Botany Street, Kensington Upper Campus

State Significant Development Application: UNSW G25 Education building

OPERATIONAL WASTE MANAGEMENT PLAN

21/02/2025
Report No. 6309
Revision H

Client

UNSW

Architect

Architectus

Architectus

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REVISION REFERENCE

Revision	Date	Prepared by	Reviewed by	Description
A	17/10/2024	R. Jayaratnam	J. Parker	Draft
B	12/11/2024	R. Jayaratnam	J. Parker	Amendment
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F	14/02/2025	R. Jayaratnam	J. Parker	Amendment
G	18/02/2025	R. Jayaratnam	J. Parker	Amendment
H	21/02/2025	R. Jayaratnam	J. Parker	Amendment

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GLOSSARY OF ABBREVIATIONS AND TERMS

TERM	DESCRIPTION
Bin-Carting Route	Travel path for transporting bins from their allocated storage location to the nominated collection point
Bin Hoist	A device used for lifting or lowering bins between different levels
Bin Lifter	A device used to mechanically lift bins for the purpose of emptying them into larger bins and/or compactors.
Bin Mover	Either a handheld device (commonly referred to as a bin tug) or a ride-on device (typically a tractor or Class C vehicle with an attached bin trailer) used to facilitate the movement of bins across long distances or up ramps
Bulk Bins	Containers with a capacity greater than 1100L designed to be collected by a front-loading vehicle
Bulky Waste	Recycling items that are too large to be deposited into bins, including furniture, whitegoods, electronics and mattresses
Collection Area/Point	Designated area or point where bins are loaded onto the collection vehicle for servicing
Comingled Recycling	Waste stream for the recycling of plastic bottles, other plastics, paper, glass and metal containers
Communal Bin Room	A central, shared bin room accessible to all residents or staff to dispose of their waste stream
DA	Development Application
DCP	Development Control Plan
EPA	Environment Protect Authority
FOGO	Food Organics and Garden Organics
General Waste	All non-recyclable and non-hazardous waste that is sent to landfill
HRV	Heavy Rigid Vehicle
Kerbside Collection	A collection arrangement whereby bins are presented in a single row along the kerb and serviced by a collection vehicle on the street.
L	Litre
LEP	Local Environmental Plan
Mixed Use Development	A development comprising a combination of both residential and commercial units or two or more different land uses within the one development.
Mobile Bins	Containers with a capacity up to and including 1100L designed to be collected by a rear-loading vehicle
Multi-unit Residential Development	Also known as MUD's, residential flat buildings, or apartment blocks, this is a residential development with multiple units that typically share facilities and services such as bins and collections.

MRV	Medium Rigid Vehicle
Onsite Collection	A collection arrangement whereby all bins are serviced by a collection vehicle within the property boundary, either in the building's basement or at grade and off-street.
Owners Corporation	An organisation or group of persons that is identified by a particular name and that acts, or may act, as an entity
Paper/ Cardboard Recycling	Waste stream for the recycling of paper and cardboard only.
Recycling	Waste stream that combines all recycling, including comingled recycling, paper/cardboard and metals.
Source Separation Receptacles	Communal containers used throughout the development for the day-to-day disposal of different waste streams
SRV	Small Rigid Vehicle
Waste Stream	A classification used to describe waste of a particular type (eg. food waste stream)
WHS	Workplace Health and Safety
Wheel-Out Wheel Back	A collection arrangement whereby a collection vehicle parks on the street and collection staff exit the vehicle to wheel each bin from a designated storage area to the vehicle for servicing and returns them upon completion.

Consultant Declaration Form

CONSULTANT DECLARATION

PROJECT DETAILS	
PROJECT NAME	
Application number	SSD-74670005
Address of subject land	8 High Street, Kensington, NSW, 2033
Lot / DP	Lot 5 DP 1264171
APPLICANT DETAILS	
Applicant name	University of NSW
Applicant address	8 High Street, Kensington, NSW 2033
REPORT DETAILS	
Name of report this declaration relates	Operational Waste Management Plan
Report reference no.	6309
Report date	7/02/2025
Company name (inc. ABN / ACN)	Elephants Foot Group
Author name	Ruban Jayaratnam
Author qualifications	Waste Management
Author address	112/116 Canterbury Road Bankstown
DECLARATION BY CONSULTANT	
Name	Ruban Jayaratnam
Registration no.	N/A
Organisation registered with	Elephants Foot Group
Declaration	The undersigned declares that Operational Waste Management Plan: has been prepared in accordance with the following policy, guidelines, or legislative requirements • contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the Operational Waste management Plan relates. • does not contain information that is false or misleading; • identifies and addresses the relevant Planning Secretary's environmental assessment requirements (SEARs) for the project; identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments to which the Operational Waste Management Plan relates; • contains a consolidated summary of the proposed or necessary mitigation measures
Signature R. Jayaratnam	
Date 18/02/2025	

1.0 ACKNOWLEDGEMENT OF COUNTRY

Elephants Foot Consulting (EFC) acknowledges that every project we work on takes place on First Peoples land. We recognise Aboriginal and Torres Strait Islander People as Traditional Custodians of this land. We pay respect to ancestors and Elders, past and present.

2.0 INTRODUCTION

This Operation Waste Management Plan has been prepared by Elephant Foot Consulting (EFC) on behalf of the University of New South Wales (UNSW) for construction and operation of a teaching and learning facility to be known as the UNSW G25 Education Building, on land at 8 High Street, Kensington.

This report has been prepared to advise on the operational phase of the UNSW G25 Education Building. Waste management strategies and audits are required for new developments to support the design and sustainable performance of the building. It is EFC's belief that a successful waste management strategy contains three key objectives:

i. ***Promote responsible source separation*** to reduce the amount of waste that goes to landfill by implementing convenient and efficient waste management systems.

ii. ***Ensure adequate waste provisions and robust procedures*** that will cater for potential changes during the operational phase of the development.

iii. ***Comply*** with all relevant council codes, policies, and guidelines.

To achieve these objectives, this operational waste management plan (OWMP) identifies the different waste streams likely to be generated during the operational phase of the high school, as well as how the waste will be handled and disposed, details of bin sizes/quantities and waste rooms, descriptions of the proposed waste management equipment used, and information on waste collection points and frequencies. It is essential that this OWMP is integrated into the overall management of the building and is clearly communicated to all relevant stakeholders.

This report accompanies a State Significant Development Application (SSD) that seeks approval for the construction and operation of a teaching and learning facility at the G25 site, within the Upper Campus of UNSW.

Specifically, the SSDA seeks consent for the following:

- Site preparation works including demolition of the existing at-grade car park, tree removal, and excavation works.
- Construction of an eleven (11) storey (plus roof plant) teaching and learning building with approximately 20,123m^2 of gross floor area, comprising:
  - Basement plant/services, Bike Storage, End of Trip facilities, ancillary service areas such as Mail and Print rooms as well as Staff Amenities
  - Ground level Food and Beverage premises and informal educational spaces
  - Teaching and Learning spaces throughout Levels 1-7, and workspaces Levels 8-10 for UNSW Faculties
  - Rooftop level including landscaping, outdoor terrace and learning space, mechanical plant and services

- Associated landscaping, replacement trees and public domain embellishment works in and around the proposed building
- Extension and augmentation of infrastructure and services as required

The Proposal will seek to deliver improvements including:

- Providing new, purpose-built learning and teaching spaces to support the University activities and strategic goals such as the development of the Randwick Health and Education Precinct
- Delivering an enhanced ground plane connection
- Providing flexible and adaptable teaching and learning spaces
- Creating a healthy, green, and welcoming place for students, staff and visitors
- Creating an experience that is an open, permeable, and connected public realm
- Creating pedestrian priority and inclusive shared public space

For a detailed project description refer to the Environmental Impact Statement prepared by Ethos Urban.

2.1 SCOPE OF REPORT

This OWMP only applies to the **operational** phase of the proposed development; therefore, the requirements outlined in this OWMP must be implemented during the operational phase of the site and may be subject to review upon further expansion of, and/or changes to the development.

The waste management of the **construction** and **demolition** phases of the development are not addressed in this report. A construction and demolition WMP will need to be provided separately.

