Waste Management

Proposed Mixed-Use (Community Housing & Retail) Development

At 11 Gibbons Street, Redfern

On Behalf of St George Community Housing 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.

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GLOSSARY OF TERMS

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

TERM	DEFINITION
Baler	A device that compresses waste into a mold to form bales which may be self-supporting or retained in shape by wire ties and strapping. It is commonly used to bale cardboard and soft plastics (plastic film).
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 1.0m³ to 4.50m³ used for the storage of refuse that is used for on-site refuse collection.
Bulk MGB	A plastic (polypropylene) receptacle that is greater than 360L in capacity generally ranging from 0.66m³ to 1.10m³ used for the storage of refuse.
Chute Discharge	The point at which refuse exits from the refuse chute.
Chute Discharge Room	Where separate to a "Bin Storage Area" an enclosed area or room housing the discharge and associated equipment for the refuse chute.
Collection Point	The identified position where refuse bins are stored for collection and emptying. The collection point can also be the bin storage area for bulk bins.
Compactor	A machine for compressing waste into disposable or reusable receptacles.
Composter	A container/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.
Hopper	A fitting into which waste is placed and from which it passes into a chute or directly into a waste container. It consists of a fixed frame and hood unit (the frame) and a hinged or pivoted combined door and receiving unit and is typically mounted on a wall
L	Litre(s) related to refuse volumes
Liquid Waste	Non-hazardous liquid waste generated by retail / commercial premises that should be connected to sewer or collected for treatment and disposal by a liquid waste contractor (including grease trap waste).
m^2	Square Metre(s) related to refuse areas
m^3	Cubic capacity related to refuse areas or equipment
Putrescible Waste	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	All material suitable for re-manufacture or re-use eg glass bottles and jars – PET, HDPE and PVC plastics; aluminum aerosol and steel cans and lids; milk and juice cartons; soft drink, milk and shampoo containers; paper, cardboard, junk mail, newspapers and

TERM	DEFINITION
	magazines.
Refuse	Material generated and discarded from residential and retail / commercial buildings including general waste, recyclables, green waste and bulky items.
Refuse Bin	A receptacle (mobile garbage (wheelie) bin, bulk MGB or bulk bin) used for the storage of refuse.
Refuse Chute	A ventilated, essentially vertical pipe passing from floor to floor of a building, for the purpose of refuse disposal, with openings as required to connect with hoppers and normally terminating at its lower end at the roof of a central refuse room(s).
Refuse Compactor	A receptacle that provides for the mechanical compaction and temporary storage of refuse, to reduce bin numbers and collection frequency.
Refuse Collection Vehicle (RCV)	A vehicle that is specifically designed for collecting and emptying refuse bins and refuse compactors.
Refuse Storage Room	An area identified for storing on-site mobile garbage bins or bulk bins within the property.
Regulated Waste	Waste prescribed under legislation as regulated waste.
Waste	Refuse material with the exclusion of recycling, green waste, hazardous waste special waste, liquid waste and restricted solid waste.
Waste (General Waste)	Generally material free of any actual or apparent contamination (pathological/infectious, radioactive and/ or hazardous chemical). Reporting use is for material considered to be free of food waste.
Collection Vehicles	
Rear-loading 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.

1. Executive Summary

The proposed mixed-use development at 11 Gibbons Street, Redfern contains approximately 160 residential units and 624m^2 of commercial/retail GFA.

On servicing days, all residential waste and recyclables will be collected by Council via on-site collection. Collections will occur two days per week for waste and two days per week for recycling, as agreed with Council's Manager Waste Strategy. All retail/commercial waste and recyclables will be collected by private contractor via on-site collection, with a collection frequency of two days per week.

TTM have referred to Section E of Council's guidelines and have outlined the general requirement compliance with the checklist in the table below.

Table 1.1: Planning for Waste Minimisation and Management- Compliance checklist

General Requirements	Compliance	Comments
Where a residential development and non-residential development occupy the same site, the waste and recycling handling and storage systems for residential waste and non-residential waste are to be separate and self-contained. Commercial and retail tenants are not to be able to access residential waste and recycling storage area(s) or interim storage containers or chutes used for residential waste and recycling.	✓	All residential and non-residential refuse handling and storage systems are separate and self-contained. Commercial and retail areas will not have access to the residential refuse room.
Collection points for both residential and non-residential waste and recycling may be shared.	✓	Resident and non-residential refuse collection areas are separated.
The Waste and Recycling Management Plan is to identify the storage areas, collection points and management systems for both residential and non-residential waste streams.	✓	All residential and non-residential storage areas, collection points and management systems are outlined in this waste management plan.
For non-residential spaces, interim waste storage containers for waste and recycling is to be located on each occupied floor sufficient for one day's generation of waste and recycling. Provision is to be made in cleaning contracts for this material to be transferred to a central waste and recycling storage area at least once daily.	✓	All non-residential uses can accommodate at least one full day's worth of refuse storage in the commercial refuse room.
The collection point is to be designed to accommodate collection vehicles wholly on-site.	✓	The refuse collection point can accommodate the vehicle wholly on-site.
Any chute located within the residential component of a mixed-use development is not permitted to carry waste generated by non-residential premises.	✓	The chutes are used for residential use only.

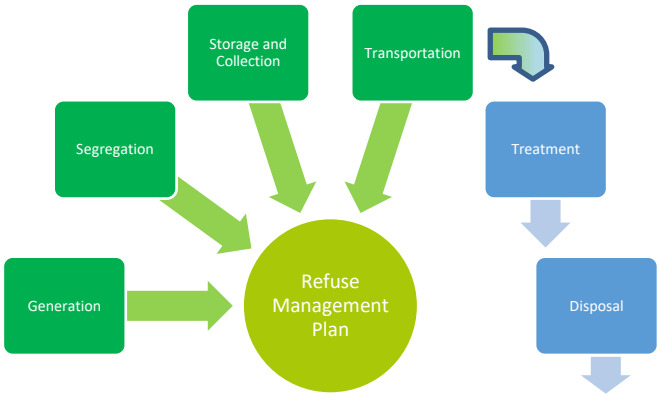
2. Introduction

2.1. Background

TTM Consulting has been engaged by St George Community Housing Limited to prepare a refuse management plan to support the proposed mixed-use development (residential flat building and commercial tenancies) located at 11 Gibbons Street, Redfern. The assessment and associated recommendations include:

- Identification of refuse streams produced within the development;
- Estimated volumes generated;
- Appropriate segregation methods for each refuse stream;
- 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;
- Pollution prevention;
- Owner and tenant education;
- Waste minimisation; and
- Operational requirements.

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 requires its own separate plan.

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

- Council's superseded Policy for Waste Minimisation in New Developments,
- Council's current Guidelines for Waste Management in New Developments (adopted August 2018), and
- Better Practice Guide for Waste Management in Multi-unit Dwellings.

2.2. Site Location

The site is located at 11 Gibbons Street, Redfern, as shown in Figure 2.1 and Figure 2.2. The site has road frontages to Gibbons Street, Marian Street and William Lane, which the latter will be utilised as the servicing road for on-site collection via the internal driveway.

