APPENDIX G

Operational Waste Management Plan

Prepared by:

TTM Consulting

Operational Waste Management Plan

Proposed Mixed-Use Development

At 15 Anderson Street, Fortitude Valley

On Behalf of Property Projects Australia Pty Ltd

About TTM

For 30 years, we've been at the centre of the Australian development and infrastructure industry. Our unique combination of acoustics, data, traffic and waste services is fundamental to the success of any architectural or development project.

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Revision Record

No.	Author	Reviewed/Approved	Description	Date
1.	M. Krisanski	S. Kenny	OWMP – Draft	11/07/2022
2.	M. Krisanski	S. Kenny	OWMP – DA Issue	08/09/2022

Executive Summary

This document is an Operational Waste Management Plan (OWMP) developed for proposed Build to Rent / Mixed-Use development to be located at 15 Anderson Street, Fortitude Valley.

The purpose of the OWMP is to provide compliance and design information relating to the handling, storage, and collection of refuse within the proposed development. Compliance relates to the alignment with the relevant sections (2,3 and 4) of the Brisbane City Council's (BCC) Refuse Planning scheme policy and complies with A063. Point 1 and 2 of the Centre Mixed Use Code. The content of the OWMP is written with the purpose of providing a guide for the design, construction and operational phase of the development and therefore may be updated to include detailed information as required for each phase.

A summary of the proposed development and waste management processes are outlined below:

- Proposed equipment:

Aspect	Waste Stream	Bin Requirements	Services Per Week
Build to Rent	General Waste	11 x 1100L *(Inc 1 to remain on equipment)*	3 x Collections per week per stream
	Commingled Recycling	30 x 1100L *(Inc 1 to remain on equipment)*	
Retail - West	General Waste	2 x 1100L	3 x Collections per week per stream
	Commingled Recycling	1 x 1100L	
Retail - East	General Waste	1 x 1100L	3 x Collections per week per stream
	Commingled Recycling	1 x 1100L	

- Refuse collection:
  - Refuse will be collected by a Commercial Contractor.
  - Refuse collection is based on a maximum of 3 days of storage between collections for all refuse streams which equates to 3 collections per week. TTM recommends a maximum of 2 days of storage between servicing where food waste is generated.
  - All refuse collections will occur in the loading bay located adjacent to the Build to Rent bin storeroom on the ground level. The refuse collection vehicles will enter the site in a forwards gear and perform a reversing manoeuvre into loading bay and exit the site in forward gear once the collections service has been performed.

- Refuse storage:

  Build to Rent:

  - Refuse will be stored in bins and equipment located in the refuse room located on the ground level.

  Retail:

  - Refuse will be stored in bins located in 1 of 2 dedicated refuse rooms located on the ground level.

- Refuse transfer:
  - The contractor will collect the bins from each of the bin rooms on ground level and return them after servicing the bins.
  - Building management / staff will be responsible for all bin rotations under the chutes and on equipment.

- Refuse disposal:

  Build to Rent:

  - Receptacle for storage of at least one day worth of waste and recycling will be provided in each apartment. Once full or as required, residents will dispose of refuse materials via the dual chute hoppers located on each level.

  Retail:

  - All commercial tenancies will be equipped with back-of-house bins (usually small caddy bins) for immediate disposal of refuse. During the day or as required staff or cleaners will transfer the refuse materials to the respective refuse room for disposal into the appropriate bins or equipment.

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1 Introduction

1.1. Background

TTM Consulting has been engaged by Property Projects Australia Pty Ltd to prepare an Operational Waste Management Plan to support the mixed-use development located at 15 Anderson Street, Fortitude Valley. It is understood that a development application will be lodged with Brisbane City Council (BCC).

1.2. Scope

The content of this OWMP is intended to provide information in reverse order to the typical movement of waste streams from disposal to collection. The reverse order provides context for refuse collection, storage and transfer. Information on refuse disposal and collection points is given for each use within the development. The recommendations in this report relate to the operational phase of the development only. Additional requirements for refuse management during or after demolition or construction phases are not included and require a dedicated plan.

The items covered within the OWMP are described in Table 1.1. The key information for council approval can be found in Section 2.

Table 1.1: Scope Items

Item	Description
Refuse streams	Identification of refuse streams & anticipated development refuse volumes likely to be produced
Refuse separation	Recommendations for appropriate segregation methods for each refuse stream
Refuse collections	Assessment of refuse collection vehicle (RCV) access and manoeuvring
Refuse storage	Detailed analysis of refuse storage facilities and design
Refuse transfer	Assessment of refuse transfer between refuse storage and collections areas
Refuse disposal	Recommendations for refuse disposal within the development
Refuse management equipment	Identification of recommended and optional refuse management systems and equipment
Refuse management operations	Recommendations for operational efficiency and ongoing management, including refuse minimisation, tenant education and safety
Building design	Recommendations for design of refuse management facilities

Detailed information including refuse calculations, site plans and drawings, recommended refuse management equipment and system specifications, common refuse signage as well as a list of terms and abbreviations are provided in the appendices.

The recommendations in this OWMP relate to the operational phase of the development. Additional requirements for refuse management during or after demolition or construction phases are not included and require a dedicated plan.

The provisions outlined in this OWMP are considered appropriate for this type of development. It is noted that the refuse rooms are suitably sized to accommodate the refuse generated and number of bins proposed based on standard storage and collection methods. The refuse rooms will also accommodate all options for alternate equipment and disposal methods.

1.3. Regulatory Considerations

1.3.1. Council's Refuse Planning Scheme

The plan satisfies BCC's requirements by providing the following information:

- Type and quantity of refuse materials to be generated during the occupancy of the proposed site.
- Refuse collection, storage, transfer and disposal arrangements during occupancy of the completed development.
- Recommended operational requirements for the operational phase of the development, and design requirements for the building and refuse management facilities.

As this development is a residential use site, TTM has referred to BCC requirements as outlined in the Refuse PSP under section 2,3 and 4 as these sections are related to the Residential Uses. Table 1.2 demonstrates the refuse management items addressed to align with BCC's Refuse PSP requirements. This also meets the acceptable outcomes as described with A063.1 and .2 of the 9.3.3 Centre Mixed Use Code.

Table 1.2: OWMP Compliance Checklist

BCC SC6.26 Refuse Planning Scheme Policy		
Item	Requirement	Compliance / Comment
Section 2 – General Requirements		
(1)	A written design proposal for waste collection is to be provided giving full details of the number of refuse bins and the storage and collection areas.	Details provided in this OWMP
(2)	The collection of refuse is to be considered during the planning phase of development. This includes the physical manoeuvring area for the refuse collection vehicle and the bin storage areas and collection points. Access for other road users including pedestrians, cyclists, motorists and other service providers (e.g. postal) is to be maintained.	Considerations provided within this OWMP
(3)	Uses with high trip-end densities provide a transport impact assessment report in accordance with the Transport, access, parking and servicing planning scheme policy with an assessment of refuse storage and collection included.	Traffic Report has been submitted with DA
(4)	The waste collection system is to achieve the following outcomes: a. both the customer and service provider can access the bin storage area and collection point conveniently; b. the location, design and operation of the bin storage and collection system do not have unreasonable adverse acoustic, odour or visual impacts on the development, surrounding properties or the streetscape; c. the supply and servicing of either mobile garbage bins or bulk bins or refuse compactors complies with the requirements of this planning scheme policy.	Complies Complies – Collection service will be undertaken on the site. Complies
Section 3 - Access and Manoeuvrability		
(1)	If refuse collection is from an on-site bin storage area for multiple dwellings or from mobile garbage bins located throughout a development, the pavement/carriageway trafficked by the refuse collection vehicle is a minimum 6.5m wide.	Complies
(2)	For detached dwellings on rear lots, pavements/carriageways trafficked by a refuse collection vehicle have a minimum width of 5.5m.	N/A
(3)	The pavement/carriageway has a minimum crossover width of 6.5m and is free from overhanging gardens or trees.	Complies
(4)	If the collection point is at the kerbside of the internal private road, it is preferred that mobile garbage bins are placed in front of each dwelling. If there are short dead-end streets off the main internal circulating road, sufficient level areas are to be provided	N/A

	beside the main internal circulating road (near the intersection) for a collection point for the mobile garbage bins required for those dwellings.	
(5)	Turning and manoeuvring facilities for refuse collection vehicles are provided to meet design requirements for the vehicles identified in Table 3.	Complies See Traffic report for swept paths.
(6)	Subdivision layouts are to provide for the safe and efficient operation and manoeuvring of a side loading refuse collection vehicle. Layouts that require a refuse collection vehicle to reverse more than two truck lengths are to be avoided. If a temporary turnaround is provided, an easement in favour of BCC for this purpose will be required over any turning area located within private property. The temporary turnaround is to be constructed to a standard that is satisfactory to Council.	N/A
(7)	Adequate lift clearances are provided to overhanging trees and wires in accordance with Table 3.	Complies Min 3.6m clearance is provided.
(8)	For MGB's, if it is necessary to wheel them to a collection point from a bin storage area: (a) the distance does not exceed 50m; (b) for a retirement facility, the distance does not to exceed 25m; (c) the mobile garbage bin transfer path is free of steps or other obstructions and does not exceed a 1:14 grade.	N/A
(9)	In instances where the gradient of the on-site manoeuvring area is greater than 5% (1:20), the pad that the collection vehicle will stand on while accessing refuse bins at the collection point, is to have a maximum gradient of 2% (1:50).	Complies RCV will stand on a flat grade for servicing.
Section 4 - Residential Refuse Collection		
(1)	Residential development is to provide sufficient capacity for 240L of refuse and 240 or 340L of recycling per dwelling, allowing for one collection per week. Note: The recycling rate of 180L/week is accepted by WaRRS as a "non-standard performance solution".	240L / Unit / Week applied for waste and recycling generataion. It should be noted that this is a Build to Rent Development and not a 'residential MUD site'
(2)	Residential development is to utilise kerbside collection where the locations for both the bin storage area and kerbside collection point can be appropriately accommodated in accordance with section 4.1.	N/A – On-site collection provided
(3)	a) On-site collection of bulk bins is provided for development comprising greater than 10 dwellings. b) the development comprises greater than 10 dwellings; or where the road verge is not properly shaped to the standard 1:50 gradient and a minimum of 2.5m wide or where the longitudinal road gradient is greater than 1:10.	On-site Service proposed
(4)	Refuse and recycling collection for a mixed-use development ensures residential and commercial bins are stored separately with separate access to each.	Build to Rent site – however, retail and BtR refuse has been separated
Section 4.1 - Kerbside Collection (MGB's) – Applies to Kerbside Collection		
Section 4.2 – On-site Collection (Bulk Bins) – This section applies to Residential services – BTR Site, however compliance with this section has been provided		
(1)	In accordance with section 4, development will avoid adverse impacts to residents, pedestrians and roads users by limiting the number of collections required per week while ensuring sufficient refuse and recycling capacity is provided to meet the needs of residents. Table 1 provides details of bulk bin volumes and the number of standard 240L kerbside bins their capacity is equivalent to. These are to be used when identifying the required refuse arrangements.	Complies

