

BRINGELLY ROAD BUSINESS HUB

Waste Management Plan

Prepared for:

ESR Australia
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Sydney 2000 NSW

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EXECUTIVE SUMMARY

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with ESR 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.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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1 Introduction

1.1 Overview

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by ESR (Aust) Pty Ltd (the Client) to prepare a waste management plan (WMP) in support of the State Significant Development Application (SSDA) for a proposed warehouse at Lot 4 within the Bringelly Road Business Hub on Bringelly Road in Leppington. This WMP reflects the Secretary's Environmental Assessment Requirements (SEARs) relevant to this project. This WMP is for the construction and operational activities of the development.

This WMP applies to the waste generated from the construction and operational stages of the Project and has been prepared using architectural drawings supplied by the Client and attached in **Appendix A**.

This WMP has been updated in response to the RFI Request by DPIE for the planning modification to SSD-8586218-Mod-1.

1.2 Objectives

The principal objective of this WMP is to identify all potential wastes likely to be generated at the Project site during construction and operational phases, including a description of how waste would be handled, processed and disposed of, or re-used or recycled, in accordance with Liverpool City Council's (Council) requirements.

The objectives of this WMP are as follows:

- Identify potential waste types likely to be generated during the construction and operational phases of the Project
- Provide advice on how identified wastes should be handled, identified, processed, disposed of, reused or recycled in accordance with Council requirements, relevant Australian codes and standards and better practice waste minimisation principles
- Encourage waste avoidance and minimisation through advice on design, ordering and planning, and
- Help implement safe and practical options for waste collection from the Project by Council or private waste servicing contractors.

1.3 Review of WMP

This WMP is not a static document. It is a working document that requires review and updating to ensure ongoing suitability for the proposed on-going operations at the site.

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.

2 Project Description

2.1 Overview of Proposed Development

The Bringelly Road Business Hub is a master plan-approved business park located in the South West Growth Corridor between Moorebank Intermodal Terminal and Western Sydney Airport, which is under-construction. The project is a 35,000 m² warehouse in the Bringelly Road Business Hub. The site will comprise one warehouse with attached offices, and will include car parking spaces, hardstands and a guard house.

The Client has received approval for the SSDA and is now seeking a planning modification (SSD-8586218-Mod-1).

2.2 Overview of Proposed Construction Work

The Project works will include construction activities.

The site plan for development of the site can be seen in **Appendix A**. The anticipated construction works for this development include:

- One warehouse building
- Three two-storey ancillary office buildings
- A guardhouse, and
- Truck, car parking areas and associated site hardstand areas.

2.3 Overview of Proposed Operations

Based on communication with the Client, SLR understands the Project will function as a temperature-controlled warehouse facility. The proposed planning modification is anticipated to have minimal impacts for waste management.

3 Better Practice Waste Management and Recycling

3.1 Waste Management Hierarchy

This WMP has been prepared in line with the waste management hierarchy shown in **Table 2**, 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.

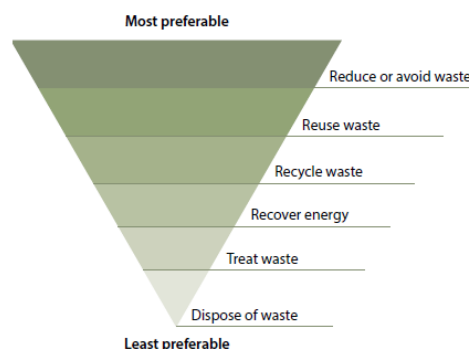


Image from NSW EPA (2014) NSW Waste Avoidance and Resource Recovery Strategy 2014-21.

Figure 1 Waste management hierarchy

3.2 Benefits of Adopting Better Practice

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

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

4 Waste Legislation and Guidance

The legislation and guidance outlined in **Table 1** below should be referred to during the demolition, construction and operational phases of the Project.

Table 1 Legislation and guidance

Legislation and Guidance	Objectives
Council legislation and guidelines	
Secretary Environmental Assessment Requirements (SEARs)	SEARs provide the additional requirements that must be completed when a critical state significant infrastructure project is submitted in a DA in NSW. The objective of SEARs submissions is to achieve better environmental outcomes by focusing on environmentally sensitive areas and areas of the greatest community concern. The provisions of the SEARs must be met for DA approval including the provision of a construction and operational waste management plan.
Liverpool Local Environmental Plan 2008 (LEP)	Liverpool Local Environmental Plan (LEP) 2008 applies to all land in Liverpool except for areas where other planning instruments have overridden the plan. Some new growth centre areas no longer use the Liverpool Local Environmental Plan 2008 and have now been overridden by State Environmental Planning Policies.
Liverpool Development Control Plan 2008 (DCP)	The Liverpool DCP came into effect in 2008 and provides greater planning detail for developments, supplementing the zoning and development standards contained within the LEP 2013. The DCP helps promote better development throughout the city, protecting the community's lifestyle and enjoyment of town centres and neighbourhoods. This WMP specifically addresses Part 1 - General Controls for all development and Part 7 - Development in Industrial Areas
State and National legislation and guidelines	
Building Code of Australia (BCA) and relevant Australian Standards	The BCA has the aim of achieving nationally consistent, minimum necessary standards of relevant health and safety, amenity and sustainability objectives efficiently.
Council of Australian Governments National Construction Code 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 EPA (2014) NSW Waste Avoidance and Resource Recovery Strategy 2014-21	The <i>NSW Waste Avoidance and Resource Recovery Strategy 2014-21</i> is aimed at ultimately "improving environment and community well-being by reducing the environmental impact of waste and using resources more efficiently" by presenting a framework intended to avoid and reduce waste generation, increase recycling, divert more waste from landfill, manage problem wastes better, reduce litter and reduce illegal dumping.
NSW EPA Resource Recovery Orders and Resource Recovery Exemptions	<p>The NSW EPA has issued a number of resource recovery orders and resource recovery exemptions under the POEO (Waste) Regulation 2014 for a range of wastes that may be recovered for beneficial re-use. These wastes typically include those from demolition and construction works, as well as operational wastes such as food waste.</p> <ul style="list-style-type: none"> Resource recovery orders present conditions which generators and processors of waste must meet to supply the waste material for beneficial re-use. Resource recovery exemptions contain the conditions which consumers must meet to use waste for beneficial re-use.