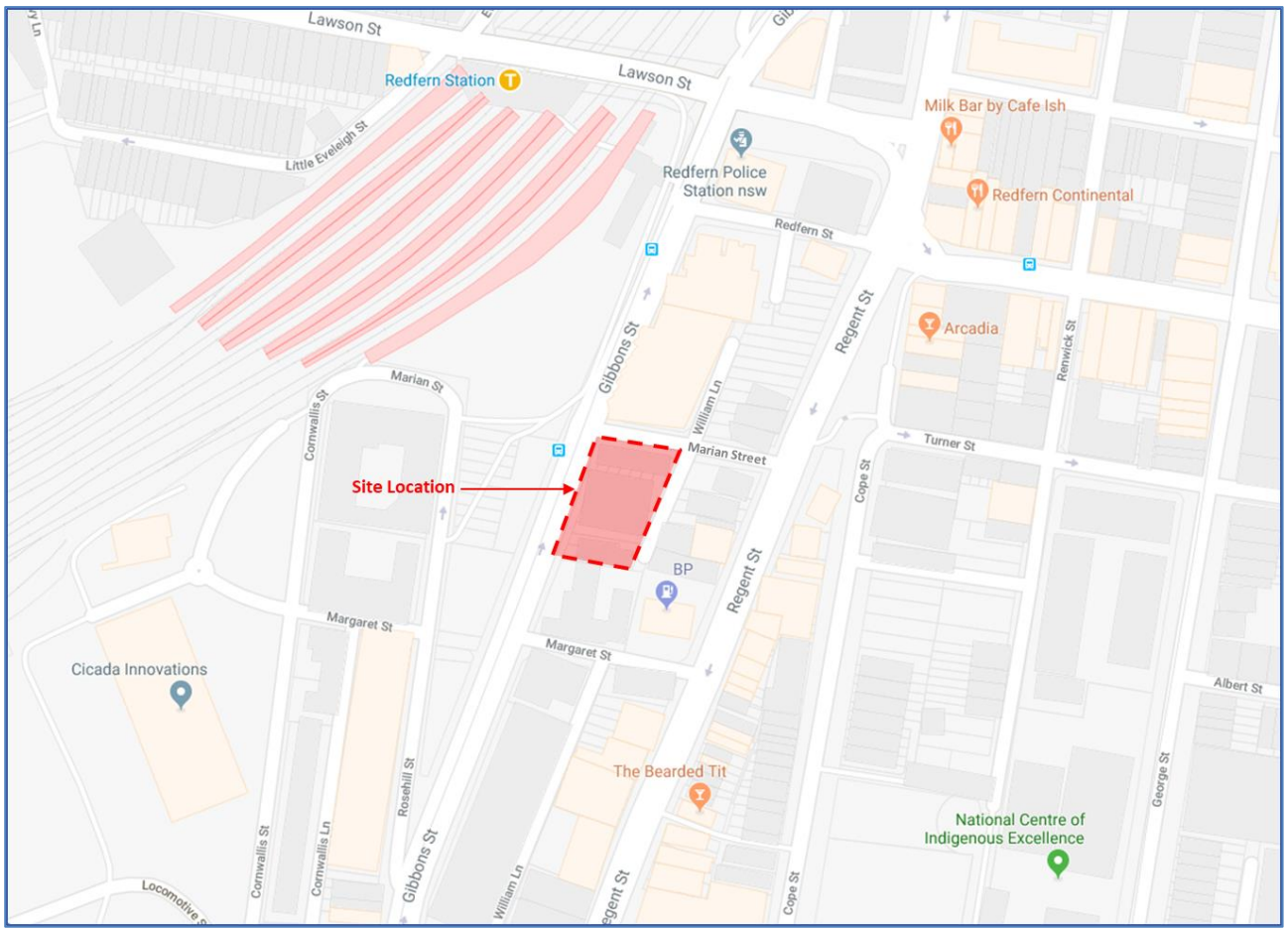


Figure 2.1: Site location

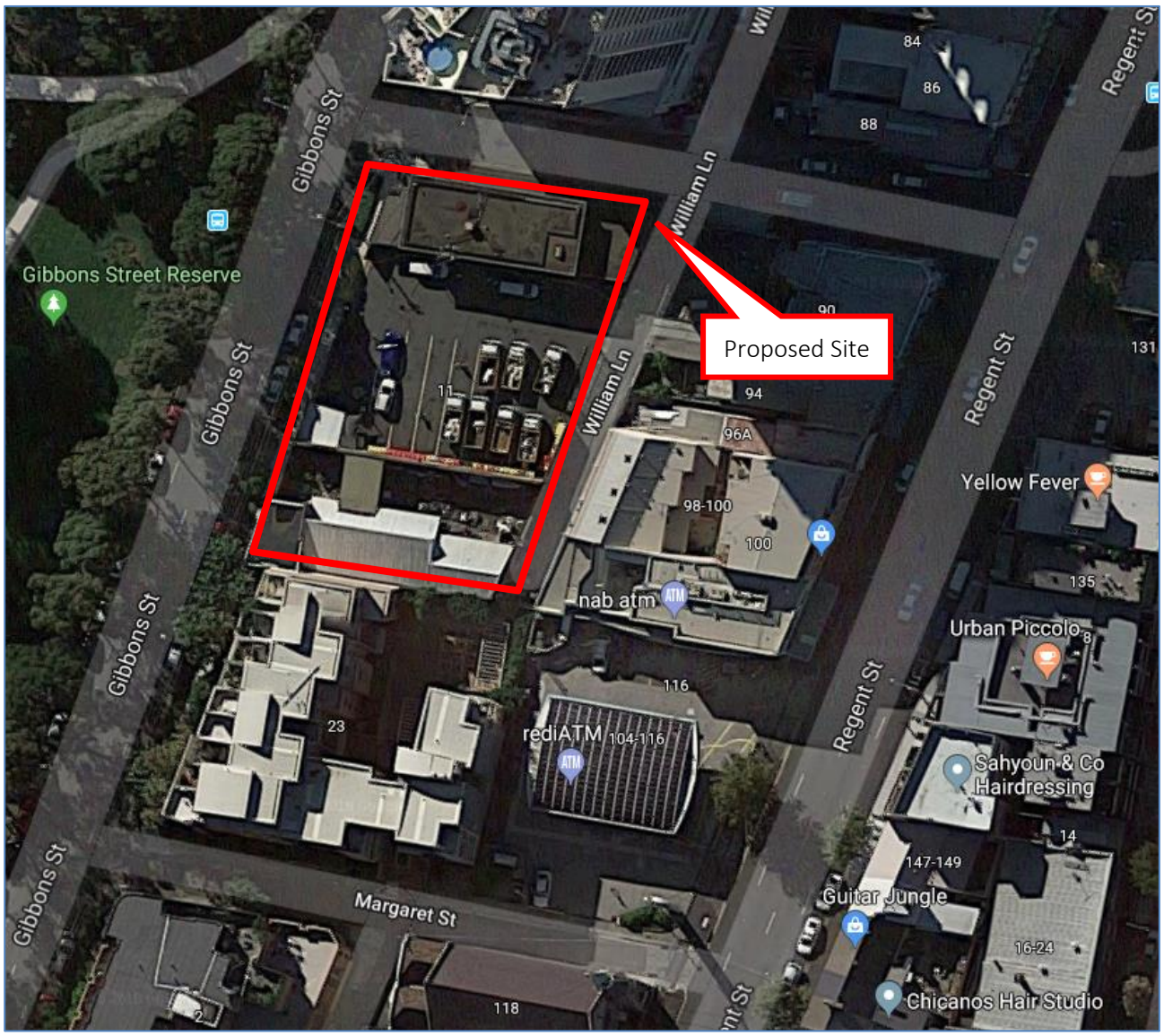


Figure 2.2: Site overhead

2.3. Development Summary

The development consists of an 18 level tower with 17 residential levels built above a ground floor with a total of 624m^2 GFA of retail/commercial space, community hub, SGCH office space and communal open space area.