(2)	The type of refuse service that is to be used (domestic or commercial) is identified, including whether the refuse collection vehicle is to be front loading, side loading or rear loading (sufficient height must be available).	Rear Loading Service proposed
(3)	A written design proposal for waste collection is to be provided, giving full details of the proposed system, bin sizes, number of bins, storage and collection areas, frequency of collection and the refuse collection vehicle size. Table 2 provides the dimensions and types of bulk bins.	Details proposed within this OWMP
(4)	The manoeuvring of the refuse collection vehicle is undertaken in a safe and efficient manner, without detrimental impacts to pedestrian amenity or safety, Council or private infrastructure or the function of the road network.	Complies
(5)	For multiple dwelling developments fronting a local, neighbourhood, district or suburban road, the RCV may enter the site in a reverse gear in a single movement. An onsite dedicated pedestrian route is provided and is separate from the required vehicle manoeuvring area to ensure pedestrian safety is protected. The pedestrian route is to provide access from the site's frontage to the development and will have a minimum width of 1.2m. The refuse collection vehicle is to leave the site in a forward gear.	Complies
(6)	For multiple dwellings developments fronting an arterial road, or where the refuse collection vehicle cannot reverse onto the site in a single movement, the refuse collection vehicle must enter and leave the site in a forward gear.	N/A
(7)	All entry and exit points are of a width and design that allows for sufficient ingress and egress for the refuse collection vehicle including a 6.5m crossover.	Complies
(8)	To maximise safety, the distance required for refuse collection vehicles to reverse on-site is minimised. Where on-site turnaround of the refuse vehicle cannot be achieved, the bin storage area and collection point is located within 30m of the street frontage.	Complies
(9)	Access for a refuse collection vehicle to the collection point is maintained at all times.	Complies
(10)	The required vertical and horizontal clearances are provided for the service to operate safely and efficiently. Operational clearance dimensions are shown in Table 3 for various types of collection arrangements.	Complies
(11)	Bulk bins of 1.1m³ or less are positioned so that collection personnel do not have to move them more than 5m. If a gradient is evident, speed bumps are provided to stop bulk bins from rolling away from the collection point.	Loading Area is within 5m of storage point. Impoissible to align all bins within 5m of the RCV.
(12)	Bulk bins of 1.5m³ or more are positioned so that front-lift refuse vehicles can drive directly to the container without relocating the bulk bin. If this cannot be achieved due to physical constraints, then the bulk bins are not moved more than 3m from the storage to the collection point.	N/A – Rear lift bins proposed
(13)	The storage areas for bulk bins are: (a) contained in an enclosure or room of sufficient size for the bulk bin quantity required; (b) easily accessible for residents and for the required servicing of bins; (c) screened from neighbouring properties for odour, amenity and noise; (d) protected from the environment; (e) provided with natural or temperature-controlled ventilation if in an enclosed room; (f) kept clear of obstructions, such as fixed bay separators, that impede the ability to change from existing bin sizes or which otherwise limit future refuse collection options; (g) kept clear of other amenities such as air-conditioning units, hot water systems or electrical hubs where located in a bin room.	Complies
(14)	If a refuse or recycling chute is provided: (a) it is to be constructed to allow refuse to fall into the centre of the bin; (b) it is to have a door / lid to ensure clean changeover of bins; (c) separate chutes and bulk bins are to be used for each waste stream;	Complies – Dual Chute system propsed. Barrier around equipment is provided

	(d) the room containing the chute and bin or compactor excludes all but authorised personnel.	
(15)	Environmental best practices may also include the installation of a trapped waste connection to the sewer system and providing a roof canopy over the designated storage area.	Complies
Section 5 – Non-Residential Refuse Collection – N/A Residential Site		
(1)	The requirements for refuse bins or refuse compactors for non-residential development will be assessed case by case, based on the type and amount of waste generated by the development, which is dependent on the operational activities of the development.	Complies
(2)	Sufficient information is provided to demonstrate that refuse collection can occur in an efficient and safe manner on site without adverse impact on amenity (acoustic, odour or visual impacts) and pedestrian and vehicular traffic.	Complies
(3)	This information may include evidence from a refuse collection contractor to demonstrate that collection will occur outside normal service/delivery or business times, where seeking permission to allow a refuse collection vehicle to use service bays or parking spaces on the site for access.	N/A
(4)	If proposing to use clearances less than the minimum vertical clearances in Table 3, a written confirmation from the proposed waste collection contractor giving full details of the proposed system, bin sizes, number of bins, frequency of collection and the refuse collection vehicle size is to be provided.	N/A – Design Vehicle proposed meets minimal vertical clearances in Table 3
(5)	If the gross floor area of a freestanding food and drink outlet, shop or office is less than 200sqm a dedicated service bay is not required for a refuse collection vehicle.	N/A
(6)	Provision is made for on-site refuse collection for Short-term accommodation if an accommodation hotel or motel.	N/A
(7)	Where disposal of industrial or commercial liquid waste by discharge to a road tanker, the road tanker is to be wholly on-site during collection.	Complies
(8)	The storage areas for industrial bins are to be either within a building or enclosure.	Complies

1.4. Site Location

The site is located at 15 Anderson Street, Fortitude Valley, as shown in Figure 1.1. The property is described as Lot 10 on SP208752. The site is located on the northern side of Anderson Street. All vehicular access will be from Anderson or Costin Street.

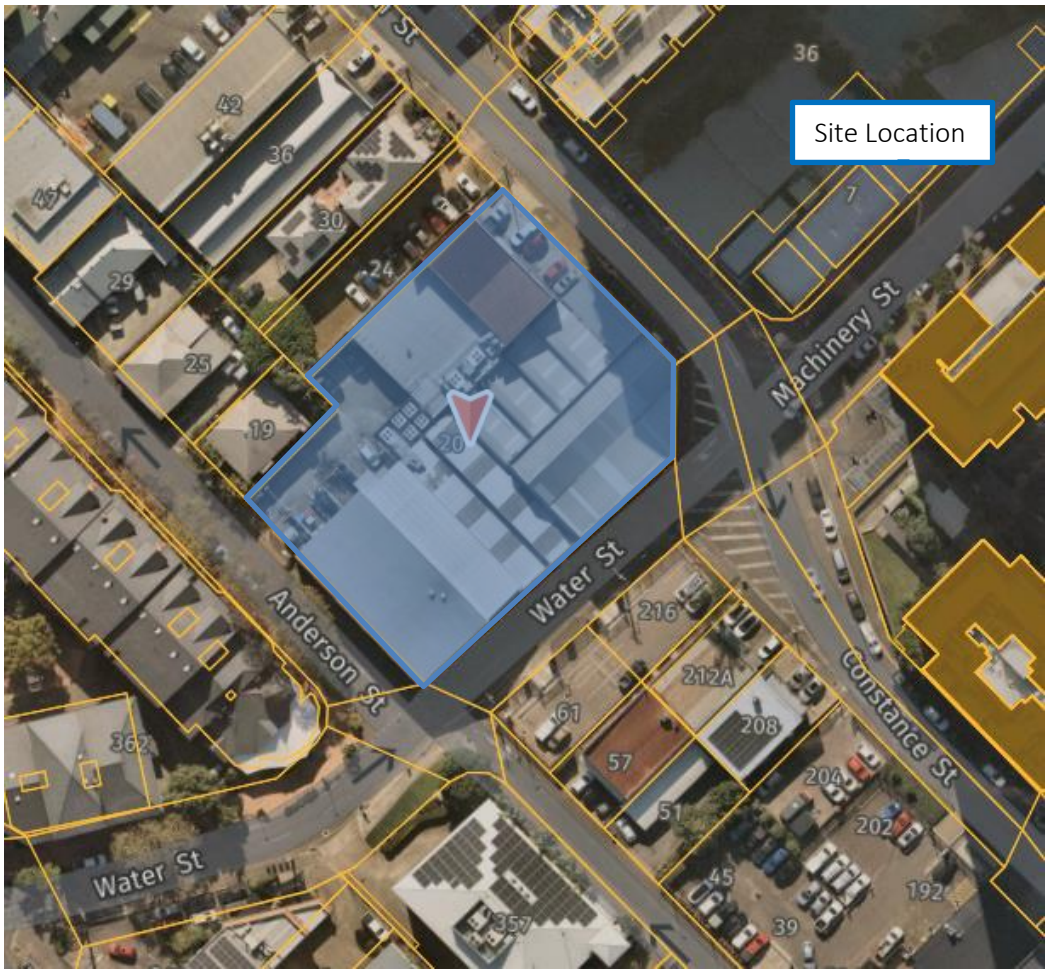


Figure 1.1: Site Location
Source: Nearmaps Imagery 22/06/22

1.5. Development Summary

The proposed development is a 25-storey building comprising of basement and 3 levels of podium parking and 20 levels of Build to Rent apartments and a ground level with retail outlets. Table 1.3 provides a summary of the development in relation to refuse generating areas for use with the refuse calculations provided in Section 2.1

Table 1.3: Development Summary

Aspect	Description	Measure
Build to Rent	Units	400
Retail – West	GFA (m^2)	143m^2
		82m^2
Retail - East	GFA (m^2)	118m^2

2 Refuse Management

This section provides the detailed refuse calculations and describes the arrangements for the collection, storage, transfer and disposal of refuse within the development. This includes associated bin quantities, storage capacities, equipment details, collection frequencies and site access details.

2.1. Refuse Calculations

The generation rates and service frequency used for the calculation of build to rent and retail refuse produced have been applied based on rates required by Brisbane City Council. It should be noted that these rates are not published, or audit verified for accuracy, these are the only rates being accepted by Brisbane City Council WaRRS Team.

Table 2.1: BCC Generation Rates

Type	Measure	General Waste	Combined Recycling*
Built To Rent	L / Unit / Week	240	240
Retail <150m^2	L / 100m^2 / Day	300	200

Table 2.2: Refuse Calculations

Compaction is being applied to the general waste stream only. The compaction ratio of 3:1 has been used as set by BCC.

Level	Measure	Quantity	General Waste L/Week	Comingle Recycling L/Week
All Levels	Units	400	96,000	96,000
Total Weekly Volumes (L / Week)			**32,00**	**96,00**
Volumes per Collection (L / Collection)			**10,667**	**32,000**
Collection and Equipment Details	Collections per Week		3	3
	Storage Capacity		3 Days	3 Days
	Equipment Size		1100L	1100L
	Equipment Quantity Required		10	29

Table 2.3: Refuse Calculations – Retail West

Aspect	Measure	Quantity	General Waste L/Week	Comingle Recycling L/Week
Retail – West	GFA (m^2)	143	3,003	2,002
	GFA (m^2)	82	1,722	1,148
Total Weekly Volumes (L / Week)			**4,725**	**3,150**
Volumes per Collection (L / Collection)			**2,025**	**1,350**
Collection and Equipment Details	Collections per Week		3	3
	Storage Capacity		3 Days	3 Days
	Equipment Size		1100L	1100L
	Equipment Quantity Required		2	1

Table 2.4: Refuse Calculations – Retail East

Aspect	Measure	Quantity	General Waste L/Week	Comingle Recycling L/Week
Retail – West	GFA (m^2)	118	2,478	1,652
Total Weekly Volumes (L / Week)			**2,478**	**1,652**
Volumes per Collection (L / Collection)			**1,062**	**708**
Collection and Equipment Details	Collections per Week		3	3
	Storage Capacity		3 Days	3 Days
	Equipment Size		1100L	1100L
	Equipment Quantity Required		1	1

2.2. Refuse Bins and Equipment Requirements

Table 2.5 and Table 2.6 below outlines the number of bins and additional equipment required for the development. As waste volumes may vary according to the development occupants' attitudes to waste disposal and recycling, bin numbers and sizes may need to be altered to suit the building operation. The table shows the maximum number of bins and equipment expected.

