FORESIGHT ENVIRONMENTAL

# Loreto Normanhurst Concept Masterplan and Detailed Stage 1 Works

# Waste Management Strategy

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This report is based on information provided by Loreto Normanhurst coupled with Foresight Environmental's knowledge of waste generated within the mixed-use development sector. To that extent this report relies on the accuracy of the information provided to the consultant. It has been compiled by Foresight Environmental on behalf of Loreto Normanhurst.

This report is not a substitute for legal advice on the relevant environmental related legislation, which applies to businesses, contractors or other bodies. Accordingly, Foresight Environmental will not be liable for any loss or damage that may arise out of this project, other than loss or damage caused as a direct result of Foresight Environmental's negligence.

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| Revision No. | Issue date | Author | Reviewed by | Reason/comments |
|---|---|---|---|---|
| 1 | 06 December 2018 | Kyle Renwick | Scott Ebsary | Draft issue for review |
| 2 | 11 December 2018 | Kyle Renwick | Scott Ebsary | Update per new plans |
| 3 | 14 January 2019 | Kyle Renwick | Scott Ebsary | Amendments to new plans |

# Contents

# 1. Overview of Development

## 1.1 Introduction

This report supports a State Significant Development Application (SSDA) submitted to the Department of Planning and Environment (DPE) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This application is SSD by way of clause 8 and schedule 1 under *State Environmental Planning Policy (State and Regional Development) 2011* on the basis that the development is for the purpose of an existing school and has a Capital Investment Value of more than $20 million.

Specifically, this application relates to a staged SSDA within the meaning of Section 4.12 of the EP&A Act, with this application being the Concept Proposal for a new site wide masterplan for the existing Loreto Normanhurst School at 91 – 93 Pennant Hills Road, Normanhurst. In addition, consent is also sought for the Stage 1 detailed design works for a new on campus student boarding facility, landscaping works, and some demolition works to the buildings between Mary Ward and existing dining room building and associated works to make good existing.

This report has been prepared having regard to the Secretary's Environmental Assessment Requirements issued for the project by DPE, ref no SEAR 8996 issued on 12 January 2018.

**"Waste"**

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

## 1.2 Background

**Need for a Campus Masterplan**

Loreto Normanhurst is an independent, Catholic day and boarding school for girls from Years 5 to 12. The existing school campus was established in 1897 and has evolved in an organic and ad-hoc manner across the span of a 120 years.

A new campus wide planning approach offers the opportunity to strategically review and plan for the campus' future in a sustainable and efficient manner such that the campus' unique aesthetic and ecological values are best preserved. The preparation of a campus wide masterplan is also consistent with the School's

'Loreto Normanhurst 2016 - 2020 Strategic Plan' which identified the need for a broader strategic plan to coordinate renewal and orderly development in a feasible and staged manner.

**Early Learning Centre**

A separate DA (D/1227/2018) has been submitted to Hornsby Shire Council on 23 November 2018 for an 80 place Early Learning Centre (ELC) building and the DA is currently under assessment. The ELC building is consistent with the overall concept masterplan, and was prepared concurrently with the final preferred campus masterplan. However, to meet the School's operational timeframe requirements for the ELC, a separate application was seen to be best pathway to allow the building to be built, fitout and operational by 2021.

## 1.3 The Site

Loreto Normanhurst is located within the suburb of Normanhurst on Sydney's Upper North Shore approximately 3km south of Hornsby and 25km north of Sydney CBD. The school is located in the local government area of Hornsby Shire Council, approximately 750m south of the Normanhurst Railway Station. The locational context of the site is illustrated at **Figure 1**.

The site comprises the existing campus grounds of the Loreto Normanhurst school at 91 – 93 Pennant Hills Road, Normanhurst. The northern part of the site accommodates much of the school's existing built form, while the rear extent consists of the school's sporting fields, and a portion of largely undeveloped land covered in remnant vegetation.

The campus itself is bound by Pennant Hills Road (to the north), Osborn Road (to the west) and Mount Pleasant Avenue (to the east). Detached dwellings on individual residential lots about the southern boundary of the site. An aerial photograph of the site is provided at **Figure 2** below.

**Figure 2** provides an aerial map of the site and its immediate surrounds.

Figure 1 - Loreto Normanhurst Campus Location Context Plan (Source: Ethos Urban)

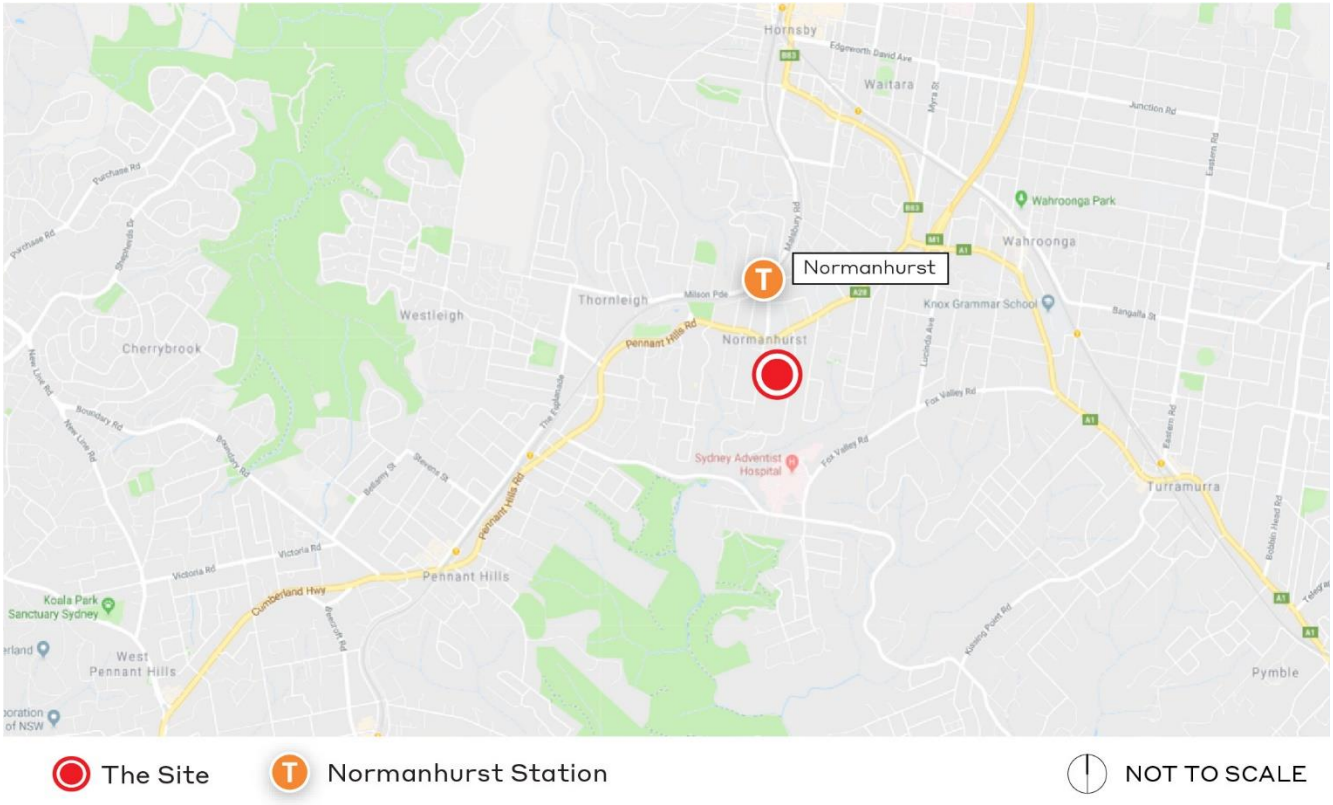



Figure 2 - Aerial Map of the Loreta Normanhurst Campus (Source: AJ+C Architects)

### 1.3.1. Legal Description and Ownership

The campus comprises several allotments, the legal descriptions of which are provided in **Table 1** below. The existing campus has a site area of approximately 13.02ha. The site in its entirety is owned by the Trustees of the Loreto Property Association.

Table 1 Legal Description

| Address | Lot | Plan |
|---|---|---|
| 16 Mount Pleasant Avenue | Lot 5 | DP 1218765 |
| | Lot 16 | DP 6612 |
| 30 – 62 Mount Pleasant Avenue | Lots 20 – 23 and 25 – 36 | DP 6612 |
| | Lot 1 | DP 34834 |
| 91 – 93 Pennant Hills Road | Lot 1 | DP 114580 |
| | Lot 3 | DP 1217496 |
| | Lot 1 – Lot 3 | DP 1218765 |
| | Lot B | DP327538 |
| 24 – 28 Mount Pleasant Avenue | Lot 1 | DP 809066 |
| 6 Mount Pleasant Avenue | Lot C | DP 366271 |
| 14 Mount Pleasant Avenue | Lot 4 | DP1218765 |
| 89 Pennant Hills Road | Lot 1 | DP136156 |

## 1.4 Overview of Proposed Development

This application sets out a new campus masterplan for the existing school campus that will guide and shape the development of the school campus for the next 30 years. This SSDA also includes detailed plans for the first stage of the concept proposal (Stage 1 works). Accordingly, consent is sought for the following:

- The concept masterplan, including:
  - Establishment of 10 new building envelopes across the site for education and ancillary uses including student accommodation;
  - Increase of the student number cap by 850 students from 1150 to 2000 students;
  - The open space and landscape design;
  - Pedestrian and circulation arrangements, and
  - Associated car parking provision.
- Detailed consent for Stage 1 works, being:
  - Construction of a new 3 to 6-storey boarding house to accommodate up to 216 boarders.
  - Excavation works to accommodate partially underground carpark and dock facilities within the proposed footprint of the new boarding house facility;
  - Demolition works to buildings between Mary Ward and existing dining room building and associated works to make good existing;
  - Landscaping works and removal and replacement of approximately 50 trees of varying significance; and
  - Augmentation of connection of services and utilities infrastructure.