2.4. Development Refuse Profile

Table 2.1and Table 2.2 summarise the refuse profile of the development.

Table 2.1: Residential Refuse Summary

Description	*# Units*	*Generated Waste* (L/week)	*Generated Recycling* (L/week)
1 bedroom	60	4,800	2,400
2 bedroom	96	7,680	3,840
3 bedroom	2	160	80
Dual Keys	2	160	80
Total	**160**	12,800	6,400

Table 2.2: Retail / Commercial Refuse Summary

Description	*GFA (m^2)*	*Generated Waste* (L/week)	*Generated Recycling* (L/week)
Retail	194	679	679
Office / community	364	182	182
Café	66	3,049	601
Total	**624**	**3,910**	**1,462**

Section 6 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 A.1. Site drawings can be found in Appendix A.2 and Appendix A.3.

3. Residential Refuse

The building size and design determines that dual refuse chutes are required for waste and recycling disposal from all residential levels (see Appendix A.2 for refuse compartment). The residential apartments waste streams may consist of the following:

Table 3.1: Generated Residential Waste Streams

Frequently Generated Waste Streams	
General waste	**General waste** 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 waste receptacles and waste chute.
Recycling (glass, aluminium and steel cans/tins/lids, paper/cardboard, semi rigid plastics)	**Recycling** should be collected in a dedicated receptacle to ensure separation from the waste material and must not be bagged. Recyclables should be placed loosely directly into the recycling chute. Large paper and cardboard items should not be disposed of via the chutes due to blockages that inevitably occur. Typically, a small bin/crate for larger recycling items is placed in close proximity to the lifts on each residential level or the ground floor for disposal of this material.
Infrequently Generated Waste Streams	
Green waste	**Green waste** is not typically produced from residential flat dwellings other than from surrounding building landscaped areas and is removed by a designated maintenance contractor. 240L bins will be provided in the retail refuse room to accommodate the generated garden organics. Servicing frequency will be on an as needs basis.
Hard waste/bulky goods	Space is allocated in the **bulky goods** area, separate to the bin storage, for storage and collection of bulky goods**.** A room, 17m^2, is provided adjacent to the residential and commercial bin rooms. Residents must coordinate all bulky goods movements and storage with building management and Council, where they will be collected onsite. It is prohibited for residents to stack or pile bulky goods items on the footpaths, in driveways, in bulk bins, or in carparks. Unless otherwise instructed by Council, charitable organisations may be contacted by the building caretaker/s as a mode for collections.
Hazardous waste (paints, batteries and cartridges) and E-waste	The building caretaker will assist in the coordination of disposal of **specialised / hazardous waste and e-waste** 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.

3.1. Apartment Level Disposal

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.1 for typical apartment bins). Residents will dispose their refuse directly to the dual refuse chutes located on each residential level in close proximity to the stairs (refer to Appendix A.2).

3.2. Transferal and Storage Process

Refuse will discharge via the waste and recycling chutes into appropriate 1100L waste and recycling bins (refer to Appendix B.3 for bin sizes). On collection day, bins will be collected directly from the residential room for servicing by Council. The chute discharge area is partitioned for safety purposes.

4. Retail/Commercial Refuse

The waste streams for the retail/commercial use may consist of the following:

Table 4.1: Generated Retail / Commercial Waste Streams

Frequently Generated Waste Streams	
General waste	**General waste** 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 not exceed the dimensions of the waste receptacles.
Commingled Recycling (glass, aluminium, steel, paper and cardboard, semi rigid plastics etc)	**Recycling** should be collected in a dedicated receptacle to ensure separation from the waste material and must not be bagged. Where applicable, other materials such as cardboard and plastics should be separated. Consideration may be given to the use of a baler for **cardboard, plastic film LDPE or HDPE recyclables.** Segregation and baling of these materials will reduce total waste output and may lower the total cost of refuse removal. Typically, a decision on the use of this equipment would be made at the start of the operational phase following review of the site final waste requirements and completion of appropriate risk assessments and operational procedures.
Infrequently Generated Waste Streams	
Hard waste/bulky goods	**Hard waste** will be coordinated with the building caretaker / staff and removed by the designated maintenance contractor.
Hazardous waste (paints, batteries and cartridges) and E-waste	Where applicable, tenants usually make their own arrangements for the disposal of **specialised / hazardous waste and e-waste** such as recycling of toner cartridges and batteries. Facilities management / cleaners will organise and assist with disposal of hard, electronic, liquid waste and any paint/chemicals. Hazardous waste must be handled with due care, separated and securely stored for collection by a specialist waste contractor.

4.1. Retail or Food and Beverage Outlet Disposal

While the proposed tenants are not determined at this stage, typically each tenant will be responsible for storage of refuse produced during operating hours within their own tenancy area. Typically, tenants will use bins up to a max size of 60L that are placed within service areas, kitchens or back of house (BOH), where space is available.

4.1.1. Transferal and Storage Process

The retail refuse room is located on the ground floor adjacent to the retail tenancy and bulky goods storage (see Appendix A.3 for refuse area). On completion of each day, or as required, nominated staff or cleaners will transfer their refuse to the commercial refuse room and place waste and recycling into respective 1100L bulk bins.

4.2. Office Disposal

Office levels and associated refuse for the development will be coordinated and managed by facilities management and any associated cleaning contractor.

Bin placement and type of bins on each of the office levels is subject to the leasing tenant, facilities manager and cleaner's agreement for refuse management. Typically, offices have a minimum 3 bin system allowing for disposal of paper, waste and recycling. A typical office bin system is shown in Appendix B.2.

Under desk bins may also form part of the refuse system. Waste bins are typically emptied by the cleaning contractor. Paper bins are typically emptied by staff into a 240L paper or secure destruction bin centrally placed within the office area.

4.2.1. Transferal and Storage Process

On completion of each working day or as scheduled, building management/cleaners collect the various refuse streams at office level and transfer via a cleaning trolley or wheelie bin to the commercial refuse room. Refuse is then placed into the appropriate collection bins for each collection stream.

Items such as recycled paper and secure destruction bins for confidential paper are organised by the leasing tenant. Bins are serviced on a "walk in – walk out" basis during working hours with bins exchanged full for empty at the office levels.

Cardboard or paper collected by management/cleaning staff should be placed in the allocated bins for this material.

5. Refuse Collections

5.1. Refuse Vehicle Access and Loading

The site will have service vehicle access via William Lane.

All bins are within close proximity to the vehicle parked position. The refuse collection vehicle (RCV) will enter and exit the site in a forward gear.

Refer to TTM Traffic Report for further detail.

5.2. Residential Servicing

Residential refuse will be collected onsite by Council. Refuse bins will be serviced by a rear-lift RCV.

On the day of service, all full refuse bins will be collected from the refuse collection room which is in proximity to the servicing area, as shown in Appendix A.3.

Refuse bin quantities have been agreed to in pre-application discussions with Council's Manager Waste Strategy and calculated on collection cycles of two days per week for waste and two days per week for recycling.

