

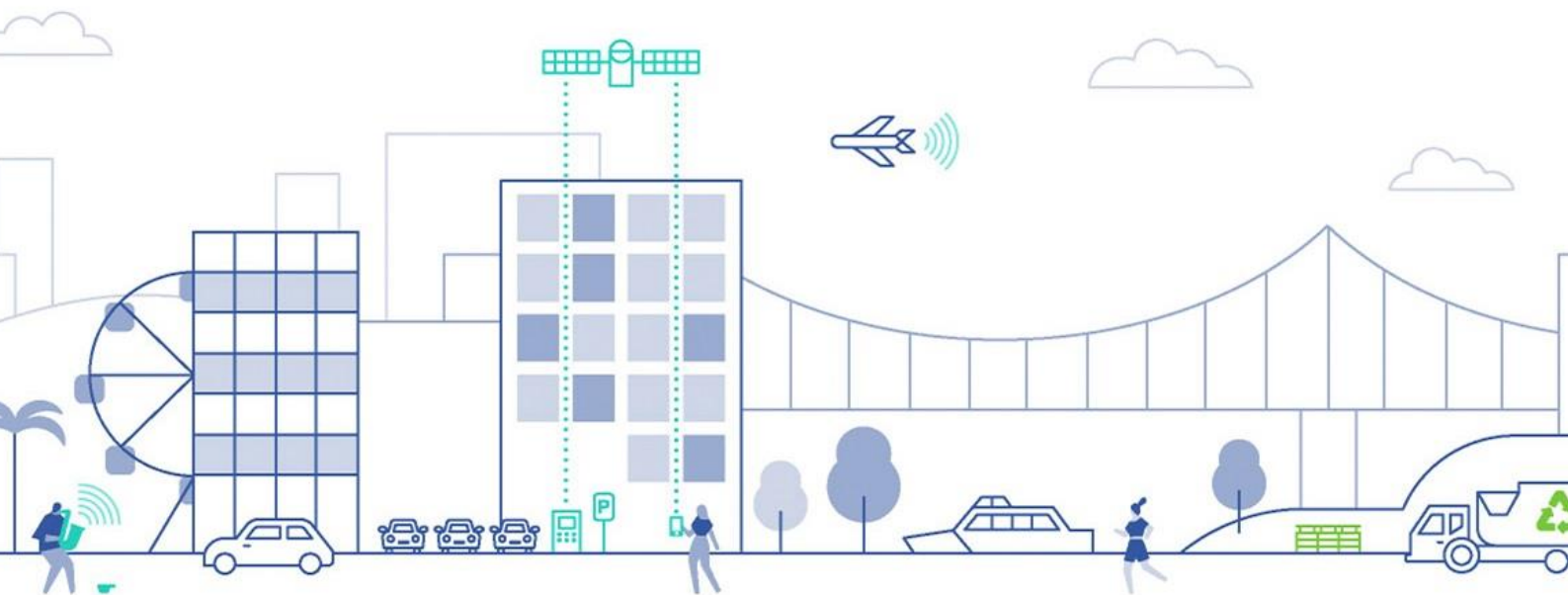


# Operational Waste Management Plan

Proposed Residential Development

At 127-129 Flowerdale Road, Liverpool

On Behalf of SGCH Sustainability Limited



## 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.

We have over 50 staff, with an unrivalled depth of experience. Our industry knowledge, technical expertise and commercial insight allow us to deliver an exceptional and reliable service.

T: (07) 3327 9500

F: (07) 3327 9501

E: [ttmbris@ttmgroup.com.au](mailto:ttmbris@ttmgroup.com.au)



## Revision Record

No.	Author	Reviewed/Approved	Description	Date
1.	R. Kochhan	A. Stamatiou	Draft OWMP	09/11/18
2.	R. Kochhan	A. Stamatiou	Draft OWMP	12/12/18
3.	A. Stamatiou	M. Krisanski	OWMP	01/02/19
4.	A. Stamatiou	M. Krisanski	OWMP	08/03/19
5.	A. Stamatiou	A. Stamatiou	OWMP	25/03/19
6.	R. Kochhan	M. Krisanski	OWMP	17/07/19
7.	R. Kochhan	A. Stamatiou	OWMP	07/11/19

## Executive Summary

The proposed community housing residential development at 127-129 Flowerdale Road, Liverpool contains 39 residential units built over 5 levels residential levels (including ground floor).

This OWMP outlines the waste management processes, equipment and construction requirements for a proposed. It identifies the different waste stream and volumes that are anticipated for this development.

Refuse disposal, storage facilities and collection arrangements by Council are outlined for the residential apartments, and recommended design and operational requirements are listed. A summary of the waste management processes are outlined below:

- Bulk bins will be collected on-street by Council and collections will occur via the kerbside on Smith Crescent.
- Bin collections will be coordinated with building management who will transfer all bins on service days to the kerbside for collection by Council via a bin tug. All internal rotations will be conducted on a daily or as needs basis by management.
- 7 x 660L general waste and 7 x 660L recycling bins are required for the refuse quantities generated by the proposed development.
- A refuse room is provided on the ground floor in close proximity to the stair and lift cores. The bin room is considered large enough to accommodate the required number of bins.
- Residents will dispose their general waste and recycling directly to the ground floor refuse room.
- Refuse bin quantities have been calculated based on collection cycles of **one day per week for waste** and **one day per week for recycling**.