2.2 REPORT CONDITIONS

The purpose of this report is to document an OWMP as part of a development application, which is supplied by EFC with the following limitations:

- Drawings, estimates and information contained in this OWMP have been prepared by analysing the information, plans and documents supplied by the client and third parties including Council and other government agencies. The assumptions based on the information contained in the OWMP is outside the control of EFC,
- The figures presented in the report are an estimate only – the actual amount of waste generated will be dependent on the occupancy rate of the building/s and waste generation intensity as well as the building management's approach to educating residents and tenants regarding waste management operations and responsibilities,
- The building manager/caretaker will adjust waste management operations as required based on actual waste volumes (e.g. if waste is greater than estimated) and increase the number of bins and collections accordingly,
- The report will not be used to determine or forecast operational costs or prepare any feasibility study or to document any safety or operational procedures,
- The report has been prepared with all due care; however no assurance is made that the OWMP reflects the actual outcome of the proposed waste facilities, services, and operations, and EFC will not be liable for plans or results that are not suitable for purpose due to incorrect or unsuitable information or otherwise,
- EFC offer no warranty or representation of accuracy or reliability of the OWMP unless specifically stated,
- Any manual handling equipment recommended in this OWMP should be provided at the recommendation of the appropriate equipment provider who will assess the correct equipment for supply,
- Design of waste management chute equipment and systems must be approved by the supplier,
- EFC cannot be held accountable for late changes to the design after the OWMP has been submitted to Council,
- EFC will provide specifications and recommendations on bin access and travel paths within the OWMP, however it is the architect's responsibility to ensure the architectural drawings meet these provisions,
- EFC are not required to provide information on collection vehicle swept paths, head heights, internal manoeuvring or loading requirements. It is assumed this information will be provided by a traffic consultant,
- Council are subject to changing waste and recycling policies and requirements at their own discretion.
- This OWMP is only finalised once the draft watermark has been removed. If the draft watermark is present, the information in the OWMP is not confirmed.

2.3 SEARS REQUIREMENTS

This Green Star report meets the specific SEARs conditions that is required for the waste management report.

Table 1: SEARS Requirements – UNSW G25 Education Building

Condition No.	Condition Requirement	Section Relevant
18	**Waste Management**	
	• Identify, quantify and classify the likely waste streams to be generated during construction and operation.	*Sections 5.0 to 5.5*
	• Provide the measures to be implemented to manage, reuse, recycle and safely dispose of this waste in accordance with any Council waste management requirements.	*Sections 5.3, 5.5 and 7*
	• Identify appropriately sited waste storage areas, collection access paths/roads, and appropriate servicing arrangements for the site	*Section 5.4*
	• If buildings are proposed to be demolished or altered, provide a hazardous materials survey.	*Hazardous materials survey is provided by an Environmental Consultant separately.*

3.0 LEGISLATION & GUIDANCE

Waste management and resource recovery regulation in Australia is administered by the Australian Constitution, Commonwealth laws, and international agreements. State and territory governments maintain primary responsibility for controlling development and regulating waste. The following legislation has been enacted in New South Wales and provides the lawful underpinnings of this OWMP.

- NSW Environmental Planning & Assessment Act 1979
- NSW Protection of the Environment Operations Act 1997
- NSW Waste Avoidance & Resource Recovery Act 2001

At the local level, councils or Local Government Areas (LGAs) require OWMPs to be included in new development applications. This OWMP is specifically required by:

- Randwick Development Control Plan 2013
- Randwick Local Environmental Plan 2013

The primary purpose of a Development Control Plan (DCP) is to guide the planning process according to the aims of the corresponding local environmental plan (LEP). The DCP must be read in conjunction with the provisions of the relevant LEP.

Information provided in this OWMP comes from a wide range of waste management guidance at the local, state, and federal levels. The primary sources of guidance include:

- Randwick City Council: Waste Management Guidelines for New Development Applications 2016
- Randwick City Council: Waste Management Appendices (A-K)
- Green Star Building Credit 4, Responsible Resource Management 2021
- NSW Better Practice Guide For Resource Recovery In Residential Developments 2019
- NSW Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012
- NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014-2021
- NSW Waste Classification Guidelines 2014
- Australia's National Waste Policy 2018

3.1 GREEN STAR

The development and waste management facilities has been designed to align a 5-star Green Star rating under the 'Green Star Buildings tool: Building Credit 4 Responsible Resource Management'. The main outcome of this Green Star credit is to ensure operational waste, and resources can be separated and recovered in a safe and efficient manner, as well as best practice waste management outcomes in operation.

The minimum expectation for responsible resource management is as follows:

- The building is designed for the collection of separate waste and resource streams.
- The building provides a dedicated and adequately sized waste and resource storage area.
- The building ensures safe and efficient access to waste and resource storage areas for both occupants and waste and resource collection contractors.

3.2 GREEN STAR ASSESSMENT CRITERIA

The following table provides an overview of Green Star Buildings Credit 4 Responsible Resource Management minimum expectation criteria as discussed in this report.

Table 2: Green Star Criteria Assessment.

Requirements of Credit 4 Responsible Resource Management	Operational Waste Management Plan (OWMP) Overview

1 Collection of Separate Waste Streams
 	
The building must provide bins or storage containers to building occupants to enable them to separate their waste. These bins must be labelled and easy to access, and evenly distributed throughout the building. They must also allow for separating the following as a minimum:
 	
• General waste going to landfill.
• Recycling streams to be collected by the building's waste collection service, including:
  • paper and cardboard
  • glass
  • plastic
• One additional waste stream identified by the project team. This may include collecting any of the following waste types: organics, e-waste, batteries etc.
 	
Any other single waste stream (except food waste) that is expected to represent more than 5% of total annual operational waste and resources (by volume) must also be included.
	Refer to the following sections in the OWMP:
	
	1. Section 5.2: Bin summary for general waste and recycling streams
	
	2. Section 5.5.5 Additional waste stream (Batteries Waste)
	
	3. Section 5.3 waste disposal procedures for general waste and recyclables
	
	4. Section 8. Education and signage of waste rooms and bin facilities across the G25 site.

2 Dedicated Waste Storage Area A dedicated area, or areas, for the storage and collection of the applicable waste streams must be provided. The	Refer to the following sections in the OWMP: 1. Section 5.1 & 5.2: Resource recovery stream volumes and collection

storage area must be sized to accommodate all bins or containers, for all applicable waste streams, for at least one collection cycle. The calculations used to demonstrate that the area provided is adequately sized to handle the recyclable waste streams specified must be based on: • Forecasted waste generated by occupants • Collection frequency for each waste stream The calculations for waste generation rates must be based on figures outlined within third-party best practice guidelines. The storage area(s) must have efficient and safe access by collection vehicles. This includes driveway access to the building, appropriate height clearances, any onsite roads and loading docks, and the storage areas themselves providing safe and easy access for bins to be emptied into collection vehicles.	frequencies for best practice waste management 2. Section 12: Waste rooms, waste room areas and waste room requirements Appendix A.1: Architectural set illustrating efficient and safe access for collection vehicles
3 Signoff by Waste Specialist and/or Contractor A waste specialist and/or contractor must sign-off on the designs to confirm they are adequately sized and located for the safe and convenient storage and collection of the waste streams identified.	Contractor will certify that they have constructed the works in accordance with the designs.

4.0 DEVELOPMENT OVERVIEW

This operational waste management plan has been prepared by EFC on behalf of the University of New South Wales (UNSW) for construction and operation of a teaching and learning facility to be known as the UNSW G25 Education Building, on land at 8 High Street, Kensington.

This report has been prepared to cater for the operational phase of the proposed development. It accompanies a State Significant Development Application (SSD) that seeks approval for the construction and operation of a teaching and learning facility at the G25 site, within the Upper Campus of UNSW.

Specifically, the SSDA seeks consent for the following:

· Site preparation works including demolition of the existing at-grade car park, tree removal, and excavation works.

· Construction of an eleven (11) to twelve (12) storey teaching and learning building with approximately 20,000m2 of gross floor area, comprising:

- Basement plant/services, Bike Storage, End of Trip facilities, Mail and Print room as well as staff amenities

- Ground Level food and beverage premises and informal educational spaces

- Teaching and Learning spaces throughout Levels 1-7, and workspaces Level 8 -10 serving a range of faculties and services

- Rooftop level including landscaping, outdoor terraces and learning space, mechanical plant and services

- Associated landscaping, replacement trees and public domain embellishment works in and around the proposed building

- Extension and augmentation of infrastructure and services as required

All figures and calculations are based on area schedules as advised by our client and shown on architectural drawings.

