FORESIGHT ENVIRONMENTAL

Curl Curl North Public School

Operational Waste Management Plan

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This report is based on information provided by The NSW Department of Education c/o TKD Architects coupled with Foresight Environmental's knowledge of waste generated within the education and commercial sectors. 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 TKD Architects .

This report is not a substitute for legal advice on the relevant environmental related legislation, which applies to businesses, contractors or other bodies. Accordingly, Foresight Environmental will not be liable for any loss or damage that may arise out of this project, other than loss or damage caused as a direct result of Foresight Environmental negligence.

Revision No.	Issue date	Author	Reviewed by	Reason/comments
1	15 May 2017	Sandy Casaroli	Scott Ebsary	Draft issue for review

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1. Introduction

This operational waste management plan (WMP) has been prepared by Foresight Environmental on behalf of the New South Wales Department of Education (the 'Applicant') as part of a State Significant Development Application for the development of Curl Curl North Public School. The site is located at the intersection of Abbott Road and Playfair Road, Curl Curl North.

The proposed development seeks to redesign the existing school to accommodate 1000 students and 69 full time employees.

The proposed school development includes the following:

- Shared facilities including Amphitheatre, Communal Hall, canteen and other specialist learning spaces;
- Administration area for the whole school;

The purpose of this operational waste management plan is to outline the systems and practices involved in managing waste and recycling during the ongoing operation of the School.

2. Spatial Use

Table 1 below details the **waste generating areas** of the new development – these areas will form the basis of the waste generation estimates to be incorporated with the whole-of-campus estimate, allowing for projected student numbers (1000) and equivalent full time (EFT) staff numbers (69).

Table 1 – Waste generating areas by location and type

Location	m2	%
Teaching Areas	682.12	43.47%
Office / Admin/Library	270.00	17.21%
Amphitheatre/Communal Hall	400.00	25.49%
Amenities (Toilets)	59.00	3.76%
Canteen/Kitchenette	158.00	10.07%
TOTAL	1569.12	100.00%

3. Waste Generation Estimate

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

- Cardboard/paper recycling
- Comingled recycling
- Food organics recycling
- General waste

Additional smaller waste streams may include toner cartridge recycling, fluoro tube/globe recycling and battery recycling.

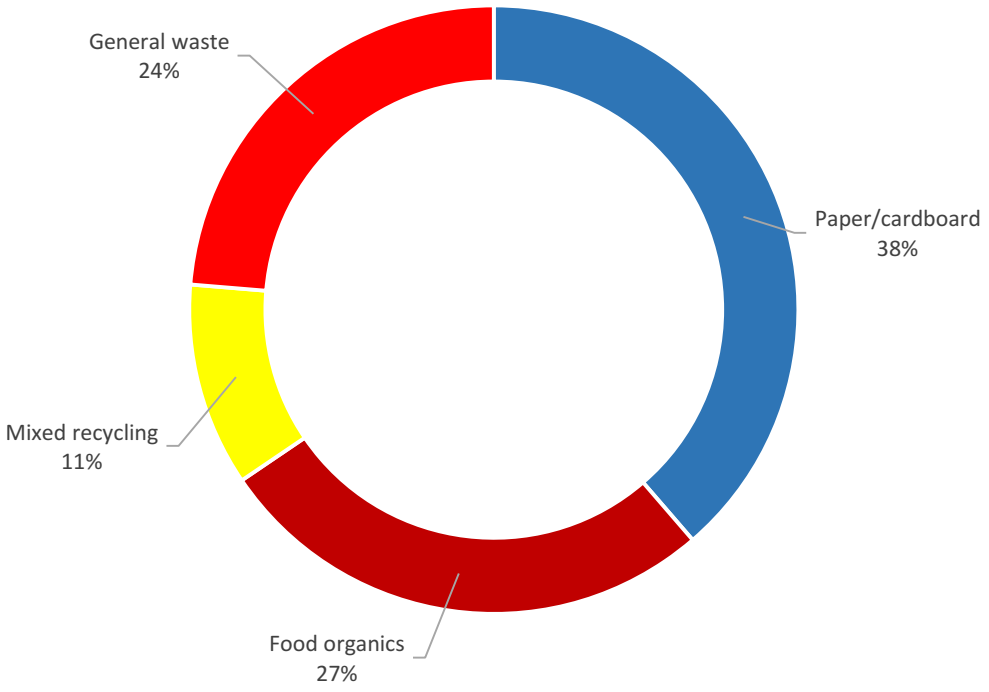
3.1 Estimated Waste Generation

Based on industry averages and historical audit data, it is estimated that the proposed facilities will generate a total of **290 kilograms and 1,917 litres** of waste and recyclables per day. It should be noted that the following waste generation profile is an estimation only, based on average teaching and office use – assuming full use during weekdays with the projected total student number of 1000 and staff of 69.