Table 2.5: Bin Requirements

Component	Refuse Stream	Bin / Equipment - Type or Size	Bins Required
Build to Rent	General Waste	1100L	11
	Commingled Recycling	1100L	30
Retail – West	General Waste	1100L	2
	Commingled Recycling	1100L	1
Retail – East	General Waste	1100L	1
	Commingled Recycling	1100L	1

Table 2.6: Additional Equipment

Component	Description	Quantity	Notes
Build to Rent	Dual Refuse Chute	1	See Appendix B.2 and B.3.
	Bin Rotation System – 4 x 1100L bin with waste compaction unit	1	See Appendix B.2 and B.3.
	Bin Rotation System – 4 x 1100L bin	1	See Appendix B.2 and B.3.

2.3. Refuse Room Requirements

All refuse will be stored within the refuse rooms located on ground level for everyday use. Bins will be presented within the respective refuse rooms for collection.

The refuse rooms are sufficiently sized to accommodate all of the bins and equipment required as provided in Table 2.5 and Table 2.6. Figure 2.1 to Figure 2.3, below shows a potential configuration for the refuse room. The configuration and size of the refuse room is provided to ensure the majority of bins are accessible or easily rotated.

The refuse area also has the following features in order to minimise odours, deter vermin, protect surrounding areas, and make it a user-friendly and safe area:

- Doors wide enough to allow for the easy removal of the largest container to be stored.
- Adequate artificial lighting.
- Not located adjacent to or within any habitable portion of a building or place used in connection with food preparation (including food storage).
- Permits unobstructed access for removal of the containers to the service point.
- Does not have any steps or lips.
- Is enclosed on all sides except for the gated entrance to ensure bins are not visible from a public place, neighbouring properties, passing vehicles or pedestrian traffic external to the site.
- Is of sufficient size to accommodate the bins with sufficient clearance around the combined bin area.
- Is positioned away from entrances to shops or residential premises.
- The height of the bin storage area allows for waste bins to be opened and closed.
- The floors to be graded to fall to a drainage point.
- Drainage points connected to sewer in accordance with trade waste requirements.
- A hose cock provided inside the room for cleaning bins and the rooms.
- The walls, ceilings, floors and equipment are to be designed and constructed of impervious material with a smooth finish to allow for easy cleaning.
- Is designed to minimise their visual impact on the surrounding areas.
- Is naturally or mechanically ventilated.

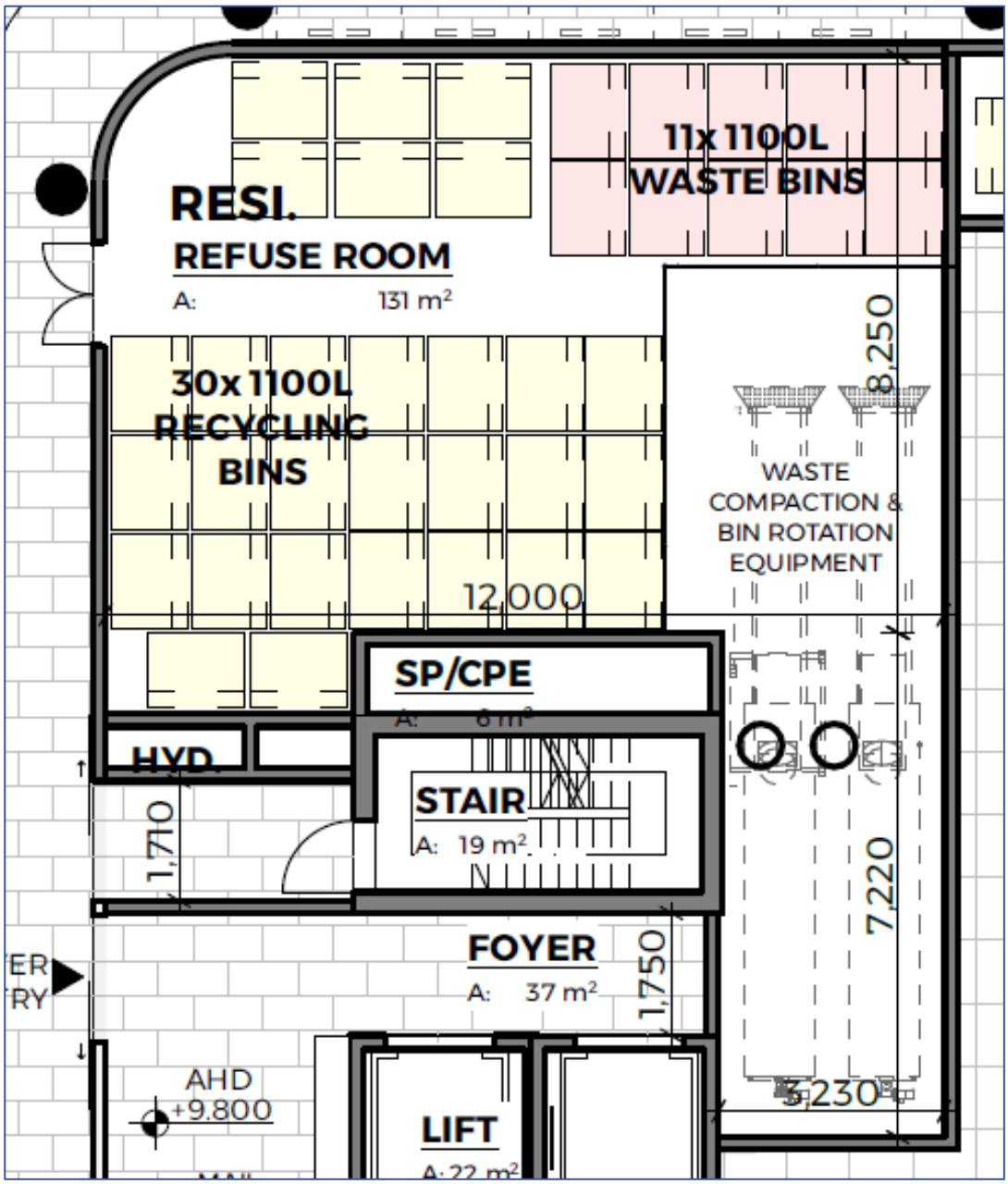


Figure 2.1: Refuse Room Layout – Build to Rent

Source: Telha Clarke, Project: 15 Anderson Street, Drawing: TP100, Rev: DA.01, Date: 04/08/2022, Plan: Ground Floor

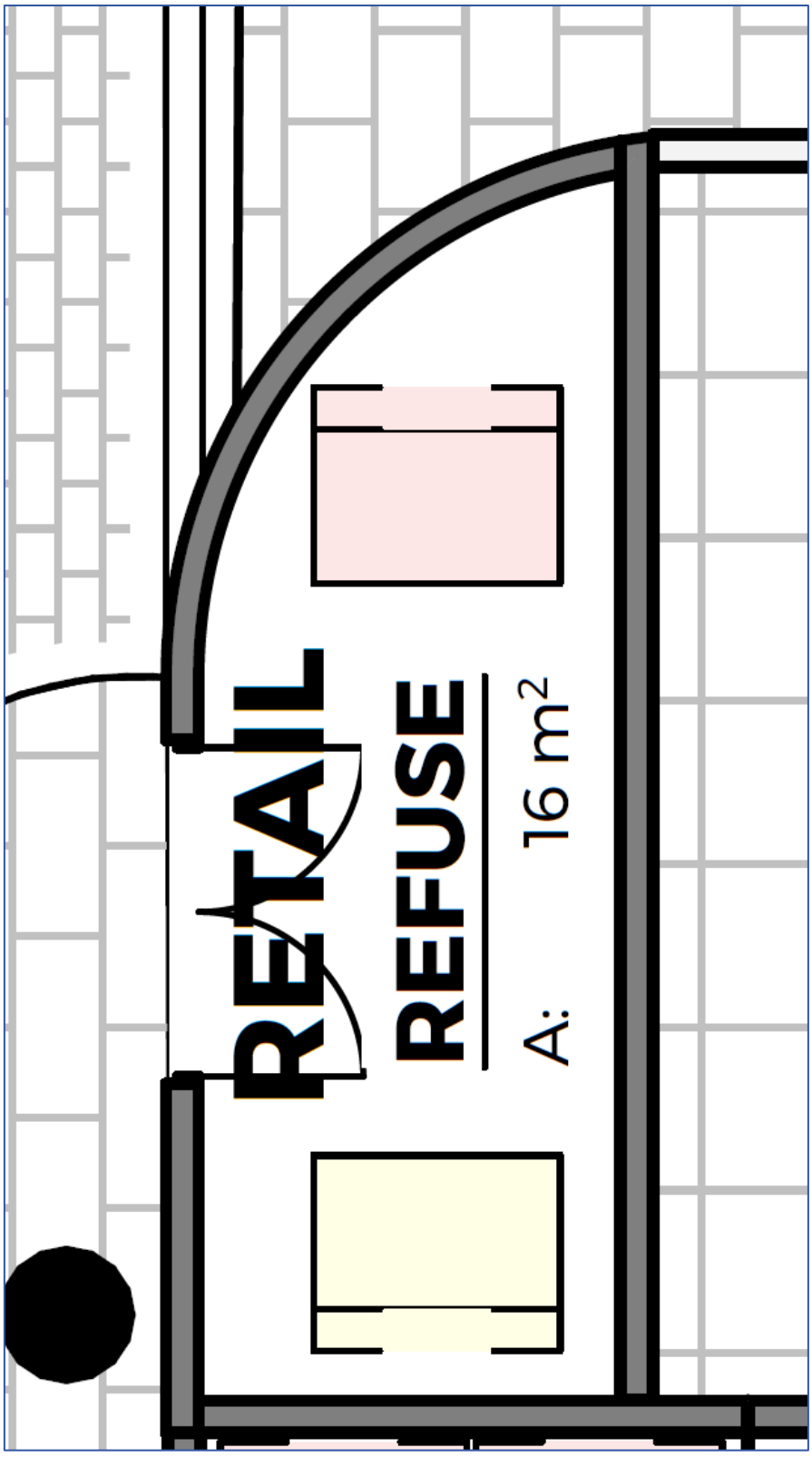


Figure 2.2: Refuse Room Layout – Retail East
Source: Telha Clarke, Project: 15 Anderson Street, Drawing: TP100, Rev: DA.01, Date: 04/08/2022, Plan: Ground Floor

