Operational Waste Management Plan

Proposed Wentworthville Public School Redevelopment

At 70-100 Fullagar Road, Wentworthville

On Behalf of Fulton Trotter Architects

About TTM

For 30 years, we've been at the centre of the Australian development and infrastructure industry. Our unique combination of acoustics, data, traffic and waste services is fundamental to the success of any architectural or development project.

We have over 50 staff, with an unrivalled depth of experience. Our industry knowledge, technical expertise and commercial insight allow us to deliver an exceptional and reliable service.

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Revision Record

No.	Author	Reviewed/Approved	Description	Date
1.	A. Stamatiou	E. Atkins	Draft DA Report	07/09/18
2.	A. Stamatiou	E. Atkins	DA Report	27/09/18
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4.	A. Stamatiou	A. Stamatiou	Minor Amendments	13/11/18
5.				

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GLOSSARY OF TERMS

In this waste management plan unless the subject matter otherwise indicates, a term or abbreviation has the following meaning:

TERM	DEFINITION
Bin Storage Area	An enclosed area designated for storing on-site refuse bins within the property.
Bulk Bin	A galvanized or steel bin receptacle that is greater than 360L in capacity generally ranging from 1.0m³ to 4.50m³ used for the storage of refuse that is used for on-site refuse collection.
Bulk MGB	A plastic (polypropylene) receptacle that is greater than 360L in capacity generally ranging from 0.66m³ to 1.10m³ used for the storage of refuse.
Collection Point	The identified position where refuse bins are stored for collection and emptying. The collection point can also be the bin storage area for bulk bins.
Composter	A container/machine used for composting specific food scraps and/or organic materials.
Green Waste	All vegetated organic material such as small branches, leaves and grass clippings, tree and shrub pruning, plants and flowers.
L	Litre(s) related to refuse volumes
Liquid Waste	Non-hazardous liquid waste generated by commercial premises that should be connected to sewer or collected for treatment and disposal by a liquid waste contractor (including grease trap waste).
m^2	Square Metre(s) related to refuse areas
Mobile Garbage Bins (MGB)	Plastic (polypropylene) bin or bins used for the temporary storage of refuse that is up to 360L in capacity and may be used in kerbside refuse collection or on-site collection.
Putrescible Waste	The component of the waste stream liable to become putrid and usually breaks down in a landfill to create landfill gases and leachate. Typically applies to food, animal and organic products.
Recycling	All material suitable for re-manufacture or re-use eg glass bottles and jars – PET, HDPE and PVC plastics; aluminum aerosol and steel cans and lids; milk and juice cartons; soft drink, milk and shampoo containers; paper, cardboard, junk mail, newspapers and magazines.
Refuse	Material generated and discarded from residential and commercial buildings including general waste, recyclables, green waste and bulky items.
Refuse Bin	A receptacle (MGB (wheelie), bulk MGB or bulk bin) used for the storage of refuse.
Refuse Collection Vehicle (RCV)	A vehicle that is specifically designed for collecting and emptying refuse bins and refuse compactors.
Refuse Storage Room	An area identified for storing on-site mobile garbage bins or bulk bins within the property.
Regulated Waste	Waste prescribed under legislation as regulated waste.

TERM	DEFINITION
Steely Bin	660L Bulk Bin made of Galvanized Steel
Waste	Refuse material with the exclusion of recycling, green waste, hazardous waste special waste, liquid waste and restricted solid waste.
Waste (General Waste)	Generally material free of any actual or apparent contamination (pathological/infectious, radioactive and/ or hazardous chemical). Reporting use is for material considered to be free of food waste.
Collection Vehicles	
Rear-loading RCV	A truck specially designed to collect municipal solid waste and recycling, typically 240L wheelie bins to 1100L bulk bins from rear loading mechanism and haul the collected waste to a solid waste treatment facility.
Front-loading RCV	A truck specially designed to collect municipal solid waste and recycling, typically 1500L-4000L bulk bins from a front-loading mechanism and haul the collected waste to a solid waste treatment facility.

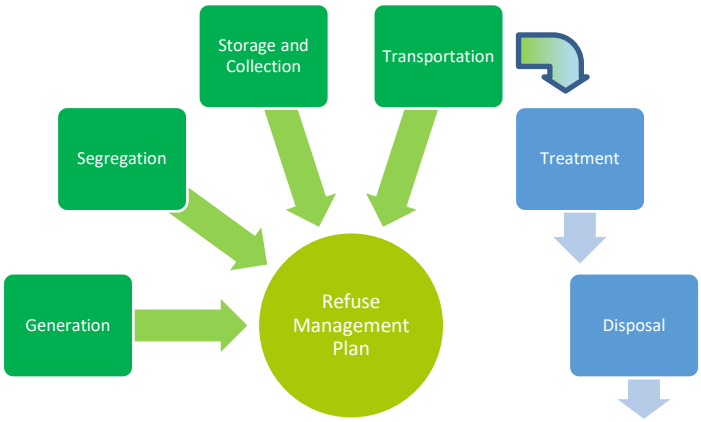
1. Introduction

1.1. Background

TTM Consulting has been engaged by Fulton Trotter Architects to prepare a refuse management plan to support the proposed school (Wentworthville Public School) redevelopment at 70-100 Fullagar Road, Wentworthville. The assessment and associated recommendations include:

- Identification of refuse streams produced within the development;
- Estimated volumes generated;
- Appropriate segregation methods for each refuse stream;
- Internal systems and equipment requirements;
- Refuse storage, collection and loading facilities design;
- Refuse collection vehicle (RCV) access and manoeuvrability;
- Operational and safety requirements;
- Pollution prevention; and
- Waste minimisation.

Refuse Life Cycle



The report takes into consideration the associated workplace health and safety issues and cost implications of waste management processes and equipment to ensure safe and cost-effective solutions are in place for long term property management. Recommendations also ensure that noise and odour nuisances are mitigated and visual amenity is maintained and does not adversely affect the surrounding properties.

The recommendations for refuse collection relate to the operational phase of the development only and do not include additional requirements during or after demolition or construction phases, which requires its own separate plan.

Information contained within the report is based on local government authority requirements related to the Cumberland City Council (formerly Holroyd City Council) and the associated waste services department. The recommendations provided are designed to comply with the City of Holroyd Development Control Plan 2013:

- Part A- General Controls
- Part C- Commercial, Shop Top Housing and Mixed-Use Development Controls.

1.2. Site Location

The site is located at 70-100 Fullagar Rd, Wentworthville, as shown in Figure 1.1 and Figure 1.2. The site has a road frontage to Fullagar Road, Garfield Street, Station Street and Monash Street, with the latter used for service vehicle access. The site is currently operating as an educational facility.

