



Lindfield Learning Village

100 Eton Road, Lindfield

Operational Waste Management Plan

Prepared by Foresight Environmental

e. [info@foresightenvironmental.com](mailto:info@foresightenvironmental.com)

w. [www.foresightenvironmental.com](http://www.foresightenvironmental.com)

This report is based on information provided by The NSW Department of Education c/o Designinc Sydney Pty Ltd 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 Designinc Sydney.

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.

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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'). It accompanies an Environmental Impact Statement (EIS) prepared in support of State Significant Development Application SSD 8114 for the development of 'Lindfield Learning Village' in the former UTS Ku-ring-gai Campus at 100 Eton Road, Lindfield, NSW (the site). The site, is located within Ku-ring-gai Municipal Council LGA.

It is proposed to refurbish the existing building to accommodate 2124 students in six home bases, each comprising 354 students ranging in ages from Kindergarten to year 12. The new school is currently to be known as the Lindfield Learning Village (the School) and will contain 'state of the art' collaborative learning spaces, shared educational facilities, open play spaces, auditorium and gymnasium in a landscaped Australian bush setting.

The proposed school development includes the following:

- Shared facilities including gymnasium, auditorium, cafeteria/dining and other specialist learning spaces, including science labs etc;
- Administration area for the whole school;
- Research space for PhD students;
- A 40-unit childcare

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 as detailed within the EIS.

## 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 (2124) and equivalent full time (EFT) staff numbers (500). These figures do not represent the total GFA of the new development – only the areas that will actually contribute to the waste estimate. Both stage 1 and stage 2 areas have been used in the waste generation estimate in order to ensure the proposed waste facilities provide sufficient capacity for the completed development.

Table 1 – Waste generating areas by location and type

	Teaching Areas*	Office / Admin	Common Areas	Amphitheatre/ Hall/Gym	Common Amenities	Canteen	Child care	Total
Stage 1 3 home bases Shared facilities M <sup>2</sup>	10,417	682	2,250	3,228	163	608	982	18,641
Stage 2 3 home bases Shared facilities M <sup>2</sup>	5,730	-	615	-	115	-	-	6,460

## 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.

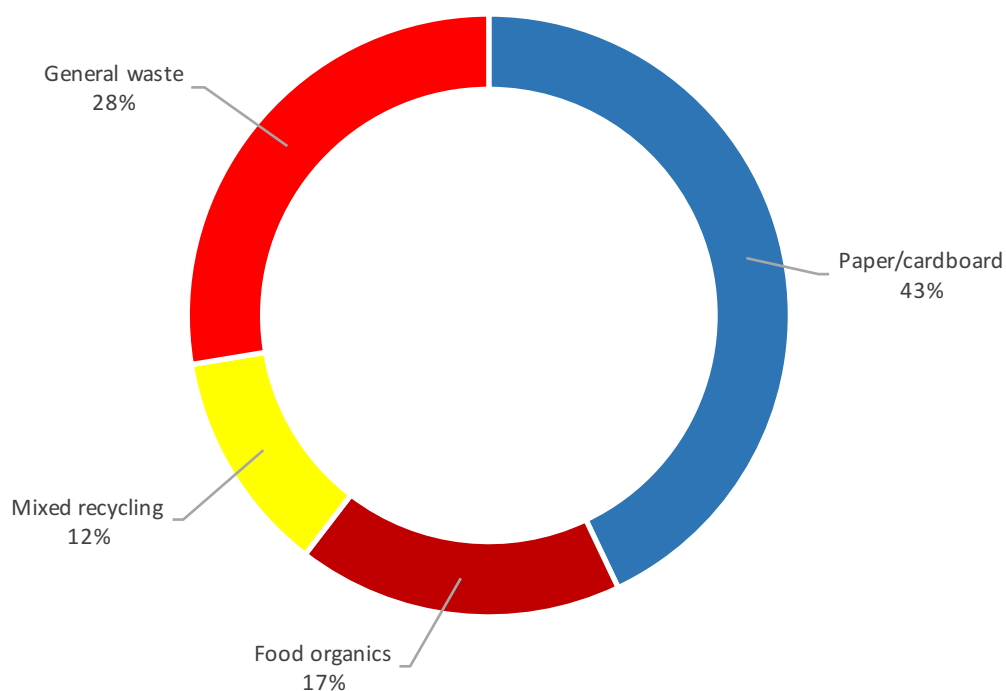
### 3.1 Learning Centre Estimated Waste Generation

Based on industry averages and historical audit data, it is estimated that the proposed facilities will generate a total of **416 kilograms and 4,730 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 2124 and staff of 500.

