Sydney Catholic School Austral

St Anthony of Padua

Stage 1 – Stage 6

Operational Waste Management Plan

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This report is based on information provided by Pepper Group Limited 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 Pepper Group Limited.

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Revision No.	Issue date	Author	Reviewed by	Reason/comments
1	7th August 2018	Kyle Renwick	Scott Ebsary	Initial Draft
2	31st August 2018	Kyle Renwick	Scott Ebsary	Update as per feedback

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1. Introduction

This operational waste management plan (WMP) has been prepared by Foresight Environmental on behalf of the Sydney Catholic School Austral (the 'Applicant') as part of the Development Application for the development of Stages 1 – 6 for the Sydney Catholic School Austral, St Anthony of Padua.

2. Overview of Development

St Anthony of Padua Catholic School (STAPCS), Austral was established in 2017 based on a preliminary masterplan developed in collaboration with Sydney Catholic Schools and their key stakeholders for an integrated P-12 school to deliver learning around contemporary learning models. This Masterplan informed the preparation of a Development Application to Liverpool City Council in 2016.

Following the commencement of the school, the consultant team worked with Sydney Catholic Schools to develop and refine the Masterplan and Stage 1 project to allow for submission as a Sate Significant Development to be assessed by the NSW Department of Planning and Environment. This Masterplan and this application has been prepared for the growth and development of the existing school to create a four stream Primary School; eight stream Secondary School, and provide integrated Preschool and child care services. The school is to be developed to provide learning opportunities from early childhood education through to Year 12, and beyond, with the curriculum and learning environments created to provide opportunities for integration with the surrounding community.

Located within the Austral and Leppington North Growth Centre, the STAPCS will provide an important amenity for residents of the area - that is targeted to include the development of up 17,350 new dwellings - consistent with the planning frameworks prepared by NSW Planning and Environment. The Masterplan has been developed with a community minded focus, with the school as a key amenity to support the development of the Austral community within the Austral and North Leppington Growth Centre

3. Waste Generation Estimate

Two waste estimates have been generated for the purposes of demonstrating the capacity of the waste systems to manage standard usage (everyday school use), and full-capacity event usage within the multipurpose hall (assuming open plan configuration and catering).
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

*With the exception within the 3 level Café Hospitality Food Tech Yr 12 building, food organics recycling will be combined with general waste due to contamination issues, however there is the opportunity to separate the stream as described in section 8.

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

3.1 Estimated Waste Generation – Standard Usage

Based on industry averages and historical audit data, it is estimated that the proposed development for business as usual will generate a total of **474 kilograms** and **4,658 litres** of waste and recyclables per day. It should be noted that the following waste generation profiles are an estimation only, based on average teaching and office use – assuming full use during weekdays with the projected upper total student numbers of 2,500 and staff of 200.

Table 1: Waste generation estimate - BAU

Stream	kg/day	L/day	kg/wk	L/wk
General Waste	301	1,859	1,507	9,293
Co-mingle	27	445	133	2,224
Paper/Cardboard	154	2,496	771	12,479
Food organics	41	146	205	732
Total	**523**	**4,945**	**2,617**	**24,727**

3.2 Estimate Waste Generation – Full Capacity Events

At capacity during events the development could potentially house up to 3,000 people from which **411 kilograms** and **3,750 litres** of waste and recyclables per day will be generated. As these events will most likely only be in operation for one day, daily waste estimates for such events only need to be considered **from a management perspective in order to determine the number of additional bins required to effectively manage the additional waste. Section 4 and 5 provide more details on bin numbers**.