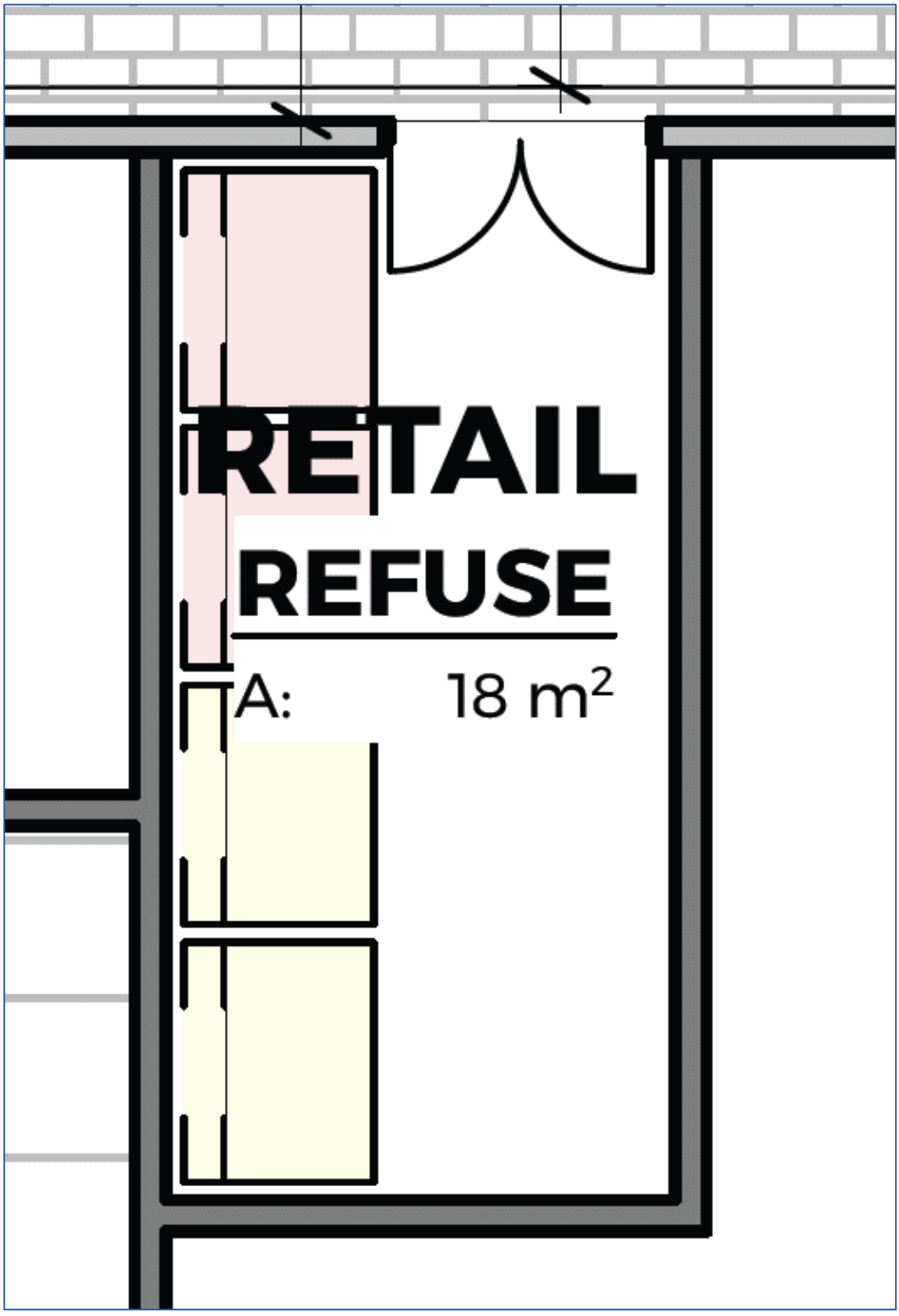


Figure 2.3: Refuse Room Layout – Retail West
Source: Telha Clarke, Project: 15 Anderson Street, Drawing: TP100, Rev: DA.01, Date: 04/08/2022, Plan: Ground Floor

2.4. Refuse Transfer

Prior to the collection service, building management staff / cleaners will be required to remove all required bins from the equipment and present them in the bin room ready for collection.

All other bin transfers will be completed by the collection contractor, who will collect the bins from the designated bin room and bring them to the RCV for collection and return all bins to the bin room once the service has been performed.

The refuse transfer path has been designed to allow for:

- The bins to be transferred via hard stand pathway.
- Allows bins to be easily manoeuvred.
- Does not impede traffic flow.
- Does not extend through any habitable parts of a building or food premises.
- Does not have any lips, stairs or steps for bins to be manoeuvred easily.

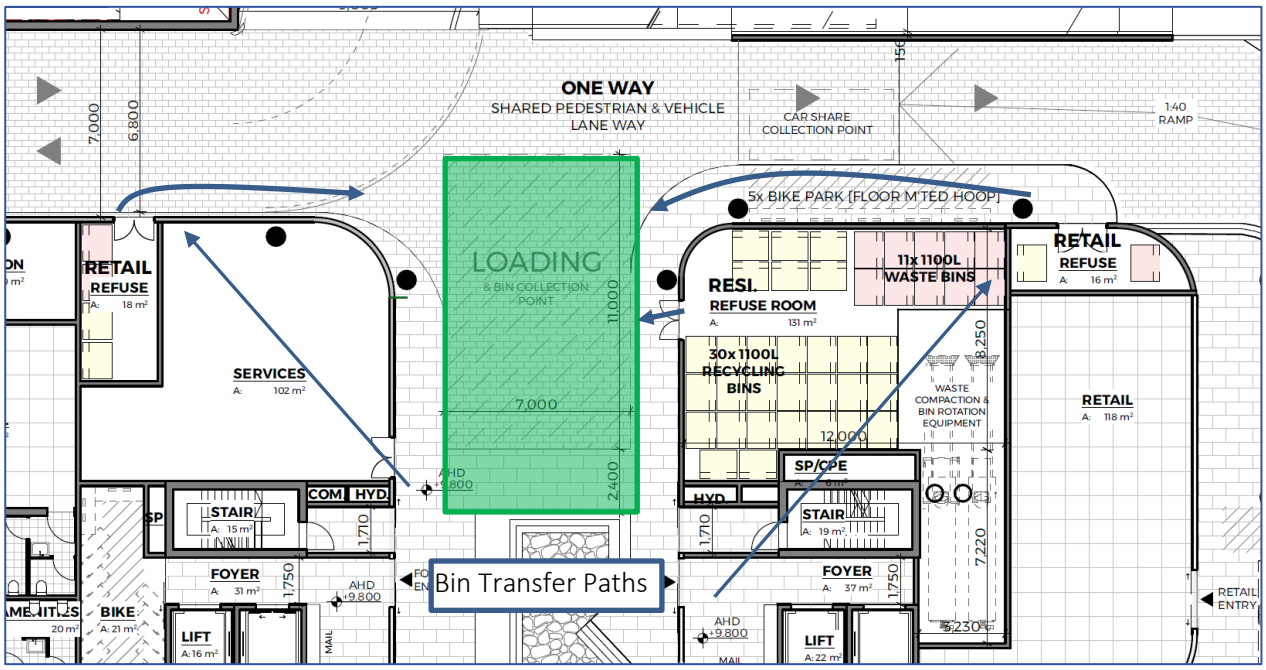


Figure 2.4: Bin Room and Servicing Area

Source: Telha Clarke, Project: 15 Anderson Street, Drawing: TP100, Rev: DA.01, Date: 04/08/2022, Plan: Ground Floor

It is important to note that Section 5 of the Refuse PSP (Non-residential refuse) does not reference transfer distances, which is specifically stated in Section 4.2.11, under 'residential refuse collection'. It is also pertinent to acknowledge that BCC WaRRS have previously advised/agreed with TTM on several occasions during discussions that private contractors can transfer longer distances than the 5m requirement indicated in Section 4.2.11 for residential collections. Further to this, commercial contractors perform a safety and risk assessment once the site is constructed (prior to operation), and a 5m, 20m or even 50m transfer distance does not determine if it is safe or not.

2.5. RCV Arrangements and Bin Servicing Areas

RCV's will enter the site via Costin Street and perform a reverse manoeuvre into the loading bay. Once the collection has been performed the RCV will exit the site in a forward's gear via Anderson Street.

All refuse will be collected directly from the designated bin rooms located on the ground floor. Once the bins have been serviced, they will be returned to the respective refuse room by the contractor ready for use by the building tenants / occupants.

The type of vehicles allocated, and demand will be subject to final design and potential selection of volume reduction equipment.

For the residential collection, the collection days and frequency are decided upon by BCC personnel prior to opening after the completion of an inspection.

For the commercial collection, the collection days and frequency form a part of the contract between building management and the preferred contractor and is agreed to based on both the building and contractors' business requirements.

As the development is within the DA stage, no contract has been entered into with a private contractor. Any contractor letter required from council should be conditioned to be provided after construction and prior to the operation of the building.

For compliance with BCC WaRRS, a rear-lift vehicle, as specified in table 3 of the refuse PSP, has been used as the design vehicle for the operational clearances.

The bin servicing area / loading bay has been designed with the following features:

- Has sufficient access and clearance for the waste and recycling collection vehicles to service the bins, including no overhead obstructions.
- Allows bins to be serviced safely while minimising the impediment to vehicle movements during servicing.
- Is clearly separated from car parking bays, footpaths and pedestrian access.
- Is devoid of stairs, lips or ramps and allows bins to be manoeuvred easily.
- Does not block the entry and exit to the property.
- Is not adjacent to a kitchen or eating area for public use.
- Is over 5m from any door, window or fresh air intake within the development or any adjoining site.
- Is screened sufficiently to minimise the view of bins from neighbouring properties or passing vehicles and pedestrian traffic external to the site.
- Is positioned away from entrances to shops or residential premises.

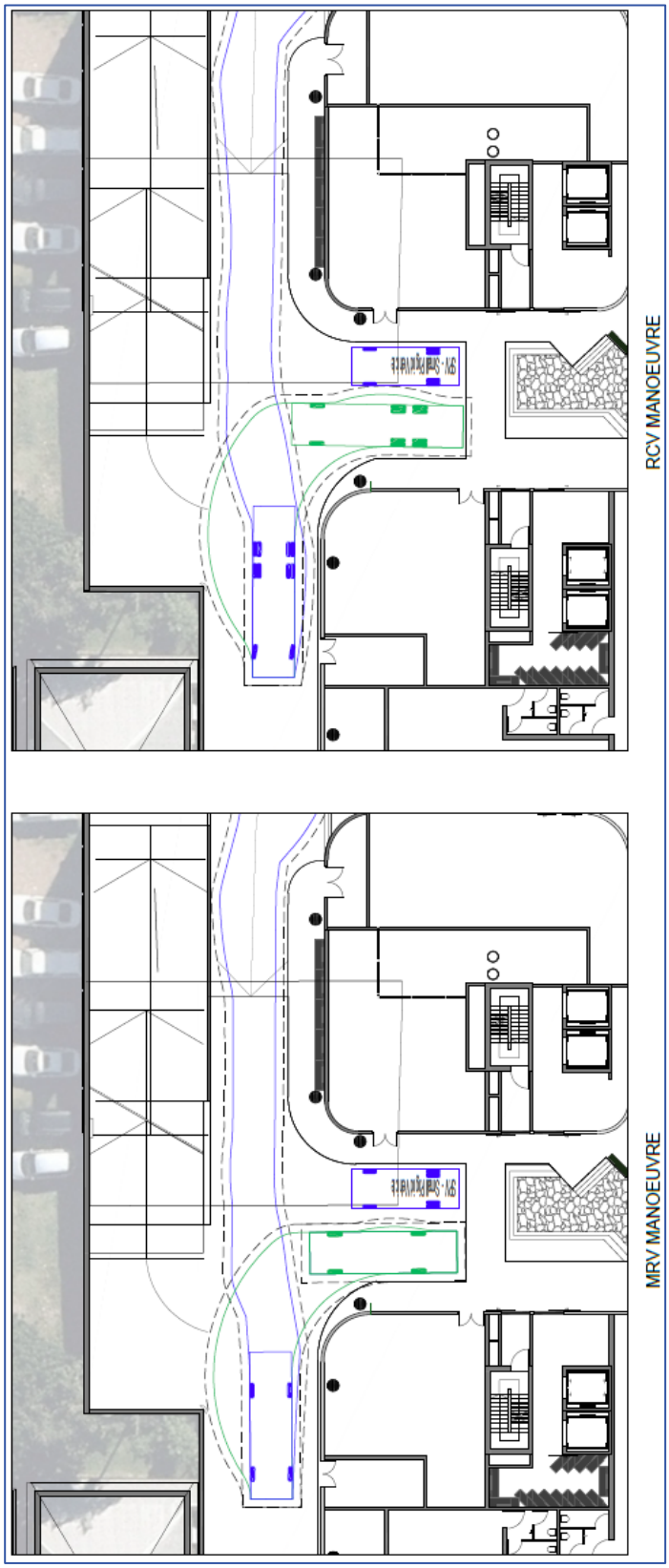


Figure 2.5: Swept Path

Source: TTM Consulting, Project: 15 Anderson Street, Drawing: 21BRT0794-05, Rev: A, Dated: 09/09/22

3 Recommended Operational Requirements

3.1. Refuse Disposal

The tables in this section summarise general recommended disposal arrangements for frequently generated and infrequently generated refuse for each use within the development. Section 3.1.1.1 describes the frequently generated refuse streams that are generated in high volumes for any given period and require significant capacity for storage prior to collections. Section 3.1.2 describes the infrequently generated refuse streams that are generated in relatively low volumes, and where minimal provision for storage can be easily managed by collection frequency.

