

Waste Management Plan

108-124 Forest Road & 1-3 Wright St,
Hurstville

A submission to George El Khouri Architects &
Durbach Block Jaggers Architects

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Glossary

Terminology	Description
AS	Australian Standard
C&D	Construction and Demolition
C&I	Commercial and Industrial
DA	Development Application
DC	Development Consent
DCP	Development Control Plan
DECC	Department of Environment and Climate Change
ENM	Excavated Natural Material
EPA	Environment Protection Authority
GRC	Georges River Council
HDCP	Hurstville Development Control Plan 2012
HLEP	Hurstville Local Environmental Plan 2012
LGA	Local Government Area
MGB	Mobile Garbage Bin
MSW	Municipal Solid Waste (also referred to as domestic or residential waste)
VENM	Virgin Excavated Natural Material
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 George El Khouri Architects (GEA) to prepare a Waste Management Plan (WMP) for the proposed mixed-use development located at 108-124 Forest Road and 1-3 Wright St, Hurstville (hereafter referred to as “the Site”). The site is located in the Georges River Council (GRC) Local Government Area (LGA) and is this WMP conforms with the following planning instruments:

- *Hurstville Development Control Plan (2012) (HDCP)*; and
- *Hurstville Local Environmental Plan (2012) (HLEP)*.

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

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

This WMP is used to inform the building design in order to deliver best practice waste management and promote sustainable outcomes. The WMP complies with Council’s codes and with all relevant statutory requirements.

1.1 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 reference/indicative design set for the development plan from the project architect, George El Khouri Architects & Durbach Block Jaggers Architects (June 2021);
- The HDCP 2012 outlines waste generation rates and services available for new developments which have been considered in the preparation of this report; and
- 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.

2 Background

2.1 Location

The site is located in the suburb of Hurstville, in the Georges River Council LGA. The site is located approximately 470m from Allawah Train Station, or 620m from Hurstville Train Station. Figure 1 below shows an aerial view of the site (highlighted in blue) and its surrounds.

Figure 1: Aerial image of site in context with its surrounds



2.2 Proposed Works

The following works will be undertaken at this site:

- Demolition of all structures and clearing of all vegetation onsite;
- Excavation of three basement levels for car parking, services and amenities; and
- Construction of a 14-storey mixed use building, featuring:
 - Building A:
 - 3 ground floor retail spaces (totalling 676m²); and
 - 117 residential dwellings (mix of studio, 1-bed, 2-bed and 3-bed) across 14 levels.
 - Building B:
 - 5 ground floor retail spaces (total of 1,404m²); and
 - 102 residential dwellings (mix of studio, 1-bed, 2-bed and 3-bed) across 10 levels.
 - Ground floor loading dock including vehicle turntable;

- Landscaped communal open space; and
- Ancillary services (such as waste storage areas and plant).

2.3 Legal Description of Site

The Site is identified in the HLEP as:

Street Address	Lot	DP
108 Forest Rd, Hurstville	Lot 1	DP 78322
112 Forest Rd, Hurstville	Lot 1	DP 75572
124 Forest Rd, Hurstville	Lot 531	DP 777334
1 Wright St, Hurstville	Lot 54	DP 78322
3 Wright St, Hurstville	Lot 55	DP 78322

2.3.1 Zoning

The Site is situated on land zoned B4 – Mixed Use, under the HLEP. Shop top housing is permitted with consent in this zone, which is defined by the following objectives:

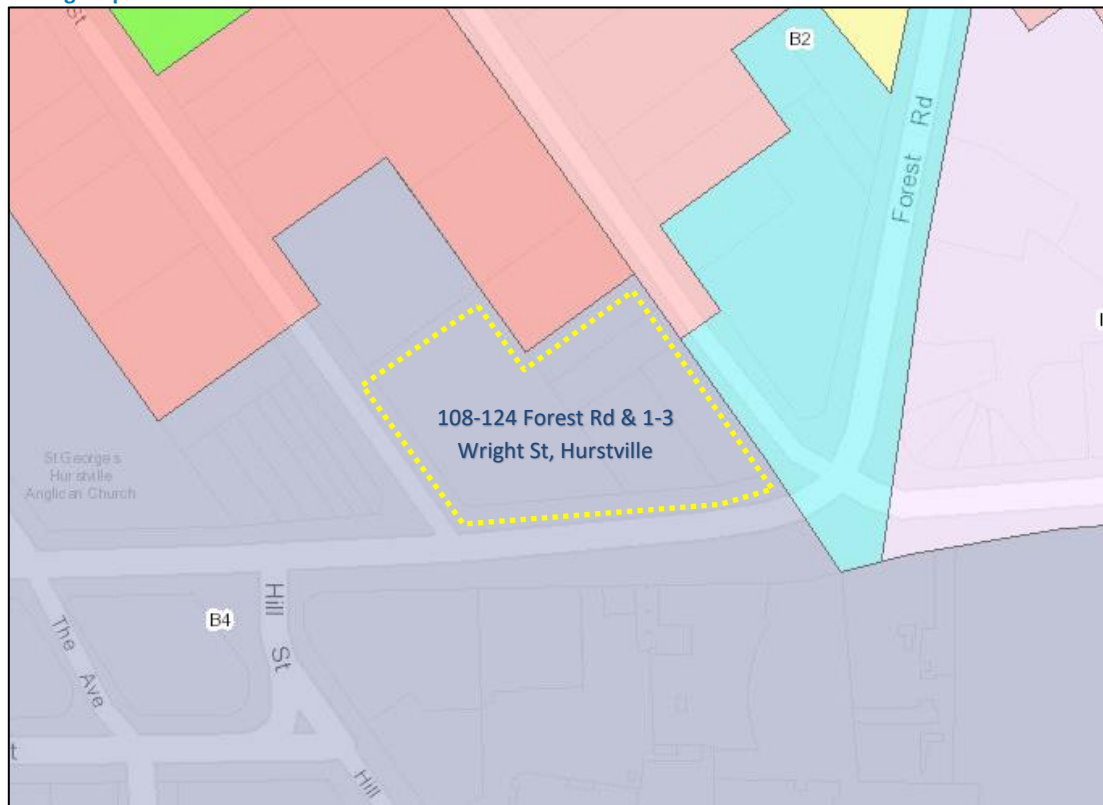
- To provide a mixture of compatible land uses.
- To integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.
- To allow for residential development in the Hurstville City Centre while maintaining active retail, business or other non-residential uses at street level.

Zones surrounding the site include:

- R3 – Medium Density Residential;
- R2 – Low Density Residential; and
- B2 – Local Centre.

Refer to Figure 2 below for a zone map of the site and surrounding area.

Figure 2: Zoning map of site and its surrounds



2.4 Current Use

The site is currently occupied by the following:

- Two-storey brick commercial retail building;
- Single storey auto service centre;
- Single storey renovation centre;
- Single storey brick dwelling; and
- Single plot of unoccupied land.

The entire site is to be cleared and levelled in preparation for the construction phase.

3 Construction and Demolition Waste

Demolition, excavation, and construction activities at the site will generate a range of construction and demolition (C&D) wastes. Throughout the development process, all materials will be reused and recycled where possible, minimising the disposal (landfilling) of materials other than those that are contaminated or unsuitable for reuse or recycling processes.

Waste storage during excavation and construction operations will involve some stockpiling of excavated and reusable material, as well as placement of skip bins for the separation of construction 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 across construction operations to facilitate the safe and efficient storage of materials and will be retained within property boundaries to avoid illegal dumping.

The quantities, densities and bulking factors for waste and recyclables has been determined based on provisions set out in the WDCP. A waste storage area shall be designated by the demolition and construction contractor and shall be sufficient to store the various waste streams expected during operations. Waste and recycling materials will be kept separate from construction materials, and all materials will be stored in bulk bins that are able to be covered to prevent damage by the elements, odour, health risks, and windborne litter. Waste storage areas will be kept clear to maintain vehicular access and shall also be kept tidy to encourage separation of waste materials and for WHS reasons.

Waste management principles, management measures and facilities in use on the site shall be included as part of the site induction for all personnel working on the site.

3.1 Site documentation

This WMP will be retained on-site during the 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 of collections;
- 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.

3.2 Demolition

This phase for the site involves the demolition of:

- Two-storey brick commercial retail building;
- Single storey auto service centre;
- Single storey renovation centre; and
- Single storey brick house dwelling.

Table 1: Demolition waste generation estimates

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling, and disposal
Concrete	1300m ³	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. C&D processor: crushing and recycling for recovered products (aggregates).
Bricks/pavers	200m 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 (treated & untreated)	<20m 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)	<20m ³	-	✓	-	On site: to be separated wherever possible to enhance resource recovery. C&D processor: metals recovery and recycling.
Plasterboard	<20m ³	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: surplus and offcut material returned to manufacturer for reuse.

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. 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 recycling.
Floor coverings	<50m 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.
Garden organics (Vegetation)	<20m ³	✓	✓	-	Removal or vegetation to make way for construction. Total to be determined by a qualified arborist. 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)	<2m ³	-	✓	-	Commercial contractor: recycling.

