



Waste Management Plan

Darlington Terraces Mixed Use
Building Additions and Alterations to
the Darlington Road Terraces and
Public Domain Improvements

November 2016

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1 Introduction

This Waste Management Plan (WMP) for the Darlington Terraces Student Accommodation project provides calculations of projected operational general waste and recycling, recommendations for suitable equipment and storage and handling practices, and a description of expected collection procedures, based on expected occupancy of Blocks A, B/C, and D.

The following documents have been used for reference in developing this report:

- NSW DECC *Better Practice Guide for Waste Management in Multi-Unit Dwellings* 2008
- *CIS Student Accommodation Design Guidelines* March 2016
- *CIS Student Accommodation Waste Management Plan (Draft)* January 2016
- *The Queen Mary Building Plan of Management* May 2015

Markups of current drawings, showing waste and recycling storage areas and bin movement pathways, are also provided.

We would like to thank all those who contributed to the development of this report.

2 Waste & Recycling Volume Calculations

Expected quantities of general waste and recycling have been estimated using the resident populations of each building, based on the number of beds, as follows:

Table 2.1: Occupancy Figures

Building	Beds
Block A	112
Block B/C	195
Block D	30
Total	337

The following standard generation rates in litres per bed per week have been applied to the number of beds per building, as follows:

Table 2.2: Standard Waste & Recycling Generation Rates (Litres per Bed per Week)

Building	Recycling	General Waste
Block A	40.0	40.0
Block B/C	40.0	40.0
Block D	40.0	40.0

Applying the occupancy figures from Table 2.1 and the waste generation rates in Table 2.2, expected volumes of waste and recycling in litres per day from each building are as follows:

Table 2.3: Expected Waste & Recycling Generation Per Building (Litres per Day)

Building	Recycling	General Waste
Block A	640.0	640.0
Block B/C	1114.3	1114.3
Block D	171.4	171.4

3 Waste & Recycling Storage Area Sizing

Based on the volumes in Table 2.3, the following tables show projected weekly volumes for each waste and recycling stream, as well as details of equipment, collection frequencies, and required floor space for equipment within each storage room.

Due to lack of space and access by collection vehicles, and the relatively small volumes of waste generated, there will not be any compaction equipment installed in any of the storage rooms.

Calculations of required floor space are based on standard bin dimensions as set out in The Department of Environment and Climate Change NSW (DECC) *Better Practice Guide for Waste Management in Multi-Unit Dwellings* 2008, p. 111 and are premised on 7 days per week collection of general waste and 4 days per week collection of recyclables by the University's waste contractor and the bin types and quantities listed in Tables 3.1-3.3.

Total bin footprints and storage area requirements include a 20% allowance for bin circulation.

Table 3.1: Building A Storage

Material Stream	Bin Size Litres	No. Bins	Collections/ Week	Litres/ Day	Footprint m ²
Recycling	660	2	4	640.0	2.76
	240	1	4		
General Waste	660	1	7	640.0	1.59
	240	1	7		
Total Bin Footprint					4.35 m²
Bin Washing Area					2.50 m²
Total Bin Storage Requirement (Includes 20% allowance for bin circulation)					7.72 m²
Total Room Area					19.7 m²
Separate Bulky Waste Storage Room					9.2 m²

Table 3.2: Buildings B/C Storage

Material Stream	Bin Size Litres	No. Bins	Collections/ Week	Litres/ Day	Footprint m ²
Recycling	660	4	4	1114.3	5.08
	240	1	4		
General Waste	660	2	7	1114.3	2.76
	240	1	7		
Total Bin Footprint					7.84 m²
Bin Washing Area					2.50 m²
Total Bin Storage Requirement (Includes 20% allowance for bin circulation)					11.91 m²
Total Room Area					32.3 m²
Separate Bulky Waste Storage Room					5.2 m²

Table 3.3: Building D Storage

Material Stream	Bin Size Litres	No. Bins	Collections/ Week	Litres/ Day	Footprint m ²
Recycling	240	2	4	171.4	0.85
General Waste	240	2	4	171.4	0.85
Total Bin Footprint					1.70
Bin Washing Area					2.50 m²
Total Bin Storage Requirement (Includes 20% allowance for bin circulation)					4.55 m²
Bulky Waste Storage Area (Incorporated in storage room)					4.0 m²
Total Room Area					9.2 m²

4 Storage Area Requirements

4.1 General

The *CIS Resource Recovery & Waste Management Standard March 2016*, Section 5.3.1 – Main Waste and Recycling Storage Room specifies that a dedicated waste and recycling storage room must be provided in all new buildings, sized to accommodate all waste and recycling volumes generated on the premises between collections.

Ceilings

The ceilings of the main waste and recycling storage room and service compartment(s) must be finished with a rigid smooth faced non-absorbent material capable of being easily cleaned.