# 2047 MASTERPLAN

# WASTE MANAGEMENT PLAN

Throughout the development of the 2047 masterplan, best practice waste management principles will be implemented to ensure maximum diversion from landfill and operational waste cost efficiency is achieved from ongoing campus operations. The following sections detail the high-level considerations that will be implemented throughout the future detailed design process for each component of the masterplan.

# 2. Waste and Recycling Streams

Based on the information provided and benchmark data from similar developments, the primary waste streams expected to be generated in the ongoing operation of the development would be:

- Cardboard/paper recycling
- Comingled recycling
- Food organics recycling*
- General waste

*With the exception of within the kitchen/canteen and food tech teaching rooms, food organics recycling is not recommended to be targeted throughout all public campus areas due to the likely challenges with contamination of this stream. It is recommended that organics separation is only targeted within areas where the quality of the material can be adequately controlled i.e. kitchen/canteen/food tech rooms etc.

Additional smaller waste streams that will be addressed throughout the campus may include:

- Green Waste/vegetation – vegetation generated from onsite maintenance activities will be managed by grounds staff. A bulk $3m^3$ front lift bin is recommended for the management of this stream which should be collected on request as required.

- Battery Recycling – Battery recycling boxes will be present where deemed necessary e.g. copy rooms, office/study common areas. These boxes will be collected when full by a dedicated contractor.

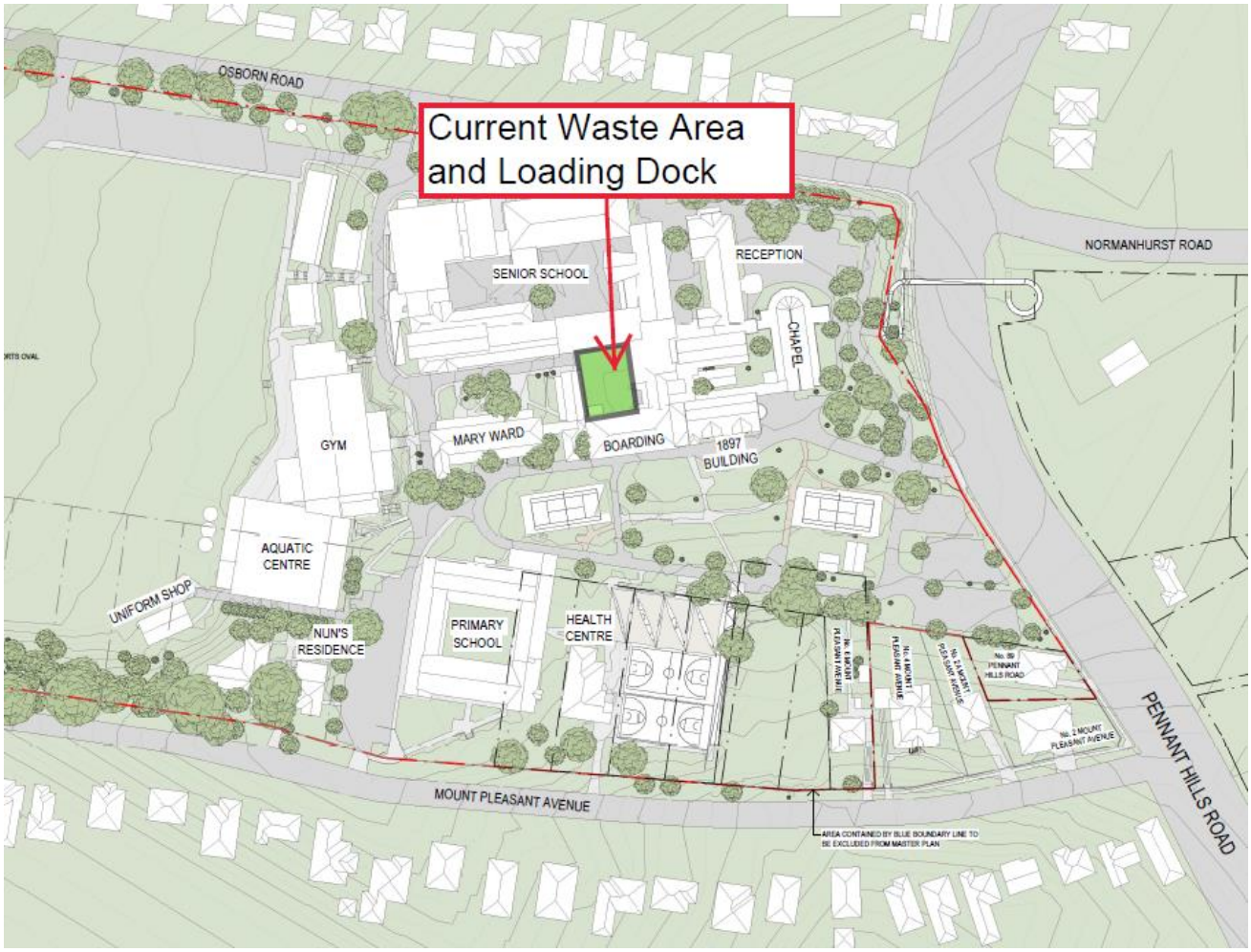
- Toner Cartridge Recycling – Used toners will be collected by administration staff and consolidated for collection by specialty cartridge recycler (usually provided by office supplier).

# 3. Waste and Recycling Storage Areas

## 3.1 Storage Area

The school currently manages all waste within the central dock which adequately services the school's waste and recycling generation. It is anticipated that the central waste area and loading dock will be relocated and redesigned during the development of the masterplan to ensure the storage facilities are appropriately sized to accommodate the requisite number of bins to manage the increased waste quantities that will be generated as a result of the increased student numbers delivered by the masterplan. The following section details the elements of best practice waste storage design that will be incorporated into the new central waste storage area.

Figure 3 - Site plan and waste storage area location



## 3.2 Amenity

The waste and recycling storage area will have the following features:

- Ventilation: The bin storage room will be ventilated to external air or mechanically exhausted in accordance with AS 1668.2-2002
- Vermin Prevention:
    - The bin storage room will feature tightly fitted doors
    - Opening will be vermin proof
    - Cleaners are to ensure that bin lids are closed when unattended
- Noise: Noise will not be an issue due to the location of the waste storage room away from public in the loading dock
- Floor: Structural concrete slab with smooth epoxy topping finish with coved wall and floor junctions. Graded drains to approved sewer connections – fitted with an in-floor dry basket arrestor approved by Sydney Water Corporation
- Walls: Brick work/concrete block or similar finished in a light coloured, washable paint
- Ceiling: Structural concrete slab over
- Lighting: Base building lighting with switches inside and outside waste room (sensors may also be used)
- Water Supply: hot and cold tap and hose connection
- Signage: clear signage identifying the various streams and appropriate use will be prominently displayed (see section on signage below)

## 3.3 Signage

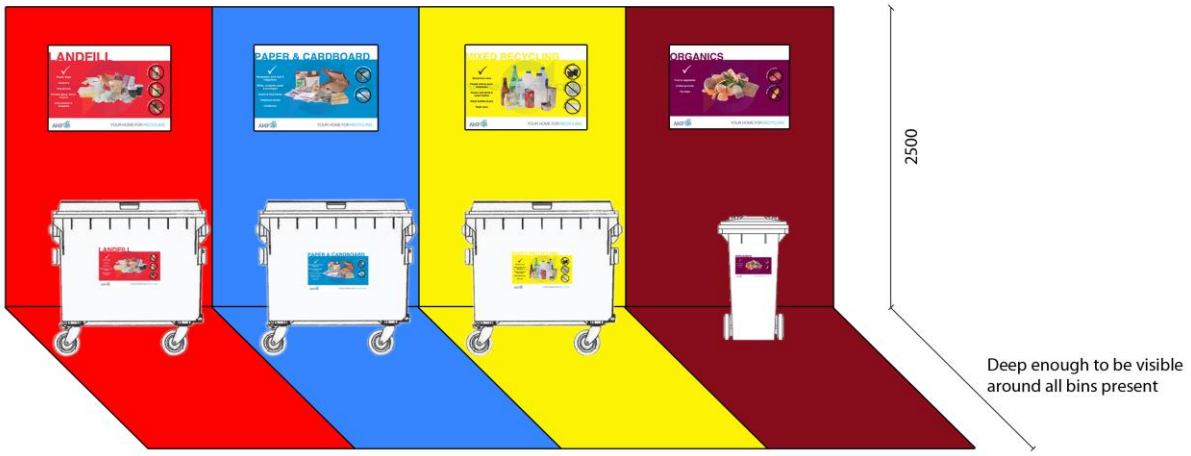
All waste and recycling streams should be differentiated with clear signage and colour-coding. This is to be present on all bins and on walls within the waste storage area. Below are examples of appropriate signage – incorporating textual information, pictures and colour-coding.

Figure 4 - Best practice signage


## 3.4 Colour-Coding

To further reinforce the differentiation between waste and recycling streams, it is highly recommended that the bin storage room be colour-coded to ensure bins are stored in the correct area and to enable easy identification of the streams provided. This can be done by painting borders on the floor indicating where bins should be stored. The colour of the paint should be consistent with the waste stream e.g. yellow paint for mixed recycling, red paint for general waste. The waste room walls can also be painted.

