WASTE MANAGEMENT PLAN

Telopea Stage 1A

Prepared for:

Frasers Property Australia Pty Ltd
PO Box 3307
Rhodes NSW 2138

SLR Ref: 610.19382-R01
Version No: -v3.0
July 2021

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 Frasers Property Australia Pty Ltd (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.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.19382-R01-v3.0	9 July 2021	Emerson Helmi Patch	Andrew Quinn	Andrew Quinn
610.19382-R01-v2.0	4 August 2020	Emerson Helmi Patch	Celine El-Khouri	Andrew Quinn
610.19382-R01-v1.0	9 July 2020	Emerson Helmi Patch	Celine El-Khouri	Andrew Quinn

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1 Introduction

1.1 Overview

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Fraser properties Pty Ltd (the Client) to prepare a Waste Management Plan (WMP) in support of a Development Application (DA) for Telopea Stage 1A, Telopea.

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

1.2 Objectives

The principal objective of this WMP is to identify all potential waste likely to be generated at the Project site during the demolition, 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 Paramatta City Council (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 waste 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 Green Star

The operational section of this WMP (refer to **Section 6**) complies with Green Star sections 8A *Performance Pathway Specialist Plan*, and 8B of the *Prescriptive Pathways: Facilities* by complying with the following criteria:

- 8B.1 Separation of Waste Streams
  - Bins or containers have been provided for building occupant use that allow for separation of the applicable waste streams
- 8B.2 Dedicated Waste Storage Area
  - A dedicated, sufficiently sized storage area for the separation and collection of various waste streams is provided
- 8B.3 Access to Waste Storage Area
  - Access to waste storage follows best practice guidelines for collection as stipulated in the credit

1.4 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 Client is developing the site at Telopea in the City of Parramatta Council area. The development will consist of 442 residential apartments in two buildings connected by a shared basement and carpark. The buildings will be part of a wider Telopea estate which will accommodate approximately 4,500 dwellings and house approximately 50,000 people as well as a substantial town centre retail area adjacent to the upgraded northern rail link.

2.2 Overview of Proposed Construction Work

Project works are expected to include site preparation, demolition and construction activities.

The anticipated construction works for this development include the construction of the below:

- One 8-level apartment building and one 13-level apartment building
- Two basement levels of joined carparking

2.3 Overview of Proposed Operations

Based on communication with the Client, SLR understands that the Project will consist of 442 apartments with no commercial or retail space attached. The site will additionally provide two levels of basement parking for residents of the building.

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 **Figure 1** which summarises the objectives of the *Waste Avoidance and Resource Recovery Act 2001.*

