4-10 Inman Road, Cromer: Waste Management Plan

A submission to SBA Architects Pty Ltd

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Disclaimer

Glossary

Terminology	Description
AS	Australian Standard
C&D	Construction and Demolition
DCP	Development Control Plan
ENM	Excavated Natural Material
EPA	Environment Protection Authority
LGA	Local Government Area
MGB	Mobile Garbage Bin
MSW	Municipal Solid Waste
MUD	Multi-Unit Dwelling
NBC	Northern Beaches Council
WDCP	Warringah Development Control Plan 2011
WLEP	Warringah Local Environmental Plan 2011
WMP	Waste Management Plan
WSP	Waste Service Provider
WSRA	Waste Storage and Recycling Area

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1 Introduction

MRA Consulting Group (MRA) was engaged by SBA Architects Pty Ltd (SBA), to prepare a Waste Management Plan (WMP) for a proposed industrial development consisting of industrial warehouse units, office spaces, and a cafe (hereafter referred to as "the Site"), located at 4-10 Inman Road, Cromer and situated in the Northern Beaches Council Local Government Area (LGA). The proposed development to include:

- Demolition of existing industrial warehouses and associated infrastructure;
- Construction of two new industrial buildings featuring:
    - Building 1 composed of 9 industrial units with ancillary office space attached; and
    - Building 2 composed of 2 industrial units with ancillary office space attached.
- Basement parking and self-storage units; and
- Ancillary facilities and infrastructure.

This WMP addresses the requirements of the Consent Authority (Council) and conforms to the following reference documents:

- *Warringah Local Environmental Plan (WLEP) 2011; and*
- *Warringah Development Control Plan (WDCP) 2011.*

Consideration has also been given to the following supplementary documents in the preparation of this WMP:

- *Better Practice Guide for Resource Recovery in Residential Developments (NSW EPA, 2019).*

This WMP has been prepared to inform the development design and assist in the delivery of better practice waste management, promoting sustainable outcomes at the demolition, construction, and operational phases for the development. The WMP addresses waste generation and storage associated to the excavation, construction and ongoing occupation of the proposed development.

The WDCP lists the following objectives related to waste management, which have each been addressed in this WMP:

- To facilitate sustainable waste management in a manner consistent with the principles of Ecologically Sustainable Development (ESD).
- To achieve waste avoidance, source separation and recycling of household and industrial/commercial waste.
- To design and locate waste storage and collection facilities which are convenient and easily accessible; safe; hygienic; of an adequate size, and with minimal adverse impacts on residents, surrounding neighbours, and pedestrian and vehicle movements.
- To ensure waste storage and collection facilities complement waste collection and management services, offered by Council and the private service providers and support on-going control for such standards and services.
- To minimise risks to health and safety associated with handling and disposal of waste and recycled material and ensure optimum hygiene.
- To minimise any adverse environmental impacts associated with the storage and collection of waste.
- To discourage illegal dumping.

This WMP addresses the waste generation and waste flows for the design of the facilities, ongoing management of waste on-site and fully addresses the WDCP requirements.

2 Background

2.1 Description of Proposed Development

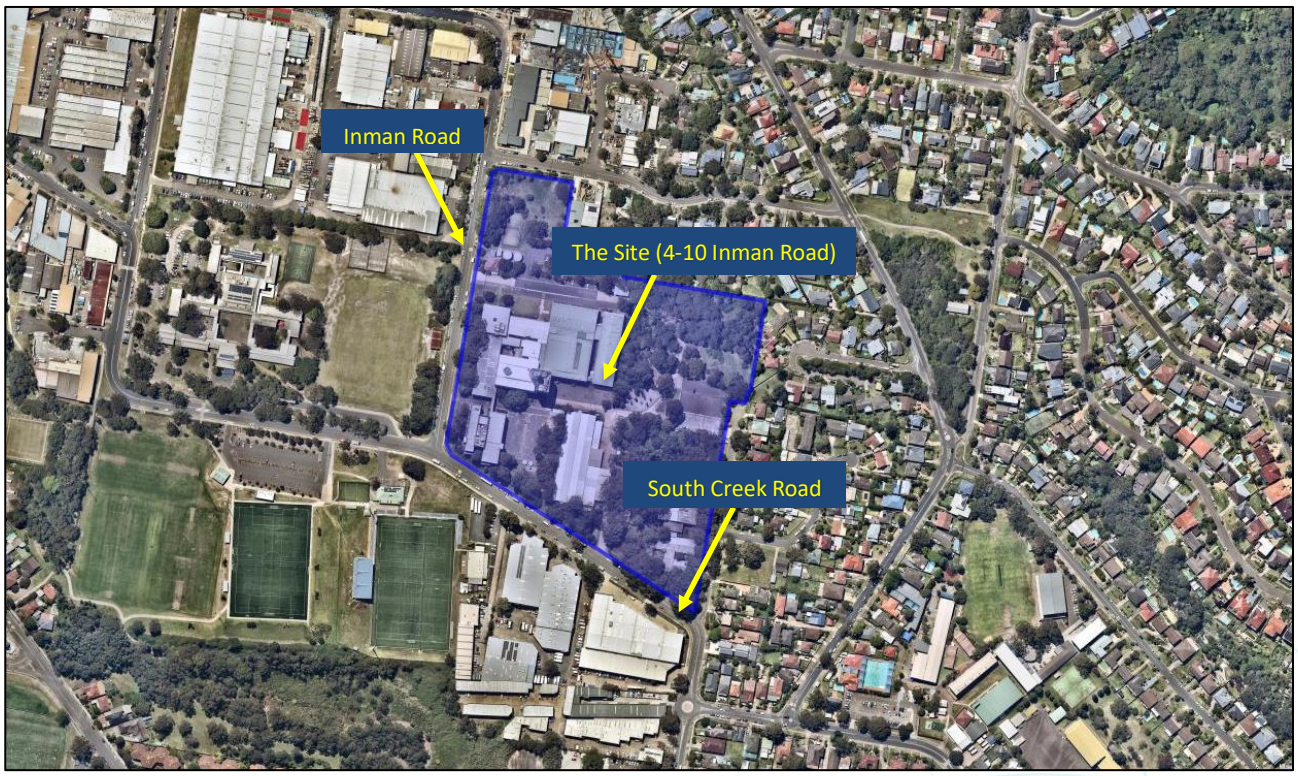
The proposed development is an industrial development of multi-unit industrial sheds, office space and a café. The proposed units located on a site of are sized between 1,020m^2 and 3,396m^2, including at least 150m^2 of office space for each industrial unit. In total, the proposed development will include 11 industrial units, office space, and one café.

The Site is occupied by existing industrial warehouses which will require demolition prior to commencement of the proposed development. All construction and demolition activities will be managed by the construction and demolition contractor. This report will address the expected waste to be generated as part of the construction and demolition activities, as well as operational waste management requirements.

2.2 Location

The development site is located in the suburb of Cromer, situated in the former Willoughby Council area, at 4-10 Inman Road (also referred to as 100 South Creek Road) (Figure 1). The existing development controls for Willoughby Council still apply pending a consolidated Northern Beaches Council DCP. The site is zoned IN1 (General Industrial) according to the Willoughby Local Environmental Plan (WLEP) 2012 and is surrounded by other industrial and residential land uses.

Figure 1: Proposed Development site at 4-10 Inman Road and surrounds



Source: Nearmap, 2019

2.3 Zoning and Use

The site is zoned as IN1 – General Industrial in the Willoughby Local Environment Plan (WLEP). Light Industry and Warehousing premises are permitted with consent in the IN1 zone, which is defined by the following objectives:

- To provide a wide range of industrial and warehouse land uses.
- To encourage employment opportunities.
- To minimise any adverse effect of industry on other land uses.
- To support and protect industrial land for industrial uses.
- To identify and preserve industrial land to meet the current and future general industrial needs of Willoughby and the wider region.
- To accommodate industrial development that provides employment and a range of goods and services without adversely affecting the amenity, health or safety of residents in adjacent areas.
- To permit land uses that serve the daily convenience needs of workers employed in the industrial area.
- To protect the viability of business zones in Willoughby by enabling development for the purpose of offices if they are ancillary to, and used in conjunction with, industrial, manufacturing, warehousing or other permitted uses on the same land.
- To improve the environmental quality of Willoughby by ensuring that land uses conform to land, air and water quality pollution standards and environmental and hazard reduction guidelines.
- To accommodate uses that, because of demonstrated special building or site requirements or operational characteristics, cannot be, or are inappropriate to be, located in other zones.