Comingled recycling and general waste are the only two streams considered for events due to contamination issues for further separation:

Table 2: Waste generation estimate - Events

Stream	kg/day	L/day
Comingled recycling	96	1,688
General waste	315	2,063
Total	**411**	**3,750**

4. Waste Management Systems

4.1 Waste Systems

Table 3 below demonstrates the recommended systems to adequately manage the waste estimates detailed above for business as usual, while table 4 shows the ***additional*** systems to manage events:

Table 3: Recommended waste systems - BAU

Stream	Bin Type	No. of Bins	Weekly Clearance Frequency	Weekly Capacity (L)	Estimated volume / week (L)	Footprint per bin (m^2)	Total Footprint (m^2)
Paper/Cardboard	MGB - 1100L	4	3	13,200	12,479	1.69	6.74
Mixed Recycling	MGB - 1100L	2	1	2,200	2,224	1.69	3.37
Food Waste*	MGB - 120L	2	4	960	732	0.27	0.54
General Waste	MGB - 1100L	3	3	9,900	9,293	1.69	5.06
Total bin footprint							**15.71**
Recommended Room Size – including circulation space							**23.56**

Table 4: Recommended additional waste systems - Events

Stream	Bin Type	No. of Bins	Daily Clearance Frequency	Daily Capacity (L)	Estimated volume / day (L)	Footprint per bin (m^2)	Total Footprint (m^2)
Mixed Recycling	MGB - 240L	8	1	1,920	1,688	0.43	3.41
General Waste	MGB - 240L	9	1	2,160	2,063	0.43	3.84
Total bin footprint							**7.25**
Additional Room Required – including circulation space							**10.87**

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 $3m^3$ front lift bin is recommended for the management of this stream which 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 waste storage area for the facility is be located on the ground floor adjacent the North-Western carpark and provides ample capacity for the required number of bins.