The building manager or caretaker will consult with Council to finalise service days and frequency prior to the time of occupancy.

5.3. Retail/Commercial Servicing

All retail refuse will be collected onsite by a private contractor. Refuse bins will be serviced by a rear-lift refuse collection vehicle (RCV).

On the day of service, all full refuse bins will be collected from the retail bin collection area which is in close proximity to the servicing area, as shown in Appendix A.3.

Refuse bin quantities have been calculated on collection cycles of two days per week for waste and two days per week for recycling.

The building manager/caretaker will liaise with and directly engage a contractor to finalise service days, frequency prior to the time of occupancy and disposal of other waste streams such as, oils and organics if required.

6. Recommended Operational Requirements

6.1. On-going Management

All refuse equipment movements are to be managed by the building manager/caretaker or cleaners at all times. The building manager/cleaner duties include, but are not limited to the following:

- General maintenance and cleaning of the chute doors on each level (frequency dependent on waste generation and will be determined based upon building operation);
- Organising, maintaining and cleaning the general and recycled waste holding areas (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 and exchanging all bins;
- Organising and coordinating bulky goods collections;
- Ensuring site safety for residents, children, visitors, staff and contractors;
- Abiding by all relevant OH&S legislation, regulations, and guidelines;
- Assessing any manual handling risks and preparing a manual handling control plan for waste and bin transfers;
- Providing to staff/contractors equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities; and
- Continual monitoring of equipment uses and scheduling to ensure best operational outcomes.

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.

6.2. Waste Minimisation

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

6.2.1. 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.

6.2.2. Monitoring and Review

Regular monitoring and inspections of waste and related equipment and facilities from the development should be conducted by building management/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 and equipment and economic feasibility. Refuse weights and movements will be recorded and reviewed by SGCH. A review is typically conducted by SGCH once the building is fully operational.

6.2.3. Signage

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

6.3. Safety

Note that transferring refuse bins is considered a hazardous manual task and 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.

6.4. Refuse Equipment Summary

Equipment required or suitable for use as part of the operational phase of the development is outlined below.

Note: all collection receptacles and bins should be branded with the appropriate stickers / hotstamping of bins.

Table 6.1: Operations Equipment

Component	Description	Quantity	Notes
Residential	*Recycling Bins* +permanent under chute	6^{+1}	*1100L bins* *See Appendix B.4*
	Waste Bins +permanent under chute	12^{+1}	
	Green waste	*Subject to final operational requirements*	
	Dual Chutes	*1*	*See Appendix B.3*
	Linear Bin Track- Waste	*1*	*See Appendix B.3*
Retail	*Recycling Bins*	1	*1100L bins* *See Appendix B.4*
	Waste Bins	3	

6.5. Operational Suppliers Summary

Equipment suppliers for use as part of the operational phase of the development are outlined below.

Table 6.2: Equipment Suppliers

Company Name	Equipment	Link
Elephants Foot Recycling Solutions	Chutes & Bin Rotation Equipment, Balers, Compactors, Bin Lifters, Weighing Systems	http://www.elephantsfoot.com.au/
Wastech	Chutes & Bin Rotation Equipment, Balers, Compactors	http://wastech.com.au/
Pakmor	Balers, Compactors, Bin Lifters, Weighing Systems, Shredders	http://pakmor.com.au/
Miltek	Balers and Compactors for waste and recycling i.e. Cardboard, Plastic, Polystyrene, Medical Waste	http://www.miltek.com.au/
Closed Loop Organics	Industrial and Domestic Composters	http://www.closedloop.com.au/domestic-composter
J.J. Richards	Pulpmaster	http://www.pulpmaster.com.au
Ace Waste	Specialised/hazardous waste collection and disposal	http://www.acewaste.com.au/
Absorbenviro	Containment, Absorbents, Drain Protection	http://www.absorbenviro.com.au/
Trade Environmental	Spill Response, Spill Containment, Storm water Management	http://www.tradeenviro.com.au/bunded-pallets/
Spill Station Australia	Spill Response and Containment Equipment	www.spillstation.com.au

6.6. Controls

6.6.1. Waste Chute

The waste chute will have the following features:

- Adequate strength for its purpose, including additional reinforcing where necessary at joints, bends and hopper intersections;
- Insect and vermin proof;
- Constructed and installed to prevent the following during use and operation of the system:
  - Transmission of vibration to the structure of the premises; and
  - Limits excessive odour excessive noise to the occupants of the building;
- Installed in a fire rated duct and ventilated in compliance with building requirements of the Building Code of Australia;
- Comply with the waste chute manufacturer's technical specifications and / or operational limitations, including installation design features and ancillary equipment required to prevent blockages and noise disturbances;

- Fitted with a shutter at the base of the chute for closing off the chute manually during bin exchange and automatically in the case of fire;
- Discharge centrally above the waste containers in the waste storage room;
- Hoppers to be:
  - Provided on each residential floor and be located in a freely ventilated position in the open air or in a dedicated room or compartment;
  - Be easily accessed by the occupants of each unit;
  - Be separate from any habitable room or place used in connection with food preparation or living areas;
  - Be designed and installed so as to:
    - Close off the service opening in the chute when the device is open for loading;
    - Be between 1.0m and 1.5m above floor level;
    - Automatically return to the closed position after use;
    - Permit free flow in to the chute;
    - Not project into the chute, and
    - Allow easy cleaning of the device and the connection between the service opening and the chute.
  - Have the largest dimension of the service opening (the diagonal of a rectangular opening) not exceeding 0.75 diameter of the chute with which the hopper is connected;
  - Have a surround on the wall around the hopper that is at least 300mm wide and made of glazed tiling or other impervious material that can easily be cleaned;
  - Have a floor adjacent to the hopper that is paved with hard impervious materials with a smooth finished surface; and
  - If located within a waste disposal room, be ventilated and finished with an impervious material covered at all angles.

It is noted that the proposed development does not include compacted waste.

6.6.2. Refuse Room

The refuse room 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 are 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;
- The floors are to be graded to fall to a drainage point;
- Drainage points 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;
- Not located adjacent to or within any habitable portion of a building or place used in connection with food preparation (including food storage);
- Permit unobstructed access for removal of the containers to the service point; and
- Will be attractively designed to minimise their visual impact on the surrounding areas.

6.6.3. Bin Collection / Servicing Point

The Council and private contractor arrangements will be scheduled and managed at separate times / days. The bin collection point is designed to the waste and recycling bins that require servicing. It will have the following features:

- Is a constructed hardstand area and bins can be manoeuvred for servicing without lifting the bin over raised surfaces (ie no steps or lips);
- Is located at least 5 metres from any door, window or fresh air intake within the development or any adjoining site;
- Is screened to ensure bins are not visible from a public place, neighbouring properties, passing vehicles or pedestrian traffic external to the site;
- Of sufficient size to accommodate the bins;
- Will be fitted with bump rails to protect the walls / surrounds from bins causing damage;
- Positioned on a level pad and is not more than 5m from the loading / servicing zone;

- Connected to the crossover by a paved path so that the bin can be manoeuvred for servicing without lifting the bin over raised surfaces (pram ramp);
- Has sufficient access and clearance for the waste and recycling collection vehicles to service the bins and does not have obstructed overhead space;
- Allows bins to be serviced safely while minimising the impediment to traffic flow during servicing as it is within the designated loading / carriageway area;
- Is clearly separated from car parking bays, footpaths and pedestrian access;
- Is clear of speed control devices;
- Does not block the entry and exit to the property; and
- Is positioned away from entrances to shops or residential premises.