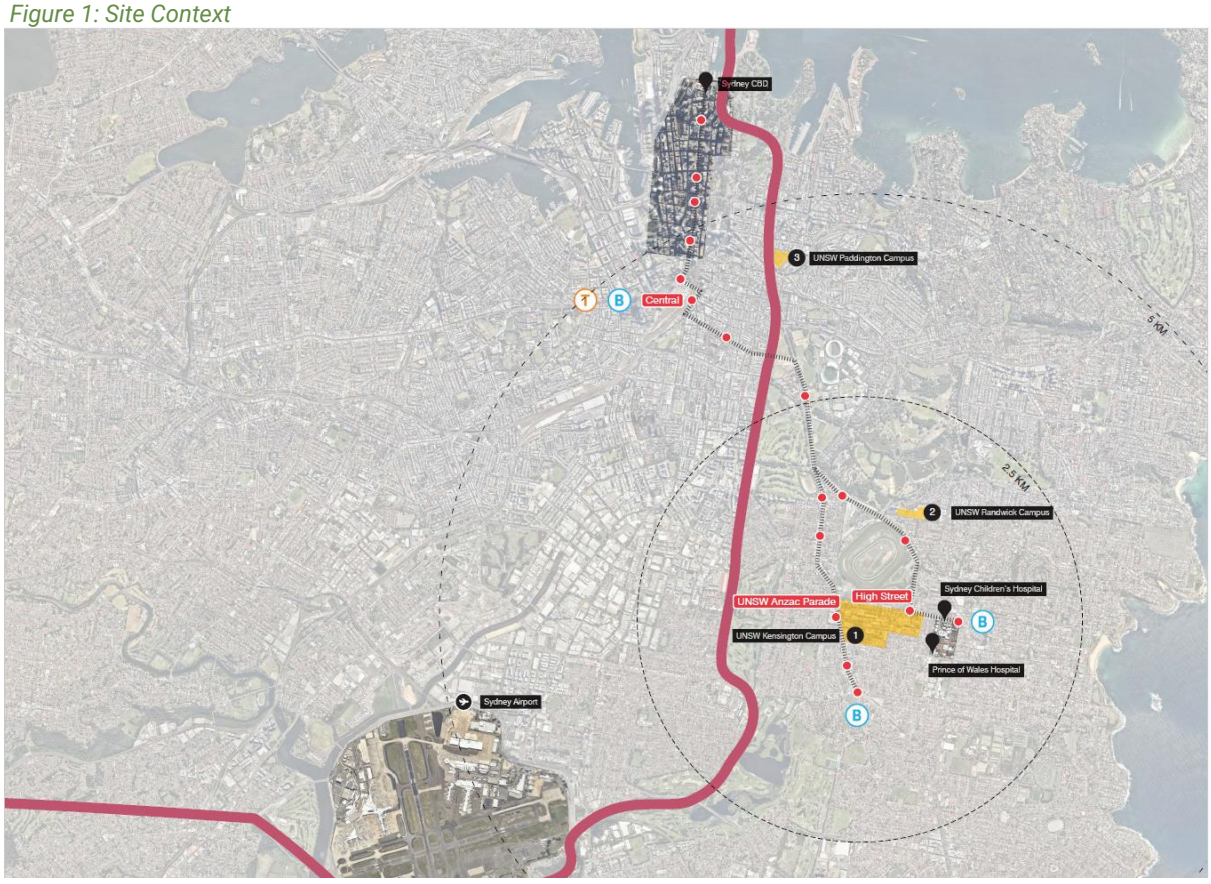
4.1 SITE CONTEXT

The site is situated within the UNSW Kensington upper campus, within the Randwick Local Government Area (LGA). The site address is 8 High Street, Kensington, which applies to the whole of the UNSW Kensington campus.

The UNSW campus forms part of the wider Randwick Health and Education Precinct, which has been strategically identified to provide a world-class coalition of education, research, innovation and healthcare organisations and to attract growth, investment and employment opportunities. This Precinct has been identified in the *Greater Sydney Region Plan – A Metropolis of Three Cities* and the *Eastern City District Plan*, for its strategic importance as a specialised centre providing for health and education research, innovation, teaching and learning.

The UNSW campus is located approximately 6km southeast of the Sydney CBD, immediately adjacent to the east is the Randwick Hospitals Complex which also forms part of the Randwick Health and Education Precinct. The UNSW site is within 600m of the Randwick Shopping Centre to the east and adjacent to Royal Randwick Racecourse to the north (refer **Figure** 1 below).

Figure 1: Site Context



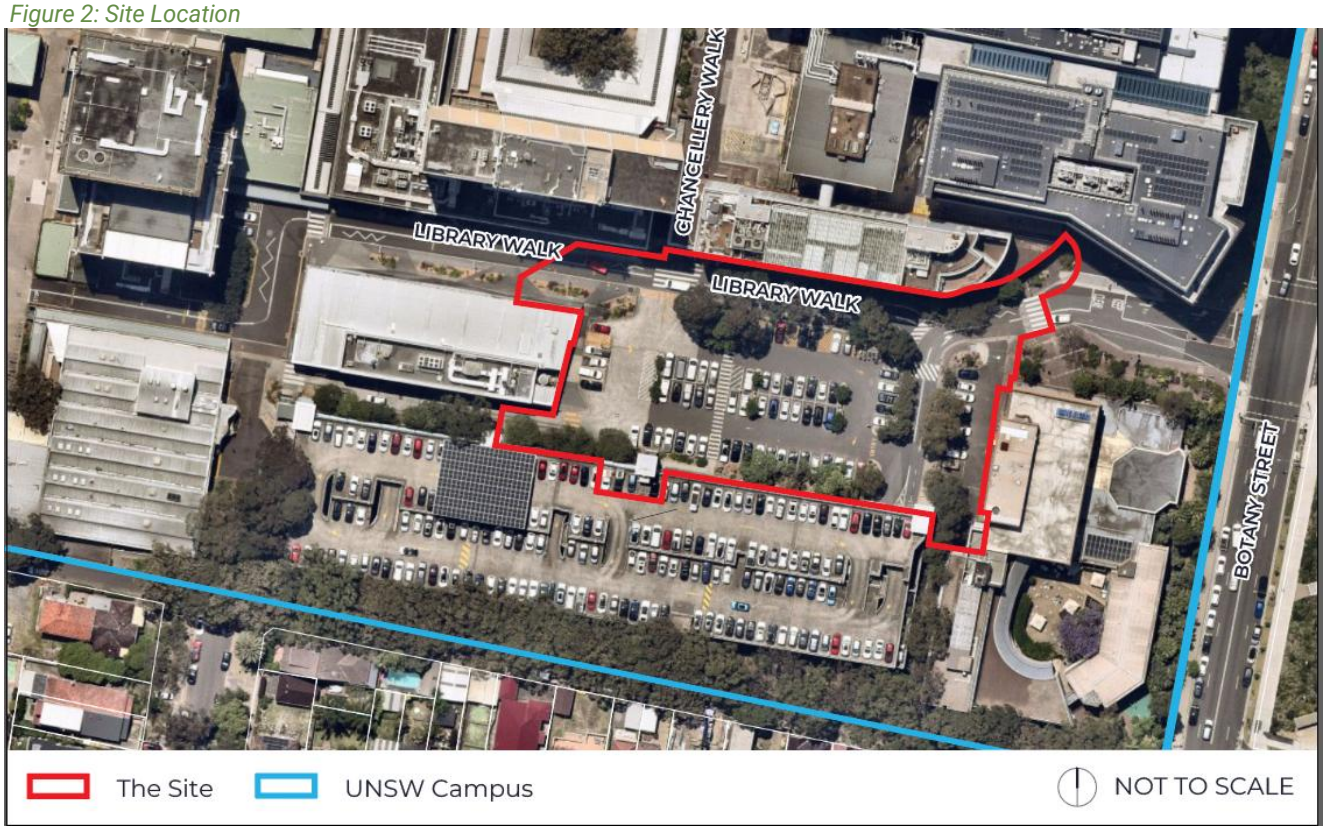
4.2 SITE DESCRIPTION

The subject site known as the G25 site, is an existing on-grade carpark comprising of hardstand pavement with line-marked spaces, trees and landscaped areas. The site also includes the eastern portion of Library Walk and the loading dock area of the AGSM (Australian Graduate School of Management) Building (G27), with no other existing development on the site.