Figure 5 - Indicative colour-coding guide

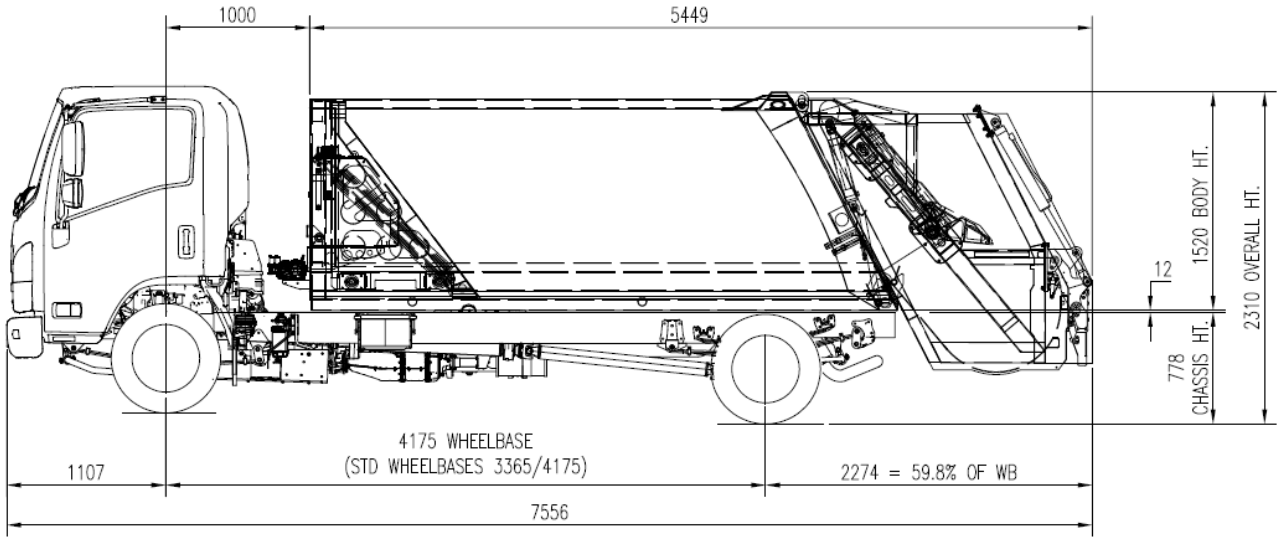


# 4. Collection

## 4.1 Waste Collection Vehicle

Waste truck specifications will vary slightly between contractors however as a guide, all streams and bins recommended in this report would typically be collected by a medium-rigid rear lift waste truck – figure 6 provides an example of a commonly used 7.6m truck by most councils and commercial waste contractors in accordance with AS2890.2.

Figure 6 - Medium rigid rear-lift commercial waste truck specifications




## 4.2 Collection Access

Collection practices are to continue as they are currently being conducted by the waste contractor. Bins are collected from the dock and then returned to the waste room once emptied.

# 5. Onsite Management Protocols

## 5.1 Waste Systems

Throughout the various teaching and meeting rooms in the school, it would be impractical and unnecessary to offer bins in every single room. Instead, it is recommended that smaller "Multi-sort" bin hubs be established throughout the floors in hallways and common spaces to service the smaller rooms as necessary. This encourages students/staff using the spaces to remove any waste they have and place it in the appropriate bin at the nearest hub – such a practice should promote recycling by giving users the choice of stream to dispose material into, and also reduce the time taken for cleaners to empty the bins.

Cleaners/facilities management will empty waste and recycling into trolley (see appendix) and then transfer to main waste storage area to be disposed into the larger bins for collection.

Figure 7 depicts a bin hub that would be best suited for small staff rooms and classrooms

Figure 7 - Multi-sort bin hubs

## 5.2 Outdoor Areas

Bin hubs should be implemented in appropriate outdoor areas. The following photographs provide examples of waste and recycling bin hubs. It is important to note that should recycling be implemented in these areas, both general waste and recycling bins be located next to each other. When separated, the likelihood of the recycling stream being contaminated by non-recyclables increases substantially.

For ease of use, bin hubs should be large enough to house a 240L MGB for each stream so that maintenance staff can simply remove the full bin and replace it with an empty one. Full bins can then be transferred to the waste storage/collection area for collection by the waste contractor.

Photographs 1 & 2 – Outdoor bin hubs


## 5.3 Bulky Design & Tech Materials

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

Figure 8 - Bulky waste cage

## 5.4 Liquid/Hazardous waste

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

Figure 9 - Hazardous waste storage cabinet

## 5.5 Waste Stream Collection Practices

Table 2 outlines the cleaners and campus operational staff collection practices for each waste stream.

Table 2 - Collection Practices

| Waste Stream | Collection Practices |
|---|---|
| Paper/cardboard recycling | 1. Cleaners empty bin hubs into cleaner trolleys. Material is then taken to the appropriate waste storage area and transferred into the paper/cardboard bins.<br>2. Where possible, bulky cardboard should be taken directly to the waste storage to be collected by cleaning staff.<br>3. Cleaners collect flattened cardboard as required and transfer it to the waste storage area where it is deposited into the paper/cardboard recycling MGB(s)<br>4. Bins collected from the waste storage areas directly by waste contractor via the loading dock |
| Comingled Recycling | 1. Cleaners empty bin hubs into cleaner trolleys. Material is then taken to the appropriate waste storage area and transferred into the MGB co-mingled bin(s) in waste storage area.<br>2. Bins collected from the waste storage areas directly by waste contractor via the loading dock |
| Organics* | 1. Organic MGB bins located throughout any kitchens or food technology rooms are to be directly transported to either a) on-site compost facilities (i.e. the liquid composter within the boarding house kitchen), or b) the appropriate waste storage area for collection.<br>2. With assistance from staff, the organic waste can then be managed by students participating in onsite compost programs. |
| General Waste | 3. Cleaners to collect general waste from bin hubs using a trolley and transport the waste to the appropriate waste storage area to be transferred into the MGB(s).<br>4. Bins collected from the waste storage areas directly by waste contractor via the loading dock |
| Vegetation | 1. Managed onsite by grounds staff – transferred to 3m3 bulk bin adjacent to waste storage area<br>2. Collected on call by contractor as required by grounds staff |
| Toner Cartridge Recycling | 1. Used toner cartridges will be collected by campus operations and placed into the designated toner cartridge recycling bin located in office areas<br>2. This will be collected on call by a dedicated contractor (i.e. Planet Ark) |
| Battery Recycling | 1. Batteries will be collected in boxes at collection point decided upon by campus management (ideally office common areas, reception areas)<br>2. This waste stream will be collected on call. |

# 6. Additional Opportunities

## 6.1 Organics Recovery/Recycling

Although offering food/organic recycling throughout all areas is not recommended due to the challenges of contamination, options for the kitchen where there is more control over the type of materials being disposed should be investigated.

Alternatively, other onsite options that would reduce the quantity of waste being taken offsite by waste contractors should be investigated. An effective solution could incorporate one or both of the following:

- Onsite compost bins
- Onsite worm farms

Figure 10 - Example of a compost setup

Figure 11 - Example of a basic worm farm

# BOARDING HOUSE WASTE MANAGEMENT PLAN

# 7. Introduction

This Operational Waste Management Plan has been prepared by Foresight Environmental on behalf of the Loreto Normanhurst (the 'Applicant') as part of the Development Application for the Boarding House. The plan details the way in which the proposed development will manage the waste and recycling generated from the ongoing use of the development in accordance with the Hornsby Development Control Plan 2013.

The proposed development consists of a boarding house with the capacity to house up to 220 boarders and includes kitchen facilities to provide breakfast and dinner for all students. For the purposes of estimating a waste profile for the development, we have assumed a litre/bed/day metric in conjunction with Foresight Environmental's extensive database of actual operational data from similar developments/assets.

This document provides a high-level overview of the waste estimates and spatial requirements for the boarding house and kitchen components as well as the proposed onsite waste management and collection

# 8. Waste Generation Estimate

The following waste estimate has been generated for the purposes of demonstrating the capacity of the waste systems to manage standard usage based on industry averages and historical audit data.

Based on the information provided and benchmark data from similar developments, the primary waste streams expected to be generated in the ongoing operation of the development would be:

- Cardboard/paper recycling
- Comingled recycling
- Food organics recycling
- General waste

The waste and recyclables generated within the kitchen facilities are to be kept separate from those generated by the general use of the students within the boarding house which are to be kept separate again from the staff, thus a profile has been created for each component of the development.

## 8.1 Estimates

Table 3 – Kitchen waste estimate

| Stream | Kg/day | L/day | Kg/week | L/week |
|---|---|---|---|---|
| General Waste | 32 | 302 | 223 | 2,123 |
| Organics* | 30 | 108 | 212 | 758 |
| Cardboard | 11 | 151 | 74 | 1,061 |
| Comingled Recycling | 5 | 76 | 32 | 531 |
| **Total** | **77** | **637** | **541** | **4,473** |

*Organics produced within the kitchen is to be managed by a liquid composter and thus will not require bin systems in the external bin room.

Only two streams have been recommended for the students and staff within the boarding house to utilise in an attempt to avoid contamination (commingled includes both paper/cardboard and other mixed recyclables).

Table 4 – Boarding House waste estimate

| Stream | Kg/day | L/day | Kg/week | L/week |
|---|---|---|---|---|
| General Waste | 14 | 130 | 96 | 910 |
| Comingled Recycling | 6 | 97 | 45 | 682 |
| **Total** | **20** | **227** | **141** | **1,592** |

Table 5 - Boarding House Staff waste estimate

| Stream | Kg/day | L/day | Kg/week | L/week |
|---|---|---|---|---|
| General Waste | 7 | 68 | 50 | 480 |
| Comingled Recycling | 19 | 68 | 134 | 480 |
| **Total** | **26** | **137** | **185** | **960** |

Table 6 illustrates the combined estimated waste and recyclables profile expected to be produced by the entire development.

