



FORESIGHT
ENVIRONMENTAL

4-6 Bligh Street, Sydney

Operational Waste Management Plan

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This report is based on information provided by Coffey coupled with Foresight Environmental's knowledge of waste generated within the mixed-use development sector. To that extent this report relies on the accuracy of the information provided to the consultant. It has been compiled by Foresight Environmental on behalf of Coffey.

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1. Executive Summary

This waste management plan has been prepared by Foresight Environmental on behalf of Architectus. The plan details the way in which the proposed hotel, commercial offices and retail development at 4-6 Bligh Street, Sydney will manage the waste and recycling generated from the ongoing use of the development in accordance with the City of Sydney Policy for Waste Minimisation in New Developments. This plan confirms that the waste facilities provided in the proposed design will adequately cater for the projected waste generation rates at the completion of the development.

2. Overview of Development

The proposed development at 4-6 Bligh Street provides for a new 55 storey mixed use hotel and commercial building. The indicative architectural scheme comprises:

- 10 storey podium, including hotel entrance lobby, commercial lift lobby, food and beverage facilities, plant, commercial offices, meeting/conference rooms, gym space, and landscaped podium with formal hotel lobby
- 37 storeys of hotel (each level including 11 rooms, with a total of 407 rooms)
- 4 levels at rooftop including hotel club lounge, function space, restaurant and bar, and publicly accessible landscaped terrace
- 4 basement levels including 17 car parking spaces, 2 loading spaces, plants, end of trip facilities and waste management facilities

The approximate usage breakdown by area is as follows:

Table 1 – Area breakdown by usage

	NLA (m ²)	Room numbers	Usage/assumptions
Retail	1168	-	Mixed use retail – fashion/restaurant/café/bar etc
Hotel		407	Assume full occupancy for purposes of waste estimate and regular use of function room
Commercial	6,137	-	Standard commercial office usage

3. Waste Generation Estimate

Based on the information provided, benchmark data from similar developments and City of Sydney guidelines, the primary waste streams expected to be generated in the ongoing operation of the development would be:

- Mixed recycling (plastics, glass, aluminium, steel)
- Cardboard and Paper Recycling
- Organic Recycling
- Soft Plastic Recycling
- General waste
- E-waste recycling
- Toner cartridge recycling

3.1 Total Waste Generated

The following tables and charts summarise the expected quantities and composition of waste and recyclables generated through the ongoing operation of the development. Waste profiles have been separated where necessary to determine the individual waste profiles of each component (i.e. hotel, commercial/mixed retail).

Table 2 – Hotel waste generation estimate

	kg/day	L/day	kg/wk	L/wk
Cardboard/Paper	132	2,193	924	15,394
Food organics	235	783	1,648	5,495
Mixed recycling	142	1,896	998	13,312
General waste	125	2,086	879	14,645
Total	634	6,959	4,449	48,846

Table 3 – Mixed Retail Waste Estimate

	KG/day	L/day	KG/Wk	L/Wk
Cardboard/paper	74	1,316	520	9,240
Organics	114	325	798	2,280
Mixed Recycling	23	382	161	2,684
Polystyrene/soft plastics	6	185	44	1,295
General Waste	48	683	336	4,797
Cooking Oil	30	31	211	218
Total	295	2,923	2,070	20,514

Table 4 – Commercial Waste Estimate

	KG/day	L/day	KG/Wk	L/Wk
Cardboard/Paper	131	1,939	918	13,611
Food organics	26	74	181	517
Mixed recycling	9	153	65	1,077
General waste	18	263	129	1,846
Total	184	2,429	1,292	17,051

E-waste and toner cartridge recycling have not been detailed in the above tables due to the ad-hoc nature of these streams – see following sections for further detail on these streams.

4. Waste Management Systems

4.1 Hotel

Table 5 details the recommended systems and indicative collection frequencies to manage the estimated waste profile for the hotel component.