TTM have referred to the State Environmental Planning Policy – Low Rise Medium Density Housing Code Design Guide and have outlined the compliance checklist below.

### Planning for Waste Minimisation and Management – Compliance checklist

Objectives	Criteria	Compliance	Comments
Waste storage facilities meet the needs of the residents, are easy to use and access, and enable efficient collection of waste.	64. Provide storage space for the type and number of bins designated in council's waste policy.	✓	<ul style="list-style-type: none"> <li>• The refuse rooms provide storage space for the required number of bins designated in Council's waste policy.</li> </ul>
	65. Where waste storage is provided in a communal area, access to this waste area is to be provided for all residents without crossing a private lot.	✓	<ul style="list-style-type: none"> <li>• All residents are provided with ground floor refuse room access.</li> </ul>
	66. Where waste storage is provided in the basement car park, a maximum ramp gradient of 1:6 is to be provided to the waste collection point.	✓	<ul style="list-style-type: none"> <li>• The maximum gradient of the transfer route provided is 1:14.</li> </ul>

	67. Where a rear lane has provision for waste collection trucks used by council, the collection point is to be from the rear lane.	✓	<ul style="list-style-type: none"> <li>No rear lane access. Servicing is provided on Smith Crescent.</li> </ul>
	68. Any communal waste area is to: <ul style="list-style-type: none"> <li>provide for water supply for cleaning,</li> <li>have a solid floor grated to a floor waste (connected to a sewer), and</li> <li>be designed to meet the requirements of council's waste policy.</li> </ul>	✓	<ul style="list-style-type: none"> <li>The refuse room will be provided with a water supply for cleaning, solid floor grated to a floor waste (connected to a sewer) and designed in accordance with Council's waste policy.</li> </ul>
	69. Despite any requirements in council's waste policy, on-site waste vehicle access and collection is not required where: <ul style="list-style-type: none"> <li>there are less than 20 dwellings, or</li> <li>the development is Torrens title subdivided.</li> </ul>	✓	<ul style="list-style-type: none"> <li>On-site waste collection is not proposed for development with 39 units.</li> <li>Servicing will occur via the kerbside.</li> </ul>
	70. A communal onsite waste collection point is to be provided where: <ul style="list-style-type: none"> <li>there are 20 or more dwellings and</li> <li>the development is strata title subdivided.</li> </ul>	✓	<ul style="list-style-type: none"> <li>A refuse room is provided on-site on the ground floor.</li> </ul>
	71. Where vehicle access is not provided to the site, any communal on-site collection point is to: <ul style="list-style-type: none"> <li>be less than 10m from the street boundary,</li> <li>be located on a surface with a gradient less than 1:20</li> <li>not require access through a security door or gate (unless this is permitted by council waste policy).</li> <li>have path that connects the collection area to the street boundary with a gradient less than 1:8 and free of steps for the transfer of bins to the collection vehicle</li> </ul>	✓	<p>Bins will be serviced along the kerbside and will:</p> <ul style="list-style-type: none"> <li>located approximately 15m from the street boundary, as per Council DCP requirements</li> <li>be located on a surface with a gradient less than 1:20;</li> <li>not require access through a security door or gate; and</li> <li>have path that connects the collection area to the street boundary with a gradient less than 1:8 (provided as 1:14) and free of steps for the transfer of bins to the collection vehicle.</li> </ul>
	72. If the waste collection point (including any communal waste collection point) is used for permanent storage of bins, it is to be screened from view from the public domain and is to have a height no greater than 1.3m, if forward of the building line.	✓	<ul style="list-style-type: none"> <li>A permanent waste storage area is provided within the refuse room, where bins will be transferred to the kerbside and returned once serviced.</li> </ul>
Waste storage facilities are designed to minimise impacts on the streetscape, building entry and amenity of residents	73. Storage areas for rubbish and recycling bins should be provided <ul style="list-style-type: none"> <li>within garages;</li> <li>in a screened enclosure that is part of the overall building design; or</li> <li>in the basement car park.</li> </ul>	✓	<ul style="list-style-type: none"> <li>A refuse room is provided in an enclosed room that is part of the overall building design via the ground floor refuse room.</li> </ul>
	74. Communal waste areas are to be located at least 3m from any bedroom or living room window.	✓	<ul style="list-style-type: none"> <li>Refuse room is located more than 5m from any bedroom or living room window.</li> </ul>

## Contents

<b>Executive Summary.....</b>	<b>2</b>
<b>1 Introduction .....</b>	<b>7</b>
1.1 Background .....	7
1.2 Scope.....	7
1.3 Site Location .....	8
1.4 Development Summary.....	9
1.5 Development Refuse Profile.....	9
<b>2 Refuse Collection .....</b>	<b>10</b>
<b>3 Residential Refuse .....</b>	<b>11</b>
3.1 Generated Refuse Streams.....	11
3.2 Disposal, Transfer and Storage.....	11
<b>4 Recommended Design Requirements.....</b>	<b>13</b>
4.1 Refuse Room .....	13
4.2 Kerbside Collection Area .....	13
4.3 Bin Carting Route .....	14
4.4 Bin Wash .....	14
4.5 Storm Water Prevention and Litter Reduction.....	14
4.6 Ventilation.....	15
<b>5 Recommended Operational Requirements.....</b>	<b>16</b>
5.1 Operational Summary .....	16
5.2 Ongoing Management.....	16
5.3 Waste Minimisation .....	17
5.3.1 Education .....	17
5.3.2 Monitoring and Review .....	17
5.3.3 Signage .....	17
5.4 Safety .....	17
<b>Appendix A Site Drawings .....</b>	<b>18</b>
Ground Floor .....	19
Typical Level.....	20
<b>Appendix B Refuse Calculations .....</b>	<b>21</b>

