



Oakdale East Estate – Precinct 2

Waste Management Plan

Goodman Property Services (Aust) Pty Ltd

The Hayesbery
1-11 Hayes Rd
Rosebery NSW 2018

Prepared by:

SLR Consulting Australia

SLR Project No.: 610.30733.00509

21 May 2025

Revision: 6.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
6.0	21 May 2025	Andrew Quinn	Chani Lokuge	Andrew Quinn

Basis of Report

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1.0 Introduction

1.1 Overview

Goodman Property Services (Aust) Pty Ltd (GPSA) is seeking developing approval for Precinct 2 at the Oakdale East Industrial Estate. The site is in Fairfield City Council area although the development is state significant. The Secretary's Environmental Assessment Requirements (SEARs) have been issued.

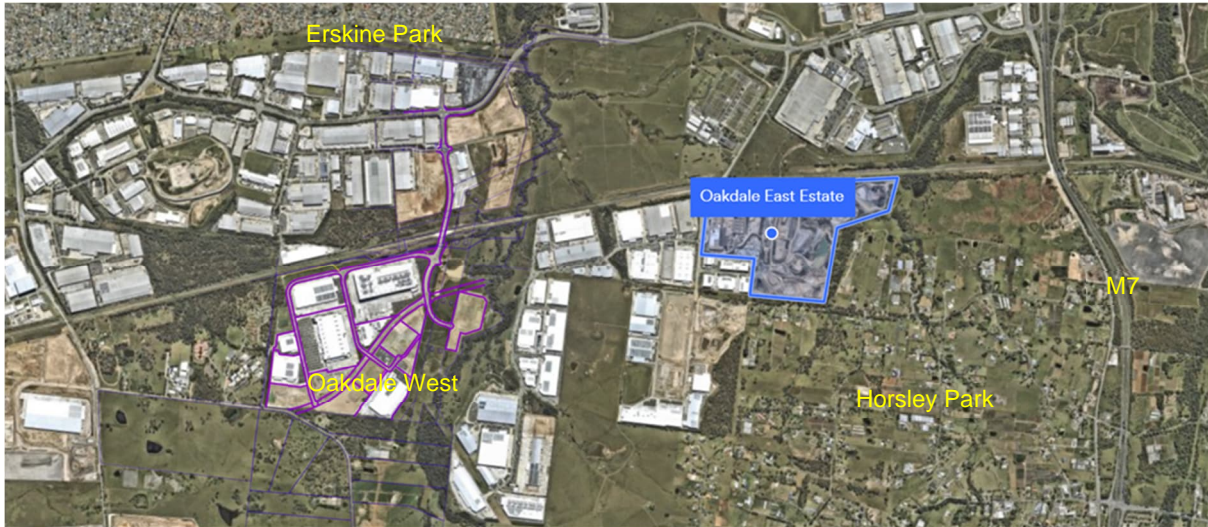


Figure 1 Location of Oakdale East Estate

The location of Precinct 2 within the site is shown in Figure 2 below.



Figure 2 Precinct 2 location

This waste management plan supports the state significant development application (SSDA) for SSD-77020757 and the relevant requirements of the SEARs have been addressed using



the Fairfield Citywide Development Control Plan 2013 Amendment 22¹ as a guide. Specifically, this report has been prepared to respond to the SEARs requirements for waste management which are shown in Table 1 below.

Table 1 SEARs

Description of requirement	Reference in this WMP
<p>Waste details of the quantities and classification of all waste streams to be generated on site during the development.</p>	<p>For the identification and classification of site clearance and construction waste please refer to:</p> <ul style="list-style-type: none"> • Section 5.2 Waste Streams and Classifications • Table 3 Potential site clearance and construction waste types, classifications and management methods <p>For the estimated quantities of site clearance waste please refer to:</p> <ul style="list-style-type: none"> • Section 5.3 Waste Types and Quantities <p>For the estimated quantities of construction waste please refer to:</p> <ul style="list-style-type: none"> • Table 5 Estimated types and quantities of construction waste <p>For the identification and classification of operational waste please refer to:</p> <ul style="list-style-type: none"> • Section 7.2 Waste Streams and Classifications • Table 8 Potential operational waste types, classifications and management methods <p>For the estimated quantities of operational waste please refer to:</p> <ul style="list-style-type: none"> • Section 7.3 Waste quantities • Table 10 Estimated operational waste quantities
<p>details of waste storage, handling and disposal during the development.</p>	<p>For construction and demolition waste please refer to:</p> <ul style="list-style-type: none"> • Section 5.5 Re-use, Recycling and Disposal • Section 5.6 Waste Separation, Storage and Servicing. <p>For operational waste please refer to:</p> <ul style="list-style-type: none"> • Section 7.4 Waste Storage Area Size • Section 7.5 Waste System Description • Section 7.8 Waste Avoidance, Reuse and Recycling
<p>details of the measures that would be implemented to ensure that the development is consistent with the aims, objectives and guidance in the NSW Waste and Sustainable Materials Strategy 2041</p>	<p>For construction and demolition waste, please refer to Section 5.1 For operational waste, please refer to Section 7.1</p>

1.2 Objectives

The principal objective of this WMP is to identify all potential wastes likely to be generated at the Development during the site clearance, construction and operational phases, including a description of how waste would be handled, processed and disposed of, or re-used or recycled, in accordance with the SEARs and guided by Council's documentation.

The specific objectives of this WMP are:

- To encourage the minimisation of waste production and maximisation of resource recovery.

¹ <https://www.fairfieldcity.nsw.gov.au/Planning-and-Building/Developments-and-Buildings/Development-Control-and-Structure-Plans>



- To assist in ensuring that any environmental impacts during the operational life of the Development comply with Council's development consent conditions and other relevant regulatory authorities.

2.0 Site Description

The application seeks approval for the construction, operation, use and fit-out approval of three warehouses spanning about 157,500 m². The development is proposed to be staged across multiple stages. Approval is sought for operation 24 hours per day seven days per week for the warehouses at Precinct 2 for warehouse and distribution use.

Precinct 2 total GLA, warehouse and office = 90,158 m², including tolerance is as follows:

- Building 2A-1:
 - Warehouse - 25,373 m²
 - Office - 1,000 m²
 - Dock Office - 100 m²
 - Total: 26,473 m²
- Building 2A-2:
 - Warehouse - 34,478 m²
 - Office - 1,000 m²
 - Dock Office - 200 m²
 - Total - 35,678 m²
- Building 2B-1:
 - Warehouse - 13,621 m²
 - Office - 600 m²
 - Dock Office - 52 m²
 - Total - 14,273 m²
- Building 2B-2:
 - Warehouse - 13,082 m²
 - Office - 600 m²
 - Dock Office - 52 m²
 - Total - 13,734 m²
- 14.6 m Ridge Height to be adopted
- 20 m cantilevered awnings over hardstand
- 3 m awnings over the recessed docks
- Speculative facilities – that is, no customer currently
- 2A-1/2 and 2B-1/2 will respectively share their fire infrastructure and essential services
- Ambient warehouses, no temperature control



- Generic fit-out to be included on plans within DA
- Solar will be installed to the facilities
- Targeting 5 Star Greenstar Rating.

The proposed development comprises the clearance of the site and construction, fit out and operation of the warehouses.

The designs for the warehouses, and the approximate site boundary, are shown in Figure 3 below.

