Julius Avenue Data Centre

6-8 Julius Avenue, North Ryde (NSW)

Waste and Recycling Management Plan

March 2025

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Rev_0	Alex Northey	Dan D'Ambrosio	14th April 2025

Contents

List of Figures

List of Tables

Glossary of terms

AS 4123	Australian Standard for Mobile Waste Containers
DA	Development Application
DCP	Development Control Plan
CH_4	Methane
CO_2	Carbon Dioxide
DCP	Development Control Plan
DP	Development Plan
E3	Employment Zone 3
EPA	Environment Protection Authority
EPI	Environmental Planning Instrument
EPS	Expandable Polystyrene
ESD	Ecological Sustainable Development
ESG	Environmental Social and Governance
GFA	Gross Floor Area
ITAD	Information Technology Asset Disposition
KG	Kilograms
LDPE	Low Density Polyethylene
M^2	Metres Squared
MGB	Mobile Garbage Bin
MM	Millimetres
MRV	Medium Rigid Vehicle
NLA	Net Lettable Area
NSW	New South Wales
PEF	Processed Engineered Fuel
POEO	Protection of the Environment Operations Act
WMS	Waste Management Supplier
WRMP	Waste Recycling Management Plan
REL	Rear End Lift
SSDA	State Significant Development Application
SEARs	Secretary's Environmental Assessment Requirements
WRMP	Waste Recycling Management Plan

Introduction

This Waste and Recycling Management Plan (WRMP) has been prepared by Waste Check on behalf of Logic Projects to support the State Significant Development Application (SSDA-80018208) for the proposed 170 MW 26,482m² GFA Julius Avenue Data Centre located at 6-8 Julius Avenue, North Ryde NSW 2113 (Lot 89 DP 1082131).

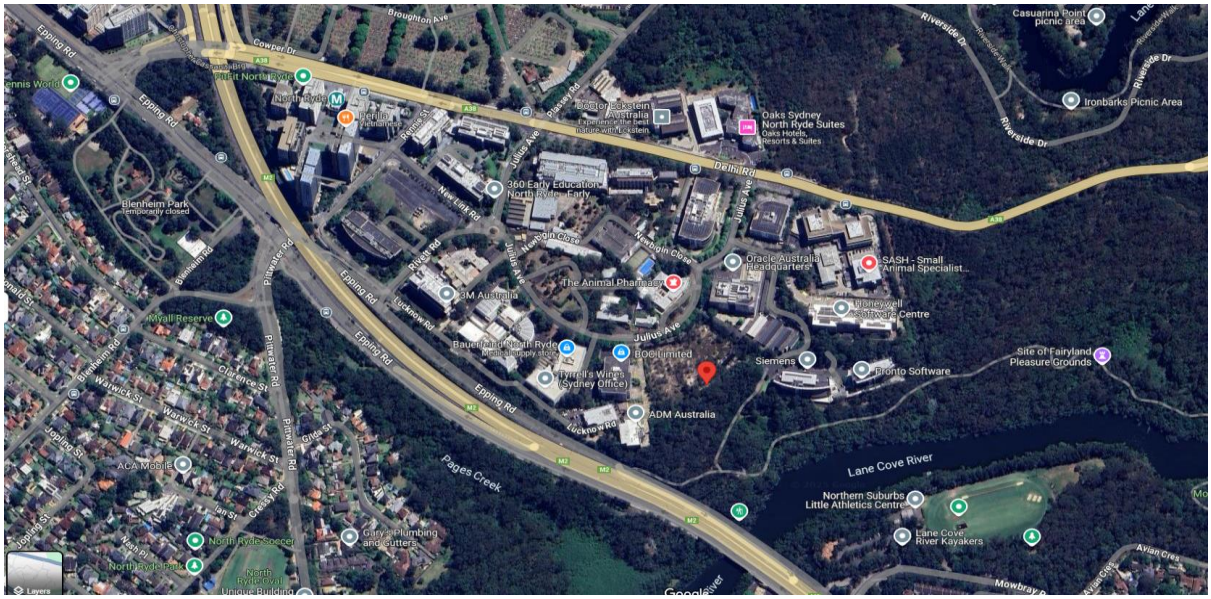


Figure 1: Aerial Image of Site 6-8 Julius Avenue, North Ryde

Figure 1 is an aerial image showing the nature of the site and its existing environs. The site is in an E3 Productivity Support Zone as per the Ryde Local Environment Plan 2014 and is surrounded by commercial uses within the same zone. This is currently vacant with the northern part of the site having been excavated and cleared of vegetation as part of a previous development consent in 2009.

Logic Projects are committed to providing an Ecological Sustainable Development (ESD) and have engaged Waste Check to ensure best practice sustainable resource management and waste minimisation practices are captured through all stages of the proposed development.

The objective of this WRMP is to satisfactorily demonstrate that the proposed development complies with the relevant Environmental Planning Instrument (EPI) controls for approval by the determining authority. **Table 1** lists all policies and guidelines that have been considered in preparing this WRMP to address Key Issue *18. Waste Management* in the Planning Secretary's Environmental Assessment Requirements (SEARs) for the SSDA as shown in **Table 2**.

Table 1: Waste Policies and Guidelines

Policies and Guidelines
The National Waste Policy: Less Waste More Resources 2018
The National Waste Policy Action Plan 2024
The NSW Protection of the Environment Operations Act (POEO Act) 1997
The NSW Protection of the Environment Operations (Waste) Regulations 2014
The NSW Waste Avoidance and Resource Recovery Act (WARR Act) 2001
The NSW Waste and Sustainable Materials Strategy 2041
The NSW EPA Construction and Demolition Waste – A Management Toolkit 2020
The NSW EPA Waste Classification Guidelines - 2014
The NSW EPA Standards for Managing Construction Waste in NSW 2019
Ryde Local Environmental Plan 2014
City of Ryde DCP 2014 – *Part 4.5 Macquarie Park Corridor & Part 7.2 Waste Minimisation and Management*
The NSW EPA Better Practice Guide for Resource Recovery in Residential Developments *(Table F3 – Calculating commercial and industrial waste and recycling generation rates)*
AS 4123 – Australian Standard for Waste & Recycling Mobile Waste Containers

Table 2: Compliance with Key Issue 18 in SEARs

SEARS Requirement	Refer to below for Compliance
Identify, quantify, and classify the likely waste streams to be generated during construction and operation	Construction – Table 4 Estimated Waste Volumes from Construction Works on page 9 Operation – Table 11 Commercial Office Core Waste Streams Generation Rates on page 15
Provide the measures to be implemented to manage, reuse, recycle and safely dispose of waste in accordance with any council waste management requirements	Construction and Demolition Stage pages 6 to 12 Ongoing and Operational Stages pages 13 to 21
Identify appropriately sited waste storage areas, collection access paths/roads, and appropriate servicing arrangements for the site.	Waste Storage Area – Figure 7: Bin Storage Area Layout - Core Waste Streams Reflecting Commercial Waste Services on page 16 Collection Access Path/ Servicing Arrangement – Figure 9: Swept Turning Paths for Standard 8.8m Long MRV Overlaid on Ground Floor Plan on page 18
If buildings are proposed to be demolished or altered, provide a hazardous materials survey.	Hazardous Material Survey not applicable.