Table 2 – Waste generation estimate

	kg/day	L/day	kg/wk	L/wk
Paper/cardboard	47	741	234	3,707
Food organics	167	515	833	2,574
Comingled recycling	10	207	49	1,036
General waste	67	454	334	2,270
Total	**290**	**1,917**	**1,450**	**9,587**

Chart 1 – Waste profile (volume)



4. Waste Management Systems

4.1 Waste Systems

Table 3 below demonstrates how the current onsite systems provide ample capacity for the estimated waste volumes detailed in Table 2 above.

Table 3: Recommended equipment and collection frequency

Waste Stream	Bin Type	No. of Bins	Weekly Clearance Frequency	Capacity (weekly)	Estimated volume / week	Footprint per bin (m^2)	Total Footprint (m^2)
Paper/Cardboard Recycling	1100L MGB	2	1	2,200	3,707	1.37	2.7
	240L MGB	10	1	2,400		0.43	4.3
Comingled Recycling	660L MGB	1	2	1,320	1,036	1.05	1.1
General Waste*	1100L MGB	3	2	6,600	4,844	1.37	4.1
TOTAL				12,520	9,587		10.8
Recommended Storage Area (including circulation space)							17.6m^2

*note: includes organics

**note: these bins will be stored throughout the school for use at the point of generation – they will only be brought to the waste storage/collection area as required for collection. It is unlikely that they will all be located at the collection area at any one time.

4.2 Other waste/recycling

The following waste stream will be collected on call as needed:

- Green Waste/vegetation – vegetation generated from onsite maintenance activities will be managed by grounds staff. A bulk 3m3 front lift bin is recommended for the management of this stream which can be located adjacent to the waste storage area near the garden/bulk store. This bin should be collected on request as required.
- Battery Recycling – Battery recycling boxes will be present where deemed necessary e.g. copy rooms, office/study common areas. These boxes will be collected when full by a dedicated contractor.
- Toner Cartridge Recycling – Used toners will be collected by administration staff and consolidated for collection by specialty cartridge recycler (usually provided by office supplier).

5. Waste and Recycling Storage Area

The current waste storage area is located off Playfair Road and provides ample capacity for the bins proposed in table 3 above.