6.6.4. Bin Carting Route

The bin carting route (from both the refuse chute room to the refuse room / bin collection point) has the following features:

- Is via the hard stand; and
- Does not have any lips, stairs/steps and no gradient.

6.6.5. Bin Wash

A bin wash will be provided within the refuse chute room and will have the following design elements:

- Constructed hardstand area with a solid concrete base;
- Graded to fall to a drainage point within the storage point;
- Drainage point connected to sewer in accordance with trade waste requirements;
- Provided with a hosecock for cleaning;
- Is in a purpose-built storage area which is air locked, fly and vermin proofed, and used solely for the storage of waste; and
- Is in a well-ventilated portion of the refuse room and not within ten (10) metres of an opening to a food premises or food handling area.

6.6.6. Storm Water Prevention and Litter Reduction

Designated personnel / 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; and
- Installing litter traps in car parks for any unwanted discharge.

6.6.7. Ventilation

Natural (unobstructed, permanent openings direct to external air no less than one-twentieth (1/20) of floor area) or mechanical ventilation (minimum rate of 100 L/s and 5L/m^2 exhausting rate) must be provided to waste storage areas unless refrigerated below four degrees Celsius.

Appendix A Detailed Information

A.1 – Development Refuse Calculations

The generation rates used, as agreed with by Council, for the calculation of refuse produced uses rates from the superseded Council of the City of Sydney Policy for Waste Minimisation in New Developments and Better Practice Guide for Waste Management in Multi-unit Dwellings.

All retail and café waste and recycling volumes are calculated based on a seven day per week operations and the office waste and recycling volumes are calculated based on a five day per week operations.

Waste and recycling volumes indicated do not include compaction, as required by Council.

Table A.1: Generation Rates

Type	Waste	Recycling
Residential flat buildings	80 L / unit / week	40 L / unit / week
Retail	50 L/100m²/day	50 L/100m²/day
Office / Community	10 L/100m²/day	10 L/100m²/day
Café	660 L/100m²/day	130 L/100m²/day

Table A.2: Residential Calculations

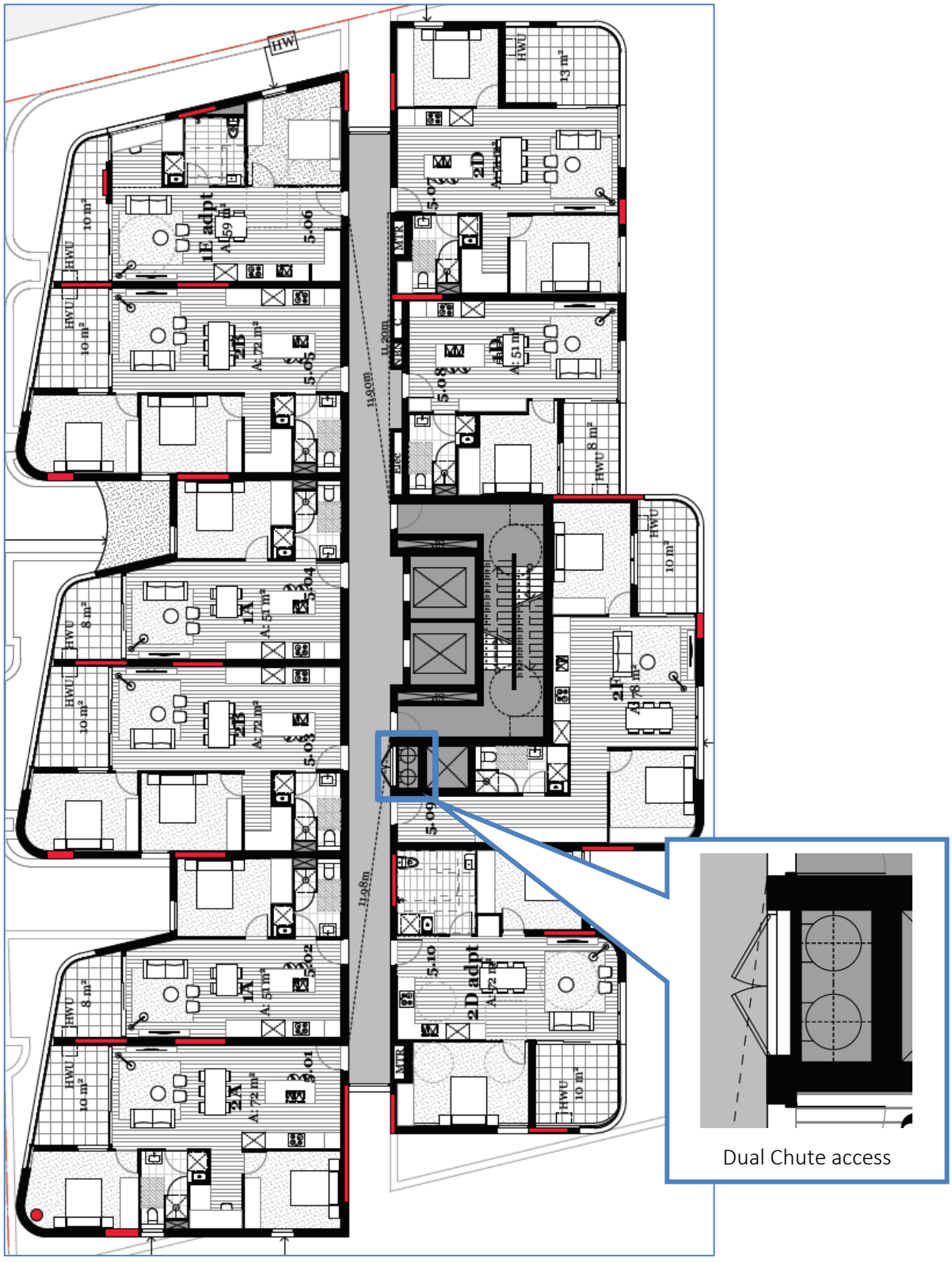
Description	# Units	Generated Waste (L/week)	Generated Recycling (L/week)
1 bedroom	60	4,800	2,400
2 bedroom	96	7,680	3,840
3 bedroom	2	160	80
Dual Key	2	160	80
Total	**160**	12,800	6,400
Refuse per day	-	**1,829**	**914**
Max refuse per collection	-	**12,800**	6,400
Collections and Equipment	**Bin Size (L)**	1100	1100
	Collections per Week	**2**	2
	No Bins Required	**12** +1	6 +1
Refuse Room	**Raw Bin Area Required**	**30.8 m²**	
	Storage Area Provided	**51 m² storage area + 22m² discharge area**	
	Bulky Goods	**17 m²**	

An additional bin for waste and recycling is required under the chutes all times during servicing.