Currently, the site is occupied by offices and warehouses, with three interconnected office buildings and a heritage brick cottage to be retained for repurposing.

Zones surrounding the site include RE1 – Public Recreation, RE2 – Private Recreation, SP2 – Infrastructure, and R2 – Low Density Residential.

2.4 Strategies

Waste management for the site considers better practice, necessary equipment, and integration with other guidance documents including the NSW Waste and Avoidance and Resource Recovery Strategy (NSW EPA 2014), and National Waste Policy: Less Waste, More Resources (EPHC 2009). The key policy aims that are considered are:

- Avoidance (to prevent the generation of waste);
- Reduce the amount of waste (including hazardous waste) for disposal;
- Manage waste as a resource; and
- Ensure that waste treatment, disposal, recovery and re-use are undertaken in a safe, scientific and environmentally sound manner.

The site is subject to the Willoughby Development Control Plan (WDCP), including objectives and principles outlined in Section 1.

2.5 Assumptions

This report is a WMP, forming part of the development documentation and assumes:

- Drawings and information that have been used in waste management planning for this WMP are the final design set for the demolition plan and development plan from the project architect, SBA Architects (18th October 2019);
- Waste generation volumes are based on WDCP waste generation rates, and waste management equipment and infrastructure recommendations have been made according to estimated waste generation and WDCP waste guideline suggestions;
- This WMP is a living document and therefore, waste management equipment and systems described in this report are subject to change based on future operations and available technology.

3 Construction and Demolition Waste

Construction activities at the site will generate a range of wastes, commonly referred to as Construction and Demolition (C&D) waste. Throughout the development process, all materials generated on site will be reused and recycled where possible, minimising the disposal (landfilling) of materials other than those that are contaminated or unsuitable for reuse or resource recovery.

Waste storage of C&D waste during construction operations will involve stockpiling of excavated and reusable material, and placement of skip bins for separation of mixed C&D materials for recycling. A skip bin for residual waste or contaminated material will also be made available at the site for disposal where necessary. Skip bins may require alternative placement during construction operations as space becomes restricted, to facilitate safe and efficient storage of materials. Skip bins and stockpiles should be placed within property boundaries to avoid illegal dumping.

The quantities, densities and bulking factors for waste and recyclables will differ on site based on actual materials and handling practices employed. Demolition and excavation waste estimations have been addressed separately to construction waste estimations for the proposed development, to better inform resource recovery opportunities for waste material generated during each stage of the development.

C&D waste storage areas (potential location indicated in Appendix A, Figure 3) will be kept clear and tidy to maintain vehicular access, encourage separation of waste materials and for WHS reasons. Site waste management principles and facilities will be a focus for the induction of all construction or other contractors working at the site.

3.1 Demolition Waste

This section details the demolition waste materials expected for the proposed development, including their quantities and management options, and was designed with consideration of the requirements in the WDCP. The information below presents options for materials reuse, recycling and disposal where applicable (e.g. excavation material may be reused as a construction fill or disposed to landfill if contaminated). All materials are intended to be sent to a suitable, licensed landfill or resource recovery facility.

Table 1 below describes the expected demolition material quantities and appropriate management methods for the proposed development, related to the demolition or deconstruction of:

- Industrial warehouse units;
- Ancillary structures; and
- Removal of some vegetation.

Table 1: Estimation of demolition materials for reuse, recycling and landfill

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
Concrete	6,400m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: on-site for filling or under gravel carpark. C&D Processor: crushing and recycling for recovered products.
Bricks/pavers	930m^3	✓	✓	-	On site: cleaned and separated wherever possible for reuse or to enhance resource recovery. C&D Processor: recovery for reuse where possible, crushing and recycling for recovered aggregate products.
Timber	N/A	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. C&D Processor: recovery and recycling for recovered product (e.g. mulch) or organics processing.
Insulation material	420m^3	✓	-	-	Reuse: retuned to supplier or manufacturer for reuse.
Metal (ferrous and non-ferrous)	<10m^3	-	✓	-	On site: to be separated wherever possible to enhance resource recovery. C&D Processor: metals recovery and recycling.
Plasterboard	85m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: surplus and offcut material returned to manufacturer for reuse where possible or replacement for gypsum in landscaping.

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
Glass	<10m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: surplus and offcut material returned to manufacturer for reuse where possible. Aggregate for concrete production. Glass recycler: recovery and recycling.
Fixtures and fittings	<10m^3	✓	✓	-	Reuse: secondhand building materials. C&D Processor: recovery and recycling.
Floor coverings	230m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. C&D Processor: recovery and recycling.
Garden organics	20m^2	✓	✓	-	Garden organics resulting from the removal of vegetation and trees. Onsite: Woodchipped for use in landscaping. Organics Processor: storage on-site (from minor excavations) processing for recovered product.
Mixed Recyclables	<5m^3	-	✓	-	Commercial contractor: recycling of paper, cardboard and mixed material containers (plastic, metal, glass).
Residual waste	15m^3	-	-	✓	Separate recyclables where possible and disposal at principal licensed waste facility.
Hazardous/special waste (e.g. spills and contaminated wastes)	Unknown	-	-	✓	It is possible that asbestos bearing material may be disturbed or removed during demolition works.

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
					Appropriate management methods specified by a licensed asbestos and site hygienist should hazardous be found at the site.

3.2 Construction Waste Management

Works would include the construction of:

- Excavation of one basement level for carparking and self-storage;
- Construction of two buildings featuring a combined 11 industrial units and ancillary office space;
- Conversion of an existing brick cottage into a café near the site entrance on Inman Road;
- Internal access, parking and roadways; and
- Sitewide landscaping.

Table 2 below describes the estimated waste quantities and appropriate management methods for material types expected to be generated throughout construction.

The information below presents multiple options for materials reuse, recycling and disposal where applicable (e.g. return to manufacturer, recycled at construction and demolition (C&D) processor, or disposed to landfill if contaminated).

Table 2: Construction waste generation estimate.

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
Excavation material	43,000m^3	✓	-	-	On site: testing (if necessary) for contamination and stockpiling of material for reuse as fill material. C&D processor: reuse/recycling of VENM and ENM Landfill if contaminated.
Concrete	320m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. C&D Processor: crushing and recycling for recovered products.
Bricks/pavers	100m^3	✓	✓	-	On site: cleaned and separated wherever possible for reuse or to enhance resource recovery. C&D Processor: recovery for reuse where possible, crushing and recycling for recovered aggregate

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
					products.
Timber	<10m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: Surplus and offcut material returned to manufacturer for reuse. C&D Processor: recovery and recycling for recovered product (e.g. mulch) or organics processing.
Metal (ferrous and non-ferrous)	50m^3	-	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: Surplus and offcut material returned to manufacturer for reuse. C&D Processor: metals recovery and recycling.
Plasterboard	<10m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: Surplus and offcut material returned to manufacturer for reuse where possible or replacement for gypsum in landscaping.
Glass	<5m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: Surplus and offcut material returned to manufacturer for reuse where possible. Glass recycler: recovery and recycling.
Fixtures and fittings	<5m^3	✓	✓	-	On site: reuse wherever possible or return to manufacturer. Reuse: Surplus and offcut material returned to manufacturer for reuse where possible. C&D Processor: recovery and

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling and disposal
					recycling.
Floor coverings	<5m^3	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: Surplus and offcut material returned to manufacturer for reuse where possible. C&D Processor: recovery and recycling.
Packaging (used pallets, pallet wrap)	20m^3	✓	✓	-	Reuse: returned to manufacturer for reuse where possible. On site: to be separated wherever possible to enhance resource recovery. C&D processor: recycling of timbers and plastic.
Garden organics	<10m^3	✓	✓	-	Minimal garden organic waste from landscaping. Organics Processor: Storage on-site (from minor excavations) processing for recovered product (e.g. mulch or other blended recovered fines) or organics treatment.
Containers (cans, plastic, glass)	<5m^3	-	✓	-	Commercial contractor: recycling.
Paper/ cardboard	20m^3	-	✓	-	Commercial contractor: recycling of fibres with segregation of paper, cardboard or other streams.
Residual waste	50m^3	-	-	✓	Separate recyclables where possible and disposal at principal licensed waste facility.
Hazardous/ special waste (e.g. spills and contaminated wastes)	Unknown	-	-	✓	Appropriate management methods specified by a licensed asbestos and site hygienist should hazardous or special waste be found at the site.