Project Details

The proposed development consists of the following waste generating stages:

1) Site preparation works, including tree clearing
2) Earthworks and additional site retaining
3) Infrastructure comprising civil works and utilities servicing
4) Construction of a data centre, with the following:
    a. Basement car parking for 54 x cars including 2 x DDA car parking spaces
    b. 12 data halls across six (6) storeys with a total capacity of 170 megawatts with upper-level mechanical equipment and rooftop plant;
    c. Six (6) storey office/front of house building;
    d. Six (6) storey generator gantry to rear of data centre;
5) Two (2) new public roads along the western and southern parts of the Site; and
6) Complementary landscaping and offset planting

Construction and Demolition Stages

This section of the WRMP addresses the following controls in City of Ryde's DCP 2014 – Part 7.2 Waste Minimisation and Management – 2.4 Demolition and Construction.

Whilst the specific contractors who will be carrying out all works including tree clearing, earthworks, site preparation and construction activities have not been selected yet, this WRMP will be used as a guide for contractors to submit tender documents addressing requirements set out below. These requirements are recommended to form a project specific Sustainable Procurement Policy to target environmental and circularity principles. Consideration should also be given to select contractors with demonstrated experience in sustainable construction and demolition.

Environmental Principle – Minimising creation of waste and diverting waste from landfill.

Circularity Principle – Using materials made from recycled content.

All works will follow the principles of the waste hierarchy (**Figure 2**).

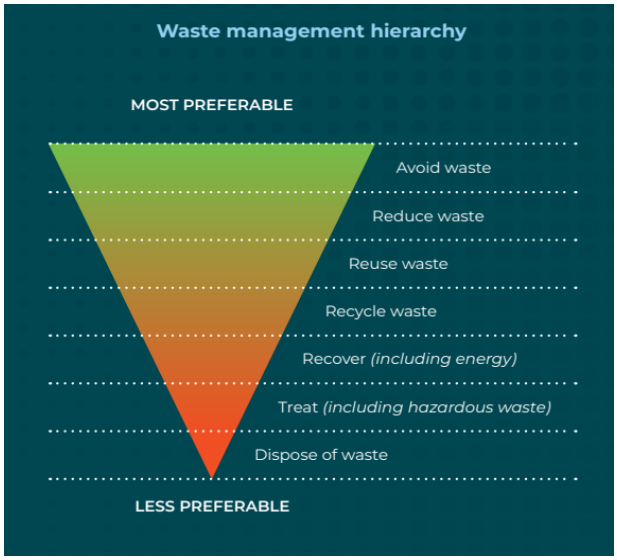


Figure 2: Waste Hierarchy (source: National Waste Policy Action Plan 2024)

Waste generated from Construction and Demolition stages of developments have great potential to meet Environmental and Circularity Principles, as materials generated through these stages can be handled high in the waste hierarchy to avoid high disposal costs associated with the POEO Act's (1997) waste levy. Recycling these materials also benefit society by reducing pollution and greenhouse gas emissions whilst ensuring the industry has access to affordable and high-quality materials in the market.

Site Preparation

Site preparation works including tree clearing and earthworks will be conducted in accordance with the following principles:

Avoid and Reduce Waste – Tree clearing, and earthworks will be conducted in accordance with accurate civil estimations and as approved to ensure the most efficient approach, avoiding excessive works and waste.

Reuse Waste –

> ***Onsite*:** Where applicable or necessary, excavated material will be used to fill/level the site in preparation for construction works.
>
> ***Offsite:*** Excavated material will be transported to licenced facilities approved to accept excavated material to be used in downstream markets.

Recycle – Trees will be transported to and/or processed by certified tree recyclers who will recycle trees into green waste and mulch, shred trees or where applicable transported to licenced facilities to be made into timber products.

Recover, Treat and Dispose of Waste – These levels of the waste hierarchy will be avoided unless unforeseen circumstances arise. Unforeseen circumstances include the identification of contaminants in any waste to be removed from the site. In this instance the contaminated waste will be transported to treatment facilities before being disposed of into landfill. Environmental sampling will be conducted by qualified environmental scientists during works to ensure all waste is disposed of appropriately. Sampling will be conducted in accordance with the requirements set out in the NSW EPA Resource Recovery Order – *The excavated natural material order and exemption 2014* and the NSW EPA Contaminated Land Guidelines – *Sampling Design part 1 – application*.

Table 3: Estimated Waste Volumes from Site Preparation Works

Waste Material	Volume	Onsite Reuse	Offsite Reuse/ Recycling	Offsite Landfill disposal	Percentage diverted from Landfill
Excavated Material	>10m^3	Yes	Yes	No (Unless contaminated)	100% (Unless contaminated)
Trees & Green waste	>10m^3	Yes	Yes	No	100%

Waste Storage and Stockpiling Areas

During site clearing and earthworks, the above detailed waste materials will be stored in designated waste storage areas onsite. The waste materials will be source separated and stored by either stockpiling materials or organising skip bins in accessible locations for contractors to dispose of waste appropriately and for collection service providers to remove waste safely and efficiently from the premises. The designated waste storage areas will be relocated throughout the progression of works to ensure all contractors have ease of access to appropriately separate waste types for removal. The site will have perimeter construction fencing and/or hoardings, ensuring that stockpiling and bin storage areas will be always screened from view from neighbouring land.

Waste Collection and Offsite Disposal

All waste collection vehicles will access the site via Richardson Place. All waste removed from site will be recorded in approved logbooks/tracking sheets detailing (but not limited to); type of material, quantities, contractor used to remove waste from the site, registration details of vehicle used to transport waste from site to disposal facility, disposal facility (name & address), time and date waste removed from site, time and date waste disposed of at facility. All weighbridge receipts will be kept and recorded onsite. Electronic copies of receipts will also be made and stored offsite as a backup.

Construction

Avoid and Reduce Waste – Sustainable Procurement Policy: Only required quantities of materials will be ordered to minimise surplus and waste. Where possible, modular construction and prefabricated materials will be utilised.

Additionally, adopting procurement policy principles will ensure directions are in place to promote procurement of materials from suppliers who supply materials made from recycled content and use reusable/recyclable packaging.

Examples of reusable/recyclable packaging materials:

- Hardwood pallets owned and returned to suppliers
- Pallets made from recyclable materials
- Materials shipping in recyclable packaging (cardboard, paper, packing paper, clear pallet wrap)
- *Avoid materials that use non-recyclable packaging (coloured soft plastics, expandable polystyrene foam/foam packing)*

Reuse Waste –

***Onsite*:** If any surplus of materials occurs, these materials will be reused onsite where possible. For example:

Bricks and pavers: crushed and used as aggregate.