Table A.3: Commercial Refuse Calculations

Description	GFA (m^2)	Generated Waste (L/week)	Generated Recycling (L/week)
Retail	194	679	679
Office/community	364	182	182
Café	66	3,049	601
Total	**624**	**3,910**	**1,462**
Refuse per day	**-**	**559**	**209**
Max refuse per collection	-	**2,234**	**835**
Collections, Equipment and Storage	**Bin Size (L)**	1100	1100
	Collections per Week	**2**	**2**
	No. Bins Required	**3**	**1**
	Raw Bin Area	6.8 m^2	
	Refuse Room	17 m^2	

A.2 – Typical Floor Plan



Source: DKO Architects- drawing no DA2005, rev P2, dated 18/09/18- Levels 5-16

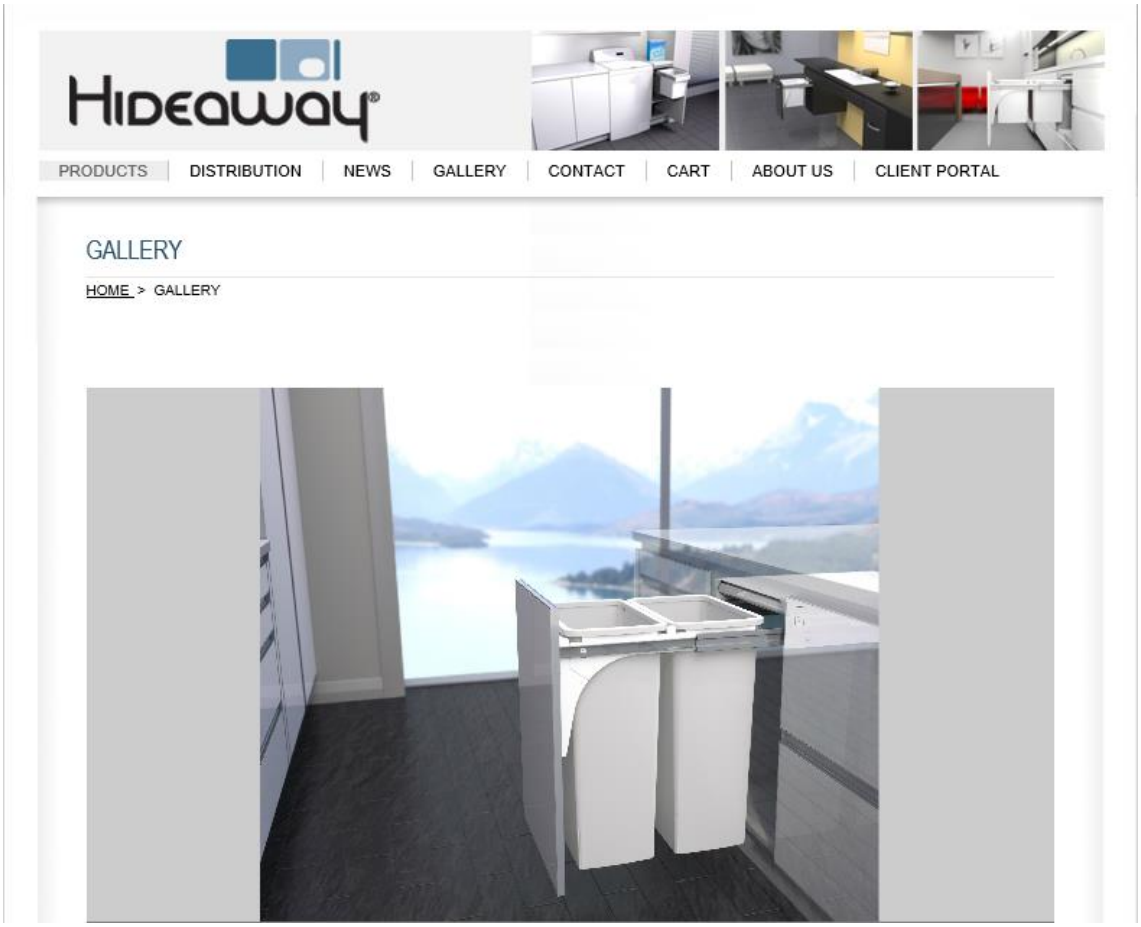
A.3 – Ground Floor Plan

Source: DKO Architects- drawing no DA2000, rev P2, dated 18/09/18- Ground Level

Appendix B Systems and Specifications

B.1 – Apartment Bins

Typical apartment/unit receptacles for refuse storage

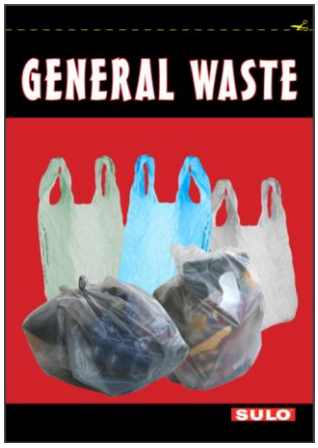


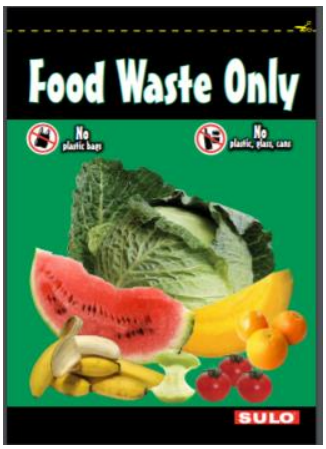
B.2 – Typical Commercial Office Bins

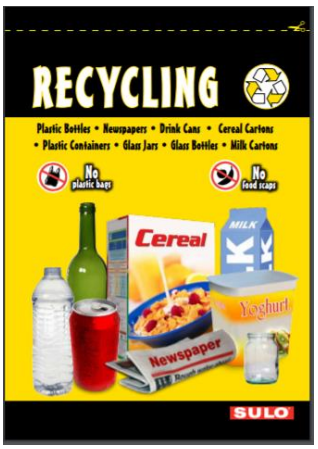
Waste and Recycling separation bins.

