Waste Management Plan

Project Duke – Data Centre, 2-22 Kent Road, Mascot

Goodman Property Australia

The Hayesbery
1-11 Hayes Street
Rosebery NSW 2011

Prepared by:

SLR Consulting Australia

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Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
7.0	21 May 2025	Andrew Quinn	Chris Hambling	Andrew Quinn

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Goodman Property Australia (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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1.0 Introduction

The proposed development (SSD-71368959) will seek approval for the construction of an 120 MVA data centre. The proposal seeks to demolish existing structures on the site, construct, fit out and the operation of a data centre 24 hours per day seven days per week, with associated works.

This waste management plan has been prepared to support the State Significant Development Application (SSDA) for the development and industry-specific SEARs have been issued. In this waste management plan the relevant requirements of the SEARs have been addressed using the Bayside Development Control Plan 2022 (BDCP)[1] 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	Section reference (this report)
18. Waste Management Identify, quantify and classify the likely waste streams to be generated during construction and operation.	Please refer to: • Section 8.2 Construction Waste Types and Quantities and Table 4 Potential demolition and construction waste types, classifications and their management methods for the identification and classification of demolition and construction waste • Section 8.3 Demolition Waste Types and Quantities and Table 8 Estimated types and quantities of construction waste for the estimated quantities of demolition waste • Section 8.4 Waste Streams and Classifications and Table 12 Estimated quantities of operational general waste and recyclingfor the estimated quantities of construction waste • Section 9.2 Waste Streams and Classifications and Table 10 Potential waste types, classifications and management methods for operational waste for the identification and classification of operational waste • Section 9.3 Waste quantities and Table 12 Estimated quantities of operational general waste and recycling • Section 9.5 E-waste and Table 16 Life time quantities of materials
Provide the measures to be implemented to manage, reuse, recycle and safely dispose of this waste.	For construction and demolition waste please refer to Section 8.5 Waste Avoidance, Section 8.6 Reuse, Recycling and Disposal. For operational waste please refer to 9.8 Waste Avoidance, Reuse and Recycling and Section 9.5 E-waste
Identify appropriate servicing arrangements for the site.	For construction and demolition waste please refer to Section 8.6 Reuse, Recycling and Disposal and Table 4 Potential demolition and construction waste types, classifications and their management methods. For operational waste please refer Table 10 Potential waste types, classifications and management methods for operational waste
If buildings are proposed to be demolished or altered, provide a hazardous materials survey.	Please refer to the separate hazardous materials survey

[1] https://www.bayside.nsw.gov.au/sites/default/files/2023-04/bayside_development_control_plan_2022.PDF

2.0 Project Summary

The works subject to SSD-71368959 include the following:

- Site preparation works including demolition, bulk excavation, and removal of existing structures on the site, tree and vegetation clearing, and bulk earthworks,
- Construction, fit out and operation, 24 hours per day seven says per week, of a 120 MVA data centre with a maximum building height of 40 m from natural ground level and total gross floor area of 26,052 m^2 comprising:
  - At-grade parking for 34 car parking spaces, one accessible car parking space.
  - Two 12.5 m loading dock spaces,
  - Four levels of technical data hall floor space with one data hall on ground level and three data halls on every other level
  - Secure entrance lobby on ground level and ancillary office space on each level and mezzanine level
- Provision of required plant and utilities, including:
  - Six 33 kV switch rooms on ground level
  - 1,172,000 L above ground diesel storage tanks
  - 5,125 kL above ground water storage tanks
  - 72 diesel generators
- Acoustic screen parapet,
- Vehicle access provided via Gardeners Road and Ricketty Street.

3.0 The Site

The project is located on land known as 2 and 10-22 Kent Road, and 685 Gardeners Road, Mascot, legally referred to as Lot 1 DP529177, Lot 1 DP1009083 and Lot 2 DP529177. The site is located on Country of the Gadigal people within the local government area of Bayside Council.

It has a total site area of approximately 23,470 m^2 with frontages to Ricketty Street, Kent Road and Gardeners Road, all of which are classified roads.

The site forms part of the Mascot West Employment lands which comprise a mix of land zoned for industrial, commercial and business park uses. To the east of the site is Mascot Station Town Centre which comprises a mix of retail, commercial, residential and recreational open space land uses.

Surrounding land uses in the immediate vicinity of the include:

- **North**: Gardeners Road, which is the local government boundary with the City of Sydney. Further to the north is existing industrial development with Alexandra Canal beyond.
- **South**: Ricketty Street is immediately south, with predominantly one- to four-storey commercial and industrial development beyond.

- **East**: Kent Road is immediately to the east, with four- to 14-storey high density residential development beyond.
- **West**: To the west is light industrial development typically one to two storeys in height.

The site is zoned E3 Productivity Support under the Bayside Local Environmental Plan 2012. The proposal is permissible with development consent in the E3 zone and meets the zone objectives.

In its existing state, the site itself contains two large warehouse buildings which are currently leased out to multiple tenants. Large extents of the site consist of hardstand for vehicle circulation and parking with a number of mature trees are located along the site's boundaries.

A summary of the site is provided in Table 2.

Table 2 Site summary

Item	Description
Site Area	23,470 m^2
Ownership	Goodman
Legal Description	Lot 1 in DP529177, Lot 1 in DP1009083 and Lot 2 DP529177

An aerial image of the site showing its location is shown in Figure 1 below.

Figure 1 - Site Location

The design of the ground floor is shown in Figure 2 below.