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling, and disposal
Paper/cardboard	5m ³	-	✓	-	Commercial contractor: segregation of paper, cardboard or other streams.
Residual waste (general refuse)	<10m ³	-	-	✓	Separate recyclables where possible and disposal at principal licensed waste facility.
Hazardous/special waste (e.g. spills and contaminated wastes)	Unknown	-	-	✓	Management by a licensed asbestos and site hygienist should hazardous or special waste be found at the site.

3.3 Construction

Works would include the following:

- Removal of some vegetation;
- Excavation of three basement levels;
- Construction of a fourteen-storey mixed-use building; and
- Landscaping.

Table 2 outlines indicative volume to weight conversion factors for common construction materials.

Table 2: Building waste material by percentage and conversion factor for volume and weight

Building waste material	Tonnes per m ³	Waste as % of the total material ordered
Brick	1	5-10%
Concrete	2.4	3-5%
Tiles	0.75	2-5%
Timber	0.5	5-7%
Plasterboard	-	5-20%
Metal	2.4	-

Source: Parramatta Waste Management Plan Application Template 2017.

Table 3 outlines the expected excavation and construction waste quantities to be generated at the site, in addition to the appropriate management methods for each material type.

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 3: Construction waste generation estimates

Type of waste generated		Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling, and disposal
Excavation material		54,000m 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		<500m ³	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. C&D processor: crushing and recycling for recovered products (aggregates).
Bricks/pavers		<160m 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.
Tiles	Roof	<5m 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.
	Interior	<2m ³	✓	✓	-	
Timber (engineered/treated)		<5m ³	-	✓	-	On site: to be separated wherever possible to enhance resource recovery.

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling, and disposal
					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.
Metals (ferrous and non-ferrous)	<5m ³	-	✓	-	Onsite: to be separated wherever possible to enhance resource recovery. C&D processor: metals recovery and recycling.
Plasterboard	<15m ³	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. Reuse: surplus and offcut material returned to manufacturer for reuse.
Glass	<2m 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	<1m 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 recycling.
Floor coverings	<20m ³	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery.

Type of waste generated	Quantity	Reuse	Recycling	Disposal	Methods for reuse, recycling, and disposal
					Reuse: surplus and offcut material returned to manufacturer for reuse where possible. C&D processor: recovery and recycling.
Packaging (used pallets, pallet wrap)	25m ³	✓	✓	-	On site: to be separated wherever possible to enhance resource recovery. C&D processor: recycling of timbers and plastic.
Garden organics (Vegetation)	<5m 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)	<2m ³	-	✓	-	Commercial contractor: recycling.
Paper/cardboard	10m ³	-	✓	-	Commercial contractor: segregation of paper, cardboard or other streams.
Residual waste (general refuse)	25m ³	-	-	✓	Separate recyclables where possible and disposal at principal licensed waste facility.
Hazardous/special waste (e.g. spills and contaminated wastes)	Unknown	-	-	✓	Management by a licensed asbestos and site hygienist should hazardous or special waste be found at the site.

4 Ongoing Waste Management

Waste management strategies related to site operations have been established according to the documents outlined in the HDCP.

The following space calculations are based off the bin dimensions sourced from NSW EPA's *Better Practice Guide for Resource Recovery in Residential Developments* (2019) (Table 4).

Table 4: MGB capacity and footprint

Bin Capacity (L)	Height (mm)	Depth (mm)	Width (mm)	Footprint (Approx. m ²)
120	940	530	485	0.33
240	1,080	735	580	0.43
660	1,250	850	1,370	1.16
1,100	1,470	1,245	1,370	1.71

Source: *Better practice guide for resource recovery in residential developments* (2019).

4.1 Residential Waste

4.1.1 Residential Waste Generation

The HDCP specifies the following waste generation rates for residential dwellings:

Table 5: HDCP residential bin allocation

Building	Number of residential dwellings	Waste Stream	Waste Generation Rates	Weekly Waste Generation (L)
A	117	General Waste	120L/unit/week	14,040
		Recycling	120L/unit/week	14,040
B	102	General Waste	120L/unit/week	12,240
		Recycling	120L/unit/week	12,240

It is noted that landscaping at the site will be maintained by an external contractor who will remove all vegetation waste from ongoing maintenance activities. In addition, since the proposed development is for a mixed-use building with residential apartments, it is unlikely that a high quantity of garden waste will be generated and therefore, no garden waste bins will be retained at the site.

All garden organic waste materials will be removed from the site immediately after generation – there is no storage of green waste proposed on the site at any time. The Site/Building Manager will be responsible for overseeing the landscaping contractor ensuring that garden organic waste is removed and processed at a facility licensed to accept it.