Treated timber: Reused for formwork, bridging, blocking and/or propping

Untreated timber: Reused for fencing or in landscape design. Also reused as floorboards or as furniture.

Plasterboard: Minimal reuse in landscaping

Offsite: Where onsite reuse is not possible, surplus materials will be transported to offsite facilities for reuse in other markets.

Recycle – Where onsite reuse is not possible, surplus materials will be transported to offsite facilities for reuse and/or recycling. These materials will be source separated by engaging waste service providers who will provide skip bins for multiple waste types.

Recover, Treat and Dispose of Waste – These levels of the waste hierarchy will be avoided for all waste streams that can be appropriately managed as detailed above. Residual waste, composite waste, and general waste from packaging and/or daily contractor activities will have dry waste or general waste bins readily available. These bins will be transported to a licenced dry waste facility to recover the energy from this material or a landfill facility

Estimated Waste Volumes from Construction Works

The estimated volumes of waste materials in **Table 4** are general estimates only based on developments of similar scale and industry standards. The Percentage diverted from landfill should be used as the metric for evaluation as these targets will formalise operational standards required to be met by all construction contractors in line with the project's Sustainable Procurement Policy Environmental Principle.

Table 4: Estimated Waste Volumes from Construction Works

Waste Material	Volume	Onsite Reuse	Offsite Reuse/ Recycling	Offsite Landfill Disposal	Percentage Diverted from Landfill
Timber	22.5m^3	Yes	Yes	Minimal	95%
Plasterboard	37.5m^3	Yes	Yes	Minimal	95%
Concrete	85.5m^3	Yes	Yes	No	100%
Bricks	85.5m^3	Yes	Yes	No	100%
Tiles	22.5m^3	Yes	Yes	No	100%
Metals	12.15m^3	Yes	Yes	No	100%
Glass	9.15m^3	No	Yes	No	100%
Recyclable Packaging including Cardboard and Pallets	40.5m^3	No	Yes	No	100%
Non-Recyclable Packaging	12.5m^3	No	No	Yes	0%
Residual	23.25m^3	No	No	Yes	0%
TOTAL Landfill Diversion	312.63m^3				**90%**
TOTAL Landfill	35.75m^3				

For a more accurate estimation of expected waste volumes, the Project Manager or lead sub-contractor should use the following 'Rule of Thumb' as detailed in City of Ryde DCP 2014 during procurement and where quantities of materials ordered will be known.

Table 5: Rule of Thumb Percentages for Calculating Expected Construction Waste Volumes

Waste Material	Percentage of Waste of Material Ordered
Timber	5-7%
Plasterboard	5-20%
Concrete	3-5%
Bricks	5-10%
Tiles	2-5%

Waste Storage Areas

During construction, the above detailed waste materials will be stored in designated waste storage areas onsite. The waste materials will be source separated and stored in dedicated skip bins in accessible locations for contractors to dispose of wastes appropriately and for collection service providers to remove waste safely and efficiently from the premises. **Figure 3** shows examples from the NSW EPA of waste signage to be installed at the waste storage areas to facilitate source separation. It must be noted that waste service providers may also provide their own waste and recycling signage which may provide specific details to improve recycling outcomes.

Figure 3: Example Construction Waste Signage (Source: NSW EPA 2025)

Designated waste storage areas will be relocated throughout the progression of works to ensure all contractors have ease of access to appropriately separate waste types for removal. The site will have perimeter construction fencing and/or hoardings ensuring that stockpiling and bin storage areas will be always screened from view from neighbouring land.

Waste Collection and Offsite Disposal

All waste collection vehicles will access the site via Richardson Place and the internal Access Road. All waste removed from site will be recorded in approved logbooks/tracking sheets detailing (but not limited to); type of material, quantities, contractor used to remove waste from the site, registration details of vehicle used to transport waste from site to disposal facility, disposal facility (name & address), time and date waste removed from site, time and date waste disposed of at facility. All weighbridge receipts will be kept and recorded onsite. Electronic copies of receipts will also be made and stored offsite as a backup.

Offsite Recycling and Disposal Facilities

Figure 4 below shows the location of Construction and Demolition Waste receival facilities. **Table 6** lists the facilities and their addresses for all contractors to refer to when transporting waste offsite. The list details the materials accepted at each facility. If contractors require more information on other facilities, the following link is provided to assist in finding appropriate facilities.