Appendix C	Systems and Specifications .....	23
Appendix D	Refuse and Safety Signage .....	25

## Table Index

Table 1.1: Refuse Summary .....	9
Table 3.1: Generated Residential Waste Streams.....	11
Table 5.1: Operations Equipment .....	16
Table B.1: Waste Generation Rates .....	22
Table B.2: Residential Refuse Calculations.....	22

## Figure Index

Figure 1.1: Refuse Life Cycle .....	7
Figure 1.2: Site location (map view).....	8
Figure 1.2: Refuse Room configuration.....	10

## Glossary

In this waste management plan, a term or abbreviation has the following meaning, unless the subject matter otherwise indicated:

TERM	DEFINITION
Bin Storage Area	A bin storage area in an enclosed area designated for storing on-site refuse bins or a refuse compactor within the property.
Bulk Bin	A bulk bin is a galvanized or steel bin receptacle that is greater than 360 litres in capacity generally ranging from 1.00 m <sup>3</sup> to 4.50 m <sup>3</sup> used for the storage of refuse that is used for on-site refuse collection.
Bulk Mobile Garbage Bin (MGB)	A bulk MGB is a plastic (polypropylene) receptacle that is greater than 360 litres in capacity generally ranging from 0.66 m <sup>3</sup> to 1.10 m <sup>3</sup> used for the storage of refuse.
Collection Point	The collection point is an identified position where refuse bins are stored for collection and emptying. for bulk bins, the collection point can also be the bin storage area.
Composter	A composter is a container or machine used for composting specific food scraps and/or organic materials.
Green Waste	All vegetated organic material such as small branches, leaves and grass clippings, tree and shrub pruning, plants and flowers.
Litre (L)	Litre(s) related to refuse volumes.
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 Bin	A refuse bin is a receptacle used for the storage of refuse, e.g. MGB's ('wheelie bins'), bulk MGB's or bulk bins.
Refuse Collection Vehicle (RCV)	A RCV is a vehicle that is specifically designed for collecting and emptying refuse bins and/or compactors.
Refuse Storage Room	A refuse storage room is an area identified for storing on-site MGB's or bulk bins within the property.
Regulated Waste	Regulated Waste is waste prescribed under legislation as regulated waste.
Square Metre (m <sup>2</sup> )	Square Metre(s) related to refuse areas.
Manual Transfer	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.
<b>Collection Vehicles</b>	
Rear-Loading RCV	A Rear-Loading RCV is a truck specially designed to collect municipal solid waste and recycling, typically 240 litre wheelie bins to 1100 litre bulk bins, from rear loading mechanism and haul the collected waste to a solid waste treatment facility.

# 1 Introduction

## 1.1 Background

TTM Consulting has been engaged by SGCH Sustainability Limited to prepare a refuse management plan to support the proposed residential flat development located at 127-129 Flowerdale Road, Liverpool. It is understood that a development application will be lodged with the Liverpool City Council (LCC).

## 1.2 Scope

The assessment and associated recommendations include:

- Identification and appropriate segregation for refuse streams produced within the development;
- Estimated volumes generated;
- Internal systems and equipment requirements;
- Refuse storage facilities design;
- Refuse collection room, area or loading bay designs;
- Refuse collection vehicle (RCV) access and manoeuvrability;
- Safety;
- Waste minimisation and pollution prevention;
- Owner and tenant education; and
- Operational requirements.

### Refuse Life Cycle

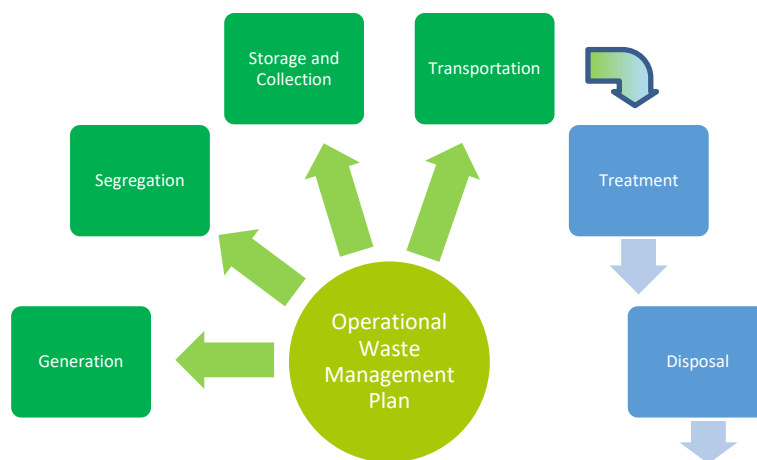


Figure 1.1: Refuse Life Cycle



The report takes into consideration the associated workplace health and safety issues and cost implications of waste management processes and equipment to ensure safe and cost-effective solutions are in place for long term property management. Recommendations also ensure that noise and odour nuisances are mitigated, and visual amenity is maintained and does not adversely affect the surrounding properties.

The recommendations for refuse collection relate to the operational phase of the development only and do not include additional requirements during or after demolition or construction phases which require a separate plan.