Table 2 – Learning Centre waste generation estimate

	kg/day	L/day	kg/wk	L/wk
Paper/cardboard	115	2,676	574	13,378
Food organics	220	956	1,101	4,780
Comingled recycling	22	695	112	3,475
General waste	104	1,692	519	8,461
<b>Total</b>	<b>461</b>	<b>6,019</b>	<b>2,305</b>	<b>30,095</b>

Chart 1 – Waste profile (volume)



### 3.2 Childcare Estimated Waste Generation

Table 3 shows the waste generation estimate for the childcare based on full occupancy (i.e. 40 children). This estimate has been separated from the Learning Centre estimate as it is expected that the childcare will be responsible for the management and collection of the waste and recycling from its operations.

Table 3 – Childcare waste generation estimate

	kg/day	L/day	kg/wk	L/wk
Paper/cardboard	1	12	5	60
Food organics	5	24	24	120
Comingled recycling	1	36	7	180
General waste	2	48	11	240
<b>Total</b>	<b>9</b>	<b>120</b>	<b>47</b>	<b>600</b>

## 4. Waste Management Systems

### 4.1 Learning Centre Systems

Table 4 below demonstrates how the current onsite systems provide ample capacity for the estimated waste volumes detailed in table 2 above.

**Table 4: Recommended equipment and collection frequency**

Waste Stream	Bin Type	No. of Bins	Weekly Clearance Frequency	Capacity (weekly)	Estimated volume / week	Footprint per bin (m <sup>2</sup> )	Total Footprint (m <sup>2</sup> )
Paper/Cardboard Recycling	1100L MGB	4	1	4,400	13,378	1.37	5.5
	240L MGB	25	2	12,000		0.43	10.7
Comingled Recycling	660L MGB	2	3	3,960	3,475	1.05	2.1
General Waste*	1100L MGB	5	3	16,500	13,241	1.37	6.9
<b>TOTAL</b>				36,860	30,095		25.1
<b>Recommended Storage Area (including circulation space)</b>							<b>38m<sup>2</sup></b>

\*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:

- 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).

## 4.3 Childcare Systems

The childcare operator will be responsible for the internal management and collection of the waste and recycling generated from their operations. There may be an opportunity to consolidate their waste collection services with the main waste service contractor for the Learning Centre. In this scenario the childcare would manage waste and recycling internally in small bins (refer to photograph 3 below) and then transfer the waste and recycling materials to be disposed in the large bins at the east waste storage area.

# 5. Waste and Recycling Storage Area

The current waste storage areas – one to the east and one to the west of the main building shown in figure 1 below - provide sufficient capacity for the bins proposed in table 3 above. Both waste areas were previously used in the former UTS campus operations and provide ample space for the storage of the required bins. Table 3 details the total bins and collection frequency required for whole Learning Centre operation – bin systems for all streams will be stored at both storage areas, with the number of bins being split between the areas appropriately as required by the actual operational practices.