https://recyclingnearyou.com.au/

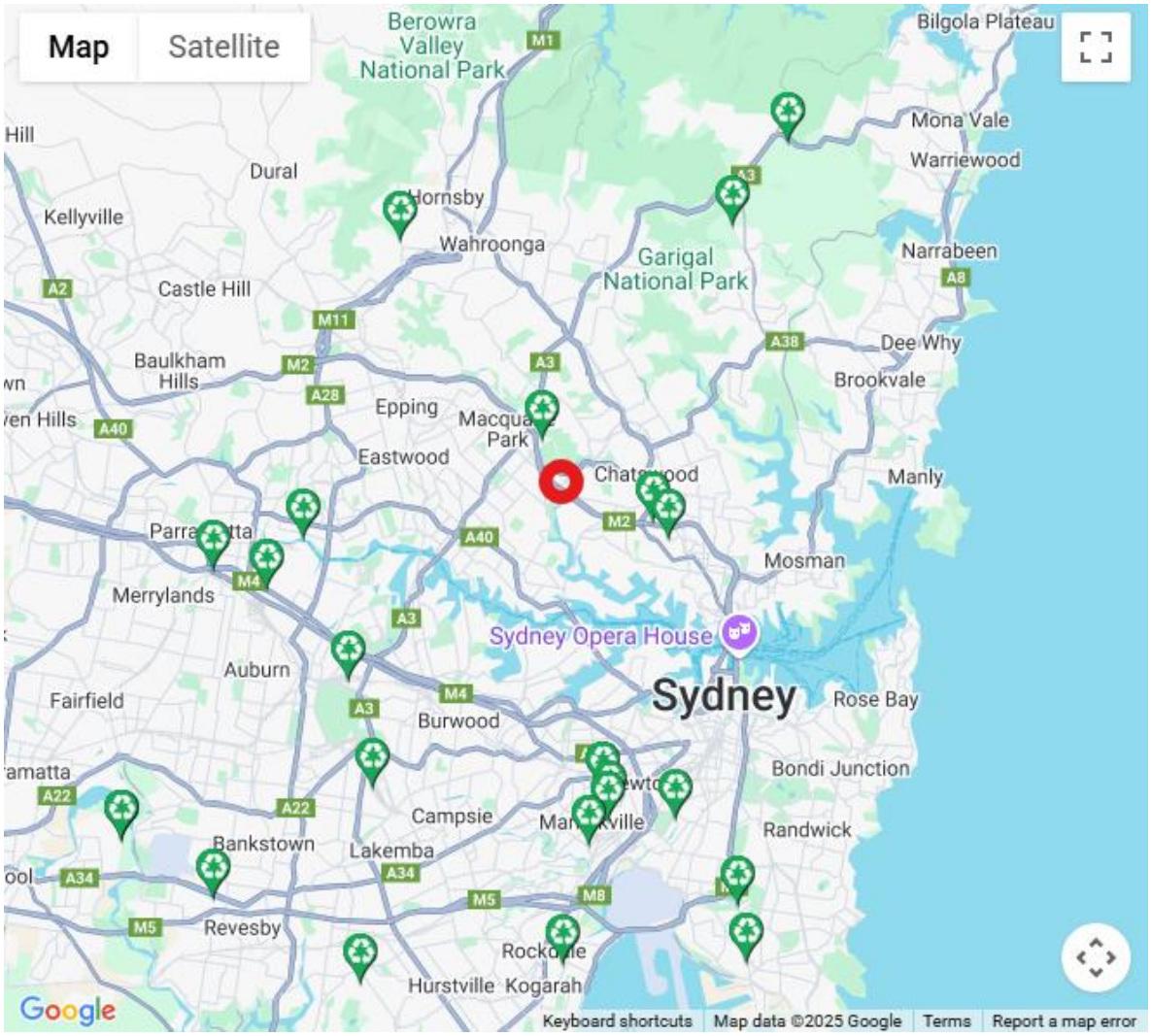


Figure 4: Construction and Demolition Facility Locations (Source: Recycling Near You 2025)

Table 6: Acceptable Materials by Construction and Demolition Waste Facilities

Facility Name	Address	Distance from site (km)	Materials accepted												
			Excavated Material	Green Waste	Treated Timber	Untreated Timber	Plasterboard	Concrete	Bricks	Tiles	Metals	Glass	Cardboard	Pallets	More materials*
Cleanaway Ryde Resource Recovery Centre	145 Wicks Road, Noth Ryde, NSW	1.6	N	Y	N	Y	N	N	N	N	Y	N	Y	Y	Y
Bingo Industries Recycling Centre	10 McLachlan Avenue, Artarmon, NSW	5.5	N	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Cleanaway Artarmon Resource Recovery Centre	12 Lanceley Place, Artarmon, NSW	6.3	N	Y	N	Y	N	N	N	N	Y	N	Y	Y	Y
Concrete Recyclers (Group) Pty Ltd	14 Thackeray Street, Camellia, NSW	8	N	N	N	N	N	Y	Y	N	N	N	N	N	Y
Sydney Transwaste Industries	160 Arthur Street, Homebush West, NSW	9.7	Y	Y	N	N	N	Y	Y	N	N	N	N	N	Y
Bingo Industries Recycling Centre	3-5 Duck Street, Auburn, NSW	10	N	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Recycled Building Centre	264 Mort Street, Granville, NSW	11.5	N	N	N	N	N	N	Y	N	N	N	N	N	N
Cleanaway Belrose Resource Recovery Centre	Crozier Road, Belrose, NSW	12.1	N	Y	N	Y	N	N	N	N	Y	N	Y	Y	Y
Bingo Industries Recycling Centre	35 Wentworth Street, Greenacre, NSW	12.7	N	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Benedict Recycling	33-39 Riverside Road, Chipping Norton, NSW	19.7	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y

Ongoing and Operational Stages

This section of the WRMP addresses the controls in City of Ryde's DCP 2014 – Part 7.2 Waste Minimisation and Management: Section 2.3 All Developments and Section 2.8 Commercial and Retail.

Waste and recycling will be mostly generated from the offices associated with the data centre. As such the following waste generation rates are applicable for waste planning to meet DCP requirements. This section of the WRMP focuses on demonstrating DCP compliance for waste management for the proposed data centre development. Part 7.2 of City of Ryde's Development Control Plan (2014) 'Waste Minimisation and Management' provides a guide for commercial waste and recycling volumes by land use and activity types. **Table 7** details the applicable commercial waste generation rates.

Estimated waste and recycling volumes

Table 7: Applicable DCP Waste and Recycling Generation Rates

Premises Type	Waste (Garbage)	Recycling
Offices	10L/100m^2 floor area/day	10L/100m^2 floor area/day

The total Net Lettable Area of the office building aspect of the development is 940m^2

Table 8: NLA's by Floor Level

Level	NLA
02	98m^2
03	209m^2
04	209m^2
05	215m^2

Using the waste and recycling generation rates in Part 4.5 of the City of Ryde's DCP (2014) the development will generate the following volumes of general waste and recycling

Table 9: Calculated Waste and Recycling Volumes

Waste Stream	Generation Rate	Total NLA	Volume Generated per day	Volume Generated per week
Garbage	10 litres per 100m^2 per day	940m^2	94 litres	658 litres
Recycling	10 litres per 100m^2 per day	940m^2	94 litres	658 litres

Based on the calculations using the DCP waste generation rates the following number of bins will be required to service the site on a once weekly collection frequency.

- 1 x 1100L garbage bin collected once weekly
- 1 x 1100L recycling bin collected once weekly

Figure 5 shows the above detailed total number of bins (drawn to scale) overlaid on the ground floor architectural drawing (prepared by Greenbox Architecture) to demonstrate that adequate space is provided for the storage of garbage and recycling bins as per DCP requirements.

The floor of the waste storage area will be constructed of concrete with an epoxy painted smooth finish and graded to a floor waste connected to the sewerage system. The waste storage area will also be mechanically ventilated (separate system supplying air to other aspects of the building).

Bin dimensions as per Ryde DCP 2014 Part 7.2 Schedule 1 Indicative Bin Sizes and Dimensions.