Information contained within the report is based on local government authority requirements related to the LCC and the associated waste services department. The recommendations provided are designed to comply with:

- LCC's Fact Sheet- Waste Management Services for Residential Flat Buildings and Multi Dwelling Housing
- LCC's Development Control Plan 2008 – Part 1 General Controls for all Development
- NSW Dept of Environment and Climate Change (DECC) *"Better Practice Guide for Waste Management in Multi-Unit Dwellings"*

Council's waste services department has been contacted to provide additional feedback, information or policy updates with relation to refuse management of the development.

### 1.3 Site Location

The site is located at 127-129 Flowerdale Road, Liverpool, as shown in Figure 1.2. The site has road frontages to Flowerdale Road and Smith Crescent, with the later to be utilised as the access frontage and servicing road.

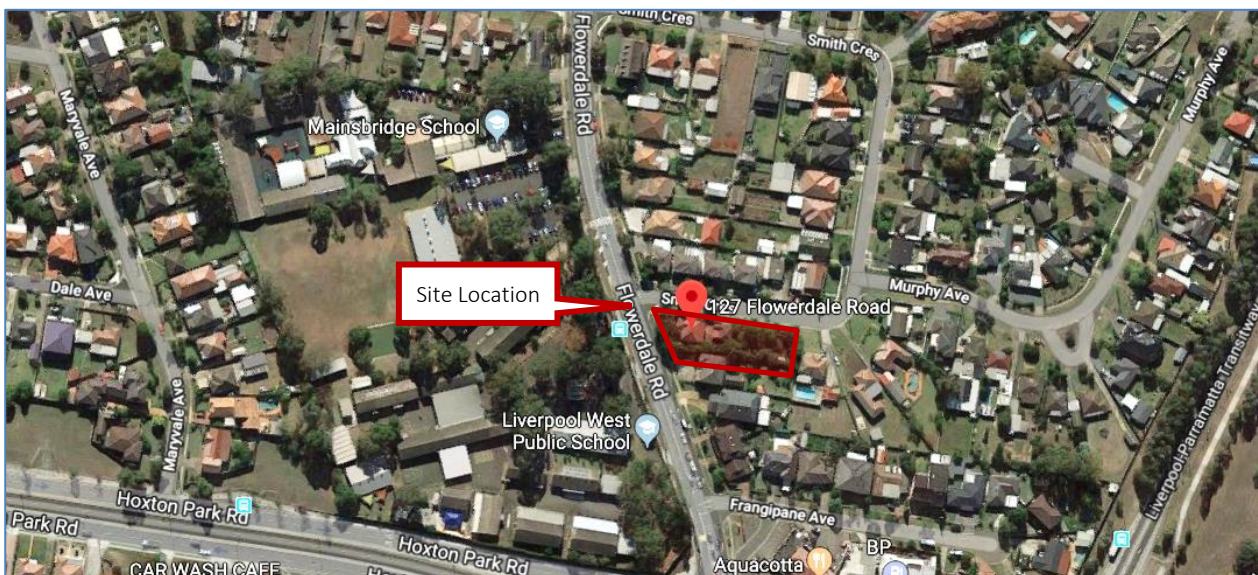


Figure 1.2: Site location (map view)

## 1.4 Development Summary

The development consists of 39 community housing residential apartments. This includes a mix of 1-bedroom and 2-bedroom units with 5 residential levels (ground level and levels 1 to 4).

## 1.5 Development Refuse Profile

The table below summarises the residential refuse profile based on anticipated waste generation rates from Council's Waste Management Services for Residential Flat Buildings and Multi Dwelling Housing Fact Sheet.

Table 1.1: Refuse Summary

Description	No. of Units	Generated Waste (L / Week)	Generated Recycling (L / Week)
1-bedroom	11	1,320	1,320
2-bedroom	28	3,360	3,360
<b>Total</b>	<b>39</b>	<b>4,680</b>	<b>4,680</b>

Section 5 of the report summarises the operational requirements for the entire development. All calculations and equipment requirements are based on the unit schedules and associated waste generation rates as outlined in the detailed information in Appendix B. Site drawings can be found in Appendix A.

## 2 Refuse Collection

It is noted the Council have previously requested kerbside collection from separate applications submitted by SGCH, which have since been approved. Council have agreed to this previous arrangement for developments outside of the CBD and will have onsite management. As such, refuse will be collected from Smith Crescent by Council via bulk kerbside collection via a rear-lift RCV.

On the day of service, all bulk bins will be coordinated with building management and transferred from the refuse room to the kerbside by building management. Bins will be transferred to the kerbside via the hardstand walkway directly from the refuse room and returned once serviced. All bins will be rotated internally by building management at least once per day for residents to access bins. Residents will have access to x 660L waste bins, 2x660L recycling bins and the bulky goods area with 8m<sup>2</sup> floor area. The configuration of the refuse room is shown below in Figure 2.1.

