

Roofing 2000, 91 – 93 Canning Highway, East Fremantle

Waste Management Plan

6 December 2021

Project No. 14-0439-1

Rev_1





waste less, achieve more

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Glossary of terms and acronyms

Chute	In multi-storey buildings, a 'chute' is literally a shaft built into the construction that allows waste and/or recyclable material to be easily transported to the ground floor level from upper levels.
Commingled recycling	Common recyclables, mostly packaging; such as glass, plastics, aluminium, steel, liquid paper board (milk cartons). Commingled recycling may include paper but often, and particularly in offices, paper and cardboard are collected separately.
FOGO	Food Organics Green Organics – a third bin offered to residents for the collection of food waste and garden waste. For multi-story development, bin comprises mainly food waste.
General Waste	Material that is intended for disposal to landfill (or in some States, incineration), normally what remains after the recyclables have been collected separately.
MGB	Mobile Garbage Bin – A wheeled bin with a lid often used for kerbside collection of waste or recyclables. (Often called a 'wheelie bin').
MRB	Mobile Recycling Bin – A wheeled bin ("wheelie" bin) with a lid often used for kerbside collection of recyclables (similar to an MGB). Generally have a different colour body and/or lid to MGBs.
Organic waste	Separated food and/or 'green' material (e.g. grass clippings or vegetation prunings).
Recyclable	Material that can be collected separately from the general waste and sent for recycling. The precise definition will vary, depending upon location (i.e. systems exist for the recycling of some materials in some areas and not in others).
Recycling	Where a material or product undergoes a form of processing to produce a feedstock suitable for the manufacture of new products.
Reuse	The transfer of a product to another user, with no major dismantling or processing required. The term "reuse" can also be applied in circumstances where an otherwise disposable item is replaced by a more durable item hence avoiding the creation of waste (e.g. using a ceramic coffee mug in place of disposable cups).

1 Introduction

This Waste Management Plan (WMP) has been prepared for Space Agency on behalf of their client Builtform Projects for the Development Application for the proposed mixed use development "Roofing 2000", 91-93 Canning Highway, East Fremantle. The proposed development will consist of 95 apartments over 19 floors and 1197 m² commercial tenancies, a café (94 m²), gym (93m²) and dining area for residents (81m²). Note the dining area is provided to residents for seating and consumption of take away food.

This WMP has been prepared based on the following information:

- Architectural plans from Space Agency received on 26 November 2021
- Area schedule from Space Agency received on 30 November 2021
- Town of East Fremantle Waste Local Law 2017
- Waste Guidelines for New Developments, City of Vincent, May 2020. Note that the Town of East Fremantle apply waste generation rates outlined in this Guideline
- Commercial and Industrial Waste Management Plan Guidelines, WALGA 2018
- Conversation and email correspondence with Connor Warn, Waste and Sustainability Officer Town of East Fremantle regarding council waste management requirements (27 July and 28 September 2021)
- Meeting held with Town of East Fremantle Waste and Planning services personnel, Builtform Projects, Space Agency and Encycle on Friday, 1 October 2021.

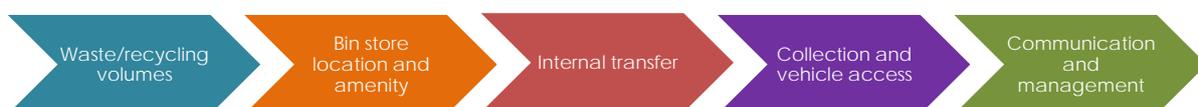
1.1 Context

For efficient and effective waste management, the collection and centralisation of waste and recyclables should be carefully considered at the building design phase. Key factors to consider at the design phase include:

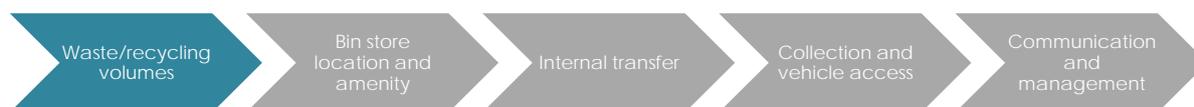
- Volumes of waste and recyclables likely to be generated during building operation
- Size of bin storage area
- Safety for all operatives involved in waste management
- Access to bins, storage areas and for waste collection vehicles
- Local council requirements, amenity, odours and noise requirements and the ongoing management of waste and recycling services

1.2 Key components of the WMP

This WMP consists of five core components. The following report will present detailed information on each of the following components.