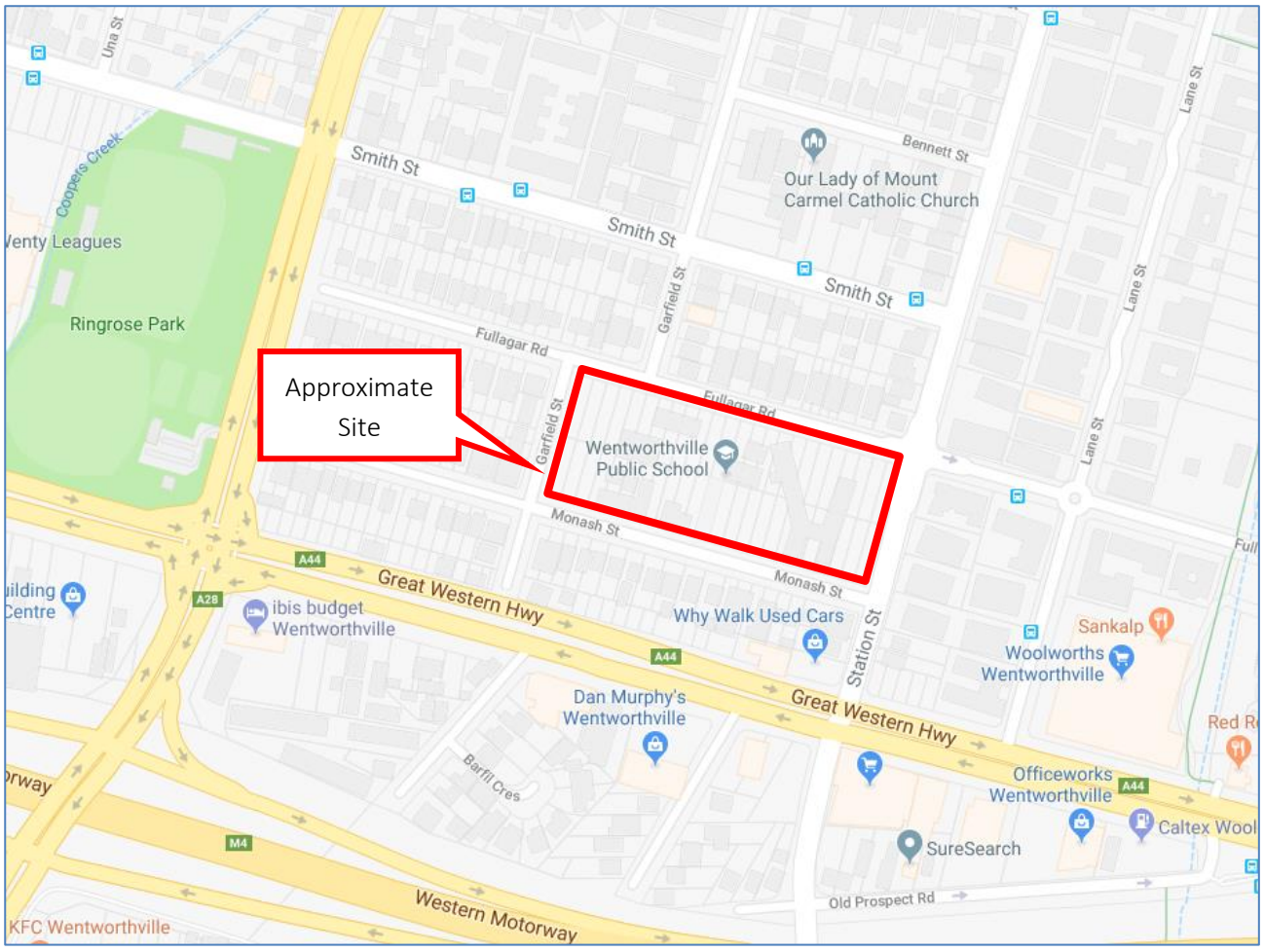


Figure 1.1: Site location

Figure 1.2: Site Aerial

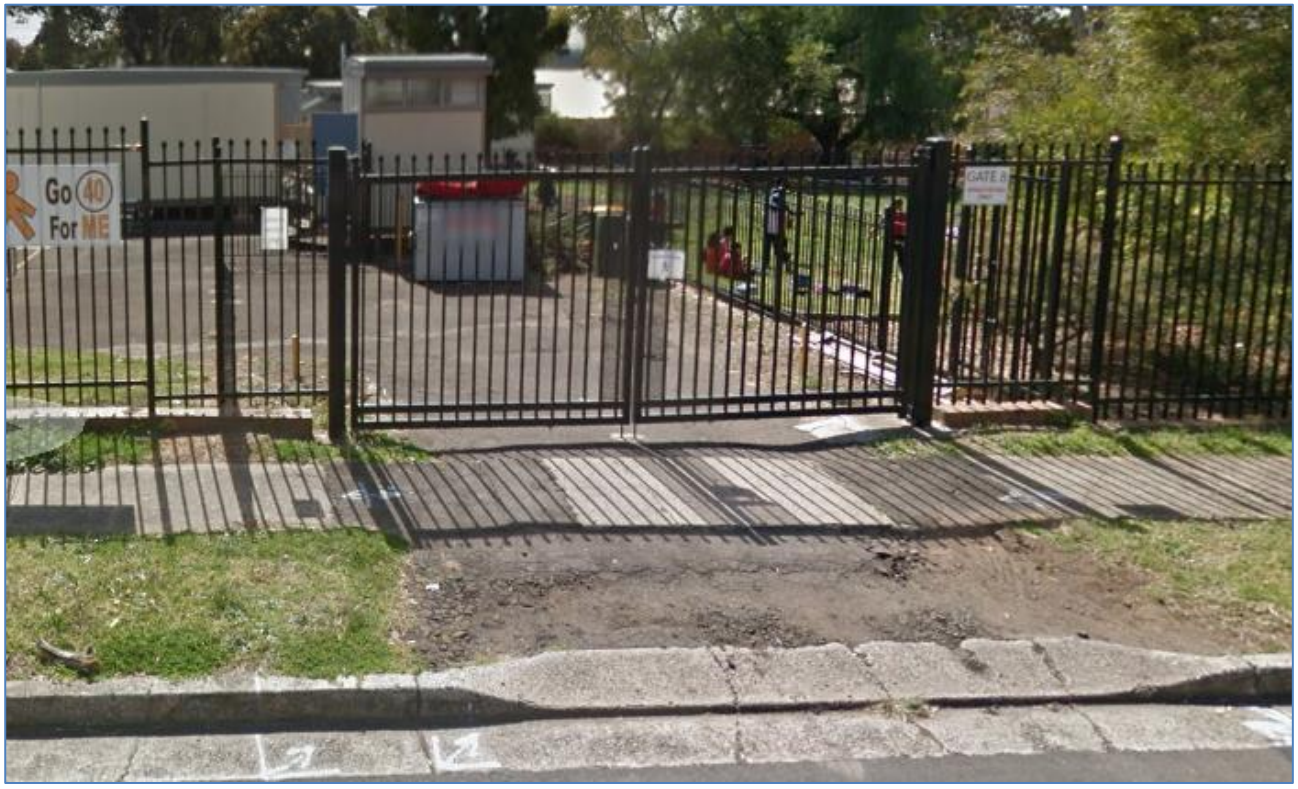


Figure 1.3: Existing Waste Collection Area

1.3. Development Summary

The development consists of an existing educational facility (school) including administration, classrooms, library and canteen areas.

The development proposal consists of removing 9 demountable buildings from an existing school, to provide 31 new teaching spaces totalling 45 permanent spaces, including a new hall, library, home bases and administration areas catering for 1000 students.

The total GFA for the new buildings is 5121.3m^2 GFA, with 1391.9m^2 GFA for the refurbishment buildings.

It is noted that all demountables will be removed at the completion of the project.

1.4. Existing Refuse Arrangements

The existing waste collection arrangements for the site are as follows:

Table 1.1: Existing Refuse Arrangements

Item	Arrangement
Existing Staff and Student numbers	• 60 staff • 604 students
Proposed Staff and Student numbers	• 80 staff • 1,000 students
Existing Waste Collection Area	Refer to Figures 1.2 and 1.3, and Appendix B
Existing Waste Generation (Bin Numbers and Collections)	• 1 x 3,000L bulk bin – general waste – weekly collection (Gate 8) – 11x 240L wheelie bins located around the school and emptied into the 3,000L bulk bin as required • 10 x 240L wheelie bins – commingled recycling located in school hallways – fortnightly collection (Gate 2)
RCV	• Front-lift collection for general waste • Rear-lift collection for recycling

Detailed calculations and equipment requirements are based on a conservative estimate of the current waste generation provided outlined in Appendix A. Site drawings can be found in Appendix B.

2. Refuse Management

The site waste streams may consist of the following:

Table 2.1: Generated Waste Streams

Frequently Generated Waste Streams	
General waste	**General waste** should be collected in a dedicated receptacle within the allotted space and bagged or wrapped prior to disposal. Operationally, general waste should be bagged and weigh approximately 3kg or less and not exceed the dimensions of the waste receptacles.
Recycling (glass, aluminium and steel cans/tins/lids, paper/cardboard, semi rigid plastics)	**Recycling** should be collected in a dedicated receptacle to ensure separation from the waste material and must not be bagged.
Infrequently Generated Waste Streams	
Organic waste	An alternate refuse disposal method, such as composting for **organic waste**, may be considered to reduce the total amount of general waste produced. Apartment style equipment is available for use where practical and space allows. Composting should be arranged with the building caretaker and further information can be found in Appendix C.
Green waste	**Green waste** is typically removed by a designated maintenance contractor.
Hard waste/bulky goods	The development has several storage spaces on the ground floor for utilisation of storage and collection of **hard waste/ bulky goods**. Unless otherwise instructed by council, charitable organisations may be contacted by the waste caretaker/ cleaner as a mode for collections.
Hazardous waste (paints, batteries and cartridges) and E-waste	The building caretaker will assist in the coordination of disposal of **specialised / hazardous waste and e-waste** such as recycling of electronic, liquid waste and paint/chemicals where required, due to safety and environmental reasons. Residents should be directed to Council's website for more details for appropriate waste and disposal.

