338 Pitt Street, Sydney: Waste Management Plan

A submission to Touchstone Partners Pty Ltd

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Disclaimer

Glossary

Terminology	Description
AS	Australian Standard
C&D	Construction and Demolition
C&I	Commercial and Industrial
DA	Development Application
DC	Development Consent
DCP	Development Control Plan
DECC	Department of Environment and Climate Change
ENM	Excavated Natural Material
EPA	Environment Protection Authority
IWC	Inner West Council
LGA	Local Government Area
MGB	Mobile Garbage Bin
MSW	Municipal Solid Waste (also referred to as domestic or residential waste)
SDCP	Sydney Development Control Plan 2012
SLEP	Sydney Local Environmental Plan 2012
VENM	Virgin Excavated Natural Material
WMP	Waste Management Plan
WNDCP	Waste Not Development Control Policy
WSP	Waste Service Provider
WSRA	Waste Storage and Recycling Area

Contents

List of Tables

List of Figures

1 Introduction

MRA Consulting Group (MRA) was engaged by Touchstone Partners Pty Ltd (Touchstone) to prepare a Waste Management Plan (WMP) for a proposed mixed-use development, located in Sydney's CBD.

This WMP supports a State Significant Development Application (SSDA) for the mixed use redevelopment of 338 Pitt Street, Sydney, which is submitted to the City of Sydney pursuant to part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). China Centre Development Pty Ltd is the proponent of the SSDA.

The site is located at the corner of Pitt Street and Liverpool Street, within the 'Mid Town' precinct of Sydney's Central Business District (CBD). The site is approximately 150m west of Museum Station and Hyde Park, and approximately 350m from Town Hall Station. The site includes several allotments and constitutes nearly one third of the city block between Bathurst Street, Pitt Street and Liverpool Street. The site is an irregular shape and has a combined area of approximately 5,900m².

The proposed development comprises of hotel, residential, commercial and retail uses and will include:

- demolition of all existing structures;
- excavation and site preparation, including any required remediation;
- construction and use of a mixed-use development, with an iconic 258m two-tower built form above a podium and internal courtyard;
- Five (5) basement levels and a lower ground level accommodating residential, retail and hotel car parking, motorcycle parking, bicycle parking, loading dock, storage and relevant building services;
- improvements to the public domain, including landscaping, pedestrian thoroughfares/connections, and landscaping; and
- augmentation and extension of utilities and services.

A detailed description of development is provided by Ethos Urban within the EIS.

The proposed development comprises of a mix of residential, hotel and other retail uses. The proposed development towers will extend to eighty storeys and feature 592 residential dwellings, and 158 hotel rooms and is situated in the City of Sydney Council (Council) Local Government Area (LGA).

This WMP addresses the requirements of the Consent Authority (Council) and conforms to the following reference and supplementary documents:

- *Sydney Local Environmental Plan (SLEP) 2012;*
- *Sydney Development Control Plan (SDCP) 2012; and*
- The City of Sydney *Guidelines for Waste Management in New Developments.*
- *Better Practice Guide for Resource Recovery in Residential Developments (NSW EPA, 2019).*

Council *Guidelines* outline the following waste management targets for residents and businesses including:

By June 2021:

- *Residents: To divert 70% of waste from landfill; and*
- *Businesses: To diver 70% of operating waste and 80% of construction and demolition waste from landfill.*

By 2030:

- *Residents: To divert 90% of waste from landfill; and*

- *Businesses: To diver 90% of operating waste and 90% of construction and demolition waste from landfill.*

This report also addresses the relevant sections of the Secretary's Environmental Assessment Requirements (SEARs) associated with the proposed development (SSD-10362). Table 1 below outlines the relevant sections of the SEARs and where in this report these are addressed.

Table 1: Secretary's Environmental Assessment Requirements (Waste)

Key issues	Description	Section where addressed
Construction Management	*an assessment of potential impacts of the construction on surrounding buildings and the public domain, including noise and vibration, air quality and odour impacts, dust emissions, water quality, stormwater runoff, groundwater seepage, soil pollution and **construction waste**, and details of measures to mitigate any impact.*	Construction waste generation and general management is addressed in Section 3. Separate construction management plan will address specific management and mitigation measures.
Utilities	*provide details on the location, construction and servicing of the waste/recycling collection facilities for the building.*	Ongoing waste management infrastructure and strategy detailed in Sections 4 & 5.

2 Background

2.1 Description of Proposed Development

The proposed development site is identified in the SLEP as:

Address	Lot Number/Cadastre	DP
233 Castlereagh Street	3	1044304
241-243 Castlereagh Street	1	90016
245-247 Castlereagh Street	1	70702
249 Castlereagh Street	B	183853
130 Liverpool Street	C	448971
128 Liverpool Street	B	448971
126 Liverpool Street	A	448971
338-348 Pitt Street	10	857070
332-336 Pitt Street	1	66428

The proposed mixed-use development will feature a range of residential and retail components, including:

- 592 residential units across 2 towers;
- Retail spaces across the ground and first floors;
- Hotel including two levels of function spaces and six levels of hotel rooms (158 rooms);
- Two levels of residential basement parking;
- Two levels of hotel and retail parking, and loading dock; and
- Ancillary services.

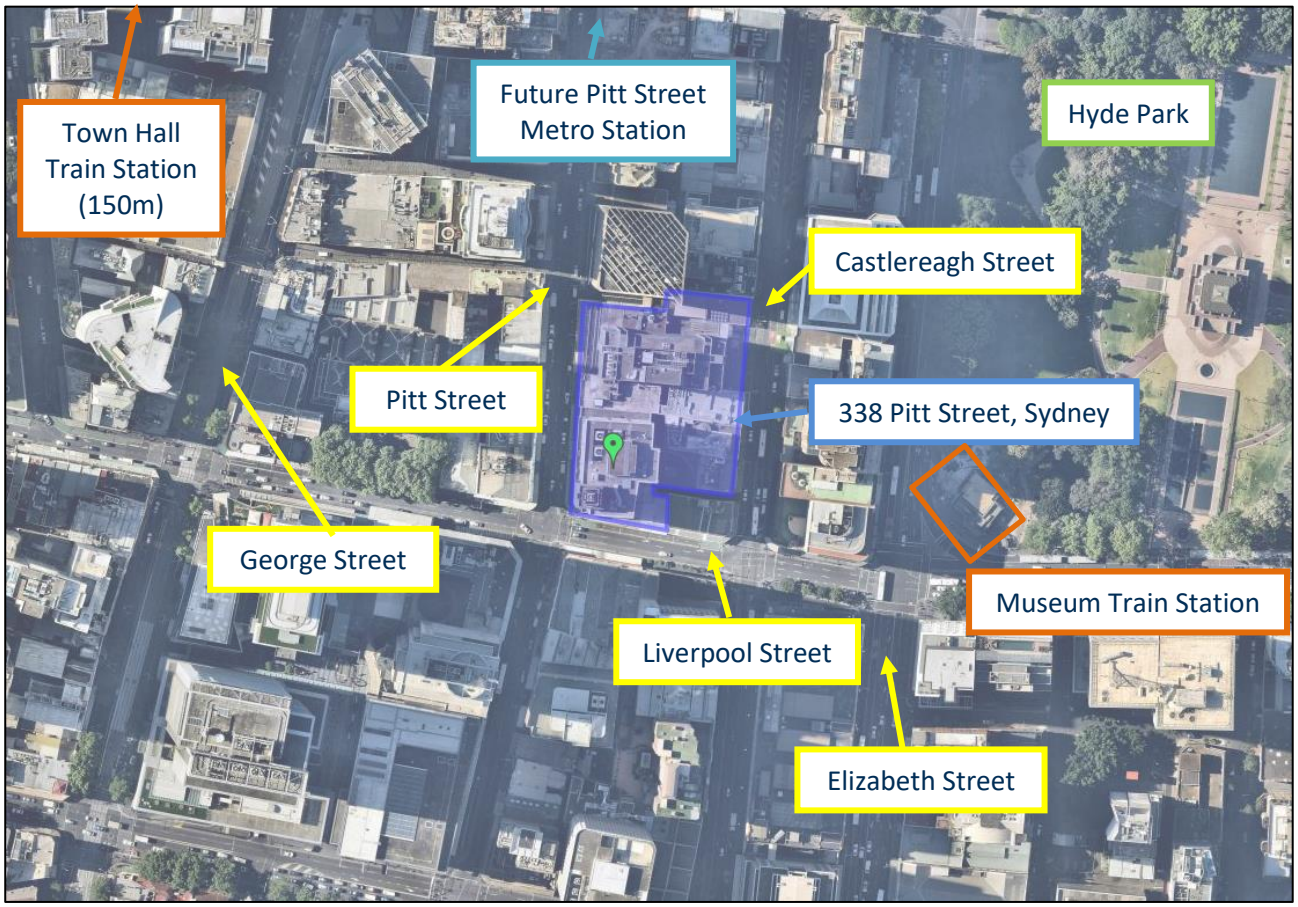
2.2 Location

The proposed development site is located on Pitt Street, with street frontages also on Castlereagh Street and Liverpool Street. The site will be accessed by vehicles through a single entry and exit point on Pitt Street. Pedestrian access will be through Pitt Street, Castlereagh Street, and Liverpool Street.