4.1.2 Bin Requirements

Table 6: Site bin requirements

Building	Waste Stream	240L Bins Collected Weekly	240L Bins Collected Twice Per Week	1,100L Bins Collected Weekly	1,100L Bins Collected Twice Per Week
A	General Waste	59	30	13	7

	Recycling	59	30	13	7
B	General Waste	51	26	12	6
	Recycling	51	26	12	6

Based on the above bin allocation according to potential collection schedules, 240L bins are not proposed to manage waste at the site due to the excessive number of bins required and the proposal for a waste and recycling chute. 240L bins will not be suitable in this instance due to excessive manual handling and the filling rate under waste chutes. As such, 1,100L bins are proposed to manage both general waste and recycling for both buildings to manage residential waste. Additionally, collection twice per week will ensure bin numbers are not excessive and manual handling per scheduled collection is minimised.

4.1.3 Waste Storage Requirements

Temporary Waste Storage

Each dwelling must have sufficient space provisioned for the storage of one days' waste generated. This includes separate receptacles for general waste and recycling.

Residential Level Chute Inlet

Each habitable level of the development will feature a waste chute inlet room. The inlet room will feature two chute inlets for the disposal of bagged general waste and loose commingled recycling.

Basement 1 Level Waste Rooms

The Hurstville DCP states 240L bins are typically utilised for residential waste collection, however 1,100L bins are also permitted for residential developments over eight storeys. For more information on the waste rooms, please refer to Section 0 of this report.

Bulky Waste Storage

Bulky waste storage is provided in each of the residential waste storage areas for the disposal of mixed bulky waste items (appliances, furniture, whitegoods, etc). Separate temporary storage will be available adjacent to the proposed loading dock for easy access to bulky waste materials for collection.

4.2 Commercial Waste

The site contains eight commercial spaces located on the ground floor. Six of the spaces are intended to be used for general retail, with the remaining two used for food and beverage retail.

4.2.1 Commercial Waste Generation

Commercial uses within the site are general retail, and food and beverage retail. The HDCP outlines the following waste generation rates for these uses:

- General Retail – Less than 100m² floor area:
 - General Waste: 50L/100m² floor area/day
 - Recycling: 25L/100m² floor area/day
- General Retail – More than 100m² floor area:
 - General Waste: 50L/100m² floor area/day
 - Recycling: 50L/100m² floor area/day
- Food and Beverage Retail:
 - General Waste: 10L/1.5m² floor area/day
 - Recycling: 2L/1.5m² floor area/day

Table 7 below outlines the site commercial waste generation.

Table 7: Site commercial waste generation

Table 1: Commercial waste generation					
Building	Retail Tenancy	Size (m ²)	Use	Waste Stream	Weekly Waste Generated
A	6	256	General Retail	General Waste	896
				Recycling	896
	7	200	General Retail	General Waste	700
				Recycling	700
	8	60	Food and Beverage	General Waste	2,800
				Recycling	560
	9	62	General Retail	General Waste	217
				Recycling	109
				Sub-total	General Waste
				Recycling	2,265
B	1	121	General Retail	General Waste	424
				Recycling	424
	2	69	Food and Beverage	General Waste	3,220
				Recycling	644
	3	598	General Retail	General Waste	2,093
				Recycling	2,093
	4	318	General Retail	General Waste	1,113
				Recycling	1,113
	5	223	General Retail	General Waste	781
				Recycling	781
			Sub-total	General Waste	7,631
				Recycling	5,055

In total, the commercial spaces onsite will generate the following waste volumes on a weekly basis:

- General Waste: 12,245L
- Recycling: 7,320L

4.2.2 Bin Requirements

Table 8 below outlines the bin requirements for commercial waste, based on the use of 1,100L MGBs.

Table 8: Site commercial bin requirements

Building	Waste Stream	Amount of Waste per Week (L)	Collection Frequency	Number of 1,100L Bins
A	General Waste	4,614	Weekly / twice per week	4 / 2
	Recycling	2,265	Weekly / twice per week	2 / 1
B	General Waste	7,631	Weekly / twice per week	7 / 4
	Recycling	5,055	Weekly / twice per week	5 / 3

Collection of commercial waste is recommended to be twice per week to reduce the number of bins required to be stored at the site, and remove commercial waste generated at the site in a timely manner.

It is recommended that a separate food organic waste collection is arranged for the food and beverage retail sites.

4.2.3 Waste Storage Requirements

Temporary Waste Storage

Each retail tenancy must have sufficient space provisioned for the storage of one days' waste generated. This includes separate receptacles for general waste and recycling. Transfer of waste from the retail tenancy to the WSRAs will be conducted by site cleaning staff.