Colour Coded Wastestation - 3 Streams for Recyclable Waste

Printable Refuse Signs



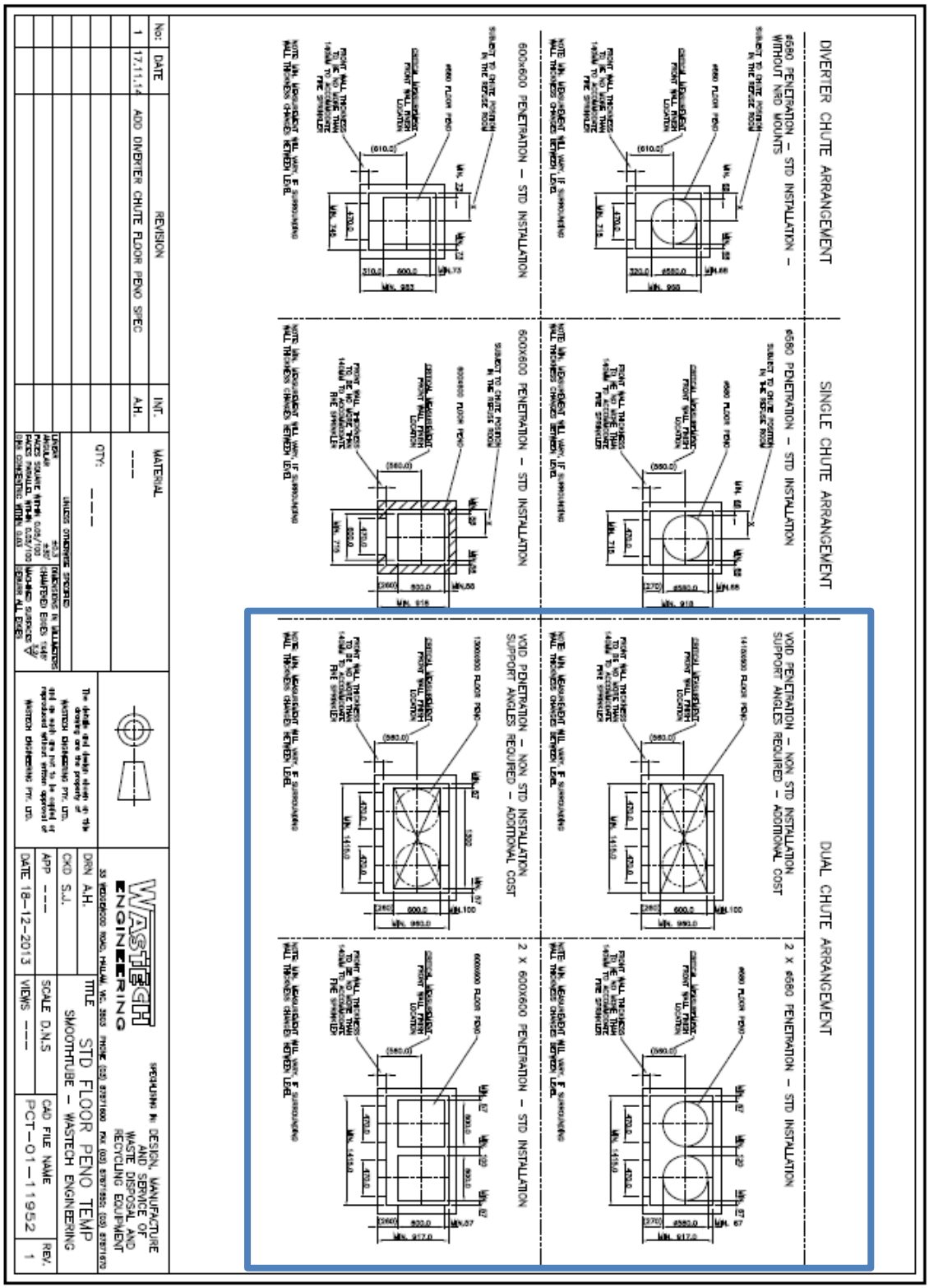




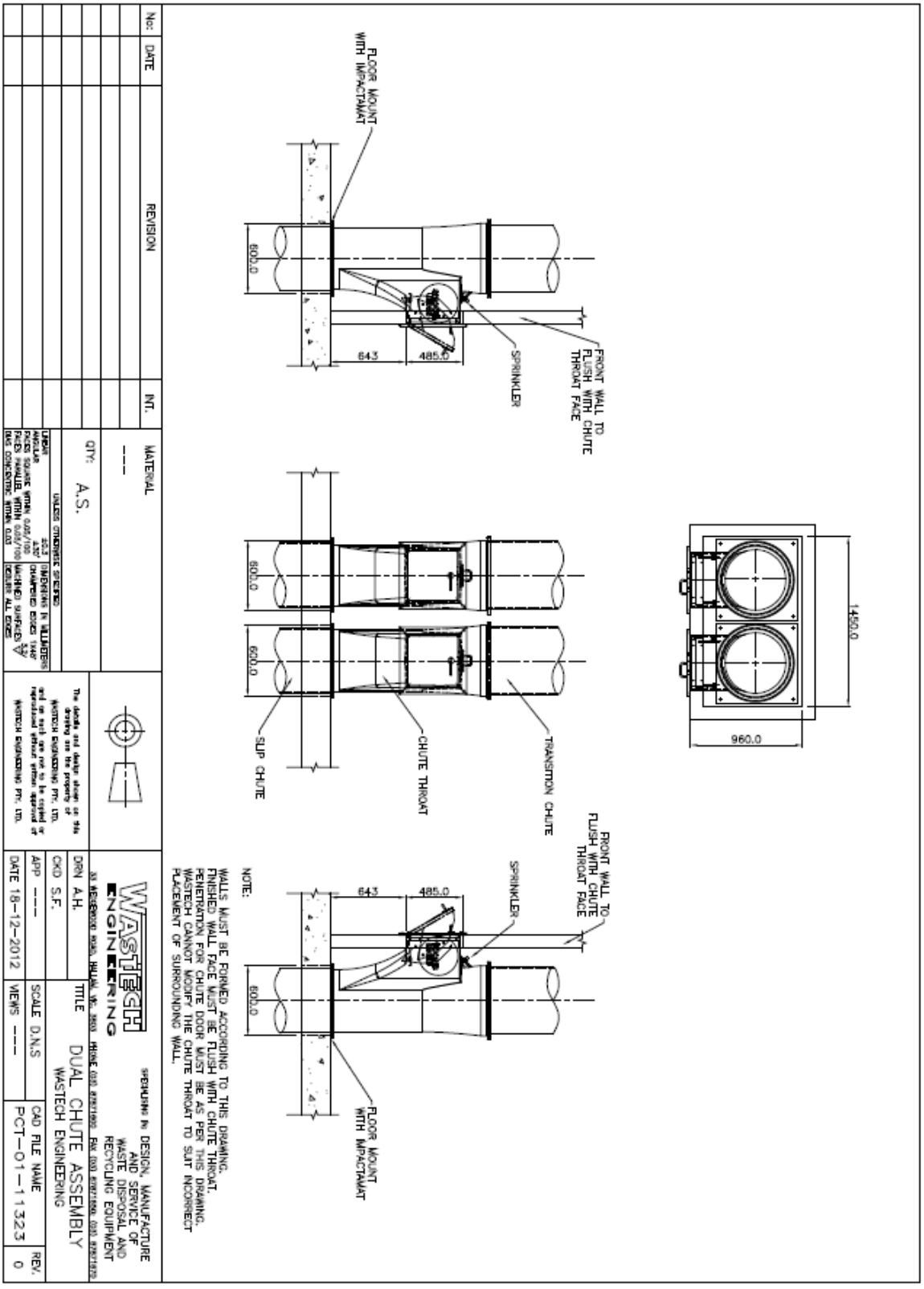
Source: http://www.sulo.com.au/products/office-recycling/waste-watcher/waste-watcher-sign-frames/