The proposed development is located roughly 85m from Museum train station, and 200m from Town Hall train station. The proposed entrance for the Pitt Street Metro station will be located approximately 150m away.

Figure 1 below depicts the site in relation to surrounding roadways and land uses.

Figure 1 The site (highlighted in blue) in context with its surrounds



2.3 Zoning and Use

The site is zoned as B8 –Metropolitan Centre in the SLEP. Residential Dwellings, Tourist and Visitor Accommodation, and Commercial premises are permitted with consent in the B8 zone, which is defined by the following objectives:

- To recognise and provide for the pre-eminent role of business, office, retail, entertainment and tourist premises in Australia's participation in the global economy.
- To provide opportunities for an intensity of land uses commensurate with Sydney's global status.
- To permit a diversity of compatible land uses characteristic of Sydney's global status and that serve the workforce, visitors and wider community.
- To encourage the use of alternatives to private motor vehicles, such as public transport, walking or cycling.
- To promote uses with active street frontages on main streets and on streets in which buildings are used primarily (at street level) for the purposes of retail premises.

Currently, the site is occupied by a number of buildings, including restaurants, retail shops, commercial office spaces, and onsite basement car parking.

Zones surrounding the site include RE1 – Public Recreation, and SP2 – Infrastructure.

2.4 Assumptions

This report is a 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 design set for the development plan from the project architect, FJMT Architects (xxxth December 2019);
- The Sydney Development Control Plan (2012) outlines waste generation rates and services available for new developments which have been considered in the preparation of this report; 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.

3 Construction and Demolition

The *Sydney Development Control Plan 2012* and the City of Sydney's *Guidelines for Waste Management in New Developments* (2018) addresses the demolition and construction phases of new development in the Sydney LGA (City of Sydney 2012). These documents refer to the management of generated waste and materials, procedures and measures for reuse and recycling, and detail key objectives for the management of C&D waste as follows:

1.1 The management of waste from construction and demolition activities is to be minimised by avoidance and reduction practices, re-use on-site and the recycling of materials.

1.2 A Waste and Recycling Management Plan detailing these practices is to be completed and included with any new DA (this includes DAs for the change-of-use of a development). The plan should include a target for resource recovery that aims to achieve a minimum 80 per cent recovery rate.

1.3 Materials should be sorted on-site for separate recycling collection. If this is not possible, sorting and recycling after the collection of mixed materials from construction and demolition is required. If the ability to recycle a material is adversely affected by being mixed with other waste types, the material is to be stored and collected separately.

1.4 On-site or off-site re-use of materials is allowed for unscheduled waste materials not hazardous to human health or safety. Any use of waste materials off-site is subject to the provisions within the Protection of the Environment Operations Act 1997 and associated regulations.

Demolition and construction activities at the site will generate a range of construction and demolition (C&D) wastes. 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 skip bins for the separation of construction materials for recycling. A skip bin for residual waste or contaminated material will also be made available at the site for disposal where necessary. Skip 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 demolition and construction contractor and shall be sufficient to store the various waste streams expected during operations. Due to the vertical nature of the proposed development, each level will require waste storage in the form of a crane lifted skip container. Waste storage areas will be kept clear to maintain vehicular access and shall also be kept tidy to encourage separation of waste materials and for WHS reasons.

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. Demolition and construction controls are addressed in the following ways (Table 2):

Table 2: Demolition and construction waste management and details

C&D Waste Management	Description	Details
Materials storage areas	Areas will be provided for reusable materials and recyclables during demolition and construction.	- Storage areas will be documented by the builder and contractors, to be appropriate to site staging and requirements ; - All waste and recycling storage containers will be stored at all times within the boundary of the site or otherwise approved for storage;

		- A designated storage area will be allocated to reusable materials (cl. D6); - Recyclable materials will be stored for collection and processing.
Quantity and type estimation	Estimations of quantities and types of materials to be reused, recycled or left over for removal from the site are to be determined.	- Demolition materials have been estimated according to current site use (see Table 3); - Materials generated during the construction phase have been estimated based on typical construction activities (see Table 4). - Information about reuse, recycling and disposal options for all types of waste produced on-site, including excavation.
Noise, dust and odour	Potential for noise and odour must be minimised.	- Effects from winds including odour and dust transportation must be considered. Demolition during adverse conditions must be avoided; - Implementation of dust controls to the site prior to and during demolition. - Trucks and trailers entering and leaving the site must have their loads adequately covered. Signage must indicate cover requirements at the entrance and exit.
Contaminated materials	Materials containing lead and asbestos must be handled and disposed of in accordance with EPA requirements.	- Removal and disposal in accordance with the requirements of the NSW EPA and WorkCover.
Management	Management and responsibilities for waste management must be described	- Responsibility for waste management during demolition and construction phases will be set out in contracts with the relevant providers; - Documentation must be retained on-site including the WMP and lawful disposal log book; - Procedures for retaining associated receipts/invoices, waste classification and site validation certificates will be the responsibility of contractors.

3.1 Demolition Waste

This section details the demolition waste materials expected for the proposed development, including their quantities and management options, and was designed with consideration of the requirements in the SDCP. The information below presents options for materials reuse, recycling and disposal where applicable (e.g. excavation material may be reused as a construction fill or disposed to landfill if contaminated). All materials are intended to be sent to a suitable, licensed landfill or resource recovery facility.

Table 3 below describes the expected demolition material quantities and appropriate management methods for the proposed development, related to the demolition or deconstruction of:

- Twenty-four-storey concrete and glass office building (233 Castlereagh St);
- Single-storey glass building ('The Passage', 233 Castlereagh St);
- Single-storey brick office (233 Castlereagh St);
- Seven-storey concrete building (241 Castlereagh St);

- Seven-storey concrete building (243-245 Castlereagh St);
- Four-storey brick building ('Stratton's Hotel', 249 Castlereagh St);
- Two-storey brick building (130 Liverpool St);
- Two-storey brick building (128 Liverpool St);
- Two-storey brick building (126 Liverpool St);
- Twenty-storey concrete and glass building (338-348 Pitt St);
- Six-storey concrete building (332-336 Pitt St);
- Basement level carpark; and
- Any ancillary structures and internal laneways.

Table 3: Estimation of demolition materials for reuse, recycling and landfill

Type of waste generated		Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
Concrete		15,000m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: on-site for filling or under gravel carpark. C&D Processor: crushing and recycling for recovered products.
Bricks/pavers		4,500m^3	✓	✓	-	On site: cleaned and separated wherever possible for reuse or to enhance resource recovery. C&D Processor: recovery for reuse where possible, crushing and recycling for recovered aggregate products.
Tiles		150m^3	✓	✓	-	On site: cleaned and separated wherever possible for reuse or to enhance resource recovery. C&D Processor: recovery for reuse where possible, crushing and recycling for recovered aggregate products.
Timber	Treated	300m^3	✓	✓	✓	On site: to be separated wherever possible to enhance resource recovery.

Type of waste generated		Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
	Untreated	4,500m^3	✓	✓	-	C&D Processor: recovery and recycling for recovered product (e.g. mulch) or organics processing. Disposal: of unrecoverable treated timbers at a suitably qualified facility for further treatment or disposal to landfill as necessary.
Insulation material		250m^3	✓	-	-	Reuse: retuned to supplier or manufacturer for reuse.
Metals (ferrous and non-ferrous)		120m^3	-	✓	-	On site: to be separated wherever possible to enhance resource recovery and stored to reduce excessive exposure to the elements. C&D Processor: metals recovery and recycling.
Plasterboard		1,500m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: surplus and offcut material returned to manufacturer for reuse where possible or replacement for gypsum in landscaping.
Glass		100m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: surplus and offcut material returned to manufacturer for reuse where possible. Aggregate for concrete production. Glass recycler: recovery and recycling.
Fixtures and fittings		10m^3	✓	✓	-	Reuse: secondhand building materials. C&D Processor: recovery and recycling.
Floor coverings		1,000m^3	✓	✓	-	On site: to be separated wherever possible to enhance

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
					resource recovery. C&D Processor: recovery and recycling.
Other (cardboard, plastic, paints, ceramics, etc)	200m^3	✓	✓	✓	Commercial contractor: recycling of paper, cardboard and mixed material containers (plastic, metal, glass). Resource recovery processor for all recyclable material. Disposal to suitably qualified facility or landfill for further treatment or disposal as necessary.
Residual waste	200m^3	-	-	✓	Separate recyclables where possible and disposal at principal licensed waste facility.
Hazardous/special waste (e.g. spills and contaminated wastes)	Unknown	-	-	✓	It is possible that asbestos bearing material may be disturbed or removed during demolition works. Appropriate management methods specified by a licensed asbestos and site hygienist should hazardous be found at the site.