Figure 1 – Waste storage area location

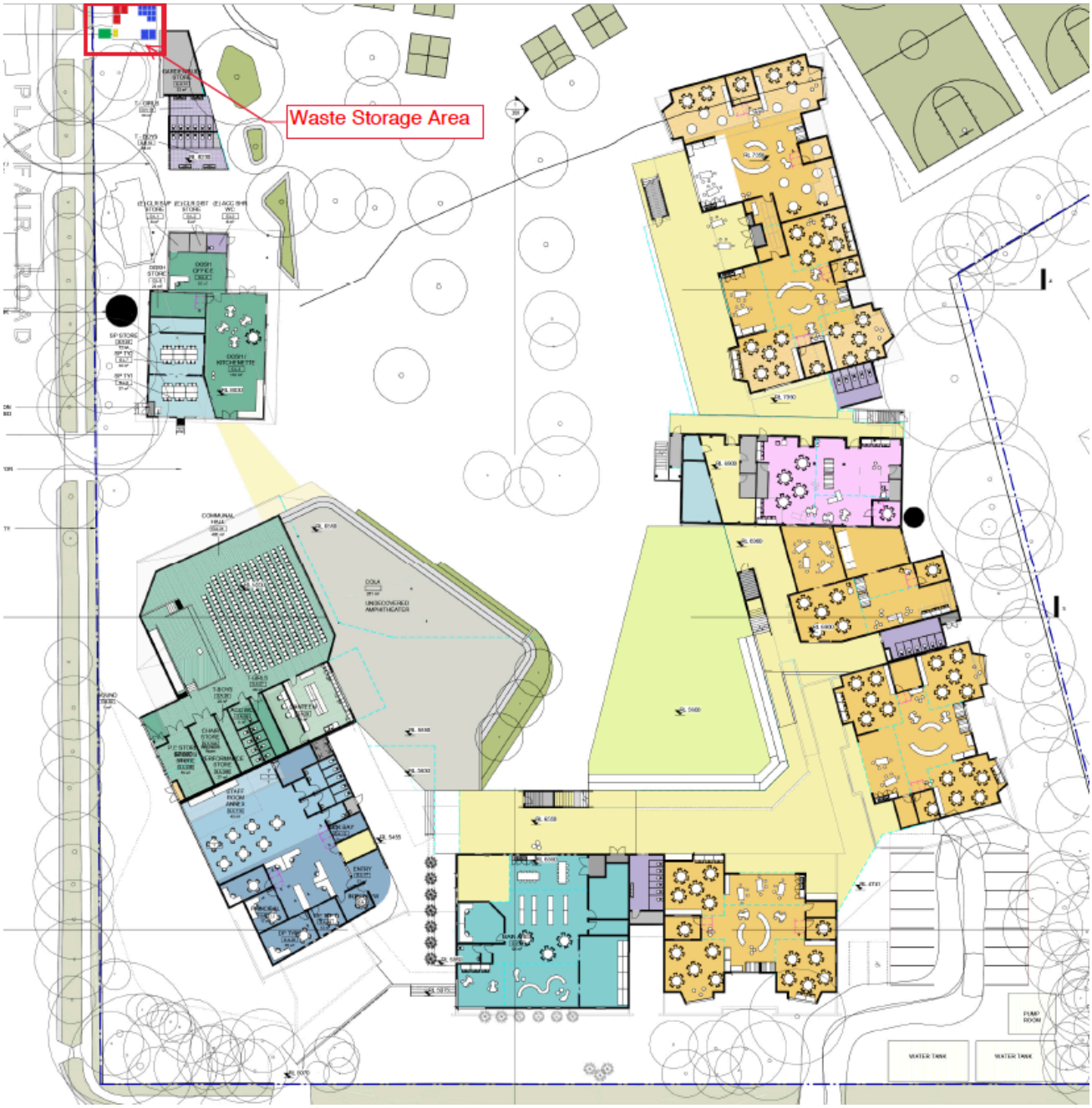
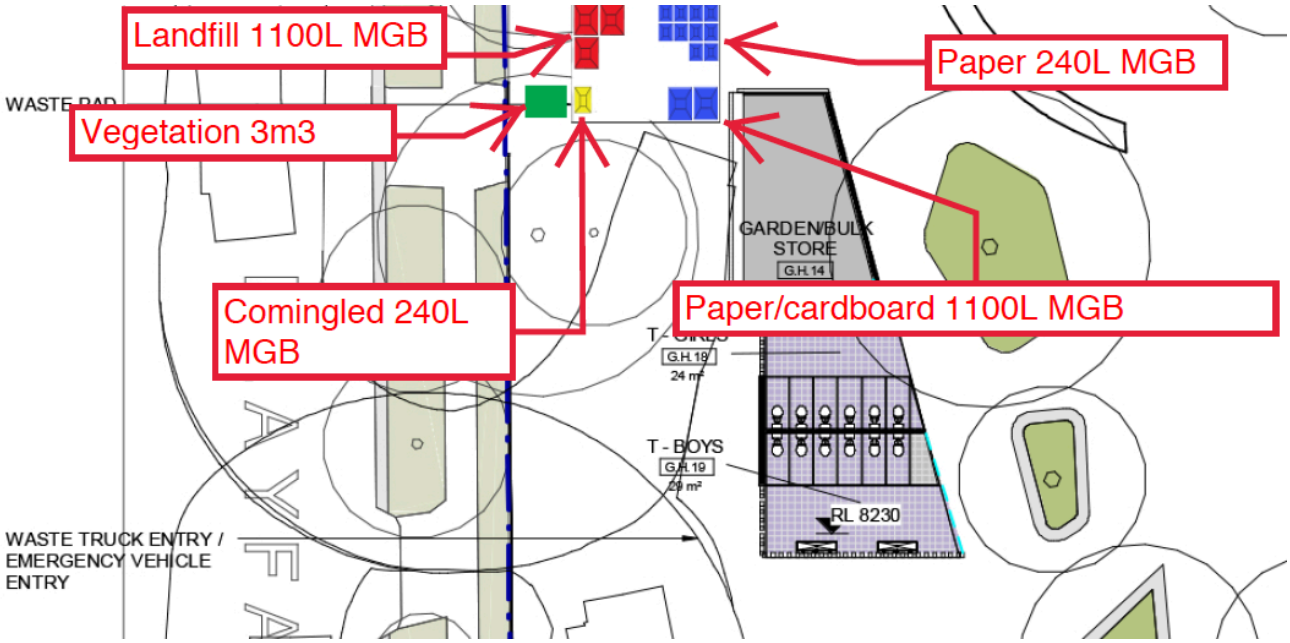