Figure 1: Waste storage area location on the ground floor

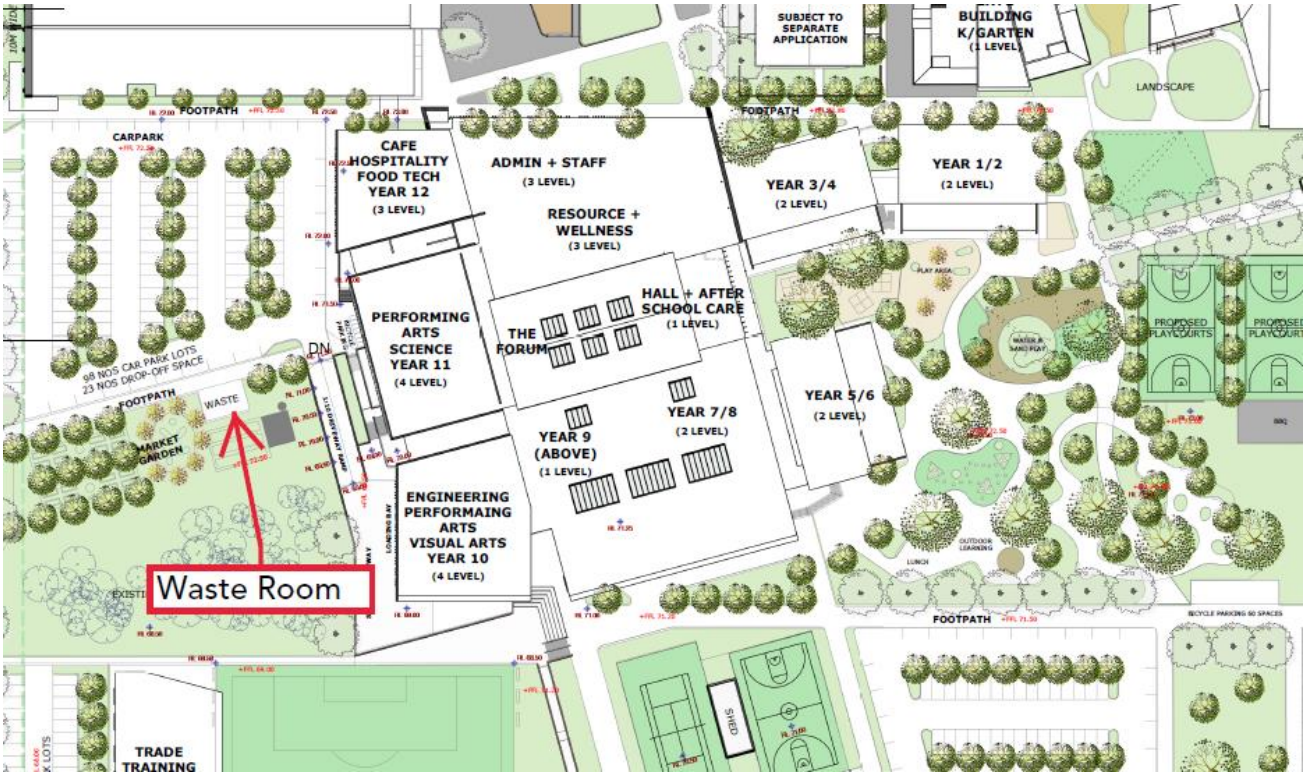
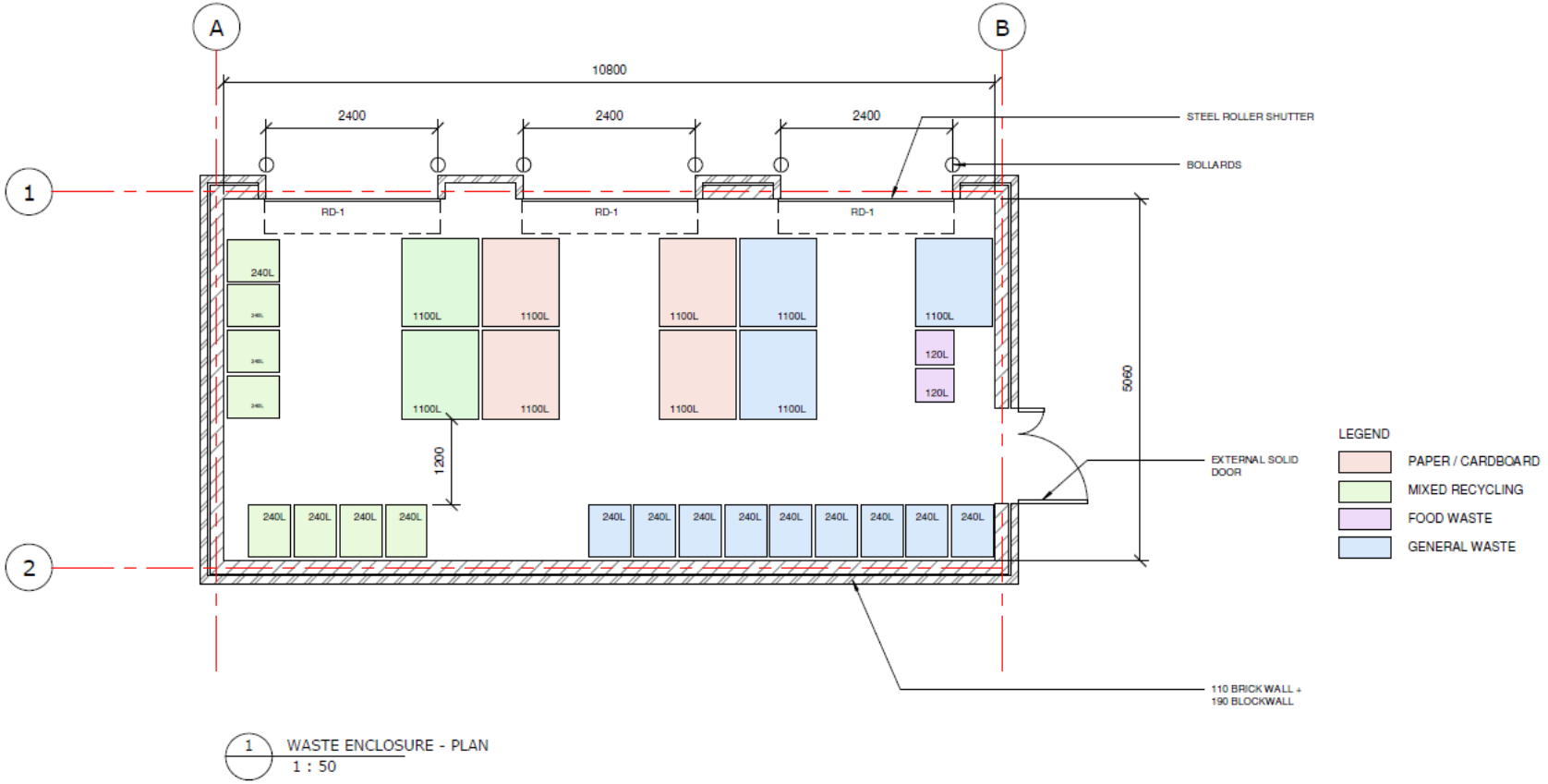


