

57-61 Archer Street Chatswood - Waste Management Plan

A Submission to Chatswood Property Pty Ltd

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57-61 Archer Street, Chatswood – Operational Waste Management Plan


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Disclaimer

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In the spirit of reconciliation MRA Consulting Group acknowledges the Traditional Custodians of Country throughout Australia and their connection to land, sea and community. We pay our respects to Aboriginal and Torres Strait Islander peoples and to Elders past, present and emerging.

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Glossary

Terminology	Definition
AS	Australian Standard
C&D	Construction and Demolition
DA	Development Application
DCP	Development Control Plan
ENM	Excavated Natural Material
EPA	Environment Protection Authority
FOGO	Food Organics & Garden Organics
LGA	Local Government Area
MGB	Mobile Garbage Bin
MSW	Municipal Solid Waste
NSROC	Northern Sydney Regional Organisation of Councils
WDCP	Willoughby Development Control Plan 2023
WLEP	Willoughby Local Environmental Plan 2012
VENM	Virgin Excavated Natural Material
WMP	Waste Management Plan
WSP	Waste Service Provider
WSRA	Waste Storage and Recycling Area

1 Introduction

MRA Consulting Group (MRA) was engaged by Chatswood Property Pty Ltd to prepare a Waste Management Plan (WMP) to accompany a detailed State Significant Development (SSD) development application for a proposed mixed use infill affordable housing development at 57-61 Archer Street & 34 Albert Ave, Chatswood (SSD-72891212). The site is situated in the Willoughby City Council Local Government Area (LGA).

The proposed development includes 150 residential apartments over 29-storeys, with a 3-storey commercial podium.

This waste management plan has been prepared in accordance with the following reference material:

- Willoughby Local Environmental Plan (WLEP) 2012
- Willoughby Development Control Plan (WDCP) 2023
- NSROC *Development Controls For Multi Dwelling Housing Residential Flat Buildings and Mixed-Use Developments* (2018)
- NSROC *Waste Management Technical Guide for Multi Dwelling Housing (MDH) Residential Flat Building (RFB) Mixed Use Developments* (2018); and
- NSW EPA's *Better Practice Guidelines for Resource Recovery in Residential Developments* (2019).

This WMP has considered the waste management objectives in the WDCP 2023, being:

- To ensure developments are designed to maximise resource recovery through waste avoidance, source separation and recycling.
- To encourage source separation of waste, reuse and recycling by ensuring developments provide adequate and appropriate bin storage and collection facilities for waste.
- To ensure developments incorporate well-designed and responsive bin storage and collection facilities that are convenient and accessible to occupants.
- To maximise residential amenity and minimise adverse environmental and health related impacts associated with waste management such as odour from bin storage areas and noise from collection areas.
- To ensure bin storage and collection facilities are designed so that they can be integrated with and comply with the requirements for Council's domestic waste services.
- To ensure developments facilitate all waste streams being handled, stored and collected in a manner to reduce risk to health and safety of all users including maintenance (such as care takers), collection staff and contractors (and required vehicles and equipment).

The WMP is used to inform the building design to deliver best practice waste management and promote sustainable outcomes for the operational phases of the development.

2 SEARs Requirements

The Minister for Planning and Public Spaces, or their delegate, is the consent authority for the SSDA and this application is lodged with the NSW Department of Planning, Housing and Infrastructure (NSW DPHI) for assessment.

This report has been prepared in response to the requirements contained within the Planning Secretary’s Environmental Assessment Requirements (SEARs) dated 5 July 2024.

The specific SEARs that this report has been prepared in relation to is listed within Table 1.

Table 1: SEARs requirements

Issue and Assessment Requirement	Document
<p>17. Waste Management</p> <ul style="list-style-type: none"> Identify, quantify and classify the likely waste streams to be generated during construction and operation. 	<p>Construction and Demolition Waste:</p> <ul style="list-style-type: none"> Demolition Waste management plan prepared by MRA Consulting, dated 9th November 2023 Early Works (Shoring and Excavation) waste management plan prepared by MRA Consulting, dated 23rd November 2023 Construction Waste – see Section 4 <p>Operational Waste - see Section 5</p>
<ul style="list-style-type: none"> Provide the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. 	<p>This waste management plan.</p>
<ul style="list-style-type: none"> Identify appropriate servicing arrangements for the site. 	<p>See Section 6</p>
<ul style="list-style-type: none"> If buildings are proposed to be demolished or altered, provide a hazardous materials survey. 	<p>Hazardous Material Survey provided separately, if needed.</p>

3 Background

3.1 Description of the Proposed Development

The proposed development site is 57-61 Archer Street and 34 Albert Avenue, Chatswood in NSW. The site is located within the Willoughby Council Local Government Area (LGA). The site has a total area of 2,644.7m² and consists of two lots which are legally identified as SP81015 and SP101358

The development will feature the construction of:

- 150 residential apartments over 32-storeys;
- 5 levels of basement car parking;
- Retail and commercial spaces on ground, level 1 and level 2; and
- Ancillary spaces such as a wellness space, cinema and rooftop swimming pool.

3.2 Location

The site is located within Sydney’s lower north shore area with a frontage to Archer Street to the west, Albert Avenue to the north and Bertram Street to the east. The site is approximately 10km from Sydney CBD, approximately 485m from Chatswood Train Station and 300m from Westfield Shopping Centre.

The following images is an aerial view of the site and surrounds (see Figure 1).