Table 6 - Total waste estimate

| Stream | Kg/day | L/day | Kg/week | L/week |
|---|---|---|---|---|
| General Waste | 53 | 500 | 369 | 3,512 |
| Organics | 30 | 108 | 212 | 758 |
| Cardboard | 15 | 216 | 106 | 1,516 |
| Comingled Recycling | 26 | 176 | 180 | 1,238 |
| **Total** | **124** | **1,001** | **867** | **7,025** |

## 8.2 Management Systems

As organic waste is to be managed by the liquid composter within the kitchen, the following table will only address the streams to be stored within the waste room.

Table 7 – Kitchen recommended waste management systems

| Stream | Bin Type | No. of Bins | Weekly Clearance Frequency | Weekly Capacity (L) | Estimated volume / week (L) | Footprint per bin ($m^2$) | Total Footprint ($m^2$) |
|---|---|---|---|---|---|---|---|
| General Waste | MGB - 1100L | 1 | 2.00 | 2,200 | 2,123 | 1.69 | 1.69 |
| Cardboard | MGB - 660L | 1 | 2.00 | 1,320 | 1,061 | 1.05 | 1.05 |
| Comingled | MGB - 660L | 1 | 1.00 | 660 | 531 | 1.05 | 1.05 |
| **Total** | | **3** | | **4,180** | **3,715** | | **3.78** |
| Recommended Room Size (including circulation space) | | | | | | | **5.67** |

Tables 8 and 9 below illustrate the systems required to manage the boarding house and boarding house staff components of the development which will be stored in their respective waste storage areas within the loading dock area.

Table 8 – Boarding House recommended waste management systems

| Stream | Bin Type | No. of Bins | Weekly Clearance Frequency | Weekly Capacity (L) | Estimated volume / week (L) | Footprint per bin ($m^2$) | Total Footprint ($m^2$) |
|---|---|---|---|---|---|---|---|
| General Waste | MGB - 1100L | 1 | 1.00 | 1,100 | 910 | 1.69 | 1.69 |
| Comingled | MGB - 240L | 2 | 2.00 | 960 | 682 | 0.43 | 0.85 |
| **Total** | | **3** | | **2,060** | **1,592** | | **2.54** |
| Recommended Room Size (including circulation space) | | | | | | | **3.81** |

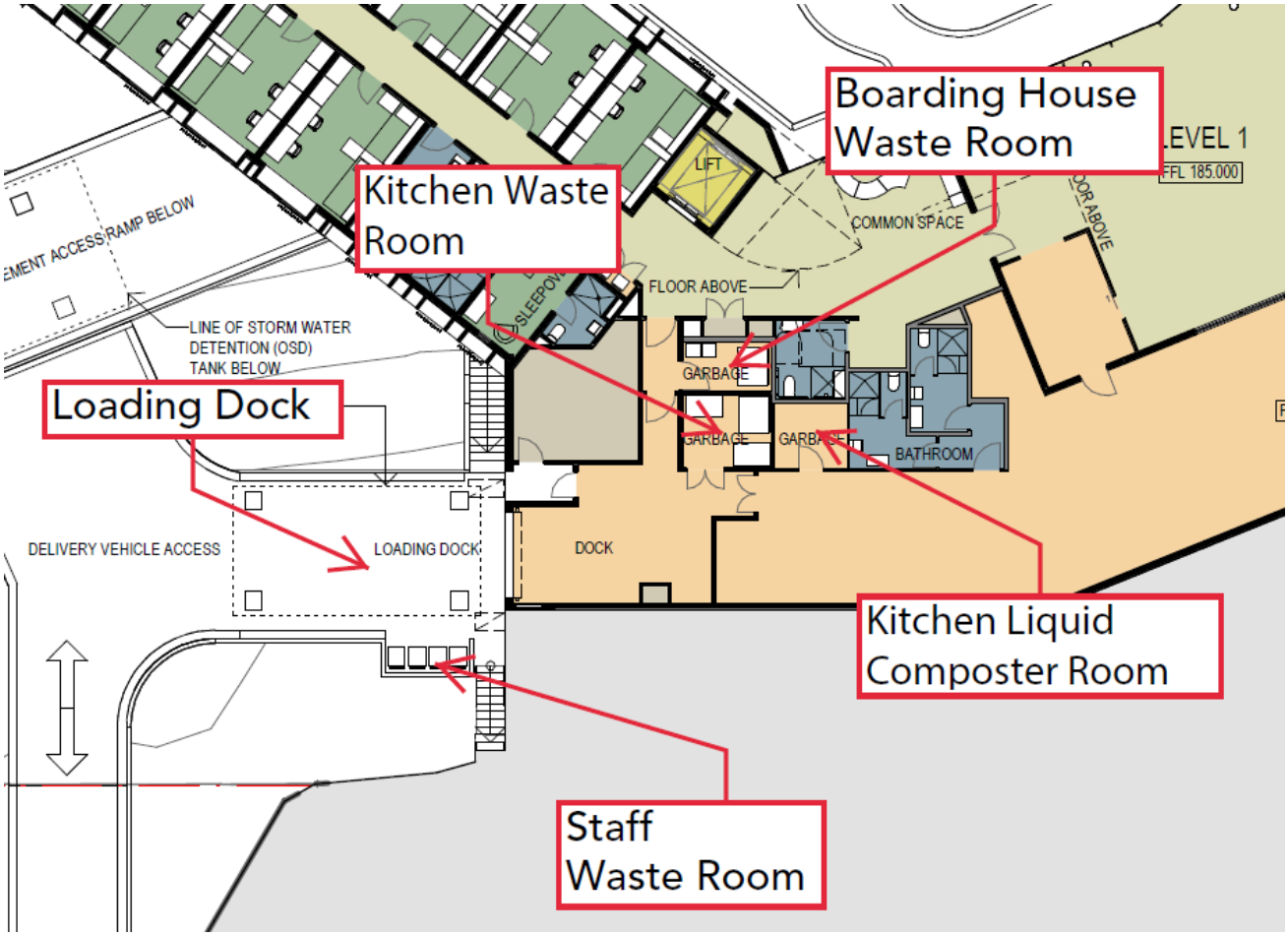
Table 9 - Boarding House Staff recommended waste management systems

| Stream | Bin Type | No. of Bins | Weekly Clearance Frequency | Weekly Capacity (L) | Estimated volume / week (L) | Footprint per bin ($m^2$) | Total Footprint ($m^2$) |
|---|---|---|---|---|---|---|---|
| General Waste | MGB - 240L | 2 | 1.00 | 480 | 480 | 0.43 | 0.85 |
| Comingled | MGB - 240L | 2 | 1.00 | 480 | 480 | 0.43 | 0.85 |
| **Total** | | **4** | | **960** | **960** | | **1.71** |
| Recommended Room Size (including circulation space) | | | | | | | **2.56** |

# 9. Waste and Recycling Storage Areas

Both the kitchen and general boarding house waste and recycling storage areas are located on level 01 next to the loading dock. The areas provided in the tables above provide indicative areas to allow for storage and adequate manoeuvrability in each of the waste rooms. Figure 12 shows an overview of the ground floor waste storage facilities and loading dock:

Figure 12 – Boarding House Level 01 layout showing waste room and loading dock



## 9.1 Amenity

Each waste and recycling storage room will have the following features:

- Ventilation: The bin storage room will be ventilated to external air or mechanically exhausted in accordance with AS 1668.2-2002
- Vermin Prevention:
    - The bin storage room will feature tightly fitted doors
    - Opening will be vermin proof
    - Cleaners are to ensure that bin lids are closed when unattended
- Noise: Noise will not be an issue due to the location of the waste storage room away from public in the loading dock
- Floor: Structural concrete slab with smooth epoxy topping finish with coved wall and floor junctions. Graded drains to approved sewer connections – fitted with an in-floor dry basket arrestor approved by Sydney Water Corporation
- Walls: Brick work/concrete block or similar finished in a light coloured, washable paint
- Ceiling: Structural concrete slab over
- Lighting: Base building lighting with switches inside and outside waste room (sensors may also be used)
- Water Supply: hot and cold tap and hose connection
- Signage: clear signage identifying the various streams and appropriate use will be prominently displayed (see section on signage below)

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

## 9.2 Signage

All waste and recycling streams should be differentiated with clear signage and colour-coding. This is to be present on all bins and on walls within the waste storage area. Below are examples of appropriate signage – incorporating textual information, pictures and colour-coding.