4.3 Waste Storage and Recycling Areas

The table below breaks down the necessary bin and equipment for each Waste Storage and Recycling Area (WSRA)

Table 9: Space requirements for WSRA A and B

Building	Waste Storage Area	Equipment / Storage	Footprint (m ²)	Space Requirement including maneuvering (m ²)
A	Residential	7 x General Waste Bins	12	40
		7 x Recycling Bins	12	
		Bulky Waste	4	
	Commercial	2 x General Waste Bins	3.5	8
		1 x Recycling Bins	1.75	
B	Residential	6 x General Waste Bins	10.3	35
		6 x Recycling Bins	10.3	
		Bulky Waste	4	
	Commercial	4 x General Waste Bins	6.9	19
		3 x Recycling Bins	5.2	
Loading Dock	Residential (Bulky Waste)	Temporary bulky waste storage area	19 (provided)	18

4.4 Waste Collection

Building management can observe bin fullness levels upon full occupancy and adjust the number of collections accordingly.

4.4.1 Residential Waste Collection

Council's elected waste contractor will service the residential portion of this development, and the following collection schedule is recommended:

- General waste collection twice per week; and
- Recycling collection twice per week.

4.4.2 Commercial Waste Collection

A private waste contractor will service the commercial portion of the development. Figures outlined in Section 4.2 for commercial waste are based on the following proposed collection schedule and may be reduced should collection frequency be increased:

- General waste collection twice a week; and
- Recycling collection twice a week.

Should collection frequency increase to twice per week, the number of bins required for commercial waste storage at the site will be reduced.

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 both residents and customers of the ground-floor businesses.

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. The closest TechCollect drop-off location for free disposal of E-Waste is at Georges River Council Works Depot (100 Roberts Avenue, Mortdale 2223).

4.6.3 Textiles Bins

Storage of textile waste prior to collection or drop-off can be in the bulky waste area, in garbage bags or in a designated clothing bin.

Re-useable clothing

There are a number of services which will collect clothes in good quality for free. Clothing Cleanup offers free collection of unwanted clothing. Clothes must be placed in plastic bags and left in a location organised during the booking process. See <https://clothingcleanup.com.au/> for more information.

Unusable clothing waste

Dirty, ripped, or otherwise unwearable clothing waste can still be repurposed or recycled. Major fashion retailers such as H&M and Zara accept clothing waste which is then recycled into cleaning cloths, insulation for cars and homes, and other products.

4.6.4 Soft Plastics

Soft plastics cannot be placed in kerbside recycling bins; however, they can still be diverted from landfill. REDcycle is a recycling program working in conjunction with Coles and Woolworths Supermarkets, that collects soft plastics to be processed by Replas into recycled plastic products. Soft plastic waste can be collected on-site and taken to the nearby Coles supermarket (225 Forest Road, Hurstville 2220).

Management can also engage a waste service such as Cleanaway to collect soft plastic waste. However, this is unlikely to be necessary if the volumes of plastic waste generated are not significant.

4.6.5 Mattress Collection

This service is provided as an on-call service when required. [Soft Landing](#) is a leading social enterprise in Sydney, providing collection and resource recovery services for mattresses. Bookings can be made online or by phone.

4.6.6 Food Waste Processing or Collection

High volumes of food waste may result from operation of any food and beverage tenancies in the ground-floor commercial 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 twice per week.

4.6.7 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.

4.6.8 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 of spills or leaks and prevents runoff to stormwater drains.

These wastes can be disposed of at the nearest Community Recycling Centre (CRC), being the St Peters CRC (15-17 Unwins Bridge Road, St Peters). Some cooking oil suppliers will also collect used oil when swapping empty barrels as part of their service.

5 Waste Management Systems

5.1 Dual Core Chute

The residential towers will utilise a dual core chute system for the disposal of residential waste. On each habitable level will be a waste chute inlet for the disposal of bagged general waste and loose recycling. In total there will be two dual-chute systems across the site (one for each building), requiring two WSRAs on the ground floor for chute outlets and bin storage.

Each chute inlet will feature a bottom-hinged self-closing chute door. Educational materials will be displayed at the waste chute inlet to inform residents of the correct disposal of materials (examples of such education can be found in Appendix C).

Some recycling materials are not recommended to be disposed of using a chute – such as large pieces of cardboard (which present a risk of blockages), and glass (which are likely to shatter). Space in each chute inlet room can be apportioned for the temporary storage of these materials. The site waste caretaker can then transport the separated materials to the WSRAs on the first basement level for appropriate disposal.

5.2 Collection Method and Loading Areas

All waste will be collected from the onsite loading dock which is accessible via an entrance from Hudson Street. The loading dock features a turntable suitable for Council's waste collection vehicles.

Table 10 outlines relevant specifications.