Figure 2 – Waste storage area – indicative layout



5.1 Signage and Colour-coding

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

6. Onsite Management Protocols

6.1 Waste systems on each level

Throughout each level are various areas with different functions – including teaching/study areas, office/admin areas, tutorial rooms etc.

Due to the amount of different rooms and areas it would be impractical and unnecessary to offer bins in every single room. Instead, it is recommended that bin hubs be established throughout the floors in hallways and common spaces to service the different areas. This encourages students/staff using the spaces to remove any waste they have and place it in the appropriate bin at the nearest hub – such a practice should promote recycling by giving users the choice of stream to dispose material into, and also reduce the time taken for cleaners to empty the bins. See photograph below for an example of a waste/recycling hub.

Signage will need to be displayed on all bins and ideally on walls above bins advising of acceptance criteria within each system.

Photograph 1 – Best practice bin hub

6.2 Outdoor Areas

Appropriate public place bin hubs should be implemented throughout high traffic outdoor areas i.e. sporting fields, break-out/lunch areas, walkways etc.

The following photographs provide examples of waste and recycling bin hubs. It is important to note that if recycling is implemented in these areas that both general waste and recycling bins must be located next to each other – when these streams are isolated from each other the likelihood of the recycling stream being contaminated by non-recyclables significantly increases.

For ease of use, bin hubs should be large enough to house a 240L MGB for each stream so that maintenance staff can simply remove the full bin and replace it with an empty bin. Full bins can then be transferred to the waste storage/collection area for collection by the waste contractor.

Photographs 2 & 3– Outdoor bin hubs

6.3 Waste Stream Collection Practices

Table 4 outlines the cleaners and campus operational staff collection practices for each waste stream

Waste Stream	Collection Practices
Paper/cardboard recycling	1. Cleaners empty bin hubs into cleaner trolleys. Material is then taken to waste storage area via the lift core and transferred into the paper/cardboard bins. 2. Where possible, bulky cardboard should be taken directly to the waste storage area or left in a designated area on each level (e.g. store rooms) to be collected by cleaning staff. 3. Cleaners collect flattened cardboard as required and transfer it to the waste storage area where it is deposited into the paper/cardboard recycling 1100L MGBs 4. Bins collected from the waste storage areas directly by waste contractor via Playfair Road.
Comingled Recycling	1. Cleaners empty bin hubs into cleaner trolleys. Material is then taken to waste storage area via the lift core and transferred into the 240L MGBs comingled bins in waste storage area. 2. Bins collected from the waste storage areas directly by waste contractor via Playfair Road.
General Waste	1. Cleaners to collect general waste from bin hubs using a trolley and transport the waste to the waste storage area to be transferred into the 1100L general waste bins. 2. Bins collected from the waste storage areas directly by waste contractor via Playfair Road.
Vegetation	1. Managed onsite by grounds staff – transferred to 3m3 bulk bin adjacent to waste storage area 2. Collected on call by contractor as required by grounds staff
Toner Cartridge Recycling	3. Used toner cartridges will be collected by campus operations and placed into the designated toner cartridge recycling bin located in office areas 4. This will be collected on call by a dedicated contractor (i.e. Planet Ark)
Battery Recycling	1. Batteries will be collected in boxes at collection point decided upon by campus management (ideally office common areas, reception areas) 2. This waste stream will be collected on call.

Figure 3 – example of segregated cleaner trolley to transfer waste from bin hubs to waste storage area

6.4 Waste Stream Acceptance Criteria

Paper/cardboard Recycling:

The paper/cardboard recycling stream offered by the Department of Education (DoE) waste contractor accepts all paper and cardboard materials including newsprint, glossy paper and mixed office paper.