Table 5: Recommended equipment and indicative collection frequency – hotel

Waste Stream	Bin Type	No. of Bins	Clearance Frequency	Capacity	Estimated volume / week	Footprint per bin m ²	Total bin Footprint m ²
Cardboard/ Paper Recycling	Baler	-	3 x weekly	Ample – approx 9 bales per week	15,394	2m ² + 6m ² for bale storage	8
Food Organics	Pulp- master	Tank in waste room - pulping units in TBD	1 x weekly	Ample	5,495	Storage tank is approx. 3m ²	3
Mixed Recycling	660L MGB	6	3 x weekly	15,840	13,312	0.98	5.88
General Waste	1100L MGB	5	3 x weekly	16,500	14,645	1.32	6.6
Total bin footprint							23.48
Suggested Room Size – including circulation space							35.22

4.2 Mixed-retail

The recommended systems for the mixed retailers mirror those proposed for the hotel above as it is recommended that they use the same commercial waste contractor to consolidate collections in order to minimize truck movements onsite and increase the onsite efficiency for retailers and cleaners.

Table 6: Recommended equipment and indicative collection frequency – mixed retail

Waste Stream	Bin Type	No. of Bins	Clearance Frequency	Capacity	Estimated volume / week	Footprint per bin m ²	Total bin Footprint m ²
Cardboard/ Paper Recycling	Baler	1	2 x weekly	Ample – approx. 5 bales per week	9,240	2m ² + 4m ² for bale storage	6
Food Organics	Pulp-master	Shared tank in hotel waste room - pulping units TBD	1 x weekly	Ample	2,280	Storage tank is located in hotel waste room	-
Mixed Recycling	660L MGB	2	3 x weekly	3,960	2,684	0.98	1.96
General Waste	1100L MGB	2	3 x weekly	6,600	4,797	1.32	2.64
Polystyrene / Soft Plastic	Bale Frame	2	3 x weekly	2,000	1,295	1.2	2.4
Total bin footprint							13
Suggested Room Size – including circulation space							19.5

4.3 Commercial offices

Table 7 below details the bins required for the management of commercial offices waste and recycling. These systems will be stored in a shared space with the retail waste systems. Equipment such as the cardboard baler and Pulpmaster organics system will be shared by both retail and commercial users to create greater collection and cost efficiencies.

Table 7: Recommended equipment and collection frequency – commercial

Waste Stream	Bin Type	No. of Bins	Clearance Frequency	Capacity	Estimated volume / week	Footprint per bin m ²	Total bin Footprint m ²
Cardboard	Baler shared with retail	-	-	Ample – approx. 9 bales per week	1,674	-	-
Paper	240L MGB	12	3 x Weekly	11520	8,022	0.43	5.16
Food Organics	Pulp-master shared with retail	-	-	Ample	517	-	-
Mixed Recycling	660L MGB	1	3x weekly	1980	1,077	0.98	0.98
General Waste	1100L MGB	1	3x weekly	3300	1,846	1.32	1.32
Total bin footprint							7.46
Recommended Room Size							11.19

5. Waste and Recycling Storage Areas

The areas provided in the tables above provide indicative areas to allow for adequate maneuverability in each of the waste rooms. The updated design delivers ample space to adequately house the recommended systems.

Table 8 summarises the location and recommended size of each dedicated waste storage area.

Table 8: Waste storage area summary

Component	Waste Area Location	Required area (m ²)	Current design provision (m ²)
Hotel	B3	35.22	43
Mixed Retail	B3	19.5	41
Commercial		11.19	

Figure 1 highlights the location of each waste storage area on basement level 3.