3.3 Waste Contractors and Facilities

To ensure best practice waste management, appropriate contractors and facilities have been proposed based on their location and service offerings (Table 3).

Table 3: Waste service contractors and facilities

Role	Details
Recommended Waste Collection Contractor	The following are local skip bin operators for consideration in the management of excavation and construction waste for the site: • Brown Bros Skip Bins; • North Shore Skip Bins; • Ku-ring-gai Skip Bins; • Orange Skip Bins; and • Bingo Bins. Or another supplier as elected by the building contractor.
Principal Off-Site Recycler	The following are local C&D processing facilities for consideration in the management of C&D waste generated at the site: • Concrete Recyclers Terrey Hills, • SUEZ Belrose Resource Recovery Centre, • Benedict Recycling Belrose, or another appropriate facility as elected by the waste management contractor.
Principal Licensed Landfill Site	Kimbriki Resource Recovery Facility, or other appropriate facility as elected by the waste management contractor.

3.4 Site documentation

This WMP will be retained on-site during the demolition, excavation and construction phases of the development, along with other waste management documentation (e.g. contracts with waste service providers).

Responsibility for the WMP, waste documentation and processes during the excavation and construction phases will be with the site manager or builder.

A logbook that records waste management and collection will be maintained on site, with entries including:

- Time and date;
- Description of waste and quantity;
- Waste/processing facility that will receive the waste; and
- Vehicle registration and company name.

Waste management documentation, the logbook and associated dockets and receipts must be made available for inspection by an authorised Council Officer at any time during site works.

4 Operational Waste Management

Ongoing waste management requirements for the site will result of the daily operation of multiple industrial units (with ancillary office space), dedicated office space and a café. Waste storage and management areas will be separate for each of the separate site uses as identified in attached plans (see Appendix A). Waste storage areas for each tenancy will be made available within each industrial unit, with waste collection occurring entirely on site property, adjacent to tenancies for ease of management and handling.

The proposed development comprises of 11 industrial units each with ancillary office space. There will also be three office buildings retained from the original site development and a café which will service the entire site.

The recommended measures outlined in the NSW EPA (2019) *Better Practice Guide for Resource Recovery in Residential Developments* and the NSW EPA (2012) *Better Practice Guidelines for Waste and Resource Management in Commercial and Industrial Facilities.*

4.1 Estimated Waste and Recycling Generation

The WDCP outlines the following waste generation rates for the site-specific breakdown of commercial and industrial uses proposed for the site:

- Offices:
    - General waste: 10L/100m^2 floor space per day
    - Recycling: 10L/100m^2 floor space per day
- Warehouses:
    - General waste: 30L/100m^2 floor space per day
    - Recycling: 30L/100m^2 floor space per day
- Cafe:
    - General waste: 300L/100m^2 floor space per day
    - Recycling: 200L/100m^2 floor space per day

The waste volume calculation for both waste and recycling for the proposed development is shown below (Table 4).

Table 4: Site waste and recycling generation rates

Building	Site Use	Area (total m^2)	General Waste (L/day)	General Waste (L/week)	Recycling Waste (L/day)	Recycling Waste (L/week)
Cottage	Café	124	372L	1,860	248	1,240
Offices	Offices	3,179	318	1,590	318	1,590
1	Warehouse 1	1,045	313.5	1567.5	313.5	1567.5
1	WH Office 1	150	15	75	15	75
1	Warehouse 2	1,322	396.6	1983	396.6	1983
1	WH Office 2	150	15	75	15	75
1	Warehouse 3	1,491	447.3	2236.5	447.3	2236.5
1	WH Office 3	150	15	75	15	75
1	Warehouse 4	1,020	306	1530	306	1530
1	WH Office 4	150	15	75	15	75
1	Warehouse 5	1,020	306	1530	306	1530
1	WH Office 5	150	15	75	15	75
1	Warehouse 6	1,020	306	1530	306	1530
1	WH Office 6	150	15	75	15	75
1	Warehouse 7	1,020	306	1530	306	1530
1	WH Office 7	150	15	75	15	75
1	Warehouse 8	1,020	306	1530	306	1530
1	WH Office 8	150	15	75	15	75
1	Warehouse 9	1,020	306	1530	306	1530
1	WH Office 9	150	15	75	15	75
2	Warehouse 10	2,115	634.5	3172.5	634.5	3172.5
2	WH Office 10	250	25	125	25	125
2	Warehouse 11	3,396	1018.8	5094	1018.8	5094
2	WH Office 11	250	25	125	25	125

Office spaces and warehouse operations are expected to generate significant proportions of paper and cardboard recycling, and so the weekly recycling generation is divided equally into two streams: commingled recycling (plastic, glass, and metal), and paper and cardboard. The total weekly amount of waste for each building onsite will be:

- Café:
    - General waste: 1,860L
    - Commingled recycling: 620L
    - Paper and cardboard: 620L
- Office building:
    - General waste: 1,590L
    - Commingled recycling: 795L
    - Paper and cardboard: 795L
- Warehouse building 1:
    - General waste: 14,967L
    - Commingled recycling: 7,483.5L
    - Paper and cardboard: 7,483.5L
- Warehouse building 2:
    - General waste: 8,266.5L
    - Commingled recycling: 4,133.25L
    - Paper and cardboard: 4,133.25L

4.2 Waste Management Equipment

A range of bins will be utilised at the site for the management of different waste streams. It is expected that the site will make use of mobile bins and bulk bins (see Appendix B for bin specification), the dimensions of which are outlined as follows (Table 5 and

Table 6), according to the NSW EPA (2019) *Guidelines for Waste Management in New Developments.*

Table 5: Mobile garbage bin specifications

Bin Capacity	140L	240L	360L	660L	1,100L
Height (mm)	1,065	1,080	1,100	1,250	1,470
Depth (mm)	540	735	885	850	1,245
Width (mm)	500	580	600	1,370	1,370
Footprint (m^2)	0.27	0.43	0.53	1.16	1.71

Table 6: Bulk bin dimensions

Bin Capacity	1.5m³	2m³	3m³	4.5m³	6m³
Height (mm)	910	1,250	1,225	1,570	1,650
Depth (mm)	905	935	1,505	1,605	1,850
Width (mm)	1,800	1,800	1,800	1,800	2,000
Footprint (m²)	1.63	1.68	2.71	2.89	3.70

All bins will be in accordance with AS4123.7-2006 mobile waste containers – colour, markings, and designation requirements. Private bins shall be labelled to identify the waste generator and site address.

Bins will be serviced by the contracted WSP according to the agreed collection schedule upon commencement of operation.

4.3 Waste Storage Requirements

With consideration to the scale of the development and number of individual site uses, a separate waste management and storage area will be allocated for each industrial unit. The Site waste storage areas for each unit will be sized and located to accommodate necessary waste storage bins and other associated waste management equipment according to estimated site waste generation rates outlined in Section 4.1.

4.3.1 Waste Storage Requirements

Proposed waste storage requirements are based on the use of 1,100L mobile garbage bins which can be supplied and serviced by a range of private waste contractors (see Appendix D for bin specifications).