3.2 Construction

Construction of a mixed-use development comprising of two residential towers connected by a bridge, and podium level composed of buildings ranging 3-10 stories. The development will feature:

- 650 apartments;
- Minimum 5-star hotel;
- Retail and office spaces;
- 5 levels of basement for parking, waste management, and loading dock; and
- Ancillary structures and landscaping.

Table 4 outlines indicative volume to weight conversion factors for common construction materials.

Table 4: Building waste material by percentage and conversion factor for volume and weight

Building waste material	Tonnes per m^3	Waste as % of the total material ordered
Brick	1	5-10%
Concrete	2.4	3-5%
Tiles	0.75	2-5%
Timber	0.5	5-7%
Plasterboard	-	5-20%
Metal	2.4	-

Source: Parramatta Waste Management Plan Application Template 2017.

Table 5 outlines the expected construction waste quantities to be generated at the site, in addition to the appropriate management methods for each material type.

The information below presents multiple options for materials reuse, recycling and disposal where applicable (e.g. return to manufacturer, recycled at construction and demolition (C&D) processor, or disposed to landfill if contaminated).

Table 5: Construction waste generation estimates

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
Excavation material	75,000m^3	✓	-	-	On site: testing (if necessary) for contamination and stockpiling of material for reuse as fill material. C&D processor: reuse/recycling of VENM and ENM Landfill if contaminated.
Concrete	1,500m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. C&D processor: crushing

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
					and recycling for recovered products (aggregates).
Bricks/pavers	50m^3	✓	✓	-	On site: cleaned and separated wherever possible for reuse or to enhance resource recovery. C&D processor: recovery for reuse where possible, crushing and recycling for recovered aggregate products.
Tiles	5m^3	✓	✓	-	On site: cleaned and separated wherever possible for reuse or to enhance resource recovery. C&D processor: recovery for reuse where possible, crushing and recycling for recovered aggregate products.
Timber (engineered/treated)	<20m^3	-	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: surplus and offcut material returned to manufacturer for reuse. C&D processor: recovery and recycling for recovered product (e.g. mulch) or organics processing.
Metals (ferrous and non-ferrous)	<10m^3	-	✓	-	Onsite: to be separated wherever possible to enhance resource recovery. C&D processor: metals recovery and recycling.

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
Plasterboard	80m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: surplus and offcut material returned to manufacturer for reuse.
Glass	<10m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: surplus and offcut material returned to manufacturer for reuse where possible. Glass recycler: recovery and recycling.
Fixtures and fittings	<5m^3	✓	✓	-	On site: reuse wherever possible or return to manufacturer. Reuse: surplus and offcut material returned to manufacturer for reuse where possible. C&D processor: recovery and recycling.
Floor coverings	<30m^3	✓	✓	-	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.
Packaging (used pallets, pallet wrap)	250m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. C&D processor: recycling of timbers and

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
					plastic.
Containers (cans, plastic, glass)	<10m^3	-	✓	-	Commercial contractor: recycling.
Paper/cardboard	50m^3	-	✓	-	Commercial contractor: segregation of paper, cardboard or other streams.
Residual waste (general refuse)	100m^3	-	-	✓	Separate recyclables where possible and disposal at principal licensed waste facility.
Hazardous/special waste (e.g. spills and contaminated wastes)	Unknown	-	-	✓	Management by a licensed asbestos and site hygienist should hazardous or special waste be found at the site.

3.3 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 6).

Table 6: Waste service contractors and facilities

Role	Details
Recommended Waste Collection Contractor	The following are local skip bin operators for consideration in the management of excavation and construction waste for the site: • Aussie Skips; • Sydney Skip Bins; • Phillips Skip Bins; • Orange Skip Bins; • Bins Express; and • Bingo Bins. Or another supplier as elected by the building contractor.
Principal Off-Site Recycler	The following are local C&D processing facilities for consideration in the management of C&D waste generated at the site: • Empire Bins Recycling Facility - Alexandria; • EcoCycle Materials - Wetherill Park; • SUEZ Artarmon Resource Recovery - Artarmon • Bingo - Auburn. Or another appropriate facility as elected by the waste management contractor.
Principal Licensed Landfill Site	Dial-A-Dump Genesis Eastern Creek, or other appropriate facility as elected by the waste management contractor.

3.4 Site documentation

This WMP will be retained on-site during the excavation and 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.

4 Use & Ongoing Waste Management

Waste management strategies related to site operations have been established according to the documents outlined in the SDCP.

Building management and the site waste caretaker will maintain waste storage and management areas located on the basement 1 level, for use by all residents and commercial tenants.

The following space calculations are based off the bin dimensions sourced from NSW EPA's *Better Practice Guide for Resource Recovery in Residential Developments* (2019) (Table 7).

Table 7: MGB capacity and footprint

Bin Capacity (L)	Height (mm)	Depth (mm)	Width (mm)	Footprint (Approx. m^2)
120	940	530	485	0.33
240	1,080	735	580	0.43
660	1,250	850	1,370	1.16
1,100	1,470	1,245	1,370	1.71

Source: NSW EPA, Better practice guide for resource recovery in residential developments (2019).

4.1 Residential Waste Management

4.1.1 Waste Generation

Table 8 below displays the expected volumes of waste generated weekly based on full residential occupation of the site.

Table 8: Residential Waste Generation

Location	Number of residential dwellings	Waste Stream	Waste generation rate	Weekly waste generation (L/week)
North Tower	329	General Waste	120L/unit/week	39,480
		Recycling	120L/unit/week	39,480
South Tower	263	General Waste	120L/unit/week	31,560
		Recycling	120L/unit/week	31,560

The total amount of waste generated from full residential occupancy per week is:

Table 9: Total Residential Waste Generation

Waste Stream	Total Weekly Volume (L)
General Waste	71,040
Recycling	71,040

4.1.2 Waste Storage

Temporary Waste Storage

Each dwelling must have sufficient space provisioned for the storage of one days' waste generated. This includes separate receptacles for general waste and recycling.

Chute Inlets

As the proposed development intends to utilise dual core waste chutes for the management of residential waste, a chute inlet will be made available on each habitable level. This area will have separate chute inlets for general waste and for recycling. Signage informing residents of appropriate disposal will be displayed in this area.

Building Chute Rooms

Each residential tower will have a chute core for the disposal of waste. Each chute core will open to a chute room (located on level Basement 1), which will retain bins for the collection of waste.

The garbage chute outlet will lead to a 1,100L MGB for the storage of either general waste or unbagged recycling. A carousel system will detect bin fullness and swap out full bins for empty ones. The site waste caretaker will also monitor bin fullness and swap empty bins for full bins on the carousel. Spare 1,100L bin will need to be retained onsite to ensure there are no gaps in service while full bins are being collected. These bins (one each for general waste and recycling) are to be stored in each tower's basement residential waste room.

4.1.3 Bin Type and Number

Each WSRA has space provision for a bin press. Compaction will be applied to general waste only. The *Guidelines* suggest a compaction ratio of 2:1 for general waste. The 1,100L bin has been selected for residential waste storage due to its capacity and relative manoeuvrability. Two collections per week for general waste and three collections per week for recycling will be sufficient to manage the expected waste volumes for full residential occupation.

Table 10 below outlines bin sizes and collection frequency options for residential waste:

Table 10: Residential WSRA Bin Requirements based on collection per week (1,100L bins)

Location	Waste Stream	1 collection	2 collections	3 collections	4 collections
North Tower	General Waste (2:1 compaction)	18	**9**	6	5
	Recycling	36	18	**9**	6
South Tower	General Waste (2:1 compaction)	15	**8**	5	4
	Recycling	29	15	**8**	5

4.1.4 Waste Storage and Recycling Area

Table 11 and Table 12 below outline the space requirement for each residential waste room in this development.