Figure 1: Waste storage areas on B3

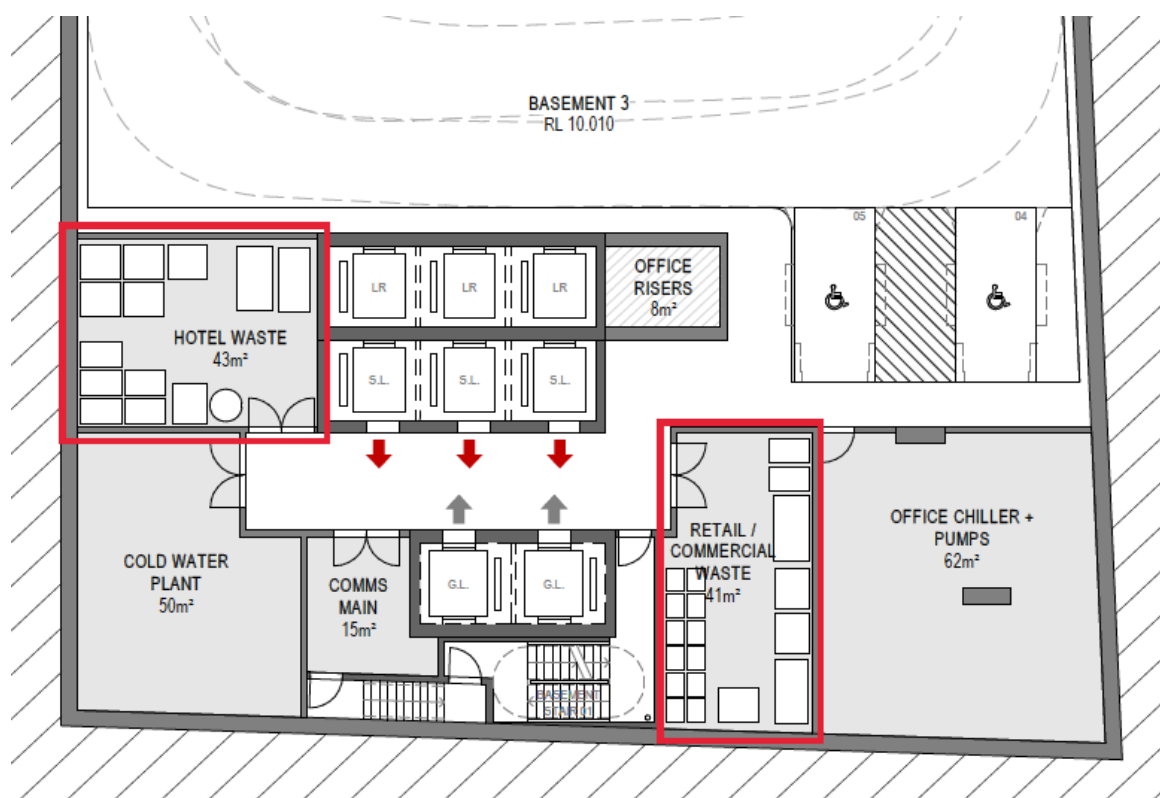
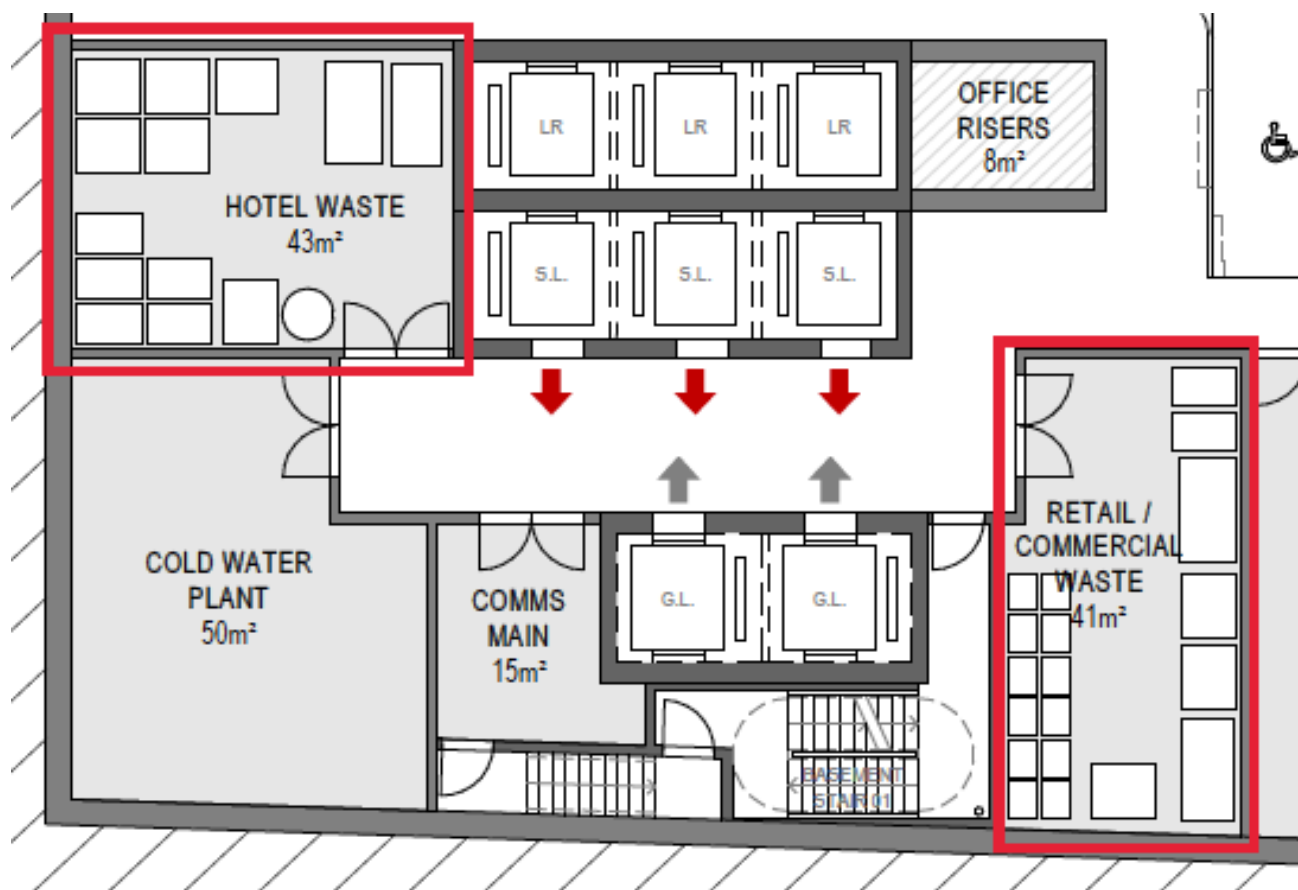