1,100L MGB's are recommended for storage of general waste, comingled recycling and paper & cardboard, based on the waste generation rates and available size of the waste storage area. 1,100L bins provide increased capacity in comparison to smaller MGB varieties, therefore reducing the required collection frequency and number of bins required to be retained on-site. Minimal manoeuvring will be necessary between the site waste storage room and the loading dock since they are situated adjacent.

Table 7 below outlines the bins required for each unit waste storage area and the relevant collection schedule for general waste and recycling respectively.

Table 7: Waste storage (1,100L bin) and collection (frequency) requirements

Building	Waste Stream	Volume (L)	Collection - 1/Week	Collection - 2/Week
Café	General Waste	1860	2	**1**
	Commingled	620	**1**	1
	Paper Cardboard	620	**1**	1
Office	General Waste	1590	2	**1**
	Commingled	795	**1**	1
	Paper Cardboard	795	**1**	1
Warehouse 1	General Waste	1642	2	**1**
	Commingled	820	**1**	1
	Paper Cardboard	820	**1**	1
Warehouse 2	General Waste	2058	2	**1**
	Commingled	1030	**1**	1
	Paper Cardboard	1030	**1**	1

Warehouse 3	General Waste	2311	3	**2**
	Commingled	1155	**2**	1
	Paper Cardboard	1155	**2**	1
Warehouse 4	General Waste	1605	2	**1**
	Commingled	800	**1**	1
	Paper Cardboard	800	**1**	1
Warehouse 5	General Waste	1605	2	**1**
	Commingled	800	**1**	1
	Paper Cardboard	800	**1**	1
Warehouse 6	General Waste	1605	2	**1**
	Commingled	800	**1**	1
	Paper Cardboard	800	**1**	1
Warehouse 7	General Waste	1605	2	**1**
	Commingled	800	**1**	1
	Paper Cardboard	800	**1**	1
Warehouse 8	General Waste	1605	2	**1**
	Commingled	800	**1**	1
	Paper Cardboard	800	**1**	1
Warehouse 9	General Waste	1605	2	**1**
	Commingled	800	**1**	1
	Paper Cardboard	800	**1**	1
Warehouse 10	General Waste	3230	3	**2**
	Commingled	1650	**2**	1
	Paper Cardboard	1650	**2**	1
Warehouse 11	General Waste	5220	5	**3**
	Commingled	2610	**3**	2
	Paper Cardboard	2610	**3**	2

Note: option highlighted bold represents recommended collection frequency for each unit.

Individual tenancies will be responsible for retaining smaller internal bins for each relevant waste stream which can then be emptied into larger bins for collection as necessary. Internal bins should be retained in the café, offices, industrial units (on the industrial floor) and any other areas where waste will be generated in large quantities without direct access to the waste storage area.

These are calculated assumptions and actual requirements will be dependent on the waste generated by the associated stores once operation has commenced. With the presence of food in the waste, more frequent collections may be required to prevent odour.

4.3.2 Café Food Waste Generation

It is expected that of the general waste stream for the proposed café use, a substantial proportion of this waste is likely to be food. Refer to Section 4.6.4 for more information on food waste management.

4.4 Bulky Waste Management

Site tenancies are expected to generate some bulky waste items (fit-out, whitegoods, etc), including items that would be returned to suppliers from deliveries (such as pallets, crates, etc). Additional space for the storage of bulky waste items will be available for each tenancy, nearby the bin storage areas.

Bulky waste will be serviced as required and can be organised between the site operator and individual tenancies. Bulky waste collection vehicles will be similar in size to those that will provide waste collection for general waste and recycling and therefore, no additional access considerations are likely to be necessary for bulky waste collection access.

4.5 Additional Waste Streams

Management may like to include the following collection systems to increase resource recovery onsite.

4.6.1 Container Deposit Scheme (CDS) eligible materials

Recyclable containers eligible for the NSW EPA's "Return and Earn" container deposit scheme can be collected separately to commingled recycling. Reverse Vending Machines (RVMs) accept these containers and issue refunds through retail vouchers (to spend or swap for cash), online into a PayPal account, or donated to a selected charity.

There are a few options to achieve CDS material recovery – a sorting machine can be purchased with the assistance of the EPA BinTrim equipment rebate program. This covers up to 50% of capital machinery costs up to $50,000. This option also allows users to directly collect or donate their refund.

Otherwise, a separate bin can be used to collect CDS materials which will be collected by a service provider such as St George Recyclers. This is a free collection services with the refund paid out via bank transfer to the organisation. St George Recyclers will either provide a blue bin ($59 fee for delivery within 14 days) or are able to collect CDS materials contained in garbage bags.

The location of either the RVM or CDS material bin can be in a public area for use by staff and visitors.

4.6.2 E-Waste Collection

An E-waste collection service can be organised for the development. This can be either an on-call service or scheduled collection depending on the need.

4.6.3 Soft Plastics

Soft plastics cannot be placed in kerbside recycling bins; however, they can still be diverted from landfill. Management can engage a waste service such as Cleanaway to collect soft plastic waste.

4.6.4 Food Waste Collection

High volumes of food waste may result from operation of any food and beverage tenancies in the lower ground retail spaces. Food waste going to landfill is a source of damaging greenhouse gases and diverting this waste stream from landfill would not only prevent this, but also reduce costs associated with general waste bin lifts. Many facilities exist in and around Sydney that process food organics waste, producing compost and in some cases electricity (via biogas) while also diverting food waste from landfill. This service would be scheduled at minimum three times a week.

4.6.5 Food Donation

Management may like to explore the potential for donation of excess consumable food from the café to charities such as OzHarvest or FoodBank NSW.

4.6.6 Problem Wastes

Cooking oil, light globes, paint tins, and cleaning chemicals are all examples of problem wastes which are unable to be disposed of through typical general waste or recycling services. Wastes such as these are to be stored separately from general waste and recycling bins. Liquid waste should be stored in an undercover, bunded area which mitigates the risk or spills or leaks and prevents runoff to stormwater drains. Some cooking oil suppliers will also collect used oil when swapping empty barrels as part of their service.

4.7 Waste Management Equipment

Management may like to incorporate some of the following equipment options to reduce waste volumes and divert waste streams from landfill.

4.7.1 General Waste Compactor

Compaction units can be utilised to reduce the number of bins retained onsite. Sizes of compactors and compaction ratios can vary. Sizes can range from individual 240L bin presses, to larger hopper fed compactors.

Management may like to consider compaction as a means of reducing bin storage requirements and/or consolidate waste collection to a designated area at the site for all tenancies (see Table 8 below).

Table 8: Compactor unit specifications

Service Provider	Compactor Capacity	Compactor Dimensions (m)*	Vehicle access (m)	Vehicle height in operation (m)	Vehicle length in operation (m)	Vehicle turning circle (m)
J.J. Richards	23m^3	6.8 (l) x 2.3 (w) x 3.2 (h)	10 (l)x 3.2 (w) x 4.1 (h)	5.2	17.1	25
Suez	23m^3	7 (l)x 2.5 (w) x 2.5 (h)	10 (l) x 3.2 (w) x 4 (h)	6	21	25
Veolia	23m^3	6.5 (l) x 2.4 (w) x 2.3 (h)	10 (l) x 3.2 (w) x 4 (h)	3.8 to pull on compactor 14 to service compactor height	20.5	25
Cleanaway	23m^3	6.9 (l) x 2.4 (w) x 1.92 (h)	10 (l) x 3.2 (w) x 3.8 (h)	7.1	16.5	22.1

** Additional 2m of width and 2m of length will be required if the compactor is fitted with bin lifter.*

Note: Above list is indicative only and is not exhaustive.

It is important to follow manufacturers advice on compaction ratios, as over-compaction can result in damage to bins, jamming of waste inside the bins, and can make bins heavy and difficult to move.

4.7.2 Cardboard Baler

Cardboard and paper can be a bulky waste stream to store, so management may like to bale cardboard to save on space. Examples of small-scale commercial balers are listed in Table 9 below. A cardboard baler may be suitable for warehouse tenancies that produce large quantities of packaging cardboard waste or if a centralised waste storage area is designated for sitewide waste management.