It is bounded to the north by the Samuels Building (F25) and Mathews Building (F23), to the west by the Solar Industrial Research Facility (SIRF) Building (G23), to the south by the multi-storey Botany Street Carpark Station (H25), and to the east by the Australian Graduate School of Management (AGSM) Building (G27) and the Gate 11 entrance to UNSW from Botany Street.

The broader UNSW Kensington Campus consists of five separate allotments. This site is situated within a single allotment legally described as Lot 5 DP 1264171. The UNSW Kensington campus is bounded by Anzac Parade (to the west), High Street (to the north), Botany Street (to the east), and Barker Street (to the south). It also includes developments to the west of Anzac Parade and north of Day Avenue, such as NIDA, the University Regiment, and the New College Post-Graduate Village. The campus currently has approximately 60,000 student enrolments.

Figure 2: Site Location



Source: Nearmap, Ethos Urban

5.0 UNSW G25 EDUCATION BUILDING WASTE MANAGEMENT

The following section outlines best practice waste management for the UNSW G25 Education building, including waste generation estimates and waste disposal and collection procedures.

5.1 WASTE AND RECYCLING GENERATION ESTIMATES

The NSW EPA's *Better Practice Guide for Resource Recovery in Residential Developments* (2019) has been referenced to calculate the total number of bins required for the anticipated tenants. Calculations are based on generic generation rates. Actual volumes of waste and recycling may differ in operation according to the tenants' actual waste management practices.

The following table shows the estimated volume (L) of general waste and recycling that will be generated by the building.

The following estimates are based on a seven-day operating week.

Table 3: Estimated Waste and Recycling Volumes for UNSW G25 Education Building

Tenancy Type	Floor Area (m^2)	General Waste Generation Rate (L/100m^2/day)	Generated General Waste (L/week)	Co-mingled Recycling Generation Rate (L/100m^2/day)	Generated co-mingled recycling (L/week)	Paper/cardboard Recycling Generation Rate (L/100m^2/day)	Generated Paper/Card board recyclign (L/week)
Learning and Teaching spaces	**8859**	10	6201	7.5	4651	7.5	4651
Informal Learning spaces	**2161**	10	1513	7.5	1135	7.5	1135
Workplaces	**2701**	10	1891	7.5	1418	7.5	1418
Multipurpose Room	**153**	5	54	5	54	5	54
Café	**115**	100	805	60	483	60	483
TOTAL	**13989**		**10463**		**7740**		**7740**
Bins & Collections		General Waste Compactor(L)	1100	Recycling Bin Size (L)	1100	Recycling Bin Size (L)	1100
		General Waste Bins per Day	1.4	Recycling Bins per Day	1.0	Recycling Bins per Day	1.0
		General Waste Collections per Week	3	Recycling Collections per Week	1	Recycling Collections per Week	1
		Total General Waste Bins Required	**4**	**Total Recycling Bins Required**	**8**	**Total Recycling Bins Required**	**8**

Note 1: The rates for recycling had been split 50:50.

5.2 BIN SUMMARY

Based on the estimated waste and recycling volumes generated by the UNSW G25 Education Building, the recommended bin quantities and collection frequencies are as follows:

General Waste: 4 x 1100L bins collected **3 x weekly**

Paper/Cardboard Recycling: 8 x 1100L bins collected **1 x weekly**

Comingled Recycling: 8 x 1100L bins collected **1 x weekly**

During the operation, it is the responsibility of the building manager/caretaker to monitor the number of bins required for the building. Waste volumes may change according to the building management, building users' activities and attitudes to waste disposal and recycling. The bin numbers, sizes and collection frequencies may need to be altered to suit the building operation. Seasonal periods that may alter waste and recycling generation i.e. public and university holidays should also be considered.

5.3 WASTE DISPOSAL PROCEDURES

All operations within the site will share bins, waste room and collection services. The retail tenancy found within the building will also implement the waste management practices in line with the operations of UNSW. All personnel within the building must adhere to the waste management procedures outlined by UNSW.

The waste room for the building is located on basement level. The waste room will contain the waste, cardboard recycling, paper recycling and co-mingled recycling bins for collection. The building management, waste collection staff and cleaners will be the only personnel with access to the waste room. All transportation of waste and recycling must be co-ordinated with building management or cleaners.

Red lidded waste bins and yellow lidded co-mingled recycling bins will be placed throughout each space in the building for the collection of waste and co-mingle recycling generated in each space. Blue paper recycling bins will be placed within each office, workspace and study space, for the collection of paper recyclables. The students, staff and visitors will be responsible for placing their waste and recycling into the correct receptacle. The fullness of the source separation bins will be monitored by building management and cleaners.

At the end of the day, or as required, the cleaners contracted by the university will circulate around each space in the building and perform cleaning tasks. At this time, the cleaners will transport the waste and recycling streams to the waste room and place the waste and recycling streams into the appropriate collection bins.

5.4 WASTE COLLECTION PROCEDURES

UNSW's waste contractor will be engaged to collect the general waste and recycling streams to an agreed schedule. This report assumes that general waste will be collected three times weekly while the recycling streams will be collected once weekly. The collection frequencies were based on UNSW Waste Management Plan 2020.

In accordance with UNSW Kensington Campus procedures, all bins must be collected from a designated collection location within Kensington Campus.

It is understood that the waste room of the new building will become a designated collection location. Therefore, the waste collection vehicle will enter the site and park on the loading bay located on the ground level. The waste collection staff will collect the bins from the waste room and return the empty bins via bin platform lift.

5.5 OTHER WASTE MANAGEMENT CONSIDERATIONS

Based on the types of uses anticipated for this development, the following waste management practices are recommended.

5.5.1 WASHROOM FACILITIES

Washroom facilities should be supplied with collection bins for paper towels (if used). Sanitary bins for female restroom facilities must also be arranged with an appropriate contractor.

5.5.2 PRINTING & PHOTOCOPYING ROOMS

It is recommended that rooms designed for printing or photocopying be provided with an area for the interim storage of paper receptacles, as well as separate receptacles for used toner and/or printer cartridges for recycling. The cleaners or nominated staff are responsible for monitoring these receptacles and ensuring that items are collected and recycled by an appropriate contractor.

5.5.3 LIQUID WASTE

Liquid wastes as such cleaning products, chemicals, paints, solvents, and motor and cooking oil will be stored in a secure room and enclosed by a low wall intended to contain any liquid spillage or inundation to other areas. Liquid waste will be drained to a grease trap, in accordance with legislation and the requirements of State government authorities and agencies. Further information can be provided by the Services Consultant.

5.5.4 BULKY WASTE

Bulky waste management within the building should be conducted in conjunction with UNSW's hard/bulky waste disposal procedures.

UNSW's Facilities Management is responsible for managing and disposing of hard and bulky wastes. Building management or university staff should contact the Facilities Management when there is furniture that is broken or no longer required.

Reusable furniture will be labelled and kept in storage or donated to a charitable organisation. Non – reusable furniture will be removed from the building by the Facilities Management and will be disposed of into the hard waste skips located around the campus.

5.5.5 BATTERIES (ADDITIONAL STREAM)

A receptacle for batteries will be placed at the ground floor for students to dispose of. This receptacle will be frequently monitored by the University and contract cleaners. Once full (or during cleaning procedures), this receptacle will be disposed of via a private contractor.

Figure 3: Examples of battery storage receptacles/bins.

5.5.6 TONER CARTRIDGES

Image consumables such as inkjet cartridges, laser toner cartridges, drum units and copier bottles will be recycled with the cartridge collection program run by Close the Loop.

Close the Loop boxes will be placed next to any printing equipment or printing facilities.

Building management is responsible for monitoring the fullness of these bins and contacting Close the Loop to service the bins once full.

5.5.7 GREEN WASTE

Green waste generated from landscaped areas of the building will be removed by the designated maintenance contractor during maintenance of landscaped areas.