Table 10: 1100L Bin Dimensions

Bin Type	Height	Depth	Width
1100 Litre Bin	1460mm	1230mm	1370mm

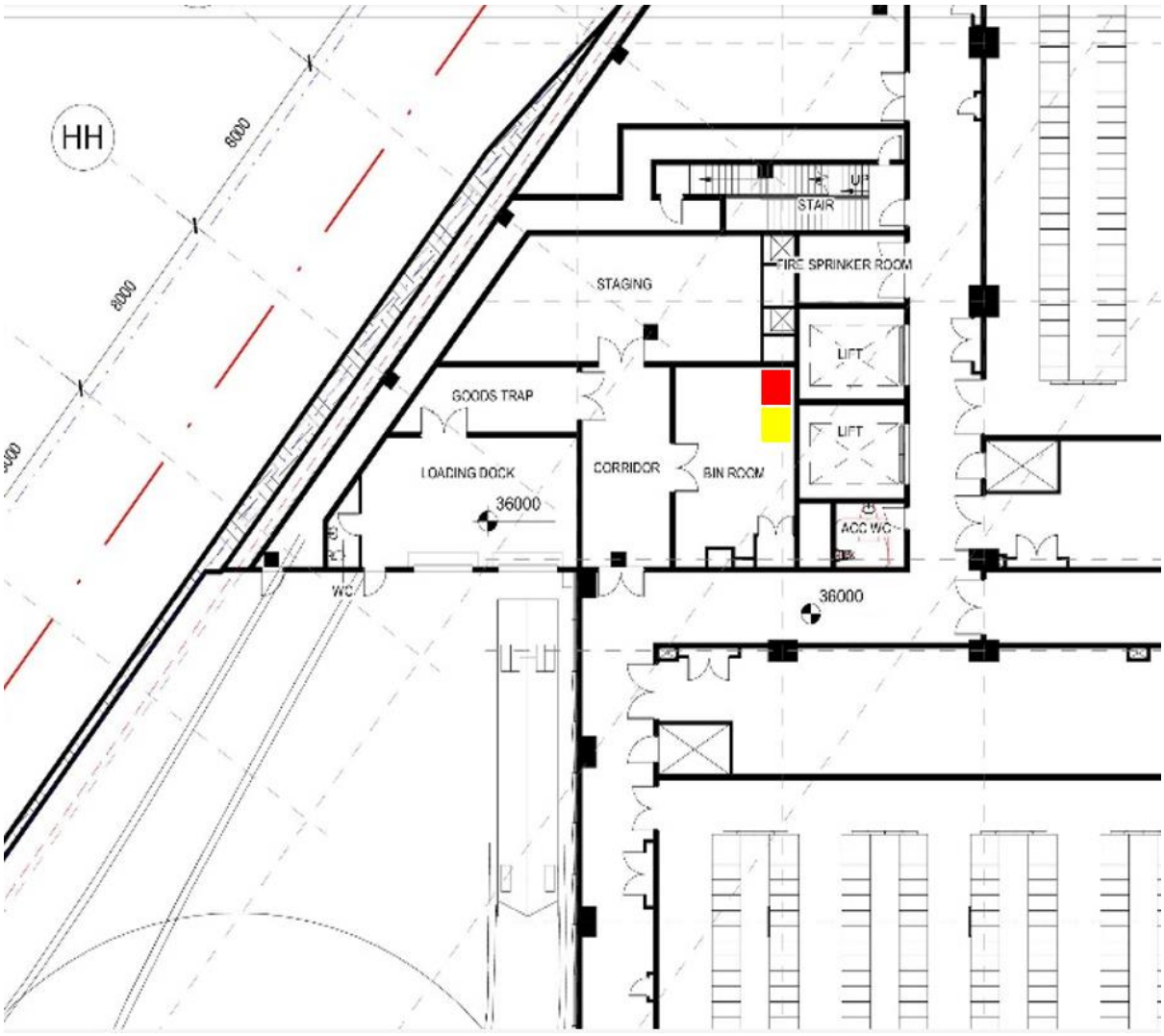


Figure 5: Bin Storage Area Layout DCP Requirements

Key

Yellow = 1100L Comingled

Red = 1100L General Waste

Waste Check Forecasted specific waste materials

Whilst the previous section of this report confirms DCP compliance for the purpose of demonstrating adequate waste storage space is provided, it does not detail the complexity of waste management systems inherent in actual business-as-usual activities.

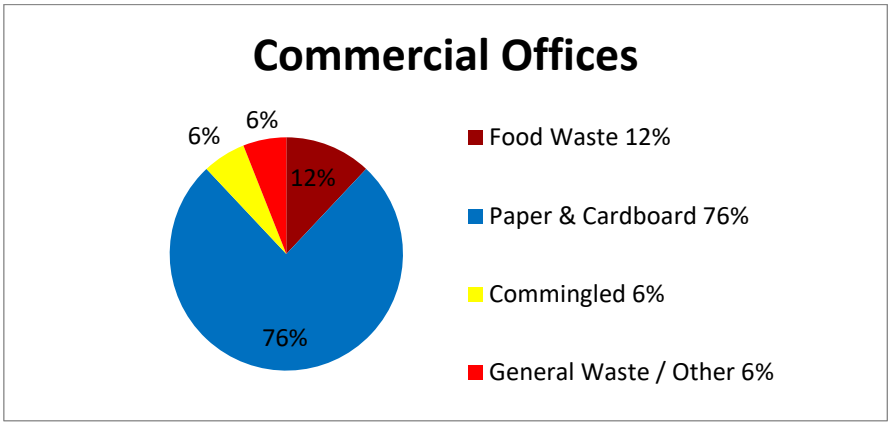


Figure 6: NSW EPA pie chart to show serviceable waste streams

Note there are some recycling materials not captured in the above chart that could be recycled so long as the material is clean and free from contaminants i.e.; E-Waste, Expandable Polystyrene (EPS), Clear Soft Plastics (LDPE) and Batteries.

The waste generation rates in **Table 9** for commercial offices fails to recognise all material waste types that are generated as per the pie chart diagrams in **Figure 6**, and in turn **Table 11** is able to better reflect the material volumes generated on a daily and weekly basis in an office environment.

Table 9: Commercial Office Core Waste Streams Generation Rates

Core Waste Stream	Volume Generated per day	Volume Generated per week
Food Waste	22.6 litres	158 litres
Paper & Cardboard	142.9 litres	1,000 litres
Commingled	11.3 litres	79 litres
General Waste (Garbage) / Other	11.3 litres	79 litres
TOTAL	**188.1 litres**	**1,316 litres**

Multiple 240L Secure Document bins are also likely to be placed on each floor and this volume of material will need to be separated from the Paper & Recycling forecasted material volumes for the Julius Avenue Data Centre.

Based on the calculations in **Table 11** the following number of AS 4123 coloured bins will be required to reflect the operational waste servicing needs of commercial office environments.

- 1 x 240L Food waste bin collected weekly
- 1 x 1100L Paper & Cardboard bin collected once weekly
- 1 x 240L Commingled recycling bin collected fortnightly
- Multiple x 240L Secure document bins collected on an as needs basis
- 1 x 240L General Waste bin collected once weekly

Table 10: 1100L & 240L Bin Dimensions

Bin Type	Height	Depth	Width
1100 Litre Bin	1460mm	1230mm	1370mm
240 Litre Bin	1080mm	735mm	580mm