Figure 1: Site and surrounding area



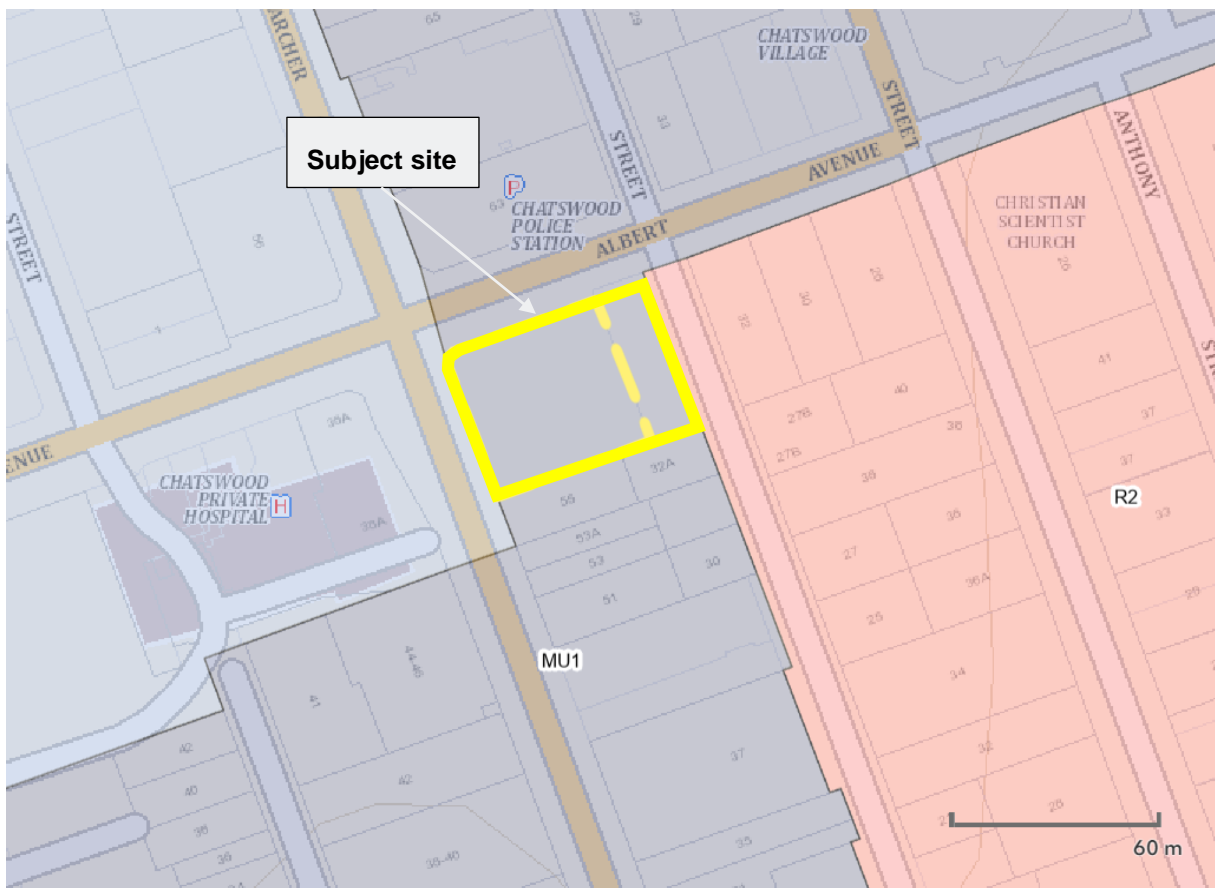
Source: Nearmap, 2024

3.3 Zoning and Land Use

The site is zoned MU1 (Mixed Use) according to the Willoughby Local Environmental Plan 2012. The objectives of this zone are:

- To encourage a diversity of business, retail, office and light industrial land uses that generate employment opportunities.
- To ensure that new development provides diverse and active street frontages to attract pedestrian traffic and to contribute to vibrant, diverse and functional streets and public spaces.
- To minimize conflict between land uses within this zone and land uses within adjoining zones.
- To encourage business, retail, community and other non-residential land uses on the ground floor of buildings.
- To allow for city living on the edges of the city centre of Chatswood, which encourages public transport use, shopping and the use of businesses and recreational services that contribute to the vitality of the city, without undermining its commercial role.

Figure 2: Land Use Zoning



Source: NSW ePlanning Spatial Viewer, 2024

3.4 Strategies

Waste management for the site considers better practice, necessary equipment, and integration with other guidance documents including the NSW Waste and Avoidance and Resource Recovery (WARR) Strategy (NSW EPA 2014), and National Waste Policy: Less Waste, More Resources (DAWE, 2018). The key policy aims that are considered are:

- Avoidance (to prevent the generation of waste);
- Reduce the amount of waste (including hazardous waste) for disposal;
- Manage waste as a resource; and
- Ensure that waste treatment, disposal, recovery and re-use are undertaken in a safe, scientific and environmentally sound manner.

3.5 Assumptions

This report is an Waste Management Plan (WMP), forming part of the development documentation and assumes:

- Drawings and information that have been used in waste management planning for this WMP are the final reference/indicative development plans from the project architect, Woods Bagot, 24th September 2024 contained in Appendix A;
- Expected waste generation volumes for the site are based on WDCP & NSROC waste guideline requirements; and
- This WMP is a living document and therefore, waste management equipment and systems described in this report are subject to change based on future operations and available technology.

4 Construction

Construction activities at the site will generate a range of construction waste. Throughout the development process, all materials will be reused and recycled where possible, minimising the disposal (landfilling) of materials other than those that are contaminated or unsuitable for reuse or recycling processes.

Waste storage during construction operations will involve some stockpiling of reusable material, as well as placement of wheeled bins for the separation of construction materials for recycling. A bin for residual waste or contaminated material will also be made available at the site for disposal where necessary. Bins may require alternative placement across construction operations to facilitate the safe and efficient storage of materials and will be retained within property boundaries to avoid illegal dumping.

A waste storage area shall be designated by the construction contractor and shall be sufficient to store the various waste streams expected during operations. Waste storage areas will be kept clear to maintain access and shall also be kept tidy to encourage separation of waste materials and for WHS reasons. The waste storage area will retain multiple bins to allow for source separation of waste to allow for ease of recovery and reuse of materials.

Waste management principles, management measures and facilities in use on the site shall be included as part of the site induction for all personnel working on the site.

4.1 Construction Waste

The development will feature the construction of:

- 150 residential apartments over 32-storeys;
- 5 levels of basement car parking;
- Retail and commercial spaces on ground, level 1 and level 2; and
- Ancillary spaces such as a wellness space, cinema and rooftop swimming pool.

Table 2 outlines indicative volume to weight conversion factors for common construction materials.

Table 2: Building waste material by percentage and conversion factor for volume and weight

Building waste material	Tones per m ³	Waste as % of the total material ordered
Soil/aggregate	1.4 – 1.6	–
Bricks	1.2	5–10%
Concrete	1.5	3–5%
Tiles/ceramics	0.5 – 1	2–5%
Timber	0.3	5–7%
Plasterboard	0.2	5–20%
Metals	0.15 – 0.9	–

Source: *Green Building Code of Australia C&D Waste Criteria*.

Table 3 outlines the estimated waste generation rates for materials through construction of the proposed development, in addition to the appropriate management methods for each material type.

Table 3: Construction waste generation estimations

Type of Material	Estimated Volumes (m ³)	Re-use on-site	Recycle (Separate collection)	Recycle (Off-site)	Landfill	% of landfill diversion	Methods for re-use, recycling or disposal
Excavated material	30,000-50,000	✓	✓	✓	<5%	>95%	Onsite: Reuse for fill and levelling. Offsite: Removed from site for reuse as recycled fill material or soil. Disposal: Removal of any contaminated material for appropriate treatment or disposal.
Bricks/pavers	20-40	✓	✓	✓	<10%	>90%	Onsite: Separated wherever possible and reused or crushed for landscaping and driveways. Offsite: Returned to supplier for reuse or removed to C&D facility for crushing and recycling for recovered products.
Concrete	50-100	✓	✓	✓	<10%	>90%	Onsite: Separated wherever possible and reused or crushed for filling, levelling or road base. Offsite: Removed to C&D facility for crushing and recycling for recovered products.
Tiles	<20	✓	✓	✓	<10%	>90%	Onsite: Separated wherever possible and reused or crushed for landscaping and driveways. Offsite: Returned to supplier for reuse or removed to C&D facility for crushing and recycling for recovered products.

Type of Material	Estimated Volumes (m ³)	Re-use on-site	Recycle (Separate collection)	Recycle (Off-site)	Landfill	% of landfill diversion	Methods for re-use, recycling or disposal
Timber (clean)	<20	-	✓	✓	<10%	>90%	Onsite: Separated wherever possible to improve resource recovery. Offsite: Returned to supplier for reuse removed to C&D facility for recovery where possible.
Timber (treated)	<30	-	✓	✓	50%	50%	Onsite: Separated wherever possible to improve resource recovery. Offsite: Returned to supplier for reuse removed to C&D facility for recovery where possible.
Plasterboard	20-40	-	✓	✓	<10%	90%	Onsite: Separated wherever possible to improve resource recovery. Offsite: Returned to supplier or removed to a C&D/plasterboard recovery facility for recovery where possible.
Glass	<20	✓	✓	✓	<10%	>90%	Onsite: Separated wherever possible and reused or crushed for landscaping and driveways. Offsite: Returned to supplier for reuse or removed to C&D facility for crushing and recycling for recovered products.
Metals (ferrous) Metals (non-ferrous)	<20	-	✓	✓	<10%	>90%	Onsite: Separated wherever possible to improve resource recovery. Offsite: Returned to supplier for reuse or removed to C&D facility for recovery and recycling.

