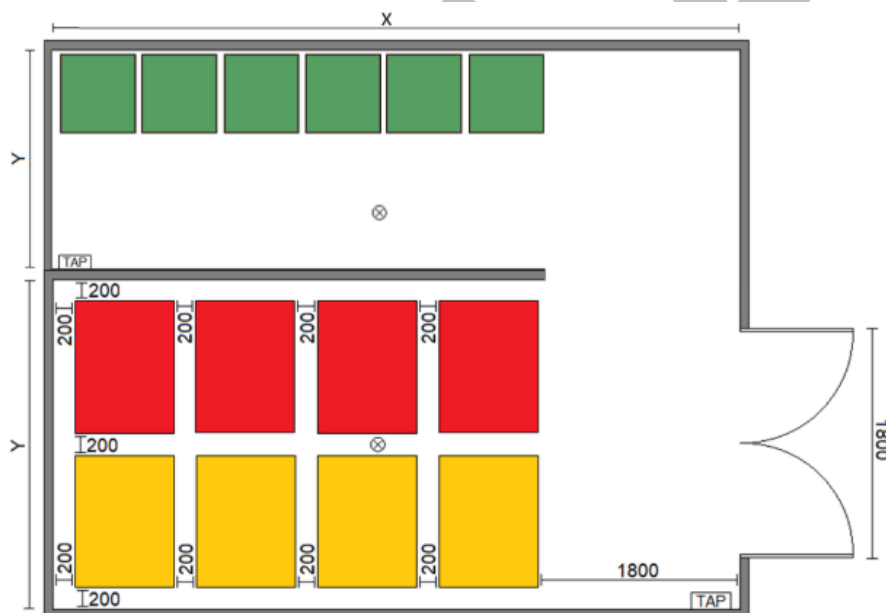


Figure 24: Concept partitioned bin service and collection room for all waste streams, room to be located within close proximity to the on-site loading bay

8.2 Bulky Waste Collection Room

All on-site waste collection infrastructure outlined in section 8 must be locked through Council's Abloy System. The system to be organised through Olympic Lock Smith using the following information:

- Lock System Number: 5OL092
- Address: Unit 28/56 Buffalo Road, Gladesville NSW 2111
- Phone: 1300 303 045

9 Caretaker Storage

To permit scheduled cleaning and maintenance of all utilities and waste collection infrastructure on-site, a cleaner and site manager is required to access the site multiple times weekly.

To permit scheduled activities the following on-site waste collection infrastructure to be provided and integrated within the built form:

- The room to be large enough to accommodate the development's chemicals, cleaning, and service infrastructure required on-site
- Room accessed by dual, 180 degree, outwards opening, self-closing doors with a minimum opening of 1800mm
- The structure to include the following infrastructure and design components:
 - Floor graded to a central drainage point connected to the sewer
 - Floor waterproofed across all intersections and extend a minimum 1200mm high on each wall.

10 Service Lifts

The (assisted or unassisted) movement of bin infrastructure up basement ramps is not suitable. To facilitate the movement of bin infrastructure between different levels one of the following infrastructure configurations to be provided:

- Dock Leveller
- Bin Service Lift.

10.1 Device Specifications

The following provisions are required for service lifts:

- Device to support the movement of bin infrastructure from the chute room to the waste collection room
- Accessed by automated, self-closing doors with a minimum unobstructed opening of 1800mm
- Be fully enclosed, walled and not permit through access to other on-site infrastructure
- Be of sufficient size to accommodate the transport of a minimum of four 1100L bins in one trip
- Specifications of the system to be submitted to Council to allow a detailed assessment to be conducted.

11 Bin Transportation

The maximum unassisted carting route for bin infrastructure is 10m measured from the chute room/s to the waste collection room. For carting routes greater than 10m a bin tug device is required to be provided and permanently stored within the development.

Tug devices are categorised into the following:

- Electric Portable Bin Tug Device
- Electric Ride on Bin Tug Device



Figure 25: Electric Portable (left) and Ride On (right) Bin Tug Devices

Device Specifications

The following provisions are required for the bin tug device:

- Permanently stored within an enclosed, walled and restricted access area within the basement
- Storage area to permit charge capabilities specific to the device
- Bin brackets to be provided and installed on the full bin allocation
 - Bin allocation provided in accordance with section 4
 - Model brackets outlined in the following section
- For larger developments an aluminium bin trailer may be required to permit bin movements
 - The storage area to be of sufficient size to accommodate the bin tug device and trailer
 - Model aluminium trailers outlined in the following pages

Bin Brackets

The universal towing device is a bracket that can be fitted to 1100L bins within a development. The device allows the bins to be attached in a 'train' configuration permitting multiple bin movements. The device has key features including:

- Attachment without the need to drill or alter bin infrastructure. The bracket is fixed to the base of the bin through the use of castor mounting bolts
- Passivated zinc finish for corrosion protection
- Spring loaded draw bar folds up to allow safe bin servicing/collection
- Directional lock castors to permit bin movements when towing in train.

Examples of bin brackets are shown in the following images.



Figure 26: Portable bin tug device with bin brackets



Figure 27: Ride on bin tug device with bin brackets

Aluminium Trailer

The aluminium trailer is used for the transportation of 1100L bins within a development. The trailer is attached to the Electric Tug Device and operates like a standard vehicle trailer. The trailer has key features including:

- Heavy Gauge Aluminium construction
- Engineered to be light weight, robust and easily cleaned
- Fixed draw bar for easy attachment
- Rear ramp for the loading of 1100L bins.

Examples of aluminium trailers are shown in the following images.



Figure 28: Portable bin tug device with aluminium trailer



Figure 29: Ride on bin tug device with aluminium trailer

12 Integrated Auger Compactors

For development with greater than 150 dwellings or multi staged developments with shared basements, auger compaction units provide an efficient on-site waste collection solution. A brief overview of the collection process is outlined below:

- The chutes outlined in the previous section 5 discharge the respective waste streams (residual and recycling) into 1100L bins
- Once the bins on the track system are full the caretaker will remove the bins and replace them with empty bins
- The full 1100L bins are transported from the chute room to the respective compaction unit using a bin tug device, outlined in section 6
- The 1100L bins are emptied into the compaction unit using the bin lifter outlined in the following pages. The bin lift is locked through a protective cage and Abloy key restricting access to the on-site caretaker/manager and Council's collection contractors
- The compaction unit compacts the respective waste stream (residual or recycling) using a maximum compaction ratio of 2:1
- The emptied 1100L bins are washed and placed back into circulation under the

respective chutes

- Council's hook lift vehicle on the designated collection day drives into the loading bay, lifts the compaction unit onto the truck outlined in the following pages and takes the unit to be emptied at the respective processing centre
- The time to conduct on-site loading of compaction units is approximately 5-10mins with a unit turnaround time of two hours

For larger developments with a central dual chute system servicing more than 150 dwellings the compaction unit can be placed directly under the chute system (residual and recycling) to collect waste alleviating the need for additional service infrastructure (1100L bins, track system, bin tug device, etc) and the need for a caretaker to constantly rotate the bins.

Waste Generation Rates

For developments incorporating compaction units, a cubic metre calculation is provided to determine the size of the compaction unit allocated to the development:

Note: The cubic area calculations for compaction units be rounded to next whole number. (i.e. an area of 18.3m³ is rounded to 19m³).

$$\begin{array}{lcl} \text{Residual} & = & \left(\begin{array}{l} \text{Number} \\ \text{of Units} \end{array} \times 0.07 \right) \\ (\text{m}^3) & & \\ \text{Recycling} & = & \left(\begin{array}{l} \text{Number} \\ \text{of Units} \end{array} \times 0.07 \right) \\ (\text{m}^3) & & \end{array}$$

Collection Specifications

The submitted architectural plans to accommodate the following provisions for the auger infrastructure:

- The development to provide integrated on-site waste collection and service provisions in accordance with Penrith DCP and this Guideline
- Compactors can be proposed for waste collection in developments with more than 150 units
- The integrated on-site loading bay to permit access for Council's standard waste collection vehicle to perform scheduled bulky waste collections.
 - Truck specifications outlined in this Guideline
- A separate compactor to be provided for each of Council's waste streams

(residual and recycling)

- Compaction units to be large enough to accommodate the waste volumes outlined in previous section.
- The size of the hook lift collection vehicle assigned to service the development is specific to the size of the compaction unit required. Council's standard hook lift vehicle specifications are outlined in section 12.
- The following minimum clearances provided between each compaction unit
 - 2000mm utilising a bin lift attached to the side of the unit
 - 1000mm utilising a bin lift attached to the rear of the unit.

Integrated Auger Infrastructure

The Integrated Auger Compaction unit will be provided and serviced by Council's Waste Collection contractors. Standard compaction sizes have been provided below:

- 17m³ Integrated Auger Compactor (5.9m long)
- 23m³ Integrated Auger Compactor (7.0m long)

The proposed compactor for each development requires a specific vehicle to be accommodated on-site. Further details on vehicle specifications are provided in Section 13.

Custom Infrastructure

There may be circumstances where site specific compaction infrastructure may be explored to permit a safe and efficient collection service. To propose a unique configuration, consultation is required with Council's Waste and Resource Recovery Department prior to a pre-lodgement meeting.