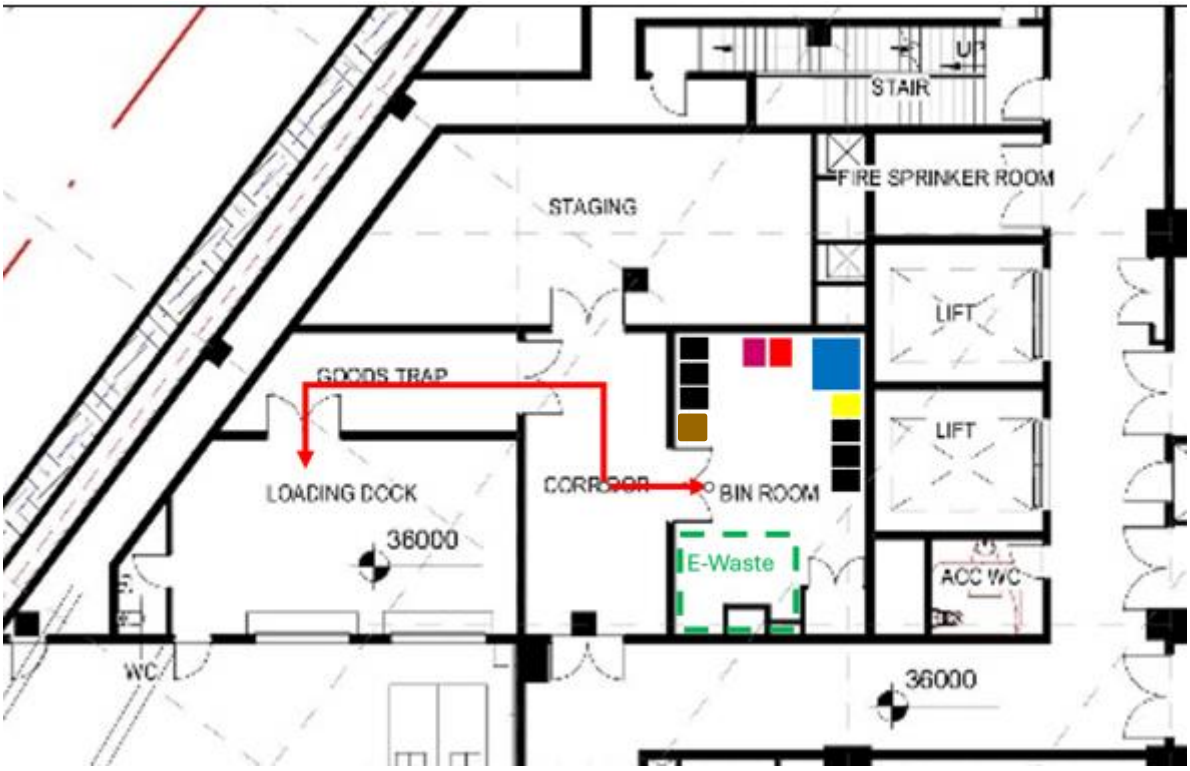


Figure 7: Bin Storage Area Layout - Core Waste Streams Reflecting Commercial Waste Services

Key

- Burgundy = 240L Food Organics
- Blue = 1100L Paper & Cardboard
- Yellow = 240L Comingled
- Black = 240L Secure Document
- White = ITAD Storage Area
- Brown = Pallet Storage Area
- Red = 240L Dry or General Waste
- Arrow = Bin Transfer Path

Data Centre – Information Technology Asset Disposition (ITAD)

The development will also produce ITAD waste items from the 12 x data halls. As IT hardware and servers require replacing every 3-5 years therefore, operational waste management systems must be formalised to ensure heavy ITAD items are appropriately captured to ensure they are properly handled and disposed of to increase recycling and diversion rates from landfill whilst also providing security for the handling of sensitive data.

However, it is important that the tenants provide their recycled ITAD weight data monthly, so that it is included in all recycling rate calculations for the Julius Ave Data Centre and this data can often improve recycling rate outcomes.

660L bins with drop down fronts and lockable lids should be provided for the storage of tenant ITAD material and a dedicated 7.5m^2 space is identified for the storage of these bins in **Figure 7.** ITAD collection can be conducted individually by the tenants or by certified secure disposal service providers to guarantee items are disposed in a manner that ensures sensitive data is appropriately handled before items are recycled, re-sold, or destroyed.

Further Waste Reduction – Sustainability & Data

Whilst the graph shown in **Figure 6** shows that 94% of total waste materials can be readily recycled by implementing waste services to capture all recyclable materials from the office spaces, and **Figure 7** shows the formalisation of an ITAD waste storage area to capture e-waste from the data centres, this report is limited to generalising waste management systems to reflect standardised industry wide experiences. Ultimately, the site can achieve further waste reduction by actively engaging in ongoing performance improvement programs to meet Scope 3 Mandatory Reporting Requirements and achieving ESG commitment targets.

Should the Julius Avenue Data Centre divert 100% of its food waste then a Dry Waste service is strongly recommended to divert the following materials from landfill including but not limited to: soft plastics, takeaway coffee cups, compostable packaging, expandable polystyrene etc. These dry waste materials are treated as processed engineered fuel (PEF) where the material is often used as a fuel replacement in the production of concrete.

Waste Check also recommends the Julius Avenue Data Centre conducts regular monitoring of the waste services to highlight key aspects where waste can be handled higher in the waste hierarchy. In turn a yearly NABERS Waste Verification Report is suggested, and this program can not only be used for tenant education purposes, to help improve recycling outcomes but can also be used to attract and retain premium tenants who have high operational recycling rate requirements like: Microsoft, Amazon, and Google.

To track the recycling rate of the Julius Avenue Data Centre a waste management supplier (WMS) with weighing capability across its entire fleet should be engaged and this data is normally provided monthly in arrears. Or alternatively a manual waste weighing solution could be installed where the cleaners weigh the waste on static scales prior to collection by the WMS, however these systems are prone to human errors and this data can now be captured automatically by waste metering technology with load cells placed between the wheel castors and the bin, with waste weight data captured in near real time like energy and water metered data. This waste metering technology is currently being piloted in the ACT.

Best Practice AS 4123 Bin Types & Liners and Waste Data

At all times the Julius Avenue Data Centre should follow the Australian Standards AS 4123 mobile waste container guidelines with an emphasis on correct MGB bin lid colours for each waste and recycling stream.

- Burgundy = Food waste
- Blue = Paper / Cardboard
- Yellow = Comingled (Mixed Recycling)
- White = E-Waste
- Red = General Waste

Utilising the AS 4123 standard lid colours highlights the importance of not only increasing the recycling rate but also the importance of diverting materials containing organic matter (carbon-based compounds) such as food waste and paper/cardboard from landfill. This minimises the building's operational greenhouse gas emissions as when organic matter is sent to landfill when it breaks down producing carbon dioxide (CO_2) in the early aerobic operational stages of the landfill, and then will continue to break down producing methane (CH_4) in anaerobic environments once the landfill is capped. In turn methane is approximately 25 times more harmful as a greenhouse gas than CO_2.

To assist the building with its recycling outcomes, clear bin liners should be mandated for internal General Waste and Comingled bins to help cleaners and other stakeholders identify any contamination in recycling bins and missed recycling opportunities in general waste bins.

Waste collection

A commercial waste management service provider will be engaged to service the building's waste and recycling materials when the building becomes operational.

It is also recommended for the Julius Avenue Data Centre to keep Paper & Cardboard material separate from Comingled material where possible, as this material is often 60% cheaper to service than Comingled material and this will help to minimise operational costs.