2 Estimated waste and recycling volumes



2.1 Local government requirements for waste volumes and bin type

The Town of East Fremantle use 'Waste Guidelines for New Developments' (City of Vincent, May 2020) for waste, recycling and Food Organics Garden Organics (FOGO) generation rates. Encycle's experience and knowledge of the use of the development is also used to calculate the generation of waste, recycling and FOGO.

The waste, recycling and FOGO generation rates for multi-unit developments (MUDs) are:

	Waste requirement	Recycling requirement	FOGO requirement
1 bedroom	40 L/unit/week	20 L/unit/week	20 L/unit/week
2 bedroom	60 L/unit/week	40 L/unit/week	40 L/unit/week
3 bedroom	80 L/unit/week	90 L/unit/week	60 L/unit/week

WALGA 'Commercial and Industrial Waste Management Plan Guidelines' were used to estimate waste generation from commercial tenancies; in addition to Encycle's experience and knowledge of the commercial uses of the building.

Specifically, the generation rates used are presented below. The final column presents Encycle Consulting's in-house estimate of the material streams present in the recycling stream based on our working experience of operational buildings in Perth.

Premises type	Waste generation rate	Recycling generation rate	Percentage breakdown of recycling stream by material
Café	3 L /1m ² /day	2 L /1m ² /day	50% cardboard 40% commingled 10% soft plastics 10% cooking oil 20% organics
Gym	0.1 L /1m ² /day	0.1 L /1m ² /day	50% cardboard 40% commingled 10% soft plastics
Office	0.1 L /1m ² /day	0.1 L /1m ² /day	79% paper 14% cardboard 10% soft plastics 7% commingled
Dining area (take away)	0.8 L /1m ² /day	0.4 L /1m ² /day	50% cardboard 40% commingled 10% soft plastics 10% organics

2.2 Design for waste management

Waste management has been designed and planned, to mitigate any potential noise and amenity aspects associated with waste vehicle collections, and with consideration to occupational health and safety in the movement and transfer of heavy bins for collection and servicing.

The design and operations have been discussed and determined in consultation with SpaceAgency and Builtform projects, planning and traffic consultants, and following a meeting held with the Town of East Fremantle's Planning Services and Waste Services around the proposed management and servicing approach.

The approach to waste management for the "Roofing 2000" development comprises:

- two dual chute systems: one in the residential 'west' and one in the 'east' core buildings for general waste and commingled recycling. The dual chute systems are accessible on each floor in designated waste rooms
- source separated FOGO collection with dedicated smaller receptacles for the collection of mainly food waste in the waste room on each floor that will be collected and emptied into larger FOGO bins for servicing
- two (2) residential bin stores
- one (1) residential bulk waste store
- one (1) commercial bin store
- two (2) temporary bin storage areas for the transfer and servicing of bins on collection days.

The bin stores will be located on the basement level with a temporary bin store area on this level located beside the bin lift. The second temporary bin store is located on the ground floor beside the bin lift for the storage and transport of bins for servicing. The location of bin stores is shown in section 3 and the internal transfer and collection logistics are detailed in section 4.

2.2.1 Bin stores and temporary store / transfer areas

For the purpose of waste management from the development, the residential bin stores, core and floors they service are identified as follows:

- Waste 1:
 - servicing dual chute system from the residential west core levels 3 to 18
 - servicing dual chute system from the residential west and east core for the ground floor and levels 1 and 2
 - servicing FOGO bins from the residential west and east core
 - provision for bulk cardboard recycling
 - provision for charity bin for textiles reuse / recycling
 - space allowed for provision of 240 L mobile recycling bin (MRB) for glass or container deposit scheme (CDS) containers (if required)
- Waste 2:
 - servicing dual chute system from the residential east core levels 3 to 11
 - space allowed for provision of 240 L mobile recycling bin (MRB) for glass or container deposit scheme (CDS) containers (if required)

- Waste 3:
 - servicing of commercial waste and commingled recycling streams
 - provision for source separation and recycling of cardboard, paper, glass, soft plastics and food waste
- Bulk waste:
 - servicing of bulk items for recycling / reuse e.g. appliances, electrical and electronic waste (e-waste)
- Waste 4:
 - Temporary storage and collection for waste and recycling on collection days and to prevent bins causing obstruction to residents / traffic access on collection days
- Waste area on ground level:
 - Temporary storage and collection for waste and recycling on collection days and to facilitate timely and effective servicing of bins and adequate access and space for waste collection vehicles.

2.2.2 Chute system

A dual chute will be installed, in both the 'east' and 'west' cores, to service waste and recycling from the residential apartments. The dual chute systems will terminate in the Waste 1 and Waste 2 residential bin stores and will comprise a chute for general waste that will be compacted (by a factor of 2:1) for collection and a chute for commingled recyclables (uncompacted). Bins beneath the chutes will be stored on a conveyor system. Compacted general waste will be collected in 660 L bins and uncompacted commingled recycling will be collected in 1100 L bins. Commingled recyclables will not be compacted as the broken glass would contaminate other recycling streams.