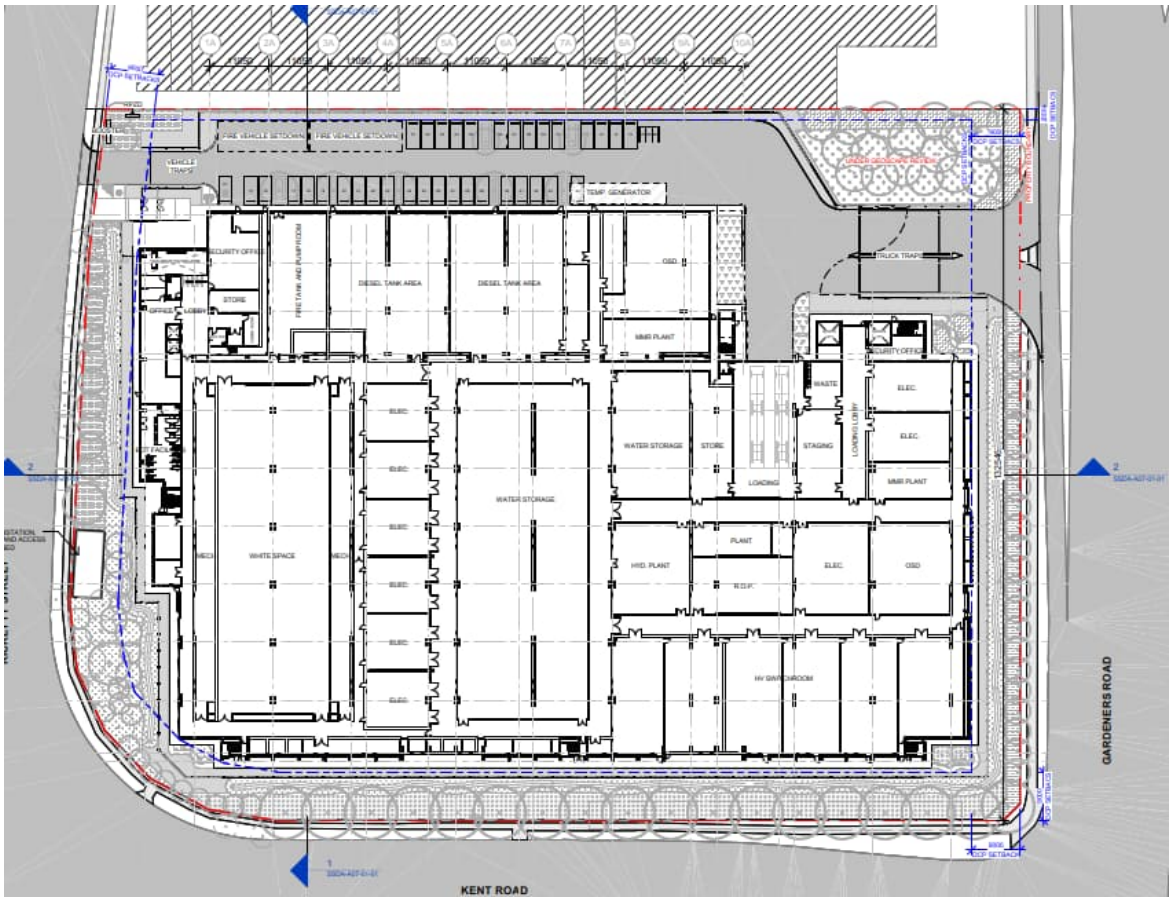


Figure 2 - Ground floor design

4.0 Objectives

The principal objective of this waste management plan (WMP) is to identify all potential waste likely to be generated at the Development site during the demolition and construction 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 requirements.

The specific objectives of this WMP are as follows:

- To encourage the minimisation of waste production and maximisation of resource recovery.
- To assist in ensuring that any environmental impacts during the construction of the Development comply with Council's development consent conditions and other relevant regulatory authorities.

5.0 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.

6.0 Better Practice Waste Management and Recycling

6.1 Waste Management Hierarchy

This WMP has been prepared in line with the waste management hierarchy shown Figure 3 , which 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.

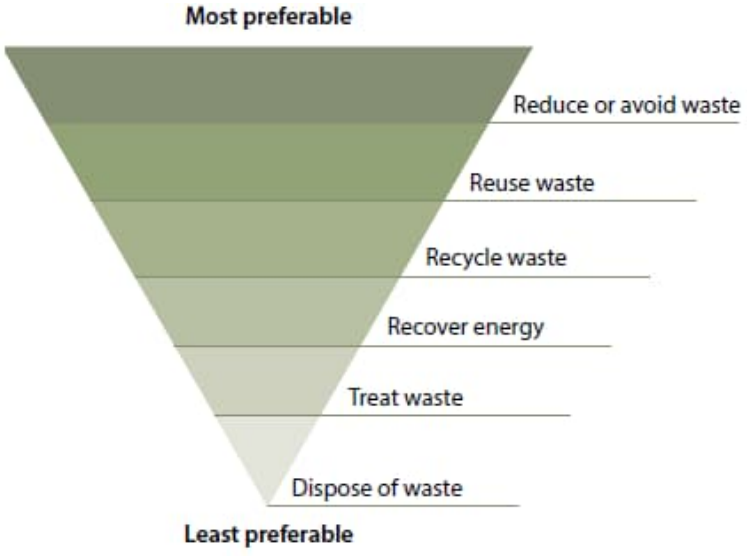


Figure 3 - Waste Management Hierarchy

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

6.2 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.

6.3 Green Building Compliance

6.3.1 LEED

Leadership in Energy and Environmental Design (LEED)[2] is the world's most widely used green building rating system and was developed by the US Green Building Council. LEED certification provides a framework for healthy, highly efficient, and cost-saving green buildings, which offer environmental, social and governance benefits.

For data centres, LEED requires the following:

> *Provide dedicated areas accessible to waste haulers and building occupants for the collection and storage of recyclable materials for the entire building. Collection and storage areas may be separate locations. Recyclables materials must include mixed paper, corrugated cardboard, glass, plastics and metals. Take appropriate measures for the safe collection, storage and disposal of two of the following: batteries, mercury-containing lamps and electronic waste.*

The proposed data centre complies with LEED waste management requirements as follows:

- The design includes a dedicated and accessible waste storage area. Its location is shown in Figure 6 on page 33.
- The recyclable materials proposed to be separated include paper and cardboard and recyclables containers, which would be composed of glass, metal and plastic drink containers. This is detailed in Table 12 on page 31.
- E-waste is proposed to be collected for recovery. Details are shown in Sections 9.2, 9.3 and 9.4.2 and in Table 10 and Table 14.

[2] https://www.usgbc.org/leed

6.3.2 Green Star

Green Star was developed by the Green Building Council of Australia[3] and is an internationally recognised rating system setting the standard for healthy, resilient, positive buildings and places.

The Green Star requirements for waste management are as follows.

Minimum Expectation

The project must comply with all three of the following criteria

- *Collection of waste streams*
- *Dedicated waste storage area*
- *Sign off by waste specialist and/or contractor*

Collection of Waste Streams

The building must provide bins or storage to the building occupants to enable them to separate waste. These bins must be labelled and easy to access, and evenly distributed throughout the building. They must also allow for separating the following as a minimum:

- *General waste going to landfill*
- *Recycling streams to be collected by the building's waste collection service, including:*
  - *Paper and cardboard*
  - *Glass*
  - *Plastic*
- *One additional waste stream identified by the project team. This may include collecting any of the following waste types: organics, e-waste, batteries etc*

Any other single waste steam (except food waste) that is expected to represent more ta 15% of the total annual operational waste and resource (by volume) must also be included.

Dedicated Waste Storage Area

A dedicated area, or areas, for the storage and collection of the applicable waste streams must be provided. The storage area must be sized to accommodate all bins or containers, for all applicable waste streams, for at least one collection cycle. The calculations used to demonstrate that the areas provided is adequately sized to handle the recyclable waste streams specified must be based on:

- *Forecasted waste generation by occupants*
- *Collection frequency for each waste stream*

The calculations for waste generation rates must be based on figures outlined within third-party best practice guidelines.

The storage areas(s) must have efficient and safe access by collection vehicles. This includes driveway access to the building, appropriate height clearances, any onsite roads and loading docks, and the storage areas themselves providing safe and easy access for bins to be emptied into the collection vehicles.

[3] https://new.gbca.org.au/green-star/exploring-green-star/

Signoff by Waste Specialist and/or Contractor

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.

The proposed data centre complies with Green Star waste management requirements as follows:

- Waste will be collected, and the design includes a dedicated waste storage area. Its location is shown in Figure 6 on page 33.
- The recyclable materials proposed to be separated include paper and cardboard and recyclables containers, which would be composed of glass, metal and plastic drink containers. This is detailed in Table 12 on page 31.
- Details of the bins proposed to be used for the storage of these materials can be found in Section 9.4.1 on page 31
- E-waste and batteries are proposed to be collected for recovery. Details are shown in Sections 9.2, 9.3, 9.4.2 and 9.8.3 and in Table 10 and Table 14
- Calculations in Table 14 show that the waste storage area is appropriately sized
- Calculations are based on wase generation rates published in the Bayside Development Control Plan 2022, third-party best practice guideline
- Figure 6 on 33 shows the location of the waste storage area and access by collection vehicles.

Compliance with Green Star requirements has been signed off by waste management specialist Andrew Quinn, whose CV credentials can be found in Section 6.4 below.

6.4 Waste Specialist

Andrew Quinn is an environmental consultant with 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, University of Technology Sydney (2000), Master of Environmental Studies, Macquarie University (2009) and has lectured in waste management at the University of NSW.