Walls

The walls of the main waste and recycling room and serviced compartment(s) must be constructed of approved solid impervious material and shall be cement rendered internally to a smooth even surface covered at all intersections.

Floors

The floors of the main waste and recycling storage room must be constructed of concrete, at least 75mm thick. The floor must be finished to a smooth surface covered at the intersection with walls and plinths and provided with a ramp to the doorway where necessary.

Access

The main waste storage room must be located close to the waste vehicle collection point and no lower than one level below street level.

Wash Facilities

The main waste and recycling storage room must be provided with adequate supply of hot and cold water mixed through a centralised mixing valve with hose cock. Bin wash facilities must be provided and include a hose cock and floor graded to a 100 mm diameter floor drain outlet. The hose cock must be protected from the waste containers and be accessible at all times.

4.2 Bin Requirements

All bins should be colour-coded to conform to the Australian standard as shown below, or otherwise an alternative scheme consistent with the University's existing systems. 240 litre bins rather than 660 litre bins are recommended for Building D, due to the small size of the storage room and relatively low volumes of materials expected to be generated.

Material Stream	Bin Body Colour	Lid Colour
Paper Recycling	Blue	Blue
Cardboard Recycling	Green	Blue
Food Organics	Burgundy	Burgundy
Commingled Recycling	Green	Yellow
Used Cooking Oil Recycling	NA	NA
General Waste	Green	Red

The above are provided for guidance only and final selection will be determined by the University.

4.3 Waste & Recycling Streams

As a minimum, the following segregated storage areas must be provided if the waste streams are likely to be generated at the premises:

- a. Commingled (mixed) recycling
- b. Paper recycling
- c. Cardboard recycling
- d. Electronic recycling (E-waste)
- e. Batteries (non-rechargeable batteries)
- f. Printer and toner cartridges
- g. Landfill (general) waste
- h. Organic waste
- i. Garden organics
- j. Hazardous waste

Of the above materials streams, (a) to (h) are likely to be generated; however, quantities of organic waste will be small and we do not recommend making separate provision for recovering this material stream. Garden organics and hazardous waste are not expected to be generated.

All other wastes would be stored in the bulky items store until Council pickup is organised – this process will be administered by the site’s cleaners or Building Manager.

4.4 Waste Chutes

It is a University of Sydney requirement for new residential buildings of more than three stories in height to incorporate waste chutes (*CIS Student Accommodation Waste Management Plan (Draft)* January 2016, page 5), with the total maximum travel distance from any dwelling to a waste chute not exceeding 45 metres.

The chutes to be installed will be cylindrical in section to avoid waste being caught within the chute, will have a diameter of 500mm or greater, and fire mitigation features to eliminate flammable items igniting and migrating fire up the chute.

Chutes will discharge into a communal compaction unit located at the ground or basement level waste storage room; each waste stream will be discharged directly into a suitably sized bin in the storage room such to avoid spillage and overflow.

The chutes will be accessible only to residents on each floor and not open onto any public spaces. Doors will open outwards unless prevented by BCA requirements. Where possible, chutes will not be situated adjacent to rooms due to noise considerations.

4.5 Education

Education of residents in correct procedures will be crucial to the success of onsite waste management and recycling. The University encourages best practice and awareness of onsite waste management through the Residential Life Program. Specific education measures will include the following:

- Built-in receptacles (minimum capacity 135 litre as required by CIS Design Guidelines) in communal areas for separating general waste, commingled recycling, paper, and cardboard, with exact numbers per building to be determined based on fitout requirements
- Each bedroom will be provided with a 15 litre general waste bin and 15 litre recycling bin
- Signage near waste chute outlets and communal areas, including storage rooms, describing correct waste management and recycling procedures
- Tenants will be advised of recycling points on campus for batteries and printer cartridges

The *Darlington Terraces Mixed Use and Student Accommodation Operation Management Plan (Draft 1 - July 2016)* contains a Waste Management Plan (Appendix A) that can be employed to engage with and educate residents.

Some of the measures referred to include:

- Paper, cardboard, and commingled recycling
- Waste reduction/avoidance including avoiding unnecessary printing
- Reuse of materials including paper for printing

The University’s Building Manager will be ultimately responsible for the resident education and engagement process.