All waste collection will be conducted onsite at the proposed loading dock. Swept turning paths demonstrating the standard 8.8m long Medium Rigid Vehicle (MRV) can access the site for waste collection purposes. **Figure 8** below shows a diagram of a typical commercially available MRV sized waste collection vehicle. **Figure 10** also shows another typical MRV sized waste collection vehicle – City of Ryde standard drawing.

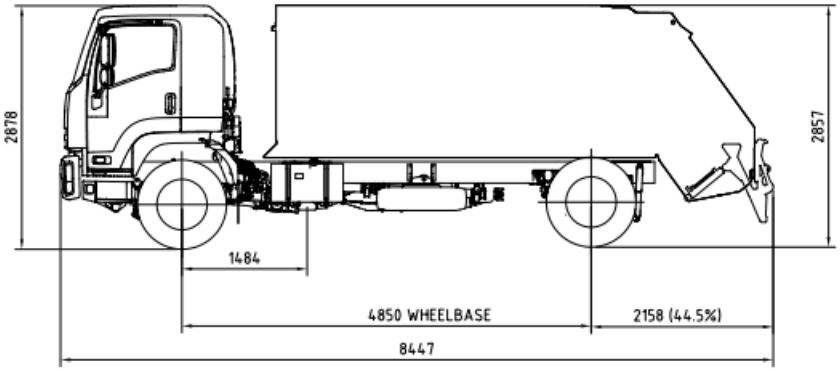


Figure 8: Typical MRV sized Waste Collection Vehicle (Source: Bucher 2025)

The waste collection vehicle will enter and exit the site in a forward direction. One reverse manoeuvre will be performed as part of a typical three point turn to position the rear of the collection vehicle at the loading dock. Waste collection staff will then exit the vehicle and access the bins directly from the bin room, wheel them to the truck to be emptied, and then wheel the empty bins back into the bin room. **Figures 7 and 9** show the obstruction-free bin transfer path leading from the bin room to the waste collection point.

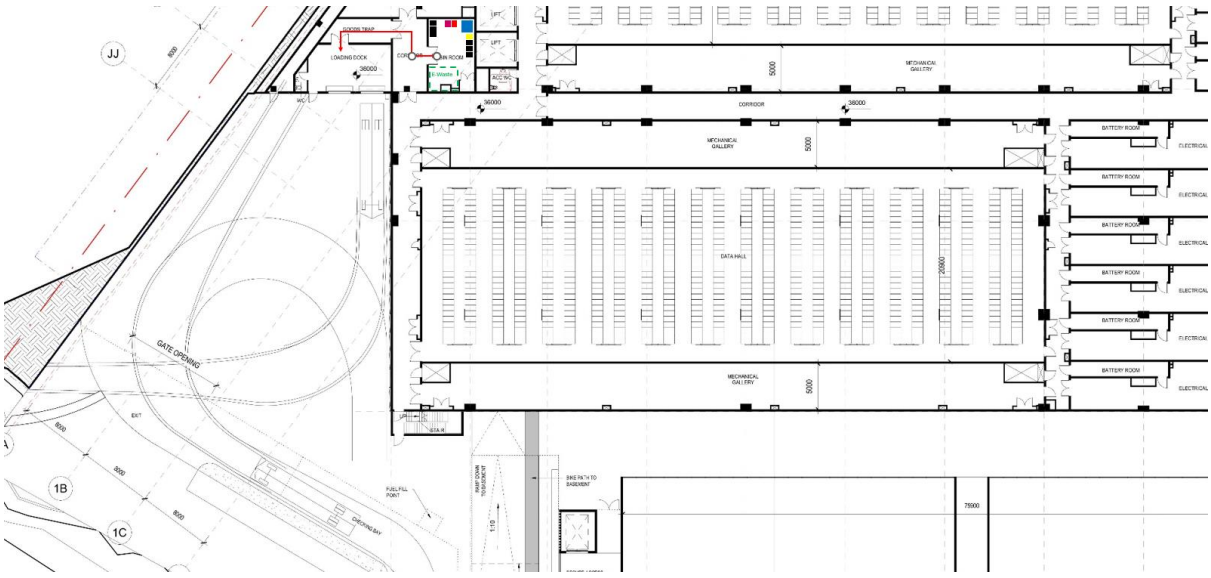


Figure 9: Swept Turning Paths for Standard 8.8m Long MRV Overlaid on Ground Floor Plan