Andrew has prepared hundreds of waste management plans for new developments. This most relevant to this project include:

- For Goodman Property
  - Project Duke, Kent Road Data Centre, Mascot
  - Project Pluto, McCredie Road Data Centre, Smithfield

  - Project Apollo, Talavera Road Data Centre. Macquarie Park
  - Project EOS, Lanceley Place Data Centre, Artarmon
- For Macquarie Tech Operations - Macquarie Data Centre, Macquarie Park
- For AW Edwards – AirTrunk Data Centre, Lane Cove
- For EMKC^3 Developments
  - AirTrunk Data Centre, Huntingwood, two sites
  - AirTrunk Data Centre, Lane Cove, two sites
- For ESR Australia – AirTrunk Data Centre, Blacktown
- For Digital Reality - Lockwood Road Data Centre, Erskine Park
- For Urbis - Canberra Data Centres, Eastern Creek
- For Lindsay Bennelong Developments - Gore Hill Data Centre.

7.0 Waste Legislation and Guidance

7.1 Bayside Development Control Plan 2022

Several sections of Bayside Development Control Plan 2022 (BDCP) refer to waste management in new developments including:

- Section 3.5.6 Loading Facilities
- Section 3.12 Waste Minimisation and Site Facilities and
- Section 6.4 Industrial premises.

Those relevant to this development are detailed below.

3.5.6 Loading Facilities

C8. Loading and waste collection points shall be:

a. located separately from public parking areas where possible

b. designed and operated so that the vehicles can manoeuvre on site without interfering with buildings, parked vehicles, and landscaping.

C9. A loading dock management plan is to be prepared for all development. This management plan shall also to address waste collection.

3.5.7 Waste collection

C1. Waste collection must be provided on-site within new building development (excluding development with less than 600 m^2 GFA and multi-unit developments with 10 dwellings or less). This waste collection bay may be shared with another loading/unloading space. Access must be designed to accommodate a Council garbage truck, or any vehicles used by private waste contractors (SRV minimum).

C2. The waste collection point is to be designed to:

a. allow waste loading operations to occur on a level surface away from parking areas, turning areas, aisles, internal roadways and ramps

b. provide sufficient side, rear and vertical clearance to allow for the waste collection activity to be undertaken (e.g. the lifting arc for automated bin lifters requires clearance to remain clear of any walls or ceilings and all service ducts, pipes and the like).

c. comply with Bayside Technical Specification - Traffic, Parking and Access.

C3. Waste rooms are to be located as close as possible to the waste collection point. Where this cannot be provided for and waste rooms are spread out across the basement of a development, a method to internally transport waste to the collection point is to be provided.

C4. Where collection vehicles are required to enter inside a building, the design of the building shall provide for:

a. a minimum vertical clearance of 4.5 metres for MRV vehicles and 3.5 m headroom clearance for SRV vehicles (clear of all service ducts, pipes etc)

b. collection vehicles to enter and exit the premises in a forward direction

c. the driveway width and gradient to be as per AS2890.2.

3.12 Waste Minimisation and Site Facilities

This Part applies to all works requiring a development application (DA) and is to be read in conjunction with Council's relevant policies and guidelines.

This Part should also be read in conjunction with the provisions outlined in Sub-section 3.5.7 (Waste Collection) and comply with these provisions.

C1. Development is to be consistent with Council's Waste Management DCP Technical Specification 2022 [see Section 7.2 below] *and all development applications are required to submit a Waste Management Plan consistent with this Technical Specification.*

C2. New development must also comply with the provisions related to Waste Collection in accordance with Sub-section 3.5.7 of this DCP.

3.12.2 On-going management

C2. Development for the purposes of any of the following:

- *Commercial development; and*
- *Any other development not listed in C1[4].*

Must comply with Sub-section 3.5.7.

[4] C1 refers to a range of residential development types

3.12.5 All other development [5]

C1. Sufficient space must be provided to accommodate the storage of waste and recycling likely to be generated on the premises between collections and any associated equipment.

C2. Waste storage rooms or areas are to be located a maximum 10 m from pick up point. Waste rooms are not to be used for any purpose other than the storage of waste.

C3. Waste and recycling receptacles must be stored at all times within the boundary of the site and concealed from the public and commercial domains unless otherwise approved by Council under Section 68 of the Local Government Act 1993*.*

C4. All waste and recycling must be inside Council approved bins or skips, with lids closed to reduce littering, stormwater pollution, odour and vermin. Waste and recycling not presented in the correct manner will not be collected.

C5. Waste and recycling storage rooms must be:

a. Enclosed to prevent noise, odour and visual impacts

b. Designed to store the entire fleet of bins plus 0.2 m between bins to allow adequate manoeuvrability room

c. Designed with a 1.8 m unobstructed clearance zone between the stored bins and the entrance for access and manoeuvrability

d. Designed with suitable door and corridor access to enable bin movement

e. Constructed of concrete or other approved materials at least 75 mm thick

f. Finished with a smooth even surface to be easily cleaned

g. Coved at the intersection with walls and plinths with a ramp to the doorway where necessary

h. Graded and drained to the sewerage system and approved by Sydney Water

i. Fitted with a close fitting and self-closing door that can be opened from within the room

j. Designed with adequate lighting and naturally/mechanical ventilation to meet Building Code of Australia requirements

k. Fitted with smoke detectors in accordance with the relevant Australian Standards

l. Equipped taps supplying hot and cold water, mixed through a centralised mixing valve with a hose cock and fitted with an aerator to increase water efficiency

m. Designed to include a clear and easy-to-read 'NO STOPPING' sign and 'DANGER' sign on the external face of waste storage rooms where appropriate

[5] This refers to non-residential development

n. Designed to ensure waste-water from the cleaning of the waste storage area and bins, is not to drain into the stormwater system and

o. Fitted with childproof compacters or mechanical devices where used in the storage of waste.

C6. All new developments are to provide adequate storage for waste to accommodate future change of use, including increased waste generation rates and grease traps.

C7. Kitchens, office tea rooms, and the like are to be designed with sufficient space for the interim storage of recyclable, organic and regular waste in separate receptacles.

C8. A waste service compartment (waste and recycling area) is to be provided on each floor of the building and have sufficient capacity to store at least 1 day's volume of waste and recycling likely to be generated on that floor.

C9. Sufficient space must be allocated within the building for the storage of reusable items such as crates and pallets.

6.4 Industrial premises

C48. A Plan of Management (POM) will be provided to ensure all relevant operations of the premises are understood and their impacts appropriately managed having regard to the context of the premises and its surrounds.

The POM must provide all details relevant to the operation of the premises. As a minimum the following must be included:

i. Waste management.

Note: The POM allows Council to exercise control over the ongoing operation of a premises by requiring, as a condition of consent, that the premises operate in accordance with the POM. A condition of consent may require that a POM be regularly revised and submitted to Council.

C49. Waste management and recycling processes of commercial and industrial facilities should be guided by the Waste Management and Recycling in Commercial and Industrial Facilities (EPA, 2012)*.*

C57. Details of proposed ancillary buildings, open storage, service areas, solid liquid waste storage and collection areas are to be provided with any development application

C58. All businesses are encouraged to include in their waste contracts provision for the collection and recycling of high grade and low grade office paper, batteries, equipment containing painted circuit boards, computers, florescent tubes, and other recyclable resources.

7.2 Waste Management Technical Specification 2022

1.5 Applicability

The provisions of this Waste Management DCP should also be used as a guide for activities that do not require consent, including for complying or exempt development, or development that falls under Part 5: 'Environmental Assessment' of the Environmental Planning and Assessment Act 1979*.*

1.7 Waste Management Plan(s) (WMP)

1.7.1 Purpose of a WMP

At a minimum, each type of WMP must:

- *Calculate the volumes and types of waste and recycling that will be generated*
- *State how waste and recycling will be handled, stored, and treated on-site*
- *State how and where waste will be reused, recycled, or disposed of*
- *Describe the roles and responsibilities in ensuring the WMP is correctly implemented*
- *If presentation or collection of waste (whether loose or containerised) occurs from Council land, Council pre-approval must be sought.*

WMPs are required when:

- *Demolishing or constructing buildings*
- *Changing the use of buildings*
- *Subdividing land or buildings.*

1.7.2 Types of WMPs

Most development applications will be required to be accompanied by a WMP.