Figure 1 – Waste storage area location

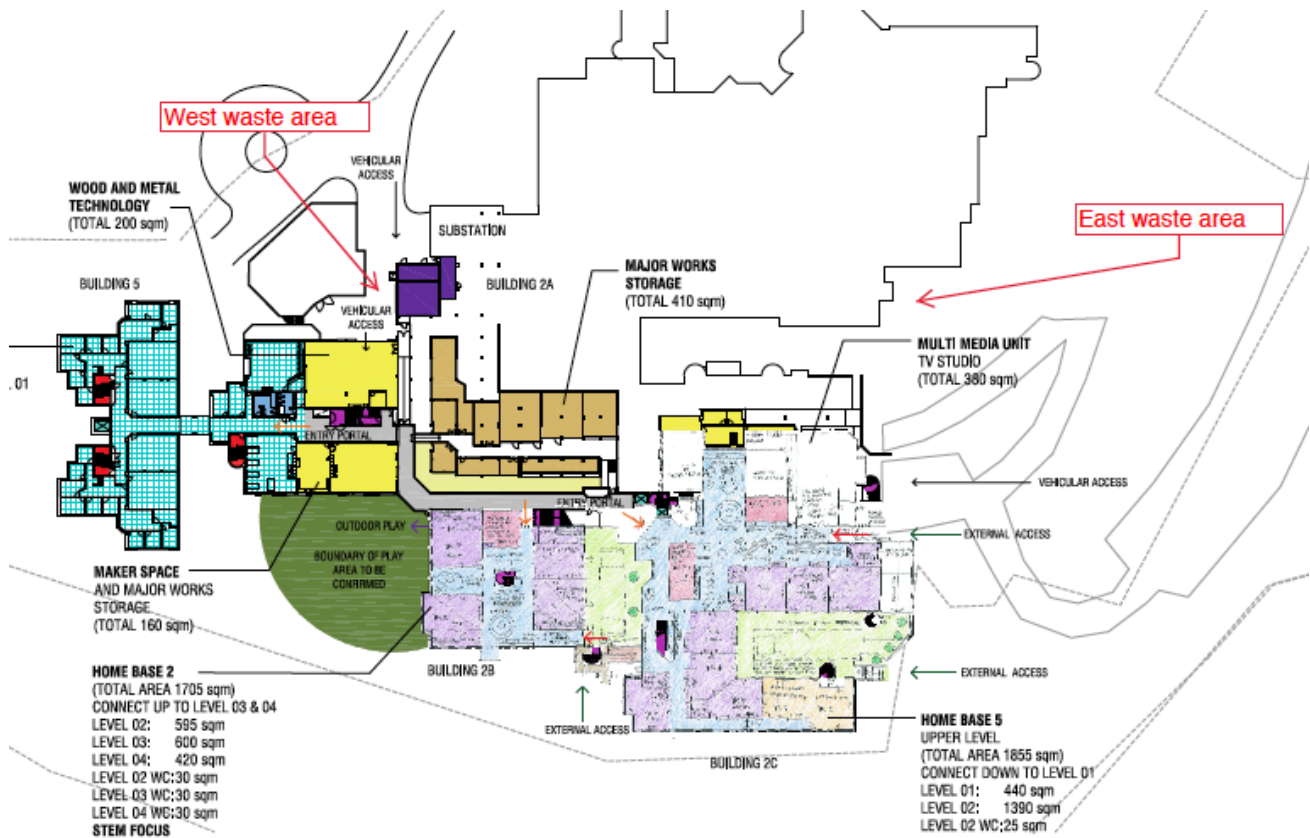


Figure 2 – Eastern waste storage area – indicative layout

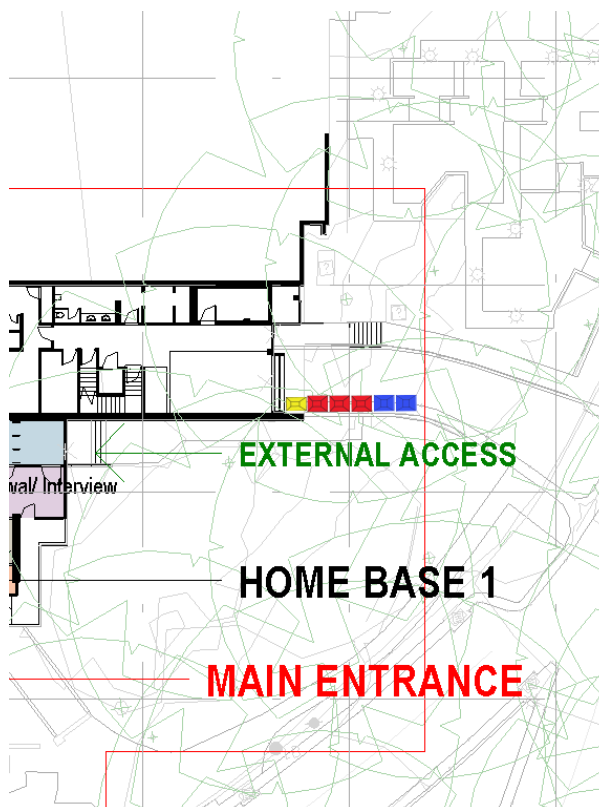
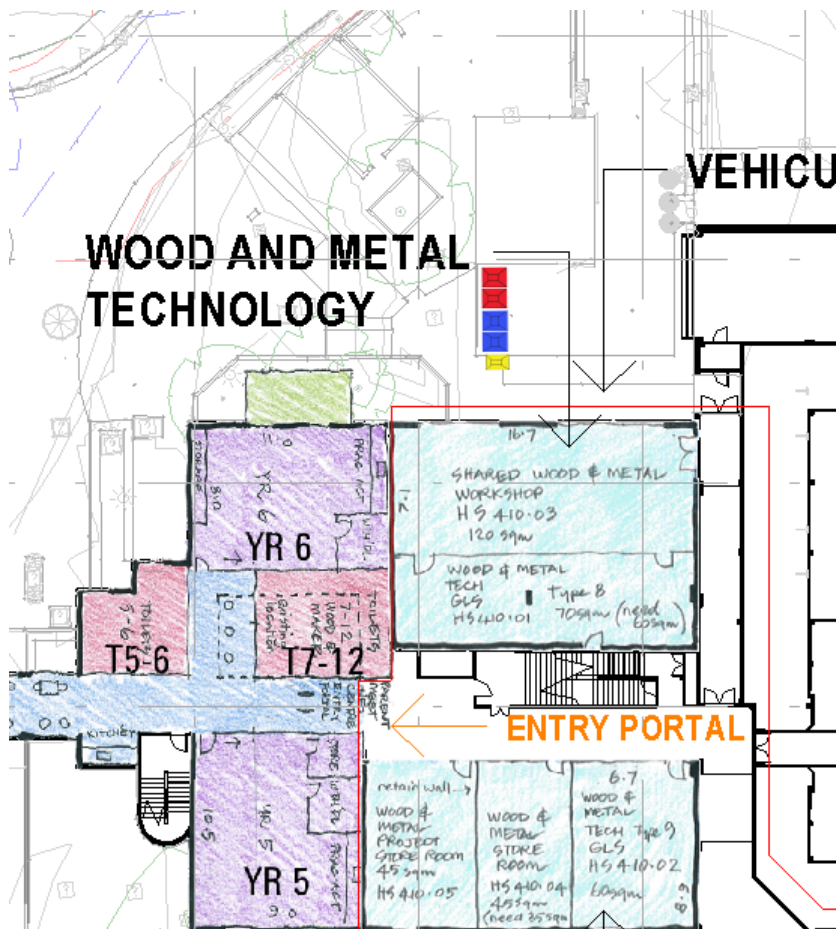