Legislation and Guidance	Objectives
NSW EPA's Waste Classification Guidelines 2014	The NSW EPA <i>Waste Classification Guidelines</i> assists waste generators to effectively manage, treat and dispose of waste to ensure the environmental and human health risks associated with waste are managed appropriately and in accordance with the <i>POEO Act 1997</i> and is associated regulations.
<i>Protection of the Environment Operations Act (POEO) 1997 and Amendment Act 2011</i>	The <i>POEO Act 1997</i> and <i>POEO Amendment Act 2011</i> 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 wastes generated during the demolition, construction and operational phases of a development, as well as the system for licencing waste transport and disposal.
The Work Health and Safety Regulation 2011	The Work Health and Safety Regulation 2011 provide detailed actions and guidance associated with the topics discussed in <i>The Work Health and Safety Act 2011</i> . The primary aim of the regulation is to protect the health and safety of workers and ensure that risks are minimised in work environments. Workplaces are to ensure that they are compliant with the requirements specified in the regulations. The regulations discuss items such as actions that are prohibited or obligated in work environments, the requirements for obtaining licences and registrations, and the roles and responsibilities of staff in workplaces.
<i>Waste Avoidance and Resource Recovery Act 2001</i>	<p>The <i>Waste Avoidance and Resource Recovery Act 2001</i> aims to promote waste avoidance and resource recovery and repeals the <i>Waste Minimisation and Management Act 1995</i>. Specific objectives of the <i>Waste Avoidance and Resource Recovery Act 2001</i> include:</p> <ul style="list-style-type: none"> • Encouraging efficient use of resources • Minimising the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste • Ensuring industry and the community share responsibility in reducing/dealing with waste, and • Efficiently funding of waste/resource management planning, programs and service delivery. <p>As of 2016, the addition to the Act of Part 5 defines the legislative framework for the "Return and Earn Container Deposit Scheme" whereby selected beverage containers can be returned to State Government authorities for a monetary refund.</p>

5 Construction Waste and Recycling Management

5.1 Targets for Resource Recovery

The performance of each new development should contribute to the following target from the NSW EPA (2014) *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*:

- 75 % of total construction and demolition waste recycled, increasing to 80 % by 2021.

It is anticipated that the waste minimisation measures in the following sections will assist the Project to meet this target. Waste reporting and audits can be used to determine the actual percentage of wastes that have been recycled during the construction stage of the Project.

5.2 Waste Streams and Classifications

The construction stage of the Project is likely to generate the following broad waste streams:

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

A summary of likely waste types generated from construction activities, along with their waste classifications and proposed management methods, is provided in **Table 2**.

For further information on how to classify a waste type refer to the NSW EPA (2014) *Waste Classification Guidelines*¹. Further information on managing construction wastes is available from the NSW EPA website² and Council's DCP.

¹ Available online from <https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/waste-classification-guidelines>

² <http://www.epa.nsw.gov.au/your-environment/waste/industrial-waste/construction-demolition>

Table 2 Potential waste types and their management methods

Waste Types	NSW EPA Waste Classification	Proposed Management Method
Construction		
Sediment fencing, geotextile materials	General solid waste (non-putrescible)	Reuse at other sites where possible or disposal to landfill
Concrete	General solid waste (non-putrescible)	Off-site recycling for filling, levelling or road base
Bricks and pavers	General solid waste (non-putrescible)	Cleaned for reuse as footings, broken bricks for internal walls, crushed for landscaping or driveway use, off-site recycling
Gyprock or plasterboard	General solid waste (non-putrescible)	Off-site recycling or returned to supplier
Sand or soil	General solid waste (non-putrescible)	Off-site recycling
Metals such as fittings, appliances and bulk electrical cabling, including copper and aluminium	General solid waste (non-putrescible)	Off-site recycling at metal recycling compounds and remainder to landfill
Conduits and pipes	General solid waste (non-putrescible)	Off-site recycling
Timber	General solid waste (non-putrescible)	Off-site recycling, Chip for landscaping, Sell for firewood <i>Treated</i> : reused for formwork, bridging, blocking, propping or second-hand supplier <i>Untreated</i> : reused for floorboards, fencing, furniture, mulched second hand supplier Remainder to landscape supplies.
Doors, Windows, Fittings	General solid waste (non-putrescible)	Off-site recycling at second hand building 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	Hazardous waste	Off-site disposal at a licenced landfill facility.
Fluorescent light fittings and bulbs	Hazardous waste	Off-site recycling or disposal; contact <i>FluoroCycle</i> for more information ³
Paint	Hazardous waste	Off-site recycling, Paintback collection ⁴ or disposal
Synthetic rubber or carpet underlay	General solid waste (non-putrescible)	Off-site recycling; reprocessed and used in safety devices and speed humps

³ Available online from <http://www.fluorocycle.org.au/> or <http://www.environment.gov.au/settlements/waste/lamp-mercury.html>

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

Waste Types	NSW EPA Waste Classification	Proposed Management Method
Ceramics including tiles	General solid waste (non-putrescible)	Off-site recycling at a crushing and recycling company
Carpet	General solid waste (non-putrescible)	Off-site recycling or disposal; reused for landscaping, insulation or equestrian uses
Plant Maintenance		
Empty oil and other drums or containers, such as fuel, chemicals, paints, spill clean ups	Hazardous waste: Containers were previously used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and residues have not been removed by washing or vacuuming. General solid waste (non-putrescible): Containers have been cleaned by washing or vacuuming.	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility
Air filters and rags	General solid waste (non-putrescible)	Off-site disposal
Oil filters	Hazardous waste	Off-site recycling
Batteries	Hazardous waste	Off-site recycling, contact the Australian Battery Recycling Initiative ⁵ for more information
Packaging		
Packaging materials, including wood, plastic, including stretch wrap or LLPE, cardboard and metals	General solid waste (non-putrescible)	Off-site recycling
Wooden or plastic crates and pallets	General solid waste (non-putrescible)	Reused for similar projects, returned to suppliers, or off-site recycling. Contact <i>Business Recycling</i> for more information ⁶
Work Compound and Associated Offices		
Food Waste	General solid (putrescible) waste	Dispose to landfill with general garbage
Recyclable beverage containers including glass and plastic bottles, aluminium cans and steel cans	General solid waste (non-putrescible)	Co-mingled recycling at off-site licensed facility or deliver to local NSW container deposit scheme 'Return and Earn' facility ⁷
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 and polystyrene	General solid waste (non-putrescible) mixed with putrescible waste	Disposal at landfill