2.1. Refuse Disposal, Transfer and Storage Process

Each classroom/office will be supplied with adequate space for storage of at least one full day accumulation of refuse. Typically, schools utilise up to 60L bin receptacles within the classrooms. These waste and recycling bins are placed within close proximity to classroom doors, desk areas, eating and washrooms. Several larger 240L bins (eleven in total) are also placed around the playground and school areas.

On completion of each day, or as required during the day, the caretaker / cleaners will transfer the waste and recycling from each room and playground area and decant into the appropriate bins in the refuse areas (see Appendix B).

3. Refuse Collections

3.1. Refuse Vehicle Access and Loading

The site will have vehicle access via Monash Street (front lift collection, forward entry into site and reverse exit) and Fullagar Road (rear lift collection, reverse entry into site and forward exit). All refuse will be collected onsite by the existing private contractor. There will be no changes to existing service accesses and arrangements as a result of these additions.

3.2. Collections

The existing collections and collection areas will remain as per existing arrangements.

Refuse bin quantities have been based on the existing collection cycles of one day per week for waste and one day per fortnight for recycling.

4. Recommended Operational Requirements

4.1. On-going Management

All refuse equipment movements are to be managed by caretaker or cleaners at all times. The caretaker/cleaner duties include, but are not limited to the following:

- Organising, exchanging, maintaining and cleaning the refuse bins and associated refuse areas (frequency will depend on waste generation and will be determined based upon building operation);
- Transporting and decanting of bins as required;
- Organising both garbage and recycled waste pick-ups as required;
- Organising and coordinating bulky goods collections;
- Ensuring site safety for residents, children, visitors, staff and contractors;
- Abiding by all relevant OH&S legislation, regulations, and guidelines;
- Assessing any manual handling risks and preparing a manual handling control plan for waste and bin transfers;
- Providing to staff/contractors' equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities; and
- Continual monitoring of equipment uses and scheduling to ensure best operational outcomes.

NOTE: As waste volumes may vary according to the development occupants' attitudes to waste disposal and recycling, bin numbers and sizes may need to be altered to suit the building operation.

4.2. Waste Minimisation

4.2.1. Education

On-going education and signage is important to ensure people continue to use the facilities as originally intended. Leasing arrangements should contain direction on expectations and waste management services.

4.2.2. Monitoring and Review

Regular monitoring and inspections of waste and related equipment and facilities from the development should be conducted by building management/designated staff for maintenance and sustainability, including but not limited to bin volumes, refuse storage areas and stormwater management.

Waste minimisation requires regular reviewing to ensure operational sustainability of refuse volumes and equipment and economic feasibility. It is recommended that refuse weights and movements are recorded and reviewed. An external review is usually conducted 12 to 18 months after the implementation of the plan.