5.5.8 OFFICES

Typically, one or more bins for paper or waste are positioned next to each workers desk or work station. One or both bins are emptied by contract cleaners. The cleaners circulate around the workplace after normal office hours and also perform other cleaning tasks. Generally vacuuming and cleaning toilets. Bins for general waste and recyclables are also located centrally in each office, generally in the kitchen area and printer room.

Blue paper recycling bins will be placed in the printer rooms and in appropriate spaces in the building. These blue bins when they are full are moved outside onto the loading dock to be emptied by the private waste contractor.

5.5.9 MANAGEMENT OF SPECIALTY WASTE STREAMS

The UNSW's Facilities Management is responsible for making arrangements for the disposal and recycling of specialised waste streams with an appropriate contractor. Specialised wastes cannot be placed in general waste as they can have adverse impacts to human health and the environment if disposed of in landfill. Staff, students and tenancies will need to liaise with the building manager/caretaker or cleaners when disposing of specialised waste streams.

Specialised waste streams include:

- Hazardous Waste
- Radioactive Waste
- Chemical Waste
- Biological Wastes
- Liquid Wastes

5.5.10 RETAIL/FOOD & BEVEREGE WASTE MANAGEMENT

The café tenant will be responsible for their own storage of waste and recycling back of house (BOH) during daily operations. On completion of each trading day or as required, nominated staff, or contracted cleaners will transport their waste and recycling to the commercial/retail bin area and place into the appropriate collection bins.

Food handling for food cooked or prepared, served and consumed on site will produce a typical waste composition of food scraps from plates, packaging waste and some plastics. To ensure the proper management and disposal of waste, tenants must be made aware of the following practices:

- All waste should be bagged, and waste bins should be plastic lined;
- Bagging of recyclables is not permitted;
- All interim waste storage is located BOH during operations;
- Individual recycling programs are recommended for retailers to ensure commingled recycling is correctly separated; packaging from all tenants are compostable
- Any food and beverage tenant will make arrangements for storing used and unused cooking oil in a bunded storage area;
- The operator will organise grease interceptor trap servicing;
- A suitable storage area needs to be provided and effectively bunded for chemicals, pesticides, and cleaning products;
- All flattened cardboard will be collected and removed to the waste area recycling MGB

Consideration should be given to the use of cooking oil collection systems. A single service provider may be used to reduce the amount of commercial traffic into the loading bay or around the precinct area. This should be measured against bulk delivery of oils where the same vehicle is used to remove containers of waste cooking oils.

6.0 STAKEHOLDER ROLES AND RESPONSIBILITY

The following table outlines the primary roles and responsibilities of the respective stakeholders:

Table 4: Stakeholder Roles and Responsibilities

Roles	Responsibilities
University New South Wales	• Ensuring that all waste service providers submit monthly reports on all equipment movements and waste quantities/weights; • Organising internal waste audits/visual assessments on a regular basis; and • Manage any non-compliances/complaints reported through waste audits. • Conduct reviews of waste management procedures and waste management related sustainability goals.
Building Manager or Waste Caretaker	• Ensuring effective signage, communication and education is provided to occupants, tenants and cleaners; • Providing staff/contractors with equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities; • Ensuring site safety for students, children, visitors, staff and contractors; • Abiding by all relevant OH&S legislation, regulations, and guidelines; • Assessing any manual handling risks and prepare a manual handling control plan for waste and bin transfers; • Preventing storm water pollution by taking necessary precautions (securing storage areas, preventing overfilling of bins) • Cleaning and transporting of bins as required; • Organising, maintaining and cleaning the general and recycled waste holding area; • Organising both garbage and recycled waste pick-ups as required; • Organising replacement or maintenance requirements for bins; • Organising bulky goods or other speciality collections when required; and • Investigating and ensuring prompt clean-up of illegally dumped waste materials.
Students, Staff and Visitors	• Dispose of all garbage and recycling in the allocated 60L method bins provided; • Ensure adequate separation of garbage and recycling; and • Compliance with the provisions of Council and the WMP.
Cleaners and Waste Maintenance Staff	• Transporting of bins from their operational location to the collection bins as required; • Cleaning around waste collection areas; • Ensuring adequate separation of garbage and recycling; and • Acting in compliance with the Macquarie University's Environmental Management Procedures regarding waste.
Waste Collection Contractor	• Provide a reliable and appropriate waste collection service; • Provide feedback to building managers/caretakers regarding contamination of recyclables; and • Work with building manager/caretaker to customise waste systems where possible.
Building Contractors	• Removing all construction related waste offsite in a manner that meets all authority requirements.

7.0 SOURCE SEPERATION

Better practice waste management includes the avoidance, reuse, and recovery of unwanted items, which can be achieved through source separation. The table below outlines what is typically included in various waste streams and how they can be managed. Refer to your local council for a list of accepted materials. Planet Ark can be accessed online to find other facilities that recover unwanted items.

Table 5: Operational Waste Streams

Waste Stream	Description	Typical Destination	Waste Stream Management
General Waste	The remaining portion of the waste stream that is not recovered for re-use, processing, or recycling. May include soft plastics, food scraps, polystyrene, etc.	Landfill	Waste should be bagged before placing in the designated waste bins.
Commingled Recyclables	A mixture of items that are commonly recycled usually segregated through a MRF. Typically include food and beverage containers (e.g. aluminium, glass, steel, hard plastics, cartons).	Resource Recovery Centre	Commingled recyclables must not be bagged, and instead should be placed loosely in the designated recycling bins (bottles and cans bin).
Paper and Cardboard Recyclables	Cardboard and paper products are recyclable materials that can be re-processed into new products.	Resource Recovery Centre	Cardboard/paper should be flattened before placing in the designated cardboard bin.
Secure Documents	Secure documents are printed paper materials that contain sensitive information.	Recycling Facility	Secure documents are placed in allocated secure document bins. Private contractor removes bins from site.
Food Waste	Food waste consists of unwanted or uneaten kitchen scraps that are easily compostable/biodegradable (e.g. vegetable peels, fruit rinds, coffee grounds).	Compostin g facility or Landfill	Food waste can be composted on-site, off-site, or else included in the general waste stream.
Electronic Waste	Discarded e-waste, electronic components and materials such as computers, mobile phones, keyboards, etc.	Resource Recovery Centre	A location should be dedicated to the storage of E-waste. When a suitable amount has been accumulated, the University is responsible for arranging the collection of e-waste with an appropriate recycling service.
Bulky Items	Items that are to too large to place into general rubbish collection. This includes disused and/or broken furniture, mattresses, white goods, etc.	Resource Recovery Centre or Landfill	A location should be dedicated to the storage of bulky waste. When a suitable amount has been accumulated, the University is responsible for arranging the collection of bulky waste with an appropriate recycling service.

Sanitary Waste	Feminine hygiene waste generated from female bathrooms.	Incineration or Landfill	Sanitary bins are serviced by sanitary waste contractor.
Other	Other recyclable items that require special recovery may include ink cartridges, batteries, chemical waste, fluorescent tubes, etc.	Resource Recovery Facility	University arranges collection by appropriate recycling services when required.

8.0 EDUCATION

University management is responsible for creating and managing the waste management education process.

Information regarding waste and recycling policies should be provided to all staff and students. Educational material encouraging correct separation of garbage and paper recycling items should be provided on each bin. It is recommended that information is provided in multiple languages to support correct practises and minimise the possibility of contamination in the collective waste bins.

Correct procedure for disposing of laboratory wastes must be communicated to all personnel utilising these facilities

8.1 SIGNAGE

Signage and education are essential components to support best practice waste management including resource recovery, source separation, and diversion of waste from landfill.

Signage should include:

- Clear and correctly labelled bins,
- Instructions for separating and disposing of waste items. Different languages should be considered,
- Locations of, and directions to, the waste storage areas with directional signs, arrows, or lines,
- The identification of all hazards or potential dangers associated with the waste facilities, and
- Emergency contact information should there be issues with the waste systems or services in the building.

The university management is responsible for waste room signage including safety signage. Appropriate signage must be prominently displayed on doors, walls and above all bins, clearly stating what type of waste or recyclables is to be placed in each bin.

All signage should conform to the relevant Australian Standards.