Integrated Auger Configurations

System Overview

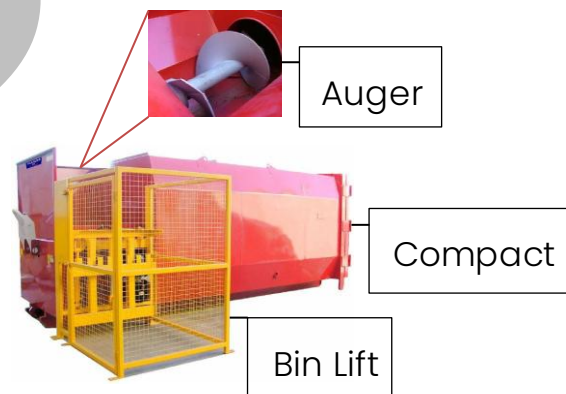


Figure 30: Overview of integrated auger compaction unit and key infrastructure

Loading Arrangements

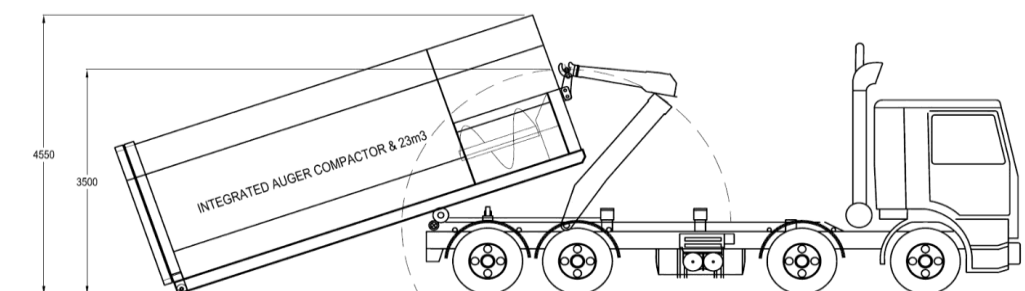


Figure 31: Hook lift vehicle ground floor collection configuration

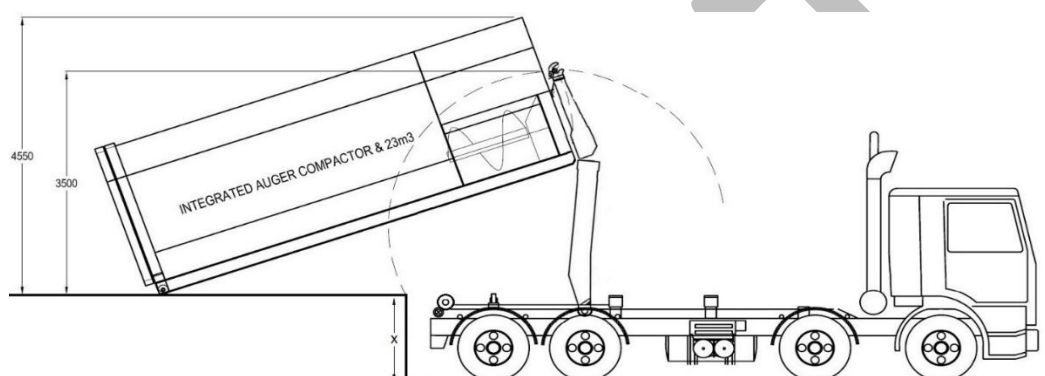


Figure 32: Hook lift vehicle elevated platform collection configuration

Electrical Requirements

To operate integrated auger compaction units the following electrical infrastructure provisions to be provided.

Integrated Auger Compactors

The electrical requirements are needed for each system (residual and recycling) proposed:

Electrical Requirements	Description
Electrical Outlet	5 Pin, 415 Volt, 32 Amp Outlet
Phase	3 Phase, 1 Neutral and 1 Earth
Location	Electrical located within 1m of the unit
Circuit Breaker	D Curve Circuit Breaker - Large enough to start and run 10kw electric motor - Breaker size to be confirmed with breaker supplier