Table 11: North Tower Residential Waste Room

Space Available	Equipment	Requirement	Space Required (with room to manoeuvre)
179m²	General Waste Bins	10 x 1,100L	75m²
	Recycling Bins	10 x 1,100L	
	Chute Outlet	3m²	
	Bin Carousel	18m²	
	Bin Press	1.5m²	

Table 12: South Tower Residential Waste Room

Space Available	Equipment	Requirement	Space Required (with room to manoeuvre)
134m²	General Waste Bins	9 x 1,100L	70m²
	Recycling Bins	9 x 1,100L	
	Chute Outlet	3m²	
	Bin Carousel	18m²	
	Bin Press	1.5m²	

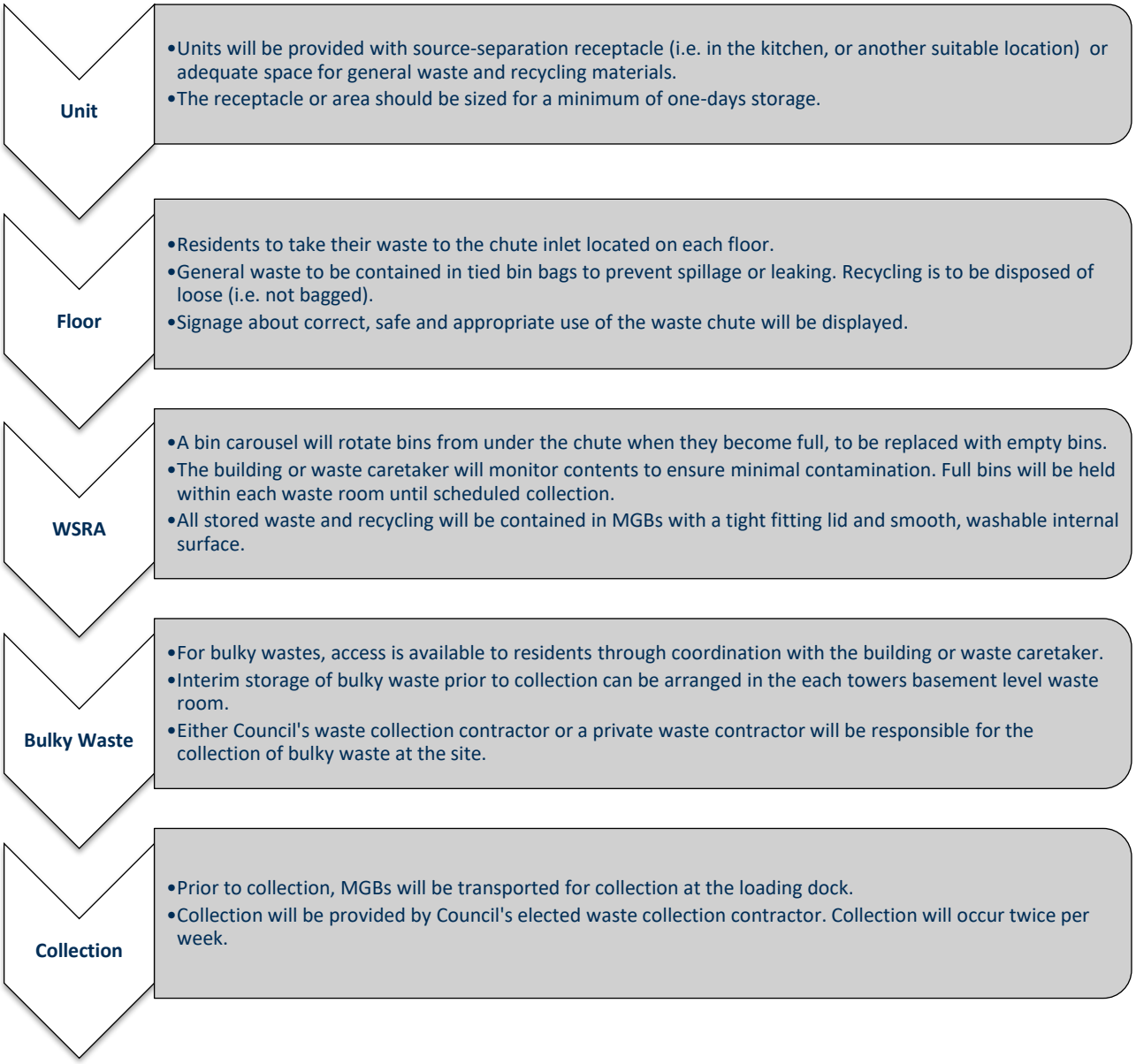
Bulky Waste

Space is allocated in each WSRA for the temporary storage of bulk waste. The waste caretaker will be responsible for arranging timely bulky waste collection by council, or a private contractor, and therefore a smaller area is sufficient for this development. The space will be managed to avoid overspill into space required for manoeuvring and access. Properly managed and maintained, this space will be able to store more than a months' worth of bulky waste.

4.1.5 Waste Flow Diagram

The flow of waste goes from unit generation to collection through several steps (Figure 2).

Figure 2: Residential waste flow



4.2 Hotel Waste Management

4.2.1 Hotel Waste Generation

The Sydney DCP outlines the following waste generation rate for hotels:

Table 13: Hotel Waste Generation

Location	Area (m^2)	Waste Stream	Waste generation ($L/100m^2/day$)	Waste generation (L/day)	Waste generation (L/week)
Hotel Rooms	8,253	General Waste	20	1,651	11,557
		Recycling	25	2,064	14,448
		Food Waste	15	1,238	8,666

Offices	462	General Waste	15	70	490
		Recycling	25	116	812
		Food Waste	5	24	168
Restaurants and Bars	271	General Waste	100	271	1,897
		Recycling	500	1,355	9,485
		Food Waste	100	271	1,897
Function Rooms	1,179	General Waste	100	1,179	8,253
		Recycling	125	1,474	10,318
		Food Waste	30	354	2,478

It is noted there are large function spaces included in the hotel plans. Extra bins and bin lifts are to be coordinated by site management to facilitate the varying waste volumes generated from these spaces.

The total waste generated for hotel uses on site per week is:

Table 14: Total Weekly Hotel Waste

Waste Stream	Total Weekly Volume (L)
General Waste	22,197
Recycling	35,063
Food Waste	13,209

4.2.2 Waste Storage

Temporary Waste Storage

Hotel Rooms:

A waste receptacle will be provided in each hotel room for the temporary storage of waste. Space will be provisioned for a general waste receptacle and a recycling receptacle. Hotel cleaning staff will be responsible for the emptying of these receptacles daily and transporting waste to the hotel WSRA by janitor waste cart.

Office Spaces:

General waste and recycling bins will be provided in each office for the hotel. Hotel cleaning staff will be responsible for the emptying of these bins daily and transporting waste to the hotel WSRA by janitor waste cart.

Bar and Dining Areas:

The back-of-house areas of bar and dining areas will hold bins for the temporary storage of waste. Bins for general waste, recycling, and food waste at minimum will be provided to allow easier source separation for staff. Bins will be transferred to the hotel garbage room at minimum once daily for emptying and cleaning and transferred back to the back-of-house.

Function Spaces:

Site management will co-ordinate with hotel event managers to ensure that functions are suitably serviced with bins, and that extra bin lifts are scheduled to meet temporary increases in waste generation onsite.

Hotel Garbage Room

The hotel WSRA is located on level Basement 1 and will be used for the storage of empty and full general waste and recycling bins.

4.2.3 Bin Type and Number

Each WSRA has space provision for a bin press. Compaction will be applied to general waste only. The *Guidelines* suggest a compaction ratio of 2:1 for general waste, the following bins would be required in each WSRA:

Table 15: WSRA Bin Requirements

Location	Waste Stream	660L		OR	1,100L	
		2 Collections	3 Collections		2 Collections	3 Collections
Hotel Garbage Room	General Waste	9	6		6	**3**
	Recycling	27	18		16	**11**

The 1,100L bin has been selected for the hotel waste storage due to its capacity and relative manoeuvrability. Three collections per week will be sufficient to manage the expected waste volumes for hotel spaces onsite.

An extra general waste and recycling bin should be provided in the waste room to avoid any gaps in service.

Food Waste

Food waste will be collected at minimum 3 times per week, using 240L bins. This bin size was selected due to its high manoeuvrability and relative lighter loads.

4.2.4 Waste Storage and Recycling Area

Table 16 below outlines the space requirements for the hotel waste room, inclusive of space for bins, equipment and manoeuvring.

