



St Catherine's School

Master Plan – Stage 1 development Operational Waste Management Plan

11th July 2014 rev. 3

This report is based on information provided by Sandrick Project Directions coupled with Waste Audit and Consultancy Services knowledge of waste generated within the commercial and education sectors. To that extent this report relies on the accuracy of the information provided to the consultant. It has been compiled by Waste Audit and Consultancy Services (Aust) Pty Ltd on behalf of Sandrick Project Directions.

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Glossary

Paper recycling	Refers to the reprocessing of most types of paper including newspaper, magazines, office paper, brochures and envelopes (including those with plastic windows). This waste stream does not include coffee cups, ream wrappers (if the lining is waxed), bottles or cans, plastic bin liners or food scraps.
Cardboard Recycling	Refers to the reprocessing of most types of cardboard such as boxes, empty pizza boxes as well as toilet and paper towel rolls. This waste stream does not include waxed cardboard or packing materials such as polystyrene or foam.
Comingled recycling	Refers to a mixed container recycling stream. Typically this would include glass containers, aluminium cans, milk cartons, tins, and HDPE and LDPE plastics. This stream does not include any paper or cardboard materials, drinking glasses, ceramic mugs or plates, coffee cups, takeaway containers or plastic bin liners. Comingled materials are collected in one stream and then sent a materials recycling facility to be sorted and recycled.
Organic Recycling	Includes all food scraps (including fruit, vegetables, bread, cake and egg shells) coffee grounds, tea bags, vacuum dust and organic material such as garden clippings that may be reprocessed and converted into energy or soil products. Depending on your contractor, this may also include meat products.
Mixed Recycling	Refers to Waverley Council recycling stream which consolidates paper, cardboard and comingled materials into one recycling stream.
General waste	Refers to currently non-recoverable material including soft plastics (plastic wrap), polystyrene, soiled paper towel or plastic bags. The general waste stream does not include hazardous material (such as batteries, fluorescent light tubes, light bulbs and/or toner cartridges), recyclable material or electronic equipment such as computers, TVs and mobile phones.

1. Introduction

Waste Audit and Consultancy Services has been commissioned by St Catherine's School Waverley, to assist with the preparation of an Environmental Impact Statement (EIS) to accompany a Development Application (DA) for the school which is located at 26 Albion Street, Waverley (the site).

The DA seeks concept approval for the school's Campus Master Plan and detailed design approval of the proposed Stage 1 works which comprise of a new Research, Performing Arts and Aquatic Centre (RPAC).

This report has been prepared to address Key Issue No. 15 "Waste" (refer below) as stated in the Director General's Environmental Assessment Requirements (DGRs) issued on 29 January 2014 (SSD 6339).

"15. Waste

Identify, quantify and classify the likely waste streams to be generated during construction and operation and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site."

The proposed Campus Master Plan comprises a number of new buildings, internal refurbishments and the reallocation of some internal spaces across the site. The primary new buildings (and associated demolition works) include:

- Demolition of the existing outdoor swimming pool and construction of a new multi-level building (RPAC). The core facilities proposed within the RPAC include a new Research Centre, Performing Arts Auditorium, Aquatic Centre and Multi-Purpose Hall, with pedestrian links to the existing Dame Joan Sutherland Centre (DJSC) and Jo Karaolis Sports Centre (JKSC).
- Demolition of the existing Jane Barker Hall (JBH) and construction of a new building.
- Demolition of the existing print room, reception and link building between Lenthall and the Administration Building (Level 6) and construction of new boarder's common room.

This report provides an overview of how the proposed facilities will manage waste and recycling once operational and integrate into the existing waste services provided by Waverley Council. Specifically, this report provides:

- Estimates of the quantity of waste and recycling generated by the new facilities
- Details of recommended systems for the management of the estimated waste profile
- A review of the proposed waste areas to ensure consistency with waste systems, and Council requirements
- An outline of the waste management practices to maximise recycling initiatives and ensure the effective management of waste.

2. Spatial Use & Waste Types Generated

2.1 Spatial Use

The development consists of 7 levels across the three new facilities. Table 1 below details the **waste generating areas** of the development – these areas will form the basis of the waste generation estimates. These figures do not represent the total GFA of the new development.