Figure 13 - Best practice signage


## 9.3 Colour-Coding

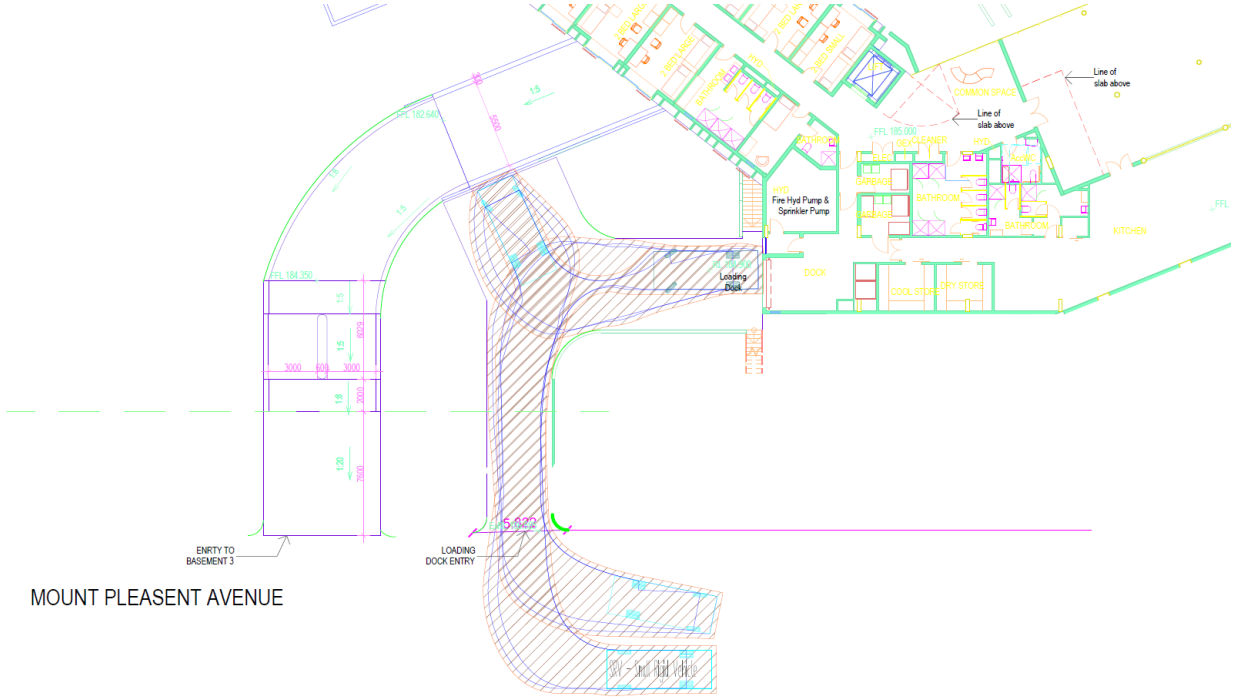
To further reinforce the differentiation between waste and recycling streams, it is highly recommended that the bin storage room be colour-coded to ensure bins are stored in the correct area and to enable easy identification of the streams provided. This can be done by painting borders on the floor indicating where bins should be stored. The colour of the paint should be consistent with the waste stream e.g. yellow paint for mixed recycling, red paint for general waste. The waste room walls can also be painted.

Photographs 1 & 2 – Examples of appropriate colour-coding

# 10. Collection

Boarding House waste is to be collected via the loading dock on the basement 1 level which can be accessed from Mount Pleasant Ave. A swept path analysis has been produced which demonstrates that an 8.8m or small rigid vehicle (SRV) can adequately access the site, as can be seen from figure 14.

Figure 14 - SRV swept path demonstrated in boarding house loading dock



# 11. Onsite Management Protocols

Throughout the many private rooms in the boarding house, it would be impractical and unnecessary to offer bins in every single room. Instead, it is recommended that smaller "Multi-sort" bin hubs (or similar equivalent) be established throughout the floors in the storerooms and common spaces to service the smaller rooms as necessary. This encourages students using the spaces to remove any waste they have and place it in the appropriate bin at the nearest hub – such a practice should promote recycling by giving users the choice of stream to dispose material into, and also reduce the time taken for cleaners to empty the bins.