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

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

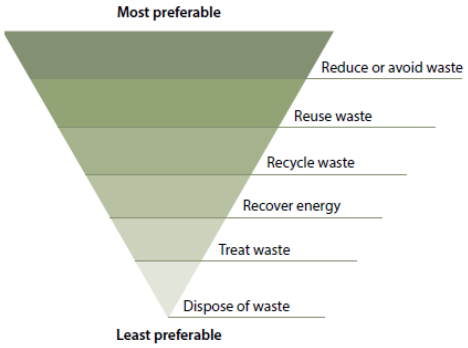


Figure 1 Waste management hierarchy

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

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	
Parramatta Development Control Plan 2011	The Parramatta Development Control Plan 2011 (DCP) applies to all development proposals in the Paramatta City Council area. The DCP supports provision of the LEP planning controls by providing detailed planning and design guidelines. The DCP has been prepared in accordance with the Section 74C of the *Environmental Planning and Assessment Act 1979* and the Environmental Planning and Assessment Regulation 2000. The DCP includes an appendix on Waste. Waste Management Guidelines for new Development Applications which was updated in 2016.
Parramatta Local Environmental Plan 2011	The Parramatta Local Environmental Plan 2011 provides the legal framework of the DCP, including land use and development permitted in a set zone. The LEP also contains provisions to conserve local heritage and protect sensitive land.
State and National legislation and guidelines	
Building Code of Australia (BCA) and relevant Australian Standards	The BCA has the aim of achieving nationally consistent, minimum necessary standards of relevant health and safety, amenity and sustainability objectives efficiently.
Council of Australian Governments National Construction Code 2019	The National Construction Code 2019 sets the minimum requirements for the design, construction and performance of buildings throughout Australia.
NSW EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012	These better practice guidelines present information on waste minimisation and resource recovery as well as information on commonly used waste management provisions. The guidelines also provide benchmarks for assessing waste production rates in Australia.
NSW Waste and Sustainable Materials Strategy 2041	Replacing the *NSW Waste Avoidance and Resource Recovery Strategy (2014-21)* (see below) identifies a focus on the transition of NSW to a circular economy. The focus of the strategy is on minimising what is thrown away, and to use and reuse resources more efficiently, making them as productive as possible. The strategy identifies the need to identify infrastructure needs, the mandating of separation of some organic waste streams, and incentivising biogas generation from waste materials.
NSW EPA (2014) NSW Waste Avoidance and Resource Recovery Strategy 2014-21	The *NSW Waste Avoidance and Resource Recovery Strategy 2014-21* 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 waste better, reduce litter and reduce illegal dumping.
NSW EPA Resource Recovery Orders and Resource Recovery Exemptions	The NSW EPA has issued a number of resource recovery orders and resource recovery exemptions under the POEO (Waste) Regulation 2014 for a range of waste that may be recovered for beneficial re-use. These waste typically include those from demolition and construction works, as well as operational waste such as food waste. • Resource recovery orders present conditions which generators and processors of waste must meet to supply the waste material for beneficial re-use. • Resource recovery exemptions contain the conditions which consumers must meet to use waste for beneficial re-use.

Legislation and Guidance	Objectives
NSW EPA's Waste Classification Guidelines 2014	The NSW EPA *Waste Classification Guidelines* assists waste generators to effectively manage, treat and dispose of waste to ensure the environmental and human health risks associated with waste are managed appropriately and in accordance with the *POEO Act 1997* and is associated regulations.
Protection of the Environment Operations Act (POEO) 1997 and Amendment Act 2011	The *POEO Act 1997* and *POEO Amendment Act 2011* are administered by the NSW Environment Protection Authority (NSW EPA) to enable the NSW Government to establish instruments for setting environmental standards, goals, protocols and guidelines. They outline the regulatory requirements for lawful disposal of waste generated during the demolition, construction and operational phases of a development, as well as the system for licencing waste transport and disposal.
The Work Health and Safety Regulation 2011	The Work Health and Safety Regulation 2011 provide detailed actions and guidance associated with the topics discussed in *The Work Health and Safety Act 2011*. The primary aim of the regulation is to protect the health and safety of workers and ensure that risks are minimised in work environments. Workplaces are to ensure that they are compliant with the requirements specified in the regulations. The regulations discuss items such as actions that are prohibited or obligated in work environments, the requirements for obtaining licences and registrations, and the roles and responsibilities of staff in workplaces.
Waste Avoidance and Resource Recovery Act 2001	The *Waste Avoidance and Resource Recovery Act 2001* aims to promote waste avoidance and resource recovery and repeals the *Waste Minimisation and Management Act 1995*. Specific objectives of the *Waste Avoidance and Resource Recovery Act 2001* include: • encouraging efficient use of resources • minimising the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste • ensuring industry and the community share responsibility in reducing/dealing with waste, and • efficiently funding of waste/resource management planning, programs and service delivery. As of 2016, the addition to the Act of Part 5 defines the legislative framework for the "Return and Earn Container Deposit Scheme" whereby selected beverage containers can be returned to State Government authorities for a monetary refund.

5 Demolition, Site Preparation and Construction Waste and Recycling Management

5.1 Targets for Resource Recovery

Targets for new development are expected to contribute to state specific targets. The NSW Waste and Sustainable Materials Strategy 2041 (DPIE, 2021[1]) sets a target of 80% average recovery rate from all waste streams by 2030.

Analysis by DPIE (2021) indicates that construction and demolition waste recovery rates in 2019-2020 were 77%.

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

5.2 Waste Streams and Classifications

The site preparation and construction of the Project is likely to generate the following broad waste streams:

- Site clearance waste,
- Construction waste,
- Packaging waste, and
- Work compound waste from on-site employees.