2.2.3 Bulk items

Where chutes are used for disposal of residential waste, it is recommended that alternative options are available for items that cannot be placed into the chutes.

Provision for 1 x 240 L MRB has been made in each residential bin store to mitigate glass being disposed down chutes and to provide for collection of CDS receptacles (if implemented).

Provision for 1 x 1100 L MRB, in the 'west' residential bin store, has been made for the effective collection and recycling of large and bulky cardboard packaging i.e. from appliances, white goods etc.

A 240 L charity bin will be provided in the 'west' residential bin store to encourage reuse for unwanted clothing and bedding items. With the transient nature of people in multi-unit developments there is a tendency to throw away items of this nature when relocating.

In addition, the 'Bulk waste' provides a storage area for bulk general waste (e.g. umbrellas, mops, etc.) that would otherwise block or damage chutes. This storage area will also include a lockable cage for e-waste. Residents will have access to the bulk waste bin store.

2.2.4 FOGO (food organics, garden organics)

The Town of East Fremantle introduced a FOGO collection service to residents in 2021 to divert food and garden organic waste from landfill. In line with the roll out of FOGO to MUDs (multi-unit developments), the building has been designed to enable source separation and collection of FOGO from each apartment.

The FOGO stream in MUDs will mainly comprise food waste (along with limited small quantities of garden waste). Our understanding is that the Town of East Fremantle supply caddies to residents as part of the implementation of the FOGO service. When caddies are full, residents will transfer the contents to dedicated 40 L collection receptacles / bins located in the waste rooms on each floor. The caddies and 40 L bins must be lined with certified compostable liners.

The caretaker will empty each 40 L receptacle into a larger 140 L MGB two to three times weekly and bring the full 140 L bins to the 'west' residential bin store on the basement level for storage and collection. The FOGO collection service is to be organised on a twice weekly basis to mitigate any potential for odour issues.

Source separated FOGO will be collected by a private service provider and brought to a commercial Organics Recycling Facility for processing into quality recycled organic products.

2.3 Number and type of bins required for development

2.3.1 Residential

The number of bins to be stored in the residential bin stores, Waste 1 and Waste 2, is based on the number of apartments that will be serviced by either the 'east' or 'west' core dual chute system for general waste and commingled recycling and source separation of FOGO by residents.

Table 1 shows the number and type of bins to be stored in Waste 1 and Table 2 shows the number and type of bins to be stored in Waste 2 bin stores. Note that allowance has been made for an additional bin to be placed on the conveyor system in each bin store, for general waste and commingled recycling, when bins are being transferred, temporarily stored and collected for servicing. This is to ensure that there will always be a bin on the conveyor belt to service waste and recyclables from the chute system.

The Bulk Waste room comprises 6 m² to allow for storage and collection of bulky items. These bulk waste items will be placed on the verge by the building caretaker for collection during the Town of East Fremantle's annual verge side collection service. Alternatively, a dedicated recycling service e.g. for e-waste will be organised for the collection of items.

Table 1: Number of bins to be stored in Waste 1 bin store

Residential apartments	Bin size (L)	Number of bins*	Collection frequency
General waste (compacted)*	660	4 (+ 1 spare)	Weekly
Commingled recycling*	1100	4 (+ 1 spare)	Weekly
Bulk glass recycling bin / CDS	240	1	As needed
Large cardboard recycling	1100	1	As needed
Charity bin for clothing/textiles	240	1	As needed
Food and garden organics	140	17	Twice Weekly

Table 2: Number of bins to be stored in Waste 2 bin store

Residential apartments	Bin size (L)	Number of bins	Collection frequency
General waste (compacted)	660	2 (+ 1 spare)	Weekly
Commingled recycling	1100	1 (+ 1 spare)	Weekly
Bulk glass recycling bin	240	1*	Weekly

*Provision for space made if required / CDS implemented

2.3.2 Commercial

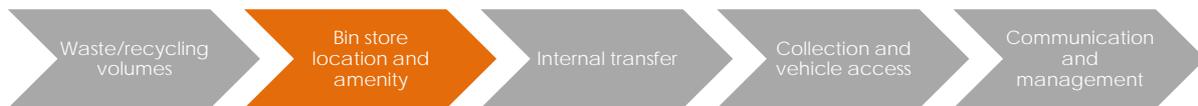
Table 3 shows the number and type of bins to be stored in Waste 3 commercial bin store for (94 m²), gym (93m²) and dining area for residents (81m²). It is assumed that the commercial office tenancies and café will operate five (5) days per week and that the café is mainly take away / reheat style operation.