Type of Material	Estimated Volumes (m ³)	Re-use on-site	Recycle (Separate collection)	Recycle (Off-site)	Landfill	% of landfill diversion	Methods for re-use, recycling or disposal
Floor covering	<15	✓	✓	✓	<10%	>90%	On site: to be separated wherever possible to enhance resource recovery. Reuse: surplus and offcut material returned to manufacturer for reuse where possible. C&D processor: recovery and recycling.
Fixtures and fittings	<10	✓	✓	✓			On site: to be separated wherever possible to enhance resource recovery. Reuse: surplus and offcut material returned to manufacturer for reuse where possible. C&D processor: recovery and recycling.
Electronic waste	<10	-	✓	✓	<10%	>90%	Offcut wires and electronics separated where possible or returned to supplier for reuse.
Packaging materials (pallets, wrap, cardboard, etc)	<50	-	✓	✓	<10%	>90%	Returned to supplier where possible or separated by material type for resource recovery.
Residual waste	50-100	-	✓	✓	100%	-	Resource recovery dependant on facility destination capability.
Total % Diversion from Landfill Estimated						>90%	

4.2 Waste Contractors and Facilities

To ensure best practice waste management, appropriate contractors and facilities have been proposed based on their location and service offerings (Table 4). The waste contractor is to be determined by construction manager and the principal off site recycler and the licenced landfill to be determined by construction manager and waste contractor.

Table 4: Waste service contractors and facilities

Role	Details
Recommended Waste Collection Contractor	<p>The following are local skip bin operators for consideration in the management of excavation and construction waste for the site:</p> <ul style="list-style-type: none"> • Brown Bros Skip Bins; • Aussie Industries Skip Bins; and • Mobile Skips <p>Or another supplier as elected by the building contractor.</p>
Principal Off-Site Recycler	<p>The following are local C&D processing facilities for consideration in the management of C&D waste generated at the site:</p> <ul style="list-style-type: none"> • Cleanaway Artarmon Resource Recovery Centre, and • Bingo Industries Recycling Centre Artarmon <p>Or another appropriate facility as elected by the waste management contractor.</p>
Principal Licensed Landfill Site	<ul style="list-style-type: none"> • Bingo Eastern Creek Recycling Ecology Park and Landfill <p>Or other appropriate facility as elected by the waste management contractor.</p>

4.3 Site Documentation

This WMP will be retained on-site during the construction phases of the development, along with other waste management documentation (e.g. contracts with waste service providers).

Responsibility for the WMP, waste documentation and processes during the excavation and construction phases will be with the site manager or builder.

A logbook that records waste management and collection will be maintained on site, with entries including:

- Time and date of collections;
- Description of waste and quantity;
- Waste/processing facility that will receive the waste; and
- Vehicle registration and company name.

Waste management documentation, the logbook and associated dockets and receipts must be made available for inspection by an authorised Council Officer at any time during site works.

5 Operational Waste Management

5.1 Overview

Operational waste management requirements of the site arise from the daily use as a mixed-use development. Residential waste generation and storage requirements are discussed in section 5.2. Commercial waste generation and storage is addressed separately within section 5.3.

Waste management systems and responsibilities are addressed in Section 6.3.

Waste management strategies related to site operations have been established according to the Willoughby DCP 2012, NSROC development controls and technical guideline documents, and NSW EPA guideline documents.

The following space calculations are based off the mobile garbage bin (MGB) and bulk bin dimensions sourced from the *NSROC Waste Management Technical Guide for Multi Dwelling Housing (MDH) Residential Flat Building (RFB) Mixed Use Developments (2018)* (Table 1).

Table 5: Mobile Garbage Bin (MGB) and Bulk Bin capacity and footprint

Bin Capacity	Height (mm)	Depth (mm)	Width (mm)	Footprint (Approx. m ²)
240L	1,110	600	600	0.41
660L	1,260	850	1,400	1.19
1100L	1,370	1,470	1,245	1.83

5.2 Residential Waste Management

5.2.1 Waste Generation

Operational waste management addressed in the following section relates to waste generation associated with the residential use. A dual chute system for recycling and general waste is utilised within this building, with separate inlets for each waste stream located on each residential floor. The chutes discharge into the waste storage area, located adjacent to the ground floor loading dock.

The following table outlines the expected waste generation rates for the residential component of the development (Table 6). The generation rates are derived from the *NSROC Waste Management Technical Guide for Multi Dwelling Housing (MDH) Residential Flat Building (RFB) Mixed Use Developments (2018)* (Section 3.6) in accordance with the WDCP.

Table 6: Residential Waste Generation per Unit

Unit Numbers	Waste Streams	Generation Rate (L/Unit/Week)	Total Weekly Generation (L/Week)
150 Units	General Waste	140	21,000
	Recycling	120	18,000
	Garden Waste	120	18,000

Unit Numbers	Waste Streams	Generation Rate (L/Unit/Week)	Total Weekly Generation (L/Week)
	Bulky Waste	10m ² per 40 Units + 2m ² for every additional 10 units	36m ²

5.2.2 Waste Storage Requirements

Waste storage space has been calculated considering estimations of bin type (Table 5) and collection frequency as described in the table below (Table 7).

Table 7: Residential spatial requirements and collection frequency

Waste Stream	Weekly Generation	Bins and Collection Frequency	Spatial requirement (m ²)*
General Waste	21,000L	5 x 1100L bins collected 4 times per week	14
Comingled Recycling	18,000L	5 x 1100L bins collected 4 times per week	14
Garden Waste	See note below – 4 x 240L bins provided		3
Bin Storage - subtotal			31m²
Bulky Waste	10m ² per 40 units + 2m ² for every additional 10 units		36
Total Spatial Requirement			67m²

*Total storage space requirement considers additional space of 1.5 x bin footprint (m²) for clearance and manoeuvrability.

Building management can observe the bin fullness levels once the site is fully occupied and adjust the number or size of the bins as necessary. The bin storage area for the site must be sufficiently sized to accommodate the proposed bins and have space to facilitate potential changes to waste service in future.

5.2.3 Garden Organics Waste

Due to the nature of the proposed development having smaller private garden areas or private balconies, it is not considered that large amounts of garden waste will be produced from the development. Building management will be responsible for engaging a landscape contractor/gardener, who is expected to remove any garden waste generated by common garden areas. Notwithstanding, 4 x 240L bins can be retained for the site by residents or contracted landscape staff.

5.2.4 Temporary Waste Storage

The NSROC guidelines specify that each individual dwelling will need adequate internal storage space for the separation of waste, recycling and food organics for minimum two days. This storage space will be located within the kitchen areas of each unit.

5.2.5 Waste Chutes

The site will incorporate a dual waste chute system to manage residential general and recycling waste streams. Residents will be responsible for transporting their waste into the appropriate chute inlet located on each floor. The

chutes discharge into the waste storage area on the ground level. Waste from chutes will discharge into 1100L MGB's placed on a linear track system. Building management is responsible for monitoring bin fullness and rotating bins in the waste storage area as required.

The chute will be designed according to the requirements of the NSROC:

- Waste chute disposal points (hoppers) are to be provided on each residential level of the development.
- Waste disposal points must be located on the corridor of each floor no more than 30m travelling distance from each dwelling.
- The chute should be behind a cupboard door to improve resident's amenity and reduce odour in the lobby/corridor.
- The chute is to be designed to minimise noise and fire risk.
- The chute is to terminate in the bin storage room and discharge directly into a bulk bin.
- Signage is to be placed on the chute hopper and recycling cupboard on every residential level indicating how to use the system effectively.