9.0 POLLUTION PREVENTION

Building management shall be responsible for the following to minimise dispersion of site litter and prevent stormwater pollution to avoid impact to the environment and local amenity:

- Promoting adequate waste disposal into the bins
- Securing all bin rooms (whilst affording access to staff/contractors)
- Prevent overfilling of bins, keep all bin lids closed and bungs leak-free
- Taking action to prevent dumping or unauthorised use of waste areas
- Require collection contractor/s to clean up any spillage when clearing bins

10.0 BIN WASHING

The bins will be cleaned by the building manager/caretaker periodically to ensure hygiene and minimise odour.

Bin washing can occur within the bin rooms, using the room clean down facilities (i.e tap connection and drain). Alternatively, a specialist bin washing contractor can be engaged to clean the bins to an agreed schedule. The specialist bin contactor would collect the bins from the bin holding area and clean the bins with their specialised vehicle.

11.0 BIN MOVING PATHS

Minimal movement of bins is anticipated for this site as bins are to be collected directly from storage location. The building manager/caretaker will be responsible for any transportation of bins that does occur.

Any movement of bins should minimise manual handling where possible, as bins become heavy when full. The building manager/caretaker must assess manual handling risks and provide any relevant documentation to key personal.

The routes along any bin moving paths should;

- Allow for a continuous route that is wholly within the property boundary.
- Be free from obstruction and obstacles such as steps and kerbs.
- Be constructed of solid materials with a non-slip surface
- Be A minimum of 300mm wider than the largest bin used onsite.
- If bins are moved manually, the route must not exceed a grade of 1:14.
- If a bin moving device is used, the route cannot exceed the maximum operating grade of the device. This is typically a grade of 1:4, however this will vary depending on the model of bin moving device acquired for the site.

12.0 WASTE ROOMS

The areas allocated for waste storage and collection areas are detailed in the table below and are estimates only.

Table 6: Waste Room Areas

Level	Waste Room Type	Equipment	Estimated Area Required (m^2)	Actual Area Provided (m^2)
B	G25 Waste Room	4 x 1100L MGBs (General Waste) 8 x 1100L MGBs (Paper/Cardboard recycling) 8 x 1100L MGBs (Co-mingled recycling)	58.0	59.2

EFC recommends bins sizes, collection frequencies and/or equipment for best practice waste management at this site, however EFC also acknowledges there are a range of other suitable options that may alter waste room requirements (e.g. floor area, accessibility, head height, etc.)

The waste room areas have been calculated based on equipment requirements and/or bin dimensions with an additional 70% of bin GFA factored in for manoeuvrability.

In addition, all doorways and passageways facilitating the movement of bins and/or bulky waste items must be at least 1500mm wide.

The following table provides further waste room requirements.

Table 7: Waste Room Requirements

Waste Room Type	Waste Room Requirements
G25 Waste Room	• In order to ensure staff safety, all bins should be arranged so they can be accessed without moving another bin • Bins must be coordinated with the hinge of the lid facing the back. This is to allow for ideal access to the bin.

13.0 CONSTRUCTION REQUIREMENTS

Waste room construction must comply with the minimum standards as outlined in the *Randwick Development Control Plan 2013,* in order to minimise odours, deter vermin, protect surrounding areas, and make it a user-friendly and safe area.

The *NSW Better practice guide for resource recovery in residential developments (2019)* also states that better practice waste rooms should achieve more than the minimum compliance requirements, which are as follows:

- Ensuring BCA compliance, including ventilation. Where required, ventilation system must comply with AS1668.4-2012 The use of ventilation and air conditioning in buildings.
- Ensuring storage areas are well lit (sensor lighting preferred) and have lighting available 24 hours a day.
- Provision of bin washing facilities, including taps for hot and cold water provided through a centralised mixing valve. The taps must be protected from bins and be located where they can be easily accessed even when the area is at bin capacity.
- Floor constructed of concrete at least 75mm thick.
- Floor graded so that any water is directed to a sewer authority approved drainage connection to ensure washing bins and/or waste storage areas do not discharge flow into the stormwater drain.
- Provision of smooth, cleanable and durable floor and wall surfaces that extend up the wall to a height equivalent to any bins held in the area.
- Ensuring ceilings are finished with a smooth-faced non-absorbent material capable of being cleaned.
- All surfaces (walls, ceiling and floors) finished in a light colour.

13.1 ADDITIONAL CONSIDERATIONS

- Waste room floor to be sealed with a two-pack epoxy;
- All corners coved and sealed 100mm up, this is to eliminate build-up of dirt;
- Tap height and light switch height of 1.6m;
- Storm water access preventatives (grate);
- All walls painted with light colour and washable paint;
- Equipment electric outlets to be installed 1700mm above finished floor level;
- Optional automatic odour and pest control system installed
- If 660L or 1100L bins are utilised, 2 x 820mm (minimum) double-doors must be used;
- All personnel doors are hinged, lockable and self-closing;
- Conform to the Building Code of Australia, Australian standards and local laws; and
- Childproofing and public/operator safety shall be assessed and ensured
- Waste and recycling rooms must have their own exhaust ventilation system either;
    - Mechanically - exhausting at a rate of 5L/m² floor area, with a minimum rate of 100L/s minimum. Mechanical exhaust systems shall comply with AS1668.4.2012 and not cause any inconvenience, noise or odour problem; or
    - Naturally - permanent, unobstructed, and opening direct to the external air, not less than one-twentieth (1/20) of the floor area.

14.0 USEFUL CONTACTS

EFC does not warrant or make representation for goods or services provided by suppliers.

LOCAL COUNCIL

Randwick Customer Service	Ph: 1300 722 542	E: council@randwick.nsw.gov.au

PRIVATE WASTE COLLECTION PROVIDER

Capital City Waste Services	Ph: 02 9599 9999	E: service@ccws.net.au
Sydney Waste	Ph: 02 8661 0031	
Waste Clear	Ph: 1300 525 352	E: admin@wastecleart.com.au

BIN MOVING DEVICE SUPPLIERS

Elephants Foot Equipment	Ph: 1300 435 374	E: equipment@elephantsfoot.com.au
Sitecraft	Ph: 1300 363 152	E: sales@sitecraft.com.au

BALER SUPPLIERS

Elephants Foot Equipment	Ph: 1300 435 374	E: equipment@elephantsfoot.com.au

ORGANIC DIGESTERS AND DEHYDRATORS

Elephants Foot Equipment	Ph: 1300 435 374	E: equipment@elephantsfoot.com.au
Waste Master	Ph: 1800 614 272	E: hello@wastemasterpacific.com.au

COOKING OIL CONTAINERS AND DISPOSAL

Cookers	Ph: 1300 882 299	E: info@cookers.com.au
Auscol	Ph: 1800 629 476	E: sales@auscol.com