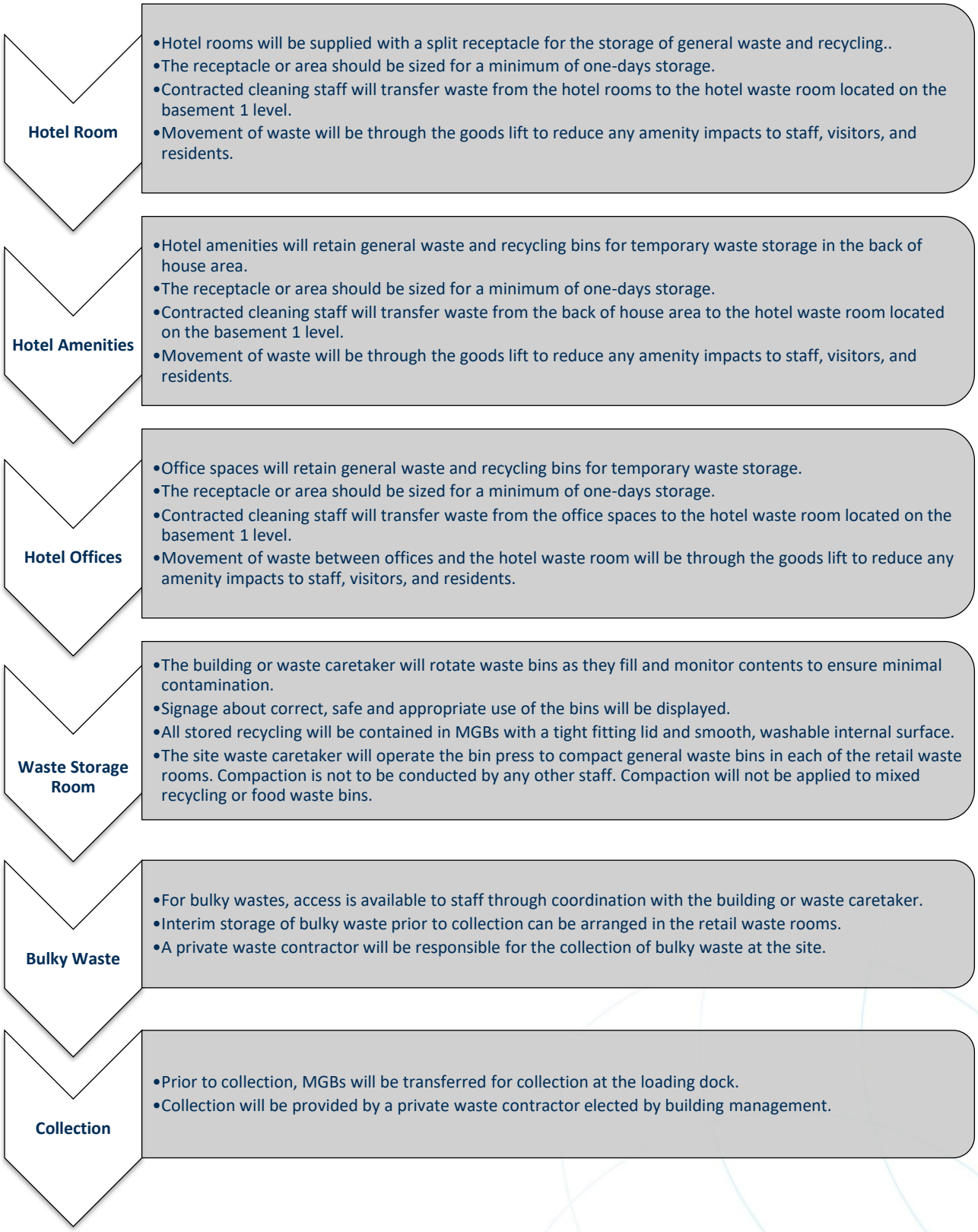
Table 16: Hotel Garbage Room Space Requirements

Space Available	Equipment	Requirement	Space Required (including space to manoeuvre)
78m^2	General Waste Bins	4 x 1,100L	62m^2
	Recycling Bins	12 x 1,100L	
	Food Waste Bins	19 x 240L	
	Bulk Waste Cage	4m^2	
	Bin Press	1.5m^2	

4.2.5 Waste Flow Diagram

The flow of waste goes from unit generation to collection through several steps (Figure 3).

Figure 3: Hotel waste flow



4.3 Retail Waste Management

4.3.1 Waste Generation

The Sydney DCP outlines the following waste generation rate for retail spaces:

Table 17: Retail Waste Generation

Location	Area (m^2)	Waste Stream	Waste generation (L/100m^2/day)	Waste generation (L/day)	Waste generation (L/week)
General Retail	2,926	General Waste	25	732	5,124
		Recycling	200	5,852	40,964
		Food Waste	5	147	1,029
Restaurant	1,193	General Waste	100	1,193	8,351
		Recycling	500	5,965	41,755
		Food Waste	100	1,193	8,351
Bar	211	General Waste	100	221	1,547
		Recycling	150	332	2,324
		Food Waste	40	89	623

The total waste generated for retail uses on site per week is:

Table 18: Total Weekly Retail Waste

Waste Stream	Total Weekly Volume (L)
General Waste	15,022
Recycling	85,043
Food Waste	10,003

4.3.2 Waste Storage

Temporary Waste Storage

Each retail tenancy will retain bins in the back-of-house area for the storage of waste. The waste storage area will have capacity for storage of minimum one-days' waste generated. Receptacles for general waste, recycling, and food waste will be maintained at minimum. Extra source separation of soft plastic and paper and cardboard is recommended to reduce bin lift costs and increase waste diversion from landfill.

Retail Waste Rooms

Retail waste storage is split into two rooms: one for the north tower, and one for the south tower (hereby referred to as WSRA-North and WSRA-South). The retail spaces will be divided by which room they dispose of waste in (please refer to Appendix A).

Table 19: WSRA Expected Waste

Location	Retail Space (m^2)	Total Weekly Volume (L)
WSRA-South ($128m^2$)	Restaurant: 543 Bar: 211 General Retail: 1,084	General Waste: 7,246
		Recycling: 36,505
		Food Waste: 4,806
WSRA-North ($63m^2$)	Restaurant: 650 Bar: 0 General Retail: 1,842	General Waste: 7,775
		Recycling: 48,538
		Food Waste: 5,197

4.3.3 Bin Type and Number

Each WSRA has space provision for a bin press. Compaction will be applied to general waste only. The *Guidelines* suggest a compaction ratio of 2:1 for general waste, the following bins would be required in each WSRA:

Table 20: WSRA Bin Requirements

Location	Waste Stream	660L		OR	1,100L	
		2 Collections	3 Collections		2 Collections	3 Collections
WSRA-South	General Waste	4	3		**3**	2
	Recycling	28	19		17	**9**
WSRA-North	General Waste	5	3		**3**	2
	Recycling	37	25		23	**16**

The 1,100L bin has been selected for the retail waste storage due to its capacity and relative manoeuvrability. Three collections per week will be sufficient to manage the expected waste volumes for retail spaces onsite.

Food Waste

Food waste will be collected at minimum 3 times per week, using 240L bins. This bin size was selected due to its high manoeuvrability and relative lighter loads.

4.3.4 Waste Storage and Recycling Area

The retail waste rooms have the following space requirements:

Table 21: WSRA South Retail Space Requirements

Space Available	Equipment	Requirement	Space Required (with room to manoeuvre)
63	General Waste Bins	3 x 1,100L	42m^2
	Recycling Bins	9 x 1,100L	
	Food Waste Bins	8 x 240L	
	Bulk Waste Area	4m^2	
	Bin Press	1.5m^2	

Table 22: WSRA North Retail Space Requirements

Space Available	Equipment	Requirement	Space Required (with room to manoeuvre)
128	General Waste Bins	3 x 1,100L	63m^2
	Recycling Bins	16 x 1,100L	
	Food Waste Bins	9 x 240L	
	Bulk Waste Area	4m^2	
	Bin Press	1.5m^2	

4.3.5 Waste Flow Diagram

Cleaning and removal of waste for commercial spaces will be conducted by contracted site cleaners. This will involve the transfer of waste from each tenancy to the retail waste rooms, through the basement 1 level (via a goods lift system). Temporary storage of retail waste can occur on the basement 1 level retail waste room (refer to Appendix A, Figure 5 and Figure 6 for locations).

Excess space is available in the south building retail WSRA for bin overflow for retail waste across the site. Additional waste streams may also be managed here due to the availability of space.