Figure 2 shows an indicative layout of the retail/commercial and hotel waste rooms.

Figure 2: Indicative layout of retail/commercial and hotel waste storage areas on B3



In accordance with the provisions of the CoS Policy for Waste Minimisation in New Developments, each waste and recycling storage room will have the following features:

- Ventilation: The bin storage room will be ventilated to external air or mechanically exhausted in accordance with AS 1668.2-2002
- Vermin Prevention:
 - The bin storage rooms will feature tightly fitted doors
 - Opening will be vermin proof
 - Cleaners are to ensure that bin lids are closed when unattended
- Noise: Noise will not be an issue due to the location of the waste storage room away from public on basement level 2.

- Floor: Structural concrete slab with smooth epoxy topping finish with coved wall and floor junctions. Graded drains to approved sewer connections – fitted with an in-floor dry basket arrestor approved by Sydney Water Corporation.
- Walls: Brick work/concrete block or similar finished in a light coloured, washable paint
- Ceiling: Structural concrete slab over
- Lighting: Base building lighting with switches inside and outside waste room (sensors may also be used)
- Water Supply: cold tap and hose connection
- Signage: clear signage identifying the various streams and appropriate use will be prominently displayed (see section on signage below)

5.1 Signage

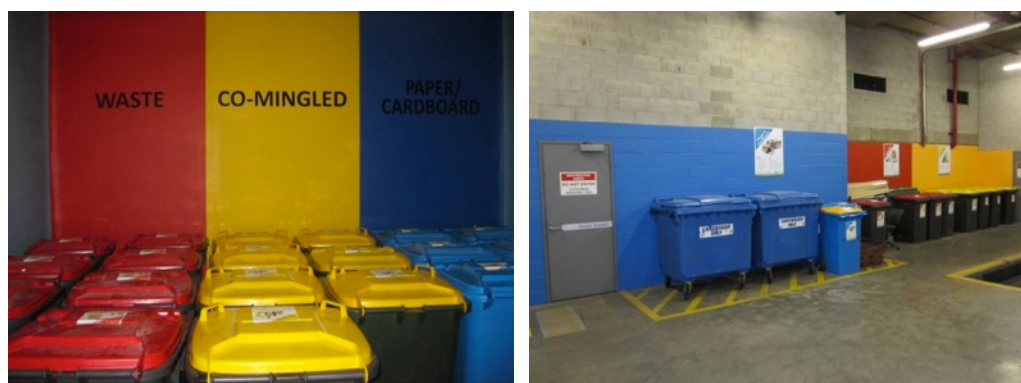
All waste and recycling streams should be differentiated with clear signage on all bins and on walls within the waste storage room. Below are examples of appropriate signage incorporating textual information, pictures and colour-coding to communicate the message.



5.2 Colour-coding

To further reinforce the differentiation between waste and recycling streams, it is highly recommended that the bin storage room be colour-coded to ensure bins are stored in the correct area and to enable easy identification of the streams provided. This can be done by painting borders on the floor indicating where bins should be stored. The colour of the paint should be consistent with the waste stream e.g. yellow paint for mixed recycling, red paint for general waste. The waste room walls can also be painted.