ODOUR CONTROL

Elephants Foot Equipment	Ph: 1300 435 374	E: equipment@elephantsfoot.com.au

SOURCE SPERATION BINS

Method Recycling	Ph: 0499 890 455

BINS AND BIN EQUIPMENT

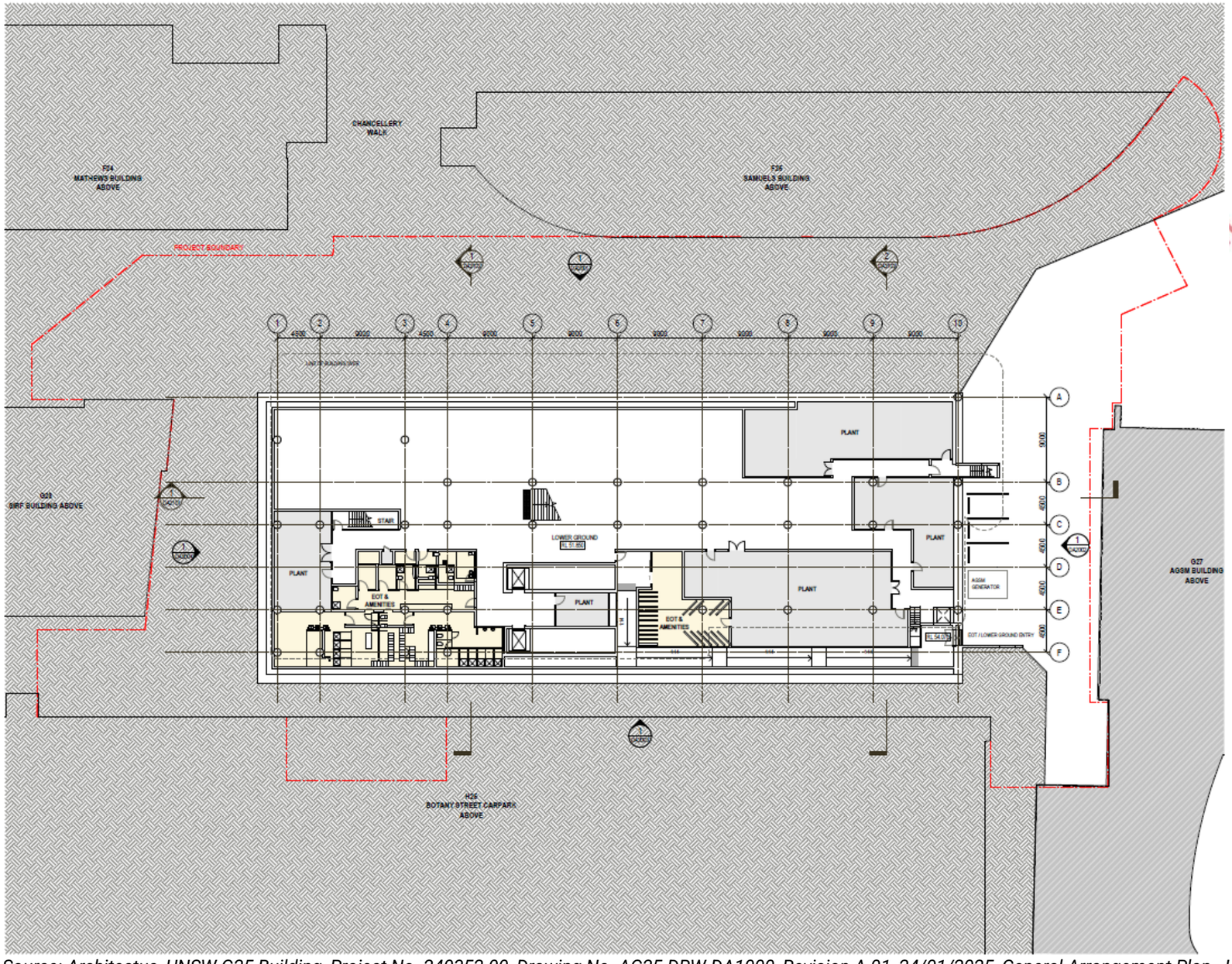
Elephants Foot Equipment	Ph: 1300 435 374	E: equipment@elephantsfoot.com.au
SULO	Ph: 1300 364 388	E: sulosales@pactgroup.com

CHUTES, COMPACTORS AND EDIVERTER SYSTEMS

Elephants Foot Chute Solutions	Ph: 1300 435 374	E: chutes@elephantsfoot.com.au

APPENDIX A: ARCHITECTURAL PLANS

APPENDIX: A.1 LOWER GROUND FLOOR PLAN



Source: Architectus, UNSW G25 Building, Project No. 240352.00, Drawing No. AG25-DRW-DA1000, Revision A.01, 24/01/2025, General Arrangement Plan - Lower Ground

APPENDIX B: PRIMARY WASTE MANAGEMENT PROVISIONS

APPENDIX: B.1 TYPICAL BIN SPECIFICATIONS

Mobile bins

Mobile bins come in a variety of sizes and are designed for lifting and emptying by purpose-built equipment.

Mobile bins with capacities of up to 1700L must comply with *AS4123.6-2006 Mobile waste containers* which specifies standard sizes and sets out the colour designations for the bodies and lids of mobile waste containers indicating the type of materials they are used to collect.

The most common bin sizes are provided below, although not all sizes are shown. The dimensions are a guide only and differ slightly between manufacturers. Some bins have flat or domed lids and are used with different lifting devices. Refer to *AS4123.6-2006* for further details.

Table G1.1: Average dimension ranges for two-wheel mobile bins

Wheelie bin

Bin capacity	80L	120L		140L		240L	360L
Height (mm)	870	940	1065	1080	1100		
Depth (mm)	530	530		540		735	820
Width (mm)	450	485		500		580	600
Approximate footprint (m^2)	0.24	0.26–0.33		0.27-0.33		0.41–0.43	0.49
Approximate weight (kg)	8.5	9.5		10.4		15.5	23
Approximate maximum load (kg)	32	48		56		96	Not known

Sources include Sulo, Single Waste, Cleanaway, SUEZ, just wheelie bins and Perth Waste for two-wheel mobile bins

Table G1.2: Average dimension ranges for four-wheel bulk bins

Dome or flat lid container

Bin capacity	660L	770L	1100L	1300L	1700L
Height (mm)	1250	1425	1470	1480	1470
Depth (mm)	850	1100	1245	1250	1250
Width (mm)	1370	1370	1370	1770	1770
Approx footprint (m^2)	0.86–1.16	1.51	1.33–1.74	2.21	2.21
Approx weight (kg)	45	Not known	65	Not known	Not known
Approx maximum load (kg)	310	Not known	440	Not known	Not known

Sources include Sulo, Signal Waste, Cleanaway, SUEZ, Just Wheelie Bins and Perth Waste

Source: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

APPENDIX: B.2 SIGNAGE FOR WASTE AND RECYCLING BINS

Waste signs

Signs and educational materials perform several functions including:

- informing residents why it is important to recover resources and protect the environment
- providing clear instructions on how to use the bins and services provided
- alerting people to any dangers or hazards within the bin storage areas.

All waste, recycling and organic bins should be Australian Standard colours and clearly and correctly labelled, such as by a sticker on the lid and/or the body of the bin.

Communal bin storage areas should be clearly signposted with signs outlining how to correctly separate waste into the bins provided. The local council responsible for waste services may be a good source of signs and posters and can advise on what signs are suitable.

Information on who to contact to find out more about the recycling and/or other resource recovery services in the building should also be displayed in communal areas, such as on a noticeboard.

The Planet Ark website also has resources available free of charge for use by businesses and councils. These signs can be found at businessrecycling.com.au/research/signage.cfm

Figure I1.1: Examples of waste wall posters (EPA supplied)

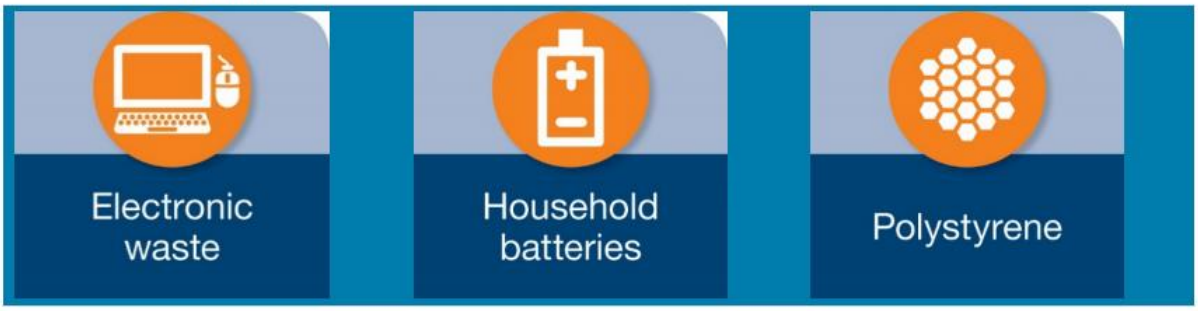
Figure I1.2: Examples of bin lid stickers (EPA supplied)

Source: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

Problem waste signs

The EPA has also produced a range of images and signs that can be used for problem wastes, such as fluoro globes and tubes, household and car batteries, e-waste and smoke detectors. To access these resources, contact the NSW EPA. Some examples are shown below.

Figure I2.1: Problem waste signs



Safety signs

The use of safety signs for waste resource recovery rooms must comply with *AS1319 Safety signs for occupational environments*. Safety signs must be used to regulate and control safety related to behaviour, warn of hazards and provide emergency information, including fire protection information. Suitable signs should be decided for each development as required.

Figure I3.1: Example safety signs

Source: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

APPENDIX: B.3 EXAMPLE COLLECTION VEHICLE INFORMATION

General

Appropriate heavy rigid vehicle standards should be incorporated into the road and street designs in new developments where onsite collections are proposed. Road and street designs must comply with relevant Acts, regulations, guidelines, and codes administered by Austroads, Standards Australia, NSW Roads and Maritime Services, WorkSafe NSW and any local council traffic requirements.