A summary of likely waste types generated from site preparation and 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*[2]. Further information on managing site preparation and construction waste is available from the NSW EPA[3] and the DCP.

[1] NSW Government, Department of Planning, Industry and Environment (DPIE), 2021. NSW Waste and Sustainable Materials Strategy 2041. Stage 1: 2021-2027 (https://www.dpie.nsw.gov.au/__data/assets/pdf_file/0006/385683/NSW-Waste-and-Sustainable-Materials-Strategy-2041.pdf)

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

[3] 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
Site Clearance		
Green waste including timber, pine and particle board	General solid waste (non-putrescible)	Separated, some chipped and stored on-site for landscaping, remainder to landscape supplies or off-site recycling. Stumps and large trees to landfill.
Clean fill	General solid waste (non-putrescible)	On-site re-use
Contaminated fill	To be classified subject to the results of testing	Off-site treatment or disposal to landfill
Excavated natural material (ENM) or virgin excavated natural material (VENM)	General solid waste (non-putrescible)	On-site re-use of topsoil for landscaping of the site, off-site beneficial re-use or send to landfill site.
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 *Treated*: reused for formwork, bridging, blocking, propping or second-hand supplier *Untreated*: 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

Waste Types	NSW EPA Waste Classification	Proposed Management Method
Asbestos	Hazardous waste	Off-site disposal at a licenced landfill facility.
Fluorescent light fittings and bulbs	Hazardous waste	Off-site recycling or disposal; contact *FluoroCycle* for more information
Paint	Hazardous waste	Off-site recycling, Paintback collection or disposal
Synthetic Rubber or carpet underlay	General solid waste (non-putrescible)	Off-site recycling; reprocessed and used in safety devices and speed humps
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 Note: Discharge to sewer subject to Trade Waste Agreement with local Council
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 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 *Business Recycling* for more information
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[4]

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

Waste Types	NSW EPA Waste Classification	Proposed Management Method
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

5.3 Site Preparation and Demolition Waste Types and Quantities

The project will be constructed on land currently occupied by residential buildings at the site. The generated waste is anticipated to be primarily green waste from grubbing and natural soils, excavation spoil, timber from trees and residential building waste from the demolition of the existing three-storey walk-up residential buildings which comprise a total of 63 dwellings.

In order to calculate the waste generated from the removal of the existing structures, SLR has used the 'Blocks of flats' demolition waste generation rates from Appendix A of The Hills Development Control Plan 2012 for estimating the type and quantities of waste generated from the demolition activities. The waste generation rates used for this Project are provided in **Table 3**.

Table 3 Waste generation rates applied to the Project's demolition activities

Rate Type	Floor Area (m^2)	Waste types and quantities (m^3)					
		Concrete	Brick	Timber or Gyprock	Metal	Roof Tiles	Other
Block of Flats	1,000	813	655	22	9	33	26

The waste generation rates in **Table 3** are used to estimate the quantities of demolition waste shown in **Table 4**. In the absence of details on the specific GFAs of the buildings to be demolished, the estimated quantities of demolition waste (shown in **Table 4**) are based on:

- Site area estimations obtained from architectural drawings attached in **Appendix A**,
- Existing dwelling numbers obtained from client information
- Site area estimates obtained from NSW Government Spatial Services SIX Maps (https://maps.six.nsw.gov.au/),

Table 4 Estimated quantities of demolition waste

Location	Area (m^2)	Timber	Concrete	Bricks	Gyprock	Metal	Roof Tiles	Other
Existing residential building area	1,950	45	1590	1280	45	20	65	55

Should the Development's excavation work encounter asbestos-contaminated materials, other contaminated materials or unexpected finds, the contractor should refer to its relevant site management plan. All excavated spoil should be classified by an appropriately experienced environmental consultant and separated into contaminated materials, if any, uncontaminated fill, ENM or VENM.