Table 3: Number of bins to be stored in the commercial bin store

	Bin size (L)	Number of bins	Collection frequency
General waste	1100	2	Weekly
Commingled recycling	1100	1	Fortnightly
Food waste*	140	3	Twice weekly
Paper	240	3	Weekly
Cardboard	1100	1	Weekly
Glass	240	4	Weekly
Soft plastic	240	1	As needed
Grease trap	400	-	As needed

*Will increase if café is open for 6 or 7 days / week. In this circumstance, the collection frequency for waste may need to increase.

3 Bin store location and amenity



3.1 Bin stores and temporary storage / collection areas

The "Roofing 2000" development will comprise 2 residential bin stores, 1 commercial bin store, 2 temporary storage / collection areas and a bulk waste room.

The bin stores and areas, located on the ground floor and basement levels are shown in Figure 1 and Figure 2, as outlined below and refer section 2.2.1 for more detail:

- Waste 1: Residential bin store servicing west core levels 3 to 18, west and east core ground floor and levels one and two on basement level
- Waste 2: Residential bin store servicing east core levels 3 to 11 on basement level
- Waste 3: Commercial bin store on basement level
- Bulk Waste: Bulk waste room on basement level
- Waste 4: Temporary bin store area for transfer / collection of waste on basement level beside the bin lift
- Waste: Temporary bin store area for transfer / collection of waste on ground floor level beside the bin lift.

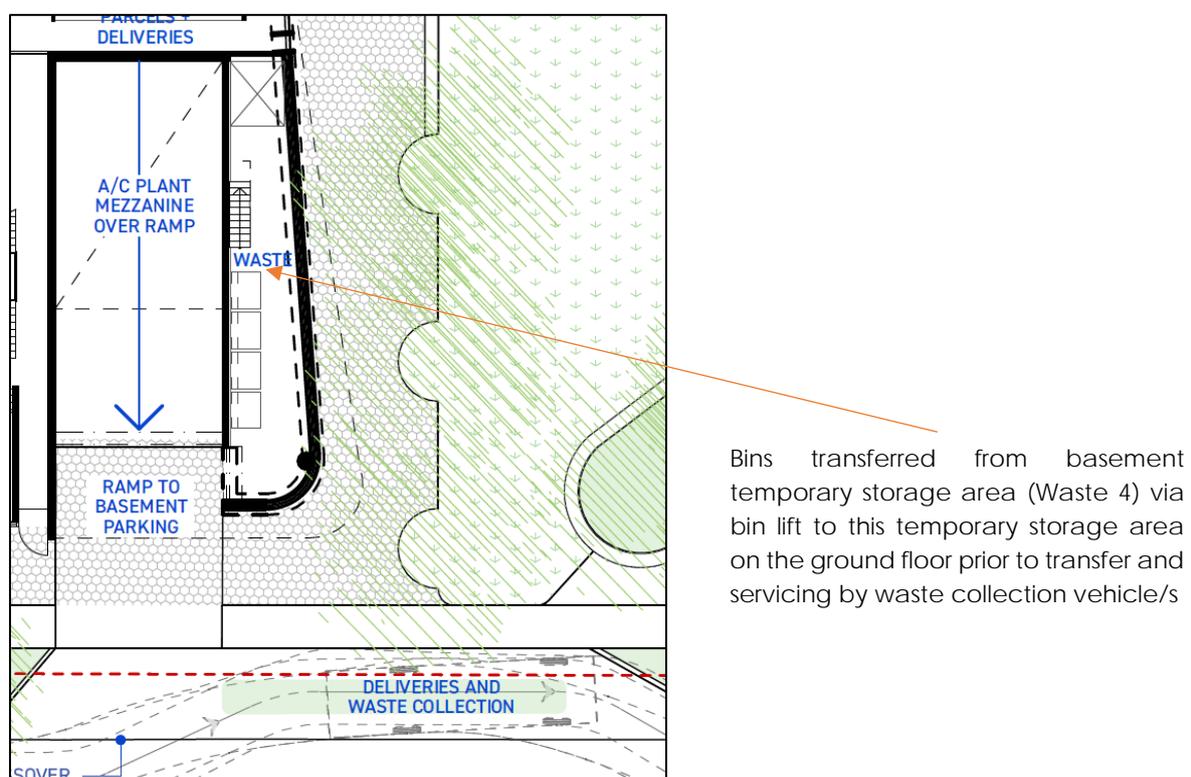


Figure 1: Location of temporary bin storage and transfer area on the ground floor