The WMPs will:

- *Minimise the amount of waste generated as part of the project*
- *Maximise the amount of waste material which is sent for reuse, recycling or reprocessing*
- *Minimise the amount of material sent to landfill.*

There are three types of WMPs for different activities and different stages of the development. Table 1 identifies the different WMPs and the activity/development stage that it would be triggered:

Table 1. Different types of WMPs

WMP	Activity/development stage	Section Reference
Demolition Waste Management Plan (DWMP)	*Where any demolition works are proposed.*	*Section 2 of this DWMP.*
Construction Waste Management Plan (CWMP)	*Where any construction works are proposed.*	*Section 3 of this CWMP.*
Operational Waste Management Plan (OWMP)	*For operational use of a site or premises for all building types outlined in this chapter.*	*Section 4 of this OWMP, and any other relevant section of the document.*

It is important that the WMPs be standalone documents to ensure all essential information regarding waste management during demolition/construction and the operational stage of the development is submitted with the development application.

The WMP should be accompanied by scaled architectural plans that illustrate the proposed on-site waste management infrastructure and how design elements support the proposed internal operations e.g. location of bin storage area, location of bin collection point, travel path for collection vehicles where on-site collection is proposed.

1.7.5 Consultation with Council

It is considered extremely important and advisable that Council be consulted and included in any and all correspondence during the master planning stage especially for large and complex developments. These meetings should discuss the details for appropriate waste management systems prior to developers submitting a DA and WMPs.

Any advice provided should be documented and should be incorporated as part of pre-development application meeting/discussions to ensure waste issues are considered early in the process and waste management is integrated as part of the overall development.

4. Operational Waste Management Plan (OWMP) - Waste Management Systems

4.3 General Controls and Requirements

The OWMP will integrate waste management facilities holistically with the overall development and ensure it can be serviced efficiently and effectively by…waste contractors.

The OWMP should describe:

- *Estimated waste and recycling generation rates and Council bin allocation and bulky waste storage allocation (see Sections 5-12 as relevant)*
- *Bin storage area/s*
- *Collection Point/s*
- *Bulky Waste storage area(s)*
- *Bin and/or chute systems*
- *Ongoing maintenance, including bin cleanliness...*

4.4 Bin Storage

Where required, a bin storage area (or room) must be located:

- *So that vandalism, nuisance and adverse amenity are avoided or minimised*

- *To be easily accessible, have unobstructed access for residents, and allow residents or building managers to easily move bins on foot to and from the Collection Point(s)*
- *So collection vehicles can access the Collection Point(s) by entering and leaving the property in a forward direction, and requires minimal to no reversing (for on-site Collection Point(s)).*

4.7 On-Site Bin Collections

Where bins are collected on-site, or if a Collection Vehicle must enter a property, the site must be configured:

- *To allow collection vehicles to enter and exit the site in a forward direction with limited maneuvering and reversing on-site*
- *To allow for a safe area for the collection vehicle to use, indicated by appropriate signage*
- *So that collection vehicles do not impede general access to, from or within the site*
- *To provide enough space around the waste vehicle to allow operators to collect waste - this can be achieved by having a designated loading area free from obstruction or on-site traffic movements and,*
- *So the access driveway and the circulation roadway are wide enough to accommodate the swept path of the collection vehicle.*

Road and access specifications must be addressed, which includes:

- *Access driveways and the route of travel to the Collection Point must be of sufficient strength and dimensions to support heavy rigid waste collection vehicles (normally rated up to 24 tonnes) and provide enough clearance for these vehicles.*
- *Access driveways and internal roads must be designed in accordance with the relevant Australian Standards.*
- *Driveway Ramp Grades must be as per AS 2890.2-2002.*
- *Access to the site must be designed so waste collection vehicles can access it and move within it safely. This is to include waste collection vehicles entering and existing the site in a forward direction.*

12 Industrial Development

12.1 Applicability

This section, section 12, includes light and general industry as defined in the Standard Instrument - Principal Local Environmental Plan and includes uses such as industrial retail outlet, industrial training facility, vehicle body repair workshop, warehouse of distribution centre and storage premises.

12.2 Controls and Requirements

The following controls and requirements apply to all industrial developments. The controls and requirements outlined in section 11 of this document, pertaining to commercial developments also comply to industrial developments. A waste Management Plan shall accompany the application. Plans submitted must show:

- *The location of designated waste and recycling storage room(s) or areas sized to meet the waste and recycling needs of all tenants. Waste should be separated into at*

least 4 streams, paper/cardboard, recyclables, general waste, industrial process type wastes; and,

- *The on-site path of travel for collection vehicles.*

WMPs submitted with the DA must show evidence of compliance with any specific industrial waste laws and protocols, for example, those related to production, storage and disposal of industrial and hazardous wastes as defined by the POEO Act.

Appropriate laws, standards, guidelines and protocols associated with the production, storage and disposal of hazardous wastes must be complied with.

13.5 Collection Vehicle Dimensions

The typical dimensions of a Collection Vehicle should be based on the table below when considering your development design and waste management planning.

Description	*Typical Allowance Required*
Length Overall	*11 metres*
Vehicle Height	*3.9 metres*
Operational Clearance Height	*4.5 metres*
Width Overall	*2.5 metres*
On-Site Width Path (Carriageway)	*3.5 metres*
Turning Circle (wall to wall)	*25 metres*
Swept Path	*21 metres*
Gross Vehicle Mass	*24 tonnes*

7.3 Other Legislation and Guidance

The legislation and guidance outlined in Table 3 below should be referred to during the demolition and construction phases of the Development.

Table 3 Legislation and guidance

Legislation and Guidance	Objectives
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 2016	The National Construction Code 2016 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 *NSW Waste Avoidance and Resource Recovery Strategy (2014-21)*, 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.

Legislation and Guidance	Objectives
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 waste that may be recovered for beneficial re-use. These waste types typically include those from demolition and construction works, as well as operational waste such as food waste. • 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 *POEO Act 1997* and is associated regulations.
Protection of the Environment Operations Act (POEO) 1997 and Amendment Act 2011	The *POEO Act 1997* and *POEO Amendment Act 2011* are administered by the NSW Environment Protection Authority (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 waste 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 provide detailed actions and guidance associated with the topics discussed in *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.
Waste Avoidance and Resource Recovery Act 2001	The *Waste Avoidance and Resource Recovery Act 2001* aims to promote waste avoidance and resource recovery and repeals the *Waste Minimisation and Management Act 1995*. Specific objectives of the *Waste Avoidance and Resource Recovery Act 2001* include: • 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/resource management planning, programs and service delivery. 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.

8.0 Demolition and Construction Waste and Recycling Management

8.1 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 these targets. Waste reporting and audits can be used to determine the actual percentage of wastes that are being, or have been, recycled during the demolition and construction stages of The Development.

8.2 Waste Streams and Classifications

The demolition and construction of the Development is likely to generate the following broad waste streams:

- Demolition waste
- Construction waste
- Plant maintenance waste
- Packaging waste, and
- Work compound waste from on-site employees.

A summary of likely waste types generated from demolition and construction activities, along with their waste classifications and proposed management methods, is provided in Table 4.

For further information on how to classify a waste type refer to the NSW EPA (2014) *Waste Classification Guidelines*[6]*.* Further information on managing demolition and construction waste is available from the NSW EPA website[7].