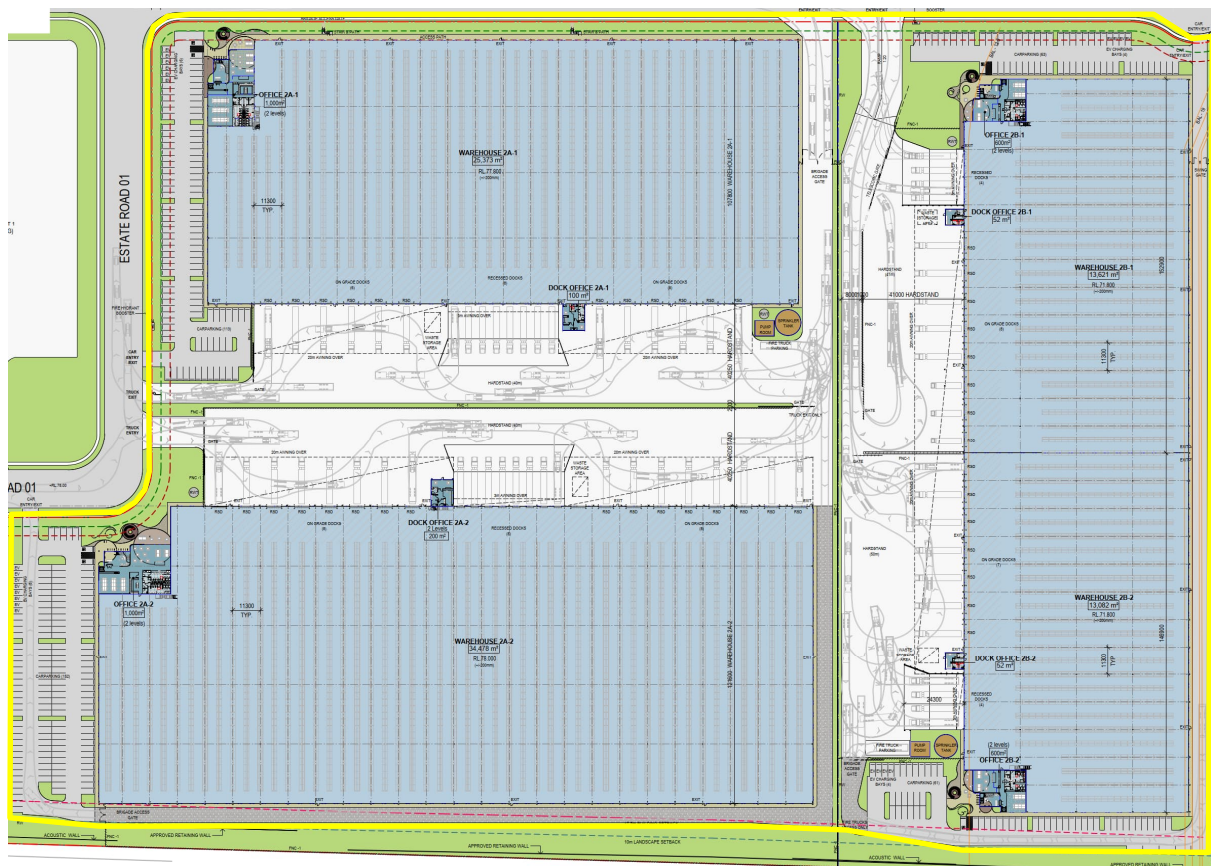


Figure 3 Precinct 2 warehouses and site boundary

3.0 Better Practice for Waste Management and Recycling

3.1 Waste Management Hierarchy

This WMP has been prepared in line with the waste management hierarchy shown in Figure 4 below. The hierarchy summarises the objectives of the *Waste Avoidance and Resource Recovery Act 2001*.

The waste management hierarchy comprises the following principles, from most to least preferable:



- Waste **avoidance**, prevention or reduction of waste generation. Achievable through better design and purchasing choices.
- Waste **reuse**, reuse without substantially changing the form of the waste.
- Waste **recycling**, treatment of waste that is no longer usable in its current form to produce new products.
- Energy **recovery**, processing of residual waste materials to recover energy.
- Waste **treatment**, reduce potential environmental, health and safety risks.
- Waste **disposal**, in a manner that causes the least harm to the natural environment.

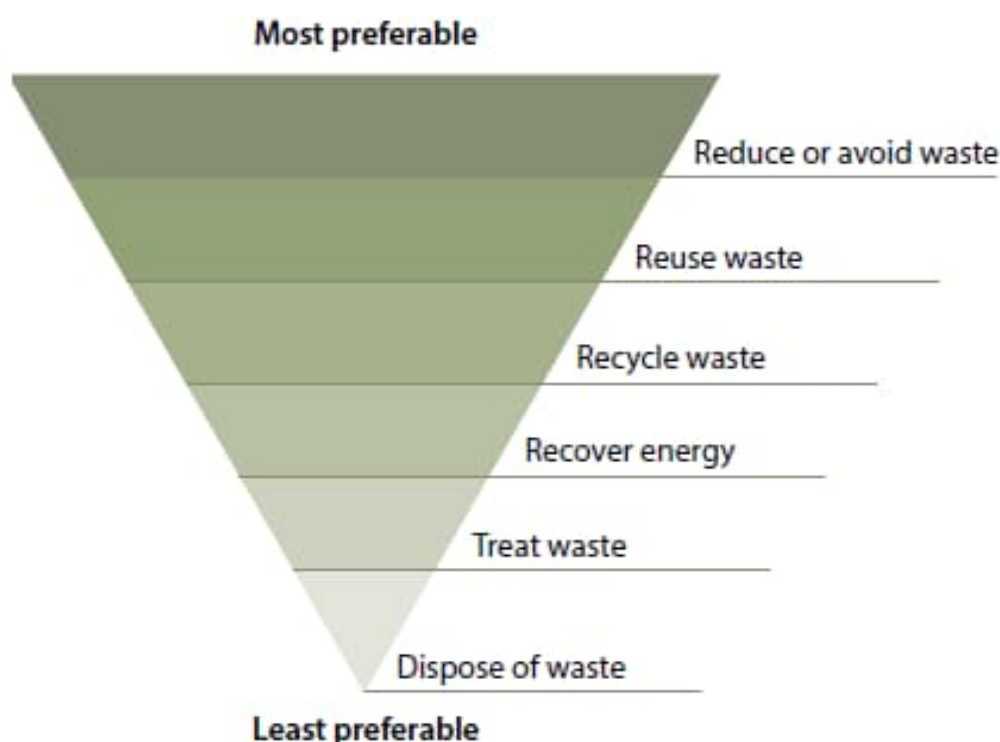


Figure 4 Waste Management Hierarchy

3.2 Benefits of Adopting Better Practice

Adopting better practice principles in waste minimisation offers significant benefits for organisations, stakeholders and the wider community. Benefits from better practice waste minimisation include:

- Improved reputation of an organisation due to social and environmental responsibility.
- Lowered consumption of non-renewable resources.
- Reduced environmental impact, for example, pollution from materials manufacturing and waste treatment.
- Reduced expenses from lower waste disposal.
- Providing opportunities for additional revenue streams through beneficial reuse.



3.3 Review of WMP

This WMP will be reviewed and updated:

- To remain consistent with waste and landfill regulations and guidelines
- If changes are made to site waste and recycling management, or
- To take advantage of new technologies, innovations and methodologies for waste or recycling management.

Copies of the original WMP and its future versions should be retained by the building manager. Changes made to the WMP, as well as the reasons for the changes made, should be documented by the building manager as part of the review process.

4.0 Waste Legislation and Guidance

4.1 Fairfield Citywide Development Control Plan 2013

The Fairfield Citywide Development Control Plan 2013 Amendment 22 (FDCP) makes a number of references to waste management. Those relevant to this development are shown below.

Chapter 9 – Industrial Development

a) *Garbage storage areas must:*

- a. Be designed so that the floors and walls can be washed on a regular basis and the wastewater collected, treated and disposed of to the sewer;*
- b. Include separation facilities for waste to be divided into separate waste streams in order to recycle materials;*
- c. Be located away from adjoining residential dwellings; and*
- d. Be located so as to not cause any negative impacts, in terms of visual appearance, noise or smell, to adjoining properties, or to the street.*

b) *Waste collection noise minimisation - The collection of waste materials from the site must be in accordance with the NSW Environment Protection Authority, Industrial Noise Policy (2000).*

9.7.2 Floor Space Ratio

a) *To ensure an adequate imperviously sealed area is set aside for on-site manoeuvring, storage, car parking, general waste, pedestrian access and landscaping, a maximum floor space ratio of 0.33:1 applies as identified on the Fairfield Local Environmental Plan 2013 – Floor Space Ratio Map.*



4.2 Other Legislation and Guidance

The waste legislation and guidance outlined in Table 2 below should be referred to during the operation of the Development.