Table 9: Examples of small-scale commercial balers

Provider	Height (mm)	Depth (mm)	Width (mm)	Bale dimensions	Bale weight	Footprint (Approx. m^2)
Elephants Foot **EF51 Low Height Baler**	2180	810	810	600mm x 715mm x 500mm	Up to 70kg	0.65
Mil-Tek **2205**	2260	540	775	960mm x 650mm x 450mm	<60kg	0.42
Waste Initiatives **WastePac 40 Baler**	1694	630	718	600mm x 535mm x 460mm	Up to 40kg	0.45

4.7.3 Food Waste Processing

An alternative to food organics collection is onsite food waste processing. In-vessel composters produce no odour and may require some input from woody garden organics, which would likely be available as a result of landscaping activities onsite. Initiatives such as NSW EPAs BinTrim program operate an equipment rebate that can cover up to half the capital cost of organics processors (up to a $50,000). Please refer to Appendix C for examples of food waste processing equipment.

4.8 Collection Method and Loading Areas

Based on the anticipated waste generation rates for the site, a private contractor will be required to collect waste generated at the site. It is recommended that the site operator tender the waste service contract for the entire site and select a waste service provider (WSP), negotiate a service agreement, and pay for these services. The site operator can then include waste management details in lease agreements and general rates for site uses.

The recommended arrangements access and collection servicing for the site are as follows (see Appendix A for indicative travel path for waste collection vehicles):

- Entrance to the site via Inman Road;
- Collection of waste and recycling bins will occur directly from each industrial warehouse building, with collection points for café and office related waste being situated towards the entrance of the site (see Figure 2, Appendix A);
- 1,100L bins shall be collected by a rear-lift vehicle (similar vehicle to collect cardboard, e-waste and film plastic bales) with typical dimensions as follows:
    - 8.8m length,
    - 3.5m operational height, and
    - 24 tonne gross vehicle mass.
- Identifiable areas will be required where users, visitors and WSP staff can recognise and avoid any risk associated with moving vehicles, and bin moving and handling;
- Exit from the site will be via the exit point onto South Creek Road.

Note: *Compaction of refuse and the breaking up of bottles will not occur in the vehicle while the collection vehicle is standing stationary at or near the site.*

Table 10 below outlines relevant requirements and specifications related to the use of collection points and loading areas.

Table 10: Collection points and loading areas requirements and specifications

Component	Requirement	Specification
Collection point	Allow safe waste collection and loading operations	- Adequate clearance and manoeuvring space; - Sufficient clearance for the safe handling of materials and equipment; and - Loading bays do not impede upon traffic and pedestrian safety.
Vehicle loading space	Space for adequate lift clearance	- Adequate operational clearance for bin lifting mechanisms.
Operating times	Appropriate collection times to limit noise and traffic disturbance	- Collection times will be arranged during off-peak traffic times to ensure minimal disturbance to site users and general traffic flows associated with the use of the site.

4.9 Site Waste Management Responsibilities

The operator will be responsible for monitoring site waste management systems as a whole and upholding the waste servicing contract for the site. Site tenancy users will be responsible for general operation of waste management systems, cleaning of bin areas and associated waste contamination reduction.

Should any issues impacting on the operational efficiency, safety and suitability of waste management be identified, site users should inform the site operator for appropriate action to be taken.

The operator (site management) is responsible for:

- Using this WMP to inform waste management operations, design and infrastructure;
- Providing educational materials and information to users outlining:
  - Waste management system and use/location of associated equipment,
  - Sorting methods for recycled waste, awareness of waste management procedures for waste minimisation, maximising recovery and reducing contamination of recyclables,
  - Improving facility management results (lessen equipment damage, reduce littering, and achieve cleanliness).
- Making information available to users, site staff and visitors about waste management procedures;
- Ensuring correct signage is installed and maintained in waste storage and service areas;
- Encouraging waste avoidance and achievement of resource recovery targets;
- Providing operational management for delivery of waste objectives;
- Holding a valid and current contract with licensed collector(s) for waste and recycling collection;
- Ensuring waste service providers access the site appropriately;
- Ensuring timing of waste collections does not clash with peak traffic periods in relation to general operation of the site tenancies;
- Organising waste, recycling and bulky pick-ups by elected contractor for the site (if not directly managed by site users);
- Organising, maintaining and cleaning the waste storage and service areas;
- Using contracts to define the allocation of responsibilities with cleaners and users;
- Monitoring any vermin and pest issues and arranging appropriate controls (traps or fumigating) and maintenance of doors or other points of potential entry; and
- Ensuring all tenants do not prevent or impede correct access of the site for waste collection.

Site users are responsible for:

- Holding a valid and current contract with a licensed collector for any specialty waste collections and disposal outside of sitewide waste management contract maintained by the site operator (arrangements through site operator may apply);
- Allocating space for a dedicated and enclosed waste and recycling storage area for intermediate storage before disposal to designated waste storage areas;
- Transfer of bins to street frontage of industrial units for collection, and return of bins to within units following collection;
- Disposing of waste and recycling at their designated building's waste storage area;
- Maintaining general cleanliness when using waste storage areas to prevent the occurrence of odour, vermin or amenity issues;
- Notify site management of waste storage use and efficiency should additional bins or services be required (that are covered under general waste arrangement as outlined in lease agreements);
- Notify site management hazards or damages related to the building waste storage areas, including but not limited to:
  - Damaged bins,
  - Illegally dumped items,
  - Apparent misuse of waste storage areas (such as vandalism, contamination, etc), and
  - Odour, vermin or amenity issues.

4.10 Waste Storage and Recycling Areas

The waste storage areas provide centralised storage that has adequate capacity to receive and store the maximum likely generation of waste and recycling between collection times. Waste storage areas must be sited and constructed to improve amenity, minimise odour, protect surrounding areas and promote user safety. Construction must conform to Building Code of Australia, Australian Standards and local laws. Specifications include:

- Sited away from areas of high pedestrian traffic to minimise odour and amenity impacts;
- Enclosed to minimise exposure and reduce risk of odour and amenity impacts;
- Signage for safety and waste bin identification;
- Safety precautions, staff training and signage for plant;
- Noise attenuation for waste management and waste storage areas that limits effects to residents from compactor, bin transfer and collection vehicle noise;
- Floors constructed of concrete or other approved solid, impervious material that can be cleaned easily;
- Adequate supply of water with hose cock as close as practicable to the doorway or storage area;
- Ventilation in accordance with Australian Standards AS1668; and
- Security and lighting.

Additional measures shall be put in place for the wash bay, and Area B which will be entirely enclosed:

- Light colour finish for all room surfaces;
- Smooth, even surface covered with vertical wall and plinth faces;
- Grading and draining to an approved drainage fitting located in the room;
- Doorway ramp (if not level);
- Close fitting and self-closing door; and
- Suitable construction including limited entry paths to prevent vermin.

4.11 Signage

Signage that promotes resource recovery, waste minimisation, safety and amenity follows the Australian Standard for safety signs for the occupational environment (Standards Australia 1994).

Signage will be designed to consider language and non-English speaking backgrounds, vision impairment and accessibility (see Appendix B). Illustrative graphics must form a minimum 50% of the area of the signage. Signage is to be prominently posted in each waste storage area indicating:

- Garbage is to be bagged and placed into waste bins;
- Details regarding acceptable recyclables and the location of their respective receptacles;
- Commingled recyclables are to be disposed of loose (not bagged);
- *No standing* and *danger* warnings applying to the area surrounding waste storage and collection areas;
- Contact details for arranging the disposal of bulky items;
- Information on keeping the areas tidy.

4.12 Prevention of Pollution and Litter Reduction

To minimise dispersion of litter and prevent pollution (to water and land via contamination of runoff, dust and hazardous materials), the operator shall be responsible for the following:

- Maintenance of open and common site areas;
- Ensuring waste storage areas are well maintained and kept clean, including:

    - Prevention of overflow,
    - Keeping lids closed, and
    - Checking for bung leaks and damage bins.
- Securing the waste storage area from vandalism and the escape of litter;
- Identification and appropriate disposal of goods with hazardous material content (paints, fluorescent tubes, smoke detectors);
- Acting to prevent dumping and unauthorised use of waste areas; and
- Requiring contractors to clean up any spillage that may occur during waste servicing or other work.