4.6 Amenity

Residential units will be insulated from noise to comply with the residential amenity provisions of the Council’s relevant Development Control Plans if they are adjacent to or above:

- Chutes or waste storage facilities
- Chute discharges
- Waste collection vehicle access points

4.7 Management

New Buildings

1. Cleaning staff will collect waste and recycling from communal areas daily and take the separated materials directly to the storage room in each building.
2. Tenants will dispose of bagged or wrapped general waste from their rooms into the waste chute opening on their floor, and recyclables from their rooms into the waste chute opening on their floor.
3. Tenants of all new buildings will take any bulky wastes directly to the dedicated area located in their building.
4. Cleaning staff will monitor the waste storage rooms regularly to ensure the waste receptacles do not overflow, replacing full bins with empty ones as needed, and generally keeping the storage rooms clean and tidy. This will include regular washing of bins.
5. In accordance with the University's collection schedule, general waste and recycling will be collected directly from storage rooms. Cleaners will be responsible for returning emptied bins to the storage rooms as soon as possible after collection by the waste contractor.

Terraces

1. Residents will dispose of general waste and recycling in receptacles located in terrace kitchen areas.
2. Cleaning staff will collect general waste and recycling from terrace kitchen areas daily and take the separated materials directly to the nearest storage room in each new building.
3. Tenants of all terraces will take any bulky wastes directly to the dedicated area located in the building most convenient to their terrace.
4. Cleaning staff will monitor the waste storage rooms regularly to keep the storage rooms clean and tidy. This will include regular washing of bins.
5. In accordance with the University's collection schedule, general waste and recycling will be collected directly from storage rooms. Cleaners will be responsible for returning emptied bins to the storage rooms as soon as possible after collection by the waste contractor.

5 Waste Storage & Collection

As detailed above, all general waste and recycling will be collected directly from the respective storage rooms on Darlington Lane on designated collection days, which will be based around 7 days per week collection of general waste and 4 days per week for recyclables.

This process will be aligned with the University's collection timetable so that bins are brought back to each building as soon as practicable after collection, and returned to their respective storage rooms.

Cleaners will also be responsible for washing bins as required. This should be done at least weekly, to prevent buildup of odours and possible infestations.

It is also a requirement that the path for wheeling bins between central waste storage points and collection vehicles must be level and free of steps and kerbs. The maximum travel distance between the storage point and the collection point for bins is 10 metres for bins including 240-litre, 660-litre, and 1100-litre Mobile Garbage Bins (MGBs).

The drawing extracts on the following pages show the waste and recycling storage areas for the development.