Table 1 – Total square metres by location type and level

Location	Teaching and Learning Rooms/ Areas	Office / Admin	Common Areas	Auditorium	Amenities	Kitchen/ servery	Non-lettable areas e.g. Switch room etc.	Total
Level 1	Carpark							
Level 2		28			85		45	158
Level 3	117				60			177
Level 4			425	551	28	27.5		1,031.5
Level 5		54			10.5			64.5
Level 6	346.5							346.5
Level 7	270							270
TOTAL	733.5	82	425	551	183.5	27.5	45	2,047.5

Table 2 shows the percentage of square metres per location type for the development.

Table 2 – Summary composition of location by squared metres

Location	m2	%
Teaching Areas	733.5	35.82%
Office / Admin	82	4.00%
Common Areas	425	20.76%
Auditorium	551	26.91%
Amenities	183.5	8.96%
Kitchen/servery	27.5	1.34%
Utility areas	45	2.20%
TOTAL	2,047.5	100%

2.2 Waste Generation Types

Based on the types of activities that will occur within the new facilities, the following waste streams would be expected:

- Cardboard recycling
- Paper recycling
- Comingled Recycling
- Food Organics Recycling
- General Waste

In addition to the above common waste streams, it is expected that some specialty wastes associated with the maintenance of the pool will be generated e.g. chemical/chlorine containers

On an ad-hoc basis there may also be small quantities of the following:

- E-waste recycling
- Battery Recycling
- Fluorescent light tube recycling

3. Predicted Generation Rates

Based on industry averages and historical audit data, it is estimated that the proposed facilities will generate a total of **111 kilograms and 1,445 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 – assume full use during weekdays and limited use on weekends. Waste generation levels will vary depending on class frequency, number of students attending and the nature of other various events likely to be held within the facilities i.e. concerts, carnivals etc.

3.1 Detailed Waste Generation Estimates

The following tables summarise the expected quantities of waste and recyclables generated for the new development in terms of weight and volume per day and week during semester. Waste generation may decrease during holiday breaks and it is recommended that waste generation is monitored during these periods and waste practices updated to reflect actuals.

Table 3 - Estimated total waste and recycling generation by stream

	kg/day	L/day	kg/wk	L/wk
Paper	20	250	142	1,750
Cardboard	4	98	30	686
Food organics	50	247	348	1,727
Comingled recycling	14	348	100	2,434
General waste	23	502	159	3,515
Total	111	1,445	778	10,112

For the purposes of integrating the estimated waste profile into the existing waste services provided by Waverley Council, the following tables apportion the breakdown provided in table 3 into the consolidated streams currently provided by Council.

Table 4 - Estimated total waste and recycling generation (Council streams)

	kg/day	L/day	kg/wk	L/wk
Mixed Recycling – incl. paper, cardboard, comingled	39	696	272	4,870
General waste – incl. organics	72	749	506	5,242
Total	111	1,445	778	10,112

4. Recommended Storage Systems & Collection Frequency

The new waste storage area is proposed beneath the Research Centre and a level path of access for cleaners/maintenance staff for transferring bins is provided off Leichhardt Lane. The storage area is approximately 20m² and will be sufficient to house the required number of bins and also provides ample flexibility to add bins for larger events if required. The storage area is fully enclosed by a wall and is lockable.

Table 5, below, details the waste collection frequencies for each waste stream currently offered by Waverley Council and the total area required to house the recommended systems.

Table 5 – Waste and recycling systems and total footprint

Waste Stream	Bin Type	No. of Bins	Clearance Frequency	Capacity (weekly)	Estimated volume / week	Footprint per bin (m2)	Total Footprint (m2)
Mixed Recycling	660 litre MGB	4	2 x weekly	5,280	4,870	0.98	3.92
General Waste	660L MGB	5	2 x weekly	6,600	5,242	0.98	4.90
Vegetation	660L MGB	1	Fortnightly	330	Ad-hoc	0.98	0.98
TOTAL				11,880	10,112		9.80