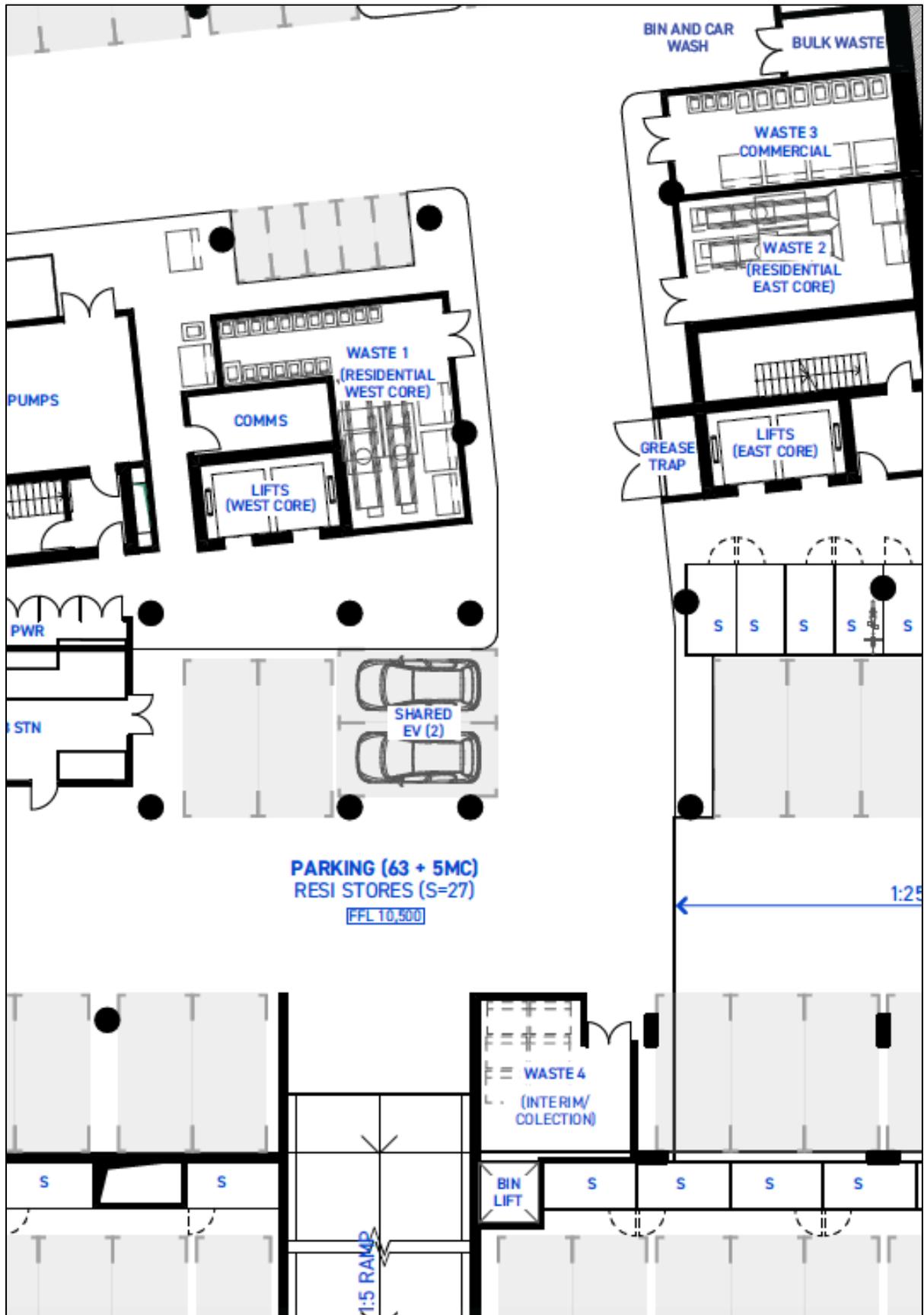


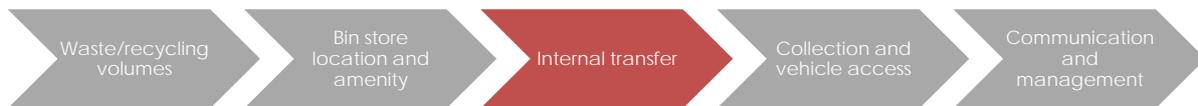
Figure 2: Residential, commercial, bulk waste and temporary bin stores on basement level