3.1.1.1. Residential Refuse

Bins will be provided for each tenancy. After each day of operation or as required, refuse will be transferred by staff / cleaners to the refuse room and decanted into the appropriate bulk bins. Further details are provided in Table 3.1.

Table 3.1: Disposal of Waste – Build to Rent

Refuse Stream	Disposal Details
WASTE	
General Waste	Waste bins should always be lined with bags and the bags tied before removal. General waste should weigh approximately 3 kg or less. Waste bins should be accompanied by a commingled recycling bin in order to facilitate separation of general waste and recycling (see below). Residential Apartments Residents will have receptacles within their individual units for collection and storage of at least one day of general waste. Bins are typically placed under the kitchen sink. Additional bins can be placed in other areas as required. Once full or when required residents will dispose of their waste materials via the waste chute hopper located on each residential level.
Organic (Food) Waste - Optional	Separating organic or food waste from general waste may be considered to reduce the total amount of general waste produced. Apartment style equipment such as organic household composter or worm farms are available for use where practical and space allows. Composting should be arranged with the building management. Refer to Appendix B.2 and B.4 for options.
RECYCLING	
Residential Comingled, including • glass • aluminum • steel cans • tins • cardboard • semi rigid plastics	Items for recycling must not be bagged and disposed in loose form. Residential Apartments Residents will have receptacles within their individual units for collection and storage of at least one day of recycling. Recycling bins are typically placed under the kitchen sink next to the general waste bin. Additional recycling bins can be placed in other areas as required. Once full residents will dispose of their recycling materials via the recycling chute hopper located on each residential level. Recycling bins will usually be used for all recycling materials (commingled recycling). Residents are encouraged to make use of the container refund scheme and separate eligible containers from the commingled recycling material (see below).
	Container deposit / refund schemes are currently in place in Queensland. Various models exist including bottle return facilities and (automated) reverse vending machines. Occupants should be encouraged to separate containers that qualify for the schemes from the waste or recycling streams, and send back to a return points. Storage space or dedicated bins within the units or refuse rooms can be provided. For the proposed developments, consideration should be given to placement of a reverse vending machine on site for disposal.

Table 3.2: Disposal of Waste – Retail

Refuse Stream	Disposal Details
WASTE	
General Waste	Depending on the type of operations of the individual tenancies, different wastes may be produced. Waste bins should always be lined with bags and the bags tied before removal. Waste bins should be accompanied by a recycling bin in order to facilitate separation of general waste and recycling. Retail Tenancies General waste from retail outlets will be captured by bins typically ranging in size from 30L to 80L that will be placed within the kitchen or back-of-house area to meet the design or layout criteria of the operators. Once full / at designated times throughout the day, staff / cleaners will transfer the waste materials directly to the respective refuse room for disposal into the provided waste bins
Organic (Food) Waste - Optional	Separating organic or food waste from general waste is recommended to reduce the total amount of general waste produced. Depending on the amount of food waste expected and type of equipment used, food waste separation can occur under one of the following scenarios: 1. 120L bins can be used in retail and food and beverage outlets for disposal of food waste if required. The bins are then transferred to the refuse room for collection. Smaller bins of 120L or 60L caddy bins can be used and decanted into 660L bins in the refuse room. A purpose-built trolley should be used to transfer caddy bins. 2. Benchtop style equipment (ie organic household composter or worm farms) can be utilised where practical and space allows, e.g. commercial offices. Composting should be arranged with building management.
RECYCLING	
Commercial Comingled, including • glass • aluminum • steel cans • tins • cardboard • semi rigid plastics	Depending on the type of operations of the individual tenancies, different recycling materials may be produced. Items for recycling must not be bagged and disposed in loose form. This can be done by decanting the materials from the individual receptacles into a larger container / bin on a trolley for transport to the refuse room. Retail Tenancies Commingled recycling from retail outlets can be captured by bins up to 120L that will be placed within the kitchen or back-of-house area to meet the design or layout criteria operators. Once full / at designated times throughout the day, staff / cleaners will transfer the waste materials directly to the respective refuse room for disposal into the provided recycling bins.
	Container deposit / refund schemes are currently in place in Queensland. Various models exist including bottle return facilities and (automated) reverse vending machines. Occupants should be encouraged to separate containers that qualify for the schemes from the waste or recycling streams, and send back to a return points. Storage space or dedicated bins within the units or refuse rooms can be provided. For the proposed developments, consideration should be given to placement of a reverse vending machine on site for disposal.

3.1.2. Infrequent Waste

Table 3.3: Disposal of Infrequently Generated Waste

Refuse Stream	Disposal Details
Green Waste	Green waste is not typically produced from this type of development other than from surrounding landscaped areas or potted plants. Green waste is usually removed by the designated maintenance contractor. The engaged contractor will be required to send this material to a composting or resource recovery facility rather than to a landfill if locally available.
Hard Waste / Bulky Goods	Hard waste may be stored in a designated room which should be located on the loading dock level. Alternatively, collections can be coordinated, and hard waste / bulky goods moved to the loading dock or a designated area for removal prior to collection. When storing bulky goods in a loading dock, it is recommended that items are placed on a pallet for easy loading via a pallet jack or forklift onto the RCV.
Hazardous Waste (paints, batteries and cartridges) **Electronic Waste**	Where applicable, occupants usually make their own arrangements for the disposal of 25pecialized or hazardous waste and electronic waste such as recycling of toner cartridges and batteries. Please refer to BCC and QLD government websites for disposal options. It is an expectation that the building management assist with disposal of hazardous, electronic or liquid waste and any paint or chemicals as required and requested. Hazardous waste must be handled with due care, separated and securely stored for collection by a specialist waste contractor. Please refer to local BCC and QLD government websites for further information.

3.2. On-going Management

The tables below are not assessable as part of the development application, instead for the demonstration of required tasks during the operational phase of the development and therefore intentionally left blank.

Responsibilities have to be assigned for all on-going refuse management operations. This is generally done by a building manager, staff and / or cleaners. The following lists (Table 3.4 to Table 3.10) are designed to help managing responsibilities and monitor the refuse operations in order to maintain efficient services and a safe environment.

Table 3.4: General Refuse Management Checklist

Objectives	Checked	Remarks
Organising of weekly pick-ups for all refuse streams.		Liaise with private contractors and BCC as required.
Managing daily bin transfers between refuse storage / collection areas if required.		
Check bin fill levels and rotate / swap bins as required		

3.2.1. Safety

Transferring refuse bins and using refuse management equipment are considered hazardous tasks. Therefore, contractors must ensure that a full risk assessment of equipment, surfaces and related gradients is complete. The contractor must provide procedural documentation to appropriate personnel prior to delivery of equipment and occupancy of the development.

Table 3.5: Safety Checklist

Objectives	Checked	Remarks
Abiding by all relevant occupational health and safety legislation, regulations and guidelines to ensure site safety for residents, visitors, staff and contractors.		
Assessment of any manual handling risks and preparation of a manual handling control plan for waste and bin transfers.		
Provision of equipment manuals, training, health and safety procedures, risk assessments and personal protective equipment to staff / contractors in order to control hazards associated with all waste management activities.		

3.2.2. Signage

All receptacles, bins and other refuse management equipment will have adequate signage. Standard signage will be provided in and around waste collection and storage areas (see Appendix C).

Table 3.6: Signage Checklist

Objectives	Checked	Remarks
Ensuring compliance of signage with government local council regulations.		Use signage provided by BCC if available
Ensuring that labelling on bins, refuse room etc. is appropriate and clear and easy to read and updated if required.		

3.2.3. Cleaning and Maintenance

Regular cleaning and maintenance of all refuse management facilities is important to maintain a safe and hygienic environment for residents, visitors, staff and contractors.

Table 3.7: Cleaning and Maintenance Checklist

Objectives	Checked	Remarks
General cleaning of all refuse holding and transfer areas including • Refuse bins, rooms and storage areas • Refuse transfer areas including lifts and staircases • Any other refuse management equipment		Frequency depends on refuse generation and building operation.
Coordination of specialised cleaning contractors as required.		
Maintenance and servicing of refuse management equipment as per schedule.		Frequency depends on equipment and building operation.
Coordination of specialised equipment contractors as required.		

3.2.4. Refuse Minimisation

Refuse minimisation is an important part of any site operation. At a minimum, the following should be implemented. Additional refuse minimisation options can be found in Appendix B.

Refuse minimisation requires regular reviewing to ensure operational sustainability of refuse volumes, equipment and economic feasibility. It is recommended that refuse weights and movements are noted and reviewed. An external review is usually conducted 12 to 18 months after the implementation of the plan.

Table 3.8: Refuse Minimisation Checklist

Objectives	Checked	Remarks
Regular review of material quantities to avoid over-ordering.		
Consideration of secondary and recycled materials where possible.		
Encouraging refuse minimisation through education and signage (see below).		
Reduce refuse through continuous monitoring and review (see below).		

3.2.5. Education and Communication

On-going education is important to ensure people continue to use the facilities as originally intended. All body corporate and leasing contracts should contain clauses pertaining to waste management arrangements and use of any associated equipment.

Table 3.9: Education and Communication Checklist

Objectives	Checked	Remarks
Communication of refuse management arrangements to residents, staff and contractors as required.		
Consideration of promotional opportunities for any successes e.g. awards programs.		