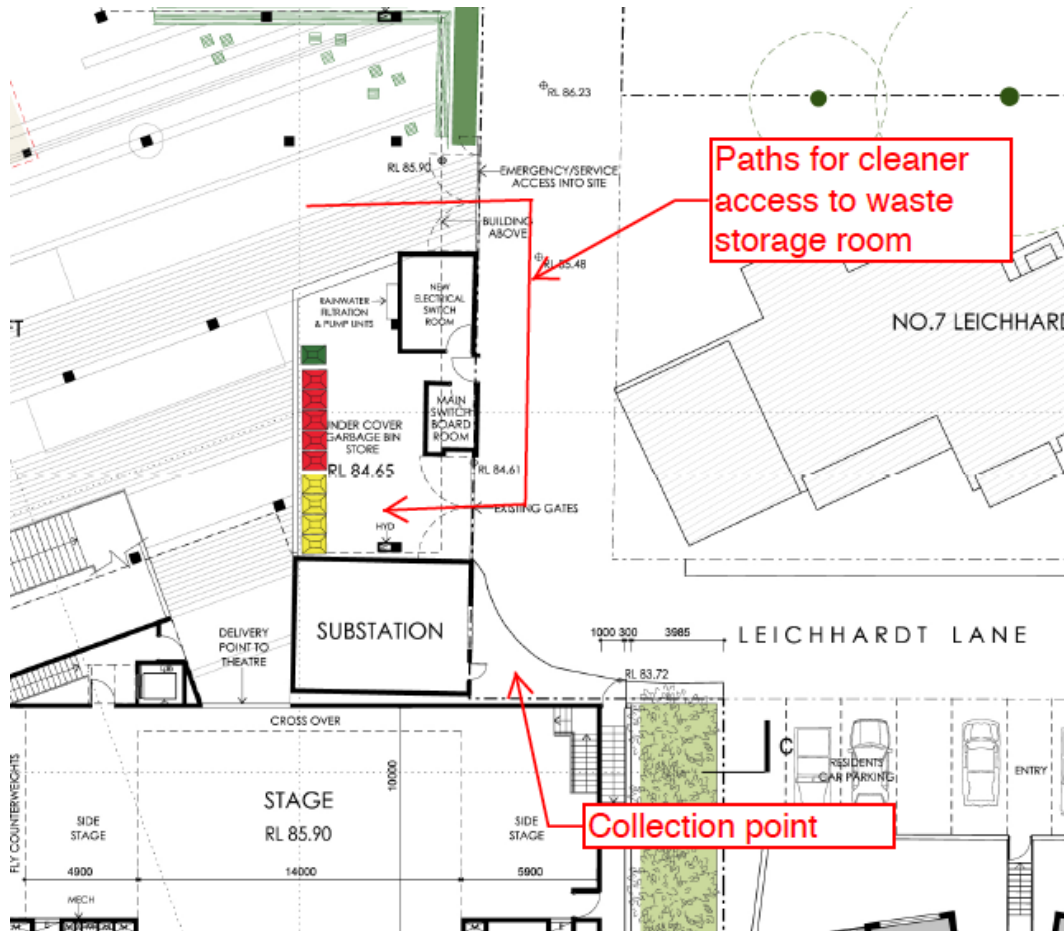
The following waste stream will be collected on call as needed:

- 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 campus operations and consolidated for collection by specialty cartridge recycler (usually provided by office supplier).
- Chemical/chlorine containers will be managed by maintenance staff – in most cases these will be returned to the supplier for reuse.

4.1 Bin Storage Room

The waste storage area should be clearly signed so that wastes and recyclables are stored correctly. Each stream will be located in a designated area. This will assist in easy identification of correct bins by cleaners and staff. Signage will be displayed in the storage areas advising of acceptance criteria within each system.

Figure 1 – Waste storage room location and access paths



5. Waste & Recycling Identification

Waverley Council provides mobile garbage bins (MGBs) with different coloured lids to aid in separation and identification of streams. The general waste stream has a red lid and the mixed recycling stream has a yellow lid.

All waste receptacles will be appropriately signed and additional signage should be displayed within the waste room. Below are examples of signage which can be implemented onsite.

Waste Audit recommends that all signs should;

- Clearly identify the waste/recycling stream;
- Use correct waste/recycling stream colour coding;
- Identify what can and cannot be disposed of in the receptacle; and
- Include highly visual elements to accommodate for individuals with inadequate English literacy.