In accordance with Council's Guidelines records of the waste volumes recycled, reused or removed off-site are to be maintained. Details of how this waste will be re-used, recycled or disposed of and the name and contact details for each receiving waste facility are required. Dockets or receipts verifying recycling and/or disposal in accordance with the WMP must be kept and presented to Council when required. Records of the waste volumes disposed off-site to landfill must show that all waste going to landfill is not hazardous.

Where possible, all disassembled materials should be sold for reuse. Where not possible, parts will be sent for recycling and reused off-site. Delivery of items to an appropriately licenced landfill is to be considered as a last resort. For reuse and recycling recommendations for demolition materials, refer to **Table 1**.

Should further information on types and quantities of demolition waste be required, SLR recommends that a demolition quantities survey is undertaken by a qualified professional.

5.4 Construction Waste Types and Quantities

The Construction Site Manager will need to specify the types and quantities of waste produced during construction and on this basis, the numbers and capacity of skip bins can be determined.

To calculate construction waste generation rates, SLR has used the 'Blocks of flats' construction waste generation rates from Appendix A of The Hills Development Control Plan 2012. The rates are listed in Appendix A of The Hills development Control Plan 2012 and are shown in **Table 5**.

Table 5 Construction waste generation rates

Rate Type	Floor Area (m^2)	Waste types and quantities (tonnes)						
		Timber	Concrete	Bricks	Gyprock	Sand or Soil	Metal	Other
Block of Flats	1,000	0.7	6.7	3.2	1.3	28.7	1.3	0.6

Based on the area schedule provided by the client for the development, these waste generation rates were used to estimate the waste generated from the construction of the development. These estimates are provided in **Table 6**.

Table 6 Anticipated types and estimated quantities of construction waste

Development Component	Area (m^2)	Waste types and quantities (tonnes)						
		Timber	Concrete	Bricks	Gyprock	Sand or Soil	Metal	Other
Building 9.1	39,511	30	265	130	55	1135	55	25
Building 9.2	22,998	20	155	75	30	665	30	15
Total	**62,509**	**50**	**420**	**205**	**85**	**1800**	**85**	**40**

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.

5.5 Waste Avoidance

In accordance with Council's DCP and better 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.
- Use leased equipment rather than purchase and disposal.
- 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.

5.6 Reuse, Recycling and Disposal

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

In accordance with Council's DCP and best practice waste management, the following specific procedures should be implemented:

- Maximise reuse and recycling of building and construction materials and minimise disposal of materials to landfill.
- Ensure Waste is minimised by the reuse and recycling of excavated and building materials on-site or in the design and construction of the building or other buildings.

- Identify and nominate opportunities to reuse materials from the demolition and excavation phase for the proposed new use as well as potential waste materials, such as recyclable packaging, off-cuts and other excess materials as part of the construction process.
- Reuse timber formwork or waste corrugated iron as formwork and examine the useability of other materials for productive purposes.
- Maximise reuse and recycling of materials from demolition and construction which can be assisted by deconstruction, where the various building components are carefully dismantled and sorted.
- Source separation of offcuts to facilitate reuse, resale or efficient recycling.
- Temporary stockpiling of surplus materials for use in later stages.
- Building waste materials shall be reused, recycled or disposed to approved landfill sites.
- Store waste 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.
- Retain used crates for storage purposes unless damaged.
- Recycle cardboard, glass and metal waste.
- 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.
- 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.

5.7 Waste Storage and Servicing

5.7.1 Waste Segregation and Storage

As outlined in the DCP and better practice waste management, waste materials from site preparation, demolition and construction activities are to be separated at the source and stored separately on-site. Council requires plans of the:

- Location of areas where waste will be sorted for disposal or recycling
- Location of areas where waste and soil stockpiles will be stored on site
- Access path for vehicles removing waste from the site.

It is anticipated that the Project will provide bins and areas on-site for the sorting, recycling and disposal of building waste materials and indicated on the site plans or drawings. Enough space should be for separate storage, for example, separate skip bins or appropriately managed stockpiles, of the following waste types:

- Landfill waste
  - Non-recyclable general waste.
- recyclable waste;
  - Bricks, concrete and scrap metal

    - Metal and steel, in a condition suitable for recycling at metal recycling facilities
    - Timber
    - Glass
    - Hardstand rubble
    - Paper and cardboard
    - General co-mingled recycling waste and
- reusable materials and
- Excavation materials.
    - Uncontaminated excavation spoil, if present
    - Contaminated excavation spoil, if present
- Hazardous waste, if present.