Photographs 1 & 2 – Examples of appropriate colour-coding



6. Onsite Management Protocols

Table 9 below outlines the onsite management protocols for the transfer of bins to the loading/collection zone on Basement Level 1. The details provided in table 9 outline a high-level management procedure for the movement of waste internally amongst the different stakeholders. It is expected that a detailed facilities management plan would be developed at an appropriate time with the operator to address the finer details of these procedures.

For efficiency and operational clarity, it is proposed that an onsite dock manager would be responsible for coordinating all dock activities (deliveries, waste collection etc) and facilities management staff (i.e. a BOH remit common to hotel, retail and commercial operators) would be responsible for the transfer of bins to and from the dedicated waste storage areas on B3 and the bin collection area on B1 on collection days. This process will ensure that bins are not left in the loading bay after collections are completed.

Table 9: Onsite management protocols for transfer of bins

Component	Management Protocol
Hotel	Hotel cleaning staff will be responsible for disposing hotel waste and recycling directly into the bins provided in their dedicated waste storage area on B3. In coordination with the dock manager, onsite cleaning staff will transfer their bins and cardboard bales to the bin collection area on B1. The dock manager will then be responsible for ensuring the successful collection of all bins with the waste contractor. After collection, the dock manager/cleaners will return empty bins to the hotel waste storage area on B3 for continued use.
Mixed Retail	All retail staff will be responsible for the management and separation of waste and recycling within their immediate BOH kitchen areas and then transferring the waste and recycling to the bins provided in their dedicated waste storage area on B3 as required. In coordination with the dock manager, onsite cleaning staff will transfer their bins and cardboard bales to the bin collection area on B1. The dock manager will then

	be responsible for ensuring the successful collection of all bins with the waste contractor. After collection, the dock manager/cleaners will return empty bins to the retail/commercial waste storage area on B3 for continued use.
Commercial offices	Office cleaning staff will be responsible for disposing commercial waste and recycling directly into the bins provided in their dedicated waste storage area on B3. In coordination with the dock manager, onsite cleaning staff will transfer their bins and cardboard bins to the bin collection area B1. The dock manager will then be responsible for ensuring the successful collection of all bins with the waste contractor. After collection, the dock manager will return empty bins to the retail/commercial waste storage area on B3 for continued use.