4.2.3. Signage

All receptacles and bins should have adequate signage and labelling, which is clear and easy to read. Standard signage should be provided in and around waste collection and storage areas (See Appendix D).

4.3. Safety

Note that transferring refuse bins is considered a hazardous manual task and therefore contractors must ensure a full risk assessment of equipment, surfaces and related gradients is complete. The contractor must provide procedural documentation to appropriate personnel prior to delivery of equipment and occupancy of the development.

4.4. Operational Equipment Summary

Equipment required or suitable for use as part of the operational phase of the development is outlined in Table 4.1 below. It should be noted that all collection receptacles and bins should be branded with the appropriate stickers and the use of the Mobius loop or similar identifying recycling equipment.

Table 4.1: Operations Equipment

Description	Quantity	Notes
Recycling Bins	17	240L wheelie bin See Appendix C
Waste Bins	2	3,000L bulk bin See Appendix C
Green Waste	Subject to operational requirements	
Organics- Receptacles for use in centralised composting / worm farm or electronic composting bins.	Supplied as and if required	

Appendix A Detailed Information

Refuse Calculations

The generation rates used for the calculation are based on a conservative estimate of the current waste generation provided. It has been assumed that the existing bins are at full capacity during servicing.

Waste and recycling volumes indicated do not include compaction.

Table A.1: Commercial Generation Rates

Type	Waste	Recycling
Existing Generation	4.5 Litres / staff & student / week	1.8 Litres / staff & student / week

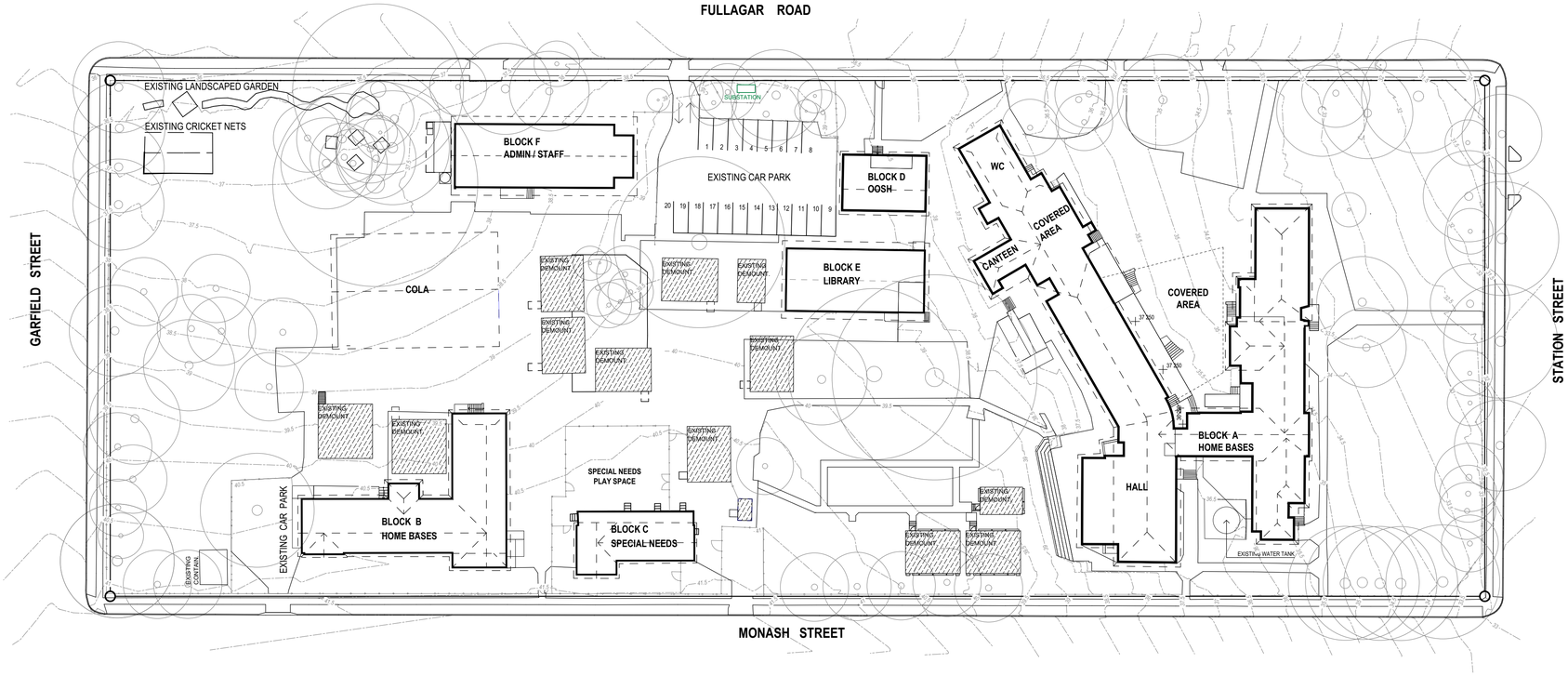
Table A.2: Refuse Calculations

Description	Population	Generated Waste (L/week)	Generated Recycling (L/week)
Proposed	1,080	4880	1952
Total	1,080	**4880**	**1952**
Refuse per day	-	**976**	**391**
Refuse per collection	-	**4880**	**3904 (per fortnight)**
Collections and Equipment	**Bin Size (L)**	3000	240
	Collections per Week	**1**	**1 (per fortnight)**
	No Bins Required	**2**	**17**

Appendix B Site Plans

EXISTING SITE PLAN LEGEND

- EXISTING BUILDINGS
- EXISTING DEMOUNTABLES
- EXISTING TREES
- ROOF OVER
- CONTOURS
- FENCE



1 **PLAN**
EXISTING SITE PLAN
SCALE: 1:500

P3	EFSG Review	31/07/18	LW
P4	Consultant Issue	06/08/18	LW
P5	Draft Schematic Design Issue	04/09/2018	JFK
P6	Issued For TSG Review	20/09/2018	JFK
P7	SSDA Consultant Report Issue	05/10/18	WG
P8	SD / SSDA Client Review Issue	11/10/18	JFK
P9	SSDA Final Coordination Issue	9/11/18	JFK
REV.	DESCRIPTION	DATE	INIT.