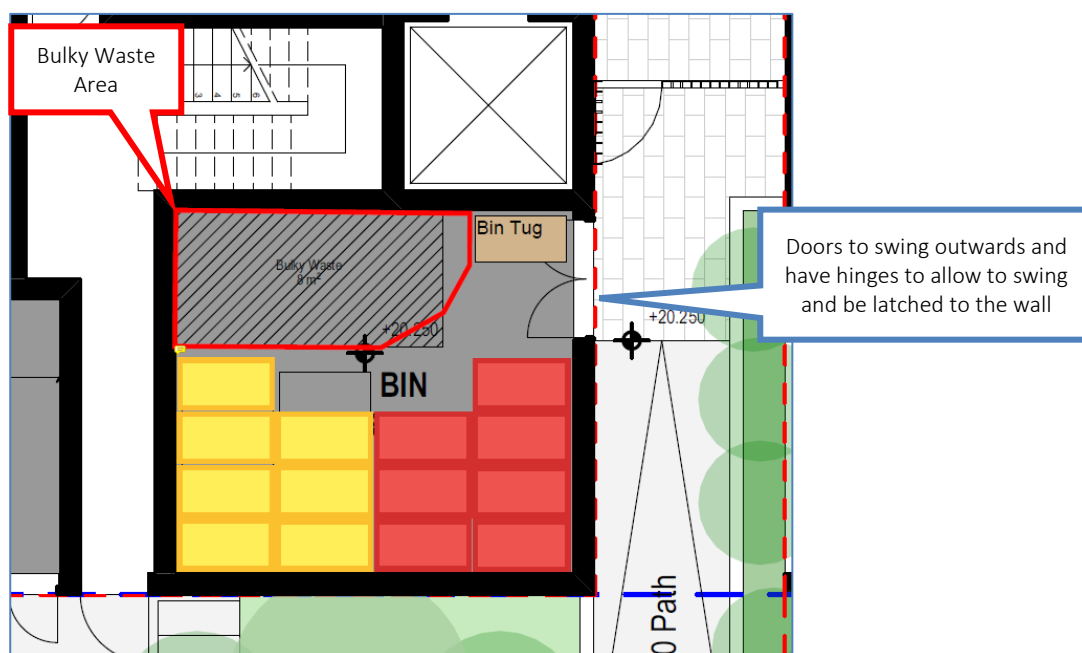


Figure 2.1: Refuse Room configuration

A bin tug or similar bin moving must be used due to the distance between the refuse room and the collection point (refer to bin carting route in Appendix A). The bin tug must be kept maintained in an operable condition at the expense of the proprietors.

All bins will be presented for collection in close proximity to the servicing area. The building manager will consult with Council to finalise service days/times and frequency prior to the time of occupancy.

Refuse bin quantities have been calculated based on collection cycles of **one day per week** for waste and **one day per week** for recycling, which is outlined in LCC's Fact Sheet '*Waste Management Services for Residential Flat Buildings and Multi Dwelling Housing*'.

The bin storage location and carting routes for bulk kerbside collection are indicated in Appendix A.

## 3 Residential Refuse

The applicant has had a long history of establishing community housing residential flat buildings throughout NSW and has experienced significant waste management issues associated with the usage of chutes and/or interim waste storage rooms on each floor. As such, exemption from the LCC's DCP 'General Controls for all Development' requirement for interim storage or the use of waste compartments (for waste and/or recycling bins) on each floor for developments above 3 stories is requested.

### 3.1 Generated Refuse Streams

The building size, operation and associated quantity of refuse produced determines that no refuse chutes or waste compartments on each floor are required. The waste streams may consist of the following:

Table 3.1: Generated Residential Waste Streams

Frequently Generated Waste Streams	
General waste	<b>General waste</b> should be collected in a dedicated receptacle within the allotted space and bagged or wrapped prior to disposal. Operationally, general waste should be bagged and weigh approximately 3kg or less and not exceed the dimensions of the waste receptacles.
Recycling (glass, aluminium and steel cans/tins/lids, paper/ cardboard, semi rigid plastics)	<b>Recycling</b> must not be bagged and should be collected in a dedicated receptacle to ensure separation from the waste material.
Infrequently Generated Waste Streams	
Green waste	<b>Green waste</b> is not typically produced from residential flat buildings other than from surrounding building landscaped areas and is removed by a designated maintenance contractor.
Hard waste/bulky goods	Approximately 8m <sup>2</sup> space is allocated in the refuse room, separate to the bin storage, for storage of <b>bulky goods</b> . Residents must coordinate all bulky goods movements with building management. Bulky items may be collected by council/contractors, or alternatively, tenants / building managers may decide to take excess bulky items to a waste management centre or charitable organisations.  LCC provide a household clean-up service and each residence is entitled to two free clean up services per calendar year for larger household waste. This includes general waste, metal, whitegoods and mattresses (refer to Council website).
Hazardous waste (paints, batteries and cartridges) and E-waste	The building manager will assist in the coordination of disposal of <b>specialised / hazardous waste and e-waste</b> such as recycling of electronic, liquid waste and paint/chemicals where required, due to safety and environmental reasons. Residents should be directed to Council's website for more details for appropriate waste and disposal.

### 3.2 Disposal, Transfer and Storage

Residents will be supplied with adequate space for storage of one full day accumulation of refuse within each apartment (typically under sink compartments or utility cupboards- see Appendix B for typical apartment bins).

Once receptacles are filled within each apartment, residents will dispose of their refuse directly to the ground floor refuse room in close proximity to the stairs and lifts into the appropriate bulk bins for waste and recycling (refer to Appendix A).

The bins will be stacked with at two general waste and two commingled recycling bins being accessible to residents at all times.

The waste generation is expected to be one 660L bin of waste and recycling filled per day. As such, building management will be responsible for rotating bins in the bin room **on a daily basis** or as required for residents to access waste and recycling bins for disposal of their refuse.