5.2.6 Liner Track System

To sufficiently manage the daily waste generation of residential spaces of the development, the waste chute discharge room is required to be fitted with a linear track system with the capacity to hold a minimum of 2 x 1,100L MGBs under each chute.

5.2.7 Bulky Waste Storage and Procedures

The current plans allocate two separate areas for bulky waste storage area. The site should maintain a bulky waste storage area separate from the waste storage area for residential tenants.

This bulky waste storage area will have sufficient space for temporarily storing of bulky waste items and shall be divided into sections (i.e. metals, e-waste, mattresses) to maximise resource recovery per WDCP guidelines.

Bulky waste items include those that cannot be disposed of to general waste and recycling, including but not limited to broken/damaged/old whitegoods, furniture, appliances, mattresses, etc.

In accordance with the NSROC *Waste Management Technical Guide for Multi Dwelling Housing (MDH) Residential Flat Building (RFB) Mixed Use Developments (2018)*, high rise flat building developments must consider a spatial requirement of 10m² for 40 units with 2m² for every additional 10 units. This requires the building to have a total of **33m²** for residents to store their bulky waste safely and efficiently.

The bulky waste store is to be located near the waste storage area with a minimum doorway width of 1.5m to accommodate large waste items.

Building management will then be responsible for arranging collection as required. Building management will liaise with the council or an elected private contractor and arrange access to the bulky waste storage area for collection staff to provide and coordinate the offtake of items from the site.

5.3 Commercial Waste Management

5.3.1 Waste Generation

Operational waste management addressed in the following section relates to waste generation associated with the commercial operations at the development. The site proposes using a commercial waste area adjacent to the loading dock on the ground level. The sites commercial areas are expected to include retail, commercial spaces, cafe and wellness spaces.

Where waste generation rates in the Council's DCP were missing for the specified use type, estimates from the NSW EPA's (2019) *Better Practice Guidelines for Resource Recovery in Residential Developments* were used in lieu. Weekly generation rates are based on a 7-day week for the Café and Gym, and 5-day week for the Commercial office spaces, as follows:

Table 8: Commercial Waste Generation Rates

Use Type	Area (m ²)	Waste Stream	Generation Rate	Total Daily Generation (L)	Total Weekly Generation (L)
Wellness space	586	General Waste	20L/100m ² /day	117.2	821
		Recycling	15L/100m ² /day	87.9	616
Retail/ Commercial Office Spaces	1,720	General Waste	10L/100m ² /day	172	860
		Recycling	10L/100m ² /day	172	860
Cafe	114	General Waste	100L/100m ² /day	114	798
		Recycling	120L/100m ² /day	137	958
Totals		General Waste		403.2L	2,479L
		Recycling		396.9L	2,434L

Table 9: Commercial Waste Collection Frequency

Waste Stream	Waste Generation (L/Week)	Bins and Collection Frequency	Minimum Storage Area* (m ²)
General Waste	2,479L	1 x 1100L + 1 x 660L bins collected weekly	5
Recycling	2,434L	1 x 1100L + 1 x 660L bins collected weekly	5
Total Spatial Requirement*			10m²

*Total storage space requirement considers additional space of 1.5 x bin footprint (m²) for manoeuvrability.

5.3.2 Temporary Waste Storage

Temporary waste storage provided to the commercial areas will include smaller receptacles in circulation spaces or back of house areas to capture at minimum one – two days of general waste and comingled recycling volumes. Cleaners and staff will be responsible for the consolidation of waste into the respective commercial bins within the loading dock.

5.3.3 Bulky Waste Storage

The bulky waste store is to be located in proximity to the commercial waste storage area with a minimum doorway width of 1.5m to accommodate large waste items. Building management will arrange the timely removal of bulky waste items by a licenced contractor or Council.

6 Waste Management Systems

6.1 Waste Management System Summary

The following specific management methods are proposed for the various collection waste streams expected to be generated at the site, including alternative waste streams outside of general waste, recycling and organics:

- **General Waste:** General waste shall be placed within a tied plastic bag prior to transferring into residential level chutes. For collection purposes, general waste shall be stored within an 1100L mobile garbage bin (MBG).
- **Commingled Recycling:** Recyclables include mixed plastic, paper, cardboard, glass, aluminium, steel. All recyclables should be decanted loose (not bagged) with containers un-capped, drained and rinsed prior to disposal into the nominated recycling chute.
- **Food Waste:** Residential food organics waste generation can be collected separately from general and recycling waste, and composted or transferred to a FOGO facility in accommodation of upcoming mandates. MUDs may implement a separate FOGO bin or compost bins on their property in an appropriate area. Organics treatment can be used to produce conditioners, compost or vermiculture castings for application on or off-site. Equipment options include different size and capacity composters, dehydrators, worm farms and macerators. For organics treated to acceptable standards, discharge of effluent or any output to sewer as commercial trade wastewater may be permitted. Site gardeners or residents may use this compost for their own garden spaces to encourage resource recycling. Such implementations may be arranged in the form of a communal composting and worm farm area with consideration of:
 - Accessibility to the designated composting area;
 - Maintenance of the composting area to mitigate odour and vermin;
 - Location and positioning of dwellings; and
 - Ensuring any runoff is kept from drainage points.

There is sufficient additional space in the loading area of the development should Council mandate food waste servicing for mixed use buildings.

- **Other (Problem) Waste:** The disposal of hard, bulky, electronic, liquid or potentially hazardous wastes shall be organised between the operator and site users as necessary. Residents are entitled to a number of bulky waste pickups periodically performed by Council, utilising a booking system.

6.2 Waste Management and Recycling Method

6.2.1 Residential Waste Flow

The flow of **residential waste and recycling** goes from generation to collection through several steps:

1. Residents are to transfer waste to waste chutes inlets located on each residential level, which will be deposited into their respective bins within the waste storage room on the lower ground floor. The maximum distance between residential dwellings and chutes/bin rooms on each residential level is approximately 30m;
2. Site management is responsible for maintaining bins and the waste storage rooms, ensuring bins are clean and in working order. Site management is also responsible for switching out full bins and monitoring bin fullness;
3. Bins under the waste chutes will be on a 1,100L bin linear track system to reduce the requirement for more frequent bin rotation;
4. Site management is to ensure contracts with Council or a private waste contractor, who also ensure appropriate collection scheduling and access is organised to minimise noise, odour, vermin, and visual amenity impacts to staff, visitors and the public.

6.2.2 Commercial Waste Flow

The flow of **commercial waste and recycling** goes from generation to collection through several steps:

1. Waste is temporarily stored at its point of generation in an appropriately sized receptacle, clearly marked for type of waste;
2. Site cleaners or tenancy staff are to transfer waste to the waste and recycling storage area for appropriate disposal into the respective bins. Commercial tenants will not have access to residential waste bins;

3. Cleaning staff and site management are responsible for maintaining bins and the waste storage rooms, ensuring bins are clean and in working order. Cleaning staff and building management are also responsible for switching out full bins and monitoring bin fullness; and
4. Building management is to ensure contracts with Council or a private waste contractor, who also ensure appropriate collection scheduling and access is organised to minimise noise, odour, vermin, and visual amenity impacts to staff, visitors and the public.