Table 6: Electrical requirements for integrated auger compactors

Integrated 17M³ Auger Compactor

Rear Bin Lifer Configuration

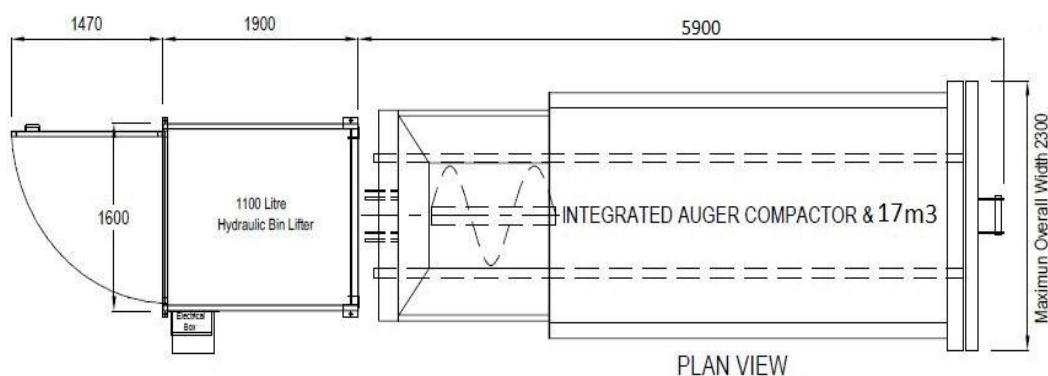


Figure 34: 17m³ Integrated Auger schematic with rear loading bin lifter

Side Bin Lifer Configuration

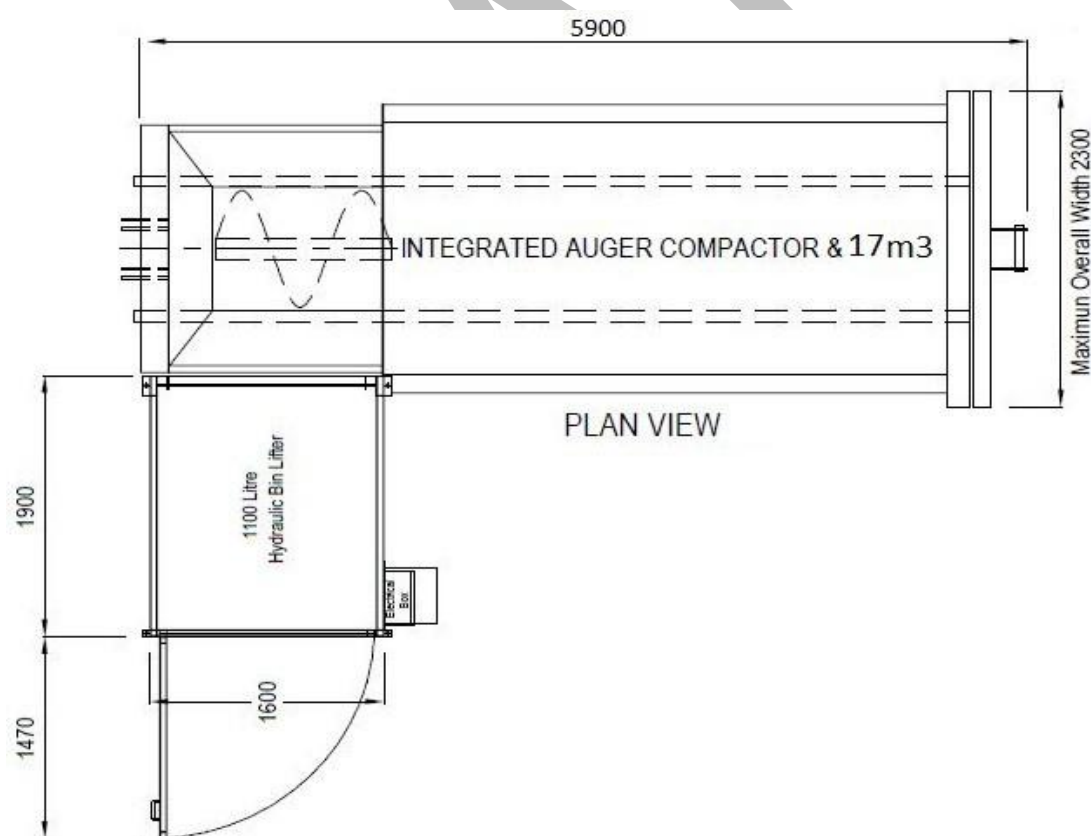


Figure 35: 17m³ Integrated Auger schematic with side loading bin lifter

Operational Height Requirements

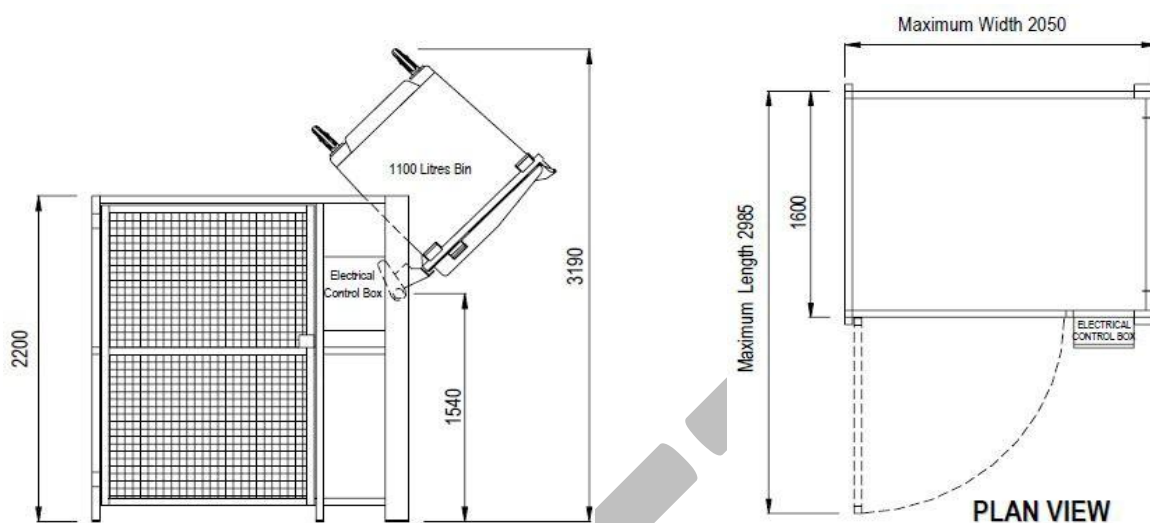


Figure 36: 17m³ Integrated Auger side view and plan view clearances

Integrated 23m³ Auger Compactor

Rear Bin Lifter Configuration

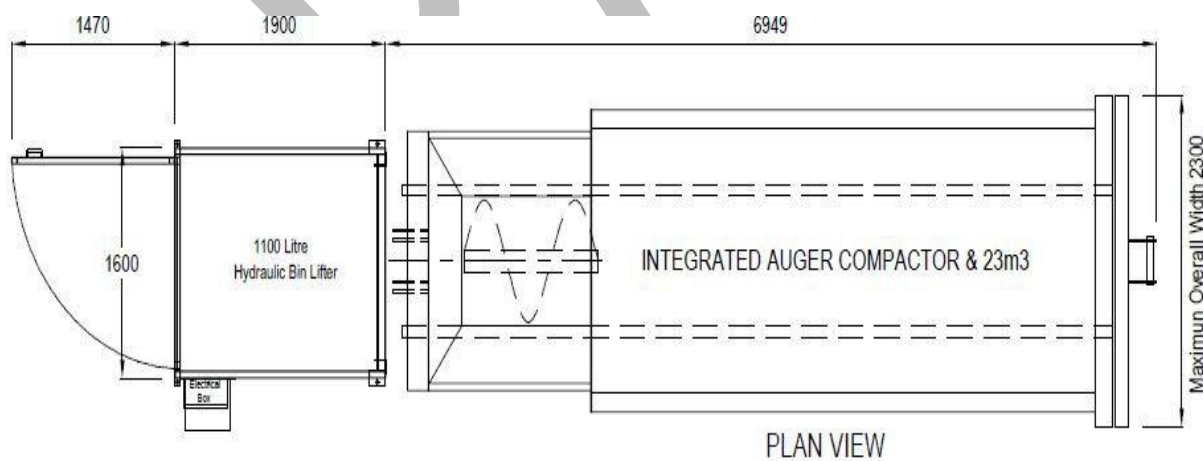


Figure 37: 23m³ Integrated Auger schematic with rear loading bin lifter

Side Bin Lifer Configuration

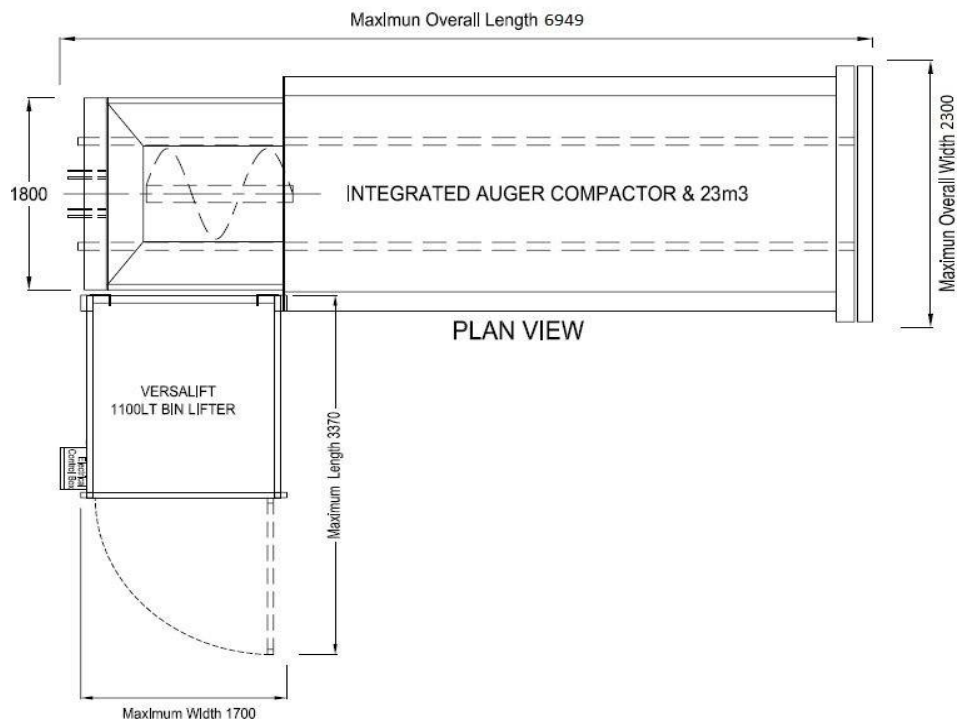


Figure 38: 23m³ Integrated Auger schematic with side loading bin lifter

Operational Height Requirements

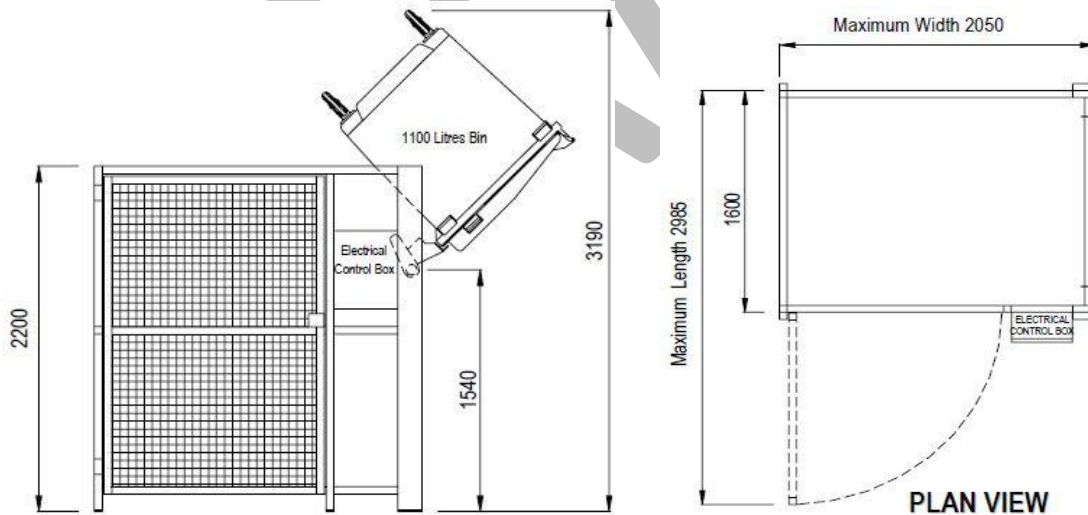


Figure 39: 23m³ Integrated Auger side view and plan view clearances

13 Waste Collection Vehicles

The following dimensions are provided for Council's standard Waste Collection Vehicles. The vehicles are split into the following classifications based upon service requirements:

- Rear Loaded Waste Collection Vehicles
- Hook Lift Waste Collection Vehicles.

13.1 Rear Load Waste Collection Vehicles

The following collection vehicles are used to provided integrated on-site waste collections for Council's standard bin infrastructure (1100L bins).

Low Entry 9.7M Heavy Rigid Waste Collection Vehicle

Vehicle Classifications	Heavy Rigid Vehicle Dimensions
Overall Length	9.7m
Operational Length	11.7m
Design Width	2.8m
Design Height	3.1m
Swept Circle	17.0m
Clearance (travel height)	3.5m
Roadway/ramp grade	1:6.5 (15.4%)
Rate of change of grade	1:12 (8.3%) in 4.0m of travel
Gross Weight (max)	28.0t
Front Chassis Clearance	13°
Rear Chassis Clearance	16°

Table 8: Council's 9.7m Heavy Rigid Low Entry Waste Collection vehicle operational specifications

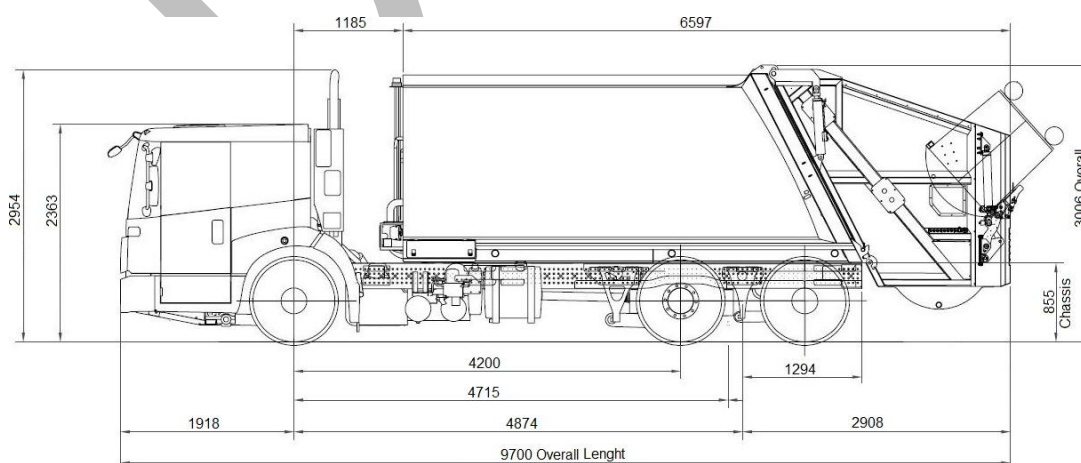


Figure 40: Council's 9.7m Heavy Rigid Low Entry Waste Collection Vehicle specifications