The refuse room is considered large enough to store all bins required for this development. Additional space has been considered for storage of the bin tug as well as storage of bulky waste items.

For details, refer to the refuse room configuration in Appendix A.

## 4 Recommended Design Requirements

It is recommended that all refuse areas are designed and constructed in accordance with the guidelines below.

### 4.1 Refuse Room

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

- Enclosed rooms will be fire rated and ventilated in accordance with the National Construction Code-Building Code of Australia.
- Doors must be wide enough to allow for the easy removal of the largest container to be stored.
- The walls, ceilings, floors and equipment have to be designed and constructed of impervious material with a smooth finish to allow for easy cleaning.
- Door frames are metal, hardwood or metal clad softwood, situated in an external wall.
- Door frames are rebated with a lock capable of being activated from within the room without a key at all times.
- Rainfall and other surface water cannot flow into the waste rooms.
- Floor are graded to fall to a drainage point.
- Drainage points are connected to sewer in accordance with trade waste requirements.
- A hose cock must be provided directly outside the rooms for cleaning bins and the room.
- Adequate artificial lighting needs to be available.
- It is not located adjacent to or within any habitable portion of a building or place used in connection with food preparation, including food storage.
- There is unobstructed access for removal of the containers to the service point.
- It is attractively designed to minimise their visual impact on the surrounding areas.

### 4.2 Kerbside Collection Area

The kerbside collection area will have the following features:

- It does not have any steps or lips- kerb ramps will be required at the pedestrian entry.
- It is located at least 5 metres from any door, window or fresh air intake of the development or adjoining sites.

- It is positioned on a level surface with the kerbside.
- It is connected to the frontage by a paved path so that the bin can be manoeuvred for servicing without lifting the bin over raised surfaces.
- It is not on a graded surface more than 1:20.

### 4.3 Bin Carting Route

The bin carting route from the refuse room to the kerbside service point has the following features:

- It is via a hard stand driveway.
- It does not have any lips, stairs or steps; an.
- The transfer path does not have a steep slope (maximum 1:14) and therefore does not require mechanical assistance to manoeuvre bins.
- Is approximately 15m from the street boundary.

### 4.4 Bin Wash

A bin wash with the following features will be provided within the refuse room:

- It is constructed hardstand area with a solid concrete base.
- It is graded to fall to a drainage point within the storage point.
- The drainage point is connected to sewer in accordance with trade waste requirements.
- It is provided with a hosecock for cleaning.
- It is in a purpose-built storage area which is air locked, fly and vermin proofed, and used solely for the storage of waste.
- It is in a well-ventilated portion of the basement and not within 30 metres of an opening to a food premises or food handling area.

### 4.5 Storm Water Prevention and Litter Reduction

Designated personnel or cleaners are responsible for on-site storm water pollution and litter reduction. To limit the impact on the environment and site, the following measures should be taken into account:

- Providing adequate signage to promote litter control.
- Providing sufficient refuse bins in appropriate areas.
- Preventing unauthorised entry to waste areas.
- Monitoring waste and prevent waste overflow.

- Promoting best practices for waste minimisation.
- Installing litter traps in car parks for any unwanted discharge.

## 4.6 Ventilation

Natural or mechanical ventilation must be provided to waste storage areas unless refrigerated below 4°C.

Natural ventilation means unobstructed, permanent openings direct to external air no less than one-twentieth (1/20) of floor area. Mechanical ventilation requires a minimum rate of 100 L/s and 5 L/m<sup>2</sup> exhaust rate.



## 5 Recommended Operational Requirements

### 5.1 Operational Summary

Equipment required or suitable for use as part of the operational phase of the development is outlined in Table 5.1 below. It should be noted that all collection receptacles and bins should be branded with the appropriate stickers.

Table 5.1: Operations Equipment

Description	Quantity	Notes
Waste bulk bins	7	660L bulk bins - See Appendix C
Recycling bulk bins	7	
Green waste	Collected by contractor and subject to final operational requirements	

Note: 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.

### 5.2 Ongoing Management

All refuse equipment movements must be managed by a building manager or caretaker. The key duty of the building manager/ caretaker is to monitor that the **correct materials** are being placed in the **correct bins**, and provide feedback and guidance to residents as far as achieving correct waste disposal practices.

Other duties include, but are not limited to the following:

- Organising, maintaining and cleaning the general and recycled waste holding areas. The frequency will depend on waste generation and will be determined based upon building operation.
- Organising both garbage and recycled waste pick-ups as required.
- Cleaning all bins.
- Organising and coordinating bulky goods collections.
- Ensuring site safety for residents, children, visitors, staff and contractors.
- Abiding by all relevant occupational health and safety legislation, regulations, and guidelines.
- Assessing any manual handling risks and preparing a manual handling control plan for waste and bin transfers.
- Providing equipment manuals, training, health and safety procedures, risk assessments and personal protective equipment to staff and contractors in order to control hazards associated with all waste management activities.
- Continual monitoring of equipment uses and scheduling to ensure best operational outcomes.

## 5.3 Waste Minimisation

Waste minimisation is an important part of any site operation. At a minimum, the following should be implemented.

### 5.3.1 Education

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.

### 5.3.2 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, including but not limited to bin volumes, refuse storage areas and stormwater management.

Waste 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.