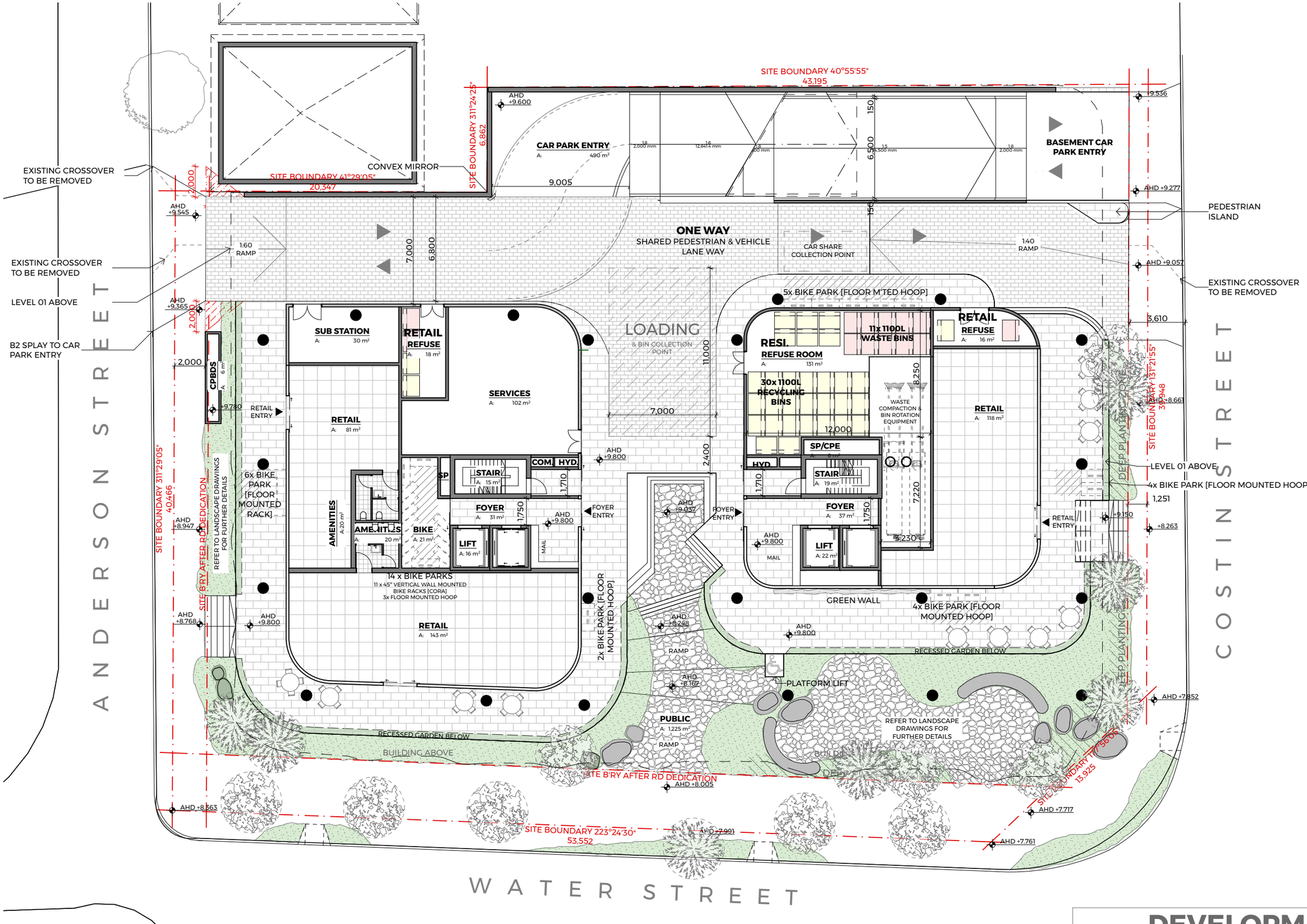
3.2.6. Monitoring and Review

Regular monitoring and inspections of waste and related equipment and facilities from the development should be conducted by building management or designated staff for maintenance and sustainability.

Table 3.10: Monitoring and Review Checklist

Objectives	Checked	Remarks
Continual monitoring of equipment uses and scheduling to ensure best operational outcomes.		
Regular review of refuse management equipment and facilities such as bin volumes, refuse storage capacities and stormwater management arrangements.		

Appendix A Site Plans and Drawings



REV	DATE	ISSUED FOR	DRAWN	CHECKED
DA.01	4/8/2022	DEVELOPMENT APPLICATION	CB	TC

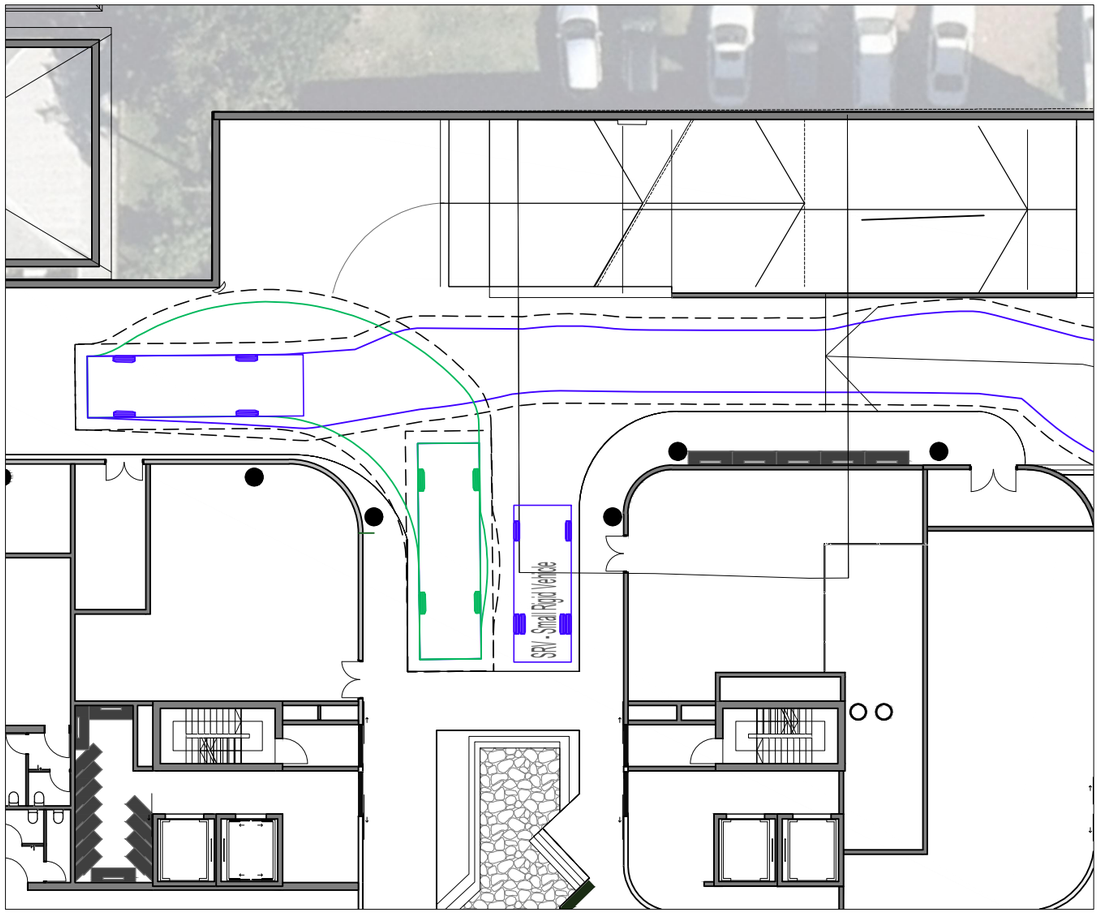
TELHA CLARKE
59 GARDEN STREET
SOUTH YARRA
PH: 03 8672 5999
E: contact@telhaclarke.com.au

DEVELOPMENT APPLICATION

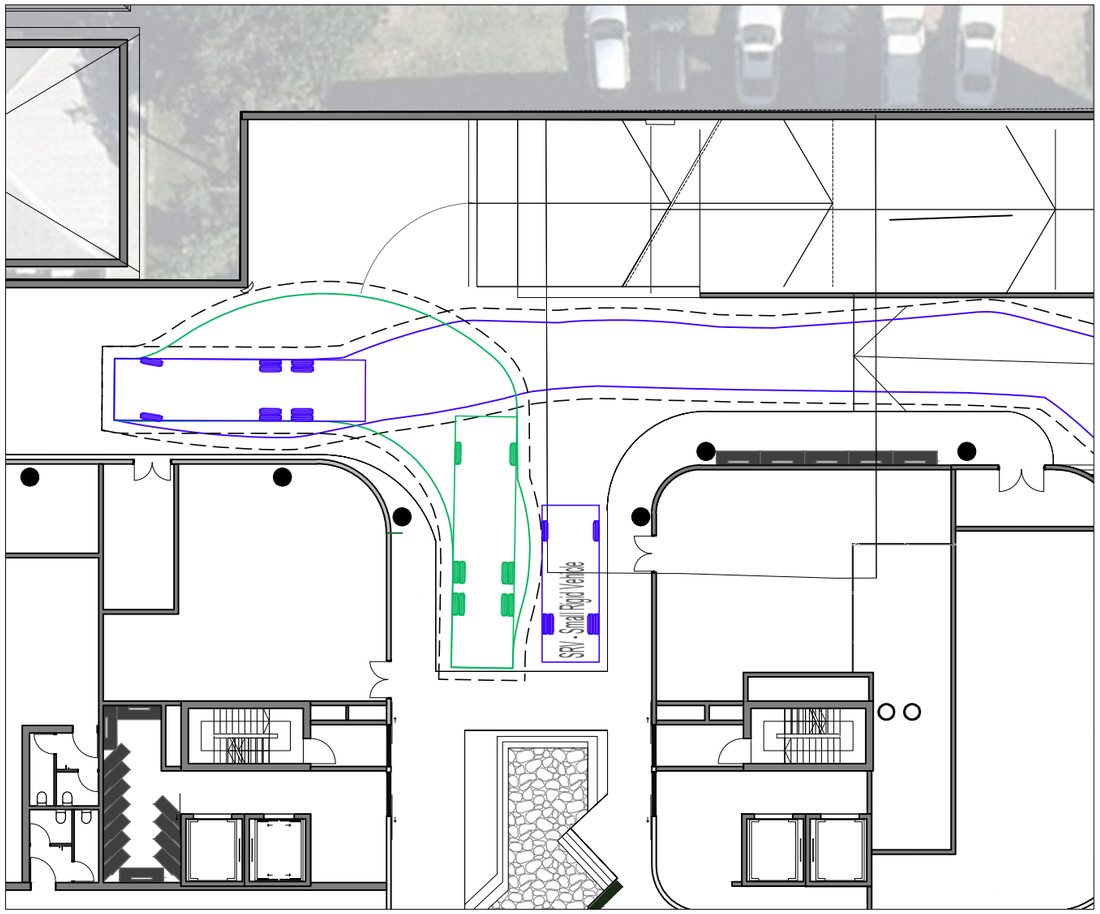
PROJECT
15 ANDERSON STREET
15 ANDERSON ST FORTITUDE VALLEY QLD 4006

DRAWING TITLE
GROUND FLOOR

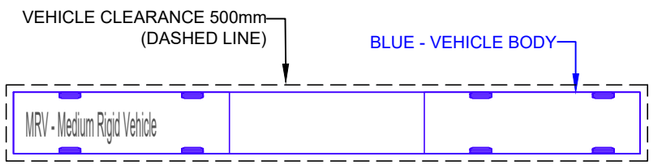
SCALE **1:250 @A3**		
DATE **17/02/16**	PLOT DATE **4/8/2022**	
DRAWN **CB**	CHECKED **TC**	
JOB NO. **21026**	DRAWING NO. **TP100**	REVISION **DA.01**



MRV MANOEUVRE

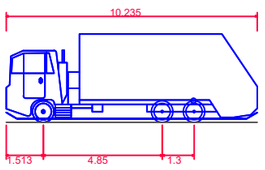


RCV MANOEUVRE



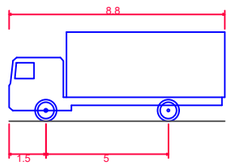
PRELIMINARY ADVICE ONLY

9 September 2022



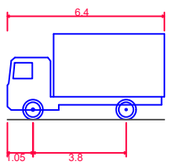
BCC Fleet 2020 (Rear Loader)

Overall Length	10.235m
Overall Width	2.500m
Overall Body Height	3.600m
Min Body Ground Clearance	0.150m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	9.500m
Design Speed Forward	5.0km/h
Clearance Envelope	0.500m



MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m
Design Speed Forward	5.0km/h
Clearance Envelope	0.500m



SRV - Small Rigid Vehicle

Overall Length	6.400m
Overall Width	2.330m
Overall Body Height	3.500m
Min Body Ground Clearance	0.398m
Track Width	2.330m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.100m