Table 10: Collection point and loading area specifications

Component	Requirement	Specification
Collection point	Allow safe waste collection and loading operations	<ul style="list-style-type: none"> - Adequate clearance and manoeuvring space; - Sufficient clearance for the safe handling of materials and equipment; and - Sectioned loading bay does not impede upon traffic and pedestrian safety.
Vehicle manoeuvring and loading space	Truck space for adequate lift clearance, manoeuvring and operation for a contractor collection vehicle	<ul style="list-style-type: none"> - Collection from the loading dock is assisted by a vehicle turntable which permits waste vehicles to enter and exit the site in a forward-facing direction; - Adequate loading bay dimensions do not impede rear lift clearance; - Operational clearance for truck manoeuvring in a forward direction in and out of the loading bay; and - The provision of space clear of vehicle parking spaces.
Operating times	Appropriate collection times to limit noise and traffic disturbance	<ul style="list-style-type: none"> - Collection times will be arranged to ensure minimal disturbance to residents, pedestrians and visitors.

The site waste caretaker will be responsible for the transfer of bins, with assistance by a bin tug or trailer, to and from the loading area. Bins will be transferred between the bin rooms and holding area no earlier than the evening before collection day and will be returned to their respective waste rooms no later than the evening of collection day. To facilitate the internal transfer of bins from WSRA B to the service lift (a distance of 62m) for access to the loading dock, a bin tug such as the example shown in Appendix B may be used.

Access driveways and internal roads will be designed in accordance with AS2890.2 Parking Facilities – Off-Street Commercial Vehicle Facilities – 2002. Collection of site waste bins by Council's waste collection vehicles (residential waste), and a private waste contractor (retail waste) will be facilitated through building

management or the site waste caretaker who will provide access to the ground floor loading dock. Collection days and times cannot be guaranteed, so the building management will need to ensure priority use is available for waste collection.

In the event that the turntable is unusable for any reason, waste collection vehicles may be able to perform a single reversing manoeuvre out of the loading dock, with supervision from the site building manager. Alternatively, waste collection vehicles may be able to pull up to the loading dock driveway, and bins wheeled out from the loading dock with assistance by bin tug or trailer retained onsite.

Site specific arrangements and indemnity (including a hazard assessment) will be separately arranged with Council prior to the commencement of residential waste services.

5.3 Building Waste Management System

The building management will engage a waste caretaker to enact and monitor day to day waste management operations. Should there be any issues that impact on the operational efficiency, safety and suitability of waste management, the waste caretaker will inform management. Operation of the waste management system is the responsibility of building management and the waste caretaker.

Building management is responsible for:

- Using this WMP to inform waste management operations, design and infrastructure;
- Providing educational materials and information to tenants and residents on sorting methods for recycled waste, awareness of waste management procedures for minimisation and recovery;
- Making information available to residents, tenants, visitors and workers about site waste management procedures;
- Appropriate signage in waste service and chute hopper inlet areas per floor and all waste management areas;
- Using contracts to define the allocation of responsibilities with cleaners, building managers and tenants;
- Holding a valid and current contract with licensed collector(s) for waste and recycling collection and disposal;
- Encouraging waste avoidance and achievement of resource recovery targets;
- Providing operational management for delivery of waste objectives;
- Organising waste, recycling and bulky pick-ups by elected contractor for the building.

Waste caretaker duties include:

- Organising, maintaining and cleaning the WSRAs and service rooms;
- Arranging access to WSRAs and bins on collection days and to liaise with the WSP for operational issues;
- Cleaning and exchanging all bins;
- Monitoring any vermin and pest issues and arranging appropriate controls (traps or fumigating) and maintenance of doors or other points of potential entry;
- Coordinating washing and clearing of blockages of the chute system based on supplier instructions (frequency and method of using in-built wash down system).

5.4 Waste Storage Room

The Waste Room will provide centralised storage that has adequate capacity to receive and store the maximum likely generation of waste and recycling between collection times. The room will be constructed to improve amenity, minimise odour, protect surrounding areas and promote user safety. Specifications are as follows:

- Signage for safety and waste bin identification;
- Safety precautions, staff training and signage for plant;
- Noise attenuation for waste management and the waste room that limits effects to residents from the waste chute and bin transfer;
- Floors constructed of concrete or other approved solid, impervious material that can be cleaned easily;
- Grading and draining to an approved drainage fitting located in the room;
- Smooth, even surface covered with vertical wall and plinth faces;
- Doorway ramp (if not level);
- Light colour finish for all room surfaces;
- Adequate supply of water with hose cock as close as practicable to the doorway;
- Close fitting and self-closing door;
- Suitable construction including limited entry paths to prevent vermin;
- Ventilation through permanent unobstructed ventilation (5% of floor area) or mechanical exhaust ventilation system (5L/s per m² of floor area);
- Appropriate refrigerated waste storage should Council determine any requirements based on large quantities of food waste generation, or if frequent waste removal from site may be difficult due to location or trading hours; and
- Security and lighting.