### 5.3.3 Signage

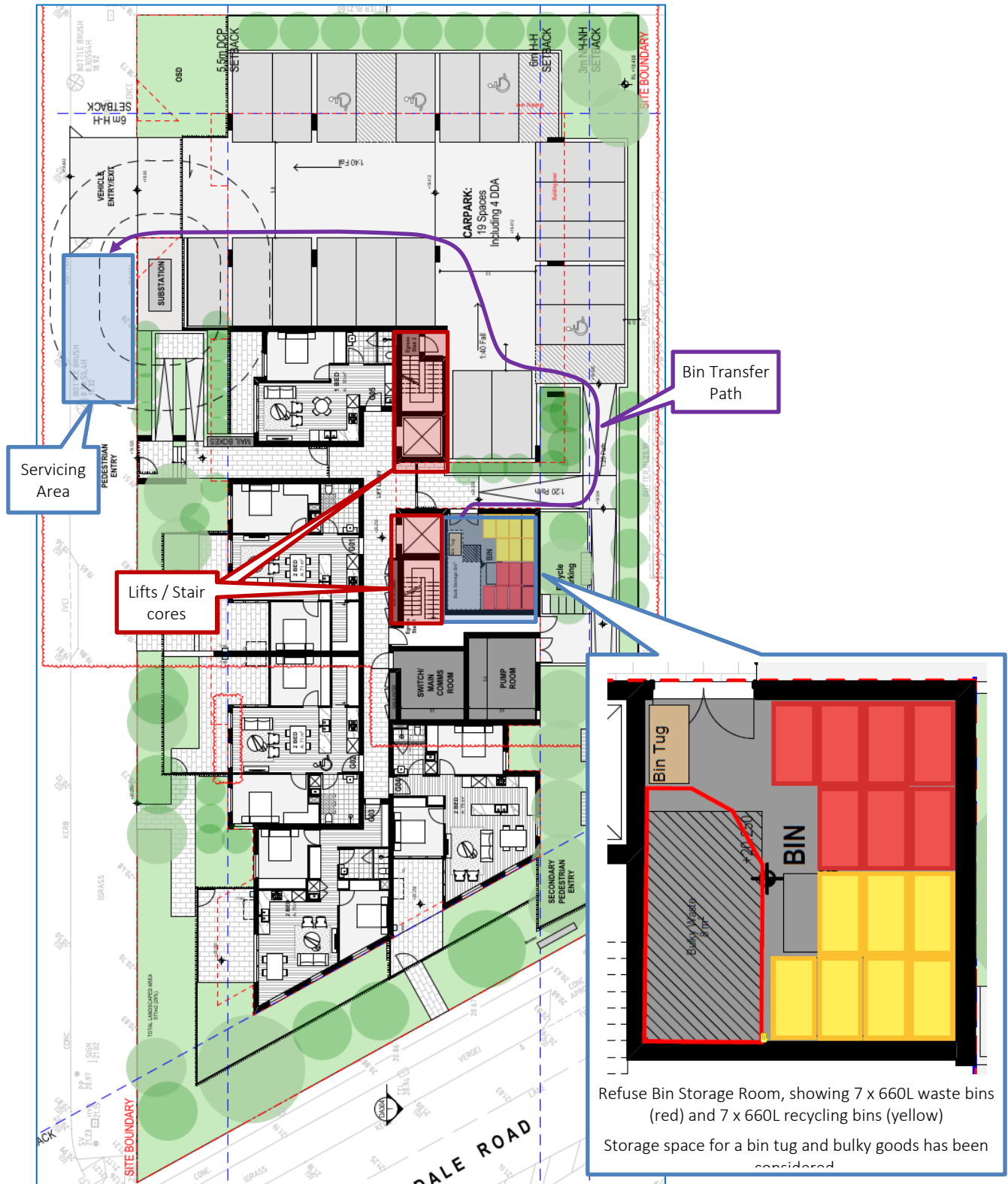
All receptacles and bins will have adequate signage, with appropriate labelling, which is clear and easy to read. Standard signage will be provided in and around waste collection and storage areas (see Appendix D).

## 5.4 Safety

Transferring refuse bins is considered a hazardous manual task. Therefore, contractors must ensure 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.