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.

5.7.2 Waste Storage Areas

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

Where a skip is required and on-site constraints do not enable it to be located on the property, a separate application for a road occupancy license is required.

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

- Allow for appropriate vehicular access to enable the removal of waste materials for reuse, recycling and/or disposal.
- Ensure construction materials are to be stored separately from waste and recycling materials to enable easy access for waste collectors.
- Allow unimpeded access by site personnel and waste disposal contractors
- Consider environmental factors which could potentially cause an impact to the waste storage, such as slope, drainage and the location of watercourses and native vegetation
- Not present hazards to human health or the environment.

In accordance with the DCP stockpiles of topsoil, sand, aggregate, soil or other material are not to be located on any drainage line or easement, natural watercourse, footpath or roadway and shall be protected with adequate sediment controls.

5.7.3 Waste Servicing and Record Keeping

Documentation, such as receipts or weighbridge dockets, for the transport and disposal of waste and recycling materials from the site must be retained.

The Site Manager or equivalent role is to:

- Keep records of waste disposal, waste or tipping receipts or dockets, 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 demolition occurs in accordance with the relevant Australian Standards.
- Arrange for suitable waste collection contractors to remove any construction waste from site
- Provide designated areas on the site sufficient colour coded or labelled storage bins, containers or stockpiles for separated and any left-over waste from the construction process in locations with convenient vehicular access for removal by the waste contractor.
- Ensure waste bins are not filled beyond recommended filling levels
- Ensure that all bins and loads of waste materials leaving site are covered
- 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 skips and bins will leave the site and be deposited in the approved site lawfully able to accept them.

5.7.4 Contaminated or Hazardous Waste Management

During the site preparation and construction phases, 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 2017.

In accordance with Council's DCP, hazardous waste management at the site may 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.

5.8 Site Inductions

All staff, including sub-contractors and labourers, employed during the site preparation and construction phases 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 waste
- 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.

5.9 Signage

In Accordance with the Council DCP and better practice waste management, standard signage is to be posted in all waste storage and collection areas. All waste containers should be labelled correctly and clearly to identify stored materials.

Signs approved by the NSW EPA for labelling of waste materials are available online[5] and should be used where applicable. A selection of signs prepared by NSW EPA is provided in **Figure 2.**

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

5.10 Monitoring and Reporting

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

- Conduct waste audits of current projects where feasible.
- Note waste generated and disposal methods.
- Look at past waste disposal receipts.

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

- Record this information to track waste avoidance, reuse and recycling performance and to help in waste estimations for future waste management plans.

As per Council's DCP, records of waste volumes recycled, reused or contractor removed are to be maintained. This can include dockets or receipts verifying recycling and disposal in accordance with this WMP. This evidence should also be presented to regulatory bodies when required.

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

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

5.11 Roles and Responsibilities

All personnel have a responsibility for their own environmental performance and compliance with all legislation. It will be the responsibility of the Building Contractor to implement the WMP, and an employee and subcontractor responsibility to ensure that they always comply with the WMP.

Where possible, an Environmental Management Representative should be appointed for the Project. Suggested roles and responsibilities are provided in **Table 7**.

Table 7 Suggested roles and responsibilities for site preparation and 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 waste.
	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

Targets for new development are expected to contribute to state specific targets. The NSW Waste and Sustainable Materials Strategy 2041 (DPIE, 2021) sets a target of 80% average recovery rate from all waste streams by 2030.

Analysis by DPIE (2021) indicates that commercial and industrial waste recovery rates in 2019-2020 were 53%.

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 Parramatta Council requirements

Requirements for waste management in new developments in the Council area are covered in Council's Waste Management Guidelines for New Development Applications 2016, which are based on Parramatta Council's DCP 2011, and current best practice waste management.