5.5 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 take into account language and non-English speaking backgrounds, vision impairment and accessibility. Illustrative graphics must form a minimum 50% of the area of the signage. Signage is to be prominently posted in each WSRA and waste access chute area indicating:

- Garbage is to be bagged and placed into the chute;
- Details regarding acceptable recyclables;
- Recyclables are to be decanted loose (not bagged);
- *No standing* and *danger* warnings apply to the area surrounding the WSRA;
- Contact details for arranging the disposal of bulky items;
- Chute operation instructions including emergency contacts; and
- The area is to be kept tidy.

Standard signage requirements and guidance for application apply (see Appendix C).

5.6 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), building management and the waste caretaker will also be responsible for:

- Maintenance of open and common site areas;
- Ensuring WSRA's are well maintained and kept clean;
- Securing the waste storage area from vandalism and the escape of litter;
- Identification and appropriate disposal of goods with hazardous material content (paints, e-waste, fluorescent tubes);
- Taking action 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.

6 References

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

Blue Environment (2016) Australian National Waste Report.

Georges River Council (2012) Hurstville Development Control Plan.

Georges River Council (2012) Hurstville Local Environmental Plan.

Department of Environment, Climate Change & Water (2010) House deconstruction fact sheet: Bricks and concrete removal.

Department of the Environment (2016) Working together to reduce food waste in Australia, Australian Government.

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>.

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 Guide for Resource Recovery in Residential Developments.

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

Figure 3: Site Plan - Typical Residential Level (level 2)