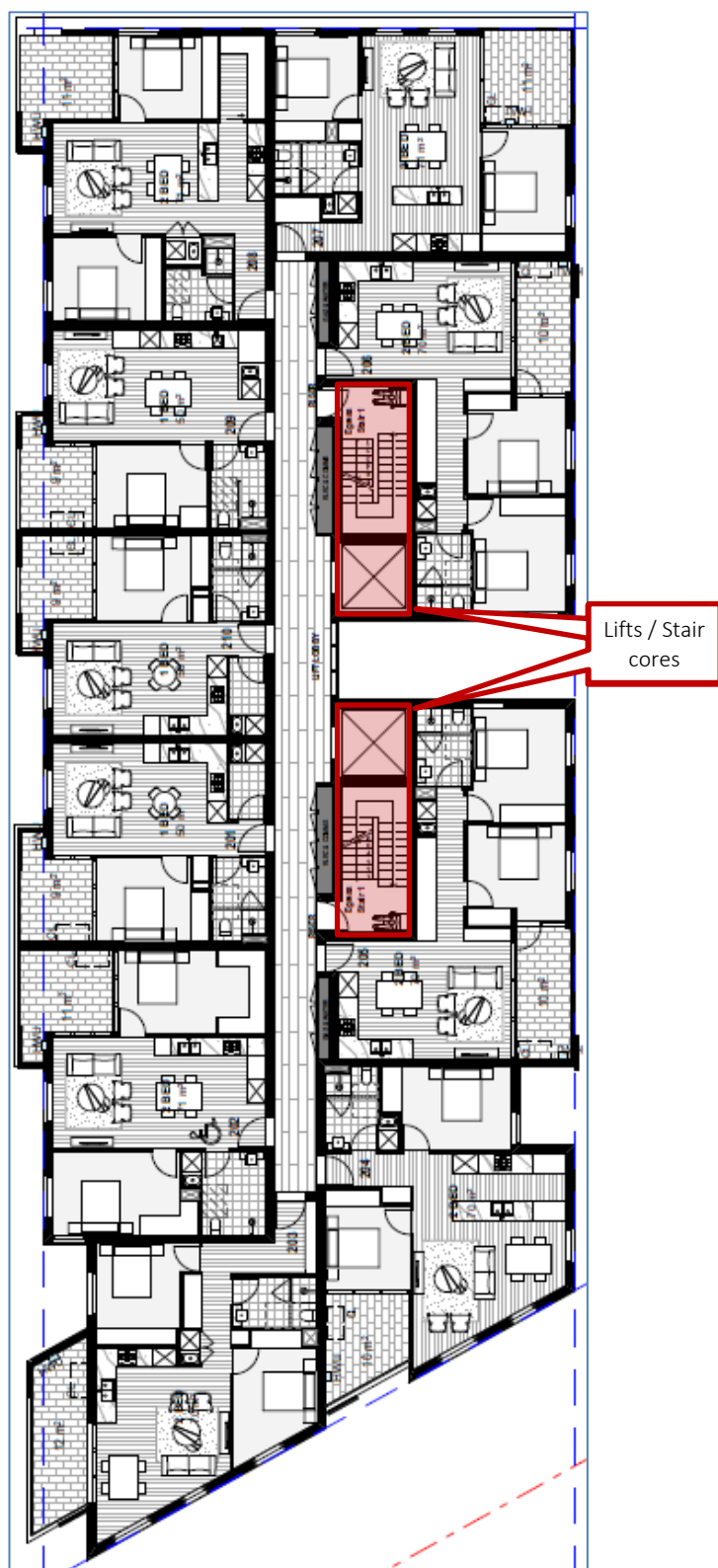
## Appendix A    Site Drawings

## Ground Floor



Source: DKO Architecture - drawing # DA200, revision B, dated 08/07/2019 – Ground Floor Plan

## Typical Level



Source: DKO Architecture - drawing # DA202, revision TP5, dated 15/02/2019 – Typical Level 2-3

## Appendix B Refuse Calculations

The generation rates used for the calculation of refuse produced uses rates recommended by Council's Waste Management Services for Residential Flat Buildings and Multi Dwelling Housing Fact Sheet.

Waste and recycling volumes indicated do not include compaction.

Table B.1: Waste Generation Rates

Type	Waste	Recycling
Residential flat buildings	120 L / unit / week	120 L / unit / week




Table B.2: Residential Refuse Calculations

Description	# Units	Generated Waste (L/week)	Generated Recycling (L/week)
1 bedroom	11	1320	1320
2 bedroom	28	3360	3360
<b>Total</b>	<b>39</b>	<b>4680</b>	<b>4680</b>
Refuse per Day		669	669
Max. Refuse per Collection		4680	4680
Collections and Equipment	Collections per Week	1	1
	Bin Size (L)	660	660
	No. of Bins Required	7	7
	Raw Bin Area (m <sup>2</sup> )	15.5	
	Bulky Goods Area (m <sup>2</sup> )	8	
	Storage Room (m <sup>2</sup> )	22	

## Appendix C    Systems and Specifications



## Typical Refuse Equipment

Example System	Waste Stream	Example	Provided by
Typical Apartment bins	Waste and recycling		Various suppliers Built and standalone options available
660L bulk bins  (L) 1420mm x (W) 1100mm x (H) 1270mm	Waste and Recycling		Council
Organics household composting or worm farm (optional)	Food waste / organics		Bunnings  Closed Loop: <a href="https://closedloop.com.au/upcycling-products">https://closedloop.com.au/upcycling-products</a>

## Appendix D Refuse and Safety Signage

## Example Refuse Signage

Signs for garbage, recycling and organics bins should comply with the standard signs promoted by DECC. Standard wall posters and bin lid stickers are available for download and printing from the Local Government section of the DECC website [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au), in black and white and appropriate coloured versions where applicable.

Further information can also be found on <https://www.liverpool.nsw.gov.au/services/waste-and-recycling>.



Sources: <https://www.ryde.nsw.gov.au/Environment-and-Waste/Waste-and-Recycling/Waste-Resources/Units-and-Apartment-Blocks>, <https://www.liverpool.nsw.gov.au/services/waste-and-recycling/return-and-earn>

## Example Safety Signage

Safety Signs are required for refuse discharge and storage rooms / areas and must comply with Australian standards “AS 1319 Safety signs for the occupational environment”. Additional state or local government requirements may also apply. Following are examples of typical signs used around a waste storage area. It should be noted however that an assessment must be completed by a qualified fire and safety consultant, prior to occupancy, to determine the correct signage to be used.

### Fire Management



### Refuse Room Management



Do not overfill bin



Lid must be closed