6.3 Management Systems and Responsibilities

The site manager will be responsible for the management of waste at the site. Should there be any issues that impact on the operational efficiency, safety and suitability of waste management, management will be responsible for making any necessary changes, responsibilities include:

- Using this WMP to inform waste management operations, design and infrastructure;
- Providing educational materials and information on sorting methods for recycled waste, awareness of waste management procedures for waste minimisation and resource recovery;
- Maintaining a valid and current contract with a licensed waste service provider for waste and recycling collection and disposal;
- Making information available to residents and visitors about waste management procedures;
- Organising, maintaining and cleaning bins as part of a regular maintenance schedule;
- Manoeuvring bins to specified onsite collection point prior to and following scheduled collection of waste bins;
- Organising bulky waste collections as required;
- Ensuring bin allocation and waste/recycling collection frequency is adequate. Requesting additional infrastructure or services where necessary; and
- Monitoring any vermin and pest issues and arranging appropriate controls (traps or fumigating) and maintenance of doors or other points of potential entry.

6.4 Collection Method and Loading Areas

Collection points for the waste service provider (WSP) and areas for handling and loading are as follows:

- Maximum 10m manual handling collection and loading from the waste storage area for 1,100L MGBs, not exceeding a grade of 1:24 to provide convenient access for the supply of waste;
- Waste collections will be scheduled to occur outside of peak visiting hours to avoid high associated traffic around the site;
- The development's allocated loading and collection point is located on the north side of the building's ground level. It is accessible via Bertram Ave. A dedicated loading bay is provided, and the waste collection vehicle will enter and exit the property safely in a forward direction;
- Clear, safe, accessible and convenient space for handling of MGBs and equipment and loading of collection vehicles
- Identifiable areas where visitors and workers can recognise and avoid any risk associated with moving vehicles and bin moving and handling.
- The site will be serviced by an MRV vehicle with dimensions in Table 10

Table 10: Waste Collection Vehicle Dimensions and Specifications

Vehicle Class	Overall Length (m)	Design Width (m)	Design turning radius (m)	Swept Circle (m)	Clearance (travel) height (m)
Medium Rigid Vehicle	8.80	2.5	10.0	21.6	4.5

Source: NSW EPA's Better Practice Guidelines for Resource Recovery in Residential Developments 2019

Table 11: Waste Vehicle Collection Specifications

Component	Requirement	Specification
Collection point	Allow safe waste collection and loading operations	<ul style="list-style-type: none"> - Adequate clearance and manoeuvring space; - Sufficient clearance for the safe handling of materials and equipment; and - Sectioned loading bay does not impede upon traffic and pedestrian safety.
Vehicle manoeuvring and loading space	Truck space for adequate lift clearance, manoeuvring and operation for a contractor collection vehicle	<ul style="list-style-type: none"> - Collection from each site use loading area by a rear lift vehicle; - Adequate loading bay dimensions to not impede lift clearance; - Operational clearance for truck manoeuvring in a forward direction; and - The provision of space clear of vehicle parking spaces (level and free of obstructions).
Operating times	Appropriate collection times to limit noise and traffic disturbance	<ul style="list-style-type: none"> - Collection times will be arranged during off-peak times to ensure minimal disturbance to pedestrians and visitors. - Hours for bin collections should comply with the following requirements: <ul style="list-style-type: none"> ➢ 8am to 7pm Monday to Saturday; and ➢ 10am to 7pm Sunday and public holidays.

6.5 Waste and Recycling Storage Areas

The waste areas will provide centralised storage that has adequate capacity to receive and store the maximum likely generation of waste and recycling between collection times. In accordance with the DCP, the bin storage areas be designed with the following considerations:

- Separate bin storage areas for residential and commercial components of the development will be provided.
- Located to protect amenity for residential occupants and adjoining residential properties. Located away from habitable windows and doors of adjoining dwellings to reduce noise and odour.
- There is enough space for each bin as listed in Table 5. The development will provide a bin storage area that is of enough size to accommodate all bins allocated and bulky waste storage for each dwelling and/or the development
- Bins will be moved safely to collection points with no steps.
- Residents will conveniently carry their waste to the correct bin from their dwelling. All residents have easy, safe and convenient access to the waste and recycling service via residential level chutes.
- Located to prevent theft and vandalism and restricts unauthorized access to prevent illegal dumping.
- Enough space will be provided to ensure adequate room for accessing bins including lifting the lids, manoeuvring, cleaning and maintaining all bins. The area is free from obstructions (e.g. steps) so as not to restrict the movement and servicing of the bins.
- The distance from the storage point to the collection point does not exceed 30m for residents.

6.6 Signage

Signage that promotes resource recovery, waste minimisation, safety and amenity follows the Australian Standard for safety signs for the occupational environment (Standards Australia 1994). Illustrative graphics must form a minimum 50% of the area of the signage. Signage is to be prominently posted in each waste storage area or where waste materials will be separated at the source. At a minimum, signage should indicate:

- Details regarding acceptable recyclables;
- *No standing* and *danger* warnings apply to the area surrounding waste storage areas;
- Contact details of the waste contractor; and
- The area is to be kept tidy.

Standard signage requirements and guidance for application apply (see Appendix B).

6.7 Prevention of pollution and litter reduction

To minimise dispersion of litter and prevent pollution (to water and land via contamination of runoff, dust and hazardous materials), building management and the waste caretaker will also be responsible for:

- Maintenance of open and stockpile areas;
- Ensuring waste storage areas are well maintained and kept clean;
- Securing the waste storage area from vandalism and the escape of litter;
- Identification and appropriate disposal of goods with hazardous material content;
- Taking action to prevent dumping and unauthorised use of waste areas; and
- Requiring contractors to clean up any spillage that may occur during waste servicing or accessing the site.

7 References

Australian Building Codes Board (2016) National Construction Code (NCC).

Blue Environment (2016) Australian National Waste Report.

Department of Environment, Climate Change & Water (2010) *House deconstruction fact sheet: Bricks and concrete removal.*

Environment Protection and Heritage Council (2018) *National Waste Policy: Less Waste, More Resources.*

North Sydney Regional Organisation of Councils (NSROC) (2018) *Development Controls For Multi Dwelling Housing Residential Flat Buildings and Mixed Use Developments*

North Sydney Regional Organisation of Councils (2018) *Waste Management Technical Guide for Multi Dwelling Housing (MDH) Residential Flat Building (RFB) Mixed Use Developments*

NSW Environment Protection Authority (2013) *NSW Waste Avoidance and Resource Recovery Strategy 2014-2021, Sydney NSW*

NSW Environment Protection Authority (2014) *Waste Classification Guidelines – Part 1: Classification of Waste, Sydney NSW*

NSW EPA (2016) Recycling Signs, Posters and Symbols. Available at:
<http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm>.

NTC Australia (2017) *Australian Code for the Transport of Dangerous Goods by Road & Rail Edition 7.5*, Melbourne, Australia.

Standards Australia (1994) *AS 1319: Safety signs for the occupational environment*, Homebush, NSW: Standards Australia.