Figure 2: Waste storage area indicative layout



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.

5.2 Amenity

The main waste and recycling storage room will have the following features:

- Ventilation: The bin storage rooms will be naturally ventilated by external air flow
- Vermin and Odour Prevention:
    - Opening will be vermin proof
    - Cleaners are to ensure that bin lids are closed when unattended
- 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
- 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)

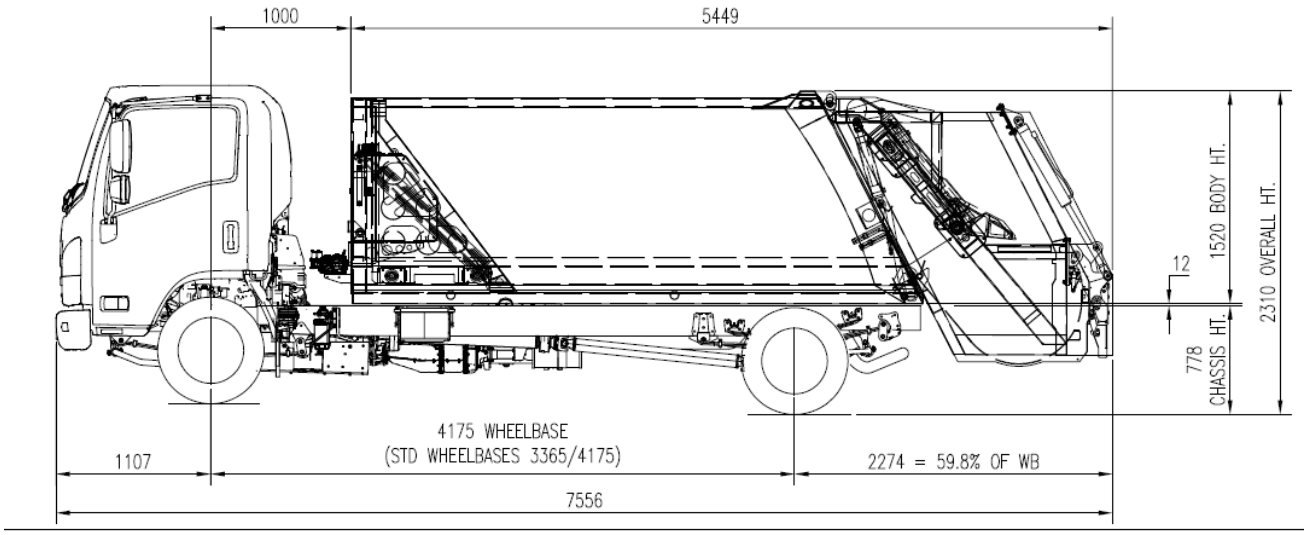
The ongoing maintenance and up-keep of the waste storage room will be the responsibility of cleaning/building management staff. They will be tasked with ensuring bins are stored neatly and are cleaned as required.

6. Collection

6.1 Waste Collection Vehicle

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 3 details the indicative dimensions of a typical MRV rear-lift truck used by most commercial waste contractors.