7. Collection

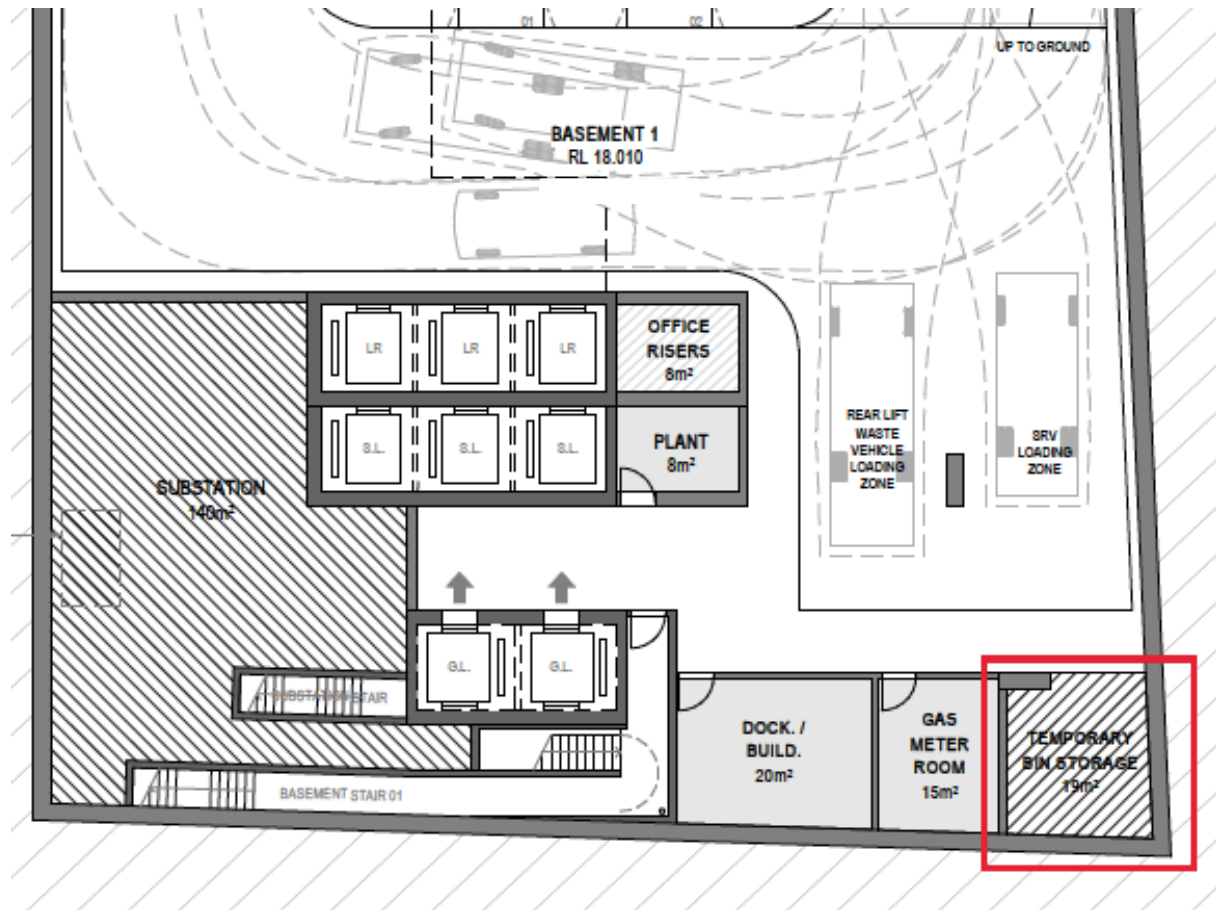
Table 10 below summarises the proposed collection schedule for the hotel, mixed retail and commercial components. An indicative schedule has been provided in order reduce the number of bin transfers required each day whilst also minimizing the amount of space required in the collection zone for the temporary storage of the bins. All scheduling would be coordinated by the dock manager to ensure efficient, shared use of the loading area. Additionally it should be noted that all waste collections can be scheduled late at night or very early in the morning to avoid congestion in the loading area with other competing activities (deliveries, contractors etc)

Table 10: Waste collection schedule

Component	General Waste	Cardboard	Mixed Recycling	Organics	Paper	Polystyrene/ Plastic
Hotel	Monday, Wednesday, Friday	Monday, Thursday	Monday, Wednesday, Friday	Wednesday		
Mixed Retail	Monday, Wednesday, Friday	Monday, Thursday	Monday, Wednesday, Friday	Wednesday		Monday, Wednesday, Friday
Commercial	Monday, Wednesday, Friday	Thursday	Monday, Wednesday, Friday	Wednesday	Monday, Wednesday, Friday	

Figure 3 below shows the temporary storage area and loading zone on B1. Collections will be conducted from this location by the appointed waste contractor.

Figure 3: Temporary storage area and loading zone



Waste truck specifications will vary slightly between contractors however as a guide, all streams and bins recommended in this report would typically be collected by a MRV rear lift waste truck – figure 4 and 5 provide examples of two common sizes used by most commercial waste contractors.