The DCP requires that a WMP be prepared for this development. The objectives of this plan are:

- To ensure facilities are provided for efficient solid waste management.
- To encourage waste minimisation, source separation, reuse and recycling, and ensure efficient storage, access, collection of waste and quality design of facilities.
- To achieve the design of waste and recycling storage and collection systems in buildings and land use activities which are: hygienic; accessible; safe to operate; quiet to operate; of an adequate size; and visually compatible with their surroundings.
- To ensure that adequate and appropriate storage areas for recyclables and waste are designed to meet the objectives of ecologically sustainable development.

Other key specifications that are relevant to this development are detailed below.

6.2.1 Residential

- Each unit must be provided with an indoor waste and recycling cupboard that is large enough to accommodate a single day's waste and provides for the separation of garbage and recycling.
- The bin carting route must allow bins to be wheeled directly to the collection point over solid, flat or ramped surfaces with a maximum grade of 7% or 3% for bulk garbage bins 360 L or greater; not over steps, landscape edging or gutters; to be free of obstructions; and a minimum 2 m wide
- Communal garbage and recycling room shall be provided near the collection point with the capacity for storing all garbage and recycling likely to be generated in the building between collections.

6.2.2 Garbage chute

- Council does not permit chutes for recyclables. Waste disposal points are to be provided on each residential level of the development in an accessible and readily identifiable location. The chutes must terminate in a garbage chute room and discharge directly into a bin that prevents spillage and overflow. The garbage chute room must be located directly under where the chute terminates. The chute is to be designed to minimise noise and fire risks by being cylindrical in section and having a diameter of at least 500 mm. The chute is to be completely enclosed in a fire-rated shaft and constructed in accordance with the Building Code of Australia.
- A site caretaker or manager will be required to transfer the garbage bins from the chute service rooms and recyclables bins from each level to the communal waste bin storage area ready for collection.

6.2.3 Vehicular access to collection point

Vehicular access to bin collection areas must be considered in terms of road gradients, horizontal alignments, vertical curves, cross-falls, verges, pavement widths, turning areas, clearance heights, manoeuvring clearance and road strength (load bearing). The collection point must:

- Be designed to allow collection vehicles to enter and exit the site in a forward direction and to adequately manoeuvre once on- site
- Be of sufficient strength and quality to support a standard waste collection vehicle
- Have a minimum basement height of 4.5 m for Heavy Rigid Vehicles access into residential developments of 6 storeys or greater
- Have grades of entry and exit ramps and manoeuvrability, including turning circles, that do not exceed the capabilities of the waste collection vehicles.

6.2.4 Storage waste Areas

The communal waste storage rooms must:

- Be large enough to accommodate all waste generated on the premises, with allowances for the separation of waste types
- Have a graded floor and drain to an approved drainage outlet connected to the sewer and have a smooth, even surface, coved at all intersections with walls
- Have walls being cement rendered to a smooth, even surface and coved at all intersections
- Have cold water provided in the room with the outlet located in a position so that it cannot be damaged, and a hose fitted with a nozzle connected to the outlet
- Be adequately ventilated, either natural or mechanical, in accordance with the Building Code of Australia and
- Have a maximum travel distance from any dwelling to the waste services room not exceeding 75 m
- Have a minimum aisle space of 1.2 m

6.2.5 Bulky Waste

- Additional dedicated areas for temporary storage of unwanted bulky items such as cardboard, furniture or appliances, are to be provided adjacent to waste storage rooms and must be accessible to all residents. According to the requirements in the DCP, the minimum area to be provided for bulky waste is 10 m^2 for developments that have up to and including 40 units, with an additional 2 m^2 for every extra 10 units.

6.3 Estimated operational waste types and quantities

6.3.1 Development details

The 442 residential units will be included over 13 levels. Details of the number of residential dwellings in each section are shown in **Table 8** below.

Table 8 Number of units per building

	Building					
Building	A	B - West[6]	B - East[7]	C	D	E
Units	**22**	**110**	**65**	**55**	**99**	**91**

6.3.2 Waste quantities

To calculate the estimate operational waste quantities likely to be generated by this development the following assumptions were made:

- Council's standard waste generation rates as outlined in the DCP of:
  - 80 litres per unit per week for general garbage
  - 40 litres per unit per week for comingled recycling
- Common bin supplier size dimensions for 660 L bins for both garbage and recycling. This is the preferred size of bin as advised through consultation with Council's waste team
- A collection frequency of once per week for both garbage and recycling.