Table 4 Potential demolition and construction waste types, classifications and their management methods

Waste Types	NSW EPA Waste Classification	Proposed Management Method
Demolition 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

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

[7] http://www.epa.nsw.gov.au/your-environment/waste/industrial-waste/construction-demolition

Waste Types	NSW EPA Waste Classification	Proposed Management Method
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 *FluoroCycle* for more information[8]
Paint	Liquid waste	Off-site recycling, Paintback collection[9] 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		
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 *Business Recycling* for more information[10]
Work Compound and Associated Offices		
Food Waste	General solid (putrescible) waste	Dispose to landfill with general garbage

[8] Available online from http://www.fluorocycle.org.au/ or http://www.environment.gov.au/settlements/waste/lamp-mercury.html

[9] Available online from https://www.paintback.com.au/

[10] Available online from https://businessrecycling.com.au/

Waste Types	NSW EPA Waste Classification	Proposed Management Method
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[11]
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

8.3 Demolition Waste Types and Quantities

8.3.1 Demolition Waste Generation Rates

The BDCP does not provide any advice on demolition waste quantities. As an alternative, SLR has adopted the 'office' and 'factory' waste generation rates from *The Hills' Development Control Plan* for estimating the type and quantities of waste generated from the proposed demolition of buildings. We have also referred to *Light Duty Asphalt Pavements - Design, Specification and Construction 2002* published by the Australian Asphalt Pavement Association in calculating car park waste demolition quantities. The demolition waste generation rates used are shown in Table 5 below.

Table 5 Demolition waste generation rates

Rate Type	Area (m^2)	Waste types and quantities (m^3)						
		Timber/ Gyprock	Concrete	Bricks	Metal	Other	Asphalt	Granular Base
Office	1,000	124	7410	1485	29	155		
Factory	1,000	4	448	205	23	18		
Carpark	1,000		22.5[12]				25[13]	100[14]
Hardstand	1,000		30		6	5		

8.3.2 Buildings for Demolition

Images from Six Maps and Google Earth show the buildings are areas for demolition and demolition. The image from SixMaps (Figure 4) shows the current site layout with boundary and building types and has been used to calculate the areas of and car parking areas for demolition.

[11] Available online from http://returnandearn.org.au/

[12] Estimate of kerb profile

[13] 25 mm depth for passenger car parking areas of this size. *Light Duty Asphalt Pavements - Design, Specification and Construction 2002* Australian Asphalt Pavement Association. Table 10 Passenger Car Parking Areas, 0-50 Bays

[14] 100 mm depth for passenger car parking areas of this size. *Light Duty Asphalt Pavements - Design, Specification and Construction 2002* Australian Asphalt Pavement Association. Table 10 Passenger Car Parking Areas, 0-50 Bays

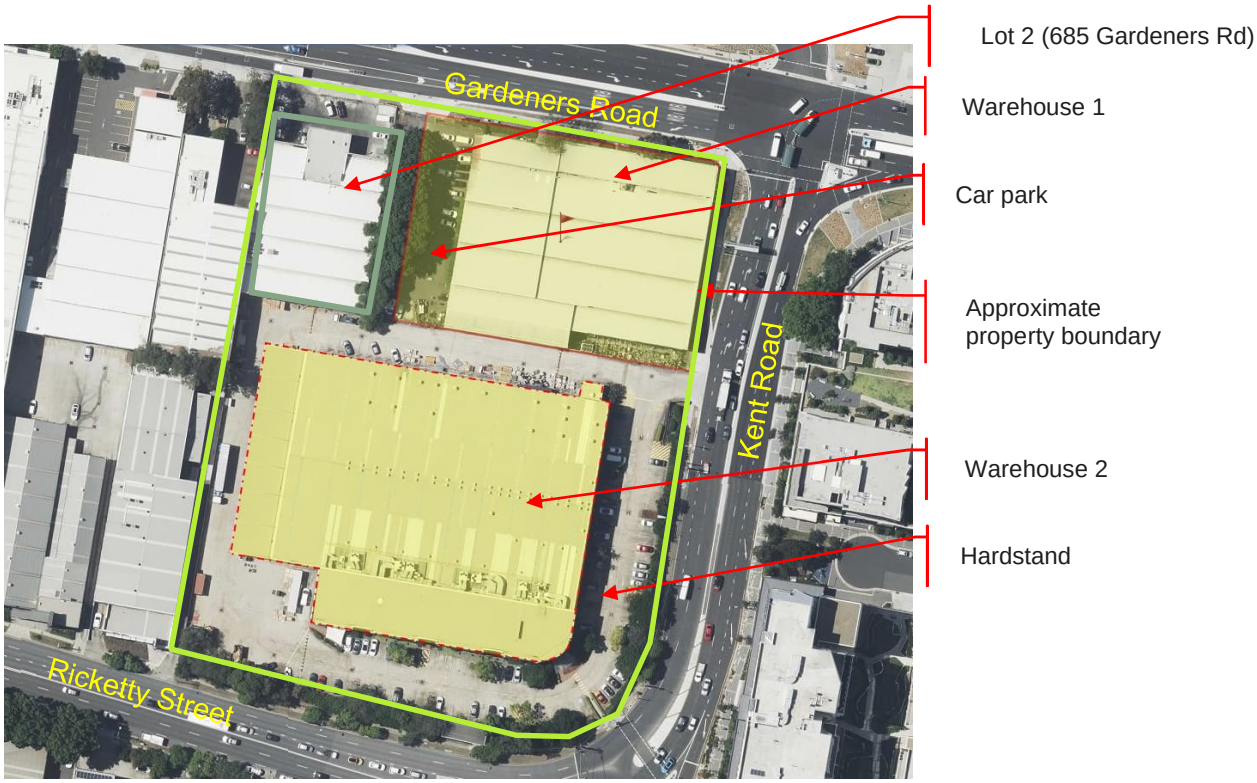


Figure 4 - Current site layout

Warehouse 1 is a two-storey brick building with a bonded metal roof. Warehouse 2 is a three-storey concrete panel building. Lot 2 is another two-storey brick building with a bonded metal roof. The areas for demolition are shown in Table 6 along with estimates of the quantities of demolition waste that may be generated.

Table 6 Estimated types and quantities of demolition waste

Development Component	Area (m^2)	Waste types and quantities (m^3)						
		Timber/ Gyprock	Concrete	Bricks	Metal	Other	Asphalt	Granular Base
Warehouse 1	3,934	16	1,762	806	90	71	-	-
Warehouse 2	7,349	29	3,292	1,507	169	132	-	-
Lot 2 (685 Gardeners Rd)	1,985	8	889	407	46	36	-	-
Car park 1	939	-	-	-	-	-	23.48	93.90
Hardstand	6,901	-	2,070	-	414	345	-	-
Total	**21,108**	**53**	**8,014**	**2,720**	**719**	**584**	**23**	**94**

8.4 Construction Waste Types and Quantities

The BDCP does not provide waste generation rates for construction activities. In the absence of readily available construction waste generation rates from Council, SLR has adopted the 'Office' waste generation rates from The Hills Development Control Plan (Hills DCP) 2012 for estimating the type and quantities of waste generated from construction of the Development.

The waste generation rates are shown in Table 7.

Table 7 Construction waste generation rates

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

These waste generation rates are used to estimate the waste generated from the construction of the Development. The anticipated construction waste quantities for the Development are shown in Table 8 below and are based on the areas shown in drawing *PROJECT-DUKE-DATA-CENTRE-SSDA-A10-01-01-GFA-AREA-DRAWINGS-REV-2 .pdf.*

The construction waste quantities anticipated are shown in Table 8 below.