The above will minimise the dispersion of site litter, prevent stormwater pollution and thus, reduce the risk of impact to local amenity and the environment.

4.13 Waste Management Plan Revisions

For any relevant future Council requests, changes in legal requirements, changes in the development's needs and/or waste patterns (waste composition, volume, or distribution), or to address unforeseen operational issues, the operator shall be responsible for coordinating the necessary Waste Management Plan revisions, including (if required):

- A waste audit and new waste strategy;
- Revision of the waste system (bin size/quantity/streams/collection frequency);
- Re-education of users/staff;
- Revision of the services provided by the waste collector(s); and
- Any necessary statutory approval(s).

5 Access Requirements and Limitations

5.1 Best practice requirements

The following best practice methods shall be incorporated where relevant/practicable to ensure site waste management is completed safely and effectively:

- The operator shall ensure that bins are not overfilled or overloaded.
- Waste incineration devices are not permitted, and any offsite waste treatment and disposal shall be carried-out in accordance with regulatory requirements.
- For bin traffic areas, should any ramp gradients be present, bin weight, and/or distance can affect the ease/safety of bin transfers. In the case of a potential safety concern, the operator shall consider the use of a suitable tug.
- The site operator and WSP shall observe all relevant WHS legislation, regulations, and guidelines. The relevant entity shall define their tasks.
- All staff/contractors should be provided with equipment manuals, training, health and safety procedures, risk assessments, and adequate personal protective equipment (PPE) to control/minimise risks/hazards associated with all waste management activities.

5.2 Limitations

This report is based on the following conditions:

- Operational use of the development (excludes design, demolition and construction stages).
- The figures presented in this report are estimates only. The actual amount of waste will depend on the development's occupancy type, occupancy rate, waste generation profile, the user's disposition toward waste and recycling, and the operator's approach to waste management. The operator shall adjust, as required, based on actual waste and recycling volumes (if the actual volumes of the streams are greater than estimated, then the number of bins and/or the number of collections per week shall be increased).
- This report shall not be used to determine/forecast operational costs, or to prepare feasibility studies, or to document operational/safety procedures.

6 References

Australian Building Codes Board (2016) National Construction Code (NCC).

Australian Government (2017) National Food Waste Strategy: Halving Australia's Food Waste by 2030, Minister for the Environment and Energy.

Environment Protection and Heritage Council (2009) National Waste Policy: Less Waste, More Resources. Available at: http://www.nepc.gov.au/system/files/resources/906a04da-bad6-c554-1d0d-45216011370d/files/wastemgt-rpt-national-waste-policy-framework-less-waste-more-resources-print-ver-200911.pdf.

Environment Protection Authority (EPA) (2017) BinTrim: Reducing Business Waste, NSW Government.

Northern Beaches Council (2011) Warringah Development Control Plan.

Northern Beaches Council (2011) Warringah Local Environment Plan.

NSW EPA (1997) Protection of the Environment Operations Act.

NSW EPA (2012) Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities.

NSW EPA (2014) NSW Waste Avoidance and Resource Recovery Strategy 2014-21.

NSW EPA (2016) Recycling Signs, Posters and Symbols. Available at: http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm.

NSW EPA (2019) Better practice guidelines for resource recovery in residential developments.

NSW Government (1979) Environmental Planning and Assessment Act.

NSW Government (2000) Environmental Planning and Assessment Regulation.

Standards Australia (1994) AS 1319: Safety signs for the occupational environment, Homebush, NSW: Standards Australia.

Standards Australia (2008) AS 4123 Mobile waste containers.

WorkCover (2011) Managing Work Environment Facilities Code of Practice.

Appendix A Site Plans and Waste Collection Vehicle Access

Figure 2: Site Plan and Waste Vehicle Access

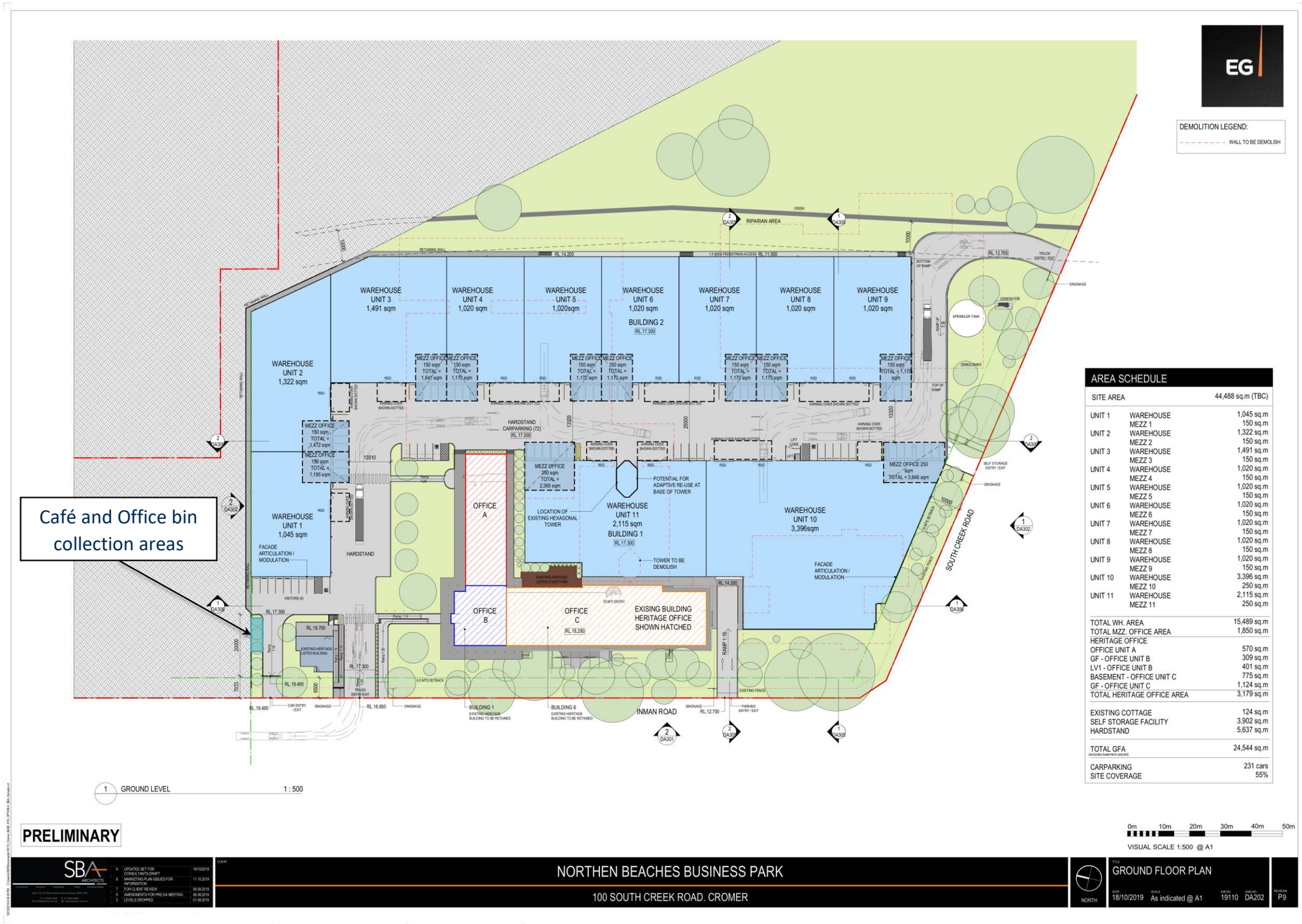
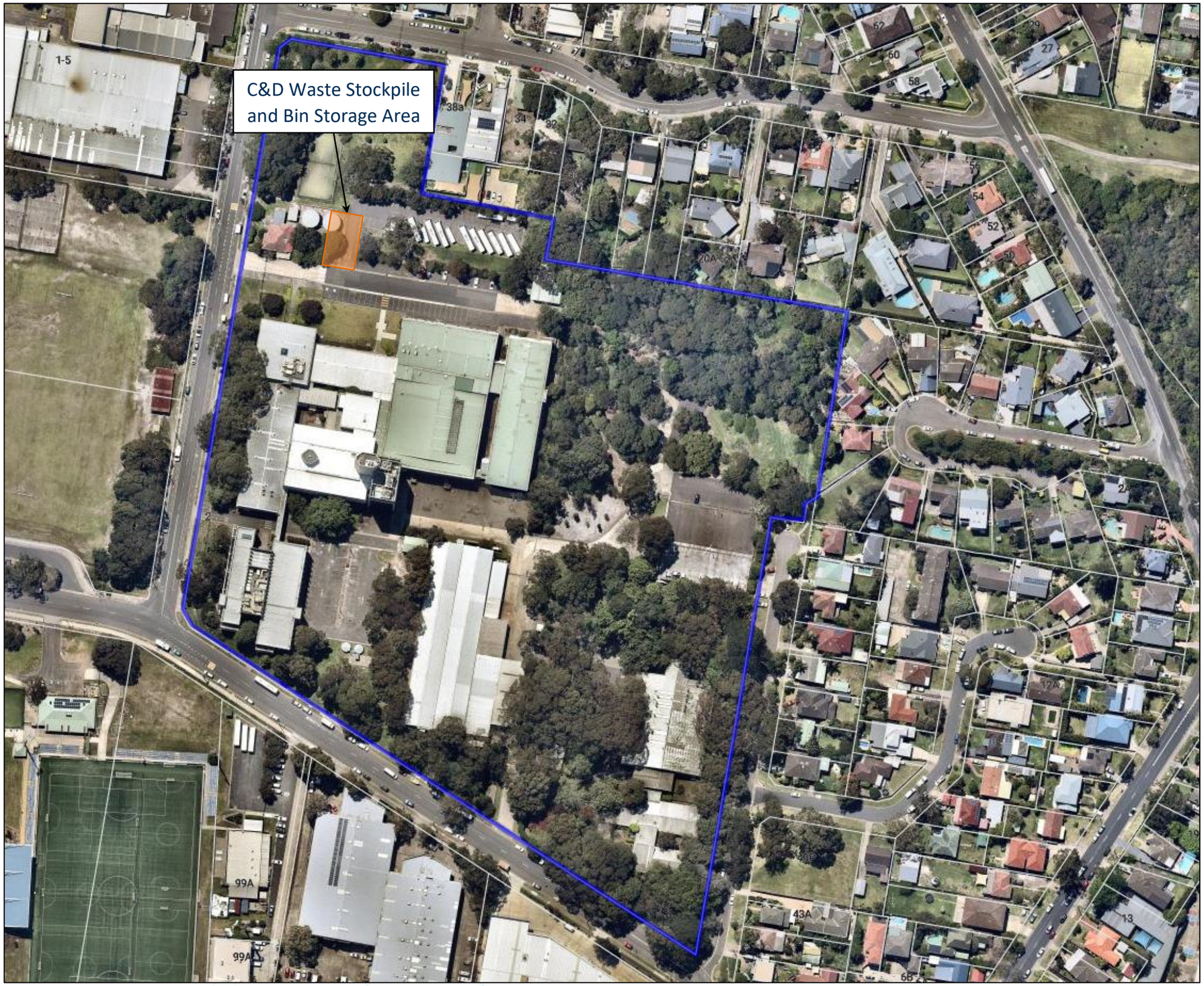