Figure 15 – Level 01 waste systems locations

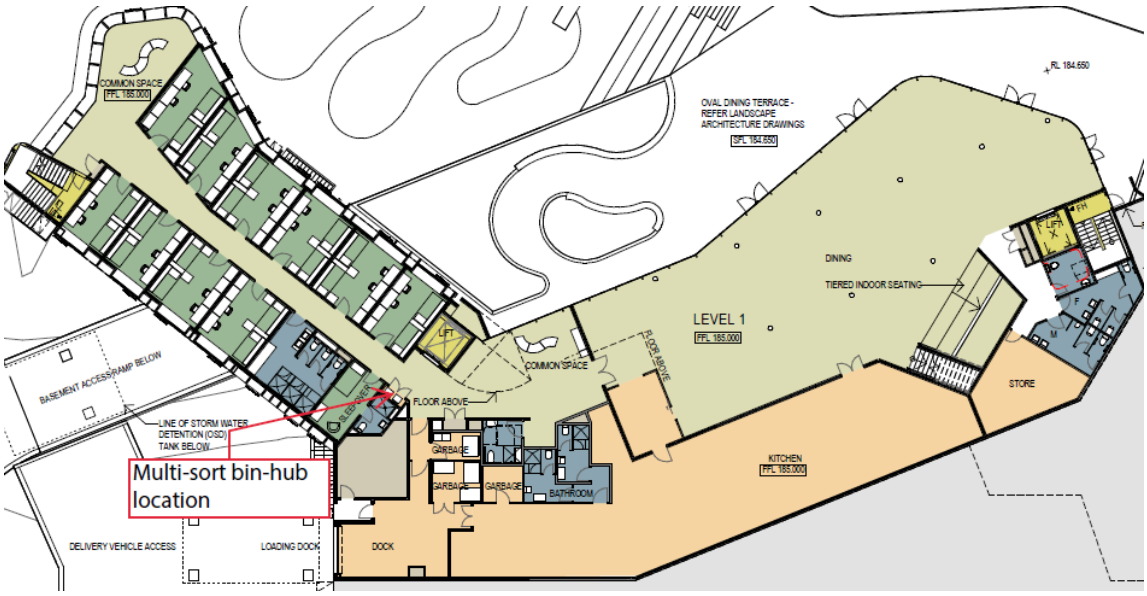



Figure 16 – Level 02 waste system locations

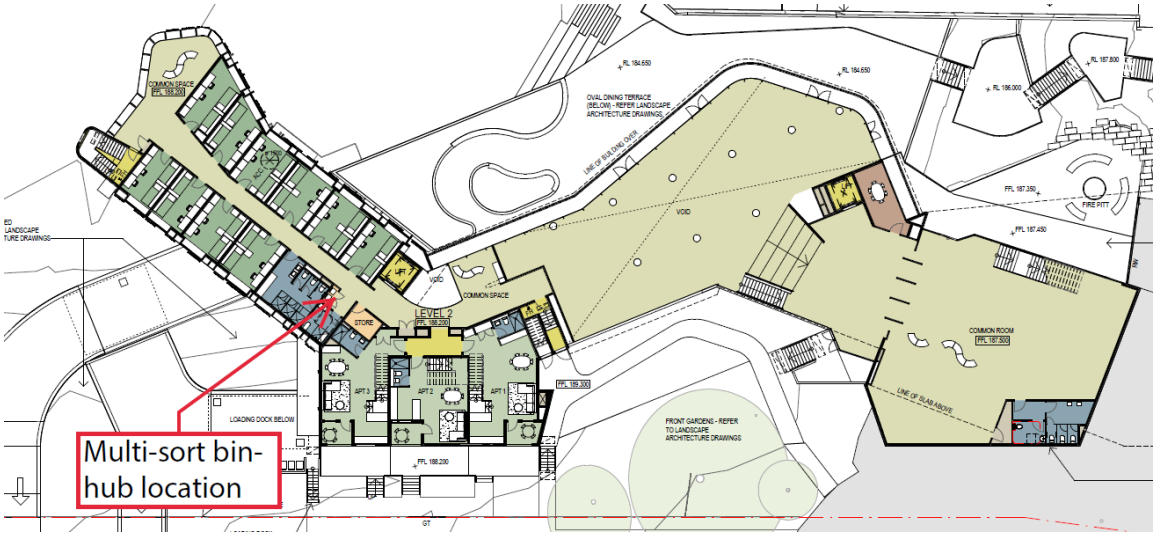


Figure 17 – Level 03 waste system locations

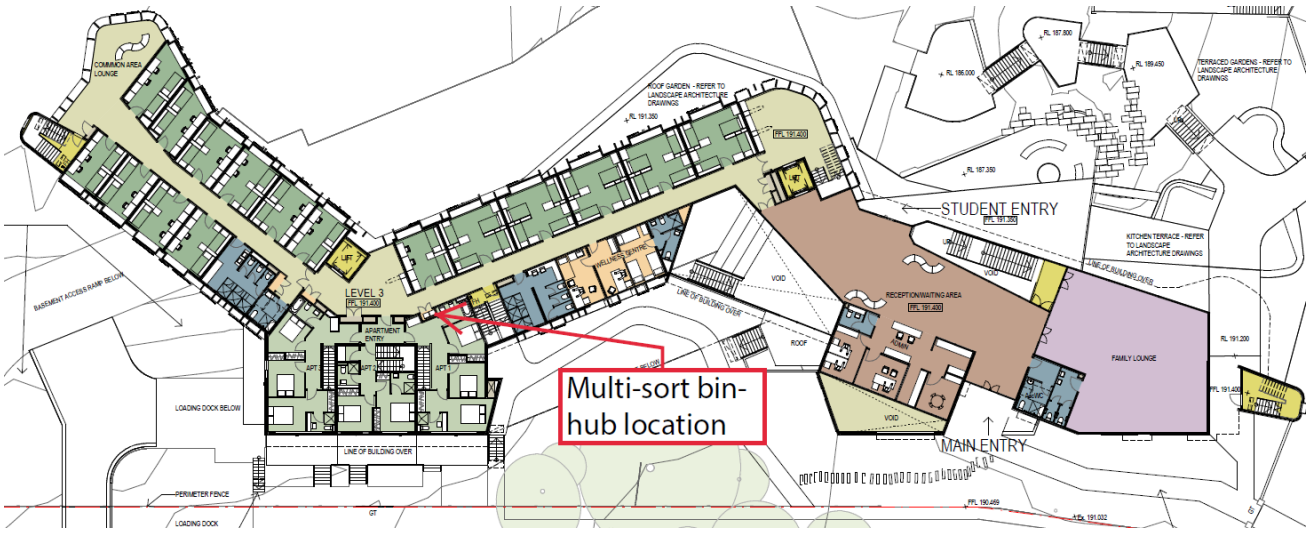



Figure 18 - Level 04 waste system locations

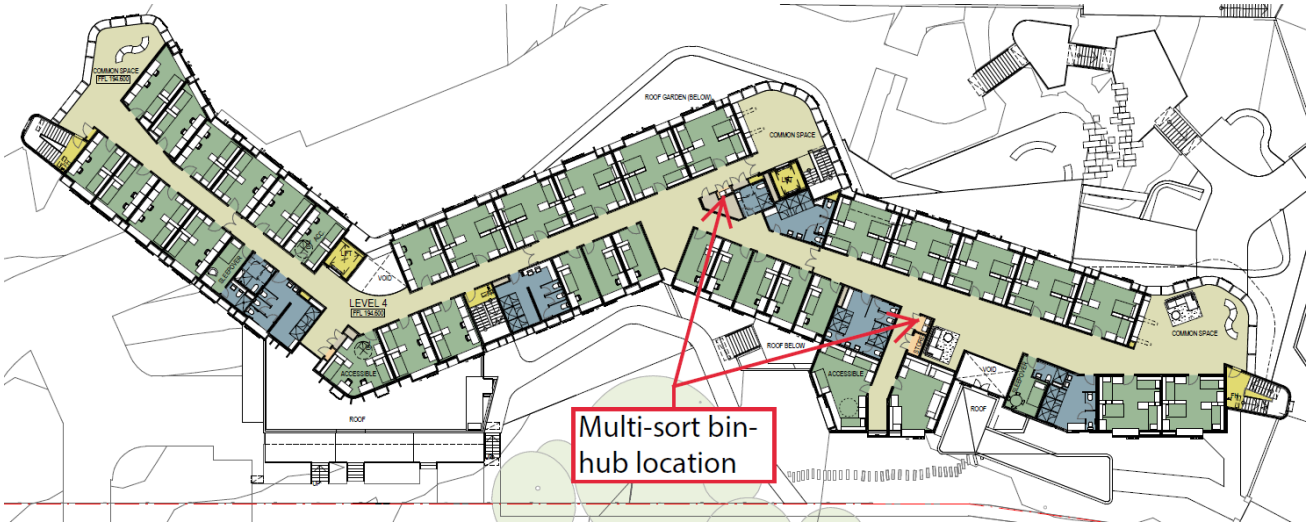
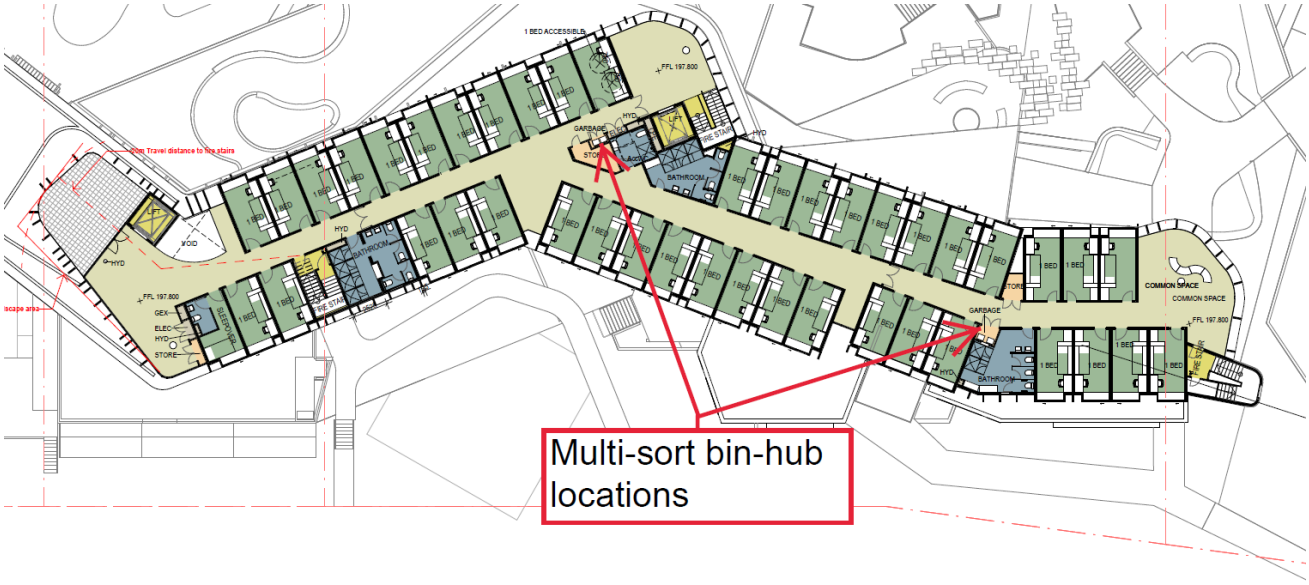


Figure 19 - Level 05 waste system locations




It should be noted that if additional bin-hubs are required they can be setup along walls in the suitable areas as depicted in the figures below.

Cleaners/facilities management will empty waste and recycling into trolley (see appendix) and then transfer to main waste storage area via the lifts to be disposed into the larger bins for collection.

Figure 20 depicts a bin hub that would be best suited for common areas

Figure 20 –Multi-sort bin hubs


Supplier information for the alternative bin hubs shown above can be found at the following link:

https://methodrecycling.com/au/products

## 11.1 Waste Stream Collection Practices

Table 10 outlines the cleaners and boarding house operational staff collection practices for each waste stream.

Table 10 - Collection Practices

| Waste Stream | Collection Practices |
|---|---|
| Paper/cardboard recycling (Kitchen only) | 1. Cleaners/Kitchen staff empty bin hubs into the paper/cardboard bins in the waste storage area as required at the end of each day.<br>2. Where possible, bulky cardboard (e.g. from deliveries) should be taken directly to the waste storage area and placed into the bins provided<br>3. Bins are to be transferred to the dock ready for collection by kitchen staff/campus maintenance staff |
| Comingled Recycling | 1. Cleaners/Loreto Normanhurst staff empty bin hubs into the MGB co-mingled bin(s) in waste storage area as required at the end of each day.<br>2. Bins are to be transferred to the dock ready for collection by Loreto Normanhurst staff/campus maintenance staff |
| Organics (Kitchen Only) | 1. Kitchen staff are to dispose of organics into the liquid food composter within the kitchen.<br>2. With assistance from staff, the organic waste can then be managed by students participating in onsite compost programs. |
| General Waste | 1. Cleaners/Loreto Normanhurst staff to empty general waste from bin hubs into the general waste bins in the waste storage area as required at the end of each day.<br>2. Bins are to be transferred to the dock ready for collection by Loreto Normanhurst staff/campus maintenance staff |

It is recommended that boarding house staff take their own personal waste directly to their designated waste room within the loading dock in an attempt to keep it completely separate from student waste.

# 12. Operational Monitoring and Performance

## 12.1 Ongoing Monitoring and Review

It is recommended that ongoing monitoring of the waste and recycling program be conducted by operations staff. The appointed waste contractor and cleaning contractor should be required to meet quarterly with operations staff to ensure all stakeholders are continuously working towards best practice.

The review process incorporates the following elements:

- Cleaners, managers and drivers regularly making note of any contamination in recycling streams and providing feedback to staff for them to address as appropriate.
- Waste contractor reports and invoices be reviewed and analysed on an ongoing basis to ensure the reported data and invoiced costs are reflective of onsite practices and performance.

## 12.2 Recycling Performance Targets

With the implementation of the recycling streams proposed in this plan, the boarding house will be equipped to capture the available recyclables generated from onsite operations. It is strongly recommended that all future recycling initiatives be focused on the continued effective capture of the common recyclables.
To sustain and improve performance, a three-year recycling target has been proposed based on achievable outcomes, which allows for progressive improvements to be made to the waste program each year.

The table below outlines an achievable target progression.

Table 11 - Year-on-year target progression

| | Year 1 | Year 2 | Year 3 |
|---|---|---|---|
| Recovery Target | 20% | 30% | 40% |
| Primary focus | Paper/cardboard and co-mingled capture | Staged roll-out of organics to limited, managed areas | Potential complete rollout of organics to all possible food generating areas |

These targets are provided as a conservative guide which should be reviewed and adjusted in light of actual onsite practices once operational. Greater diversion opportunities may be available to facility management.

# CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLAN

# 13. Introduction

This Construction and Demolition Waste Management Plan has been prepared by Foresight Environmental on behalf of Loreto Normanhurst (the 'Applicant'). The plan details the way in which the proposed developments:

- Construction of a new 3 to 6-storey boarding house
- Demolition works to buildings between Mary Ward and existing dining room building

will manage the waste and recycling generated during the demolition and construction phases of the development.

# 14. Waste Generation Estimate

The aim of this Plan is to ensure that all waste resulting from construction and demolition activities is managed in an effective and environmentally aware manner. Specifically,

- To maximize the reuse and recycling of demolition and construction materials
- To reduce the volume of materials going to landfill
- To maximise waste material avoidance and reuse on site
- To ensure that where practicable, an efficient recycling procedure is applied to waste materials
- To ensure efficient storage and collection of waste

The quantity of waste materials to be generated onsite are estimates based on the information provided to Foresight Environmental and therefore the systems that will be put in place need to incorporate flexibility to allow for variation in the total quantities generated.

## 14.1 Demolition

The testing and classification of any excavated material is not covered in this report. Where necessary separate specialist testing should be conducted by the project managers.

If acid sulphate soils are present on site, a separate management plan will need to be prepared for handling and disposal of such soil.

The tables below detail the estimated composition by area or volume of demolition waste to be generated.