6. Waste Handling Practices

6.1 Waste Transport Protocols

The waste storage area for the development is located on Leichhardt Lane. Cleaners are able to access the room via a level path of access as shown in figure 1. All access to the waste storage room is level with no major inclines.

Full waste and recycling receptacles will be transported by cleaning staff to the existing collection point adjacent to the substation on Leichhardt Lane on collection days to be collected by Waverley Council waste services. After collection is complete, the bins will be retrieved by cleaning staff and returned to the waste storage room for use.

6.2 Waste Systems on Each Level

Throughout each level are various areas with different functions – including teaching/study/research areas, auditorium, backstage/green rooms, aquatic centre, workout rooms, office/admin areas, meeting 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 recycling and waste hubs be established throughout the floors in hallways, high-traffic areas and common spaces to service the different areas. This forces students/staff using the rooms to remove any waste they have from the room as they leave 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.

It is recommended that additional waste/recycling hubs are located at the exits of the auditorium to cater for the users entering and exiting.

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 waste/recycling hub



*note – this example is for a 3-stream system, the St Catherine's School RPAC development would employ a 2-stream system (general waste and mixed recycling) to be consistent with the Council waste service.

6.3 Waste Stream Collection Practices

Table 6 below outlines the cleaners and campus operational staff collection practices for each waste stream

Table 6 – Waste stream collection practices

Waste Stream	Collection Practices
Mixed recycling	<ol style="list-style-type: none"> 1. Empty bin hubs into cleaner trolleys. Material is then taken to waste storage room via the lift core and transferred into the mixed recycling bins. 2. 240L paper bins in print areas will be transferred to the waste storage room when full and replaced with an empty bin from the waste storage room. 3. Where possible, bulky cardboard should be taken directly to the waste storage room or left in a designated area on each level to be collected by cleaning staff. 4. Cleaners collect flattened cardboard as required and transfer it to the waste storage room where it is deposited into the cardboard 660L MGBs 5. Bins will be transferred by cleaners from the waste storage to the designated collection point near the substation on Leichhardt Lane as per the collection schedule. Cleaners will then return the bins to the waste storage room after collection.

Waste Stream	Collection Practices
General Waste	<ol style="list-style-type: none"> 1. Cleaners to collect general waste using a trolley and transport the waste to the waste storage area to be transferred into the 660L general waste bins. 2. Bins will be transferred by cleaners from the waste storage to the designated collection point near the substation on Leichhardt Lane as per the collection schedule. Cleaners will then return the bins to the waste storage room after collection.
Toner Cartridge Recycling	<ol style="list-style-type: none"> 1. Used toner cartridges will be collected by campus operations and placed into the designated toner cartridge recycling bin located in office areas 2. This will be collected on call by a dedicated contractor (i.e. Planet Ark)
Battery Recycling	<ol style="list-style-type: none"> 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.
Garden waste	<ol style="list-style-type: none"> 1. All vegetation/green waste generated from garden maintenance will be managed by grounds maintenance staff. A green waste 660L MGB will be located within the waste room which can be collected by Council as required either on a weekly or fortnightly basis.

Figure 2 – example of a segregated cleaner trolley recommended to collect waste from bin hubs throughout levels



6.4 Waste Stream Acceptance Criteria

Mixed Recycling:

The mixed recycling stream offered by Waverley Council accepts all paper and cardboard materials including newsprint, glossy paper and mixed office paper. Also accepted in the mixed recycling stream are all recyclable plastic containers, aluminium containers, glass bottles and steel cans.

Food Organics Recycling:

The food organics recycling system should accept all organics materials including food scraps, coffee grounds and paper hand-towel (depending on the waste contractor). Food organics bin lids and signage should be colour-coded burgundy.

Food organics bins should be lined with a clear plastic liner so that the material is easily distinguishable from general waste bins, and any contamination is easily identified. Food organic bins will be 120L MGB's. Cleaners will need to ensure that the contents of the clear liners are decanted into the food organics 120L MGBs as the plastic liners may be classified as contamination by the waste service provider.

General Waste:

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