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Paul Trotter fraia		NSW 7177	QLD 2646
Ryan Loveday raia			QLD 4500
Robert Wesener fraia		NSW 5802	QLD 2633

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PHASE: **SCHEMATIC DESIGN**

CLIENT: NSW Department of Education

PROJECT: Wentworthville Public School

ADDRESS: 70-100 Fullagar Road
WENTWORTHVILLE, NSW

DRAWING: **EXISTING SITE PLAN**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

PROJECT NUMBER	DIRECTOR	CHECKED
7068WV01	JW	

DRAWING NUMBER: **AEX-1001**

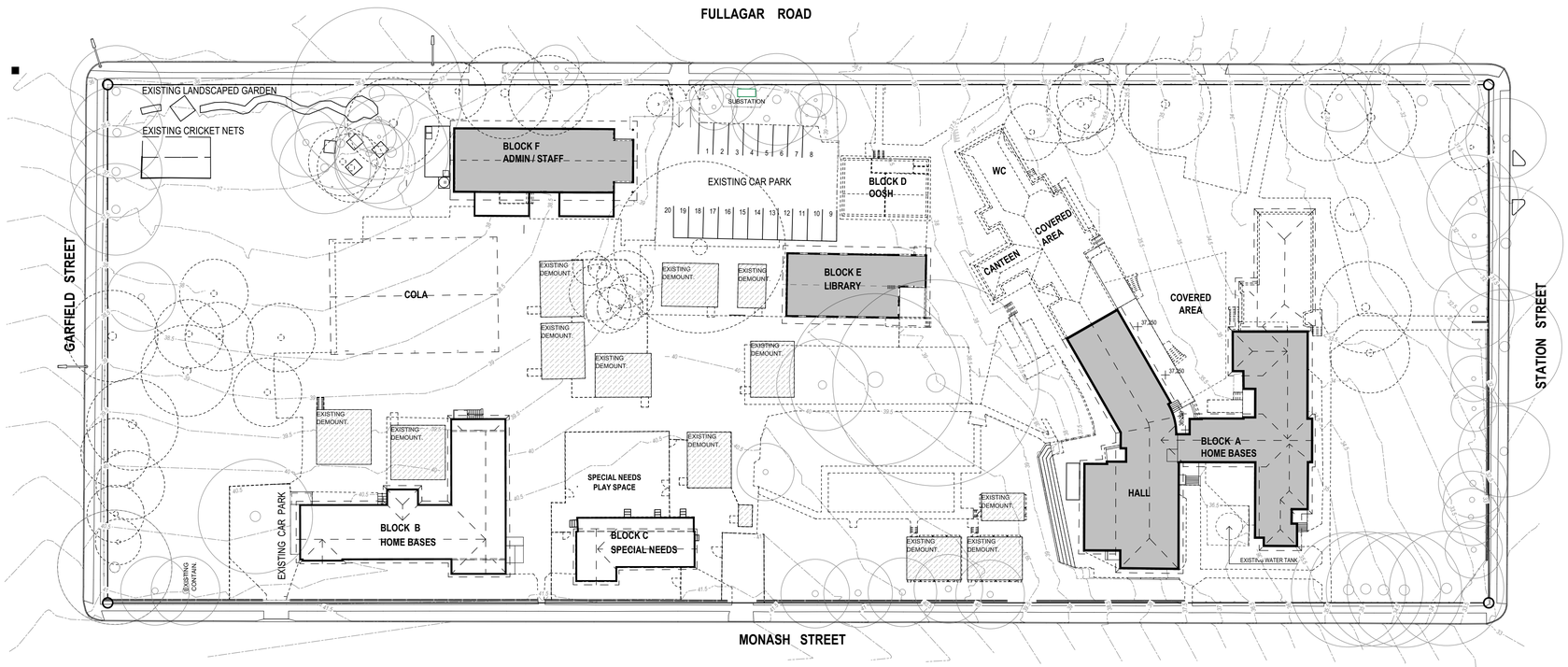
REVISION: **P9**

150mm @ A1 | 100 | 50 | 50 | 100 | 150mm @ A1

plot date: Friday, 9 November 2018 file location: BIM Server: sydbimsyd 21 - BIM Server 21/7068 WVPS

DEMOLITION SITE PLAN LEGEND

- EXISTING BUILDINGS TO BE RETAINED
- EXISTING BUILDINGS TO BE REFURBISHED
- EXISTING BUILDINGS TO BE DEMOLISHED
- EXISTING DEMOUNTABLE TO BE REMOVED UPON COMPLETION
- EXISTING TREES: RETAINED / REMOVED
- ROOF OVER
- CONTOURS
- FENCE



1 **PLAN**
EXISTING + DEMO SITE PLAN
SCALE: 1:500

P1	Draft Schematic Design Issue	04/09/2018	JFK
P2	Issued For TSG Review	20/09/2018	JFK
P3	SD / SSDA Client Review Issue	11/10/18	JFK
P4	SSDA Draft Issue	6/11/18	JFK
P5	SSDA Final Coordination Issue	9/11/18	JFK
REV.	DESCRIPTION	DATE	INIT.

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PHASE **SCHEMATIC DESIGN**

CLIENT NSW Department of Education

PROJECT Wentworthville Public School

ADDRESS 70-100 Fullagar Road
WENTWORTHVILLE, NSW

DRAWING **SITE DEMOLITION PLAN**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

PROJECT NUMBER	DIRECTOR	CHECKED
7068WV01	JW	

DRAWING NUMBER	REVISION
AEX-1002	P5

150mm @ A1 | 100 | 50

50 100 150mm @ A1

plot date: Friday, 9 November 2018 file location: BIM Server: sydbimsyd 21 - BIM Server 21/7068 WVPS