Table 2 Legislation and guidance relevant to this development

Legislation and Guidance	Objectives
State and National legislation and guidelines	
Building Code of Australia (BCA) and relevant Australian Standards	The BCA has the aim of achieving nationally consistent, minimum necessary standards of relevant health and safety, amenity and sustainability objectives efficiently.
Council of Australian Governments National Construction Code 2019	The National Construction Code 2019 sets the minimum requirements for the design, construction and performance of buildings throughout Australia.
NSW EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012	These better practice guidelines present information on waste minimisation and resource recovery as well as information on commonly used waste management provisions. The guidelines also provide benchmarks for assessing waste production rates in Australia.
NSW Waste and Sustainable Materials Strategy 2041: Stage 1 – 2021-2027	Replacing the <i>NSW Waste Avoidance and Resource Recovery Strategy (2014-21)</i> , the NSW Waste and Sustainable Materials Strategy 2041 focuses on the transition of NSW to a circular economy. The strategy focuses on minimising what is thrown away, and to use and reuse resources more efficiently, making them as productive as possible. The strategy identifies the need to identify infrastructure needs, the mandating of separation of some organic waste streams, and incentivising biogas generation from waste materials.
NSW EPA Resource Recovery Orders and Resource Recovery Exemptions	The NSW EPA has issued a number of resource recovery orders and resource recovery exemptions under the POEO (Waste) Regulation 2014 for a range of wastes that may be recovered for beneficial re-use. These wastes typically include those from demolition and construction works, as well as ongoing wastes such as food waste. <ul style="list-style-type: none"> Resource recovery orders present conditions which generators and processors of waste must meet to supply the waste material for beneficial re-use. Resource recovery exemptions contain the conditions which consumers must meet to use waste for beneficial re-use.
NSW EPA's Waste Classification Guidelines 2014	The NSW EPA Waste Classification Guidelines assists waste generators to effectively manage, treat and dispose of waste to ensure the environmental and human health risks associated with waste are managed appropriately and in accordance with the <i>POEO Act 1997</i> and its associated regulations.
<i>Protection of the Environment Operations Act (POEO) 1997 and Amendment Act 2011</i>	The POEO Act 1997 and POEO Amendment Act 2011 are administered by the NSW EPA to enable the NSW Government to establish instruments for setting environmental standards, goals, protocols and guidelines. They outline the regulatory requirements for lawful disposal of wastes generated during the demolition, construction and operational phases of a development, as well as the system for licencing waste transport and disposal.
The Work Health and Safety Regulation 2017	The Work Health and Safety Regulation 2017 provides detailed actions and guidance associated with the topics discussed in The Work Health and Safety Act 2011. The primary aim of the regulation is to protect the health and safety of workers and ensure that risks are minimised in work environments. Workplaces are to ensure that they are compliant with the requirements specified in the regulations. The regulations discuss items such as actions that are prohibited or obligated in work environments, the requirements for obtaining licences and registrations, and the roles and responsibilities of staff in workplaces.
<i>Waste Avoidance and Resource Recovery Act 2001</i>	The <i>Waste Avoidance and Resource Recovery Act 2001</i> aims to promote waste avoidance and resource recovery and repeals the <i>Waste Minimisation and Management Act 1995</i> . Specific objectives of the <i>Waste Avoidance and Resource Recovery Act 2001</i> include:



Legislation and Guidance	Objectives
	<ul style="list-style-type: none"> • encouraging efficient use of resources • minimising the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste • ensuring industry and the community share responsibility in reducing/dealing with waste, and • efficiently funding of waste and resource management planning, programs and service delivery. <p>As of 2016, the addition to the Act of Part 5 defines the legislative framework for the 'Return and Earn Container Deposit Scheme' whereby selected beverage containers can be returned to State Government authorities for a monetary refund.</p>

5.0 Site Clearance and Construction Waste and Recycling Management

5.1 Targets for Resource Recovery

Targets for new development are expected to contribute to state-specific targets. The NSW Waste and Sustainable Materials Strategy 2041 (DPIE, 2021) sets a target of 80% average recovery rate from all waste streams by 2030. Analysis by DPIE (2021) indicates that construction and demolition waste recovery rates in 2018-2019 were 77%.

It is anticipated that the waste minimisation measures in the following sections will assist the Development to meet an 80% target. Waste reporting and audits can be used to determine the actual percentage of wastes that are being, or have been, recycled during the site preparation, site clearance and construction stages of the Development. Calculations in Table 5 show that 95% of the construction waste stream can be recycled.

Waste generated during site clearance and construction will be reused on site wherever possible, especially in the case of soil and fill. Waste and recyclables taken off site will be recycled, or disposed of, at facilities lawfully able to accept them.

5.2 Waste Streams and Classifications

The site clearance and construction activities are anticipated to generate the following broad waste streams:

- Site clearance waste as outlined in Section 5.3.1
- Construction waste as outlined in Section 5.3.2
- Packaging waste, and
- Work compound waste from on-site employees.

A summary of likely waste types generated from site clearance and construction activities, along with their waste classifications and proposed management methods are provided in Table 3.



Table 3 Potential site clearance and construction waste types, classifications and management methods

Waste Types	NSW EPA Waste Classification	Proposed Management Method
Site clearance and Construction		
Sediment fencing, geotextile materials	General solid waste (non-putrescible)	Reuse at other sites where possible or disposal to landfill
Concrete	General solid waste (non-putrescible)	Off-site recycling for filling, levelling or road base
Bricks and pavers	General solid waste (non-putrescible)	Cleaned for reuse as footings, broken bricks for internal walls, crushed for landscaping or driveway use, off-site recycling
Gyprock or plasterboard	General solid waste (non-putrescible)	Off-site recycling or returned to supplier
Sand or soil	General solid waste (non-putrescible)	Off-site recycling
Metals such as fittings, appliances and bulk electrical cabling, including copper and aluminium	General solid waste (non-putrescible)	Off-site recycling at metal recycling compounds and remainder to landfill
Conduits and pipes	General solid waste (non-putrescible)	Off-site recycling
Timber – treated	General solid waste (non-putrescible)	Reused for formwork, bridging, blocking, propping or second-hand supplier
Timber - untreated		Off-site recycling, chip for landscaping, sell for firewood, reused for floorboards, fencing, furniture, mulched secondhand supplier and remainder to landscape supplies.
Doors, windows, fittings	General solid waste (non-putrescible)	Off-site recycling at secondhand supplier
Insulation material	General solid waste (non-putrescible)	Off-site disposal
Glass	General solid waste (non-putrescible)	Off-site recycling, glazing or aggregate for concrete production
Asbestos	Special waste	Off-site disposal to a licensed landfill facility.
Fluorescent light fittings and bulbs	General solid waste (non-putrescible)	Off-site recycling or disposal, contact <i>FluoroCycle</i> for more information ²
Paint	Liquid waste	Off-site recycling, Paintback collection ³ or disposal
Synthetic rubber or carpet underlay	General solid waste (non-putrescible)	Off-site recycling, reprocessed for other uses
Ceramics including tiles	General solid waste (non-putrescible)	Off-site recycling
Carpet	General solid waste (non-putrescible)	Off-site recycling, disposal or reuse
Packaging		

² Available online from <http://www.fluorocycle.org.au/> or <http://www.environment.gov.au/settlements/waste/lamp-mercury.html>

³ Available online from <https://www.paintback.com.au/>



Waste Types	NSW EPA Waste Classification	Proposed Management Method
Packaging materials, including wood, plastic, including stretch wrap or LDPE, cardboard and metals	General solid waste (non-putrescible)	Off-site recycling
Wooden or plastic crates and pallets	General solid waste (non-putrescible)	Reused for similar projects, returned to suppliers, or off-site recycling. Contact <i>Business Recycling</i> for more information ⁴
Worker Compound and Associated Offices		
Food Waste	General solid (putrescible) waste	Dispose to landfill with general garbage
Recyclable beverage containers, such as glass and plastic bottles, aluminium cans and steel cans	General solid waste (non-putrescible)	Recycling at off-site licensed facility or at NSW container deposit scheme 'Return and Earn' facility ⁵
Clean paper and cardboard	General solid waste (non-putrescible)	Paper and cardboard recycling at off-site licensed facility
General domestic waste generated by workers such as soiled paper and cardboard, food and polystyrene	General solid waste (non-putrescible) mixed with putrescible waste	Disposal at landfill

For further information on how to determine a waste's classification refer to the NSW EPA (2014) *Waste Classification Guidelines*.⁶ Further information on managing site preparation, site clearance and construction wastes is also available on the NSW EPA website.⁷

5.3 Waste Types and Quantities

5.3.1 Site Clearance

Infrastructure works have been completed and a cleared pad already prepared. A polymer spray has been applied for dust suppression.