⁵ <http://www.batteryrecycling.org.au/home>

⁶ Available online from <http://businessrecycling.com.au/search/>

⁷ Available online from <http://returnandearn.org.au/>

5.3 Construction Waste Types and Quantities

The construction site manager will need to specify the types and quantities of wastes produced during construction and on this basis, the numbers and capacity of skip bins can be determined.

In the absence of readily available construction waste generation rates from Council, SLR has adopted the waste generation rates from Appendix A of The Hills Development Control Plan (DCP) 2012 for estimating the type and quantities of waste generated from construction of the Project. The waste generation rates listed in the Hills DCP include '2 Bedroom', '3 Bedroom', 'Block of Flats', 'Factory' and 'Office'. SLR has adopted the 'Factory' and 'Office' rates to measure waste expected from the Project, as the construction of a factory and office is the most relevant in representing the construction of the industrial warehouse and office precinct.

In the absence of readily available published information for 'Carpark', construction waste generation rates, SLR has developed 'Carpark' construction rates based on the 'Office' rates by:

- Removing timber, bricks and gyprock as these materials are unlikely to be present in significant quantities in a modern carpark structure, and
- Increasing the rates for concrete, sand or soil, metal and 'other', in proportion, to maintain the total assumed tonnage per 1000 m² of construction.

The waste generation rates are shown in **Table 3**.

Table 3 Average waste generation rates for the construction of the project

Rate Type	Floor Area (m ²)	Waste types and quantities (m ³)						
		Timber	Concrete	Bricks	Gyprock	Sand or Soil	Metal	Other
Factory	1,000	0.25	2.10	1.65	0.45	4.80	0.60	0.50
Office	1,000	5.1	18.8	8.5	8.6	8.8	2.75	5
Carpark	1,000	--	30.6	--	--	14.3	4.5	8.1

These waste generation rates are used to estimate the waste generated from the construction of the Project. The anticipated construction waste quantities for are shown in **Section 5.3.1** below.

The waste generation rates for 'Factory' are applied to calculate the waste quantities from the construction of each level of the warehouses and the mezzanines. The 'Office' waste generation rates are applied to calculate the waste quantities from all office administration areas, the guard house and dock office 1. The 'Carpark' waste generation rates are applied to calculate the waste quantities from the construction of all external hard surface areas including carparks, light duty pavement and heavy-duty pavement. The areas are based on area information provided by ESR site plans.

Actual waste quantities and composition will vary; however, this estimate is provided so that the construction site manager can make provision for on-site or off-site re-use and recycling opportunities.

5.3.1 Construction waste quantities

The construction waste quantities anticipated are provided in **Table 4**. The areas are based on area information provided by ESR site plans in **Appendix A** with the exception of carpark areas which have been estimated from the site plans by SLR.

Table 4 Estimated types and quantities of construction waste from Project

Project area		Area (m ²)	Waste types and quantities (m ³)						
			Timber	Concrete	Brick	Gyprock	Sand and Soil	Metal	Other
Project site	Warehouse	34,744	10	75	60	20	170	25	20
	Office (2 levels)	1,024	10	20	10	10	10	5	10
	Warehouse Dock offices	201	5	5	5	5	5	5	5
	Guard House	19	5	5	5	5	5	5	5
	Light Duty Carpark	5,933	-	185	-	-	85	30	50
	Heavy Duty Driveway	22,704	-	695	-	-	325	105	185
Totals		64,625	30	985	80	40	600	175	275

Waste quantity estimates have been rounded up to the nearest 5 m³.

At the time of preparing this plan, architectural drawings with storage details for construction waste were not available. This is to be updated by the site manager once waste streams, estimated quantities, and final disposal locations and recycling services have been identified.

5.4 Waste Avoidance

In accordance with best practice waste management, the building contractor, building designer and/or equivalent roles should:

- Develop a purchasing policy based on the approximate volumes 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 Project 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 Project works with low embodied energy properties or materials that have been salvaged or recycled for the construction of the Project 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.

5.5 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 2** for an outline of the proposed reuse, recycling and disposal methods for potential construction waste streams generated by the Project.

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

- Ensure the site's project 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 Project's life.

- Determine opportunities for the use of prefabricated components and recycled materials.
- 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.

5.6 Waste Storage and Servicing

5.6.1 Waste Segregation and Storage

Waste materials produced from construction activities should be separated at the source and stored separately on-site. It is anticipated that the Project 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.

5.6.2 Waste Storage Area

Waste storage areas should be accessible and allow enough space for storage and servicing requirements. The storage areas should also be flexible in order to cater for change of use throughout the Project construction. 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.

In accordance with better practice waste management, areas designated for waste storage should:

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

5.6.3 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.

5.6.4 Contaminated or Hazardous Waste Management

During the construction phase, SLR recommends that a qualified and certified contractor is engaged to remove all contaminated or hazardous materials, for example, asbestos, and dispose of all contaminated or hazardous waste at an appropriately licenced facility.

All asbestos and other hazardous waste must be handled according to appropriate legislation and regulation including the Work Health and Safety Regulation 2011.

Hazardous waste management at the project site could require a licence from the EPA and approval from Council. If hazardous waste is identified for removal, Council and NSW EPA are to be consulted prior to undertaking any hazardous waste removal.

5.7 Site Inductions

All staff, including sub-contractors and labourers, employed during the construction phase of the Project 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.

5.8 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 online⁸ and should be used where applicable. A selection of signs prepared by NSW EPA is provided in **Figure 3**.