Standard Entry 10.5M Heavy Rigid Waste Collection Vehicle

Vehicle Classifications	Heavy Rigid Vehicle Dimensions
Overall Length	10.5m
Operational Length	12.5m
Design Width	2.8m
Design Height	3.7m
Swept Circle	22.5m
Clearance (travel height)	4.5m
Roadway/ramp grade	1:6.5 (15.4%)
Rate of change of grade	1:16 (6.25%) in 7.0m of travel
Gross Weight (max)	28.0t
Front Chassis Clearance	13°
Rear Chassis Clearance	16°

Table 9: Council's 10.5m Heavy Rigid Waste Collection vehicle operational specifications

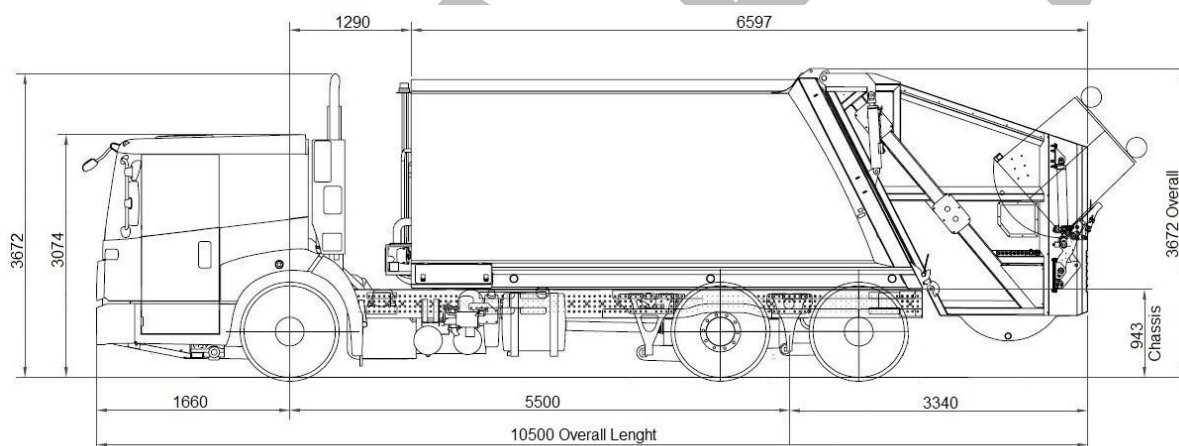


Figure 41: Council's 10.5m Heavy Rigid Waste Collection Vehicle specifications

13.2 Hook Lift Waste Collection Vehicles

Hook Lift Collection Vehicle Specifications

The following vehicle is used to service 17m³ and 23m³ Integrated Auger Compactors.

To propose a unique configuration, consultation is required with Council's Waste and Resource Recovery Department prior to a pre-lodgement meeting.

Vehicle Classifications	Heavy Rigid Vehicle Dimensions
Overall Length	9.3m
Operational Length Loaded	9.5m
Design Width	2.8m
Design Height	3.7m
Swept Circle	21.6m
Clearance (travel height)	4.5m
Roadway/ramp grade (max)	1:6.5 (15.4%)
Rate of change of grade (max)	1:16 (6.25%) in 7.0m of travel
Gross Weight (max)	28.0t
Front Chassis Clearance	13°
Rear Chassis Clearance	16°

Table 10: Council's 9.3m Heavy Rigid Hook Lift Waste Collection vehicle operational specifications

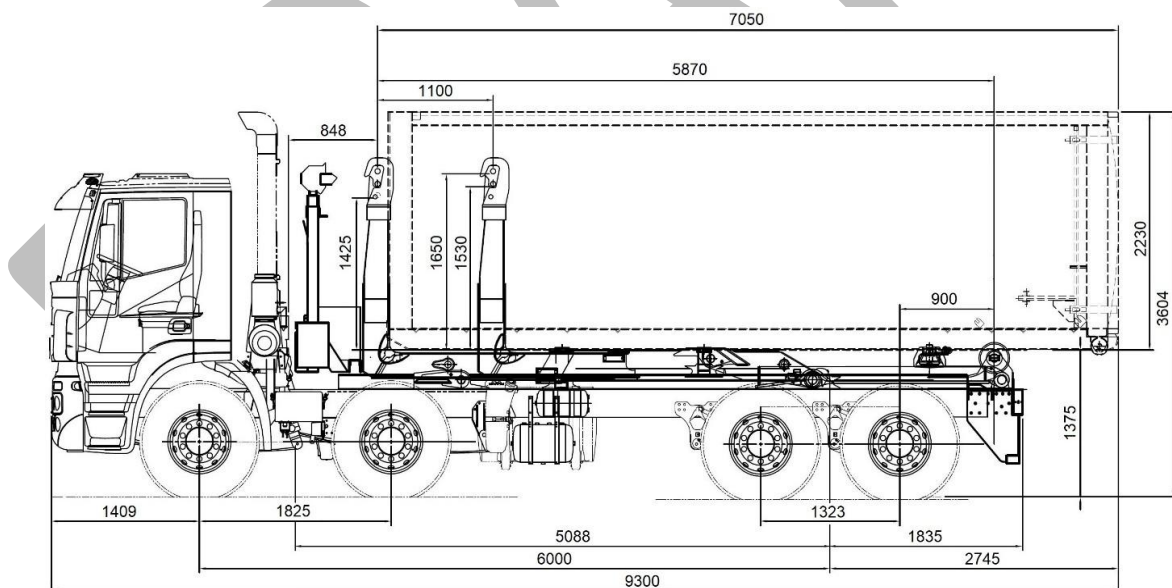


Figure 42: Council's 9.3m Heavy Rigid Hook Lift Waste Collection Vehicle specifications

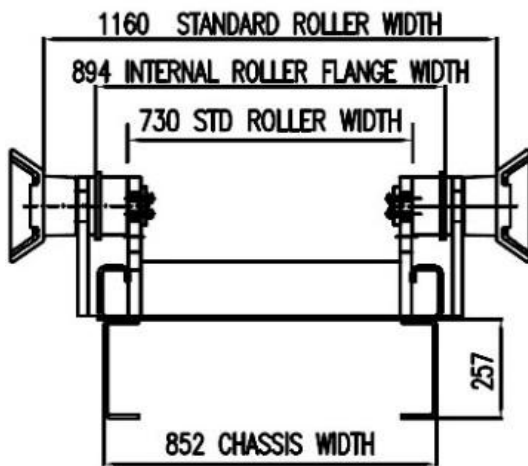


Figure 43: Council's 9.3m Heavy Rigid Hook Lift Waste Collection Vehicle tray specifications

14 Turntables

Turntable Overview

Turntables are typically characterised into the following:

- 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.
- 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.

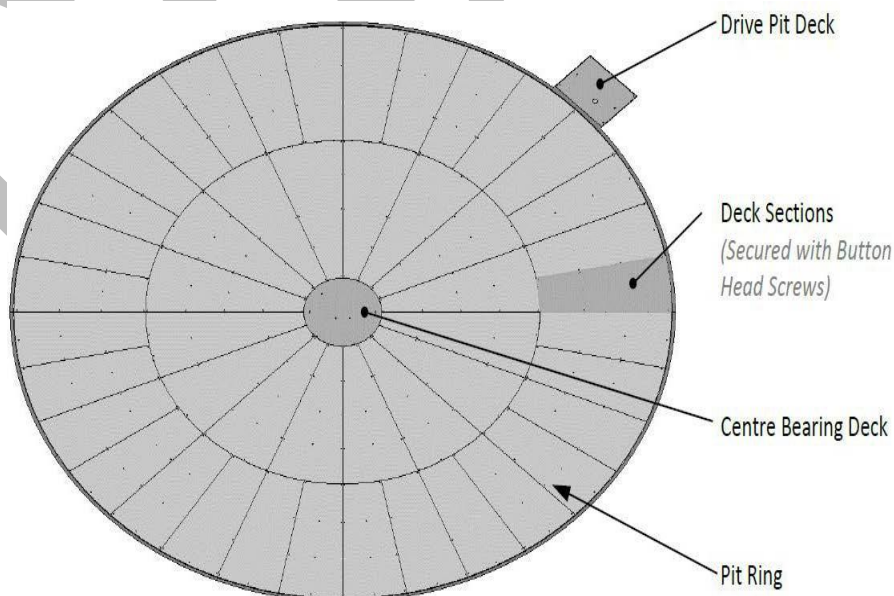


Figure 44: Turntable overview outlining key components and terminology

Turntables 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.

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.