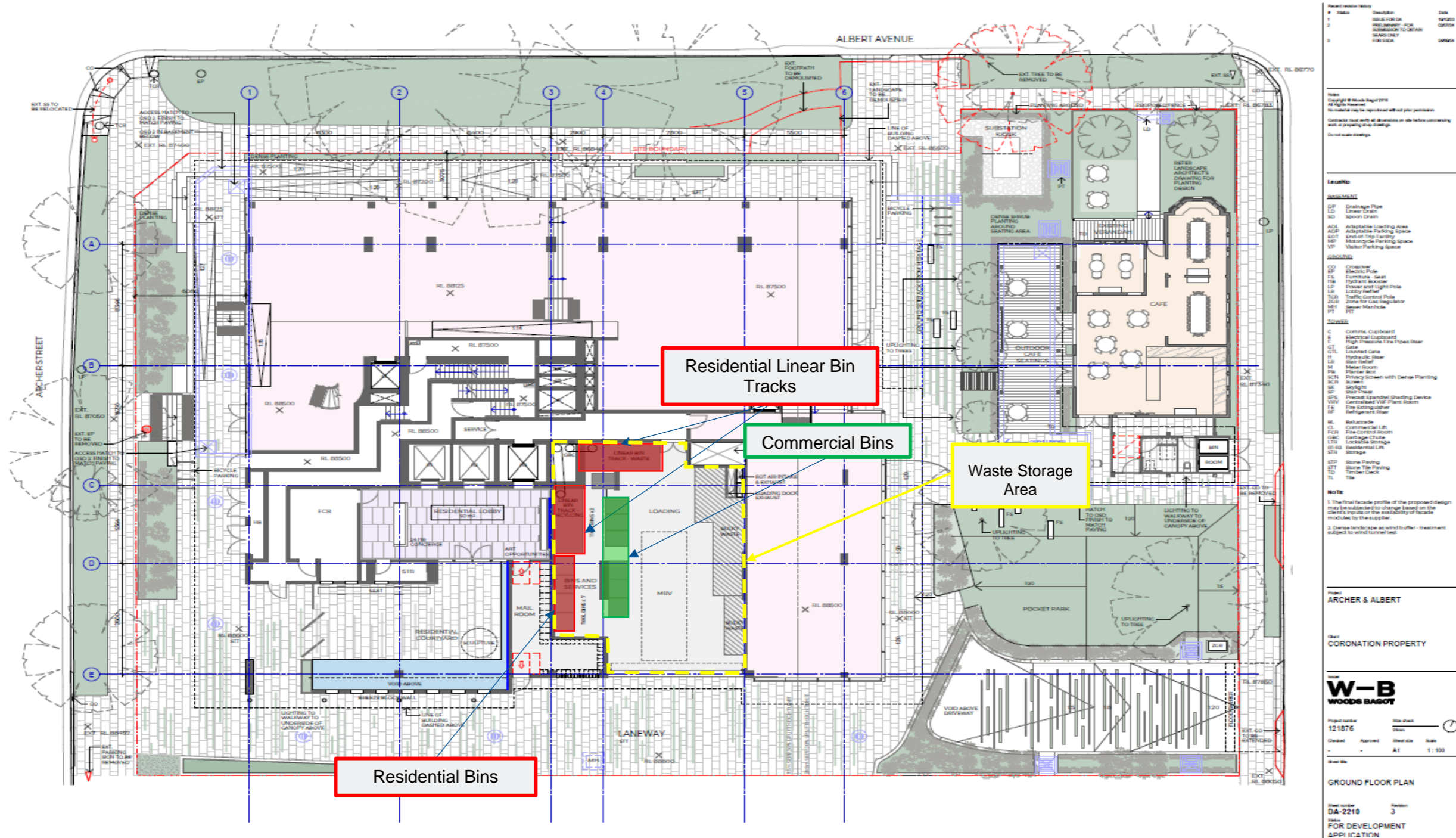
Standards Australia (2008) AS 4123 Mobile waste containers.

Willoughby Local Environmental Plan 2012

Willoughby Development Control Plan 2023

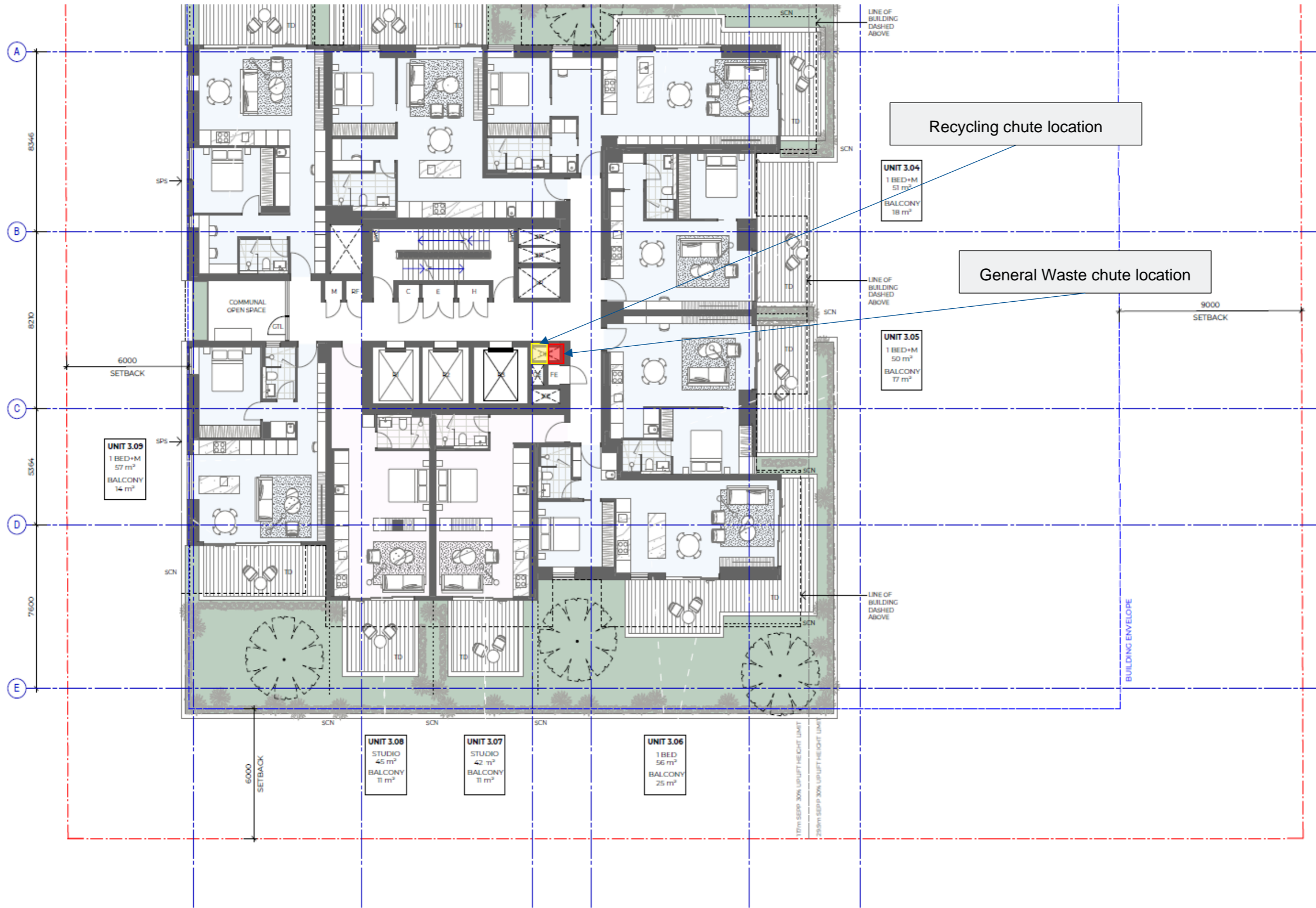
WorkCover (2011) Managing Work Environment Facilities Code of Practice

Appendix A – Ground Floor Plan



Source: Woods Bagot, 2024.