3.2 Bin store amenity

Bin Transfer	
Aisle door and lift width:	<p>Stairs and ramps must be avoided in areas where bins will be moved between points of generation, storage and collection.</p> <p>All doors, corridors and lifts on the transfer route must be designed for the largest bin to fit through (at least 1100 mm).</p>
General health and safety:	<p>Waste systems are to be designed to ensure that bins (particularly when full) are not required to be moved over any significant distances, up/down steep ramps (grade of slope <1:14) and definitely avoiding stairs or other potential hazards.</p> <p>A bin lift is to be installed on the basement floor beside Waste 4 to transfer bins from the basement level to the ground floor for collection and servicing.</p> <p>Design includes dedicated temporary storage and transfer areas (Waste on the ground level and Waste 4 on the basement level in Figures 1 and 2 respectively) so that bins do not block access to residents or present a safety risk to residents or traffic.</p> <p>Manual handling of waste in garbage bags is to be excluded from the waste management systems where possible.</p>
Bin store	
Location:	<p>Waste 1, 2 and 3 bin stores and the Bulk Waste bin store are located on the basement level that is convenient for both building users and commercial tenancy staff.</p>
Access	<p>Bins will be transferred from Waste 1, 2 and 3 bin stores on the relevant collection day. Bins will be temporarily stored in Waste 4 on the basement level and then be moved via a bin lift to the temporary waste storage area on the ground floor.</p> <p>The bins will then be moved from the temporary storage area on the ground floor for servicing by the waste collection vehicle on the ground floor level.</p> <p>The waste presentation point is within the property boundary at a specifically designed pull in bay for waste collection (and deliveries) to the building. The pull in bay has been specifically designed to mitigate traffic access to the building by residents (i.e. to the basement / carpark) and to provide room and safe manoeuvrability for the waste collection vehicle.</p>
Spatial Requirements	<p>Sufficient space must be provided to store general waste, commingled recycling, cardboard, glass, soft plastics and FOGO in separate bins.</p> <p>The bins are spaced to allow access to a single row of bins.</p>

Washing bins and waste storage area:	Solid and impervious walls and floors evenly graded to an industrial floor waste (including a charged 'water-trap' connected to sewer or an approved septic system), with a hose cock to enable bins and /or the enclosure to be washed out. 100mm floor waste gully to waste outlet. Both hot and cold mains water supply will be available.
Floors:	The floor should be constructed in concrete in accordance with AS 2870. It should be evenly graded to an industrial floor waste (refer 'Bin wash'). The slab thickness should be a minimum of 100mm, be impervious and have a brush finish treatment.
Bin store walls and ceilings:	All internal walls in bin stores will be cement rendered (solid and impervious) to enable easy cleaning. Ceilings will be finished with a smooth faced, non-absorbent material capable of being easily cleaned. Walls and ceilings will be finished or painted in a light colour.
Vehicle head height clearance:	The design of bin stores will provide for adequate separate ventilation with a system that complies with Australian Standard 1668 (AS1668). The ventilation outlet is not in the vicinity of windows or intake vents associated with other ventilation systems.
Ventilation and odour:	Ventilated roller doors will be specified both internally and externally to enable bins to be easily wheeled into and out of the bin stores. Openings (e.g. doors) should be self-closing, but able to be locked open.
Doors:	Ventilated roller doors will be specified both internally and externally to enable bins to be easily wheeled into and out of the bin stores. Bin stores must be fitted with self-closing doors.
Vermin:	Roller or self-closing doors to the bin store/s will be installed to eliminate access by vermin.
Lighting:	Bin stores will be provided with artificial lighting, sensor or switch controlled both internal/external to the room.
Noise:	Noise is to be minimised to prevent disruption to occupants or neighbours through considering the location of the bin store and collection point and the timing of collections.
Fully Enclosed:	The bin stores will be fully enclosed and only be accessible by residents, tenancy staff and the waste service provider.
Aesthetics:	The bin stores will be consistent with the overall aesthetics of the development.
Signage:	Visual aids and signage will be provided to ensure that the area works as intended.

4 Internal transfer



4.1 Residential

Residents will be responsible for storing waste and recyclables separately within their apartment.

Residents will be responsible for disposing of waste and recycling down the correct chute by using the chute hatches on each level in the waste rooms. Items not suitable for disposing down the chutes, such as cardboard boxes, bulky waste items and clothing/bedding are to be taken down the residents lifts to the residential bin store/s and placed in the correct bin.

Residents will place FOGO collected in caddies into dedicated 40 L receptacles in the waste rooms on each floor. The caretaker will bring up an empty 140 L MGB and empty the contents of the 40 L receptacles into the 140 L bin. Once the FOGO bin is full, it will be brought down to Waste 1 residential bin store.