Figure 3: Proposed C&D Waste Storage Area



Appendix B Standard Signage

Waste Signage

Signs for garbage, recycling and organics bins should comply with the standard signs promoted by the NSW Office of Environment and Heritage (NSW OEH 2008b) and as stated in the Willoughby DCP.

Standard symbols for use in signage, bin facade and educational materials are promoted through the NSW Environment Protection Authority. They are available for download from the NSW EPA website (NSW EPA 2016b), in black and white and colour versions. The Australian Standard series AS 4123 (Part 7) details colours for mobile waste containers (Standards Australia 2008).

Figure 4: Examples of standard signage for bin uses

Safety Signs

The design and use of safety signs for waste and recycling rooms and enclosures should comply with AS 1319 (Standards Australia 1994). Safety signs should be used to regulate, and control safety related to behaviour, warn of hazards and provide emergency information, including fire protection information. Below are some examples. Clear and easy to read 'NO STANDING' and 'DANGER' warning signs must be fixed to the external face of each waste and recycling room where appropriate.

Figure 5: Example and layout of safety signage

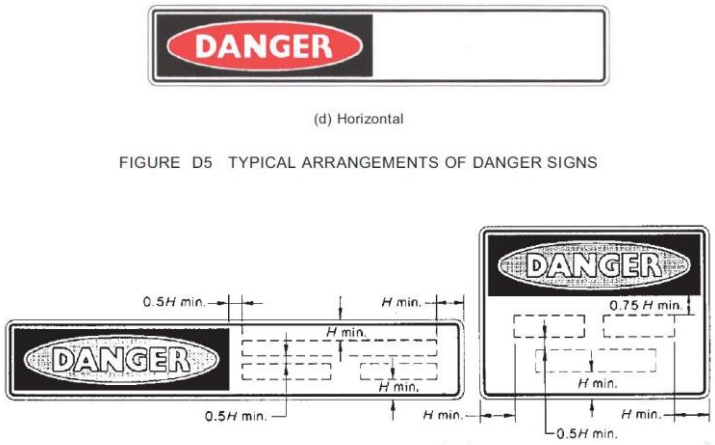


Figure 6: Example waste and recycling signage

Figure 7: Example recycling information signage

Appendix C Organics Equipment

CLOSED LOOP ORGANICS UNIT SPECIFICATIONS

Closed Loop's organic recycling units are fully contained, commercial aerobic on-site composting units that can reduce food waste by up to 90 per cent in 24 hours.

CLO10s

Capacity/day: 20kg
Electricity usage/month: 500kWh (maximum)
Electricity requirements: AC 240V
Power rating: 50Hz, 2.1kW
Overall footprint (mm): 1160 (w) x 620 (d) x 1030 (h)
Overall dry weight: 240kg

CLO30s

Capacity/day: 60kg
Touchscreen Controls | Automatic Operation
Electricity usage/month: 1100kWh (maximum)
Elec. requirements: AC 3 phase, 20 amp, 5 pin dedicated outlet
Power rating: 415V, 50Hz, 4kW
Overall footprint (mm): 1960 (w) x 870 (d) x 1250 (h)
Overall dry weight: 450kg

CLO50s

Capacity/day: 100kg
Touchscreen Controls | Automatic Operation
Electricity usage/month: 1700kWh (maximum)
Elec. requirements: AC 3 phase, 20 amp, 5 pin dedicated outlet
Power rating: 415V, 50Hz, 6kW
Overall footprint (mm): 2155 (w) x 1060 (d) x 1350 (h)
Overall dry weight: 660kg

CLO100s

Capacity/day: 200kg
Touchscreen Controls | Automatic Operation
Electricity usage/month: 3500kWh (maximum)
Elec. requirements: AC 3 phase, 20 amp, 5 pin dedicated outlet
Power rating: 415V, 50Hz, 13kW
Overall footprint (mm): 2584 (w) x 1250 (d) x 1580 (h)
Overall dry weight: 1100kg

OPTIONAL FEATURES

- Load cells for accurate measurements of inputs and outputs (CLO30 and above)
- Internet connection for SMS Alerts and remote connection (CLO30 and above)
- 120 Litre Bin Lifter (CLO100)

Dehydrators

Dehydrators reduce the volume of food and garden organic waste by removing the majority of water held by the waste. The products from dehydrators include extracted water which can be re-used, as well as dehydrated organic material which can be used as a soil amendment or fuel. Dehydrators differ from composters as they only dehydrate waste and do not produce compost.