Figure 2 Examples of NSW EPA labels for waste skips and bins

5.9 Monitoring and Reporting

The following monitoring practices are to be undertaken to improve construction waste management and to obtain accurate waste generation figures:

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

As required by Council's DCP, all demolition and construction waste dockets must be kept which show which facility received the material for recycling or disposal. Audits may be conducted by Council to verify that dockets have been kept and waste recycled and disposed of as described within the WMP. Dockets will need to show the company's Australian Business Number. 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 NSW EPA approved waste materials signage <https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/business-government-recycling/standard-recycling-signs>

5.10 Roles and Responsibilities

All personnel have a responsibility for their own environmental performance and compliance with all legislation. It will be the responsibility of the 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 Project. Suggested roles and responsibilities are provided in **Table 5**.

Table 5 Suggested roles and responsibilities for construction waste management

Responsible Person	General Tasks
Construction Site Manager	Ensuring plant and equipment are well maintained.
	Ordering only the required amount 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 Project.
	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.

6 Operational Waste Management

6.1 Targets for Resource Recovery

The waste management performance of each new development should contribute to the overall NSW State targets for recycling outlined in the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*. The targets include increasing waste diverted from landfill to 75% and recycling 70% of commercial, industrial and municipal solid waste⁹. Each commercial and industrial development can contribute to this NSW State target through an effective waste management plan.

It is anticipated that the waste minimisation measures in the following sections will assist the Project to meet the state's targets. Waste reporting and audits can be used to determine the actual percentage of waste that are being, or have been, recycled during operation.

6.2 Waste Streams and Classifications

The operation of the Project is anticipated to generate the following broad waste streams:

- Domestic 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 and e-waste, and
- Stores, plant and general maintenance waste.

Potential ongoing waste types, their associated waste classifications, and management methods are provided in **Table 6**. For further information on how to determine a waste's classification, refer to the NSW EPA (2014) Waste Classification Guidelines. Suggestions for recycling drop off locations and contacts can be found on <https://businessrecycling.com.au/> for each waste type.

Table 6 Potential waste types, classifications and management methods for operational waste

Waste Types	NSW EPA 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

⁹ <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wastestrategy/140876-warr-strategy-14-21.pdf?la=en&hash=EC6685E6624995242B0538B18C2E80C0CA2E51B3>

Waste Types	NSW EPA Classification	Proposed Management Method
Food waste	General solid (putrescible) waste	Compost on or off-site or dispose to landfill with general garbage
Batteries	Hazardous waste	Off-site recycling, alternatively contact the Australian Battery Recycling Initiative for more information
Mobile Phones	Hazardous waste	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	Hazardous waste	Off-site recycling
Printer toners and ink cartridges	Hazardous waste	Off-site recycling, free disposal box or bags and pickup service exists for printer toners and ink cartridges
General garbage, including non-recyclable plastics	General solid (putrescible and non-putrescible) waste	Disposal at landfill
Maintenance		
Spent smoke detectors ¹⁰	General solid (non-putrescible) waste, or Hazardous waste (some commercial varieties)	Disposal to landfill, or off-site disposal at licensed facility
Glass, other than containers	General solid (non-putrescible) waste	Off-site recycling
Light bulbs and fluorescent tubes	Hazardous waste	Off-site recycling or disposal, contact FluoroCycle ¹¹ or Lamp Recyclers ¹² for more information
Cleaning chemicals, solvents, area wash downs, empty oil or paint drums, chemical containers	Hazardous waste if containers used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and residues have not been removed by washing or vacuuming. General solid (non-putrescible) waste if containers cleaned by washing or vacuuming.	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility.
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

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

¹¹ <https://www.fluorocycle.org.au/>

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

6.3 Estimated Quantities of Operational Waste

In the absence of waste generation rates from Liverpool City Council, SLR has adopted the waste generation rates for 'Offices' and 'Warehouse' from the Penrith City Council DCP 2014 section 3.3.4¹³ for estimating the type and quantities of waste generated for from the operational activities of the Project. The operational waste generation rates used are shown below in **Table 7**.

Table 7 Waste generation rates applied to the operations of the Project

Type of Premises	General Waste Generation (L/100 m ² /day)	Recycling Generation (L/100 m ² /day)
Warehouse	10	10
Offices	10	10

Using the waste generation rates in **Table 7** above, the approximate weekly waste quantities for the Project have been calculated and are presented in **Section 6.3.1**. The operational waste quantities were additionally calculated based on the below assumptions:

- GFAs as presented on the architectural drawings shown in **Appendix A**
- A week comprising seven days of operation, and

Based on the Project's activities, SLR estimates that large quantities of the recycling stream will include pallets and plastic and cardboard packaging waste. To minimise packaging waste generated in the recyclables stream, it is recommended that packing waste is returned to the suppliers where possible. Standard pallets are recommended to be returned to their owners and non-standard and broken pallets are to be stockpiled and collected as required by a private waste contractor.

If additional collection services are required, such as secured document destruction, these can be organised with a private waste contractor who can provide additional bins and take collected waste to an off-site licenced facility.

6.3.1 Estimated quantities of operational waste

The estimated quantities of operational waste generated by the Project are shown in **Table 8**. The naming conventions used in **Table 8** are as per the plans provided by the Client.

Based on communication with the Client, the anticipated operations of the Project are primarily anticipated to be packaging waste consisting of paper and recycling. Comingled recycling is anticipated to be minimal and primarily be generated from the office areas.

Table 8 Estimated quantities of operational general waste and recycling

Complex	Location	Area (m ²)	General Waste (L/week)	Comingled recycling (L/week)
Warehouse	Warehouse (including mezzanine)	39,444	27,615	27,615

¹³ <https://www.penrithcity.nsw.gov.au/building-development/planning-zoning/planning-controls/development-control-plans>

Complex	Location	Area (m ²)	General Waste (L/week)	Comingled recycling (L/week)
	Office (2 levels)	1,000	700	700
	Warehouse Dock offices	201	175	175
	Guard House	19	35	35
	Total	40,664	28,525	28,525

Waste quantity estimates have been rounded up to the nearest 5 L.

'Other Recycling': comingled recycling excluding paper and cardboard.