Comingled Recycling:

The comingled recycling stream offered by the DoE waste contractor accepts all recyclable plastic containers, aluminium containers, glass bottles and steel cans.

General Waste:

The general waste stream accepts all other non-recyclable materials including food waste/scraps.

7. Additional Opportunities

7.1 Waste Diversion Opportunities

The following initiatives represent opportunities for Curl Curl North Public School to explore in an effort to reduce total waste generation. These options are not a requirement however should be considered to move towards best practice waste management.

7.1.1. Organics Recovery/recycling

It should be noted that offering food/organic recycling throughout all areas of the school is not recommended due to the challenges of contamination, however options should be investigated for the canteen where there is more control over the type of materials being disposed ensuring that organics bins would remain free of contaminants.

The waste contractor should be consulted to explore the commercial options they offer for dedicated organics recycling. Alternatively, other onsite options should be investigated which would actually reduce the quantity of waste being taken offsite by waste contractors. An effective solution could incorporate one or all of the following:

- Onsite compost bins
- Onsite worm farms

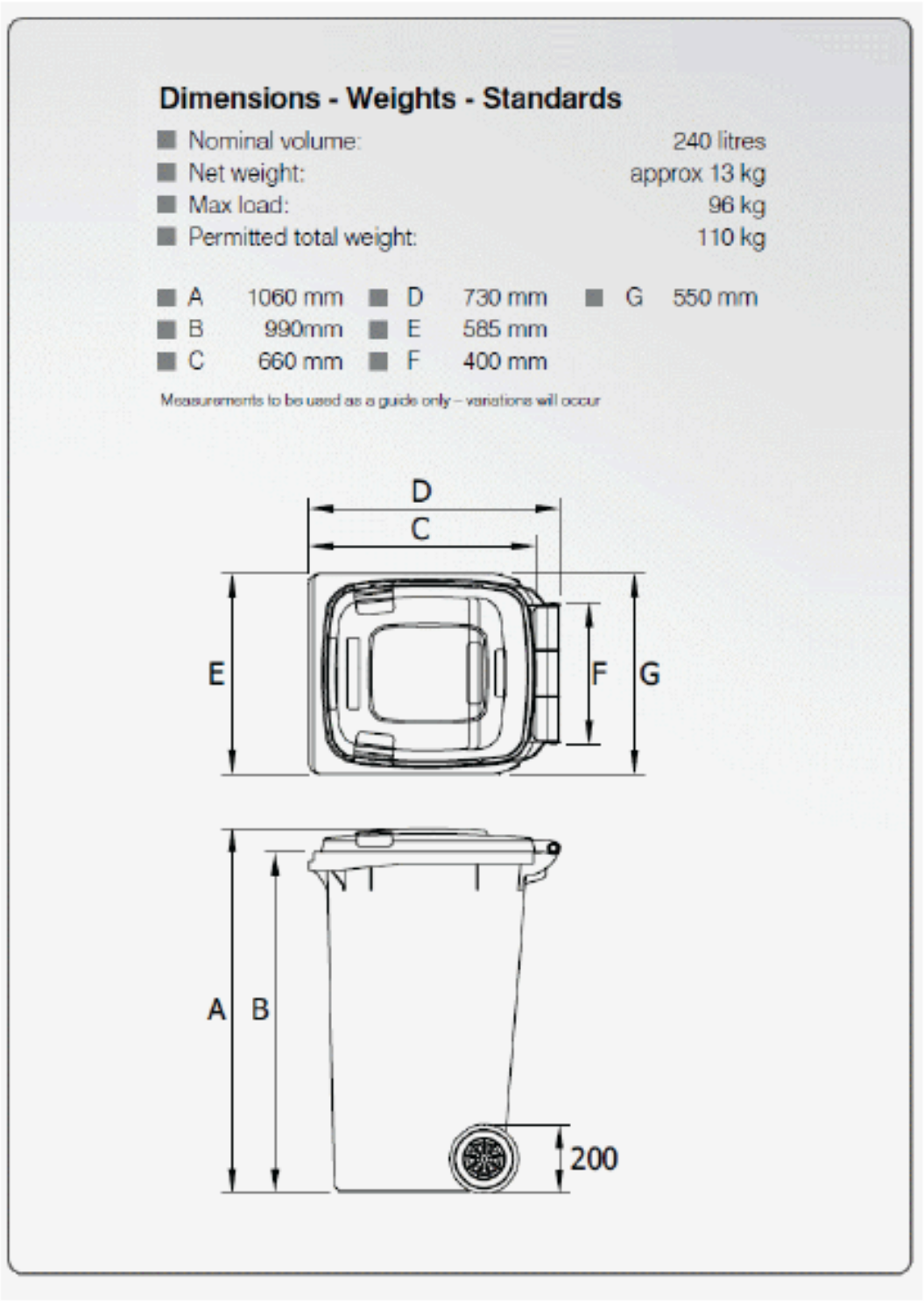
Figure 4 – example of compost set up

Figure 5 – example of basic worm farm

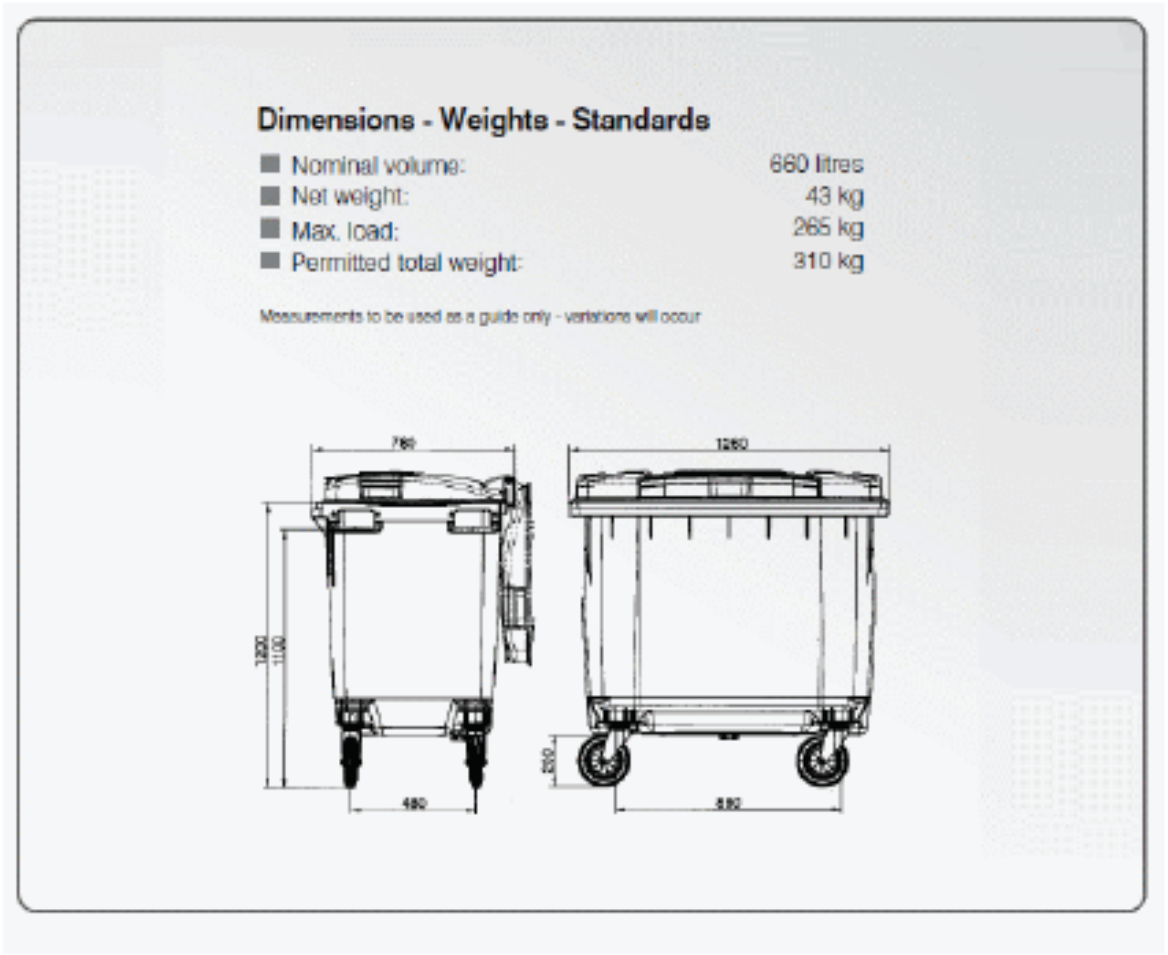
8. Appendix

The following figures provide the approximate dimensions of the proposed bin systems.