Vehicle Entry Alignment

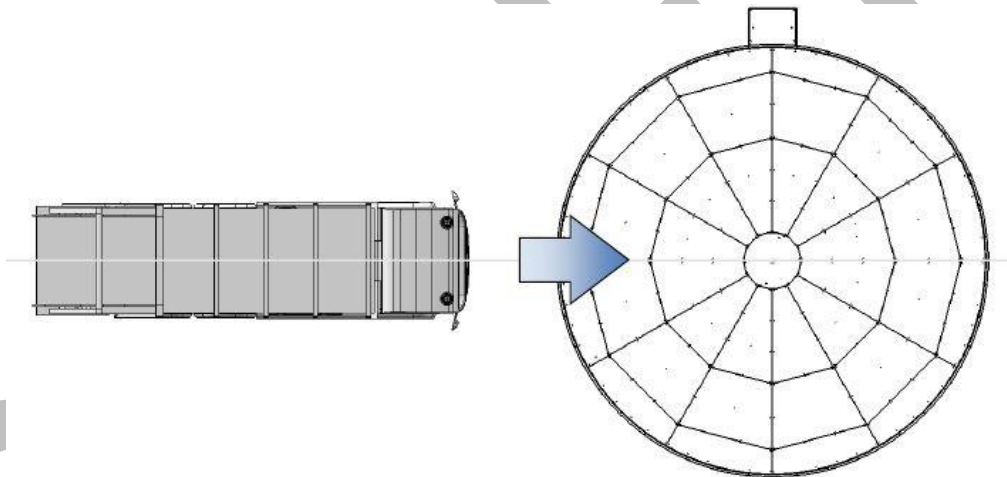


Figure 45: Alignment of a heavy rigid waste collection vehicle onto a turntable

Vehicle Loading Alignment

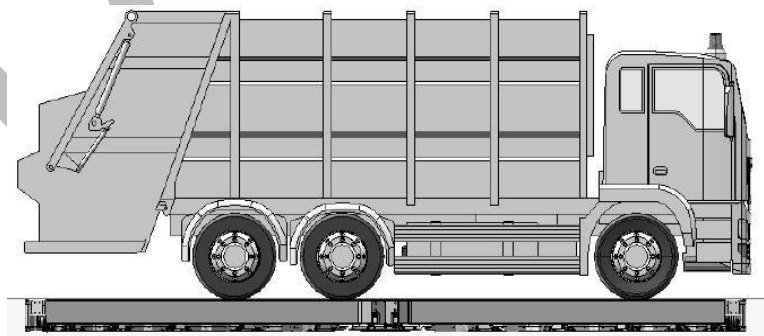


Figure 46: Central alignment of heavy rigid waste collection vehicle during turntable operational manoeuvres

Turntable Operation Model

Pre-Operation Procedure

- Position the vehicle on the turntable such that all the wheels of the vehicle are fully seated on the turntable deck
- Ensure that the vehicle's parking brake is applied to prevent movement of the vehicle during turntable operation
- Ensure that the vehicle's outer limits and the turntable perimeter is free of any kind of obstacle

Note: An Abloy key lock is to be applied to the isolating switch to restrict access of the turntable to Stata and Council's Collection Contractors.

Operation Procedure

- Select desired direction HMI panel (Clockwise or Anti-Clockwise)
- Press and hold the operation button
- Remain at the control panel while the turntable is operation
- Release the operation button when the vehicle is in the required position
- Safely drive the vehicle off the turntable, only after the turntable has reached a stationary position

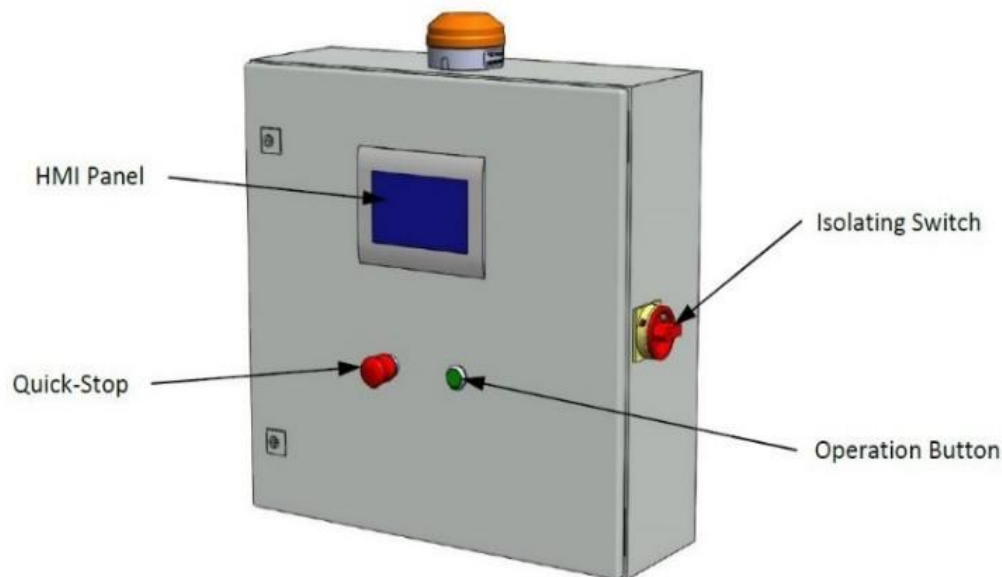


Figure 47: Turntable operation box

15 Automated Waste Collection Systems

Staged Development Precincts

Developments that are a part of key precincts or staged developments may consider the implementation of Automated Waste Collection Systems. AWCS is a network of underground pipes that transport municipal and/or industrial/commercial waste at high speeds (60–70 km/hour) to a designated waste collection point. Typically, developments that wish to incorporate these technologies require a minimum of 1,000 units.

Detailed information, design specifications, and schematics are available in the Section E of the Waste Guideline Document.

To explore the viability of AWCS on individual sites Council advises a pre-lodgement meeting is booked with Council's Waste and Resource Recovery Department.

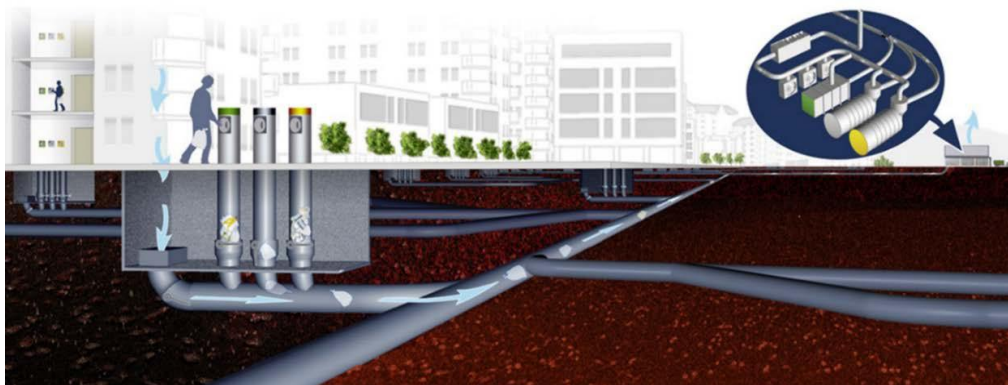


Figure 48: Automated Waste Collection System Overview

16 Indemnity Agreement

On-Site Waste Collection

Prior to the issue of any Occupation Certificate, all RFBs are required to enter a formal agreement with Penrith City Council for the use of Council's Waste Collection Service. This is to include Council being indemnified against claims for loss or damage.

By entering into an agreement with Penrith City Council for waste collection, the development will be required to operate in full compliance with Council's Waste collection and Processing Contracts for Standard Waste Collection. The provision of Council's waste collection service will not commence until formalisation of the agreement.

The form is available on Council's Website through the following:

<https://www.penrithcity.nsw.gov.au/council/our-organisation/forms>

Part D Industrial and Commercial

1 Introduction: Design Principles

Waste Management Considerations

Industrial and Commercial developments need to be designed to permit a safe and efficient integrated on-site waste collection service. In assessing Development Applications (DA's) the following must be taken into consideration:

- Implement best practice waste and resource recovery technologies and processes that minimise waste generation and maximise re-use, recycling and resource recovery across all stages of the development
- Provide integrated waste collection infrastructure within the development responsive to Council's Development Control Plan
- Implement innovative waste management and collection systems that are sustainable, efficient and enhance the amenity of occupants, adjoining users and the public domain
- The development to incorporate integrated waste collection infrastructure and storage facilities to permit source separation for tenancies at the point of disposal responsive to relevant State Circular Economy Policies and Diversion Targets for each waste stream.

1.2 Service Classification

The waste collection infrastructure and service allocation outlined in Part D of this Guideline apply to the following classifications:

Commercial Premises

Any of the following:

- Business premises
- Office Premises
- Retail Premises

Industrial Activity being:

The manufacturing, production, assembling, altering, formulating, repairing, renovating, ornamenting, finishing, cleaning, washing, dismantling, transforming, processing,

recycling, adapting or servicing of, or the research and development of, any goods, substances, food, products or articles for commercial purposes, and includes any storage or transportation associated with any such activity.

Commercial or industrial components of mixed-use development shall comply with Part D of this Guideline. .

Mixed Use Development:

A building or place comprising 2 or more different land uses.

2 Integrated On-Site Service Provisions

2.1 On-Site Collection

Industrial and commercial buildings to be designed to accommodate integrated on-site waste collection using a Standard Heavy Rigid Waste Collection Vehicle. The on-site loading bay to be integrated wholly within the built form.