Applicants and building designers should consult with councils and other relevant authorities before designing new roads or streets and access points for waste collection vehicles to establish specific design requirements.

Table H4.1: Australian Standards for turning circles for medium and heavy rigid class vehicles

Vehicle class	Overall length (m)	Design width (m)	Design turning radius (m)	Swept circle (m)	Clearance (travel) height (m)
Medium rigid vehicle	8.80	2.5	10.0	21.6	4.5
Heavy rigid vehicle	12.5	2.5	12.5	27.8	4.5

Source: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

Large collection vehicles

Waste collection vehicles may be side-loading, rear-loading, front-lift-loading, hook or crane lift trucks. Vehicle dimensions vary by collection service, manufacturer, make and model. It is not possible to provide definitive dimensions, so architects and developers should consult with the local council and/or contractors.

The following characteristics represent typical collection vehicles and are provided for guidance only. Reference to *AS2890.2 Parking facilities: off-street commercial vehicle facilities* for detailed requirements, including vehicle dimensions, is recommended.

Table B2.1: Collection vehicle dimensions

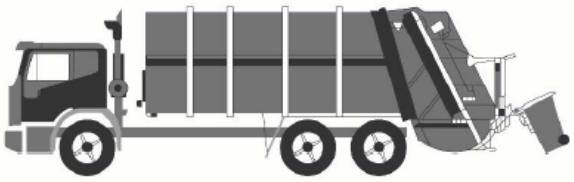
Vehicle type	Rear-loading	Side-loading*	Front-lift-loading	Hook truck	Crane truck
Length overall (m)	10.5	9.6	11.8	10.0	10.0
Width overall (m)	2.5	2.5	2.5	3.0	2.5
Travel height (m)	3.9	3.6	4.8	4.7	3.8
Operational height for loading (m)	3.9	4.2	6.5	3.0	8.75
Vehicle tare weight (t)	13.1	11.8	16.7	13.0	13.0
Maximum payload (t)	10.0	10.8	11.0	14.5	9.5
Turning circle (m)	25.0	21.4	25.0	25.0	18

* The maximum reach of a side arm is 3 m.

Sources: JJ Richards, SUEZ, MacDonald Johnson, Cleanaway, Garwood, Ros Roca, Bingo and Edbro. Figures shown represent the maximum dimensions for each vehicle type.

Rear-loading collection vehicles

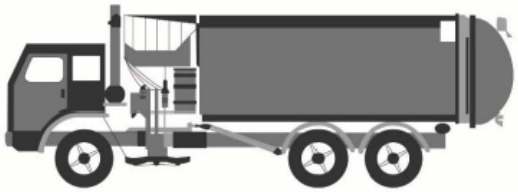
These vehicles are commonly used for domestic waste collections from MUDs and RFBs and sometimes for recycling. They can be used to collect waste stored in mobile bins or bulk bins, particularly where bins are not presented at the kerbside. They are also used for collecting bulky waste.



Rear-loading waste collection vehicle

Side-loading collection vehicles

This is the most commonly used vehicle for domestic waste, recycling and organics collections. It is only suitable for collecting mobile bins up to 360L in capacity.



Side-loading waste collection vehicle

Front-lift-loading collection vehicles

These vehicles are commonly used for collecting commercial and industrial waste. They can only collect specially designed front-lift bulk bins and not mobile bins.

Front-lift-loading waste collection vehicle

Small collection vehicles

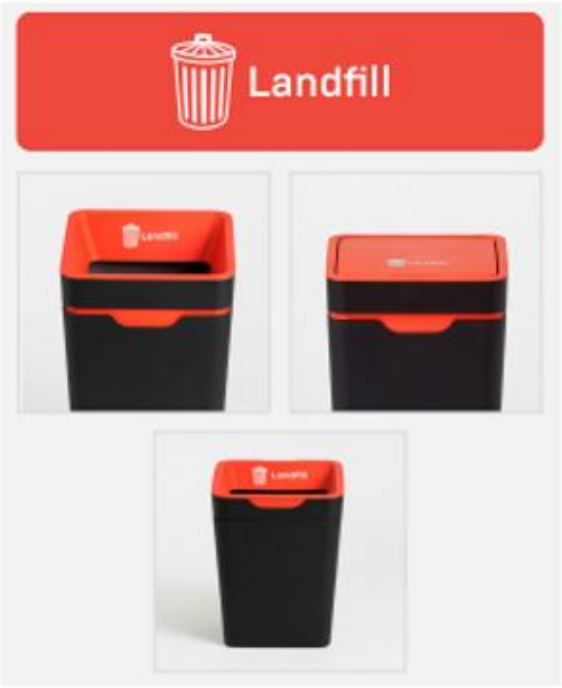
Typically, councils and their contractors operate with large collection vehicles (heavy rigid class vehicles) because they carry greater payloads and allow for more cost-effective collection services. Some councils, or their contractors, may have smaller collection vehicles in their fleet. Early discussion with the council is important to confirm this, but it should not be assumed that the council will have access to small collection vehicles.

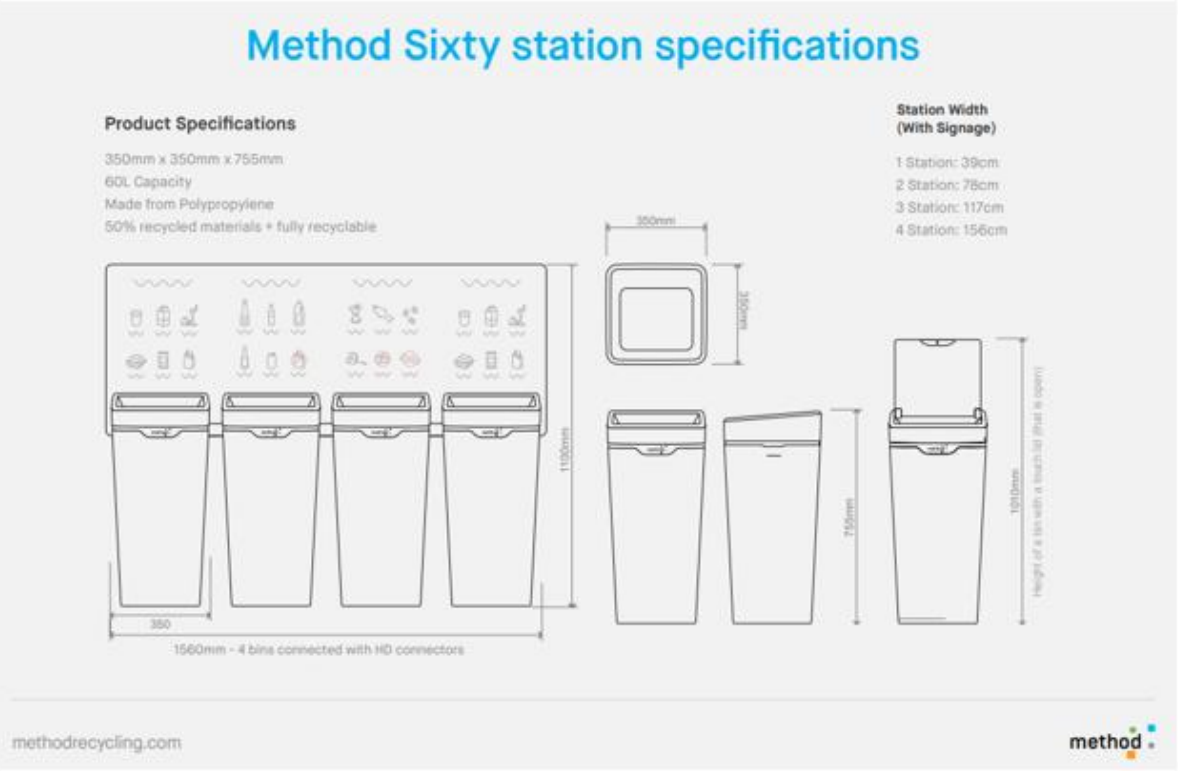
The waste management systems and the location of the collection point should always be designed so that the council can provide the standard domestic waste service.

Source: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

APPENDIX C: SECONDARY WASTE MANAGEMENT PROVISIONS

APPENDIX: C.1 SOURCE SEPARATION RECEPTACLES





Source: Method Recycling - www.methodrecycling.com