The Project is anticipated to produce minimal quantities of garden organics, less than 100 L per week. This waste will be taken by a landscaping contractor who will dispose of it at an off-site licenced facility.

6.4 Waste Storage Area Size

The waste storage area must be large enough to adequately store all quantities of operational waste and recycling between collections. In accordance with Council requirements, the storage area size must:

- Have sufficient housing for the agreed number of bins
- Have sufficient space for user access, bins, and manoeuvring of bins
- Ensure that storage and collection of waste and recyclables is easily and safely accessible for tenanted users, cleaners and collection contractors

In the absence of bin dimensions from Council, SLR has adopted the bin dimensions from the Penrith City Council DCP 2014 section 3, as outlined in **Table 9**.

Table 9 Dimensions and approximate footprint of bins

Dimension	Height (mm)	Depth (mm)	Width (mm)	Footprint (m ²)
3 m ³	1,540	1,520	2,060	3.13

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 150% of the total minimum bin GFA. 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 buildings in the Project. The waste storage area sizes are shown in **Section 6.4.1**.

The recommended storage area does not include consideration for the storage of bulky and hazardous waste. For the additional storage space for bulky and hazardous waste, refer to **Section 6.52**.

6.4.1 Waste storage area size

The estimated number of bins required for weekly storage of operational waste and recycling generated by the project are in **Table 11** and are based on:

- The estimated quantities of operational waste and recycling as shown in **Table 8**
- Bin dimensions from as shown in **Table 9**

- Garbage and recycling collection frequency as shown in **Table 10** below

Table 10 Collection frequency

Garbage	Comingled Recycling
4	4

The waste storage area calculations in **Table 11** are recommendations, based on preliminary master planning information, and should be updated for each building once detailed drawings are available.

Table 11 Recommended number of bins and storage area for weekly operations

Location	Bins Required		Total Number of Bins	Recommended Storage Area (m ²)
	General Waste	Comingled Recycling		
Warehouse	3 x 3 m ³	3 x 3 m ³	6	25

In accordance with waste management best practice, the architectural drawings, attached in **Appendix A**, show a waste area size in line with the recommendations provided by this report.

The collection vehicles required for 3 m³ front lift bins require 6.2 m height clearance to empty the bins. Therefore, front-lift bins are commonly used in outdoor areas with no restrictions on overhead clearance. For this reason, SLR recommends that the waste storage areas be in an outdoor area with no restrictions on overhead clearance.

6.5 Bulky and Hazardous Waste Management

Sufficient space will be provided in the Project for the storage of large and/or bulky items and hazardous wastes that cannot be disposed of in the general waste or recyclable streams. This would include broken pallets, furniture, shelving, monitors, batteries and fluorescent tubes.

Building management may consider organising a separate casual collection service for as required, to remove bulky waste items, or engaging a contractor to collect and transport these items for reuse, recycling or disposal.

6.6 Waste Storage Room Location

In accordance with better practice waste management and recommendations from Council's DCP, the waste storage area should be located so that:

- Collection is on a level area less than 5% (1V:20H) gradient, and away from ramps and steps
- Collection servicing vehicles can efficiently and effectively service the development without reversing
- There is compatibility with collection servicing vehicle dimensions, such as height, width and turning radius
- A distance between bin collection and storage is less than 15 metres
- It is away from principal street frontages
- It is screened from view

- It does not cause any negative impacts, in terms of visual appearance, noise or smell, to adjoining properties, or to the street
- It avoids pedestrian or vehicular traffic hazards likely to be caused by waste collection and storage,

SLR recommends the architectural plans for this Project are updated to show the waste storage area recommended in **Section 6.4**. Following the revision of the architectural plans, SLR recommends that this WMP is updated.

6.7 Waste Storage Area Features

In accordance with best practice waste management and Council's DCP, the Project's waste storage area should have the following features:

- Have a distance between bin collection and storage of less than 15 metres
- Be located to minimise noise impacts during use and collection, away from principal street frontages and screened from view. Any waste management equipment must not be visible from the street.
- Be well ventilated
- Be constructed using materials compatible with the proposed and adjoining development(s)
- Have adequate lighting for safe use after dark
- Have a hose cock and a sewer drainage point in or adjacent to the storage area. The hose cock should not impede or protrude into bin storage space
- Fine grade drain cover sufficient to prevent coarse pollutants from entering the sewer
- Signage should:
 - Be in English and all other applicable languages
 - Include illustrative graphics for at least half of the sign
 - Be posted in all waste management areas
 - Clearly identify the purpose and content of all bins, specifically what can be recycled
 - Signal for the area to be maintained, tidy and clean
 - Display a telephone number to arrange for bulky waste disposal.
- Be designed so that the floors and walls can be washed on a regular basis
- Adequate vermin prevention measures
- Reduce potential noise and odour impacts

6.8 Waste Servicing

The following general waste servicing access requirements should be implemented:

- Waste will be removed regularly.
- Arrangements should be in place so that the waste and recycling storage rooms are not accessible to the general public.

In accordance with best practice waste management, the following is recommended for the access provisions for of waste collection vehicles:

- Collection vehicles should be able to enter and exit the collection area in a forward direction
- Drawings should show the site's entry point, vehicle's route of travel and manoeuvring
- Swept path models should illustrate how a standard waste collection vehicle will enter, service and exit the site
- Unobstructed access, adequate driveways and ramps of sufficient strength to support waste collection

Hazardous waste produced at the site will be collected by appropriately licensed specialised services.

Once a private waste contractor is engaged, a valid waste and recycling collection contract is recommended to demonstrate disposal at a waste facility lawfully able to accept it. Written evidence of the valid contract should be kept on-site.

6.9 Waste Avoidance, Reuse and Recycling Measures

6.9.1 Waste Avoidance

Waste avoidance measures include:

- Participating in take-back services to suppliers to reduce waste further along the supply chain
- Avoiding printing where possible
- Review of packaging design to reduce waste but maintain 'fit for purpose'
- Providing ceramic cups, mugs, crockery and cutlery rather than disposable items
- Purchasing consumables in bulk to avoid unnecessary packaging
- Presenting all waste reduction initiatives to staff as part of their induction program, and
- Investigating leased office equipment and machinery rather than purchase and disposal.