The flow of waste goes from retail generation to collection through several steps (Figure 4).

Figure 4: Retail waste flow

4.4 Additional Waste Streams

Management may like to include the following collection systems to increase resource recovery onsite.

4.5.1 Container Deposit Scheme (CDS) eligible materials

Recyclable containers eligible for the NSW EPA's "Return and Earn" container deposit scheme can be collected separately to commingled recycling. Reverse Vending Machines (RVMs) accept these containers and issue refunds through retail vouchers (to spend or swap for cash), online into a PayPal account, or donated to a selected charity.

There are a few options to achieve CDS material recovery – a sorting machine can be purchased with the assistance of the EPA BinTrim equipment rebate program. This covers up to 50% of capital machinery costs up to $50,000. This option also allows users to directly collect or donate their refund.

Otherwise, a separate bin can be used to collect CDS materials which will be collected by a service provider such as St George Recyclers. This is a free collection services with the refund paid out via bank transfer to the organisation. St George Recyclers will either provide a blue bin ($59 fee for delivery within 14 days) or are able to collect CDS materials contained in garbage bags.

The location of either the RVM or CDS material bin can be in a public area for use by both residents and customers of the ground-floor businesses.

4.5.2 E-Waste collection

An E-waste collection service can be organised for the development. This can be either an on-call service or scheduled collection depending on the need.

4.5.3 Textiles bins

Storage of textile waste prior to collection or drop-off can be in the bulky waste area, in garbage bags or in a designated clothing bin.

Re-useable clothing

There are a number of services which will collect clothes in good quality for free. Clothing Cleanup offers free collection of unwanted clothing. Clothes must be placed in plastic bags and left in a location organised during the booking process. See https://clothingcleanup.com.au/ for more information.

Unusable clothing waste

Dirty, ripped, or otherwise unwearable clothing waste can still be repurposed or recycled. Major fashion retailers such as H&M and Zara accept clothing waste which is then recycled into cleaning cloths, insulation for cars and homes, and other products.

4.5.4 Soft Plastics

Soft plastics cannot be placed in kerbside recycling bins; however, they can still be diverted from landfill. Considering the high potential volumes of soft plastic, management may engage a waste service such as Cleanaway to collect soft plastic waste.

4.5.5 Mattress Collection

This service is provided as an on-call service when required. Soft Landing is a leading social enterprise in Sydney, providing collection and resource recovery services for mattresses. Bookings can be made online or by phone.

4.5.6 Food Waste Processing

High volumes of food waste may result from operation of any food and beverage tenancies in the ground-floor commercial spaces. Food waste going to landfill is a source of damaging greenhouse gases and diverting this waste stream from landfill would not only prevent this, but also reduce costs associated with general waste bin lifts. Food waste can make up to 30% of general waste bin volume by weight. Many facilities exist in and around Sydney that process food organics waste, producing compost and in some cases electricity (via biogas) while also diverting food waste from landfill.

An alternative to food organics collection is onsite food waste processing. In-vessel composters produce no odour and may require some input from woody garden organics, which would likely be available as a result of landscaping activities onsite. Initiatives such as NSW EPAs BinTrim program operate an equipment rebate that can cover up to half the capital cost of organics processors (up to a $50,000). Please refer to Appendix B for examples of food waste processing equipment.

4.5.7 Food Donation

Management may like to explore the potential for donation of excess consumable food from the food retailers to charities such as OzHarvest or FoodBank NSW.

5 Equipment and Waste Management Systems

6.1 Waste and Recycling Equipment

Dual-Core Waste Chute

Residential waste will be disposed of using a dual-core waste chute, available on each habitable level of the development. The chutes will lead to the residential waste rooms on level basement 1. 1,100L MGBs will collect the disposed waste and full bins will be rotated for empty ones using a carousel system.

Residents are responsible for the correct disposal of waste using the chute systems, and maintenance will be conducted by a suitably qualified member of staff or contractor.

Waste Compactor

Each waste room will be provided with a bin press unit, which will compact general waste to a ratio of 2:1. Mixed recycling and food waste are not to be compacted and the unit will be operated by the site waste caretaker only.

Plastic and Cardboard Balers

Large volumes of cardboard and soft plastics are expected to be generated as a result of retail and hotel operations. A baler is effective at volume reduction and may reduce the number of required collections for recycling. One baler for each retail waste room and hotel waste room is recommended for this site.

6.2 Collection Method and Loading Areas

The collection point and areas for handling and loading are as follows:

- Collection and loading will occur within the loading docks, with access from Pitt Street;
- The loading docks will be located on the basement 1 level;
- Clear, safe, accessible and convenient space for handling of MGBs and equipment and loading of collection vehicles; and
- Identifiable areas where residents, visitors and site staff can recognise and avoid any risk associated with moving vehicles, and bin moving and handling.

Table 23 outlines relevant specifications.

Table 23: Collection point and loading area specifications

Component	Requirement	Specification
Collection point	Allow safe waste collection and loading operations	- 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	- Collection from the loading dock is assisted by sufficient space allocation for a turning bay suitable for a Heavy Rigid Vehicle; - Adequate loading bay dimensions do not impede rear lift clearance; - Operational clearance for truck manoeuvring in a forward direction in and out of the loading bay; and - The provision of space clear of vehicle parking spaces.

Operating times	Appropriate collection times to limit noise and traffic disturbance	- Collection times will be arranged to ensure minimal disturbance to residents, pedestrians and visitors.

The waste rooms will be utilised for the storage of full bins prior to collection and empty bins that can be rotated when bins become full.

Waste collection vehicles will access each loading dock through Pitt Street, where the waste caretaker will position the MGBs for collection. There is a minimal distance between the waste storage rooms and waste loading area.

Collection of site waste bins by the Waste Service Provider will be facilitated through building management or the site waste caretaker who will provide access to the ground floor loading dock.

6.2.1 Residential Waste Collection

Residential waste will be collected by Council's elected waste contractor. Collection will occur at a rate of two times per week for general waste and recycling.

6.2.2 Retail and Hotel Waste Collection

Commercial waste will be collected by a private waste contractor. Collection will occur up to three times a week for all waste streams.

6.3 Management System and Responsibilities

Building management and the site waste caretaker 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, the waste caretaker will inform management. Operation of the waste management system is the responsibility of building management and the waste caretaker. 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. Methods of communication can be by email, letters, social media, and signage;
- Maintaining a valid and current contract with a licensed waste service provider for waste and recycling collection and disposal;
- Ensuring SafeWork NSW requirements for access, manoeuvring, transferring and emptying of waste/recycling bins are met by the waste caretaker;
- Making information available to residents, commercial tenants, visitors and site staff about waste management procedures;
- Collection of waste from commercial and ancillary services in a mobile waste management/janitor trolley, for direct disposal into designated bins retained in ground floor bin storage area;
- Manoeuvring bins to specified onsite collection point prior to and following scheduled collection of waste bins;
- Organising, maintaining and cleaning waste management areas as part of a regular maintenance schedule;
- Maintenance of equipment and infrastructure for waste where possible (within the means of staff);
- Organising the relevant waste contractor for additional maintenance or waste management for the site (including bulky waste);
- 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 Waste Storage and Recycling Area Specifications

The WSRAs will provide centralised storage that has adequate capacity to receive and store the maximum likely generation of waste and recycling between collection times. Each WSRA will be constructed to improve amenity, minimise odour, protect surrounding areas and promote user safety. WSRA specifications include:

- Signage for safety and waste bin identification;
- Safety precautions, staff training and signage for plant;
- Noise attenuation for waste management and WSRAs that limits effects to residents from any compactor, bin transfer and collection vehicle noise;
- Floors constructed of concrete or other approved solid, impervious material that can be cleaned easily;
- Grading and draining to an approved drainage fitting located in the room;
- A smooth, even floor surface covered with vertical wall and plinth faces;
- Doorway ramp (if not level);
- Light colour finish for all room surfaces;
- Adequate supply of water with hose cock as close as practicable to the doorway;
- Close-fitting and self-closing door, large enough to facilitate access of MGBs and bulky waste items;
- Suitable construction including limited entry paths to prevent vermin;
- Ventilation through permanent unobstructed ventilation (5% of floor area) or mechanical exhaust ventilation system (5L/s per m^2 of floor area); and
- Security and lighting.

6.5 Chute System

The chute system accepts both waste and recyclables. This dual chute system assists in the promotion of resource recovery and convenience to residents. Residents will have access to a dual chute on every floor. The installation of a recycling chute eliminates the need to have recyclables stored and removed throughout the building. This reduces manual labour and improves visual amenity.