Figure 3 – Western waste storage area – indicative layout



## 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 3 – 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.

Photograph 4 – 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	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>3. Cleaners collect flattened cardboard as required and transfer it to the waste storage area where it is deposited into the paper/cardboard recycling 660L MGBs</li> <li>4. Bins collected from the waste storage areas directly by waste contractor via Eton Road.</li> </ol>
Comingled Recycling	<ol style="list-style-type: none"> <li>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.</li> <li>2. Bins collected from the waste storage areas directly by waste contractor via Eton Road.</li> </ol>
General Waste	<ol style="list-style-type: none"> <li>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.</li> <li>2. Bins collected from the waste storage areas directly by waste contractor via Eton Road.</li> </ol>
Organic Recycling	<ol style="list-style-type: none"> <li>1. Please refer to section 7 below</li> </ol>
Toner Cartridge Recycling	<ol style="list-style-type: none"> <li>2. Used toner cartridges will be collected by campus operations and placed into the designated toner cartridge recycling bin located in office areas</li> <li>3. This will be collected on call by a dedicated contractor (i.e. Planet Ark)</li> </ol>
Battery Recycling	<ol style="list-style-type: none"> <li>1. Batteries will be collected in boxes at collection point decided upon by campus management (ideally office common areas, reception areas)</li> <li>2. This waste stream will be collected on call.</li> </ol>

Figure 2 – 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 Lindfield Learning Village to explore in an effort to reduce total waste generation. These options 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.

A practical approach to implementing an organics stream would be to locate organics bins (120L MGBs) in the canteen back of house area and in any other food preparation areas (i.e. food technology classrooms). Canteen staff and students/teachers where relevant would be responsible for separating any food preparation waste into the dedicated organics bins. If the appointed waste contractor provides an organics recycling service then these bins would be transferred to the waste storage area on a set schedule of no longer than every two days to be collected by the waste contractor.

It is recommended that the proposed waste contractor confirm their ability to provide an organics recycling service prior to being engaged to ensure the school has the support required to implement an organics recycling stream.