5.3.2 Construction Waste Types and Quantities

Council's Guidelines do not provide any advice on construction waste quantities. As an alternative, SLR has adopted the 'Factory' and 'Office' waste generation rates from *The Hills' Development Control Plan* and data from *Light Duty Asphalt Pavements - Design, Specification and Construction 2002* Australian Asphalt Pavement Association, for estimating the type and quantities of waste generated from construction of the proposed buildings. The construction waste generation rates used are shown in Table 4 below.

⁴ Available online from <https://businessrecycling.com.au/>

⁵ Available online from <http://returnandearn.org.au/>

⁶ Available online from <https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/waste-classification-guidelines>

⁷ Available online from <http://www.epa.nsw.gov.au/your-environment/waste/industrial-waste/construction-demolition>



Table 4 Construction waste generation rates

Rate Type	Area (m ²)	Waste types and quantities (m ³)								
		Timber	Concrete	Bricks	Gyprock	Sand or Soil	Metal	Other	Asphalt	Granular Base
Factory	1,000	0.25	2.1	1.65	0.45	4.8	0.6	0.5		
Office	1,000	5.1	18.8	8.5	8.6	8.8	2.75	5		
Carpark	1		0.225						0.250	0.1
Hardstand	1,000		2.1			4.8	0.6	0.5		

The areas shown in Table 5 are based on the areas for the Development shown in drawing *24233_OEE_Precinct_2_DA_Drawings_241112.pdf*.

Estimates of the quantities of construction waste generated from the Development are shown in Table 5 below.

Table 5 Estimated types and quantities of construction waste

Lot	Component	Area (m ²)	Waste types and quantities (m ³)								
			Timber	Asphalt	Concrete	Granular Base	Bricks	Gyprock	Sand or Soil	Metal	Other
2A	Warehouse	59,851	15	0	126	0	99	27	287	36	30
	Office	2,300	12	0	43	0	20	20	20	6.3	12
	Carpark	6,768	0	17	15	68	0	0	0	0	0
	Hardstand	21,866	0	0	46	0	0	0	105	13	11
2B	Warehouse	26,703	6.7	0	56	0	44	12	128	16	13
	Office	1,304	6.7	0	25	0	11	11	11	3.6	6.5
	Carpark	5,791	0	14	13	58	0	0	0	0	0
	Hardstand	12,645	0	0	27	0	0	0	61	7.6	6.3
Total		137,228	40	31	350	126	173	70	613	83	79

5.4 Waste Avoidance Strategies

The Building Contractor, Building Designer and/or those in equivalent roles should follow better practice waste management and the principles of ecologically sustainable development.

Recommendations for the Building Designer include:

- Using prefabricated components
- Using low formaldehyde wood products, post-consumer reused timber and/or Forest Stewardship Council certified timber
- Using fittings and furnishings that have been recycled, are made from or incorporate recycled materials and have been certified as sustainable or environmentally friendly by a recognised third-party certification scheme
- Preferentially using building materials, fittings and furnishings, including structural framing, roofing and façade cladding, that have longer life and better re-use and recycling potential
- Reducing the use of polyvinyl chloride products



- Preferentially using paints, floor coverings and adhesives with low VOC (volatile organic compound) content
- Avoiding unsustainable timber imports including western red cedar, oregon, meranti, luan or merbau
- Selecting materials based on low embodied energy properties that suit the Project, such as recycled materials including recycled steel and glass-wool insulation, or concrete with slag and fly ash content
- Centralising wet areas together to minimise piping, and
- Designing for deconstruction rather than demolition.

Recommendations for the Building Contractor include:

- Applying practical building designs and construction techniques
- Minimising excavation works
- Investigating leased equipment and machinery rather than purchase and disposal
- Sorting and segregating site preparation and construction wastes to ensure efficient reuse and recycling of wastes
- Preferentially selecting building materials, fittings and furnishings, including structural framing, roofing and façade cladding, that have longer life and better re-use and recycling potential
- Store wastes on-site appropriately to prevent cross-contamination and/or mixing of different waste types
- Reducing packaging waste by:
 - Returning packaging to suppliers where practicable to reduce waste further along the supply chain
 - Purchasing in bulk
 - Requesting cardboard or metal drums rather than plastics
 - Requesting metal straps rather than shrink wrap, and
 - Using returnable packaging such as pallets and reels.
- Arranging deliveries ‘as needed’ to mitigate degradation, weathering or moisture damage, and
- Ensure subcontractors are informed of and implement site waste minimisation and management procedures.

5.5 Re-use, Recycling and Disposal

Effective management of site clearance and construction materials and waste, including options for reuse and recycling where applicable and practicable, will be conducted. Only waste that cannot be cost effectively reused or recycled is to be sent to landfill or appropriate disposal facilities.

Refer to Table 3 for an outline of the proposed reuse, recycling and disposal methods for potential waste streams generated by the development.

The following specific procedures should be implemented:



- vegetation and soil generated from site clearance works would be reused on site as fill material and for landscaping where possible
- concrete, tiles and bricks should be reused or recycled off-site
- steel should be recycled off-site, and all other metals should be recycled where economically viable
- framing timber should be reused on-site or recycled off-site
- windows, doors and joinery should be recycled off-site, where possible
- all used crates should be stored for reuse unless damaged
- all glass that can be economically recycled should be recycled
- all solid waste timber, brick, concrete, rock that cannot be reused or recycled should be taken to an appropriate facility for treatment to recover further resources or for disposal to landfill in an approved manner
- all asbestos, hazardous and/or intractable wastes will be disposed of in accordance with SafeWork NSW and NSW EPA requirements
- provision for the collection of batteries, fluorescent tubes, smoke detectors and other recyclable resources should be provided on site, and
- all waste and recycling should be disposed of through a council approved system.

5.6 Waste Separation, Storage and Servicing

5.6.1 Waste Separation and Storage

Waste materials produced from site clearance and construction activities will be separated at the source and stored separately on-site. A more detailed construction waste management plan will be prepared that will provide further information on waste storage on site during construction.

It is anticipated that there will be enough space on-site for separate storage in, for example, separate skip bins or appropriately managed stockpiles, of the following waste types:

- Bricks, concrete and scrap metal
- Metal and steel, in a condition suitable for recycling at metal recycling facilities
- Timber
- Glass
- Hardstand rubble
- Cleared vegetation
- Uncontaminated excavation spoil, if present
- Contaminated excavation spoil, if present
- Hazardous waste, if present
- Paper and cardboard
- General co-mingled recycling waste, and
- Non-recyclable general waste.



If there is insufficient space on-site for full separation of waste types, the site manager, or equivalent role, should consult with the waste and recycling collection contractor to confirm which waste types may be co-mingled before removal from the site.

5.6.2 Waste Storage Areas

Waste storage areas will be accessible and allow sufficient space for storage and servicing requirements. The storage areas will also be flexible in order to cater for change of use throughout the project. Where space is restricted, dedicated stockpile areas will be delineated on the site, with regular transfers to dedicated skip bins for sorting.

All waste placed in skips or bins for disposal or recycling will be adequately contained to ensure that waste does not fall, blow, wash or otherwise escape from the site. Waste containers and storage areas will be kept clean and in a good state of repair.

Applicable weather protection measures should be considered for storage spaces.

In accordance with good practice waste management, areas designated for waste storage will:

- Allow unimpeded access by site personnel and waste disposal contractors
- Take into account environmental factors which could potentially cause an impact to the waste storage, such as slope, drainage and the location of watercourses and native vegetation
- Allow sufficient space for the storage of garden waste and other waste materials on-site
- Employ adequate environmental management controls to prevent off-site migration of waste materials and contamination from the waste. For example, consideration of slope, drainage, proximity relative to waterways, stormwater outlets and vegetation
- Consider visual amenity, safety and accessibility in their selection, and
- Not present hazards to human health or the environment.

5.6.3 Waste Servicing and Record Keeping

The Site Manager or equivalent role will:

- Arrange for suitable waste collection contractors to remove any construction waste from site
- Ensure waste bins are not filled beyond recommended filling levels
- Ensure that all bins and loads of waste materials leaving site are covered
- Maintain waste disposal documentation detailing, at a minimum:
 - Descriptions and estimated amounts of all waste materials removed from site
 - Details of the waste and recycling collection contractors and facilities receiving the waste and recyclables
 - Records of waste and recycling collection vehicle movements, for example, date and time of loads removed, licence plate of collection vehicles, tip dockets from receiving facility, and



- Waste classification documentation for materials disposed to off-site recycling or landfill facilities.
- Ensure lawful waste disposal records are readily accessible for inspection by regulatory authorities such as Council, SafeWork NSW or NSW EPA, and
- Remove waste during approved hours.