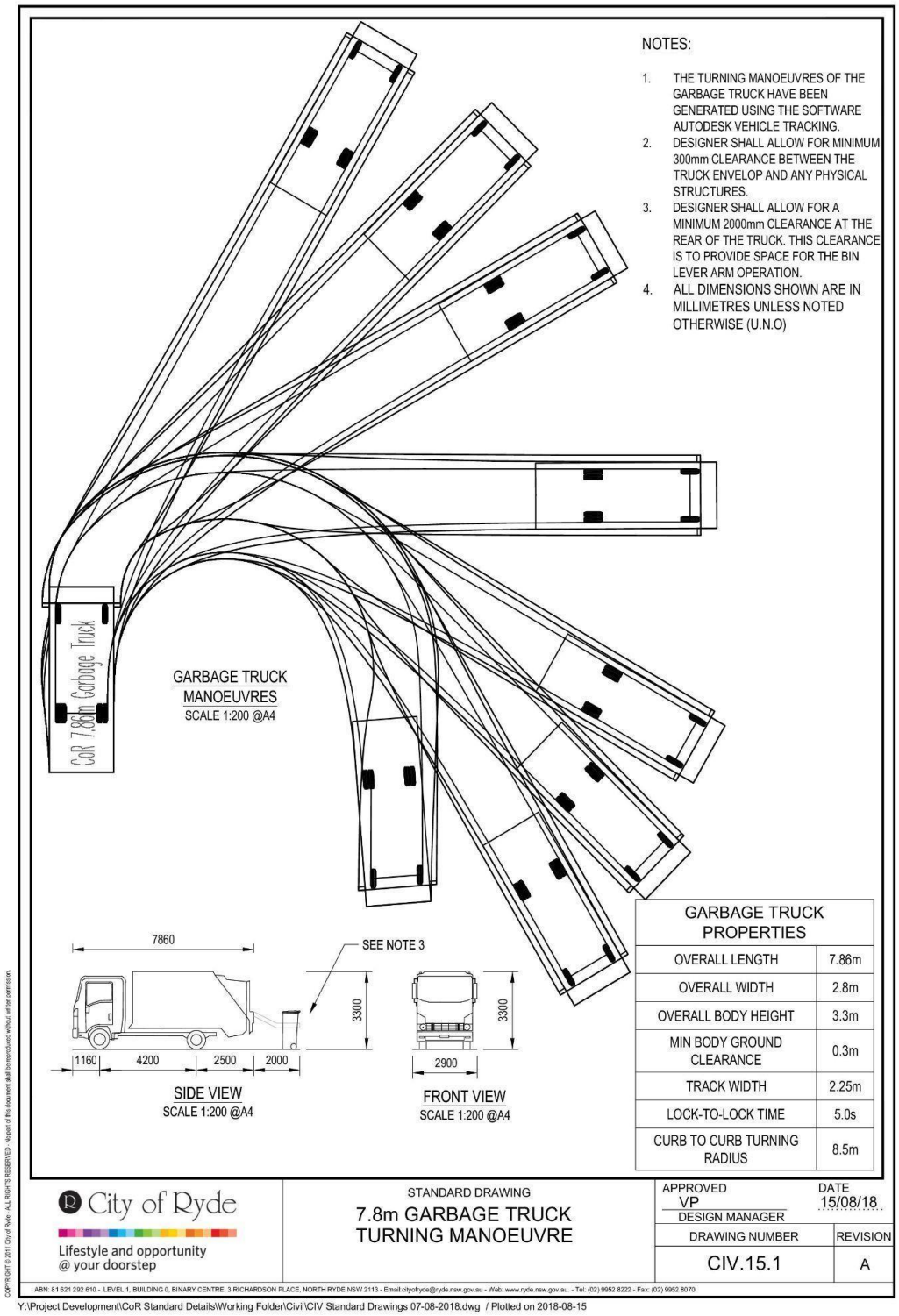


Figure 10: City of Ryde Standard Drawing 7.8m Garbage Truck Turning Manoeuvre

Operational Waste Management Process

Adopting initiatives that continue to target the Sustainable Procurement Policy Environmental and Circularity Principles used throughout all stages of the development will ensure that staff and cleaning contractors will continually reduce the Julius Avenue Data Centre waste footprint. Initiatives such as ordering photocopy paper with recyclable packaging, procuring electronic suppliers who do not use EPS in their packaging, reusing Comingle bin liners and encouraging other waste wise activities throughout daily operations.

We also recommend utilising bin "nests" (as depicted in **Figures 11** and **12**) throughout the building to assist staff in the correct disposal of materials at the source through communal disposal points. Kitchen area bin nests will include General Waste, Commingled Recycling and Organic Waste bins. Workstation bin nests will include General Waste, Paper & Cardboard and Comingled Recycling bins. Each workstation will be allocated one bin nest to ensure all staff have access to disposal points. The bin nests include educational graphics and signage with colour coded lids and different apertures to assist staff in disposing of materials correctly, resulting in reduced contamination and increased recycling rates.

Cleaners will routinely service the bin nests and transport all waste materials to the AS 4123 colour coded bins in the waste storage area on the ground floor level.

FACILITY RESOURCES HUB

Additional measures where the site will avoid waste being generated will include the Facility Manager formalising shared resources for all tenants to use when needed. Shared resources such as power and hand tools, manual handling equipment, and other maintenance equipment will be owned, securely stored in a common space, and managed by the Facility Manager. Tenants will be encouraged to book in with the Facility to use these shared resources. This will avoid each tenant purchasing their own resources multiplying the likelihood of disposal to landfill.

Figure 11: Kitchen bin nests (Source: Source Separation Systems)

Figure 12: Workstation bin nests (Source: Source Separation Systems)

Table 11: Proposed Waste Management Process

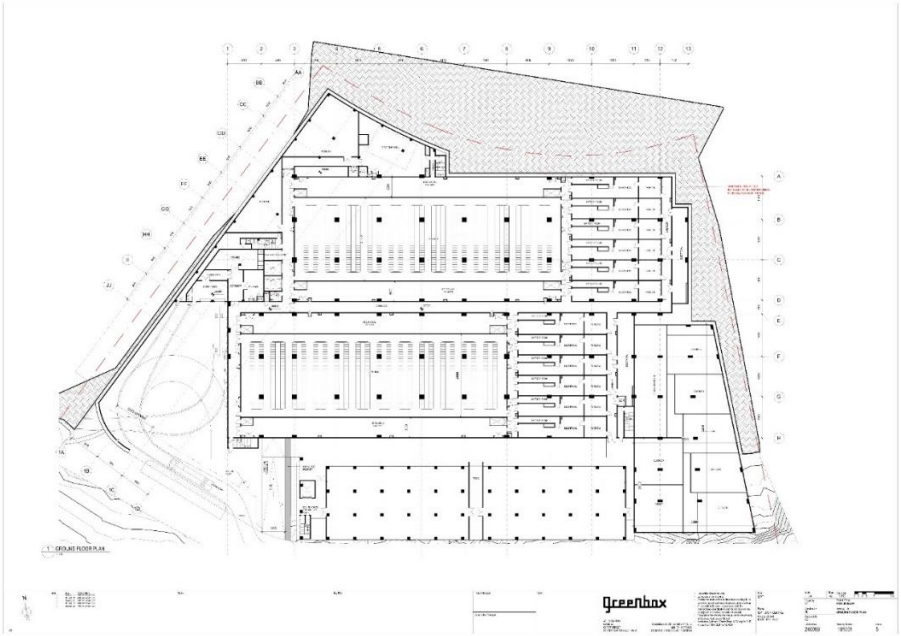
Bin Type	Bin Liner Type	Responsibility
Food Waste	Green Compostable	Cleaners remove bagged material from internal kitchen bins and place tied bags into ground level AS 4123 coloured MGB's
Paper & Cardboard	No Liner	Cleaners place clean waste material loosely into the AS 4123 coloured MGB's on the ground level as needed
Comingled Recycling	Clear Liner	Cleaners remove bagged clean recyclables from internal bins and empty liner contents loosely into the ground level AS 4123 coloured MGB's (re-use liners)
Secure Document	No Liner	Waste contractor swaps over bins from each floor with empty ones Material weighed by WMS and actual data supplied monthly
Batteries and Clean Clear Soft Plastics	No Liner	Cleaners empty clean material loosely into the dedicated ground level recycling services as needed
ITAD	No Liner	Facility Management to formalise check-in sheets for placing items in ITAD waste storage area Material weight data must be captured either at the point of collection in metered 660L bins or supplied by the tenant monthly
Pallets	N/A	Facility Manager stores and separates branded (Loscam & CHEP) pallets from unbranded pallets and organises collection of this material when pallets ≥ 5 units, to be re-used or recycled with a sample of unbranded pallets weighed on a quarterly basis
General Waste	Clear Liner	Cleaners remove bagged material from internal bins and place liners and contents into the AS 4123 coloured bins located on the ground level

Appendices

Example Construction and Demolition Waste Tracking Sheet

Project Name:	Julius Avenue Data Centre									
Date	Time Left Site	Rego	Bin Size	Waste Material	Contractor Name	Disposal/ Receival Facility	Time Entered Disposal/ Receival Facility	Weighbridge Weight	Weighbridge Receipt Number	Signed

Architectural Drawing for Waste Storage Area



Hardware Solutions

660L MGB With Drop Down

Waste Metering Weighing Technology

Metering Technology Pilot