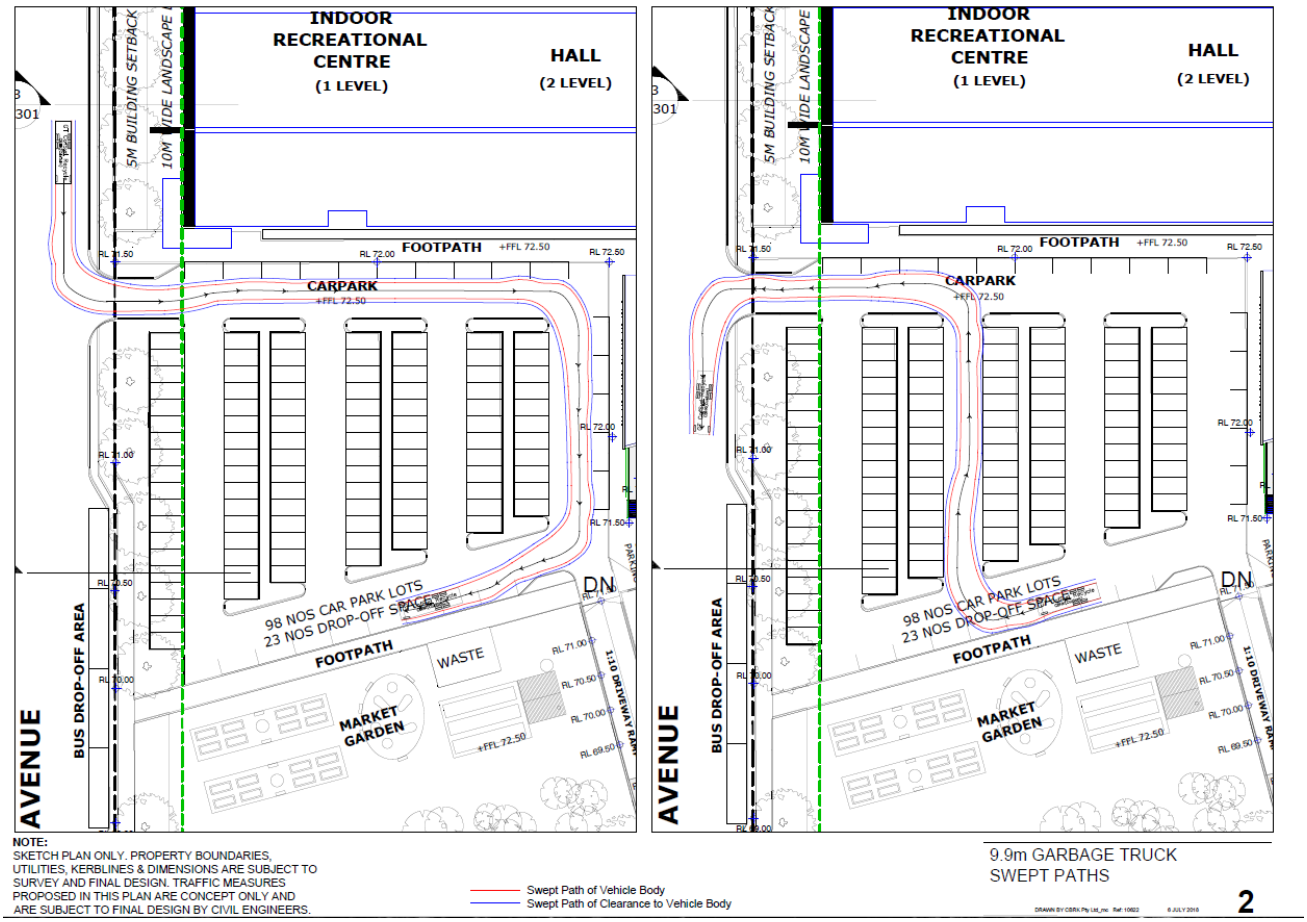
Figure 3: Medium rear-lift commercial waste truck specifications



6.2 Collection Access

The waste truck will access the storage area via Fourth Avenue as per figure 4. A swept path analysis has been produced which demonstrates that the MRV can adequately access the site:

Figure 4: Waste truck access path and MRV swept path



7. Onsite Management Protocols

7.1 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.