If skips and bins are reaching capacity, removal and replacement will be organised as soon as possible. All site-generated building waste collected in the skips and bins will leave the site and taken to a site lawfully able to accept them.

5.6.4 Waste Servicing and Transport

The frequency of the waste removal will, in most cases, be dictated by the quantities of material being deposited into each of the dedicated skip bins. All skips leaving the site will be covered with a suitable tarpaulin to ensure that the spillage of waste from the skips while in transit is eliminated.

5.7 Signage

Standard signage will be posted in all waste storage and collection areas. All waste containers will be labelled correctly and clearly to identify stored materials.

Signs approved by the NSW EPA for labelling of waste materials are available online⁸ and should be used where applicable. A selection of the EPA's signs is shown in Figure 5 below.



Figure 5 Examples of NSW EPA labels for waste and skip bins

5.8 Site Inductions

All staff, including sub-contractors and labourers, employed during the site preparation and construction phases of the Development will undergo induction training regarding waste management.

⁸ NSW EPA approved waste materials signage <https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/business-government-recycling/standard-recycling-signs>



Induction training will cover, as a minimum, an outline of the WMP including:

- Legal obligations and targets
- Emergency response procedures on-site
- Waste priorities and opportunities for reduction, reuse and recycling
- Waste storage locations and separation of waste
- Procedures for suspected contaminated and hazardous wastes
- Waste related signage
- The implications of poor waste management practices, and
- Responsibilities and reporting, including identification of personnel responsible for waste management and individual responsibilities.

5.9 Monitoring and Reporting

During the site clearance and construction phases, the following monitoring practices will be undertaken to improve site clearance and construction waste management and to obtain accurate waste generation figures:

- Conduct waste audits of current projects where feasible.
- Note waste generated and disposal methods.
- Look at past waste disposal receipts.
- Record this information to track waste avoidance, reuse and recycling performance and to help in waste estimations for future waste management plans.

Records will be maintained for all waste quantities that are recycled, reused or removed by a contractor. All site clearance and construction waste dockets will be kept which show which facility received the material for recycling or disposal.

Daily visual inspections of waste storage areas will be undertaken by site personnel and inspection checklists and logs recorded for reporting to the site manager or equivalent role on a weekly basis or as required. These inspections will be used to identify and rectify any resource and waste management issues.

Waste audits should be carried out by the building contractor or equivalent role to gauge the effectiveness and efficiency of waste segregation procedures and recycling and reuse initiatives. Where audits show that the above procedures are not carried out effectively, additional staff training will be undertaken and signage will be re-examined.

5.10 Roles and Responsibilities

All personnel have a responsibility for their own environmental performance and compliance with all legislation. It will be the responsibility of the site manager, or equivalent role, to implement the WMP, and the responsibility of employees and subcontractors to ensure that they always comply with the WMP.



Suggested roles and responsibilities for waste management at the site are provided in Table 6. Where possible, a construction environmental manager, or equivalent role, should be appointed for the site preparation and construction work. An equivalent construction environmental manager role is defined to be a person dedicated to overseeing the environmental compliance and performance of a development. Where a construction environmental manager is not appointed, responsibilities in Table 6 for the construction environmental manager will become those of the site manager.

Table 6 Suggested roles and responsibilities for site clearance and construction waste management

Role	Responsibilities
Site Manager	<ul style="list-style-type: none"> • Ensuring plant and equipment are well maintained • Ordering only the required amount of materials • Keeping materials segregated to maximise reuse and recycling • Ensuring that waste sorting and storage areas are maintained in a tidy and functional state and do not present hazards to human health or the environment • Ensure hazardous or contaminated materials are appropriately managed and disposed • Ensure site records and documentation is kept and is complete • Ensure this WMP are implemented, and • Liaise with Council and regulatory authorities as required.
Construction Environmental Manager or equivalent	<ul style="list-style-type: none"> • Ensuring staff and contractors are aware of site requirements for waste management • Establishing separate skips and stockpiles and recycling bins for effective waste segregation and recycling purposes • Developing or identifying, and using, local commercial opportunities for re-use of materials where re-use on-site is impractical • Facilitate correct waste collection • Engage suitable waste collection and disposal contractors • Approval of off-site waste disposal locations and checking licensing requirements • Arranging for the assessment of potentially hazardous or contaminated materials • Arranging for appropriate contaminated waste management and approval of off-site waste transport, disposal locations and checking licensing requirements • Monitor and maintain site environmental controls and • Monitoring, inspection and reporting requirements.

6.0 Green Star Requirements

Section 8A Performance Pathway: Specialist Plan of the Green Star -Design & As Built v1.3 outlines the green star requirements.

One (1) point is awarded where a qualified waste auditor prepares an Operational Waste Management Plan (OWMP) for the building in accordance with best practice approaches. The requirements or recommendations made in the Operational Waste Management Plan must then be reflected in the design of the building's facilities.

For information on what qualifications are required to be a deemed a qualified waste auditor, please see the Guidance section.

OWMPs can influence the amount of waste recycled and generated by occupants, tenants and visitors. For the purposes of this credit, the OWMP must be developed for implementation



at the site and building level and be applicable to the Green Star project boundary. OWMPs are usually implemented by building owners or operators.

The OWMP must be developed by a qualified waste auditor. The Table 7 below shows the minimum requirements of OWMP with the relevant sections they are addressed in this OWMP.

Table 7 Green Star Requirements

	Minimum requirements of OWMP	Where addressed in this OWMP
1	Identify the site boundary, the waste streams relevant to the project, and the individual roles responsible for delivering and reviewing the OWMP;	The site boundary is identified in Figure 3. Operational waste streams relevant to the project can be found in Section 7.2 Responsibility for delivering the OWMP can be found in Section 7.12
2	Set diversion from landfill targets and/or targets for reducing total materials generation (general waste materials and recyclable/reusable materials), as well as monitoring and measurement procedures for waste and recycling streams by weight;	Operational waste targets can be found in Section 7.1 Details of proposed monitoring can be found in Section 7.11
3	Outline methods for encouraging the separation of waste streams, such as bins, storage areas, or recycling facilities in public areas as required	Details of proposed separation of waste streams can be found in Section 7.9 and signage in Section 7.10
4	Identify storage areas for all waste streams and outline best practice safety and access requirements for their collection	Details of waste storage area and access can be found in Sections 7.4, 7.5 and 7.7
5	Identify safe methods for vehicle access and transfer of waste	Details of waste vehicle access can be found in Section 7.7
6	Incorporate a review process to assess the success of the OWMP and make improvements, based on operational experience.	Details of the reviewing requirements can be found in Section 3.3.

7.0 Operational Waste and Recycling Management

7.1 Targets for Resource Recovery

Targets for new development are expected to contribute to state-specific targets. The NSW *Waste and Sustainable Materials Strategy 2041* (DPIE, 2021) sets a target of 80% average recovery rate from all waste streams by 2030. Analysis by DPIE (2021) indicates that the commercial and industrial waste recovery rate in 2019 was 53%.

It is anticipated that the waste minimisation measures in the following sections will assist the Development to achieve this recycling rate. Waste reporting and audits can be used to determine the actual percentage of wastes that are being or have been recycled during operation. Calculations in Table 10 show that 34% of the operational waste stream can be recycled.

7.2 Waste Streams and Classifications

The operation of the Development is likely to generate the following broad waste streams:

- Domestic type waste generated by tenants, staff and visitors
- Office waste
- Garden organic waste from landscaped areas
- Bulky waste items such as furniture and e-waste.



Potential waste types, their associated waste classifications, and management methods are provided in Table 8.