Figure 3: Waste chute locations - indicative residential floor level



- SD Spoon Drain
 - ADL Adaptable Loading Area
 - ADP Adaptable Parking Space
 - EOT End of Trip Facility
 - MP Motorcycle Parking Space
 - VP Visitor Parking Space
- GROUND**
- CO Crossover
 - EP Electric Pole
 - FS Furniture - Seat
 - HB Hydrant Booster
 - LP Power and Light Pole
 - LR Lobby Railing
 - TCR Traffic Control Pole
 - ZGR Zone for Gas Regulator
 - MH Sewer Manhole
 - PT Pit
- TOWER**
- C Comms. Cupboard
 - E Electrical Cupboard
 - F High Pressure Fire Pipes Riser
 - GT Gate
 - GTL Louvered Gate
 - H Hydraulic Riser
 - LR stair Railing
 - M Meter Room
 - PB Planter Box
 - SCN Privacy Screen with Dense Planting
 - SCR screen
 - SK skylight
 - SP Stair Press
 - SPS Precast Spandrel shading Device
 - VRV Centralised VRF Plant Room
 - FE Fire Extinguisher
 - RF Refrigerant Riser
- BL Balustrade
 - CL Commercial Lift
 - FCR Fire Control Room
 - GBC Garbage Chute
 - LTR Lockable Storage
 - DR-RS Residential Lift
 - STR storage
 - STP Stone Paving
 - STT Stone Tile Paving
 - TD Timber Deck
 - TL Tile

NOTE:

1. The final facade profile of the proposed design may be subjected to change based on the client's inputs or the availability of facade modules by the supplier.
2. Dense landscape as wind buffer - treatment subject to wind tunnel test

Project
ARCHER & ALBERT

Client
CORONATION PROPERTY

Issue
W-B
WOODS BAGOT

Project number
121876

Size check
25mm

Checked - Approved - Sheet size - Scale
A1 1:100

Sheet title
AFFORDABLE HOUSING LEVEL 3

Sheet number
DA-2213

Revision
3

Status
FOR DEVELOPMENT

Source: Woods Bagot, 2024

Appendix B – Standard Signage

Waste Signage

Signs for garbage, recycling and organics bins should comply with the standard signs promoted by the NSW Office of Environment and Heritage (NSW OEH 2008b).

Standard symbols for use in signage, bin facade and educational materials are promoted through the NSW Environment Protection Authority. They are available for download from the NSW EPA website (NSW EPA 2016b), in black and white and colour versions. The Australian Standard series AS 4123 (Part 7) details colours for mobile waste containers (Standards Australia 2008).

Figure 4: Examples of standard signage for bin uses



Safety Signs

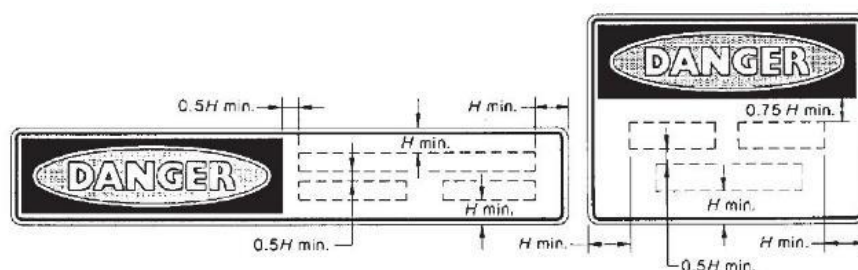
The design and use of safety signs for waste and recycling rooms and enclosures should comply with AS 1319 (Standards Australia 1994). Safety signs should be used to regulate, and control safety related to behaviour, warn of hazards and provide emergency information, including fire protection information. Below are some examples. Clear and easy to read 'NO STANDING' and 'DANGER' warning signs must be fixed to the external face of each waste and recycling room where appropriate.

Figure 5: Example and layout of safety signage



(d) Horizontal

FIGURE D5 TYPICAL ARRANGEMENTS OF DANGER SIGNS



Appendix C – Linear Track System



1100 LITRE LINEAR TRACK SYSTEM

PRODUCT INFORMATION

Elephants Foot 1100 Litre bin Linear Track System is a versatile waste handling solution for many types of multi-storey or multi-level developments. The Linear Track System collects waste or recycling being disposed from the floors above through the chute system, discharging the material via a hopper that feeds the bins. Electromechanically driven with automated operation, the system utilises linear motion to automatically change over full bins. Once all the bins are filled, an indicator light will illuminate signifying that the bins are ready for withdrawal and collection. Available with or without compaction unit, our standard 1100 litre bin Linear Track System is available in the standard 2 bin option. Our 3 Bin option is available as a special order.



SPECIFICATIONS

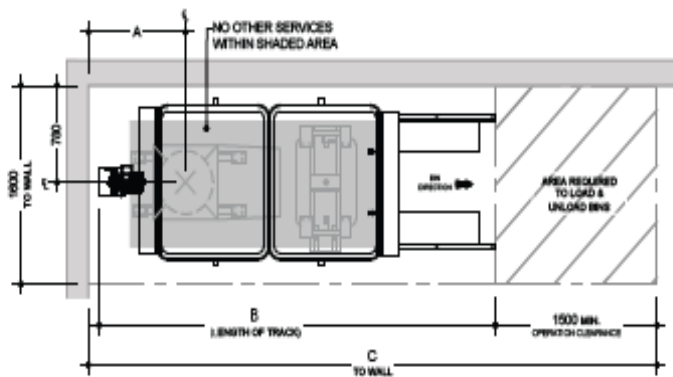
System Control	Electric PLC
Power Supply	415 V AC / 20A / 5 PIN
Motor Size (kW)	1.1
Maximum bin load	440 kg
Noise (dBA)	<85
Bin Size (L)	1100
Cycle time (sec)	60
Bin Quantity options	2 or 3

OPTIONAL EXTRAS

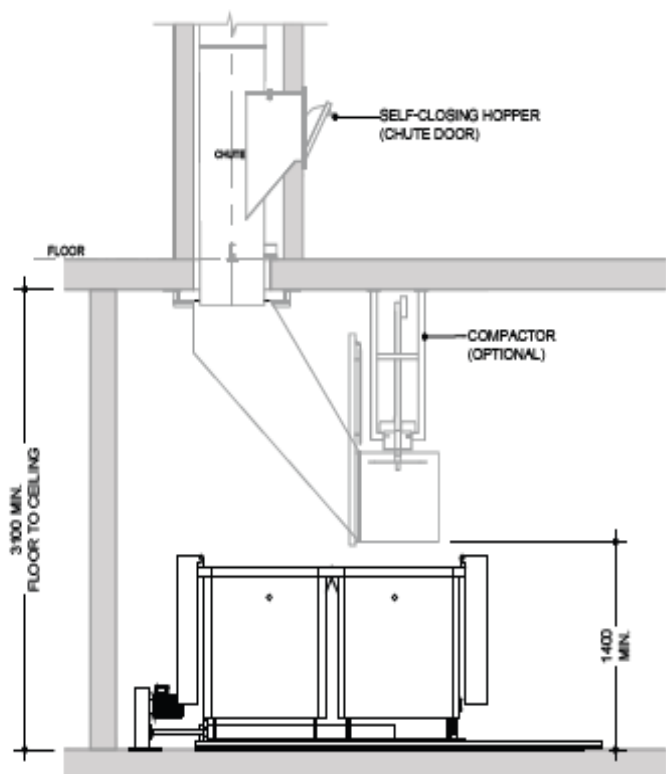
- Compaction unit – Please refer to the bin compactor product information sheet for details and specifications
- Enhanced safety add on's – Interlocking barriers, occupancy sensors or safety light curtains (presence sensing light barriers)
- Full bin SMS and email notification
- CMMS and BMS integration
- Extend warranty – Terms and conditions apply

STANDARD FEATURES & BENEFITS

- Simple operation with user friendly controls
- Increased waste servicing efficiency for the development.
- Automatic system control with manual override
- Robust unit construction for long performance life
- Low service and maintain costs
- Rotating flashing beacon (activated during operation)
- Quiet and efficient system operation
- Maximise safety for residents, caretakers and collectors
- Restrained design with minimal moving parts
- Can suit low ceiling clearances
- Floor contact components fully galvanised steel
- Retro fitting options to suit other chutes systems
- Compliant with relevant Building Codes and Standards
- Standard 12 month warranty



1100 LITRE BIN LINEAR TRACK SYSTEM			
No. of Bins	Reference (mm)		
	A	B	C
2	900	3700	5300
3	2100	5940	7550



Notes:

Bins not provided by Elephants Foot

Drawings shown are for general information purposes only and provide minimum equipment spacial requirements for waste room design.