6.9.2 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.

6.9.3 Recycling

Recycling opportunities include:

- Collecting and recycling e-wastes
- Flatten or bale cardboard to reduce number of bins required
- Paper recycling trays provided in office areas for scrap paper collection and recycling
- Collecting printer toners and ink cartridges in allocated bins for appropriate contractor recycling, and
- Development of 'buy recycled' purchasing policy.

6.10 Communication Strategies

Waste management initiatives and management measures should be clearly communicated to building managers, owners, employees, customers and cleaners. 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
- Increased recovery of recyclables and organics material, if implemented, and
- Greater contribution to targets for waste reduction and resource recovery, the environment and heritage conservation.

To realise the above benefits, the following communication strategies should be considered:

- Use consistent signage and colour coding throughout the Project
- Ensure all staff are trained in correct waste separation and management procedures
- Provide directional signage to show location of and routes to waste storage area
- General waste and co-mingled recycling bins should be clearly labelled and colour-coded to ensure no cross contamination, where applicable
- Employees and cleaners should adhere to the WMP for compliance, in consultation with management, and
- Repair signs and labels promptly to avoid breakdown of communications.

6.11 Signage

In accordance with best practice waste management, the waste storage and collection areas should be provided with appropriate signage. These signs should clearly identify waste management procedures and provisions to contractors, tenants and visitors should be distributed around the Project.

Signs which clearly identify waste management procedures and provisions to staff and visitors should be distributed around the Project. Key signage considerations are:

- 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 4**
- Signposts and directions to location of waste storage area
- Clear signage in all waste storage areas to instruct users how to correctly separate waste and recycling
- Maintaining a consistent style colour scheme and system for signs throughout the Project, and
- Emergency contact information for reporting issues associated with waste or recycling management.

Colour-coded and labelled bin lids are necessary for identifying bins. All signage should conform to the relevant Australian Standard and use labels approved by the NSW EPA¹⁴. The design and use of safety signs for waste rooms and enclosures should comply with Australian Standard AS 1319 Safety Signs for the Occupational Environment and clearly describes the types of materials designated for each bin.



Figure 3 Example of bin labels for operational waste

6.12 Monitoring and Reporting

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

Visual assessments of bins and bin storage areas should be conducted by the building manager, at minimum:

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

In addition, audits are to be conducted on a half-yearly basis to ensure WMP provisions are maintained.

Quantities of waste and recycling associated with disposal of waste and recycling, including dockets, receipts and other physical records should be recorded by the Building Manager. This is to allow reviews of the waste management arrangements and provisions at the site over time. Records of waste disposal should also be available to regulatory authorities such as the NSW Environmental Protection Authority and SafeWork NSW, upon request.

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

¹⁴ NSW EPA waste signage and label designs <http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm>