The communication of the chute system, FOGO and bulk bins will be incorporated into the ongoing communication to residents as part of the education for the successful performance of a chute system for the apartments.

4.2 Commercial

Cleaners will transfer waste from the commercial office tenancies, gym and dining area and café staff and / or cleaners will transfer waste from the café to the Waste 3 commercial bin store.

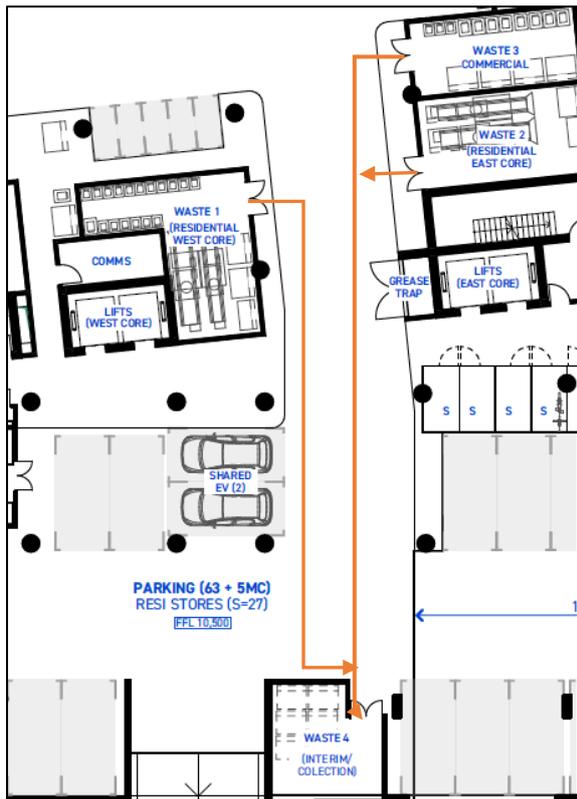
4.3 Transfer of bins for collection

On the relevant collection day, the caretaker or a private waste service provider will transfer residential bins and / or commercial bins from Waste 1, 2 and / or 3 bin stores on the basement level. Bins will be temporarily stored in Waste 4 on the basement level and then be moved via a bin lift to the temporary waste storage area on the ground floor.

The bins will then be moved from the temporary storage area on the ground floor for servicing by the waste collection vehicle on the ground floor level.

The waste presentation point is within the property boundary at a specifically designed pull in bay for waste collection for the building. The pull in bay has been designed to ensure consistent traffic access to the building by residents (i.e. to the basement / car park) and to provide room and safe manoeuvrability for the waste collection vehicle.

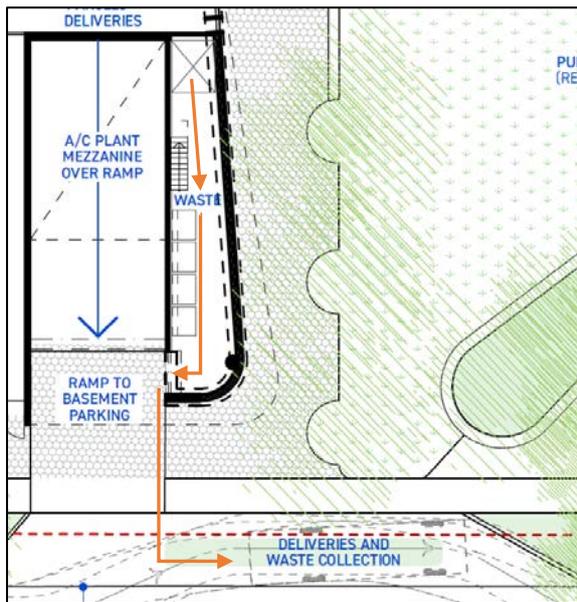
The transfer route for the bins from the bin stores to the temporary storage / transfer areas and waste vehicle collection point is shown in Figure 3.



Waste disposed in bins from chutes or from FOGO collections from residential apartments in Waste 1 and Waste 2

Commercial waste disposed in bins Waste 3

Bins transferred from Waste 1, 2 and / or Waste 3 to Waste 4 for temporary storage on basement level



Bins moved via bin lift from basement to ground floor temporary storage / transfer area

Bins transferred to waste collection point to be serviced by waste collection vehicle/s. Bins then moved back to ground floor temporary storage area via bin lift to Waste 4 and then empty bins replaced in Waste 1, 2 and / or 3 bin stores

Figure 3: Bins transfer route for collection

5 Collection and vehicle access



A private waste service provider will service the full range of residential and commercial bins and the Town of East Fremantle have advised their awareness and agreement on this approach.

A designated pull in bay has been designed to service the bins, located off St. Peter's Road and within the boundary of the property.