These drawings are not intended for site specific use or for construction. Each project is unique and will be designed to suit.

Additional equipment options, systems and configurations are available. For design assessment, information and advice, please contact an Elephants Foot design consultant on 1300 435 374



Source: Elephants Foot.

Appendix D – Chute Specifications Example

Technical Specifications

Smoothtubes™ Plastic Chutes

Chute Construction

Nominal Internal Diameter: Garbage 530mm
Material: LLDPE (linear low density polyethylene). Internal surface is closed cell, ultra smooth finish that resists waste residue build up, odour, blockages, corrosion and liquid. +Fire hazard property tests in accordance with BCA Clause C1.10 and Specification C1.10 in complying with Australian Standard AS1530.4-2014 by Warrington Fire Research (Aust) Pty Ltd.

Material Thickness: Chute tubes 5mm nominal.

Mounts: Designed to be flexible and smoke seal at every level.

Noise & Vibration Prevention: Acoustic lagging is not necessary. Refer to acoustic report. Isolation is provided at every level under the floor mounts. Flexible mount is isolated from concrete using polyurethane sealant that is acoustically rated.

Ventilation: 200mm diameter galvanised steel ventilation fan and discharge cowl assembly. The fan is supplied with 240 volt single phase plug and lead. The cowl assembly comes complete with deklite flashing. The vent is connected to the top of the chute by a flexible duct.

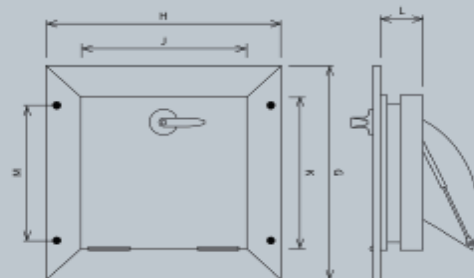
Loading throat door: Smoothtubes™ Loading Throats are molded within the chute tube creating a smooth flowing entry to reduce impact noise and minimise blockages. Loading doors -304 grade Stainless Steel with a fire block core, door frame sealed to wall using fire sealant. Compliance to Australian Standards AS1530.4-2014 (FRL:-/120/30). Doors are self closing. Key locks are supplied standard for Linen doors, Garbage and recycling doors. Fire sprinklers are installed in every loading throat ready for connection to fire services by others.

Deflector: The discharge of the chute has a 3 or 5mm thick Galvanised Steel deflector, set at 45 degrees (min) for discharge directly into a bin. The deflector is fitted with a fire activated fusible link close-off door which can be manually overridden, to close the chute for bin changes. For garbage discharge into an EcoPack Compactor the fire door is not required as the Compactor isolates the chute at all times.

Installation

Chute sections weigh no more than 15kg each allowing easy transport and installation by hand without reliance on Tower Cranes. Bricking up instructions are detailed on the front panel of every loading throat, which stays fitted until installation of loading door to prevent unauthorised use and potential damage from building rubble.

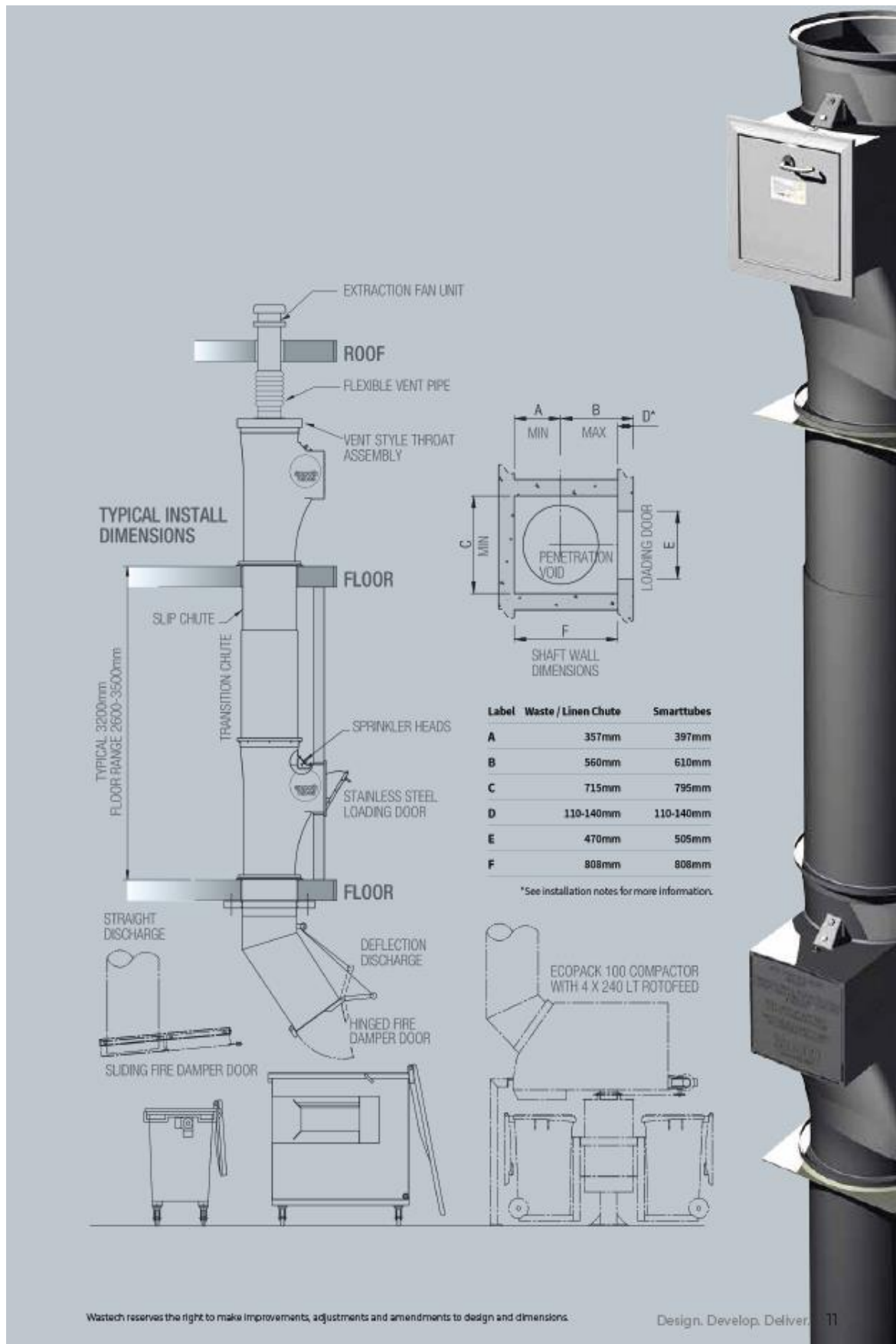
Chute Door Dimensions



Dimensions

Label	Waste Door	Linen Door	Recycling Door
G	603mm	573mm	603mm
H	603mm	573mm	603mm
J	435mm	432mm	432mm
K	435mm	432mm	432mm
L	110mm	110mm	110mm
M	380mm	380mm	380mm

10 A large range of configuration options and layouts are available. For more information or specifications, please contact a Wastech consultant on 1800 465 465.



Source: Wastech Engineering.

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