6.13 Roles and Responsibilities

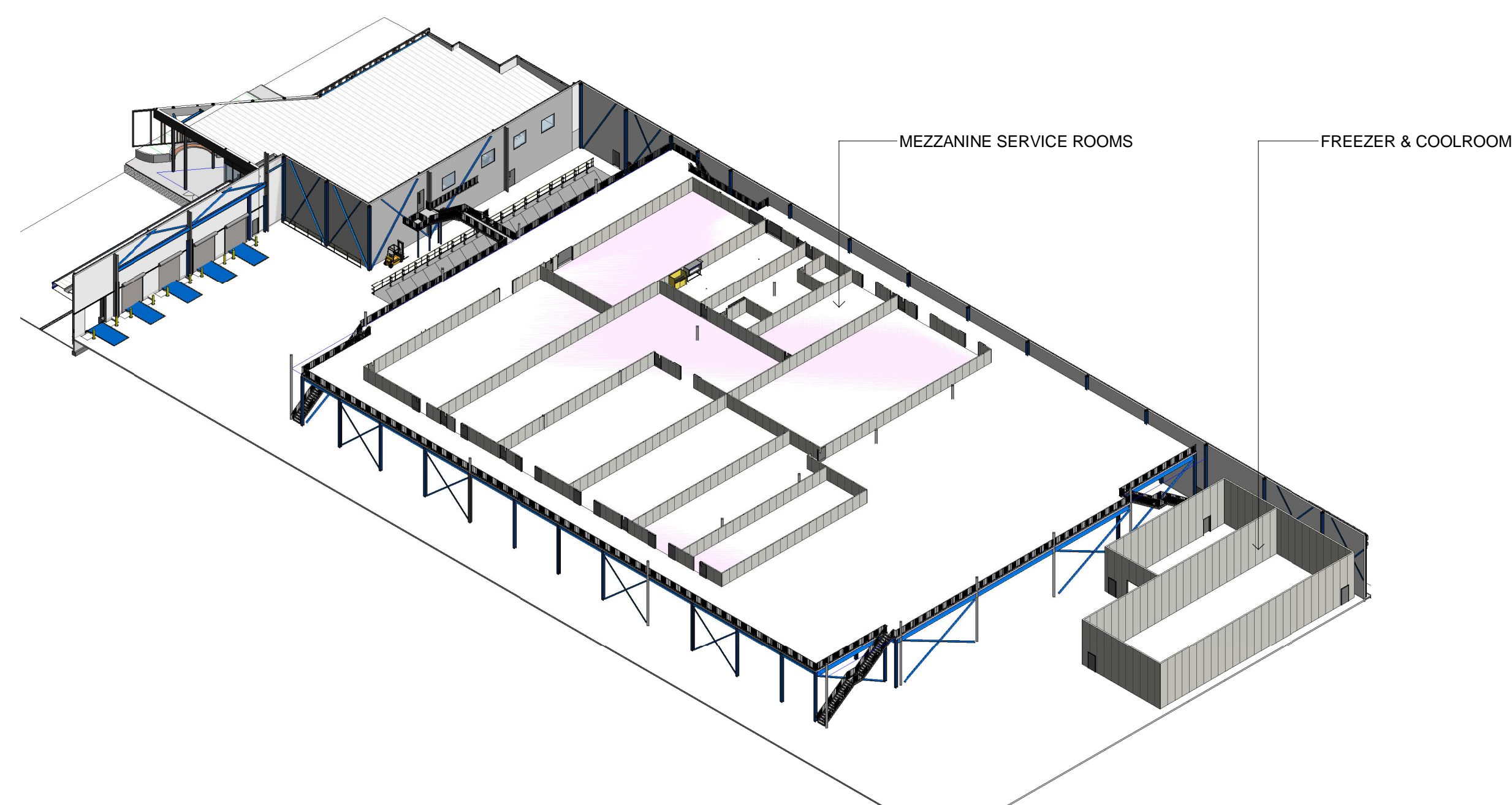
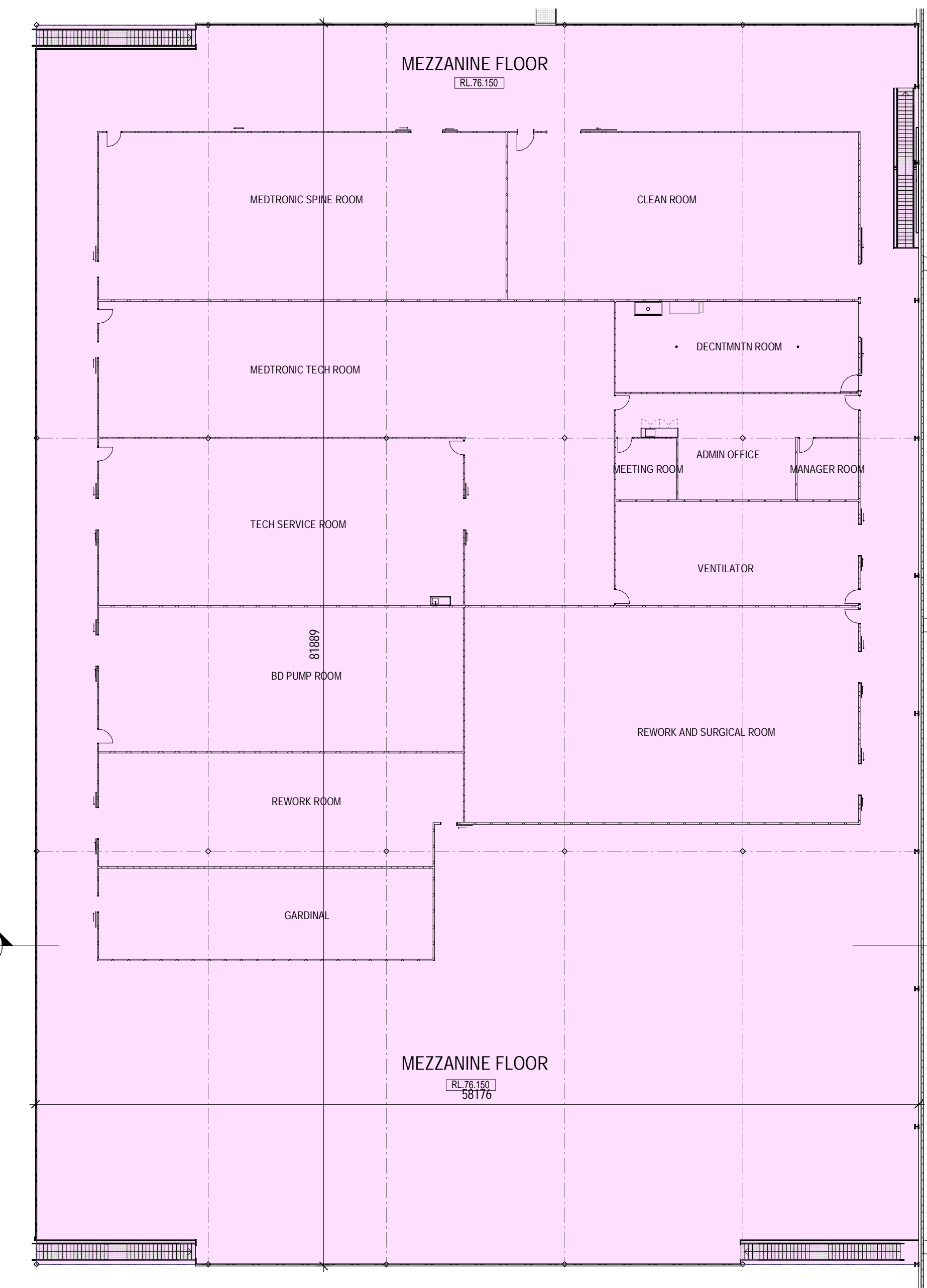
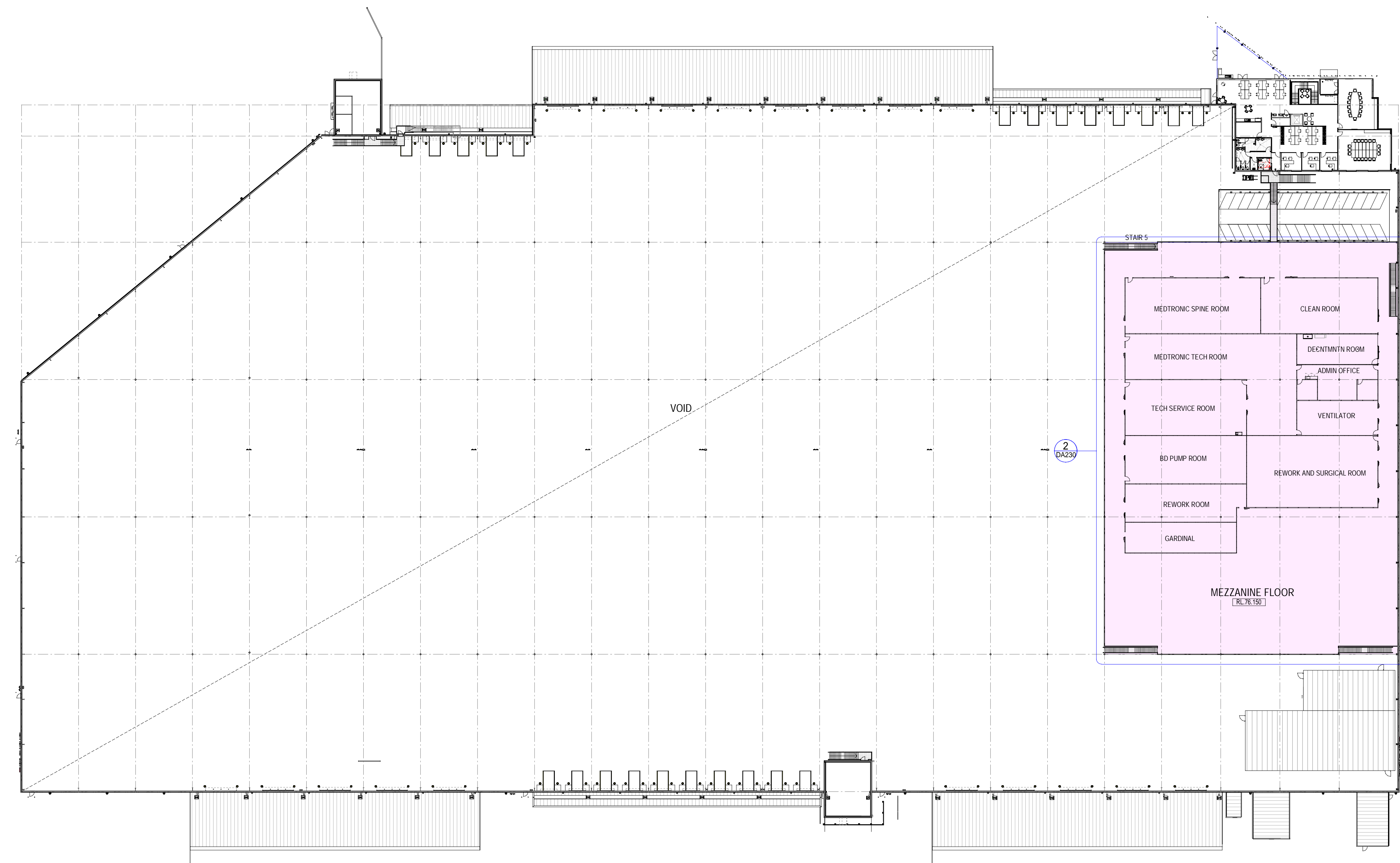
It is the responsibility of the Building Manager, or equivalent role, to implement this WMP and a responsibility of all warehouse tenants and staff to follow the waste management procedures set out by the WMP. SLR recommends that all subcontractors enlisted by the Client are to have roles and responsibilities identified and the Project's waste management system clearly explained. A summary of recommended roles and responsibilities are provided in **Table 12**.