Chute penetrations have been indicated on every floor as required on the reference/indicative drawings.

The chute system includes access areas on every floor, chute core, service access points and chute outlet to the Basement residential waste storage and recycling area. A full chute specification is required for the build, this includes:

- A dual core waste and recycling chute system in either 600mm galvanised steel or 510mm recycled LLPDE polyethylene plastic;
- A minimum two-hour fire rated door for the chute openings;
- To minimise noise disturbance, chutes and hoppers wrapped with 50mm poly-wool noise insulation foil and the walls of the shaft area surrounding the chute system built to an Rw50 (sound reduction index) specification;
- Minimal offsets of the chute in relation to outlet;
- Vents exiting at the top of each chute and wash down system. Frequency of maintenance and upkeep (washing) to be instructed by chute supplier; and
- Chute openings for placement of fire sprinklers on every second level.

6.6 Signage and Education

Signage that promotes resource recovery, waste minimisation, safety and amenity follows the Australian Standard for safety signs for the occupational environment (Standards Australia 1994, Figure 2 and 3).

Signage is designed to consider language and accessibility (i.e. to be understood as clearly as possible by those with different abilities of vision, knowledge of the English language, intellectual ability and with other conditions). Signage is to be prominently posted in each WSRA and relevant waste service area indicating:

- Detail on acceptable recyclables;
- Recyclables are to be decanted loose (not bagged);
- No standing and danger warnings apply to the area surrounding the WSRA;
- Contact details for arranging the disposal of bulky items; and
- The area is to be kept tidy.

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

6.7 Prevention of Pollution, Illegal Dumping and Litter Reduction

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

- Maintenance of communal areas and the WSRA;
- Securing the waste storage area from vandalism and the escape of litter;
- Identification and appropriate disposal of goods with hazardous material content (paints, e-waste, fluorescent tubes);
- Acting to prevent dumping and unauthorised use of waste areas; and
- Requiring contractors to clean up any spillage that may occur during waste servicing or other work.

7 References

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

Blue Environment (2016) Australian National Waste Report.

City of Sydney Council (2012) Sydney Local Environmental Plan. NSW legislation.

City of Sydney Council (2012) Sydney Development Control Plan.

Department of Environment and Climate Change (2008) NSW Model Waste Not DCP Chapter.

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

Department of the Environment (2016) Working together to reduce food waste in Australia, Australian Government.

Environment Protection and Heritage Council (2009) National Waste Policy: Less Waste, More Resources. Available at: http://www.nepc.gov.au/system/files/resources/906a04da-bad6-c554-1d0d-45216011370d/files/wastemgt-rpt-national-waste-policy-framework-less-waste-more-resources-print-ver-200911.pdf.

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

NSW OEH (2008) NSW Better Practice Guide for Waste Management in Multi-Unit Dwellings, Australian Standards and Statutory Requirements.

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

Standards Australia (2008) AS 4123 Mobile waste containers.

WorkCover (2011) Managing Work Environment Facilities Code of Practice.

Appendix A Site Plans

Figure 5: Site Waste Rooms (North Section)

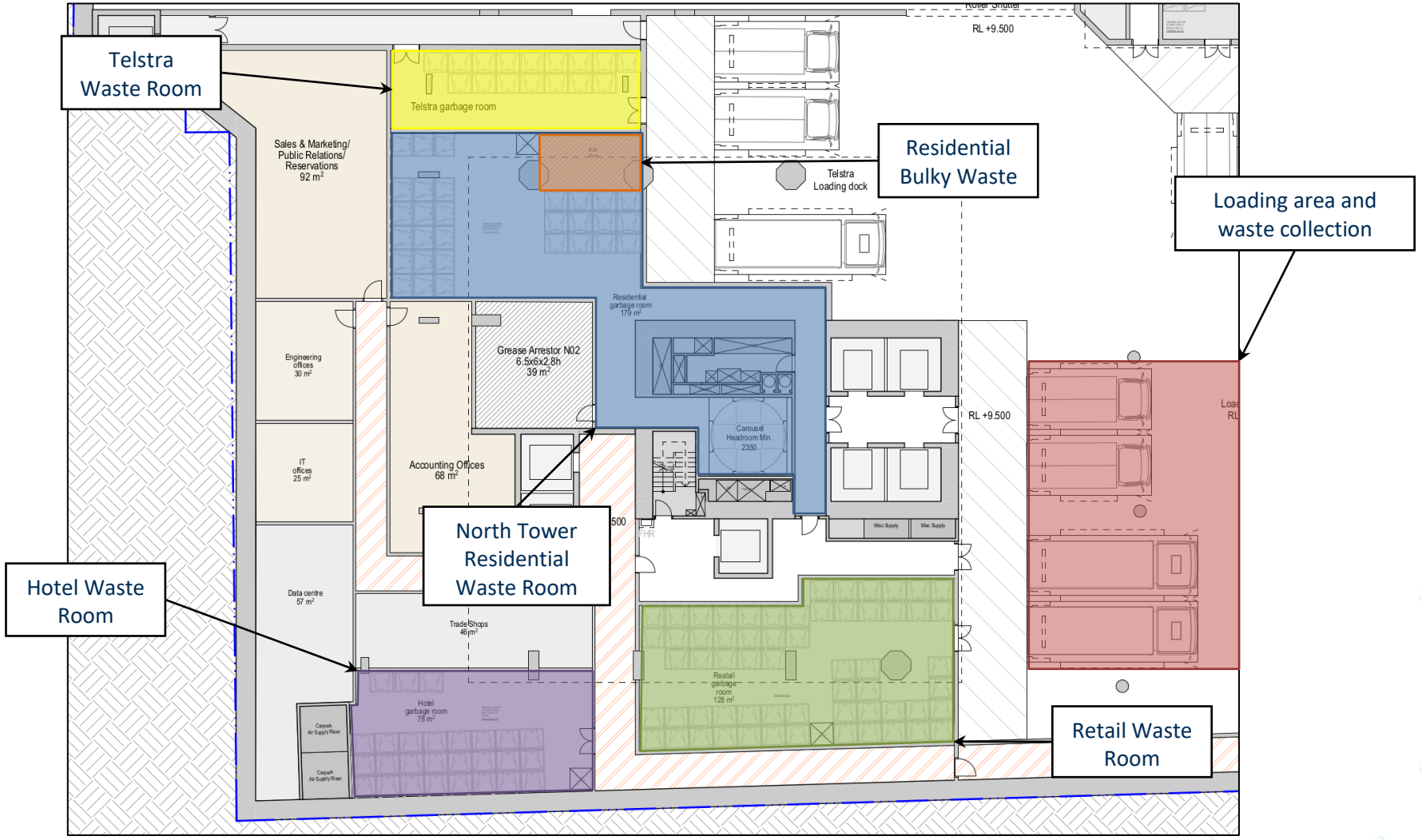
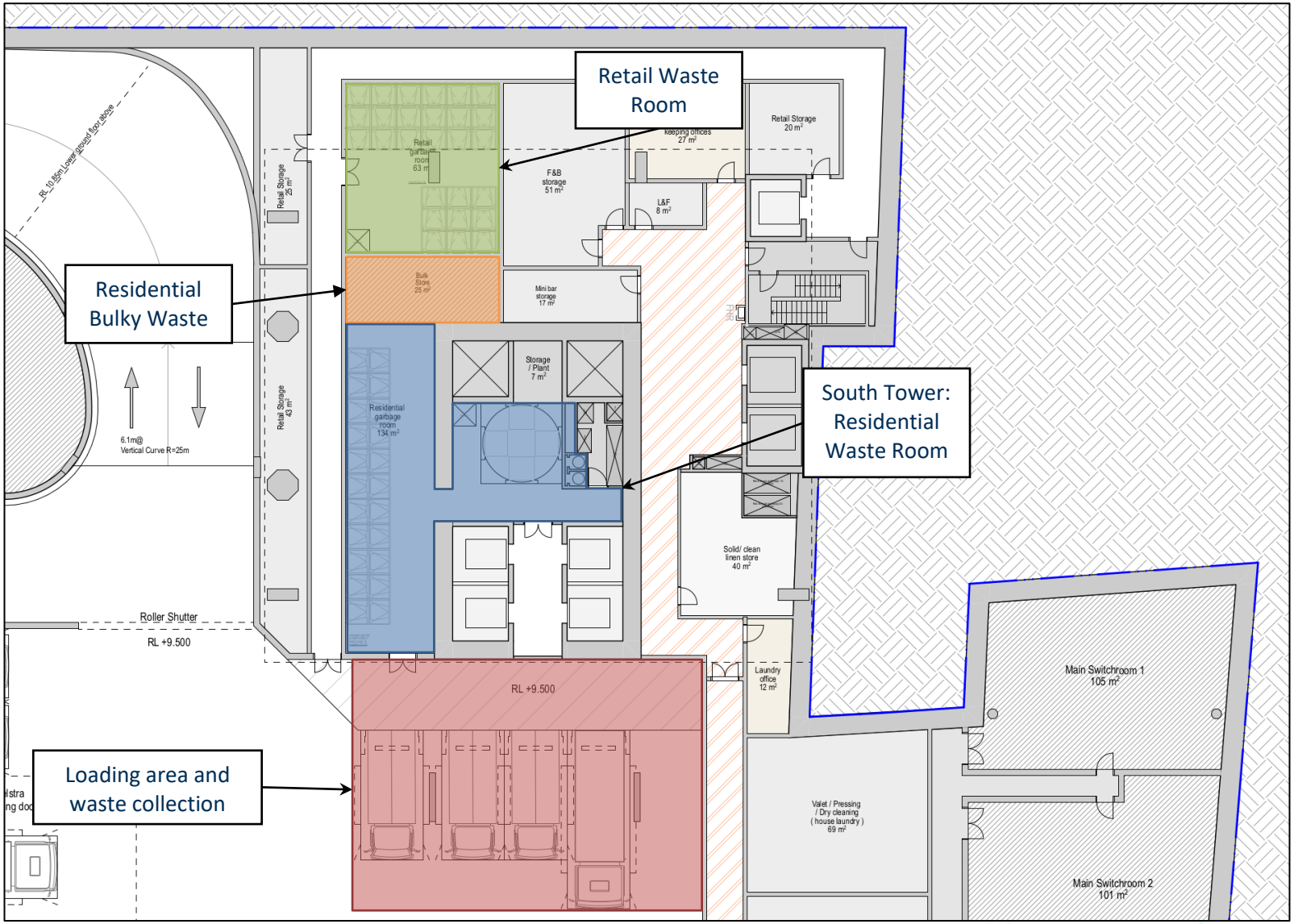