Table 8 Estimated types and quantities of construction waste

Level	Area Classification	GFA (m^2)	Waste types and quantities (m^3)						
			Timber	Concrete	Bricks	Gyprock	Sand and Soil	Metal	Other
Ground	Factory	4,943	1.2	10.4	8.2	2.2	23.7	3.0	2.5
Ground Mezzanine	Offices	341	1.7	6.4	2.9	2.9	3.0	0.9	1.7
Level 1	Factory	6,532	1.6	13.7	10.8	2.9	31.4	3.9	3.3
Level 1 Mezzanine	Offices	396	2.0	7.4	3.4	3.4	3.5	1.1	2.0
Level 2	Factory	6,870	1.7	14.4	11.3	3.1	33.0	4.1	3.4
Level 2 Mezzanine	Offices	396	2.0	7.4	3.4	3.4	3.5	1.1	2.0
Level 3	Factory	6,165	1.5	12.9	10.2	2.8	29.6	3.7	3.1
Level 3 Office Roof Terrace	Offices	408	2.1	7.7	3.5	3.5	3.6	1.1	2.0
Total		**26,051**	**14.0**	**80.4**	**53.5**	**24.3**	**131.2**	**18.9**	**20.0**

8.5 Waste Avoidance

In accordance with better practice waste management, the Building Contractor, Building Designer and/or equivalent roles should:

- Develop a purchasing policy based on the approximate quantities of materials to be used so that the correct quantities are purchased.
- Arrange for delivery of materials on an ‘as needed’ basis to avoid material degradation through weathering and moisture damage.
- Communicate strategies to handle and store waste to minimise environmental, health and amenity impacts.
- Select materials with a low environmental impact over the lifecycle of the building.
- Choose timber from certified plantations and avoid unsustainable timber imports including western red cedar, oregon, meranti, luan or merbau.
- Use leased equipment rather than purchase and disposal.
- Minimise site disturbance and unnecessary excavation.
- Incorporate existing trees and shrubs into the landscape plan.

- Grouping wet areas together to minimise the amount of pipe work required.
- Design the Development to require standard material sizes or make arrangements with manufacturing groups for the supply of non-standard material sizes.
- Design works for de-construction.
- Reduce 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.
- Use prefabricated materials.
- Select materials for Development works with low embodied energy properties or materials that have been salvaged or recycled for the construction of the Development including concrete that utilises slag and fly ash content, structural and reinforced steel that uses recycled steel content or bulk insulation products that contain recycled content, such as recycled glass in glass-wool.
- Preferentially use paints, floor coverings and adhesives with low VOC (volatile organic compound) content.
- Reduce the use of polyvinyl chloride products.
- Implement measures to prevent the occurrence of windblown litter, dust and stormwater pollution.
- Ensure subcontractors are informed of and implement site waste minimisation and management procedures.

8.6 Reuse, Recycling and Disposal

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

Refer to Table 4 for an outline of the proposed reuse, recycling and disposal methods for potential demolition and construction waste streams generated by the Development.

In accordance with best practice waste management, the following specific procedures should be implemented:

- Ensure management of the site includes minimising waste generation, requiring the appropriate storage and timely collection of waste materials, and maximising re-use or recycling of materials.
- Store wastes on site appropriately to prevent cross-contamination and guarantee the highest possible re-use value.
- Consider the potential of any new materials to be re-used and recycled at the end of the Development's life.

- Determine opportunities for the use of prefabricated components and recycled materials.
- Strip topsoil from areas designated for excavation and store it on site for reuse.
- Reuse excavation material will be on-site where possible.
- Re-use formwork where appropriate.
- Retain roofing material cut-offs for re-use or recycling.
- Retain used crates for storage purposes unless damaged.
- Recycle cardboard, glass and metal wastes.
- Recycle or dispose of solid waste timber, brick, concrete, asphalt and rock, where such waste cannot be re-used on site, to an appropriately licenced construction and demolition waste recycling facility or an appropriately licenced landfill.
- Dispose of all asbestos and/or hazardous wastes in accordance with SafeWork NSW and NSW EPA requirements.
- Deliver batteries and florescent lights to drop off-site recycling facility.
- Return excess materials and packaging to the supplier or manufacturer.
- Dispose of all garbage via a council approved system.

8.7 Waste Storage and Servicing

8.7.1 Waste Segregation and Storage

Waste materials produced from demolition and construction activities should be separated at the source and stored separately on-site. It is anticipated that the Development will provide enough space on-site for separate storage, 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
- 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 segregation 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 prior to removal from the site.

8.7.2 Waste Storage Areas

Waste storage areas will be accessible and allow enough space for storage and servicing requirements. The storage areas will also be flexible in order to cater for change of use throughout the Development. Where space is restricted, dedicated stockpile areas are to 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 the waste does not fall, blow, wash or otherwise escape from the site. Waste containers and storage areas are to be kept clean and in a good state of repair.

Areas designated for waste storage should:

- Allow unimpeded access by site personnel and waste disposal contractors
- Consider 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 enough 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, accessibility and convenience in their selection, and
- Not present hazards to human health or the environment.

8.7.3 Waste Servicing and Record Keeping

The Site Manager or equivalent role is to:

- 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 hours approved by Council.

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

8.8 Site Inductions

All staff, including sub-contractors and labourers, employed during the demolition and construction phases of the Development must undergo induction training regarding waste management for the Site.

Induction training is to 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.

It is the responsibility of the Site Manager or Building Contractor to notify Council of the appointment of waste removal, transport or disposal contractors.

8.9 Signage

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

Signs approved by the NSW EPA for labelling of waste materials are available online[15] and should be used where applicable. A selection of signs prepared by NSW EPA is provided in Figure 5.

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

Figure 5 - Examples of NSW EPA labels for waste skips and bins

8.10 Monitoring and Reporting

The following monitoring practices are to be undertaken to improve demolition 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 Resource Recovery Management Plans.

Records of waste quantities recycled, reused or contractor removed should be maintained. This can include dockets or receipts verifying recycling and disposal in accordance with this WMP. This evidence should also be presented to regulatory bodies when required.

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 on a weekly basis or as required. These inspections will be used to identify and rectify any resource and waste management issues.

Waste audits are to be carried out by the Building Contractor 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 re-examined.

8.11 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 Building Contractor to implement the WMP, and an employee and subcontractor responsibility to ensure that they always comply with the WMP.

Where possible, an Environmental Management Representative should be appointed for the Development. Suggested roles and responsibilities are provided in Table 9.

Table 9 Suggested roles and responsibilities for demolition and construction waste management

Responsible Person	General Tasks
Construction Site Manager	Ensuring plant and equipment are well maintained.
	Ordering only the required amounts of materials.
	Keeping materials segregated to maximise reuse and recycling.
	Ultimately responsible for routinely checking waste sorting and storage areas for cleanliness, hygiene and safety issues, contaminated waste materials, and also ensuring that all monitoring and audit results are well documented and carried out as specified in the WMP.
Construction Environmental Manager or equivalent	Approaching and establishing the local commercial reuse of materials where reuse on-site is not practical.
	Establishing separate skips and recycling bins for effective waste segregation and recycling purposes.
	Ensuring staff and contractors are aware of site requirements.
	Provision of training of the requirements of the WMP and specific waste management strategies adopted for the Development.
	Contaminated waste management and approval of off-site waste transport, disposal locations and checking licensing requirements.
	Approval of off-site waste disposal locations and checking licensing requirements.
	Assessment of suspicious potentially contaminated materials, hazardous materials and liquid wastes.
	Monitoring, inspection and reporting requirements.

Daily visual inspections of waste storage areas may be delegated to other on-site staff. All subcontractors will be responsible for ensuring that their work complies with the WMP through the project induction and contract engagement process.

9.0 Operational Waste and Recycling Management

9.1 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.

9.2 Waste Streams and Classifications

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

- Domestic type waste generated by employees, including food waste
- Bulk packaging waste, including polystyrene, plastic wrapping and cardboard boxes
- Office waste
- Garden organic waste from landscaped areas
- Bulky waste items such as furniture, batteries and e-waste.

Potential waste types, their associated waste classifications, and management methods are provided in Table 10. For further information on how to determine a waste's classification, refer to the NSW EPA *Waste Classification Guidelines* 2014. Recycling drop-off locations and contacts can be found on https://businessrecycling.com.au/ for each waste type.