Table 12 Operational waste management responsibility allocation

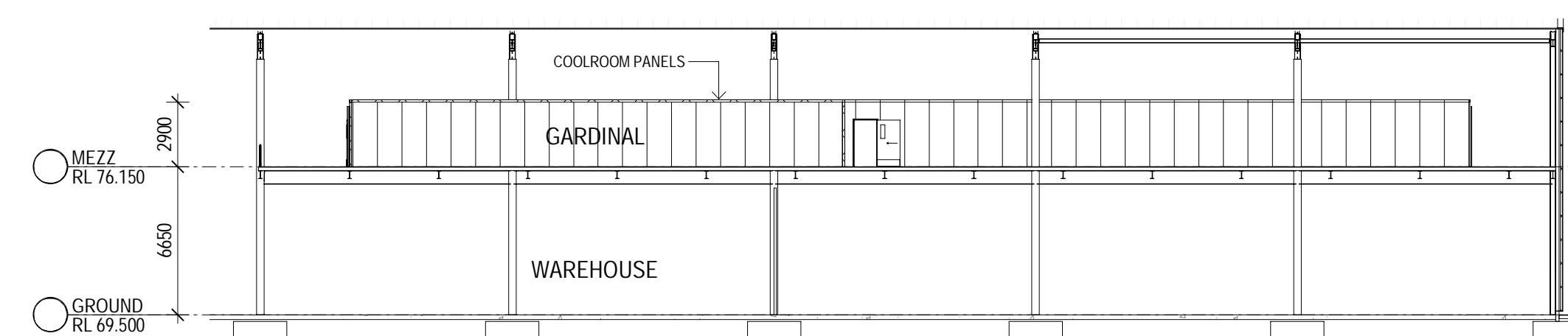
Responsible Person	General Tasks
Management	Ensure the WMP is implemented throughout the life of the operation.
	Update the WMP regularly, for example each year, to ensure the Plan remains applicable.
	Undertake liaison and management of contracted waste collections.
	Organise internal waste audits on a regular basis.
	Manage any complaints and non-compliances reported through waste audits etc.
	Perform inspections of all waste storage areas and waste management equipment on a regular basis.
	Organise cleaning and maintenance requirements for waste management equipment.
	Monitor bins to ensure no overfilling occurs.
	Ensure effective signage, communication and education is provided to alert visitors, employees 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.
	Ensure waste and recycling storage rooms are kept tidy.
	Ensure that regular cleaning and daily transfer of bins is being undertaken by the cleaners
	Ultimately responsible for the management of all waste management equipment, cleaning requirements, waste transfer and collection arrangements.
Cleaners and Staff	Removal of general waste, recyclables, cardboard waste and hazardous waste from floor areas for transfer to centralised waste and recycling collection rooms daily or as required.
	Cleaning of all bins and waste and recycling rooms weekly or as required.
	Compliance with the provisions of this WMP.
Gardening Contractor, as applicable	Removal of all garden organics waste generated during gardening maintenance activities for recycling at an off-site location or reuse as organic mulch on landscaped areas.

APPENDIX A

Site plans



2 MEZZANINE FLOOR PLAN 1 : 250



3 MEZZ SECTION 1 : 250

1 MEZZANINE. 1 : 500

4 AXONOMETRIC - MEZZANINE.

INDUSTRIAL DEVELOPMENT

LOT 4, BRINGELLY ROAD, LEPPINGTON, SYDNEY



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TITLE				
MEZZ FLOOR PLAN & SECTION				
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03/02/2021	As indicated @ A1	20245	DA230	A

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