The pull in bay has been designed to prevent congestion and to avoid blocking access to the basement for residents, to mitigate amenity aspects by having collection within the property boundary and to provide space and access for large waste collection vehicles.

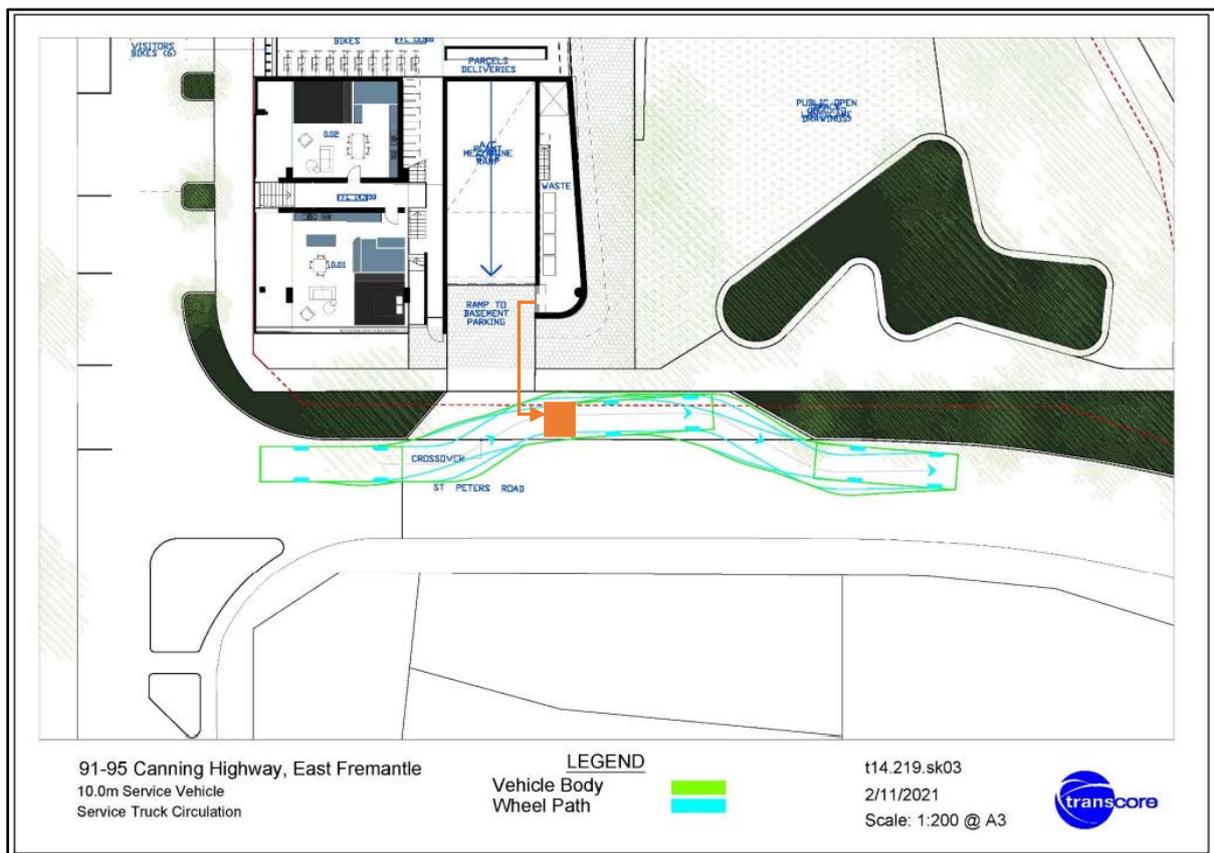


Figure 4: Bin collection and servicing point by waste collection vehicle

6 Ongoing communication and management



6.1 Management

The building caretaker will be responsible for overseeing the waste management systems. The caretaker will be trained and informed about their responsibility to work closely with the service provider regarding the schedule for collection and presentation of bins. The staff member will be responsible for maintaining the bin store in a clean and tidy condition at all times and ensuring bins are washed regularly.

The caretaker will be responsible for rotating full bins at the base of each chute with empty bins. The caretaker will be responsible for ensuring that the chutes do not become dirty or odorous and will be responsible for washing the chutes regularly. Advice from the manufacturers will advise the best way to do this.

6.2 Communication

For the successful performance of a chute system for the apartments, the continuing education of residents on correct segregation of waste and recyclables and usage of the chutes will be an imperative requirement for building management.

Successful education can be achieved through communication formats such as building intranet site, newsletters, noticeboards, social media, etc. This ongoing communication would be in addition to illustrated clear signage (relying on pictures rather than words).