Table 12 – Boarding House composition of demolition waste by volume

| Material | $M^3$ |
|---|---|
| Concrete | 110.00 |
| Bricks | 85.80 |
| Residual Mixed Waste | 27.50 |
| Carpet | 11.00 |
| Metal | 10.50 |
| Tiles | 9.80 |
| Plasterboard | 6.60 |
| Glazing | 1.46 |
| **Total** | **262.66** |

Table 13 – Mary Ward and existing dining room building composition of demolition waste by volume

| Material | $M^3$ |
|---|---|
| Bricks | 134.00 |
| Concrete | 60.00 |
| Plasterboard | 30.00 |
| General Residual | 15.00 |
| Carpet | 10.00 |
| Tiles | 6.00 |
| Glazing | 2.00 |
| **Total** | **257.00** |

## 14.2 Construction

Active site management during the construction phase will ensure all waste/recyclable materials are disposed of appropriately and that all waste receptacles are of sufficient capacity to manage onsite activities.

The tables below detail the estimated composition by area or volume of construction waste to be generated.

Table 14 – Boarding House composition of construction waste by volume

| Material | $M^3$ |
|---|---|
| Fill/excavation | 10,158.00 |
| General residual | 72.00 |
| Tiling | 43.75 |
| Concrete | 40.44 |
| Carpet | 25.29 |
| Brick | 14.56 |
| Metal | 5.84 |
| Plasterboard | 5.34 |
| Paint | 2.79 |
| Insulation | 2.72 |
| Waterproof | 0.89 |
| Glazing | 0.61 |
| Vinyl | 0.43 |
| Timber | 0.19 |
| **Total** | **10,372.84** |

# 15. Waste Management Strategy

Consideration of waste management during all phases of the development will provide the best opportunity to minimise the volume of waste generated throughout the project's lifetime. Whilst recycling and reuse of materials are important aspects of waste management, waste minimisation techniques incorporated into construction and demolition can prevent materials from being brought onto the site that will eventually become waste. The following waste hierarchy will be used as a guiding principle:


The construction and demolition team will implement this Waste Management Plan, incorporating the following best practice management techniques as a minimum:

## 15.1 Avoid and Reduce

Minimise the production of waste materials in the construction process by

- Assessing and taking into consideration the resultant waste from different design and construction options
- Purchasing materials that will result in less waste, which have minimal packaging, are pre-cut or fabricated. Where possible, arrange for packaging to be removed by the delivery company

- Not over ordering products and materials
- Ordering materials cut to size to reduce waste material onsite

## 15.2 Reuse

Ensure that where ever possible, materials are reused either on site or offsite

- Identify all waste products that can be reused
- Any demolition and excavation materials should be salvaged and retained onsite for re-use where possible
- Put systems in place to separate and store reusable items
- Identify the potential applications for reuse both onsite and offsite and facilitate reuse

## 15.3 Recycling

Identify all recyclable waste products to be produced on site

- Provide systems for separating and stockpiling of recyclables
- Provide clear signage to ensure recyclable materials are separated
- Process the material for recycling either onsite or offsite

Note: In some cases, it may be more efficient to send the unsorted waste to specialised waste contractors who will separate and recycle materials at an offsite location.

## 15.4 Disposal

Waste products which cannot be reused or recycled will be removed and disposed of. The following will need to be considered:

- Ensure the chosen waste disposal contractor complies with OEH requirements
- Implement regular collection of bins
- Maintain records of both recycled and general waste volumes being transferred offsite or reused onsite.
- The only materials to be sent to landfill are those that cannot be recycled due to contamination, legal requirements or lack of facilities to enable recycling.

# 16. Waste Management Systems

## 16.1 Onsite and Offsite Systems

Onsite separation of the various waste streams is encouraged to lower recycling costs so to avoid additional fees for sorting at appropriate facilities. However, it is highly unlikely that each stream will be separated and thus will need to be processed offsite for recycling. Those streams that may be hard to individually separate will be treated as "residual mixed waste".

The following tables combine the estimated volumes for each component of the development as the recycling practices are to be replicated during each respective phase.

### 16.1.1. Demolition

Table 15 – Waste management systems (demolition)

| Material | Estimated volume ($m^3$) | Onsite (re-use or recycle) | Offsite (recycling contractor) |
|---|---|---|---|
| Concrete | 170.00 | Crushed for road base where possible | Removed from site as required for recycling/reuse at C&D facility for processing. |
| Bricks | 219.80 | | |
| Carpet | 21.00 | | Stockpiled and collected as required by carpet supplier for recycling contractor |
| Metal | 10.50 | | Stockpiled and collected as required by specialty metal recycler or taken to appropriate C&D facility for separation and recycling |
| Tiles | 15.80 | | Collected by contractor to be sorted and re-processed at an appropriate C&D recycling facility into recycled products where possible |
| Residual Mixed Waste | 42.50 | | |
| Plasterboard | 36.60 | | |
| Glazing | 3.46 | | |

### 16.1.2. Construction

Table 14 details the expected waste materials and management systems for the construction phase of the project.

Table 16 – Waste management systems (construction)

| Material | Estimated volume ($m^3$) | Onsite (re-use or recycle) | Offsite (recycling contractor) |
|---|---|---|---|
| Fill + contaminated fill* | 10,158.00 | Suitable soil to be reused or remediated (capped) where appropriate for onsite landscaping/fill | All surplus fill will be taken offsite to suitable C&D facility for processing/reuse |
| Concrete | 40.44 | Crushed for road base | Separated where possible and taken to concrete recycling facility – deposited onsite directly into skips or trucks to be removed from site. |
| Brick | 14.56 | | |
| Tiling | 43.75 | | |
| Carpet | 25.29 | | Stockpiled and collected as required by carpet supplier for recycling contractor |
| Metal | 5.84 | | Stockpiled and collected as required by specialty metal recycler or taken to appropriate C&D facility for separation and recycling |
| Plasterboard | 5.34 | | Stockpiled onsite and collected by plasterboard supplier/recycler or taken to appropriate recycling facility |
| Residual Mixed Waste | 79.63 | | Collected by contractor to be sorted and re-processed at an appropriate C&D recycling facility into recycled products where possible |
| Paint | | | |
| Insulation | | | |
| Waterproof | | | |
| Glazing | | | |
| Vinyl | | | |
| Timber | | | |

*refer to 16.4 of this report for specific details about contaminated fill.

Note: The quantities of construction and demolition waste materials have been estimated using industry guides for predicting waste quantities[1]. The figures in Tables 13 and 14 above are estimates and are used as a guide for designing the waste management systems on site. These figures will be adjusted according to the final building material selection and quantities. The waste management systems will be adjusted as necessary.

It should be noted that there are multiple offsite recycling/disposal facilities available for the appropriate processing of the materials detailed above and the facility choice will depend largely on the waste contractor/supplier engaged. See section 17.

## 16.2 Waste Storage and Collection

A designated waste storage area will be established for the collection of all waste and recyclables. The waste storage area shall have appropriate signage to clearly identify the area to construction workers and to prevent unauthorised access to the area.

Stockpile size should be minimised by regular removal of waste from site and construction staging plans must allow for the waste storage area to move within the site as the development progresses.

The construction waste storage area does not have to be enclosed. However, containers should be covered where possible to prevent transmission of dust and fine particles, odour, wind impacts, vermin and vandalism or theft. Containers will be stored on a hardstand area with appropriate sediment control measures implemented to mitigate run-off into stormwater. Any spillages in the waste storage area should be treated immediately using a spill kit. Contaminated or hazardous wastes should be stored in a secure area with appropriate signage.

## 16.3 Site waste control and management

To ensure adequate site environmental standards are maintained, is recommended that the following controls be implemented and enforced by the proponent:

1. All waste generated during the project is assessed, classified and managed in accordance with the "Waste Classification Guidelines Part 1: Classifying Waste" (DECCW, December 2009)

[1] McGregor Environmental Services (2000) Predicting C&D waste quantities in the Inner Sydney Waste Board Waste Planning Guide for Development Applications-Planning for Less Waste (1998) NSW Waste Boards

2. The body of any vehicle or trailer, used to transport waste or excavation spoil from the premises, is covered before leaving the premises to prevent any spill or escape of any dust, waste or spoil from the vehicle or trailer
3. Mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer or motorized plant leaving the site, is removed before the vehicle, trailer or motorized plant leaves the premises.

## 16.4 Hazardous Wastes

During any demolition and material recovery activities, contractors should beware of potentially hazardous materials. Hazardous construction materials should be disposed of in accordance with EPA guidelines in order to protect the environment and personnel. In order to avoid risk to the environment and any breach of legislation this development endeavours to uphold the following practices:

- Early identification and reporting of hazardous waste
- Reporting of any suspicious activities of involved stakeholders (waste generator, transporter or receiver) to including handling waste unlawfully or illegally dumping waste through the Environment Line on 131 555.
- Ensure waste is transported to a place that can lawfully accept it under Section 143 of the Protection of the Environment Operations Act 1997.
- Take all reasonable precautions and exercise due diligence at all times to prevent/minimise commission of any offence.
- Keep accurate written records such as:
    - who transported the waste (company name, ABN, vehicle registration and driver details, date and time of transport, description of waste)
    - copies of waste dockets/receipts from the waste facility (date and time of delivery, name and address of the facility, its ABN, contact person).

## 16.5 Contracts and Purchasing

Each subcontractor working on the site will be required to adhere to this Waste Management Plan.

The Head Contractor will ensure each subcontractor:

- Takes practical measures to prevent waste being generated from their work
- Implements procedures to ensure waste resulting from their work will be actively managed and where possible recycled, as part of the overall site recycling strategy or separately as appropriate

- Ensures that the right quantities of materials are ordered, minimally packaged and where practical pre fabricated. Any oversupplied materials are returned to the supplier
- Implements source separation of off cuts to facilitate reuse, resale or recycling.