B.3 – Refuse Equipment

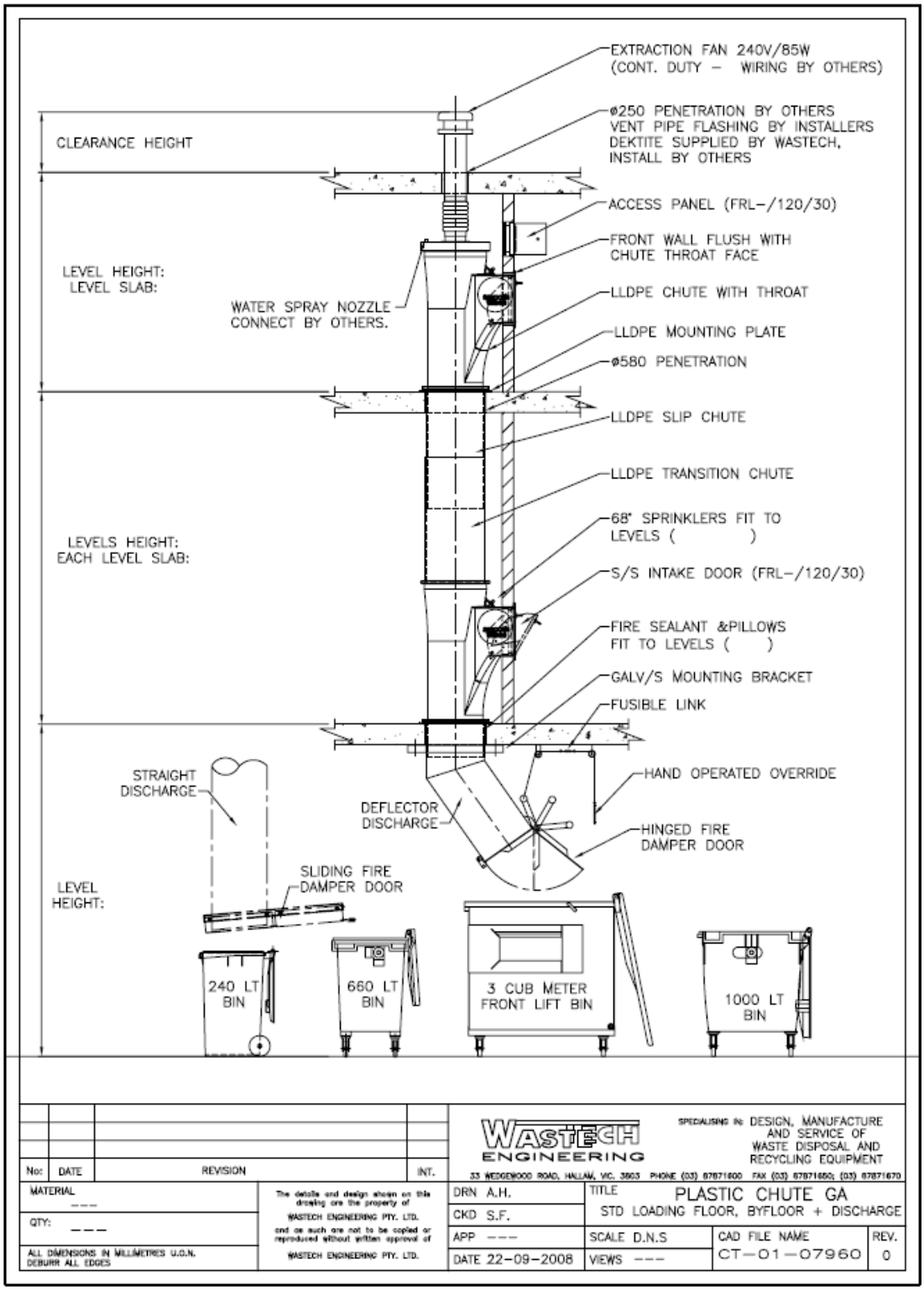
Waste Chutes- Standard Floor Penetration



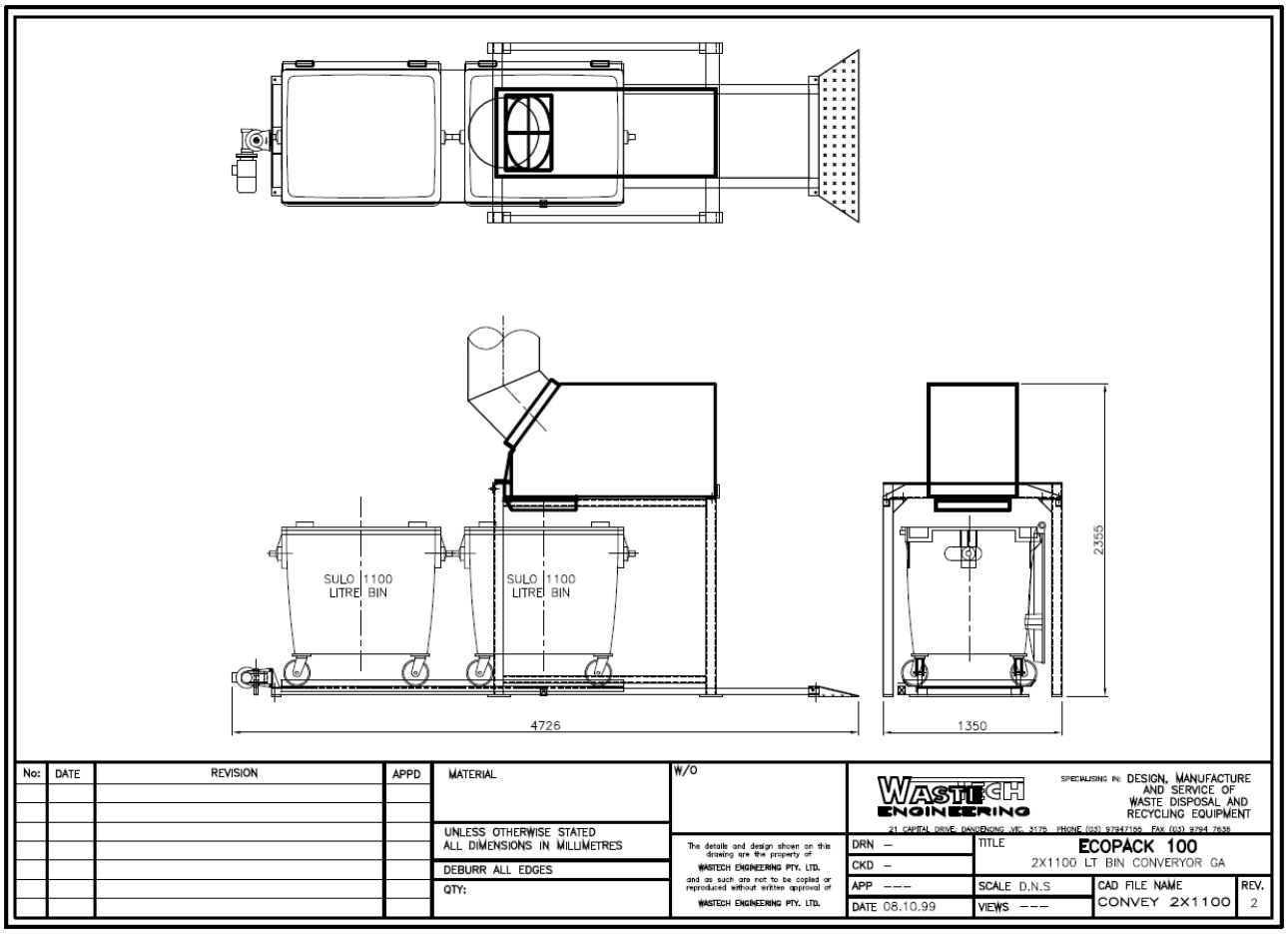
Waste Chutes- Typical Dual Chute Assembly



Waste Chutes- Typical Chute Section



Linear Bin Track



B.4 – Council Collection Bins

Bin type	120L MGB	240L MGB	660L MGB	1100L MGB
Height	940 mm	1080 mm	1250 mm	1470 mm
Length	560 mm	735 mm	850 mm	1245 mm
Width	485 mm	580 mm	1370 mm	1370 mm

Wheelie Bin

Bulk Bin

Appendix C Refuse Signage

C.1 – Refuse Signage Resource

Waste signs

Signs for garbage, recycling and organics bins should comply with the standard signs promoted by the 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, in black and white and appropriate coloured versions where applicable.

Example wall posters

Example bin lid stickers

Example Public Place Signage

C.2 – Example Refuse Chute Signage

C.3 – 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