Table 8 Potential operational waste types, classifications and management methods

Waste Types	NSW EPA Waste Classification	Proposed Management Method
General Operations		
Clean office paper	General solid (non-putrescible) waste	Paper recycling at off-site licensed facility
Cardboard including bulky cardboard boxes	General solid (non-putrescible) waste	Cardboard recycling at off-site licensed facility
Recyclable beverage containers, glass and plastic bottles, aluminium cans, steel cans	General solid (non-putrescible) waste	NSW container deposit scheme 'Return and Earn', container recycling at off-site licensed facility
Food waste	General solid (putrescible) waste	Compost on or off-site or dispose to landfill with general garbage
Lead-acid or nickel-cadmium batteries	Hazardous waste	Off-site recycling, Contact the Australian Battery Recycling Initiative ⁹ for more information
Other batteries	General solid waste (non-putrescible)	
Mobile Phones	General solid waste (non-putrescible)	Off-site recycling; can be taken to the Mobile Muster program. Contact Mobile Muster for more information
Bulky polystyrene	General solid (non-putrescible) waste	Off-site recycling or disposal at landfill
Furniture	General solid (non-putrescible) waste	Off-site reuse or disposal to landfill
E-waste	General solid waste (non-putrescible)	Off-site recycling
Clinical waste	Special waste	Stored, handled, collected and disposed of according to AS 3816 and the <i>Protection of the Environment Operations Act 1997</i>
Printer toners and ink cartridges	General solid waste (non-putrescible)	Off-site recycling, free disposal box or bags and pickup service exists for printer toners and ink cartridges
General garbage, including non-recyclable plastics	General solid (putrescible and non-putrescible) waste	Disposal at landfill
Maintenance		
Spent smoke detectors ¹⁰ - some commercial varieties	Hazardous waste	Disposal to landfill, or off-site disposal at licensed facility
Spent smoke detectors - others	General solid (non-putrescible) waste,	
Glass, other than containers	General solid (non-putrescible) waste	Off-site recycling

⁹ <http://www.batteryrecycling.org.au/home>

¹⁰ The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) require that when more than 10 smoke alarms (particularly americium-241 sources) are collected for bulk disposal they must be treated as radioactive waste and the requirements of the National Health and Medical Research Council's Code of practice for the near-surface disposal of radioactive waste in Australia (1992) must be met.



Waste Types	NSW EPA Waste Classification	Proposed Management Method
Light bulbs and fluorescent tubes	General solid (non-putrescible) waste	Off-site recycling or disposal, contact FluoroCycle ¹¹ or Lamp Recyclers ¹² for more information
Empty oil and other drums or containers, such as fuel, chemicals, paints, spill clean ups that were previously used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and residues have not been removed by washing or vacuuming.	Hazardous waste	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licenced facility
Empty oil and other drums or containers, such as fuel, chemicals, paints, spill clean ups that have been cleaned by washing or vacuuming.	General solid waste (non-putrescible)	
Garden organics - lawn mowing, tree branches, hedge cuttings, leaves	General solid (non-putrescible) waste	Reuse on-site or contractor removal for recycling at licenced facility

For further information on how to determine a waste's classification, refer to the NSW EPA (2014) Waste Classification Guidelines. Recycling drop-off locations and contacts can be found on <https://businessrecycling.com.au/> for each waste type.

7.3 Waste quantities

The FDCP provides no advice on waste generation rates for offices and warehouses. The operational waste generation rates used are shown below in Table 9 below and are those published by the NSW EPA in its *Better Practice Guide for Resource Recovery in Residential Developments*.

Table 9 Operational waste generation rates

Type of Premises	EPA Guidelines Premises Type	Waste generation rates (L/100 m ² /day)	
		Garbage	Recycling
Warehouse	Wholesale Trade	100	50
Offices	Offices	10	15

Using the waste generation rates in Table 9 above, the approximate weekly waste quantities for the Development have been calculated based on the following assumptions:

- The floor areas estimated from drawing *24233_OEE_Precinct_2_DA_Drawings_241112.pdf*
- Seven days per week operation.

The estimated quantities of operational waste generated by the development are shown in Table 10 below.

¹¹ <https://www.fluorocycle.org.au/>

¹² <https://www.lamprecyclers.com.au/>



Table 10 Estimated operational waste quantities

Warehouse	Use Type	Area (m ²)	(L/day)		(L/week)	
			General Waste	Recycling	General Waste	Recyclables
2A-1	Warehouse	25,373	25,373	12,687	177,611	88,806
	Office	1,100	110	165	770	1,155
	Total	26,473	25,483	12,852	178,381	89,961
2A-2	Warehouse	34,478	34,478	17,239	241,346	120,673
	Office	1,200	120	180	840	1,260
	Total	35,678	34,593	17,419	242,186	121,933
2B-1	Warehouse	13,621	13,621	6,811	95,347	47,674
	Office	652	65	98	456	685
	Total	14,273	13,686	6,908	95,803	48,358
2B-2	Warehouse	13,082	13,082	6,541	91,574	45,787
	Office	652	65	98	456	685
	Total	13,734	13,147	6,639	92,030	46,472

7.4 Waste Storage Area Size

7.4.1 Garbage and Recycling Bins

The waste storage area for the Development must be large enough to adequately store all quantities of operational waste and recycling between collections. Given the nature of the development and its size and scope, a combination of front lift and compactor waste collection service is that most likely to be used by a waste contractor.

The front lift bin capacity of 4.5 m³, and compactor capacity of 38 m³, has been assumed when calculating bin numbers for the warehouse.

All waste storage area calculations have considered common front lift bin and compactor dimensions as shown in Table 11 below. Please note that dimensions may vary with manufacturers and waste service providers.

Table 11 Dimensions and approximate footprint of bins

Bin Capacity	Height (mm)	Depth (mm)	Width (mm)	Footprint (m ²)
4.5 m ³	1,540	1,520	2,060	3.31
38 m ³	2,830	8,665	2,500	21.66

The estimated number of bins and compactors required for weekly storage of operational waste and recycling generated by the Development are shown in Table 12 and are based on:

- The estimated quantities of operational waste and recycling shown in Table 10
- Bin dimensions shown in Table 11
- Recyclables will be primarily cardboard.



Table 12 Recommended number of bins and storage areas

Warehouse	Bin Capacity	Collection Frequency per Week		Number Required		Footprint (m ²)	Recommended Storage Area (m ²)
		Garbage	Recyclable Cardboard	Garbage	Recyclable Cardboard		
2A-1	4.5 m ³	N/a				21.7	43.3
	38 m ³	2	1	1	1		
2A-2	4.5 m ³	N/a				21.7	43.3
	38 m ³	2	1	1	1		
2B-1	4.5 m ³	6	6	4	2	22.9	45.8
	38 m ³	N/a					
2B-2	4.5 m ³	6	6	4	2	22.9	45.8
	38 m ³	N/a					

7.4.2 Space allowed for waste storage

The drawings show waste storage areas, and these can be seen in Figure 6 below.