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	09-09-22	ORIGINAL ISSUE	NG	NG	JB

SCALE 0 2 4 6 8 10m

SCALE 1:200 AT ORIGINAL SIZE

NORTH

CLIENT: PROPERTY PROJECTS AUSTRALIA

TTM CONSULTING PTY LTD
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LEVEL 8, 369 Ann Street, BRISBANE, QLD, 4000
P.O. BOX 12015, BRISBANE, QLD, 4003
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PROJECT: **15 ANDERSON STREET, FORTITUDE VALLEY**

DRAWING TITLE: **SWEPT PATH MOVEMENTS**
LOADING BAY MANOEUVRES
DESIGN VEHICLES - RCV, MRV & SRV

PROJECT NUMBER	21BRT0794
ORIGINAL SIZE	A3
DRAWING NUMBER	21BRT0794-05
REVISION	A
DATE	9 Sep 2022
SHEET	1 OF 1

Appendix B Systems and Specifications

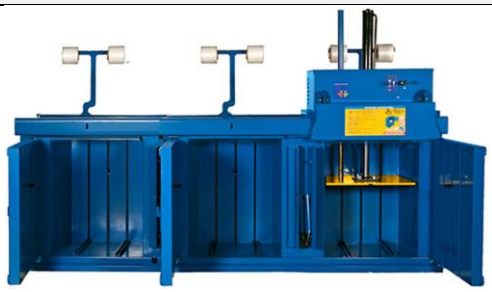
B.1 Typical Refuse Bins

Bin Types	Waste Streams	Examples	Information
Back-of-house bins	General waste, recycling, food waste, paper / cardboard		Various options and sizes available. Tenant to supply depending on preference and space available. Example: 60L metro bins Dimensions approx. 559 x 279 x 635mm (L x W x H) Examples: https://www.spacepac.com.au
Caddy Bins	Food Waste		Example: https://pulpmaster.com.au/pulpmaster-caddy-system
240L bins	General waste, paper, recycling, green waste		Dimensions approx. 740 x 580 x 1080mm (L x W x H) (dimensions may depend on contractor) Examples: http://www.justwheeliebins.com.au, http://wheeliebinsonline.com.au
1100L bins	General waste, recycling, paper / cardboard		Dimensions approx. 1070 x 1240 x 1330mm (L x W x H) (dimensions depend on contractor) Examples: http://www.justwheeliebins.com.au, https://www.australianwastemanagement.com.au

B.2 Typical Refuse Management Equipment

Systems	Waste Streams	Examples	Information
Organics Household Composting, Worm Farm, Digesters	Food waste / organics		Organics / food waste separation, composting and digesting; household-type and commercial grade equipment available Examples Urban Composter https://www.urbancomposter.com.au Closed Loop https://closedloop.com.au/upcycling-products ORCA https://www.feedtheorca.com
Food Waste Processing, Storage and Disposal	Food waste / organics		Volume reduction and organics / food waste recycling through food waste separation and macerating Examples: Pulpmaster Food Processing and Storage https://pulpmaster.com.au Under-sink food waste macerators and disposers https://www.insinkerator.com.au (household type macerators) https://insinkerator.emerson.com (commercial-grade macerators)
Cooking oil storage and recycling	Used cooking oil		Cooking oil recycling Example: https://www.cookers.com.au Cooking oil delivery, used oil collection and provision of required equipment

Systems	Waste Streams	Examples	Information
Bunded pallets	Liquid Waste		Spill containment, e.g. for waste cooking oil containers Example: https://www.tradeenviro.com.au/bunded-pallets https://www.materialshandling.com.au/products/bunded-pallet
Compactors / bin presses	General waste		Volume reduction through refuse compaction Examples: Stationary compactor, range between 10000L to 35000L https://www.wastech.com.au/products/compactors Litter bin compactor https://www.solarbins.com.au/features/big-belly-solar-bin Under-chute compactor https://www.wastech.com.au/products/chutes/ecopac-compactor Bin press https://wasteinitiatives.com.au/products/waste-compactors
Balers	Paper / cardboard, plastics		Volume reduction of paper, cardboard, plastics by compaction (baling) Examples: https://www.miltek.com.au/balers-and-compactors https://www.wastech.com.au/products/balers https://wasteinitiatives.com.au/product/vertical-balers/wastepac-60

Systems	Waste Streams	Examples	Information
			
Trolleys	General waste, recycling, food waste, paper / cardboard	   	Assisted manual transfer of refuse Examples: https://rubbermaidcommercial.com.au/products/waste-management/mega-brute https://www.materialshandling.com.au/products/deluxe-compact-cleaning-carts

B.3 Refuse Transfer and Disposal Methods

Method	Examples	Description
Manual transfer / disposal	   	**Manual transfer** is simply the process of physically carrying waste bags, food waste receptacles or recycling boxes and crates without assistance. From a safety perspective, this is acceptable for small quantities and initial disposal into refuse chutes, refuse compartments or, in the case of ground level activities, directly into the refuse storage room. • **Waste** material should be bagged prior to any transfer from apartments, suites, offices, back-of-house areas etc. to waste storage compartments or rooms. • **Food waste** should be placed in receptacles such as a caddy style bin or bucket which will not allow leakage during transfer. • **Recycling** material should be placed in boxes or crates prior to transfer. • **Cardboard and paper** items can be placed within another cardboard box for transfer. Examples: https://www.alamy.com
Assisted manual transfer		**Assisted manual transfer** includes the use of any wheeled container, wheelie bin or trolley with a capacity to carry refuse items with a combined weight of 20kg and above. The equipment bares the weight of the material, but it still requires physical force and or balance to move the bin or trolley. From a safety perspective, this type of equipment should be a minimum requirement for transfer of material greater than 20kg and when transferring between individual levels to the refuse storage room or loading areas. Use of enclosed or caged equipment will also eliminate 'litter or leakage trails' which can occur when using open or unsealed equipment. Examples: http://www.justwheeliebins.com.au, https://rubbermaidcommercial.com.au, https://www.materialshandling.com.au

B.4 Refuse Minimisation Options

Refuse Minimisation Options – Waste

Systems	Description
Food rescue	OzHarvest and Second Bite are food rescue organisations working throughout Australia. The organisation collects surplus foods from businesses (including Woolworths, Coles, Goodman Fielder and other smaller companies) and redistributes the foods to welfare agencies. They provide regular scheduled collections or ad-hoc / on call collections, and they have refrigerated vehicles. Other accepted items include fresh fruit and vegetables, tinned goods, cold meats and deli items, and readymade meals (which will only be accepted frozen). Where food rescue organisations are available, consideration may be given to suitable space for the temporary storage of food stuffs, including dry storage and the placement of a small fridge if cold room space is not available. There is no associated collections cost. Hence, it can be considered a zero-cost option for disposal of what would otherwise be food waste, and it supports the community at the same time.   Sources: www.ozharvest.org, www.secondbite.org
Composting	Food waste composing is an option of reducing the amount of general waste going to landfill where organic waste can create methane gas due to anaerobic digestion, which contributes to global warming. Systems of different scales exist from small benchtop composters for individual households or apartments to commercial size systems. Examples are shown below. The process usually involves breaking down organic food scraps through natural processes. This includes systems such as worm farms or composters where microbes break down the food waste, with or without the aid of compost additives. The composted products are rich in nutrients and good bacteria, and they can be added to flower bed or gardens. Most food wastes and other organic (garden) material can be composted including meat, fish, vegetables, fruit, dairy, coffee or wilted flowers. However, large bones, excessive liquids such as cooking oil or seafood shells should not be placed in the composers.  Sources: https://www.urbancomposter.com.au, https://closedloop.com.au/upcycling-products, https://www.feedtheorca.com
Food waste separation and collection	When considering separation of organic food waste, the handling and potential for volume reduction should also be considered. As an example, the **Pulpmaster** system can be used to reduce the stored volume of food waste produced, and to prepare the material for re-use. Typically, the system is placed in proximity to sink areas in the kitchen, particularly where food preparation waste or plate scrapings can be easily disposed. This provides a fully sealed transfer system for storage and collection. Pulping systems can also be placed back-of-house spaces for

Systems	Description
	restaurants and cafes or placed within a refuse room for centralisation to multiple users. Pulped food waste is pumped into holding tanks for storage and collection via a 50mm pipe and collected by a liquid vacuum tanker. The images below provide visual context of the connection from pulping machine to storage tank and the option for decanting 120L bins into the machine via a bin lifter and auger feed. The tank may be up to 20m away from the pulping machine. The distance is increased when including vertical drops from upper levels of the building. The storage tank may be up to 30m from a loading area, with the only requirement being a service pipe with camlock end connection placed within proximity of the loading area. Collections are completed by a vacuum tanker which may range in size depending on the size of the storage tanks and the distance of the tank from the loading area.      Source: http://pulpmaster.com.au
Waste Conversion	Converting waste by reducing its volume and weight means less material to be disposed of, which results in fewer refuse collection vehicle kilometres. This allows cost savings in logistics and has a positive environmental effect due to less fuel used per amount of waste to be disposed. As an example, OMPECO provide a solution for converting general and medical waste into a sterilised, dehydrated ground material as shown below. The process involves loading the sterilisation chamber with waste material and crushing / shredding of the material by rotors to produce a fine ground. During the process, the material is heated by friction to 100˚C which causes the moisture in the waste material to evaporate. After evaporation, the material is heated further to sterilisation or pasteurisation. The ground material is then cooled down to be unloaded from the converter. The final product has excellent long-term handling and storage properties, the it has up to 80% less volume and 50% less weight than the original waste material. It can be used in waste to energy systems as it is comparatively dry with a high calorific value.    Source: http://www.ompeco.com/italian/language/en/home-2/#
Waste compaction	Various compaction equipment exists for reducing the volume of (general) waste. As a result, less bins and / or fewer bin collections and service vehicle trips are required, which helps to reduce costs and environmental impact.