Table 10 Potential waste types, classifications and management methods for operational waste

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 Initiative16 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 *Protection of the Environment Operations Act 1997*
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		

[16] http://www.batteryrecycling.org.au/home

Waste Types	NSW EPA Waste Classification	Proposed Management Method
Spent smoke detectors[17] - 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
Light bulbs and fluorescent tubes	General solid (non-putrescible) waste	Off-site recycling or disposal, contact FluoroCycle[18] or Lamp Recyclers[19] 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 licensed 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

9.3 Waste quantities

For estimating the type and quantities of waste generated from the operational activities of the Development, SLR has adopted the 'Offices' rate waste generation rate from the BDCP for the 'offices' and 'rooftop terrace office' areas.

The operational waste generation rates used are shown below in Table 11.

Table 11 Operational waste generation rates

Type of Premises	General Waste Generation (L/100 m²/day)	Recycling Generation (L/100 m²/day)
Offices	10	10

Using the waste generation rates in Table 11 above, the approximate weekly waste quantities for the Development have been calculated. The operational waste quantities were calculated based on the assumptions below:

- The floor areas shown in the drawing *PROJECT-DUKE-DATA-CENTRE-SSDA-A10-01-01-GFA-AREA-DRAWINGS-REV-2.pdf*
- A week comprising seven days of operation.

[17] 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.

[18] https://www.fluorocycle.org.au/

[19] https://www.lamprecyclers.com.au/

- 95% of the office recycling stream is paper and cardboard and 5% is recyclable containers.[20]

The quantities of operational waste estimated to be generated by the Development are shown in Table 12.

Table 12 Estimated quantities of operational general waste and recycling

Use Type	GFA (m^2)	Litres per day		Litres per week		
		Garbage	Recycling	Garbage	Paper and Cardboard	Recyclable Containers
Offices	3,085	309	309	2,160	2,052	108
Security Office	83	8.3	8.3	58	55	2.9
Meeting room	45	4.5	4.5	32	30	1.6
Roof terrace	280	28	28	196	186	10
Total	**3,493**	**349**	**349**	**2,445**	**2,323**	**122**

E-waste will be collected and recycled under special arrangements with suppliers and does not require bins for regular collection.

9.4 Waste Storage Area Size

9.4.1 Garbage and Recycling Bins

The waste storage areas 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 rear lift waste collection service is the most likely using 240 L bins and these have been assumed when calculating bin numbers and storage space.

All waste storage area calculations have used the bin dimensions listed in the BDCP, as shown in Table 13.

Table 13 Dimensions and approximate footprint of bins

Bin Capacity	Height (mm)	Depth (mm)	Width (mm)	Footprint (m^2)
240 L	1080	735	580	0.43

To allow for ready movement of bins into and out of the bin storage area, the bin storage area is to provide a floor area of at least 200% of the total minimum bin footprint. This can also act as a contingency in the event of spikes in waste generation. This has been considered in the calculation of the waste storage area for each of the units in the Development.

The recommended storage areas do not include storage of bulky waste. For additional storage space for bulky waste, refer to Section 9.4.2.

The estimated number of bins required for weekly storage of operational waste and recycling generated by the Development are shown in Table 14 and are based on:

[20] Industry fact sheets - Commercial offices EPA 2012/0341 November 2012 ISBN 978-1-74293-876-9

- The estimated quantities of operational waste and recycling shown in Table 12
- Bin dimensions from the BDCP shown in Table 13.

Table 14 Recommended number of bins and storage area

Bin Capacity (L)				Collections per Week				Number of Bins				Bin Storage Area Required (m^2)					
Garbage	Paper and Cardboard	Recyclable Containers	Batteries	Garbage	Paper and Cardboard	Recyclable Containers	Batteries	Garbage	Paper and Cardboard	Recyclable Containers	Batteries	Garbage	Paper and Cardboard	Recyclable Containers	Batteries	Total	Total Including Manoeuvring
240	240	240	120	3	3	1	On call	4	4	1	1	1.7	1.7	0.4	0.3	4.1	8.2

9.4.2 Bulky Waste

Bulky waste includes waste materials that because of their size and shape may be difficult to dispose of in the garbage or recycling bins. Typically, this could be items such as broken pallets, broken furniture, batteries, e-waste and other damaged, disused or obsolete materials. This area could also be used for storage of reusable items such as crates and pallets.

The BDCP says that storage area should be provided for bulky waste, and the storage of reusable items such as crates and pallets, but does not specify any particular area size to be made available.

SLR recommends 5 m^2 be allocated for bulky waste storage. Therefore, in addition to the recommended waste storage area shown in Table 14, the total waste storage area recommended for the Development is that in Table 15 below.

Table 15 Total recommended waste storage areas

Recommended Storage Area (m^2)		
Waste and Recycling Bins	Bulky waste	Total Storage Area
8.2	5	13.2

9.5 E-waste

Although the data halls are not expected to regularly produce much waste, from time-to-time significant quantities of e-waste will be generated. E-waste may include broken or upgraded computer hardware, circuits and electrical components and their associated packaging. Some e-waste contains toxic chemicals, such as lead, mercury and arsenic, but can also contain precious metals that can be recycled.

A 90 MVA data centre like that proposed could, over its life time, generate the quantities of materials from e-waste shown in Table 16 below.[21]

[21] https://www.simslifecycle.com/resources/white-paper-data-center/

Table 16 Life time quantities of materials

Material	Quantities (t)
Plastics	1,078
Aluminium	2,384
Steel	12,312

Where possible, facility operators will extend the life of equipment and hardware by implementing a regular maintenance schedule and adopting other proactive care measures such as monitoring the efficiency of cooling solutions to reduce the risk of equipment being discarded before its time. Smart thermostats and in-built sensors may be used to balance temperature maintenance with energy efficiency.

Equipment will be re-used by implementing circular models for servers, and re-purposing older hardware as back-up equipment.

Disposal of e-waste will be the responsibility of equipment suppliers who will collect obsolete equipment when new equipment is installed. Bulk bins, or other methods for transporting large quantities of e-waste, will be used at those times to remove it. Suppliers will use the loading dock as required. Once removed from the site it is expected that suppliers will sell-on any suitable hardware or recycle it lawfully through an approved recycler.

9.6 Space allowed for waste storage

The drawings show a waste storage area on the ground floor next to the loading dock. This is shown in Figure 6 below.