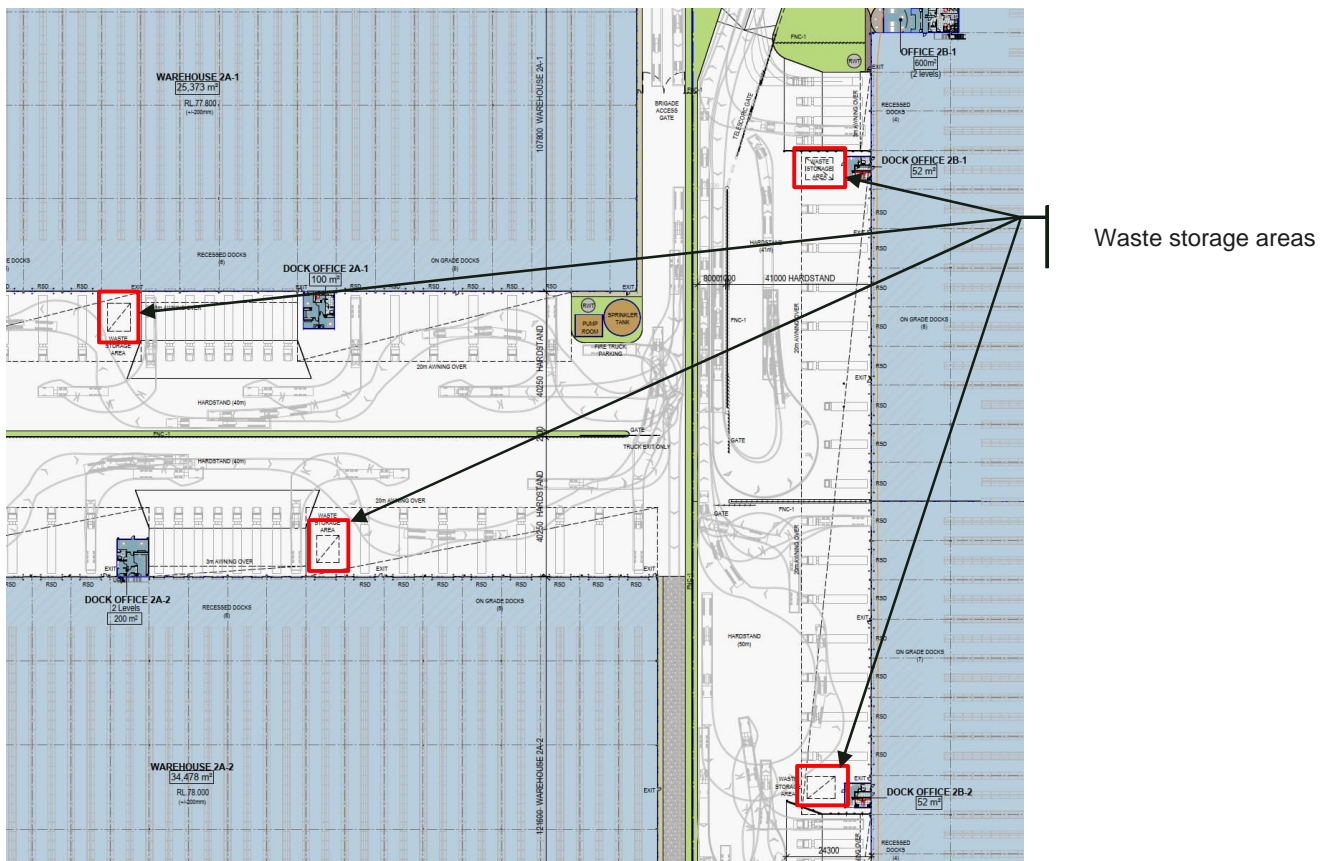


Figure 6 Proposed waste storage locations

Each of the zones marked 'Waste Storage Area' is about 53 m². Including the area adjacent to the warehouse gives each zone a total of about 72 m², which is adequate to store the bins and compactors proposed.



7.5 Waste System Description

Tenants will store bins and compactors in the proposed locations. Waste streams will be separated and placed in the bins and compactors at the storage locations. Waste collection vehicles will enter the site through the heavy vehicle entrance and drive to the bin locations. Front lift bins will be emptied by a front lift collection vehicle. Compactors will be collected by hook vehicles which will either swap the full bin for an empty one and take the full bin off site for emptying or take the full bin for emptying before returning it. Waste collection vehicles will then exit the site through the heavy vehicle exit.

Depending on the type of business operated by the tenant, the tenant may generate other waste streams such as soft plastics, food or metals. These materials may be stored inside the buildings. If storage is required outside the buildings, there is more than enough space to accommodate additional bins and compactors if required.

Please refer to the separate traffic management plan for details of heavy vehicle access and movements.

7.6 Litter Control

Bins will be purpose-designed with close fitting hinged lids and doors. No litter is expected to be generated during storage. There is some potential for litter to be generated during collection. An operational waste management plan, yet to be prepared will provide more details on the practices to be implemented for the minimisation of litter generation and confinement of litter.

7.7 Waste Vehicle Access

The following access provisions will apply for collections:

- Collection vehicles will be able to enter and exit the site in a forward direction
- Unobstructed access, adequate driveways and ramps of sufficient strength to support waste collection vehicle have been allowed for.

7.8 Waste Avoidance, Reuse and Recycling

7.8.1 Waste avoidance

Waste avoidance measures include:

- Returning packaging materials like cardboard to the suppliers through the services of the supplier delivery trucks, allowing the reduction of waste further along the supply chain
- Providing ceramic cups, mugs, crockery and cutlery rather than disposable items
- Bulk purchasing and the purchasing of items that use minimal packaging
- Presenting all waste reduction initiatives to staff and tenants as part of their induction program, and
- Leasing equipment and machinery rather than outright purchase and disposal.



7.8.2 Re-use

Possible re-use opportunities include establishing systems with in-house and supply chain stakeholders to transport products in re-useable packaging where possible.

7.8.3 Recycling

Recycling opportunities include:

- Collecting and recycling e-wastes
- Printer toners and ink cartridges, if purchased, are collected in allocated bins for appropriate contractor recycling
- Paper recycling trays provided in communal and staff areas for scrap paper collection and recycling
- Providing separate receptacles for general waste, recycling and paper and cardboard throughout public areas, as well as within staff areas, to encourage source-separation of waste streams
- Work with tenants to investigate opportunities for the use of recycled paper bags or reusable bags in place of plastics bags
- Separating, by a reasonable distance, the storage areas for recyclables from the general waste storage areas to avoid cross contamination, and
- Development of 'buy recycled' purchasing policy.

7.9 Communication Strategies

Education and communication on waste management initiatives and measures will be regularly and clearly conveyed to staff, cleaners and visitors. Benefits of providing this communication include:

- Improved satisfaction with services
- Increased ability and willingness to participate in recycling
- Improved amenity and safety
- Improved knowledge and awareness through standardisation of services
- Increased awareness or achievement of environmental goals and targets
- Reduced contamination of recyclables stream which can incur a collection contractor penalty fee
- Increased recovery of recyclables and organics material, if implemented, and
- Greater contribution to state-wide targets for waste reduction and resource recovery.

To realise these benefits, the following communications strategies are recommended for the Facilities Manager:

- Use consistent signage and colour coding throughout the Development
- Ensure all staff are informed of correct waste separation and management procedures
- Provide directional signage to show locations and routes to waste storage areas



- Repair signs and labels promptly to avoid a breakdown in communication
- Clearly label general and comingled waste bins to ensure no cross contamination and to identify the types of waste that may be disposed of in each bin, and
- Educate all tenants, staff and contractors associated with the Development, ensuring they adhere to this WMP.

7.10 Signage

Signs which clearly identify waste management procedures and provisions to contractors, staff and visitors will be posted at the Development as appropriate.

The design and use of safety signs will comply with Australian Standard *AS 1319 Safety Signs for the Occupational Environment* and clearly describe the types of materials designated for each bin.

Colour-coded and labelled bin lids are necessary for identifying bins and the Australian Standard *AS 4123.7-2006 (R2017) Mobile waste containers Part 7: Colours, markings, and designation requirements* provides recommendations for the designated colours for waste bins depending on the type of waste the bins are to receive. The colours that will apply to ongoing waste generated by the Development are:

- Blue: Paper and cardboard
- Yellow: Recyclables (other than paper and cardboard)
- Red: General waste.

All bin signage should also follow the NSW EPA's standard signage.¹³

Other key signage considerations include:

- Clear and correct labelling on all waste and recycling bins, indicating the correct type or types of waste that can be placed into a given bin, as shown in Figure 7 below
- Signposts and directions to location of waste storage areas
- Clear signage in all waste storage areas to instruct users how to correctly separate waste and recycling
- Maintaining a consistent style colour scheme that complies with AS 4123, and a system for signs throughout the Development, and
- Emergency contact information for reporting issues associated with waste or recycling management.

¹³ NSW EPA waste signs/posters <http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm>





Figure 7 Example NSW EPA labels for operational waste

7.11 Monitoring and Reporting

Monitoring will ensure waste and recycling management arrangements and provisions for the Development are functional, practical and are maintained to the standard outlined in this plan, at a minimum.

Visual assessments of bins and bin storage areas will be conducted by the Facility Manager, at minimum:

- Weekly, in the first two months of operation to ensure the waste management system is sufficient for the operation, and
- Every six months, to ensure waste is being managed to the standards outlined in this document.

In addition, audits may be conducted to ensure WMP provisions are maintained.

Quantities of waste and recycling associated with disposal of waste and recycling, including dockets, receipts and other physical records will be recorded by the Facility Manager. This is to allow reviews of the waste management arrangements and provisions at the site over time. These records will allow progress of the development to meet the set recycling targets (as outlined in Section 7.1) to be assessed in-line with Green Star requirements. Records of waste disposal will also be available to regulatory authorities such as the NSW EPA and SafeWork NSW, upon request.



Any deficiencies identified in the waste management system, including unexpected waste quantities, will be rectified by the Facility Manager as soon as it is practical. Where audits show that recycling is not carried out effectively, management will carry out additional staff training, signage re-examination and reviews of the waste management system where the audit or other reviewing body has deemed necessary. If this waste management plan no longer sufficiently meets the needs of the Development, review and updates to maintain suitability must be undertaken.