Systems	Description
	Examples of typical waste compaction equipment include the following: • Under chute compactors can be installed in developments with waste chutes. This allows to compact waste material before it is discharged from the chute into the waste bins. • Bin presses can be used to annually compress waste material in bins of different sizes. • For public spaces, litter bins are available with a built-in compaction mechanism that reduces the volume of waste material in the bins. An innovative example is the solar compactor shown below. Energy produced by a solar panel on top of the bin is used to operate a fill level sensor and automated internal compaction mechanism, allowing up to eight times more waste to be stored in the bin before collection is required. In addition, notification about the fill level of the bins can be sent out in order to monitor bins and manage collection frequencies.  Sources: https://www.wastech.com.au/products/compactors, https://www.wastech.com.au/products/chutes/ecopac-compactor, https://wasteinitiatives.com.au/products/waste-compactors, https://www.solarbins.com.au/features/big-belly-solar-bin
Charity donations	A good way of minimising waste is to reuse items that are still good to use. Several charity organisations exist that accept items such clothing, shoes, bedding, books, toys, furniture, kitchenware and other household items. The donated items must not be torn, damaged or broken. Electrical appliances such as white goods are usually not accepted. Common organisations operating in Australia include Saint Vincent de Paul Society (Vinnies) and Lifeline (see images below). Items can be placed into the organisations' charity / donation bins located in various public spaces such as near community or shopping areas. Alternatively, they can be dropped off at the organisations' shops during opening hours. Refer to https://www.lifeline.org.au or https://www.vinnies.org.au for further information. For larger developments and precincts where large amounts of donation items can be expected, the placement of charity bins within the development should be taken into consideration.   Sources: https://www.vinnies.org.au, https://lifelinesouthcoast.org.au

Refuse Minimisation Options – Recycling

Systems	Description
Container deposit schemes	Container deposit / refund schemes are currently in place in several states in Australia. Various models exist including bottle return facilities and (automated) reverse vending machines. Residents, tenants, staff and cleaners should be encouraged to separate containers that qualify for the schemes from the waste or recycling streams, and return them to one of the return points. Storage space or dedicated bins within tenancies, apartments or communal areas should be provided. For larger developments or precincts where large amounts of empty containers are expected, consideration may be given to an on-site return point. The return points should be located near recycling bins so that cardboard boxes or plastic bags that have been used to transfer the empty containers to the return point can be disposed appropriately. This can prevent cluttering of the area around the return point. The images below show a typical return point and containers that commonly qualify for a deposit refund.    Sources: https://returnandearn.org.au, https://envirobank.com.au/bottle-and-can-recycling-queensland, https://www.containersforchange.com.au/how-it-works
Glass crushing	Bottle crushers can reduce back-of-house and refuse room storage volumes by up to 80%. The machines are quiet and efficient. The inclusion of a glass crusher may either be designed into bar or kitchen areas, placed in back-of-house areas, or a machine may take the place of an existing recycling bin within a refuse storage room. Scanners are also being developed for these machines for scanning of bottles prior to crushing to align with government bottle return schemes. The images below show a typical setting of a glass crusher in a bar.    Sources: http://www.insideenterprises.com.au/bottlecycler/index.html, http://www.bottlecycler.com

B.5 Refuse Management Equipment Suppliers

Waste Management Equipment	Balers	Compactors	Shredders	Glass Crushers	Chutes	Bin Tugs / Trailers	Trolleys / Manual Handling Equipment	Bin Lifters / Tippers	Bin Rotation	Weighing Systems	Spill Containment, Spill Response, Absorbents, Drain Protection	Food Waste Management / Vacuum Systems, Pulping, Digestors	Composting	Waste Cooking Oil Systems	Smoking Management	Bins (General), Bin Stands	Bin Cleaning Equipment	Sorting Equipment
Elephants Foot Recycling Solutions http://www.elephantsfoot.com.au	✓	✓		✓	✓			✓	✓	✓								
Waste Initiatives https://wasteinitiatives.com.au	✓	✓	✓	✓														✓
Wastech http://wastech.com.au	✓	✓	✓		✓			✓										
Pakmor http://pakmor.com.au	✓	✓	✓					✓		✓								
Miltek http://www.miltek.com.au	✓	✓																
BottleCycler http://www.bottlecycler.com				✓														
Materials Handling https://www.materialshandling.com.au						✓	✓	✓			✓					✓	✓	
Spacepac http://ev.spacepac.com.au						✓	✓											
Spacepac Solutions http://www.spacepac.com.au						✓	✓								✓	✓		
Draffin https://draffin.com.au								✓							✓	✓		
Electrodrive / Lift Master http://www.electrodrive.com.au						✓		✓										
Absorbenviro http://www.absorbenviro.com.au											✓							
Trade Environmental http://www.tradeenviro.com.au											✓							
Spillstationaustralia www.spillstation.com.au											✓							

Waste Management Equipment	Balers	Compactors	Shredders	Glass Crushers	Chutes	Bin Tugs / Trailers	Trolleys / Manual Handling Equipment	Bin Lifters / Tippers	Bin Rotation	Weighing Systems	Spill Containment, Spill Response, Absorbents, Drain Protection	Food Waste Management / Vacuum Systems, Pulping, Digestors	Composting	Waste Cooking Oil Systems	Smoking Management	Bins (General), Bin Stands	Bin Cleaning Equipment	Sorting Equipment
Pulpmaster http://pulpmaster.com.au												✓						
Australian Vacuum Systems http://www.australianvacuumsystems.com.au												✓						
Meiko https://www.meiko.com.au												✓						
Closed Loop Organics https://closedloop.com.au/upcycling-products,													✓					
Compost Revolution https://compostrevolution.com.au													✓					
Urban Composter https://www.urbancomposter.com.au													✓					
ORCA Digester https://www.feedtheorca.com													✓					
Cookers https://www.cookers.com.au														✓				
Rubbermaid https://rubbermaidcommercial.com.au/products/waste-management							✓				✓				✓	✓		
Sulo http://www.sulo.com.au							✓						✓			✓		
Australian Waste Management https://www.australianwastemanagement.com.au/products								✓								✓		

B.6 Refuse Management Service Providers

Specialist Waste Services	Food Waste	Waste Cooking Oil	Hazardous Waste	Liquid Waste	Electronic Waste	Industrial Waste	Construction & Demolition Waste	Waste Water	Secure Document Destruction
Cleanaway * https://www.cleanaway.com.au		✓	✓				✓	✓	
JJ Richards * https://www.jjrichards.com.au		✓	✓	✓		✓	✓	✓	
Veolia * https://www.veolia.com/anz			✓	✓	✓		✓	✓	✓
Suez * https://www.suez.com.au				✓	✓		✓	✓	
SecondBite https://www.secondbite.org	✓								
OZ Harvest https://www.ozharvest.org	✓								
Cookers https://www.cookers.com.au		✓							
ToxFree https://www.toxfree.com.au			✓		✓	✓			
AceWaste https://www.acewaste.com.au			✓			✓			

Appendix C Refuse Signage

C.1 Refuse Signage

Waste signage guideline are provided by the Queensland government: https://www.qld.gov.au/environment/pollution/management/waste/recovery/recycling/signage.

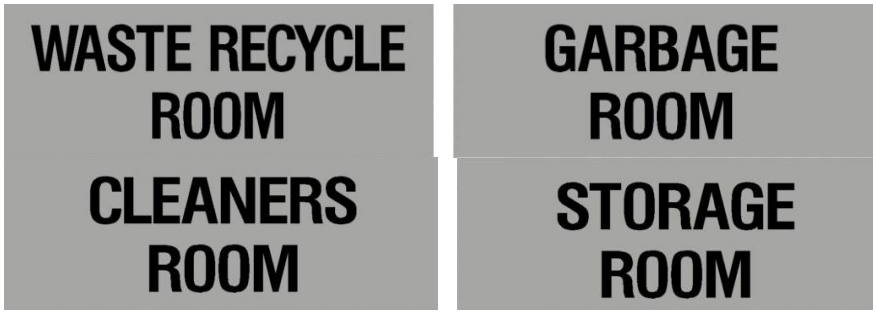
General Refuse Signage

Other Refuse Signage

C.2 Other Refuse, Facility and Safety Signage

Various signage including refuse area, safety and facility signage should be arranged through certified signage providers. Example signs can be found at http://www.signblitz.com.au, https://www.wayout.com.au or https://www.smartsign.com.

Example Refuse Room Signage



Example Facility Signage

Example Safety Signage

Appendix D Terms and Abbreviations

In this OWMP, a term or abbreviation has the following meaning unless indicated otherwise:

TERM	ABBREVIATION	DEFINITION
Equipment		
Bin (Refuse Bin)		A plastic or steel container for disposal and temporary storage of waste or recycling items. Various types and sizes exist for different items and purposes. Examples include residential unit bins, bulk bins, MGB, steely bins and specialised for medical waste or cigarette butts.
Bin Storage Area		An enclosed area designated for storing on-site refuse bins or a refuse compactor within the property.
Bulk Bin		A galvanized or steel bin receptacle that is greater than 360L in capacity generally ranging from 1.00m³ to 4.50m³ used for the storage of refuse that is used for on-site refuse collection.
Bulk Mobile Garbage Bin	Bulk MGB	A plastic (polypropylene) receptacle that is greater than 360L in capacity generally ranging from 660L to 1100L used for the storage of refuse.
Collection Point		An identified position where refuse bins are stored for collection and emptying. The collection point can also be the bin storage area.
Compactor		A receptacle that provides for the mechanical compaction and temporary storage of refuse. It allows to reduce bin numbers and collection frequency.
Composter		A container or machine used for composting specific food scraps and/or organic materials.
Food Waste Recycling System		Defined as a vacuum or pump-based system for shredding, macerating or pulping of food waste. The food waste is transferred through pressure (service) pipes to sealed liquid storage tanks.
Green Waste		All vegetated organic material such as small branches, leaves and grass clippings, tree and shrub pruning, plants and flowers.
Liquid Waste		Non-hazardous liquid waste generated by commercial premises should be connected to sewer or collected for treatment and disposal by a liquid waste contractor (including grease trap waste).
Mobile Garbage Bin	MGB	A plastic (polypropylene) bin or bins used for the temporary storage of refuse that is up to 360L in capacity and may be used in kerbside refuse collection or on-site collection.
Putrescible Waste		Putrescible waste is the component of the waste stream liable to become putrid and usually breaks down in a landfill to create landfill gases and leachate. Typically applies to food, animal and organic products.
Recycling		Recycling contains all material suitable for re-manufacture or re-use, e.g. glass bottles and jars; plastics such as PET, HDPE and PVC; aluminium aerosol and steel cans and lids; milk and juice cartons; soft drink, milk and shampoo containers; paper, cardboard, junk mail, newspapers and magazines.
Refuse		Refuse is material generated and discarded from residential and commercial buildings including general waste, recyclables, green waste and bulky items.
Refuse Storage Room		An area identified for storing on-site MGBs or Bulk Bins within the property.
Refuse Tolley		A cart on wheels that can be used to collect smaller quantities of refuse from different areas or rooms of a building or site, and wheel the collected refuse to a (bulk) bin storage area where it is disposed. Refuse trolleys are commonly used in hotels or offices.
Regulated Waste		Regulated waste is waste prescribed under legislation as regulated waste.

TERM	ABBREVIATION	DEFINITION
Transfer (Manual Transfer)		Manual transfer means physical transfer of refuse material and associated bulk bins or trolleys without assistance.
Waste		Waste is referred to as refuse material with the exclusion of recycling, green waste, hazardous waste, special waste, liquid waste and restricted solid waste.
Waste (General Waste)		General waste is generally referred to as material free of any actual or apparent contamination such as pathological / infectious, radioactive materials and / or hazardous chemical. Reporting use is for material considered to be free of food waste.
Wheelie Bin		A MGB of up to 360L, usually with 2 wheels for easy transfer. A common type is a 240L wheelie bin used for kerbside collection in many residential areas.
Measures		
Cubic Metre	m^3	Volume in cubic metre(s) related to refuse management equipment.
Ground Floor Area	GFA	The GFA of all storeys of a building is measured from the outside of the external walls or the centre of a common wall. It is commonly measured in square metres.
Kilogram	kg	Kilogram(s) related to refuse weight.
Litre	L	Litre(s) related to refuse volumes.
Square Metre	m^2	Square metre(s) related to refuse areas.
Ton	T	Ton(s) related to refuse weight.
Collection Vehicles		
Body Truck		A conventional heavy vehicle with a covered loading area. It is generally not specifically designed for emptying the content of bins into the truck during refuse collections, but can be used to carry entire (full) bins for servicing by bin swap-over.
Refuse Collection Vehicle	RCV	A vehicle specifically designed for collecting and emptying refuse bins and refuse compactors.
Rear-End-Loading Refuse Collection Vehicle	REL RCV	A truck specially designed to collect municipal solid waste and recycling, typically 240L wheelie bins to 1100L bulk bins, from rear loading mechanism and haul the collected waste to a solid waste treatment facility.
Tank Truck		An RCV that is specifically designed to collect liquid wastes such as waste cooking oil and food waste pulp. The waste is typically pumped from a waste storage tank into the truck via a hose. Liquid waste management equipment is often provided by the contractor who collects the waste and operates the truck.