Typical materials

- ☒ Food organics

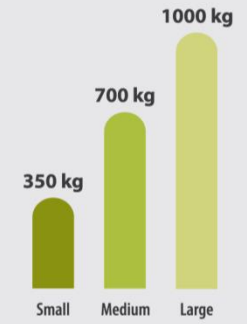
Specifications

- **Loading:** Manual, Semi-Automatic (pump/hopper)
- **Unloading:** Manual
- **Consumables:** N/A
- **Working Life:** 10-20 Years
- **Power:** 415V
- Sewage/waste water hookup may be required to operate a dehydrator. This may require additional Council approval.
- Lateral and Overhead clearances need to be considered in some cases, and are variable.

Please note: Dehydrators will only be approved for a rebate when the outputs are sent to a commercial composting service or licensed facility or if the equipment has a resource recovery exemption.

Relevant standards

AS 4024.1 2006 Series: Safety of Machinery by Third Party Independent verification



Pre-Digestion with disposal to sewer

Biologically converts solid food waste into liquid. System uses microorganisms to decompose food waste into a liquid that can be disposed to sewer.

Typical materials

- ☒ Food organics
- ☒ NOT large bones and oils
- ☒ NOT fibrous material e.g. corn husks

Specifications

- **Loading:** Manual
- **Consumables:** Microbes need to be replaced yearly
- **Working Life:** 15 Years
- **Power:** 208V, 3 Phase Power
- Cold water hook up required
- Sewer connection required (must have approval from a water authority to hook up to sewer)
- Lateral and Overhead clearances need to be considered in some cases, and are variable
- Can be linked with a grinder to manage bones and fibrous materials.

Cost:
$55,000 – $75,000

Machinery weight:
1300 lbs (small unit)

Processing (per hour):
300 lbs (small unit)

1000 lbs
(medium unit)

1500 lbs (large unit)

Relevant standards

AS 4024.1 2006 Series: Safety of Machinery by Third Party Independent verification

Macerators

Macerators reduce the volume of food waste by turning the solid food waste into pulp. The pulp slurry is pumped to an exterior holding tank for collection by a licensed contractor. Macerators are usually a leased piece of equipment. Leased equipment is not eligible under the Bin Trim Rebate Program.

Typical materials

- ☒ Food organics
- ☒ NOT oyster and mussel shells

NOT fibrous material e.g. corn husks

Cost:
$50,000 – $60,000

Machinery weight:
140 kg

Processing:
2000 kg per hour

Specifications

- **Loading:** Manual
- **Unloading:** Semi-Automated
- **Consumables:** N/A
- **Working Life:** 15 Years
- **Power:** 415V
- Cold water hook up required
- Lateral and Overhead clearances need to be considered in some cases, and are variable.

Please note: Macerators will only be approved for a rebate when used in conjunction with a commercial collection service to a licensed organic recycling facility or a Resource Recovery Exemption compliant land application system.

Relevant standards

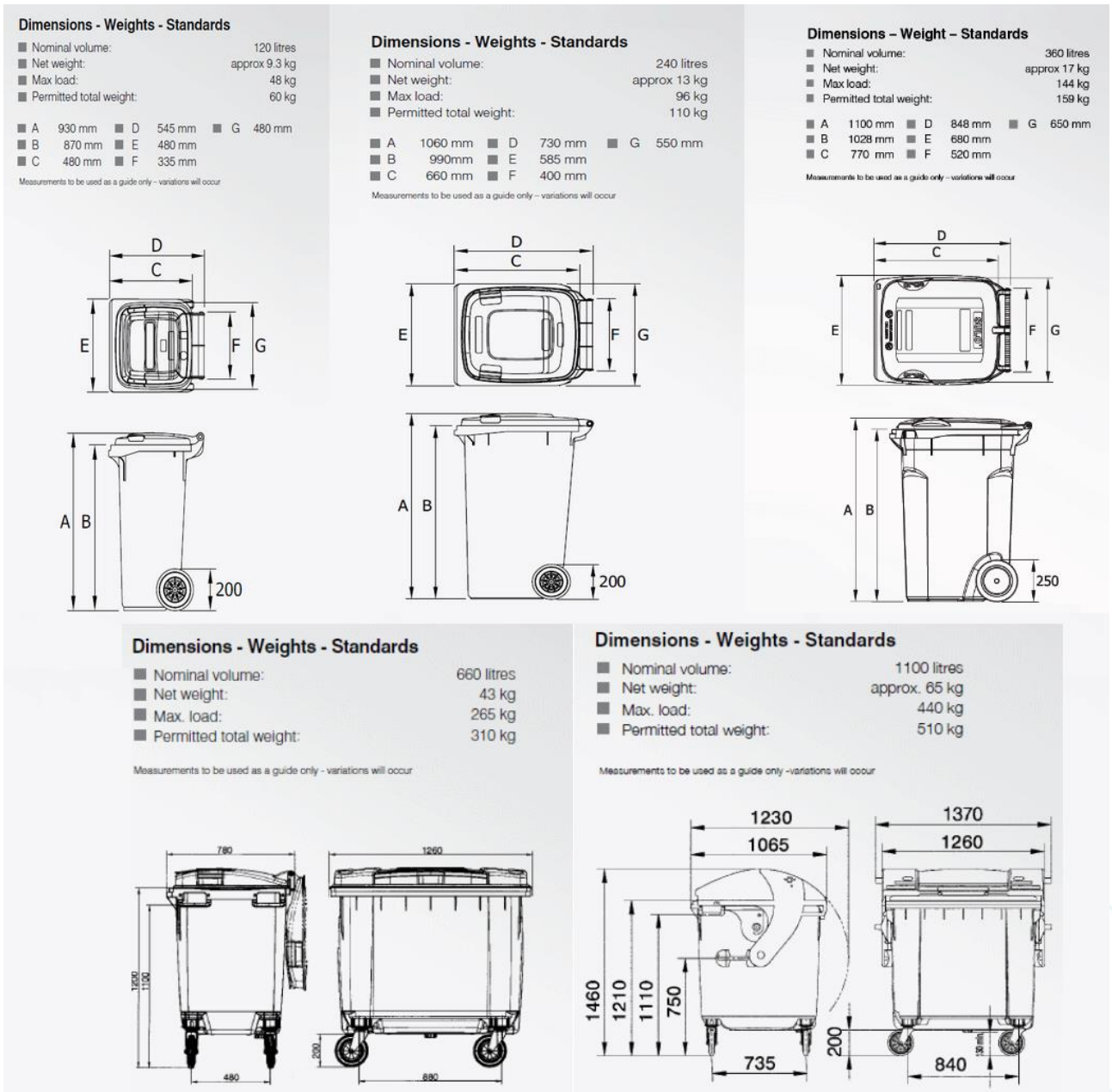
AS 4024.1 2006 Series: Safety of Machinery by Third Party Independent verification

Appendix D Bin Types

This WMP proposes the use of small (rear-lift) bins, and medium (front-lift) bins. Each bin type is specific to each store as the bin size will impact on the vehicle access requirements. This section outlines the dimensions of each bin type. Some bin types below are not in the recommended bin types throughout the WMP, but may be useful for planning purposes should other options be preferred.

Rear-lift wheelie bins are ideal for sites with limited restrictions like specialty retail and small offices. Lightweight and easy to manoeuvre, these small-sized containers are easy to use and can be secured with lockable lids.

Figure 8: Rear-lift mobile bins (120L, 240L, 360L, 660L & 1,110L)



Reference: www.sulo.com.au. Sizes may vary with manufacturer or supplier.

Figure 9: Front-lift steel bulk bin sizes and dimensions

Bin Size/Waste Stream	Height (h)	Width (w)	Depth (d)	
1.5 cubic metre	900 mm	1800 mm	900 mm	
3.0 cubic metre	1200 mm	1800 mm	1325 mm	
4.5 cubic metre	1500 mm	1800 mm	1600 mm	

Source: KS Environmental

Note: figures are indicative only and may vary depending on manufacturer and supplier.