Figure 4: Small rear-lift commercial waste truck specifications

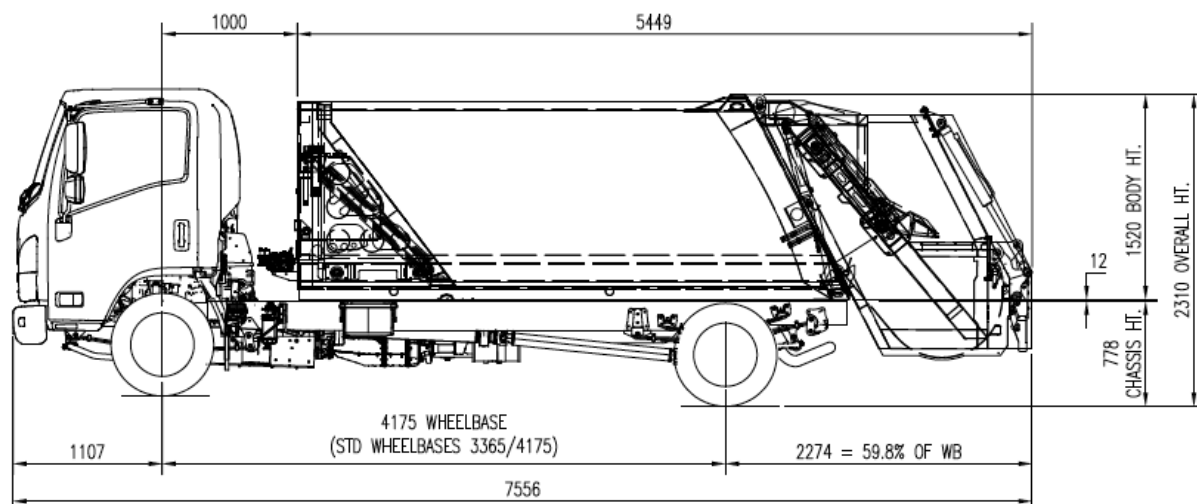
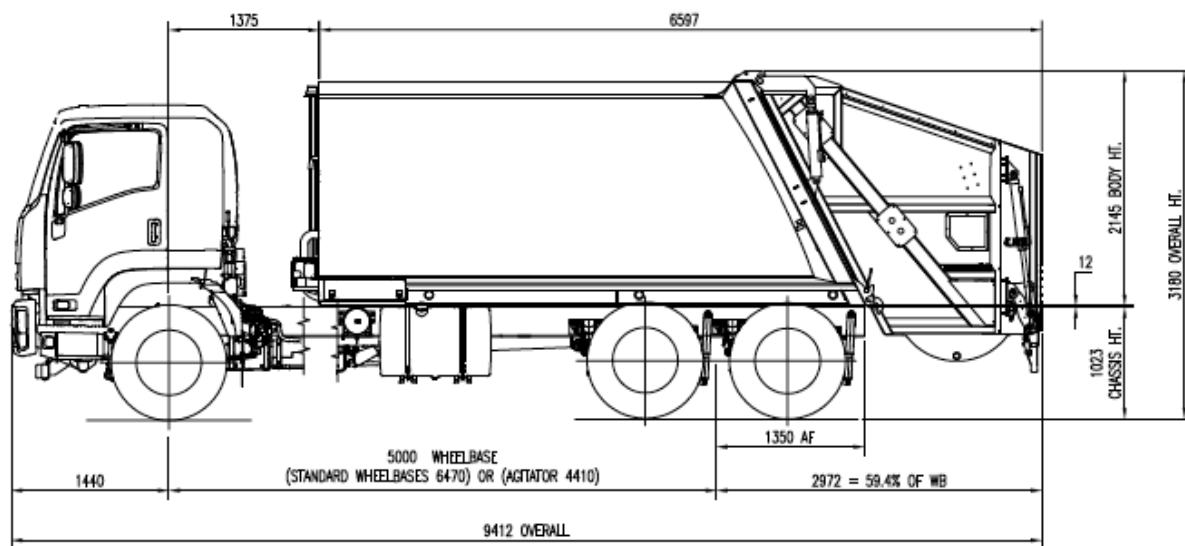
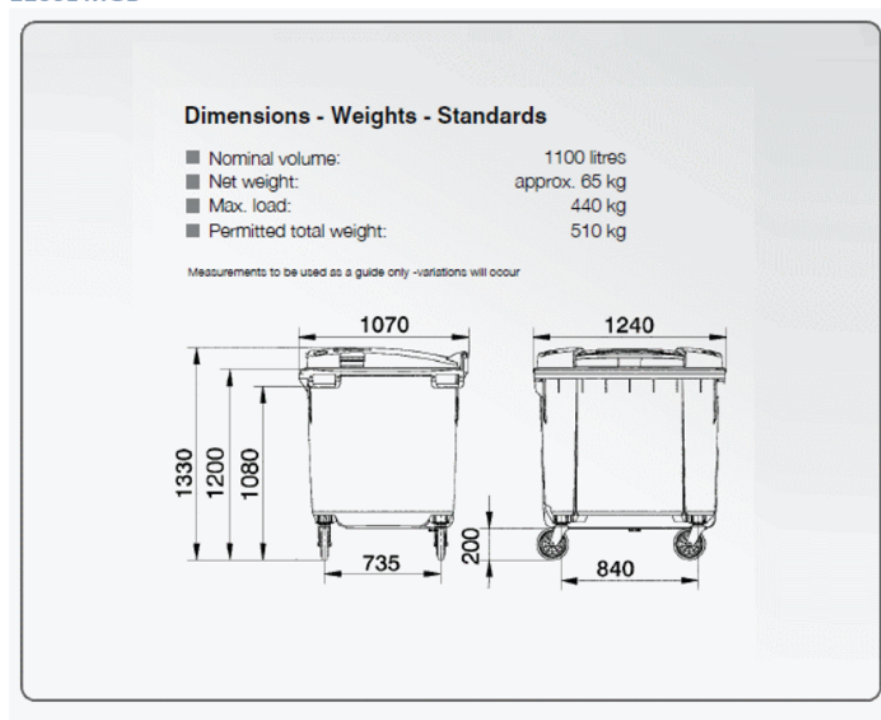