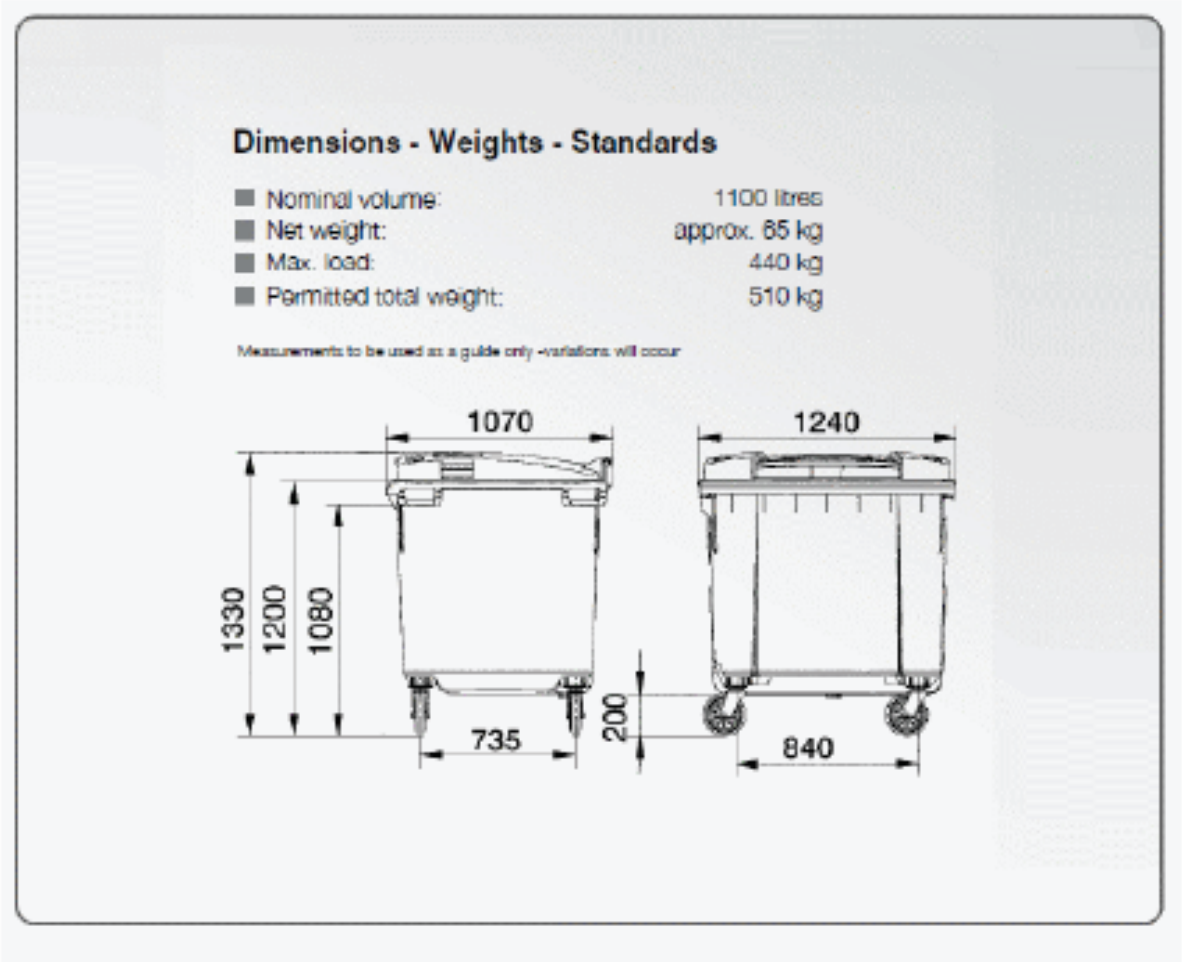
240L MGB



660L MGB


Dimensions - Weights - Standards
Nominal volume: 660 litres
Net weight: 43 kg
Max. load: 265 kg
Permitted total weight: 310 kg
Measurements to be used as a guide only - variations will occur
780
1260
1370
1000
480
320
880

1100L MGB


Dimensions - Weights - Standards
Nominal volume: 1100 litres
Net weight: approx. 65 kg
Max. load: 440 kg
Permitted total weight: 510 kg
Measurements to be used as a guide only -variations will occur
1070
1240
1330
1200
1080
735
200
840