Alternatively, in lieu of a commercial organics recycling service, 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

These systems would be managed by onsite maintenance staff or a collaborative approach could be devised which engages students and staff to take some ownership over the management of these systems and possibly incorporated into the delivery of the curriculum i.e. a school sustainability initiative

Figure 3 – example of compost set up



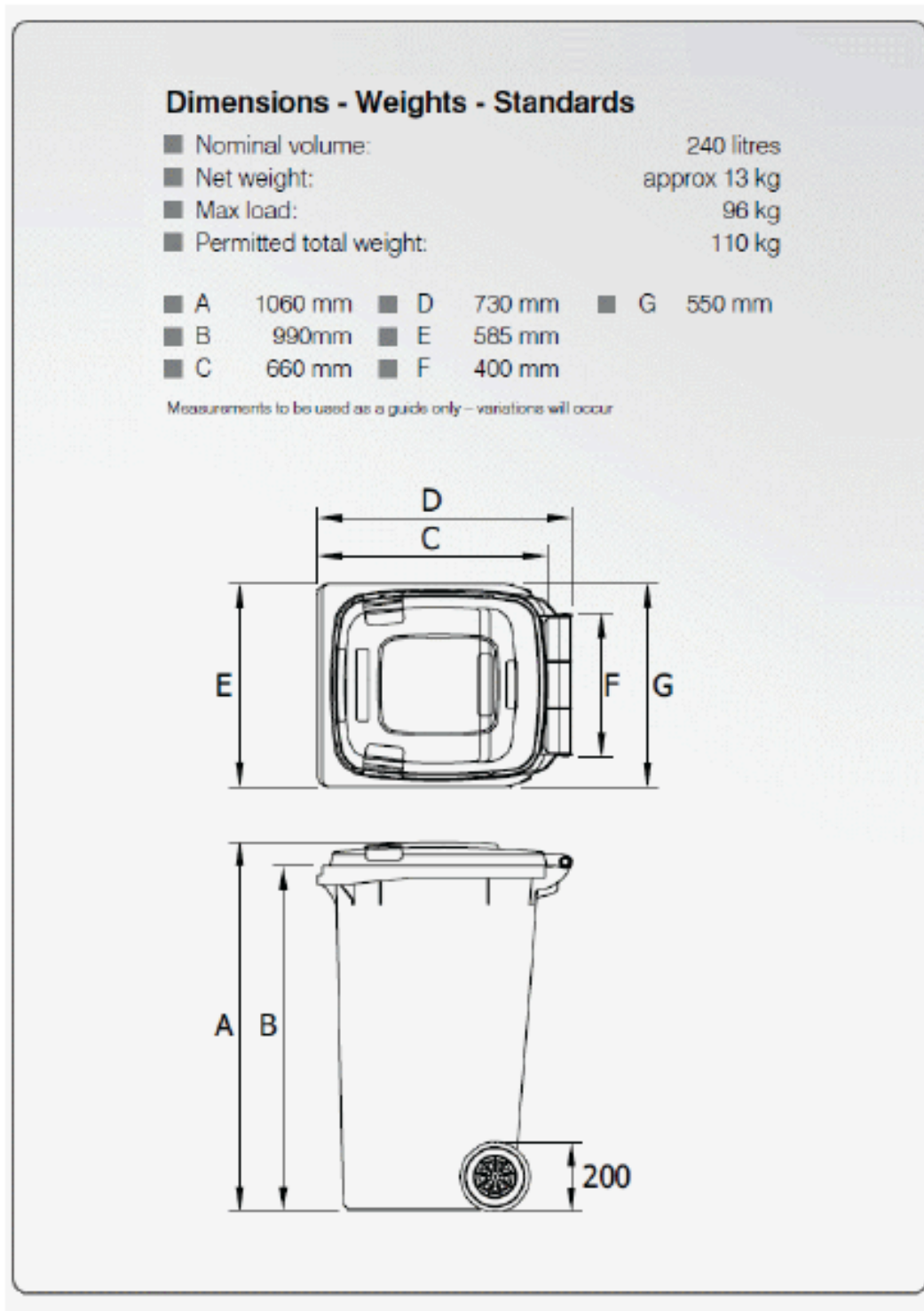
Figure 4 – example of basic worm farm



## 8. Appendix

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

### 240L MGB

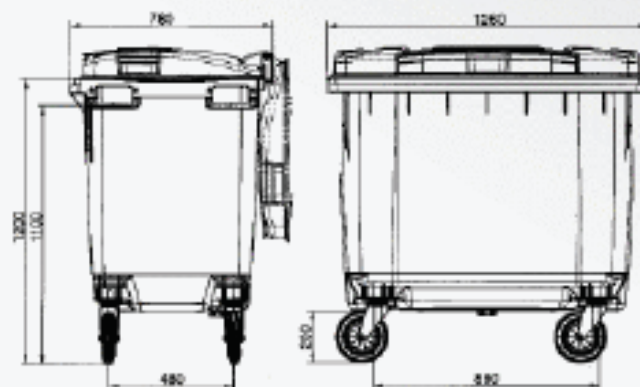


## 660L MGB

### 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





## 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