Figure 5: Medium rear-lift commercial waste truck specifications

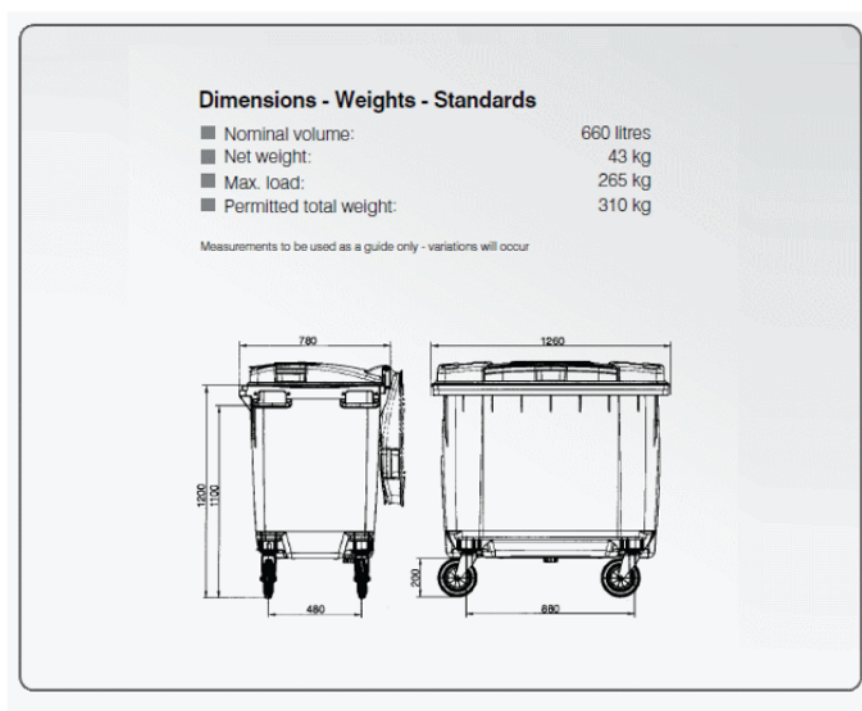


8. Appendix

1100L MGB



660L MGB





Pulpmaster 4000 – Features and Benefits

- Fully Stainless Steel for Durability
- Back to Base Communication
- All machine functions monitored
- Liquid cycle for organic liquid waste
- Category 4 Safety Rated
- Low water use – average 20L per tonne
- Reduction in waste volume up to 50%
- Auto cycle for quick efficient use
- Tank level monitored electronically
- All mechanical functions in the machine
- Wash cycle for easy cleaning
- Can process 1 kilogram a second
- Power usage – average 2.5kwh per tonne
- Reduced Truck Movements



Pulpmaster 4000
70 Litres per Load

Pulpmaster Waste Storage Tank – Specifications

1500L Tank Dimensions

Material: HDPE Thickness: 10mm

Storage Capacity: 1500 Litres

Height: 1550 mm

Length: 1800 mm

Width: 840 mm

Clearance Dimensions – Pulpmaster Tank

Shallow end and wall side – 10 mm

Kamlock end – 300 mm

Front side – 800 mm

Top of tank – 400mm

Features

Rubber seals on the lid and lid frame

One way vent to assist pump outs

Carbon filter for odour control



2700L Tank Dimensions Material: HDPE Thickness: 10mm

Storage Capacity: 2700 Litres

Height: 1800 mm

Length: 2020 mm

Width: 1100 mm

Clearance Dimensions – Pulpmaster Tank

Shallow end and wall side – 10 mm

Kamlock end – 300 mm

Front side – 800 mm

Top of tank – 400mm

Features

Rubber seals on the lid and lid frame

One way vent to assist pump outs

Carbon filter for odour control