PROPOSED SITE PLAN LEGEND

EXISTING BUILDINGS TO BE RETAINED

EXISTING BUILDINGS TO BE REFURBISHED

PROPOSED BUILDINGS

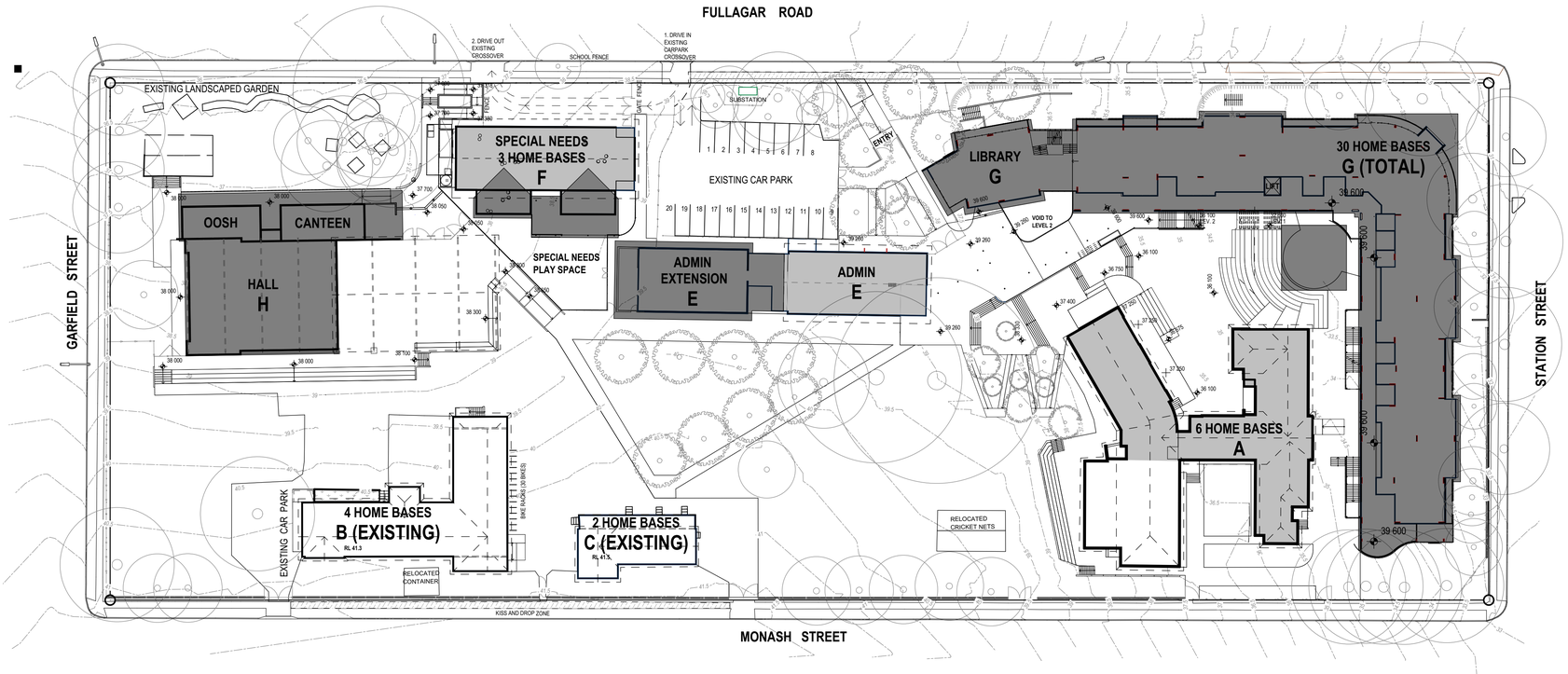
EXISTING TREES:

PROPOSED TREES

ROOF OVER

CONTOURS

FENCE



1 **PLAN**

PROPOSED SITE PLAN L3 (APPROX RL 39)

SCALE: 1:500

REV.	DESCRIPTION	DATE	INIT.
P5	Consultant Issue	06/08/18	LW
P6	Draft Schematic Design Issue	04/09/2018	JFK
P7	Issued For TSG Review	20/09/2018	JFK
P8	SSDA Consultant Report Issue	05/10/18	WG
P9	SD / SSDA Client Review Issue	11/10/18	JFK
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PHASE **SCHEMATIC DESIGN**

CLIENT NSW Department of Education

PROJECT Wentworthville Public School

ADDRESS 70-100 Fullagar Road
WENTWORTHVILLE, NSW

DRAWING **LEVEL 3 - PROPOSED SITE PLAN**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