Figure 5: Best practice bin hub

The supplier information for the above bin hubs can be found at the following link:
https://www.sourceseparationsystems.com.au/recycling-products/multisort-recycling-bin.html

Figure 6: Alternative bin hub setup

Supplier information for the alternative bin hubs shown above can be found at the following link: https://methodrecycling.com/au/products

During large events where additional bin will be required throughout the open plan configuration, bins will be brought from the waste storage area. It is recommended that a general waste and a mixed recycling bins are always positioned next to each other to maximise the diversion of recyclables from landfill. Lightweight event covers can be added to 240L MGBs to assist with the identification of the streams – shown in figure 6 below.

Figure 7: Bin hub cover example

The supplier information for these covers can be found in the link below:
https://www.sourceseparationsystems.com.au/recycling-products/bin-covers.html

Spare empty bins will be stored in the waste storage room to be swapped for full bins from the permanent bin housings or for additional capacity during events. An additional 10x240L for each stream (general waste and mixed recycling) has been allowed to ensure adequate capacity for all usage scenarios – the waste storage room provides ample space for the proposed number of bins.

7.2 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.

Figure 8: Outdoor bin hubs

Supplier information for the outdoor bin hubs shown above:
http://www.bottonandgardiner.com.au/urban/litter-bins/wheel-bins-housing/mindil-bin-housing

7.3 Waste Stream Collection Practices

Table 5: 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 lift cores 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 1,100L MGBs 4. Bins collected from the waste storage areas directly by waste contractor via Fourth Avenue.
Comingled Recycling	1. Cleaners empty bin hubs into cleaner trolleys. Material is then taken to waste storage area via lift cores and transferred into the 1,100L MGBs comingled bins in waste storage area. 2. Bins collected from the waste storage areas directly by waste contractor via Fourth Avenue.
Organics	1. Cleaners empty organic caddies into cleaner trolleys and transfer to the 120L bins located within the café and hospitality building. 2. Material is then taken to waste storage area via lift cores for collection. 3. Alternatively, organics are collected and transferred a compostable option (see section 8) to be utilised within the Market Garden.
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 1,100L general waste bins. 2. Bins collected from the waste storage areas directly by waste contractor via Fourth Avenue.
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 9: Example of segregated cleaner trolley to transfer waste from bin hubs to waste storage area

8. Additional Opportunities

8.1 Waste Diversion Opportunities

The following initiatives represent opportunities for Sydney Catholic School Austral 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.

8.1.1. Bulky Design & Tech materials (timber/metal etc)

Bulky waste such as timber and metals from the trade training centre and engineering labs will be managed by teaching staff within teaching areas. It is proposed for consideration that maneuverable crates/cages be located within design/technology workshops for the storage of scrap materials (timber, metal etc). These crates will have a duel function – scraps and offcuts can be placed in the crates and made available to other users for re-use. It is anticipated that most materials will be reused with only limited quantities of materials needing disposal periodically. When crates become full and the materials are deemed unfit for reuse, they can be wheeled to the waste storage area to be collected by the appointed waste contractor upon request.

Figure 10: Example of crate for bulky materials

8.1.2. Liquid/Hazardous waste (science labs/art studios)

Liquid/hazardous waste generated from visual art studios and science labs should be managed in dedicated bunded hazardous waste storage cabinets – they should be implemented in visual arts store rooms and in science prep/chemical store rooms for the safe storage of any paints, solvents or liquid chemicals associated with class/science lab activities. These wastes should then be collected by a specialist contractor directly for appropriate disposal i.e. Chemsal

Figure 11: Example of hazardous waste storage cabinet

8.1.3. 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 kitchen and hospitality facilities, particularly for use during large events where catering may be involved 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 reduce the quantity of waste being taken offsite by waste contractors. An effective solution could incorporate one or all the following within or nearby the Market Garden:

- Onsite compost bins
- Onsite worm farms

Figure 12: Example of compost set up

Figure 13: example of basic worm farm

9. Appendix

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

Figure 14: 240L MGB Dimensions

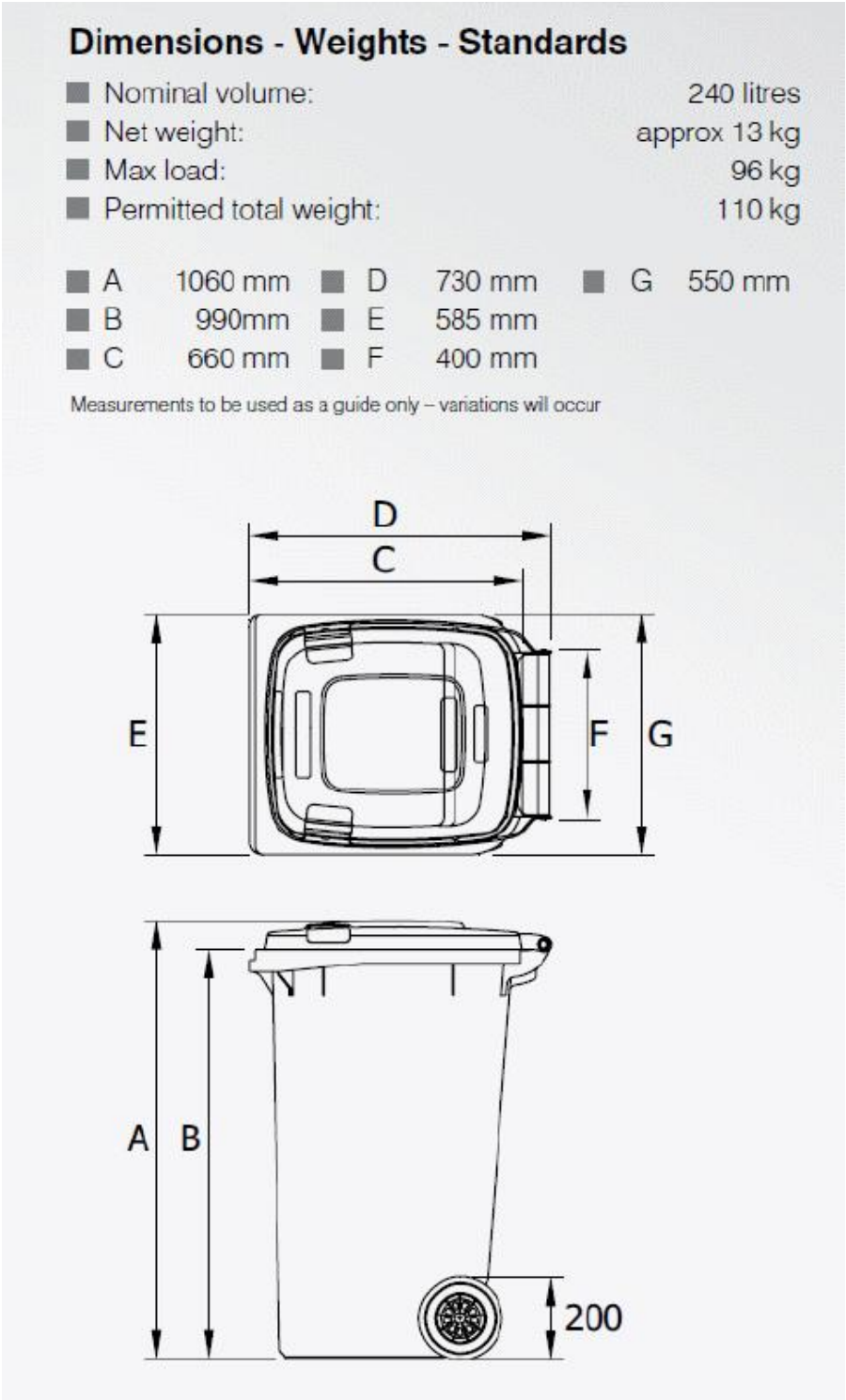


Figure 15: 120L MGB Dimensions

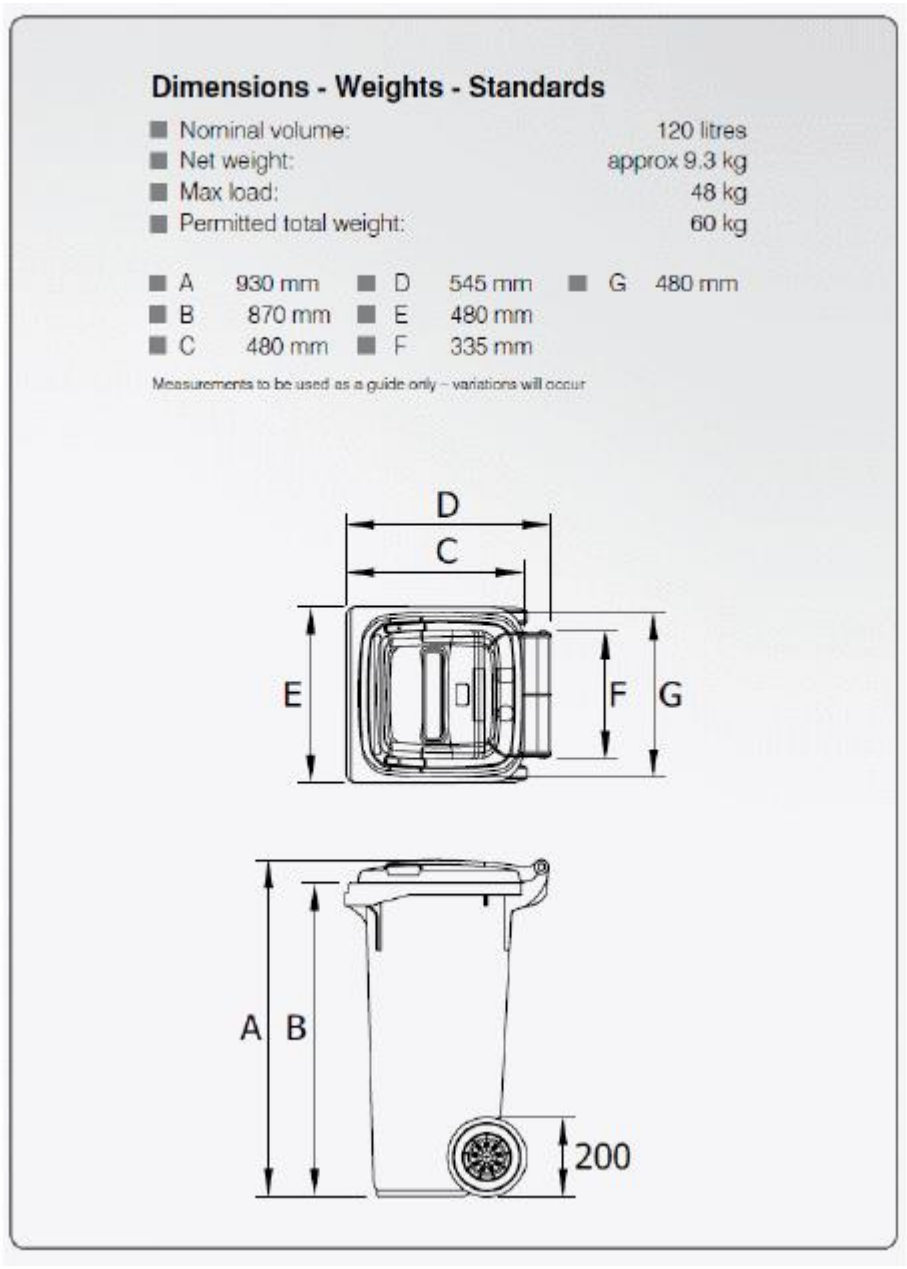


Figure 16: 1,100L MGB Dimensions