2.2 Design for Council Collection Vehicles

Standard waste collection vehicles used to service Commercial, Industrial and Mixed-Use developments are outlined below:

- 9.7m Heavy Rigid Rear Loaded Waste Collection Vehicle
- 10.5m Heavy Rigid Rear Loaded Waste Collection Vehicle
- 10.5m Heavy Rigid Front Loaded Waste Collection Vehicle and operational specifications outlined in section 6.

2.3 On-Site Service Infrastructure

Site Access

As per Penrith DCP 2014, a standard waste collection vehicle must be able to safely and efficiently access the site and nominated integrated on-site loading bay in a forward direction with little or no need to reverse.

Reverse manoeuvres will only be considered for loading bay access free from all active carriageways and pedestrians' paths of travel.

Architectural Plans

As per Penrith DCP 2014, architectural plans must be prepared to accommodate provisions for waste storage areas and collection. It is important plans illustrate the following, to allow a detailed assessment of integrated on-site collection configuration

and service infrastructure:

- Elevations and cross sections of all on-site collection vehicle manoeuvres proposed
- Integrated waste infrastructure (waste collection room) with bin infrastructure displayed
- Floor plans and cross sections showing unobstructed access for all tenancies to the integrated waste collection infrastructure

Loading Bays

All on-site loading bays are to be integrated wholly within the development's built form, free from active carriageways and fully enclosed. Chapter C5 in the Penrith DCP 2014 stipulates that the bay has to incorporate the following infrastructure specifications:

- Access via an automated restricted opening
- Provide sensor lighting
- Mechanical ventilation provided responsive to collection vehicle specifications
- Acoustic attenuation in accordance with the Building Code of Australia
- Located within close proximity to the central elevator core.

Service Clearances

All waste collection vehicles to be provided with a minimum 2000mm unobstructed clearance zone to support collection operations of 660L and 1100L bins. The clearance zone to be measured in addition to the vehicle's overall length and operations width.

A 700mm clearance zone to be provided on the driver's side (RHS) of the waste collection vehicle to permit driver access from the vehicle and unobstructed path of travel to the waste collection infrastructure (waste collection and bulky waste collection rooms).

Multi-Use Loading Bays

The integrated on-site loading bay to be designed to facilitate use by removalists, deliveries and supporting service vehicles when not utilised for waste collection operations.

Priority access to be managed to ensure unobstructed access for the waste collection vehicles is provided during scheduled collection operations.

Maximum Potential Payload

All vehicle manoeuvres proposed for standard waste collection vehicles to be supported by on-site infrastructure (ramps, slabs, clearances, etc) to accommodate a waste collection maximum operational weight of 28 tonnes.

Alternative Solutions

In accordance with Penrith DCP, alternative solutions may be discussed with Council prior to and/or after a pre-lodgement meeting.

The plans to be submitted to Council to allow a detailed assessment to be conducted by Waste Services and the respective DA Planner. The assessment is undertaken to determine the viability of the proposal in accordance with Council's Development Application policy provisions, Council's Waste and Resource Recovery Strategy and Collection Contract Service Provisions.

Plan of Operations

All development applications to be accompanied with a Plan of Operations outlining how waste collection infrastructure and service provisions will be conducted, including:

- Bin Infrastructure Sizes
- Collection Frequency
- Hours of collection
- Waste collection vehicle dimensions
- Access to on-site infrastructure
- Caretaker/manager requirements
- Waste Streams provided
- Waste Generations Rates

3 Service Infrastructure

The service infrastructure to be integrated wholly within the development's built form and provide unobstructed access to all waste streams generated on-site.

3.1 Bin Infrastructure

The bin dimensions provided reflect typical bins used to service waste streams within commercial and industrial developments:

Rear Lift Bins

Bin Size and Type	Length (mm)	Width (mm)	Height (mm)
240L	740	600	1100
660L	1260	800	1400
1100L	1240	1090	1330

Table 11: Standard Bin Sizes



Figure 49: Typical 240L, 660L and 1100L bins

Front Lift Bins

Size	Length (mm)	Width (mm)	Height (mm)
1.5m ³ Bin	1080	2070	1190
3.0m ³ Bin	1520	2060	1540
4.5m ³ Bin	1860	2050	1850

Table 12: Standard Bin Sizes



Figure 50: Typical 1.5m³, 3.0m³ and 4.5m³ bins

4 Model Waste Generation Rates

4.1 Food Premises

Type of Premise	Residual Waste Generation	Recycling Generation
Restaurant	660L/100m ² floor area/day	200L/100m ² floor area/day
Supermarkets	660L/100m ² floor area/day	240L/100m ² floor area/day
Convenience Store	300L/100m ² floor area/day	150L/100m ² floor area/day
Cafe	300L/100m ² floor area/day	200L/100m ² floor area/day
Takeaway/Café (pre-packaged food)	150L/100m ² floor area/day	150L/100m ² floor area/day
Childcare	80L/100m ² floor area/day	80L/100m ² floor area/day
Licensed club	50L/100m ² floor area/day	50L/100m ² floor area/day

Table 13: Model waste generation rates for food premises

4.2 Specialty Food Premises

Type of Premise	Residual Waste Generation	Recycling Generation
Butcher	80L/100m ² floor area/day	50L/100m ² floor area/day
Delicatessen	80L/100m ² floor area/day	50L/100m ² floor area/day
Fish Shop	80L/100m ² floor area/day	50L/100m ² floor area/day
Greengrocer	240L/100m ² floor area/day	120L/100m ² floor area/day

Table 14: Model waste generation rates for specialty food premises

4.3 Accommodation

Type of Premise	Residual Waste Generation	Recycling Generation
Hotel/Motel	5L/bed/day	5L/bed/day

Table 15: Model waste generation rates for accommodation

4.4 Non-food Premises

Type of Premise	Residual Waste Generation	Recycling Generation
Education/Training (Teaching Space)	5L/100m ² floor area/day or 0.5L/student/week	5L/100m ² floor area/day or 0.5L/student/week
Offices	10L/100m ² floor area/day	10L/100m ² floor area/day
Shops (no food)	50L/100m ² floor area/day	50L/100m ² floor area/day
Show Rooms	40L/100m ² floor area/day	10L/100m ² floor area/day
Warehouse (office)	10L/100m ² floor area/day	10L/100m ² floor area/day
Gym	10L/100m ² floor area/day	50L/100m ² floor area/day
Hairdresser	60L/100m ² floor area/day	50L/100m ² floor area/day

Table 16: Model waste generation rates for non-food premises

4.5 Alternate Use

For commercial and industrial waste streams that are not outlined in the previous section, supporting documentation is required to validate the proposed volumes for the respective waste streams anticipated for the development.

5 Integrated Waste Collection Infrastructure

5.1 Waste Collection

All developments to include a waste collection room integrated wholly within the built form for the storage of the development's bin infrastructure for each waste stream.

Waste Collection Room

The following provisions are to be met for the waste collection room:

- The room to be large enough to accommodate the entire suite of bins
 - 200mm clearance provided between each bin for manoeuvrability
- Room to store a minimum 3 days' worth of waste material onsite
 - Bin allocation outlined in section 3
- An 1800mm unobstructed clearance zone to be provided between the stored bin and the access doorway
- Room accessed by dual, 180 degree, outwards opening, self-closing doors with a minimum opening of 1800mm

- The structure to include the following infrastructure and design components:
 - Floor graded to a central drainage point connected to the sewer
 - Floor waterproofed across all intersections and extend a minimum 1200mm high on each wall.

6 Waste Collection Vehicles

The following dimensions are provided for standard Waste Collection Vehicles. The vehicles are split into the following classifications based upon service requirements:

- Rear Loaded Waste Collection Vehicles
- Front Lift Waste Collection Vehicles.

6.1 Rear Loaded Waste Collection Vehicles

The following collection vehicles are used to provided integrated on-site waste collections for bin infrastructure.

Council's Low Entry 9.7m Heavy Rigid Waste Collection Vehicle

Vehicle Classifications	Heavy Rigid Vehicle Dimensions
Overall Length	9.7m
Operational Length	11.7m
Design Width	2.8m
Design Height	3.1m
Swept Circle	17.0m
Clearance (travel height)	3.5m
Roadway/ramp grade	1:6.5 (15.4%)
Rate of change of grade	1:12 (8.3%) in 4.0m of travel
Gross Weight (max)	28.0t
Front Chassis Clearance	13°
Rear Chassis Clearance	16°

Table 17: Council's 9.7m Low Entry Heavy Rigid Waste Collection vehicle operational specifications