PROJECT NUMBER **7068WV01**

DIRECTOR **JW**

CHECKED

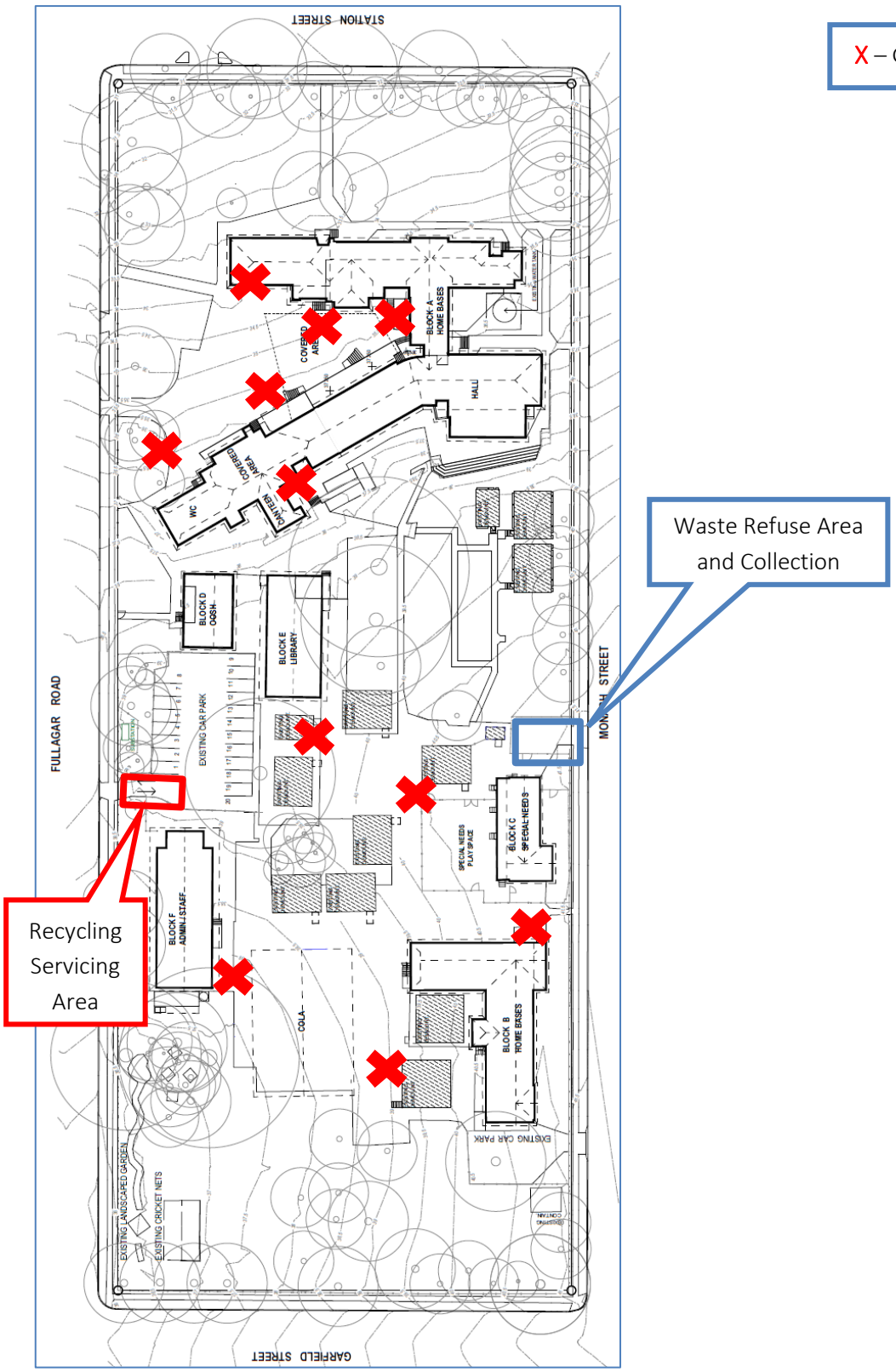
DRAWING NUMBER **SD-1001**

REVISION **P11**

50 100 150mm @ A1

plot date: Friday, 9 November 2018 file location: BIM Server: sydbimsyd 21 - BIM Server 21/7068 WVPS

Ground Floor Plan



Source: Fulton Trotter Architects- drawing # AEX1001, Rev P7, dated 05/10/18 - Proposed Site Plan

Appendix C Systems and Specifications

Collection Bins

Bin Type	Height	Depth	Width
120L	940mm	560mm	485mm
240L	1088mm	735mm	580mm
3000L	1590mm	2040mm	1450mm

Example Composting

How to manage waste at school

What is compostable, collecting food scraps and setting up composting and worm farming

Did you know?

About half of what we throw into the garbage bin is food and garden waste!

Mixed with the rest of our garbage, the potential of these organic materials is lost – they are usually wasted in landfills where they contribute to environmental problems like the greenhouse effect and water pollution.

Food and garden scraps are too valuable to waste. Recycling your school's food and garden scraps on site not only saves energy (less trucks to have to pick up the material), but also provides a natural soil conditioner for your gardens.

By turning your food and garden waste into compost you can make a difference to our environment, by –

- reducing the amount of waste you dispose
- reducing the use of artificial fertilisers
- improving your local soil quality
- creating a more natural, healthier (and happier) place for your students

What is compostable?

All food can be collected as well as paper food wrappings and paper bags. (The small amounts of meat in left over sandwiches shouldn't affect your composting system.)

The benefits of composting

Composting food and garden scraps helps to complete a natural cycle of life. Composting occurs naturally everywhere. As plants grow and eventually die, their nutrients are made available again by returning to the soil.

1. Cut back on school waste and save money

One major benefit of composting is that you will greatly reduce the amount of garbage your school throws away. Sending less waste to landfills is an effective way to reduce your environmental impact.

Compostable food and garden waste can make up a significant percentage of landfill waste. Experts say that between 25 percent and 50 percent of the food we buy ends up being thrown away.

Composting is one of many environmentally friendly ideas that can also save your school money. By composting your schools organic waste you can cut back on garbage disposal bills while helping the earth.

2. Help reduce greenhouse gases

Your school can have a direct effect on reducing greenhouse gases just by composting. Organic waste that is sent to landfills ends up buried, where sunshine and air cannot reach it. The result is decomposition that occurs in an anaerobic environment, which creates methane gas. Cutting back methane emissions, which are many times more effective at trapping heat than carbon dioxide, is a top priority in reducing greenhouse gas.

3. Free organic fertiliser

Composting gives you a free supply of organic fertiliser for your school garden. Compost as a fertiliser

- contains nutrients and microorganisms that your plants, shrubs, and trees will love
- retains water in your soil, thereby reducing erosion
- encourages nature to work for you
- earthworms and many other beneficial creatures flourish in enriched soils. Their activities help release essential nutrients, which strengthen plants and increase their resistance to diseases

Mix your compost with your soil as you prepare your garden beds for planting. You can also use compost to top-dress the soil around the bases of perennial plants, trees, and shrubs.

Put the benefits of composting to work for you by starting your school composting system. Composting is an easy and rewarding way to reduce your schools garbage and feed the soil.

Composting

Things to consider before you start composting

Who will manage the compost?

- Student ECO/Environment team
- School caretaker/gardener
- Teachers
- Cleaner

Ensure that more than one person is responsible so there is always back up.

How will the food for composting will be collected

A food collection bucket should be placed beside every garbage bin.

- Collection buckets should be
- 10 litre size (maximum)
- should have a lid
- should have a handle (a second hand tradesmen's bucket with a small hole cut into the lid is ideal save money by asking for donations within the school).

Clean signage on the bucket and education about what is compostable is essential

Simple ideas for signage

- school colouring competition to custom make signs
- Council can provide generic signs

Who does the collection?

- Bin monitors (senior students)
- Bin committee
- Caretakers
- Environmental group or committee

Setting up the composting

How many bins?

- A waste audit can be done to determine the number of bins required. (Council can assist with your audit. The audit can become part of your SEMP).
- Alternatively start with a minimum of two bins and add extras as required.

Where to put the bins?

Ideally the bins should be

- on the soil in a warm, well drained location
- in a sunny spot
- close to the garden where the compost will be used
- close to water

Other considerations are

- Space near bin for collection/storage of mulch and other 'woody' materials
- Space near bin for storage of finished compost
- Hessian bags to cover the compost
- Compost turning tool for easy aeration

Follow our Easy Compost Recipe to make great compost.

Worm farming

Another way to use your valuable food scraps.

What is worm farming?

Worm farming is another great way to compost your foods craps. Worms will eat most of your kitchen waste and turn it into a high-quality fertiliser. Worm farming is great for people who live in units, high rises or have limited space or garden material. Worm farms don't smell, they don't take up much room and can be kept indoors.

What type of worms will be in the worm farm?

Composting worms, such as Tigers, Reds and Blues, are the only species that live, work and breed well in the rich, moist, organic environment of a worm farm.

How many worms are needed to start a farm?

You start a worm farm with about ½ kg or 2000 worms. The population doubles approximately every three months until the population reaches the capacity of the container. Worms are self regulating and will stop breeding once they reach the capacity of their container, as the older worms die off they will start breeding again.

What worms like to eat?

Worms like to eat most vegetables (except tomatoes, raw potatoes and peelings, carrot tops), they love fruit especially melon, pineapple and apple (they don't like citrus), they enjoy herbs (but don't like strong flavours like chilli, onion and garlic). Worms will also eat soaked and ripped cardboard, hair, tea bags and crushed egg shells.