Figure 4: Site Plan - Basement 1 Level

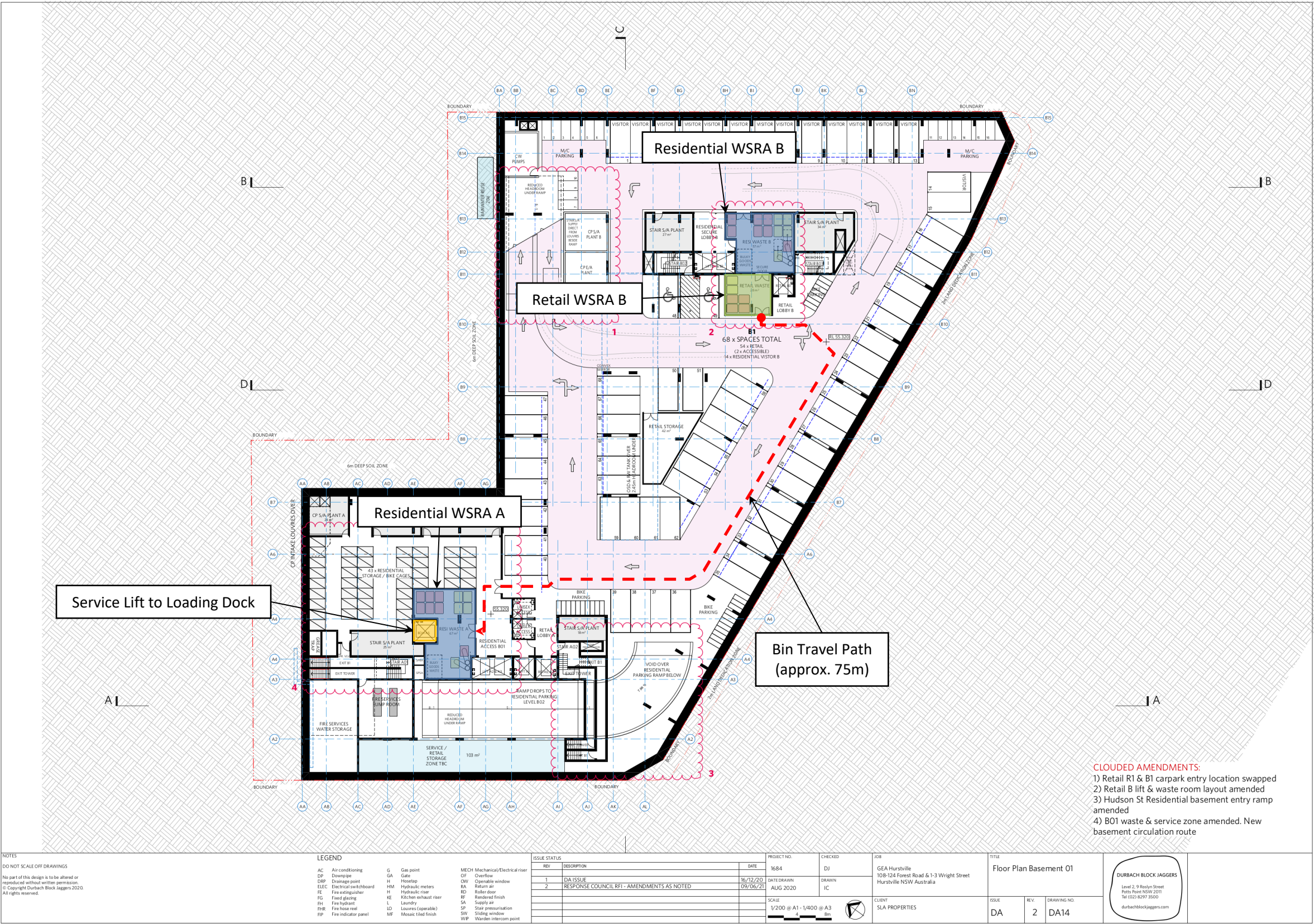


Figure 5: Site Plan - Ground Level



Figure 6: Proposed C&D waste storage and stockpile location



Appendix B Bin Tug and Trailer

SITECRAFT
 MATERIALS HANDLING EQUIPMENT



17 Macquarie Drive, Thomastown, VIC 3074

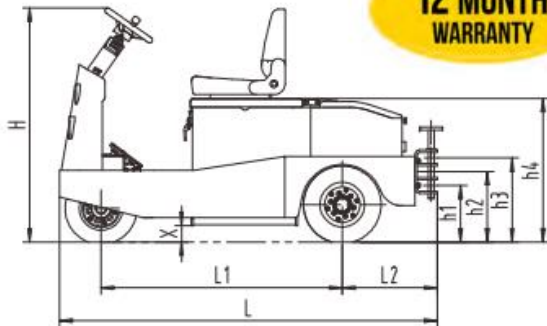
Phone: 1300 363 152

Fax: 1300 722 383

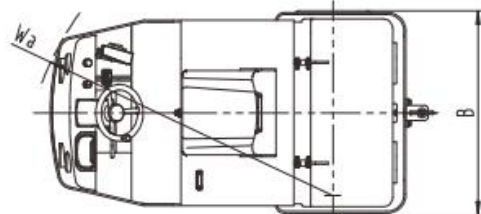
E: sales@sitecraft.com.au ABN: 36 423 328 526

SITECRAFT HEAVY DUTY ELECTRIC TOW TRACTOR

- > Towing capacities from 2000 kg to 6,000 kg
- > **Full AC electric system** has a brake-releasing function, making the unit easy and effortless to operate; The maintenance-free motor completely solves the issues of DC motor carbon brush.
- > Batteries located in the lowest part of frame ensures excellent stability
- > Quick open back service cover for easy maintenance and part replacement
- > CANbus technology reduces wiring complexity and increases reliability
- > H type axle design provides excellent stability
- > New high-range steering design; light steering and easy to maintain.
- > New large-screen instrument display provides information clearly and directly to the operator.



**12 MONTH
 WARRANTY**



Model		ST-2000AC	ST-3000AC	ST-5000AC	ST-6000AC
Towing Capacity	Kg	2000	3000	5000	6000
Drawbar Centre Height	h1/h2/h3 mm	280/350/420	280/350/420	280/350/420	280/350/420
Motor	Kw / V	3Kw / 36V	3Kw / 36V	5Kw / 48V	5Kw / 48V
Total Size	L x B x H mm	1720 x 968 x 1270	1720 x 968 x 1270	1975 x 1100 x 1270	1975 x 1100 x 1270
Total Weight (With Batteries)	Kg	740	780	1240	1280
Wheel Size	Solid Rubber	15*4-8	15*4-8	15*4-8	15*4-8
Wheelbase	L1 mm	1055	1055	1280	1280
Rear Hanging Distance	L2 mm	382	382	500	500
Seat Height	h4 mm	910	910	910	910
Ground Clearance	X mm	90	90	90	90
Turning Radius	Wa mm	1500	1500	1650	1650
Maximum Speed	Km/h	10	8	14	12
Battery	V/Ah	36/200	36/250	48/360	48/400
Battery Weight	Kg	200	250	610	650
Charger	On-board V/Ah	36/30	36/30	48/50	48/50

SITECRAFT HEAVY DUTY ELECTRIC TOW TRACTOR



Sitecraft ST3000-AC tow tug moving 660 & 1100 litre bins



Sitecraft ST3000-AC tow tug moving 660 & 1100 litre bins



ST3000-AC tow tug complete with 6 x 250AH heavy duty batteries



Appendix C 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).

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 7: 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 8: Example and layout of safety signage



(d) Horizontal

FIGURE D5 TYPICAL ARRANGEMENTS OF DANGER SIGNS