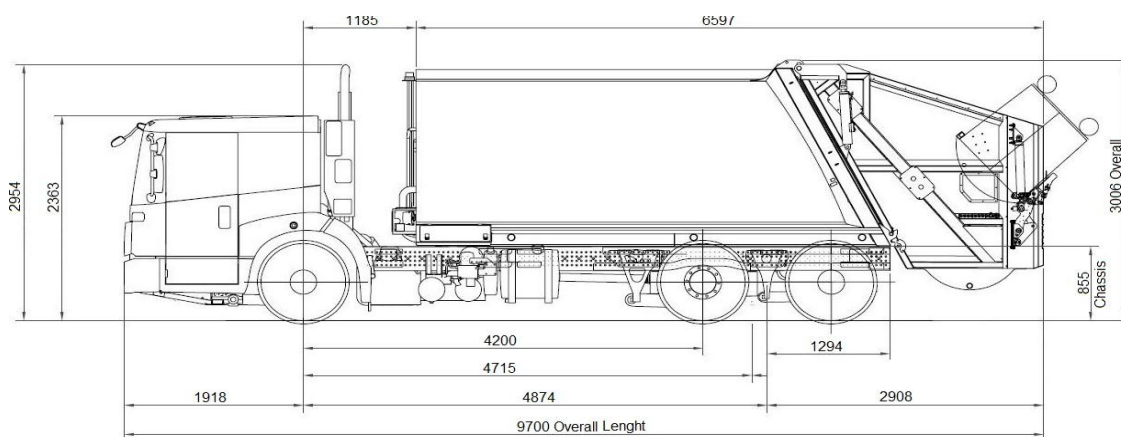


Figure 51: Council's 9.7m Low Entry Heavy Rigid Rear Load Waste Collection Vehicle specifications

Standard Entry 10.5m Heavy Rigid Waste Collection Vehicle

Vehicle Classifications	Heavy Rigid Vehicle Dimensions
Overall Length	10.5m
Operational Length	12.5m
Design Width	2.8m
Design Height	3.7m
Swept Circle	22.5m
Clearance (travel height)	4.5m
Roadway/ramp grade	1:6.5 (15.4%)
Rate of change of grade	1:16 (6.25%) in 7.0m of travel
Gross Weight (max)	28.0t
Front Chassis Clearance	13°
Rear Chassis Clearance	16°

Table 18: 10.5m Heavy Rigid Rear Load Waste Collection Vehicle operational specifications

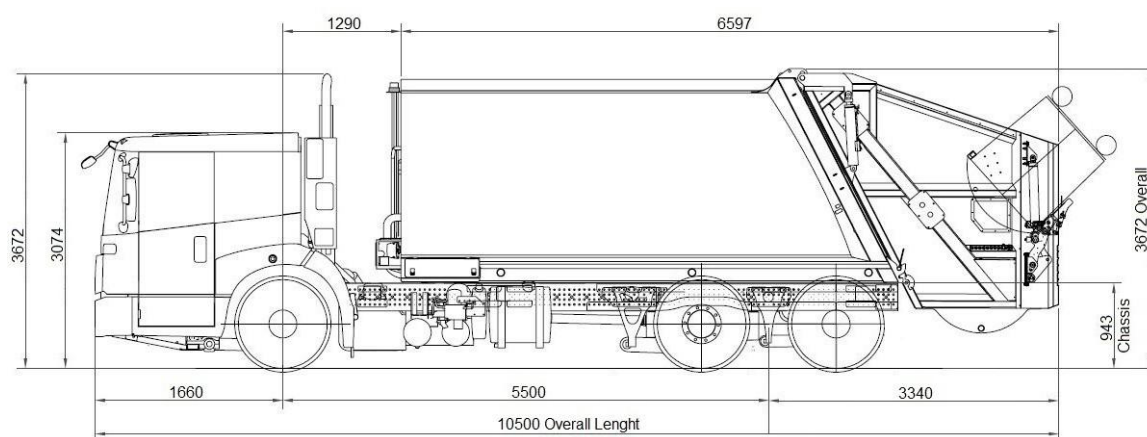


Figure 52: 10.5m Heavy Rigid Rear Load Waste Collection Vehicle specifications

6.2 Front Load Waste Collection Vehicles

Front Lift 10.5m Heavy Rigid Waste Collection Vehicle

The following collection vehicles are used to provide integrated on-site waste collections for bin infrastructure:

Vehicle Classifications	Heavy Rigid Vehicle Dimensions
Overall Length (m)	10.5
Operational Length (m)	12.5
Design Width (m)	2.8
Design Height (m)	4.1
Operational Height (m)	+4.5m (specific to bins proposed)
Swept Circle (m)	22.5
Clearance (travel height) (m)	4.5
Roadway/ramp grade (max)	1:6.5 (15.4%)
Rate of change of grade (max)	1:16 (6.25%) in 7.0m of travel
Gross Weight (max tonnes)	28.0
Front Chassis Clearance	13°
Rear Chassis Clearance	16°

Table 19: 10.5m Heavy Rigid Front Lift Waste Collection vehicle operational specifications

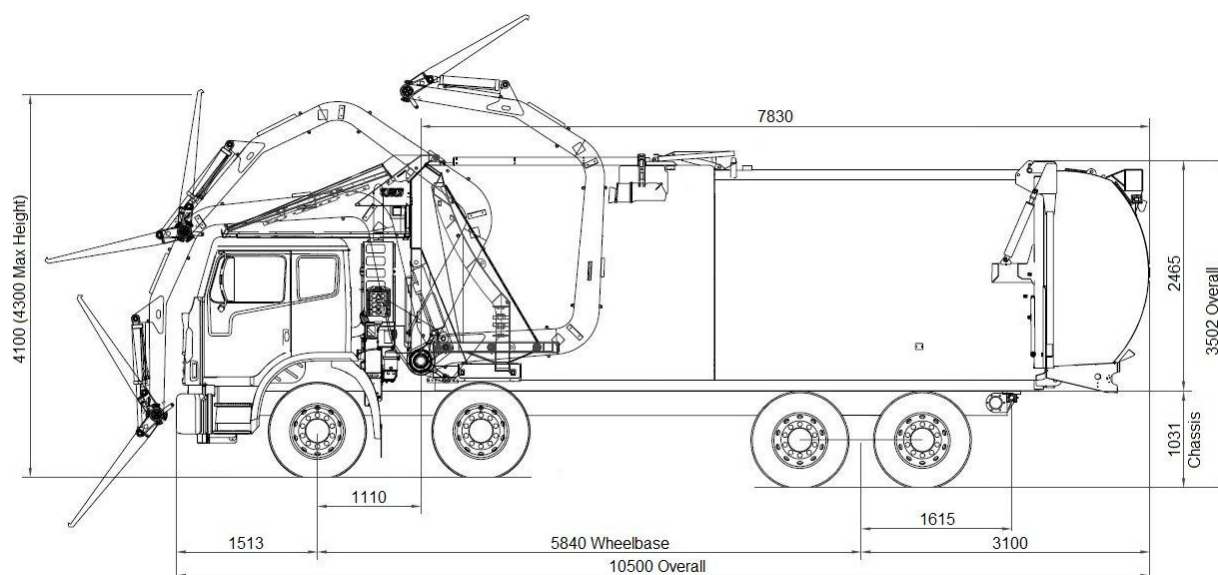


Figure 53: 10.5m Heavy Rigid Front Lift Waste Collection vehicle specifications

Part E Automated Waste Collection Systems

1 Background

Waste management practices of all proposed developments need to consider resident and public amenity and safety at all stages of the waste management process, including storage, transfer and collection.

Automated Waste Collection Systems redefine traditional waste collections within higher density developments. The system enables all waste collection and streams to be collected and transported underground to a centralised collection station. This technology can be explored within green and brown field developments servicing residential, commercial, and mixed use developments.

2 System Overview

Automated Waste Collection Systems (AWCS) is a network of underground pipes that transport municipal and/or industrial/commercial waste at high speeds (60–70 km/hour) to a designated waste collection point.

The system can be broken down into three components:

1. The user interface (inlets)
2. The transportation method (pipe network)
3. The waste disposal interface (the collection station)

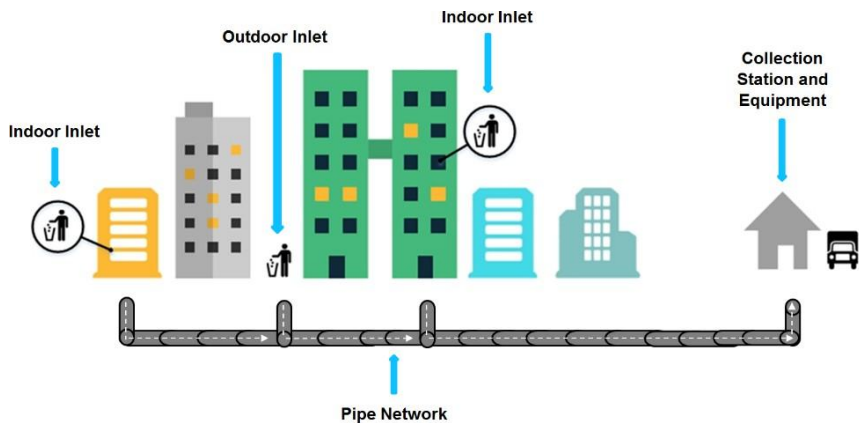


Figure 54: Automated Waste Collection System schematic identifying key infrastructure

2.1 Inlets

The location and quantity of inlets implemented within each development will be determined following consultation with individual suppliers. This will take into consideration the estimated waste generation rates, frequency of collection and the safe/convenient access for users.



Figure 55: Free standing inlets within recreational spaces

The systems are regulated by a control system housed in the collection station. This allows the automated opening of pipes once a pre-determined volume of waste is placed in the inlet. This is designed to reduce the cross contamination of waste streams.



Figure 56: Free standing inlets and supporting underground networks for the transportation of waste items

Inlets can be located indoors (commonly wall mounted) and/or outdoors (commonly free standing). This flexibility allows maximum user accessibility.



Figure 57: Typical free standing (left) and wall mounted (right) inlets

2.2 Pipe Network

The underground pipe network transports waste from the inlet to the collection station, where waste is separated, compacted and stored in sealed containers.