The worm farm

In establishing and maintaining a worm farm you are looking after a living creature, as living creatures worms require three basics: 1) shelter, 2) food and 3) water.

Worms are easy going so you can choose the style of worm farm best for you.

Basically a worm farm is a series of stackable boxes made up of plastic, wood or any other lightweight, waterproof material (polystyrene boxes from the fruit shop are ideal). You can easily make your own worm farm or if you prefer you can purchase a worm farm from Hornsby Shire Council.

If you are making your own worm farm, the base should have a solid floor to catch the run off or worm tea from the upper layers or trays. Layers stacked above the base layer need to have holes in them to allow run off to drip into the bottom tray and for the worms to move between layers.

Sample worm farm available from Hornsby Shire Council

Easy steps to worm farming

Step 1: Provide shelter - set up your worm farm.

Place the worm farm in a shady place in your backyard or in a low light area on your balcony, worm farms can be kept inside if you like.

Before adding your worms to the worm farm, you will need to provide them with bedding material to the second working tray. A combination of finished compost, leaves and paper works best as bedding. However a coir fibre brick for the bedding is provided in the worm farm kit - make sure there is enough to come up to the line.

The bedding material should be moist before it is added to the first working tray of your worm farm. Make the bedding layer 10 to 15 cm deep.

Spread worms out on the surface of the bedding and allow them to burrow. Leave the worms for a week to allow them to settle in. The worms will live in the bedding, wriggling from lower trays to the upper trays to eat the food.

Step 2: Provide food – what and how to feed your worms

When starting out, add a small amount of food to the first working tray. You may not be able to feed your worms all your food scraps in the first few weeks. Do not overfeed – about ½ kg per 2,000 worms per week is enough to keep them going. Once your worms start multiplying, you will be able to give them more food.

To help the worms eat more, you can mash, blend or process food before adding it to the farm.

The worm farm will take a few months to get going - worms can consume their own weight in food each day!

Remember, don't add too much food at once and only add more when most of the previous meal has disappeared.

After you have fed your worms, keep their environment moist and dark by covering them with moist newspaper, a piece of underfelt/carpet or a hessian bag. You will only need to use your second working tray if/when the first working tray becomes full (keep in your garage or shed until this time).

What worms eat

Just like us, worms have their likes and dislikes. Worms will eat most of the scraps from your kitchen, with only a couple of exceptions.

Worms like to eat...

- most vegetable and food scraps (they really like variety)
- soaked and ripped pizza boxes /egg cartons
- shredded and soaked cardboard
- paper – ripped into small bits
- hair
- crushed egg shells

Worms don't like...

- onions – including garlic and shallots
- citrus fruit
- chillies
- raw potato peelings

Worms are fussy about...

- meat
- dairy foods
- fatty foods

(Worms will eat these foods, but they can sometimes make the worm farm smelly and attractive to maggots, it's therefore best to avoid, or not add these foods at all.)

Do not feed worms manure from animals or fruit/ vegetables scraps which have recently been sprayed with pesticides as they could kill your worms.

Step 3: Adding water

Worms rely on moisture within the soil to maintain their body functions. It is essential to keep the worm farm moist – the consistency of a wet sponge, but not too moist or too dry, as the worms will die.

Add water to the farm as required, this can simply be done by gently pouring a bucket full of water over the top (leave the hessian or newspaper cover in place). During periods of high temperatures you may need to "water" your worm farm every day.

Remember to remove the liquid or "worm tea" in the bottom tray regularly. Leaving the tap open with a bucket or container under the tap to collect the worm tea is the easiest most convenient way to collect the worm tea.

It is also a good idea if your worm farm is outside and there is a lot of rain as leaving the tap open will allow the farm to drain freely.

The worm tea makes a great natural liquid fertilizer, full of nutrients. Mix the worm tea with water (1:10) to the colour of weak tea before feeding your plants.

Step 4: Harvesting

Harvest the castings from the first working tray when the castings have reached 2cm above the moulded line. Stop feeding the worms for one week, remove the newspaper/hessian and remove the first working tray and empty. Rotate with the second (so this becomes the first working tray), put some food scraps in the top tray and cover. The worms will move up towards the food in the second working tray.

How to use the worm liquid and castings

The castings harvested from your worm farm can be

- mixed into compost and used in your "no dig" veggie garden
- added to potting mix when potting plants (caution - if harvesting in spring and autumn you could get baby worms appearing in pot plants!)
- applied around the drip line of plants (especially vegetables and herbs) when planting into your "no dig" veggie garden
- applied around the dripline of native trees

Worm liquid or worm tea – liquid fertiliser drains through the worm farm and into the Collector Tray.

To use; mix 1 part worm tea to 10 parts water and use as a liquid fertilizer for your plants. If too strong it will burn plant roots. The diluted worm tea can also be sprayed on to foliage as a natural insecticide.

Help!

Too dry

Worms rely on moisture within the soil to maintain their body functions. (If your worm farm is too dry you may also have ants.)

Fix it by:

- water over the top of the newspaper/hessian especially in hot weather

Too wet

Worms can drown if there is too much liquid in the liquid collection tray.

Fix it by:

- leaving the bottom tap open to allow the liquid to drain
- aerate the castings with a fork and add in some lime

Too acidic

If worms aren't laying eggs, the farm will probably be too acidic (from fruit and sugary foods). An indication is the presence of small white worms and ants.

Fix it by:

- adding a sprinkle of lime every month or so (1 tablespoon per kg of food)
- add water

Maggots

Maggots come from meat, dairy or fatty foods in the worm farm.

Fix it by:

- soak some bread in milk and leave in the feeding tray, the bread acts as a magnet for the maggots, after about two days dispose of the bread and maggots

Source: http://www.hornsby.nsw.gov.au/__data/assets/pdf_file/0006/85794/How-to-manage-waste-at-school.pdf

Appendix D Refuse Signage

Refuse Signage Resource

Signs for garbage, recycling and organics bins should comply with the standard signs promoted by the DECC.

Standard wall posters and bin lid stickers are available for download and printing from the Local Government section of the DECC website www.environment.nsw.gov.au, in black and white and appropriate coloured versions where applicable.

Example wall posters

Example bin lid stickers

Example Public Place Signage

Example Safety Signage

Safety Signs are required for refuse discharge and storage rooms / areas and must comply with Australian standards “AS 1319 Safety signs for the occupational environment”. Additional state or local government requirements may also apply. Following are examples of typical signs used around a waste storage area. It should be noted however that an assessment must be completed by a qualified fire and safety consultant, prior to occupancy, to determine the correct signage to be used.

Fire Management

Refuse Area Management