The Site Manager will be responsible for:

- Ensuring there is a secure location for on-site storage of materials to be reused on site, and for separated materials for recycling off site.
- Ensuring all skips/bins/stockpiles are clearly labelled identifying which material is suitable for each receptacle
- Engaging appropriate waste and recycling contractors to remove waste and recycling materials from the site
- Co-coordinating between subcontractors, to maximise on site reuse of materials
- Monitoring of bins on a regular basis by site supervisors to detect any contamination or leakage
- Ensuring the site has clear signs directing staff to the appropriate location for recycling and stockpiling station/s. And that each bin/skip/stockpile is clearly sign posted
- Providing training to all site employees and subcontractors in regards to the WMP as detailed in section 16.6 below.
- Should a subcontractor cause a bin to be significantly contaminated, the Site Manager will be advised by a non-conformance report procedure. The offending subcontractor will then be required to take corrective action, at their own cost. The non-conformance process would be managed by the Head Contractors' Quality Management Systems
- Retaining demolition and construction waste dockets to confirm and verify which facility received the material for recycling or disposal.

## 16.6 Training and Education

All site employees and sub contractors will be required to attend a site specific induction that will outline the components of the WMP and explain the site specific practicalities of the waste reduction and recycling strategies outlined in the WMP.

All employees are to have a clear understanding of which products are being reused/recycled on site and where they are stockpiled. They are also to be made aware of waste reduction efforts in regards to packaging.

The site manager will post educational signage in relation the recycling activities on site in breakout areas, lunch rooms etc.

# 17. Waste Facilities

The following waste recycling facilities provide disposal options within reasonable distance to the project. It is the responsibility of the site manager to ensure that the chosen facilities can accept the material being sent to it.

## Genesis Alexandria

| Contact | Materials Accepted |
|---|---|
| 76 Burrows Rd<br>Alexandria NSW<br>http://www.dadi.com.au/ | • Solid Fill – Soil<br>• Concrete<br>• Bricks<br>• Plasterboard |

## Bingo Recycling Centre - Banksmeadow

| Contact | Materials Accepted |
|---|---|
| 38 McPherson St<br>Banksmeadow NSW<br>https://www.bingoindustries.com.au/recycling-centres/nsw/banksmeadow/ | • Aluminium Scrap, Iron & Steel, Other Metals<br>• Solid Fill – Soil, Garden Cuttings<br>• Concrete<br>• Bricks |

Note that this facility might not accept steel

## Sydney Transwaste Industries

| Contact | Materials Accepted |
|---|---|
| 160 Arthur St<br>Homebush West NSW 2141<br>http://www.transwaste.com.au/ | • Solid Fill – Soil<br>• Concrete<br>• Scrap Metal<br>• Vegetation<br>• Bricks |

# 18. Appendix

## 18.1 Bin System Dimensions

Figure 21 - 240L MGB Dimensions

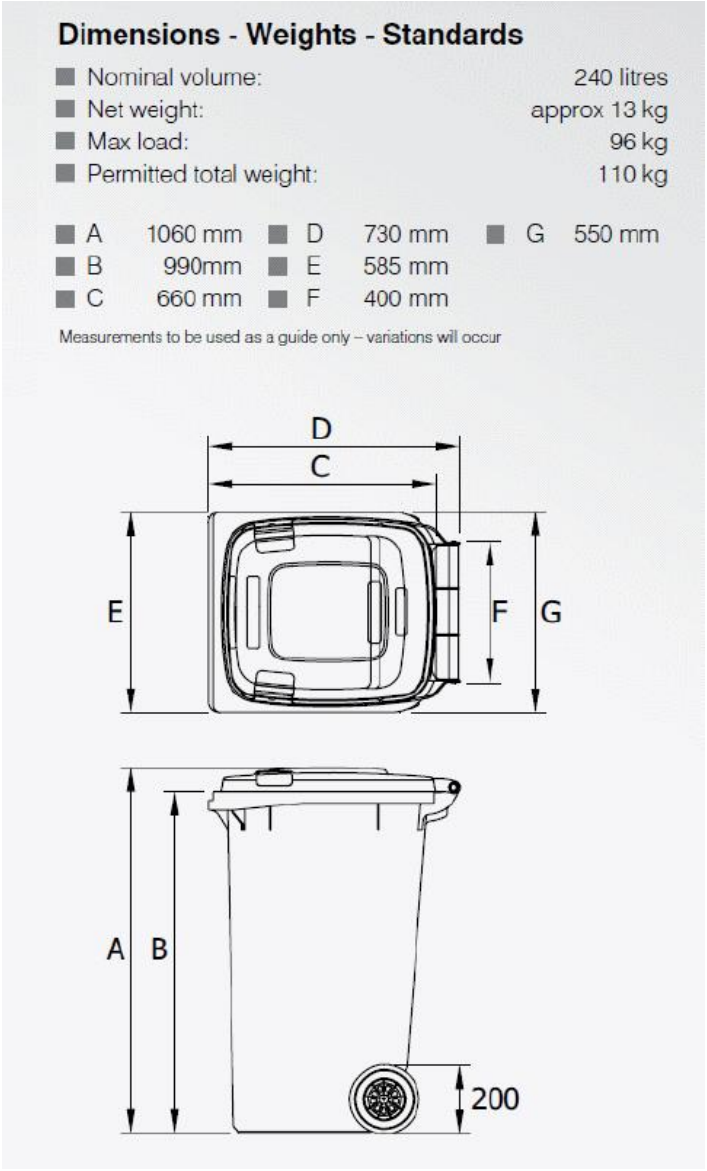


Figure 22 - 660L MGB Dimensions

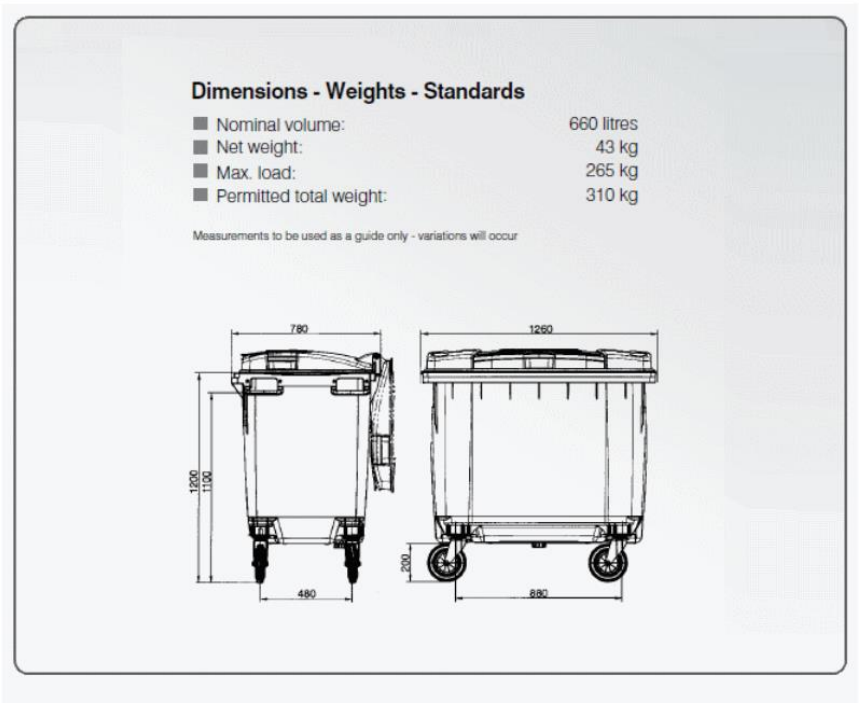
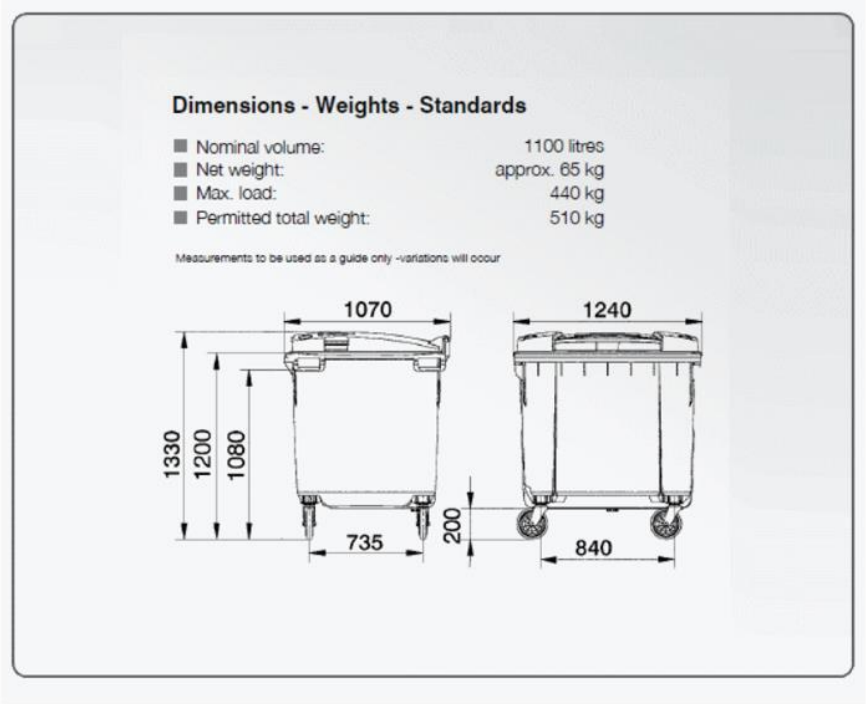



Figure 23 - 1,100L MGB Dimensions



## 18.2 Multi-sort Trolley Transport

Figure 24 - Examples of segregated cleaner trolleys to transfer waste from bin hubs to waste storage areas