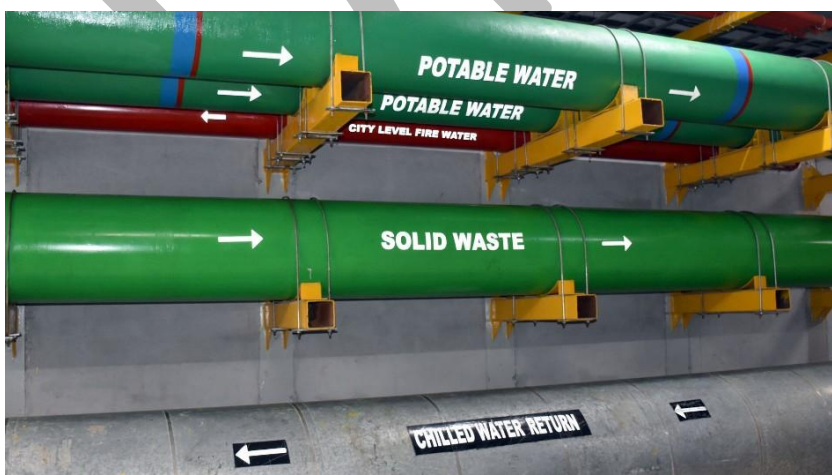


Figure 58: AWCS pipe network located adjacent to other underground services

The pipe network is commonly constructed of steel (carbon and aluminium stainless steel) with a pipe diameter generally between 200–500mm and buried 1–2m deep. The thickness and curve radius of the underground pipe system is directly dependent on the type and quantity of waste proposed.

2.3 Collection Stations

Once the items reach the collection station, a diverter is engaged to align with the waste stream travelling within the network (residual, recycling, organics). This allows multiple streams to be serviced whilst minimising the need for separate pipe infrastructure for each waste stream.

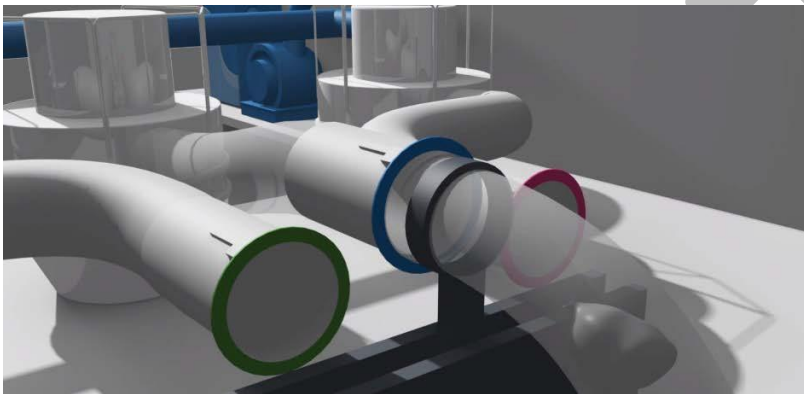


Figure 59: Diverters to support separation of waste streams into separate compaction units

The diverter then directs the waste into the respective compaction units for storage. The units have compaction units specific to the waste being stored and maximise storage efficiency.



Figure 60: Compaction units with the respective waste stream

The location of the collection station can be incorporated within the development or located outside the proposed site. For collection points greater than 4km from the original disposal point (inlet) boosters are needed to facilitate transport of material

within the pipe network. Once full, the containers are collected by hook lift trucks and transported to Council's processing/recycling facilities.



Figure 61: Transportation of AWCS compaction units by hook lift vehicles

Waste collection points allow for flexibility in their design and location. This allows the collection point to be integrated within the development or located as a stand-alone structure. These configurations support reduced truck movements within city centres whilst supporting heightened collection operations and source separation of residential and commercial waste. The two configurations are illustrated in the figures below.

Integrated within the Development



Figure 62: Integrated waste collection station configuration



Figure 63: Integrated waste collection station configuration

Designated Collection Point



Figure 64: Centralised collection station servicing multiple developments/stages



Figure 65: Centralised collection station servicing multiple developments/stages

3 System Benefits

3.1 Overview

The AWCS offers numerous advantages across multiple areas including development, environmental, social and technical outlined below:

Development Advantages

The introduction of AWCS has the potential to:

- Reduce basement heights
- Reduce floor area allocated to waste collection infrastructure
- Lower operational costs
- Increase asset value and return on investment
- Enhance the development's marketability
- Achieve higher sale and rental values and tenant retention.

Environmental Advantages

The introduction of AWCS has the potential to:

- Increase recycling and landfill diversion rates
- Reduce noise related to waste collection in local areas
- Remove odour and vermin through the removal of standard bins
- Reduce Greenhouse gas emissions
- Improve localised air quality
- Increase visual amenity through the removal of kerbside presentation/ collection

Social Advantages

The introduction of AWCS has the potential to:

- Eliminate spillage during collection operations
- Reduce traffic congestion and increase safety on local roads through removal of heavy rigid collection vehicle on local roads
- Reduce risks associated with collection vehicles
- Improve driver safety and OH&S
- Improve hygiene through minimal handling of waste and exposure to pathogens by users and collection contractors

Technical Advantages

- 24/7 service availability with flexible collection hours and reduced service time
- Ability to adjust to fluctuations in waste generation
- Minimal collection vehicle access specifications and requirements
- Joint residential and commercial collection opportunities
- Minimal requirements for caretaker intervention in system operations

4 Technical Considerations

4.1 Matters to Consider

The key areas to consider when looking to install an AWCS into developments are:

- The number of waste streams to be serviced
- Wastes streams that cannot be serviced by AWCS:
 - bulky household waste
 - combustible and flammable substances
 - hard wastes (stones or metal scraps)
 - viscous waste (binders and adhesives)
 - spongy waste (cushions, pillows, blankets, etc)
 - large volumes of liquids
 - dangerous chemicals
- Service and maintenance agreements
- Location and size of the collection station (on-site or off-site)
- Correct and safe use of the system by all users accompanied by education to minimise system misuse and blockages

4.2 Infrastructure Requirements

User Interface

Safe and efficient operation of the AWCS to incorporate:

- Waste service room
- Interim storage areas for larger recyclable goods on each residential level
- Separate indoor and outdoor inlets for the collection of waste

- Separate waste chutes for each waste stream being serviced
- Underground pipe network

Collection Interface

Safe and efficient operation of the AWCS to incorporate:

- Separate waste containers for the collection of the various streams produced
- Road/hardstand space for container changeover and service vehicle loading
- Storage space for surplus waste items
- Waste separator (if required for streams such as organics)
- Compactor
- Exhauster room
- Pump, filter and carbon units
- Dust filter
- Air exhaust pipe
- Control/electrical room.

4.3 Joint Usage

To facilitate the joint usage of the AWCS in mixed use developments, a Radio-Frequency Identification (RFID) card reader system can be used to control and restrict system access. RFID cards can measure the waste disposal data of users in mixed use developments. The system can regulate areas by waste type and have the potential to invoice residential and/or commercial streams based on the volumes of waste disposed.



Figure 66: Waste inlets with the RFID System

4.4 Maintenance / Caretaker Responsibility

An AWCS requires ongoing operation and system maintenance by a caretaker and/or AWCS staff member to ensure the system's longevity.

The primary role of the caretaker for an AWCS involves:

- **Monitoring:** the caretaker is responsible for determining collection terminal frequencies in conjunction with Council based upon the waste generation data available. Depending on the system's scale, the caretaker should be part-time (two hours a day) with the ability to contract out responsibilities
- **Maintenance:** the system's maintenance involves programmed and emergency maintenance as outlined by the system's supplier.

4.5 Safety Requirements

In order to improve inlet safety, there are four main strategies:

1. Where inlets have unlimited access in residential areas (indoor and outdoor inlets), the inlet opening should not be larger than 30cm
2. The inlet door should be positioned a minimum 110–120cm above the ground
3. Where larger inlet doors are required (for some retail and commercial users), restricted access is needed through the implementation of a RFID system or alternative technologies
4. Electrical locking of inlets during emptying.

5 System Suitability

5.1 Suitability Considerations

AWCS are primarily suitable for greenfield developments where there is no need to work within the constraints of existing buildings or infrastructure. This allows the pipe network to be installed with other essential services (water, electricity, sewerage). However, an AWCS can be retrofitted into existing developments and buildings, if required.

The system can be installed in areas with a few hundred dwellings. However, it is typically financially feasible with over 1,000 dwellings within medium-high density and a mixture of retail and residential uses.

In developments where the number and density of units is a concern, an AWCS has the ability to service multiple developments through the staging of the underground pipe network. The AWCS can operate on a relatively small base load initially with the understanding that additional loads over time will be managed as future developments

are connected.

The technical and financial suitability of an AWCS for a specific development needs to be assessed individually based upon:

- the scale of the development
- type of retail and residential premises
- site specific constraints

6 Further Information

6.1 Council's Waste and Resource Recovery Department

Contact the Waste and Resource Recovery Department on **4732 7777** for more information.

Developers considering implementing AWCS within a proposed development are encouraged to arrange a pre-lodgement meeting. This will allow Council and respective Council staff member to review the viability of the proposal and AWCS configuration to operate in accordance with Council's collection contract provisions and Waste and Resource Recovery Strategy objectives.



Figure 67: AWCS integrated within masterplan proposal