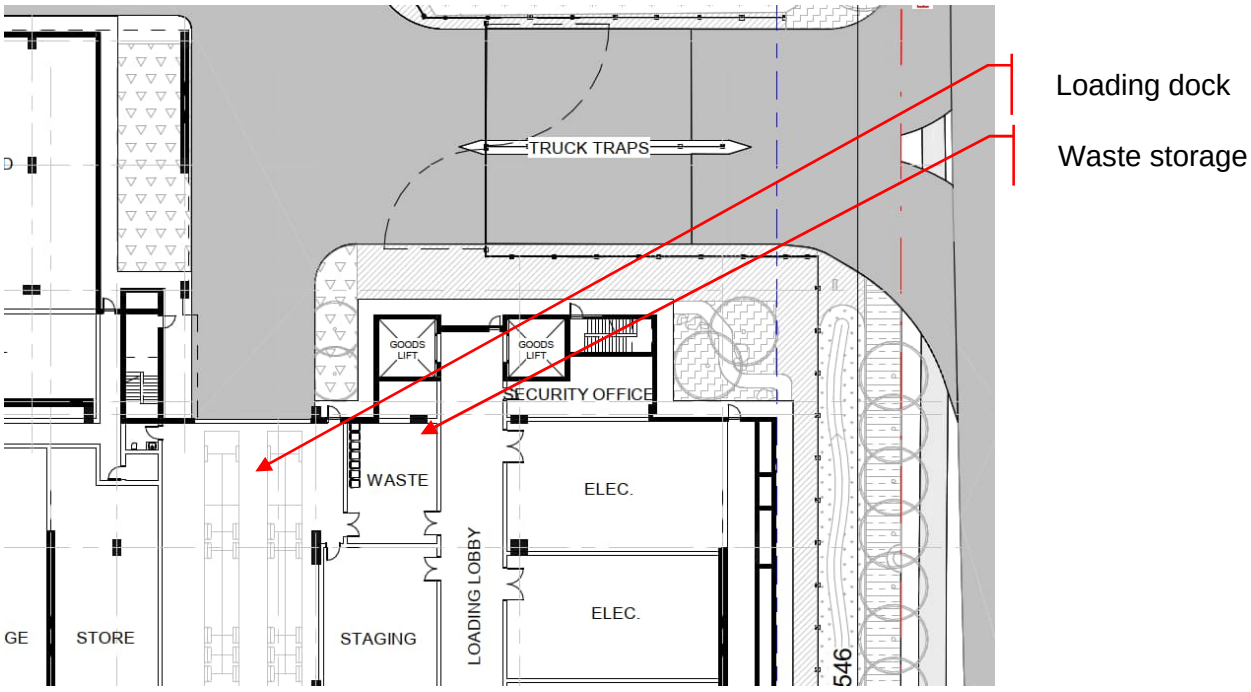


Figure 6 - Ground Level showing waste storage area

Drawing *SSDA-A03-00-01* shows that the waste storage area is 55 m^2, which is adequate for the proposed number of bins and quantities of waste.

9.7 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.

Waste collection contractors will take bins from the waste storage room to the loading dock where they will be emptied into the collection vehicle and then returned to the waste storage room.

9.8 Waste Avoidance, Reuse and Recycling

9.8.1 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.

9.8.2 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.

9.8.3 Recycling

Recycling opportunities include:

- Collecting and recycling e-waste and batteries
- 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.

9.9 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 staff and contractors associated with the Development, ensuring they adhere to this WMP.

9.10 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.

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

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.

Figure 7 - Example NSW EPA labels for ongoing waste

9.11 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 17.

Table 17 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 development.
	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 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.

Responsible Person	General Tasks
	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 any waste compactors, balers or other equipment, if installed, 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 and recyclables from meeting rooms and break out space to the waste and recycling storage areas each day or as required.
	Maintain and operate compactors and balers, if in use, and ensure no overfilling occurs.
	Cleaning of all bins and waste and recycling area 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.
Staff	Place waste, recyclables, cardboard waste in bins and store in designated waste storage area.
	Adhere to all waste management directions and comply with the Development's waste management provisions as outlined by the Facilities Manager.

10.0 Assessment and findings

The WMP establishes that during ongoing operation of the data centre, three collections for waste, three for paper and cardboard and one for recyclable containers will be provided each week. This amounts to seven vehicle movements per week.

The WMP also establishes that the amount of space allowed for waste and recycling on-site is more than adequate to store the amounts projected to be generated.

11.0 Compliance with the Bayside DCP

The waste management requirements of the Bayside DCP 2022 are detailed in Section 7.1 on page 9. As far as it is possible to say, based on the proposed plans, the development complies with the DCP.

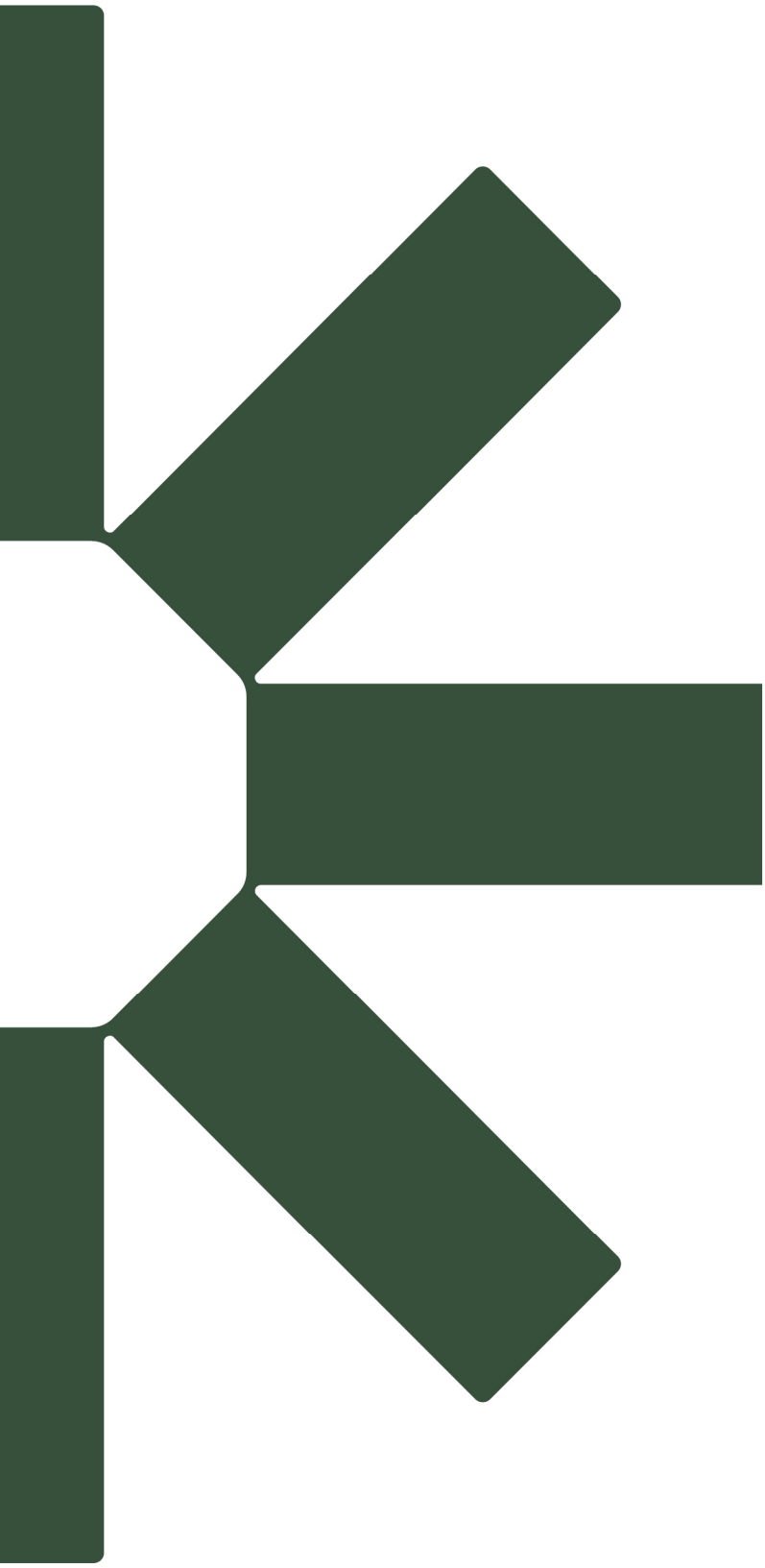
12.0 Cumulative impacts

The projected quantities of waste and recyclables, 4,927 L each per week, are insignificant compared to the quantities of waste and recyclables generated in Sydney every day. Allowance has been made for the separation of recyclables as much as possible, guided by the waste generation rates in the BDCP. It is possible that further separation and recovery of waste materials will be made during the operational phase of the development.

The seven waste and recycling vehicle movements anticipated to be required each week are insignificant compared to the number of vehicle movements undertaken in the Mascot commercial and industrial area every day.

13.0 Mitigation measures

As the waste-related impact of the data centre is negligible, no mitigating measures are proposed beyond those for the separation of recyclables already detailed.



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