Figure 5.1.1: Building A Storage

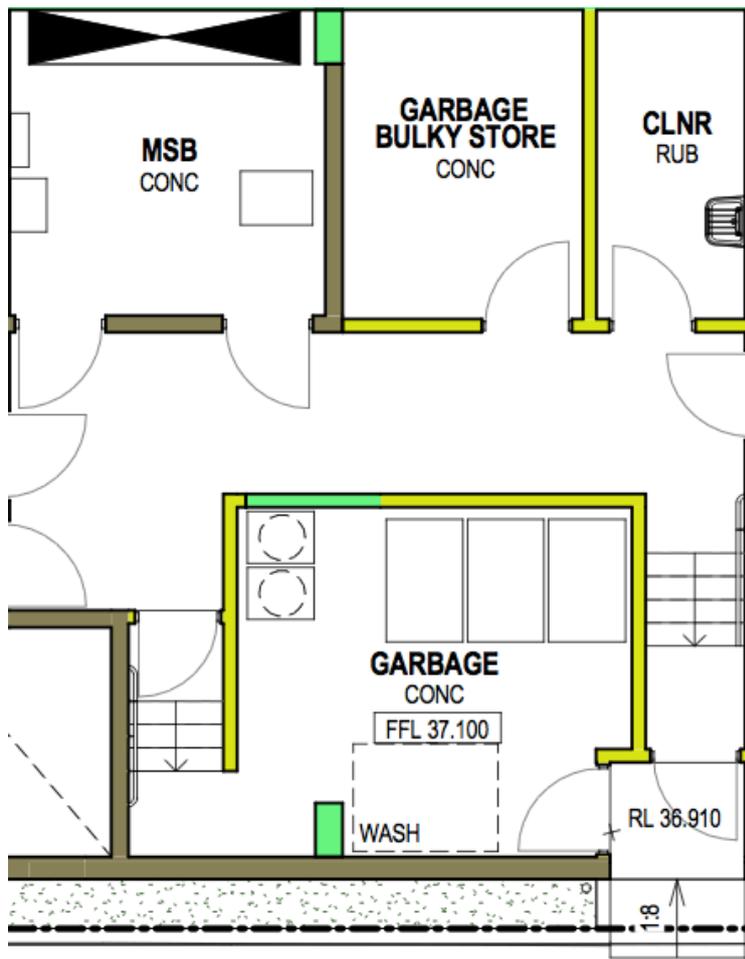


Figure 5.1.2: Building B Storage

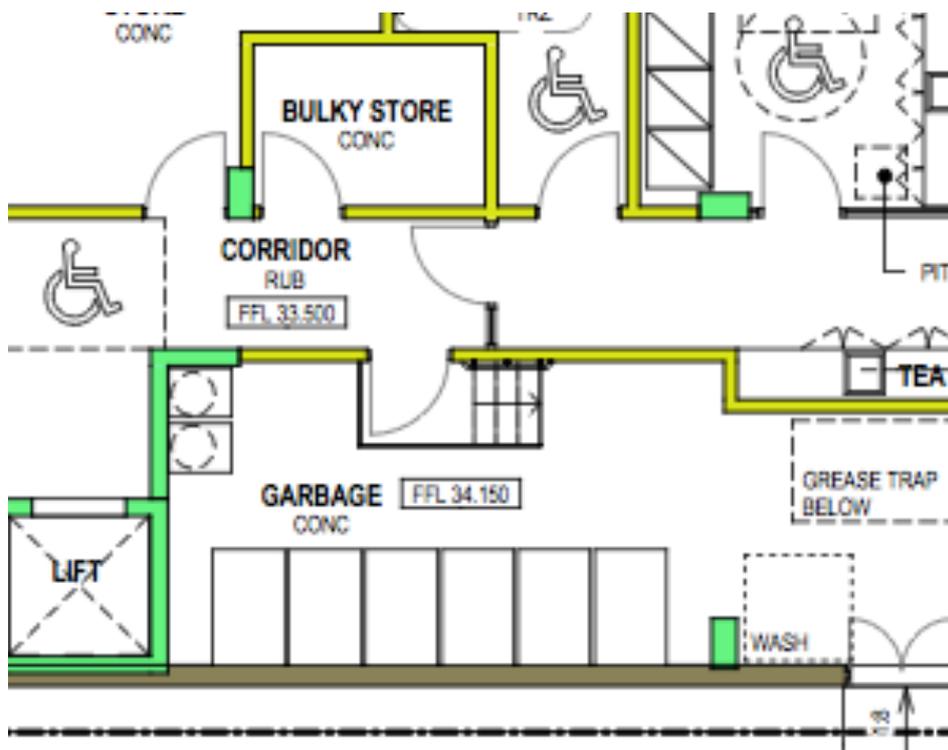
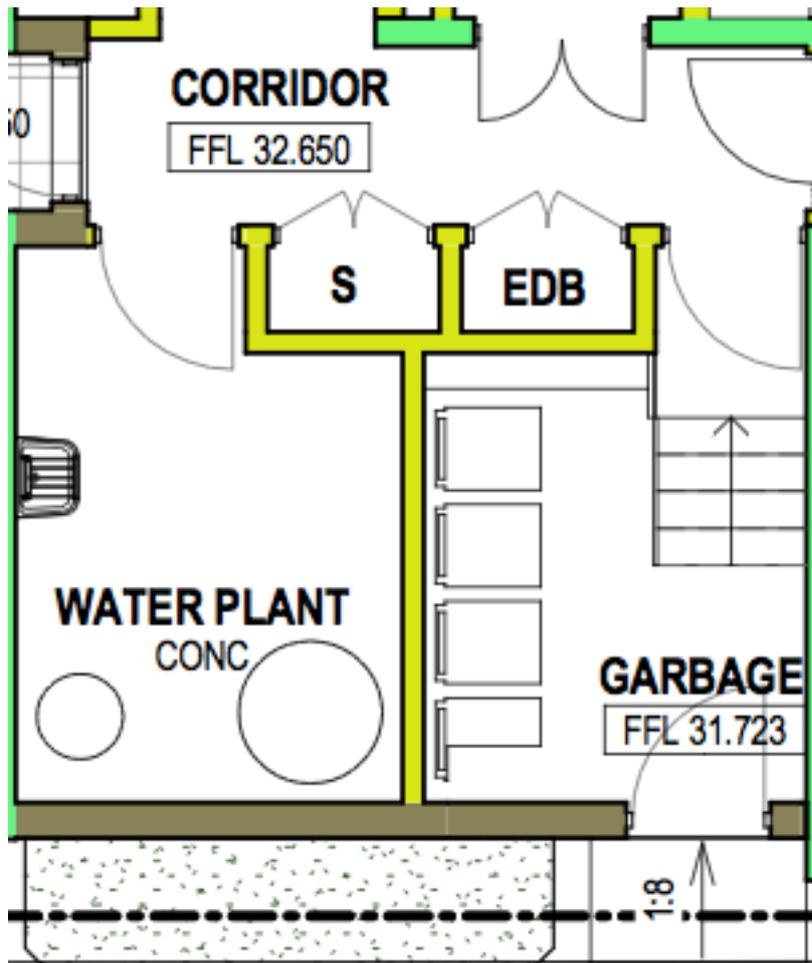


Figure 5.1.3: Building D Storage



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