Figure 6: Site Waste Rooms (South Section 2)



Appendix B Organics Equipment

CLOSED LOOP ORGANICS UNIT SPECIFICATIONS

Closed Loop's organic recycling units are fully contained, commercial aerobic on-site composting units that can reduce food waste by up to 90 per cent in 24 hours.

CLO10s

Capacity/day: 20kg
Electricity usage/month: 500kWh (maximum)
Electricity requirements: AC 240V
Power rating: 50Hz, 2.1kW
Overall footprint (mm): 1160 (w) x 620 (d) x 1030 (h)
Overall dry weight: 240kg

CLO30s

Capacity/day: 60kg
Touchscreen Controls | Automatic Operation
Electricity usage/month: 1100kWh (maximum)
Elec. requirements: AC 3 phase, 20 amp, 5 pin dedicated outlet
Power rating: 415V, 50Hz, 4kW
Overall footprint (mm): 1960 (w) x 870 (d) x 1250 (h)
Overall dry weight: 450kg

CLO50s

Capacity/day: 100kg
Touchscreen Controls | Automatic Operation
Electricity usage/month: 1700kWh (maximum)
Elec. requirements: AC 3 phase, 20 amp, 5 pin dedicated outlet
Power rating: 415V, 50Hz, 6kW
Overall footprint (mm): 2155 (w) x 1060 (d) x 1350 (h)
Overall dry weight: 660kg

CLO100s

Capacity/day: 200kg
Touchscreen Controls | Automatic Operation
Electricity usage/month: 3500kWh (maximum)
Elec. requirements: AC 3 phase, 20 amp, 5 pin dedicated outlet
Power rating: 415V, 50Hz, 13kW
Overall footprint (mm): 2584 (w) x 1250 (d) x 1580 (h)
Overall dry weight: 1100kg

OPTIONAL FEATURES

- Load cells for accurate measurements of inputs and outputs (CLO30 and above)
- Internet connection for SMS Alerts and remote connection (CLO30 and above)
- 120 Litre Bin Lifter (CLO100)

Dehydrators

Dehydrators reduce the volume of food and garden organic waste by removing the majority of water held by the waste. The products from dehydrators include extracted water which can be re-used, as well as dehydrated organic material which can be used as a soil amendment or fuel. Dehydrators differ from composters as they only dehydrate waste and do not produce compost.

Typical materials

- ☒ Food organics

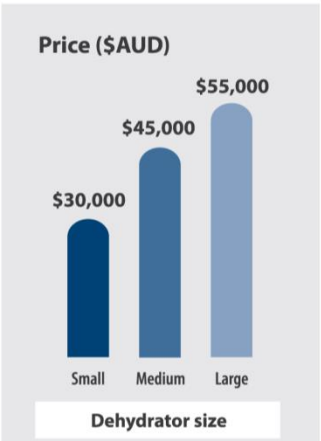
Specifications

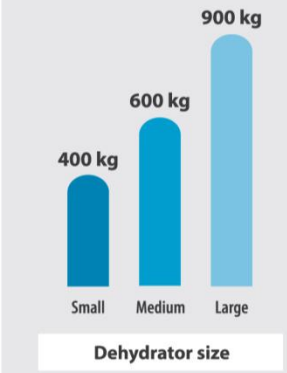
- **Loading:** Manual, Semi-Automatic (pump/hopper)
- **Unloading:** Manual
- **Consumables:** N/A
- **Working Life:** 10-20 Years
- **Power:** 415V
- Sewage/waste water hookup may be required to operate a dehydrator. This may require additional Council approval.
- Lateral and Overhead clearances need to be considered in some cases, and are variable.

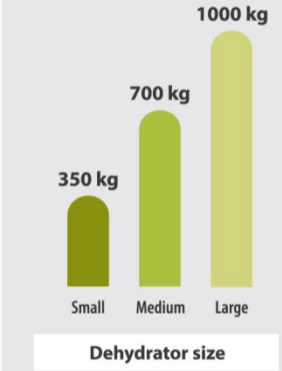
Please note: Dehydrators will only be approved for a rebate when the outputs are sent to a commercial composting service or licensed facility or if the equipment has a resource recovery exemption.

Relevant standards

AS 4024.1 2006 Series: Safety of Machinery by Third Party Independent verification







Pre-Digestion with disposal to sewer

Biologically converts solid food waste into liquid. System uses microorganisms to decompose food waste into a liquid that can be disposed to sewer.

Typical materials

- ☒ Food organics
- ☒ NOT large bones and oils
- ☒ NOT fibrous material e.g. corn husks

Specifications

- **Loading:** Manual
- **Consumables:** Microbes need to be replaced yearly
- **Working Life:** 15 Years
- **Power:** 208V, 3 Phase Power
- Cold water hook up required
- Sewer connection required (must have approval from a water authority to hook up to sewer)
- Lateral and Overhead clearances need to be considered in some cases, and are variable
- Can be linked with a grinder to manage bones and fibrous materials.

Cost:
$55,000 – $75,000

Machinery weight:
1300 lbs (small unit)

Processing (per hour):
300 lbs (small unit)

1000 lbs
(medium unit)

1500 lbs (large unit)

Relevant standards

AS 4024.1 2006 Series: Safety of Machinery by Third Party Independent verification

Macerators

Macerators reduce the volume of food waste by turning the solid food waste into pulp. The pulp slurry is pumped to an exterior holding tank for collection by a licensed contractor. Macerators are usually a leased piece of equipment. Leased equipment is not eligible under the Bin Trim Rebate Program.

Typical materials

- ☒ Food organics
- ☒ NOT oyster and mussel shells

NOT fibrous material e.g. corn husks

Cost:
$50,000 – $60,000

Machinery weight:
140 kg

Processing:
2000 kg per hour

Specifications

- **Loading:** Manual
- **Unloading:** Semi-Automated
- **Consumables:** N/A
- **Working Life:** 15 Years
- **Power:** 415V
- Cold water hook up required
- Lateral and Overhead clearances need to be considered in some cases, and are variable.

Please note: Macerators will only be approved for a rebate when used in conjunction with a commercial collection service to a licensed organic recycling facility or a Resource Recovery Exemption compliant land application system.

Relevant standards

AS 4024.1 2006 Series: Safety of Machinery by Third Party Independent verification

Appendix C 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 7: 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 8: Example and layout of safety signage

(d) Horizontal

FIGURE D5 TYPICAL ARRANGEMENTS OF DANGER SIGNS