7.12 Roles and Responsibilities

It is the responsibility of the Facilities Manager, or equivalent role, to implement this WMP and a responsibility of all tenants and staff to follow the waste management procedures set out by the WMP. A summary of recommended roles and responsibilities are provided in Table 13 below.

Table 13 Suggested operational waste-related roles and responsibilities

Responsible Person	General Tasks
Facilities Manager or equivalent role	Ensure the WMP is implemented throughout the life of the operation.
	Update the WMP as needed to ensure the plan remains applicable to the site.
	Undertake liaison and management of contracted waste and recycling collections with Council, contractors and any relevant authorities.
	Regularly conduct waste audits to review system performance and identify any additional materials that could be recovered.
	Manage any complaints and non-compliances reported through waste audits and other sources.
	Ensure all monitoring and audit results are well documented and conducted as specified in this WMP.
	Conduct regular waste sorting, physical condition and cleanliness inspections of bins, waste storage rooms and all other waste management equipment for functionality, hygiene and safety.
	Organise cleaning and maintenance requirements for waste management equipment as required.
	Ensure waste and recycling storage rooms are kept tidy.
	Monitor bins to ensure no overfilling occurs and manage unexpected waste quantities to mitigate waste overflow in storage areas
	Ensure effective signage, communication and education is provided to alert visitors, employees, site management staff and cleaners about the provisions of this WMP and waste management equipment use requirements.
	Monitor and maintain signage to ensure it remains clean, clear and applicable.
	Manage ongoing education on correct source separation and waste management at least every three months.
	Ensure that regular cleaning and daily transfer of bins is correctly being undertaken by the cleaners.
	Ensure all waste compactors and balers are maintained and operational.
Ultimately responsible for the management of all waste management equipment, cleaning requirements, waste transfer and collection arrangements.	
Cleaners and caretakers	Transfer general waste, recyclables, cardboard waste and hazardous waste from public spaces to the waste and recycling storage areas as required.



Responsible Person	General Tasks
	Maintain and operate compactors and balers, if obtained, and ensure no overfilling occurs.
	Cleaning of all bins and waste and recycling rooms as per the direction of the site manager, or equivalent role.
	Monitor bins to ensure no overfilling occurs.
	Ensure bins and waste storage areas are kept tidy and clean.
	Compliance with the provisions of this WMP.
Tenants	Transfer general waste, recyclables, cardboard waste and hazardous waste to allocated waste and recycling storage areas in the loading docks.
	Adhere to all waste management directions and comply with the Development’s waste management provisions as outlined by the Facilities Manager.

8.0 Waste Specialist

A waste specialist and/or contractor must sign-off on the designs to confirm they are adequately sized and located for the safe and convenient storage and collection of the waste streams identified.

This waste management plan was prepared by Andrew Quinn, an environmental consultant with more than 30 years’ experience in waste management. He has worked for the NSW EPA, waste management contractors and consultants.

His experience includes waste management plans for new developments, transfer station and resource recovery facility concept design and master planning, operational systems assessments, expert witness and due diligence for waste projects, waste chapters for EISs, contract and tender preparation, tender assessment and evaluation, resource recovery technology research, resource recovery management strategy and policy development, data analysis, managing and conducting waste audits of residential, commercial, industrial, landfill and MRF streams and in remote locations.

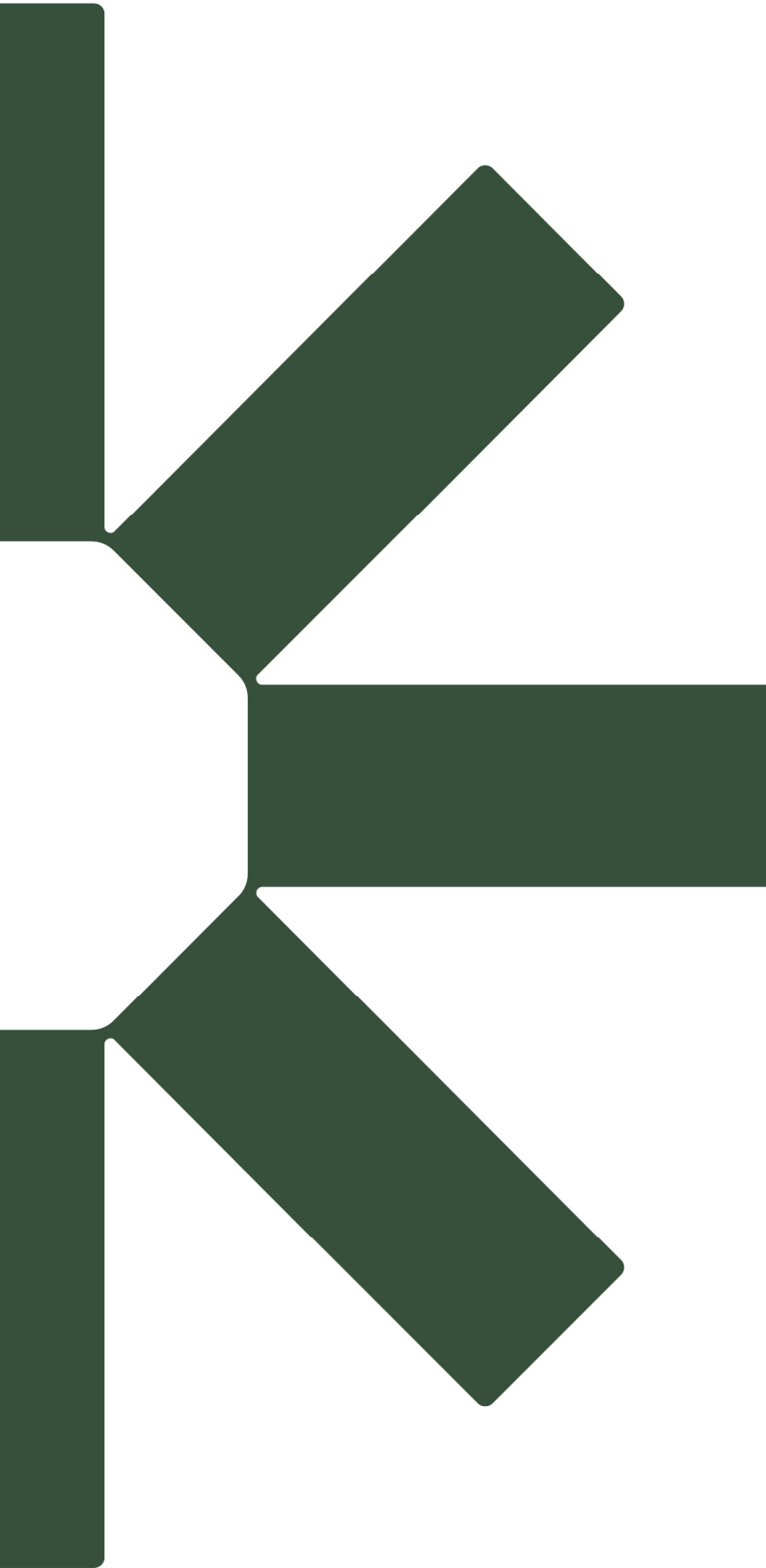
Andrew has a Bachelor of Applied Science from the University of Technology Sydney (2000) and a Master of Environmental Studies from Macquarie University (2009). He has lectured in waste management at the University of NSW.

Andrew developed the *Better Practice Guidelines for Waste Management and Recycling in Commercial Facilities*, the NSW EPA’s official guidelines for waste management and recycling in commercial facilities. He has also prepared hundreds of waste management plans for new developments. Some of those for GPSA most relevant to this project include:

- Oakdale Development, Kemps Creek, NSW – Numerous waste management plans prepared for a number of stages, buildings and modifications in the Oakdale Industrial Estate, a major industrial development in Western Sydney
- M7 Business Park - Waste management plan for the redevelopment and reuse of a heritage warehouse.
- 202 Euston Rd, Alexandria, NSW - Waste management plan for a warehouse development
- Coal Pier Industrial Estate, Banksmeadow, NSW - Waste management plan for two warehouse buildings in this industrial estate.

As a result of this experience, he qualifies as a waste specialist under the Green Star definition.





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