To allow for safe and easy 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.

Table 9 Bin numbers and storage areas

Building	Total number units	Residential total per week (L)		Number of 660 L bins		Total bin storage area (including manoeuvring) (m^2)	Minimum chute room area Required (including manoeuvring) (m^2)
		Garbage	Recycling	Garbage	Recycling		
A	22	1,760	880	3	2	141.5	7.0

[6] As Building B will have two waste chute rooms, B-West signifies the units of Building B that are on the left or West section of the development

[7] As Building B will have two waste chute rooms, B-East signifies the units of Building B that are on the right or East section of the development

B - West	110	8,800	4,400	14	7		32.6
B - East	65	5,200	2,600	8	4		21.2
C	55	4,400	2,200	7	4		16.3
D	99	7,920	3,960	12	6		27.9
E	91	7,280	3,640	12	6		27.9
Total	**442**	**35,360**	**17,680**	**54**	**27**		

As outlined in **Table 9** above, assuming the use of 660 L bins, a minimum of 54 will be required for garbage and 27 for recyclables, making a total of 81 bins for the development.

6.3.3 Bulky waste

Based on the number of units and Council requirements as outlined in **Section 6.2.5**, the bulky waste storage area must be a minimum of 90.4 m^2.

6.3.4 Waste storage area size

The amount of space allowed for each element of waste is shown below in **Table 10.**

Table 10 Residential waste space allowance

Tower	Number of 660 L bins	Area required (m^2)
Garbage	54	62.9
Recyclables	27	31.4
All streams	87	94.3
Total including space for manoeuvring	--	141.5
Bulky waste allowance	--	90.40
Total residential waste storage space		**231.9**

The project's lower ground floor indicates an area of 182 m^2 allocated to the waste holding room and garbage room, see **Figure 3**.

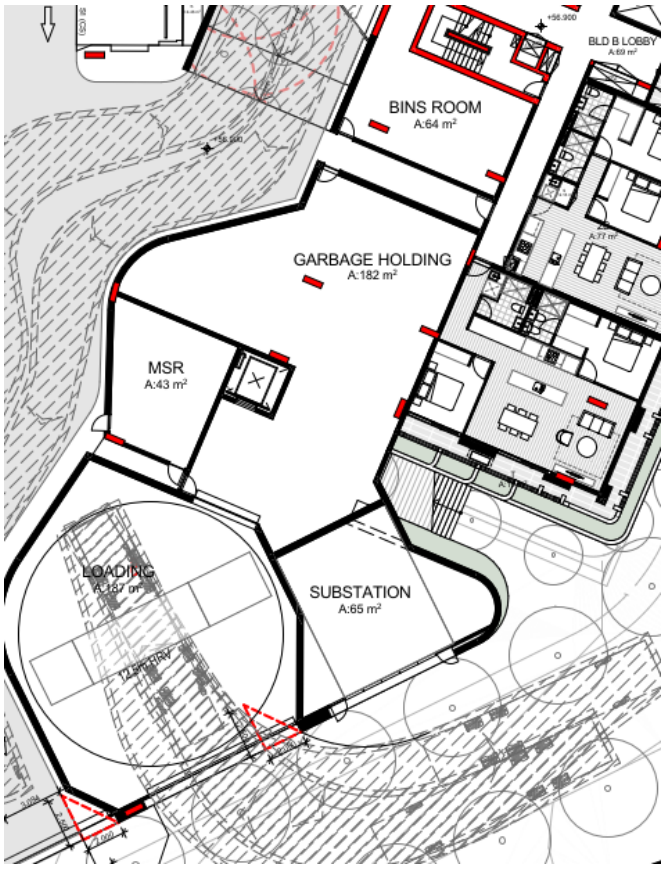


Figure 3 General waste room and bulky waste storage area

6.3.5 Garbage chutes and waste Handling

Each building will feature six garbage chutes, one each in buildings A, B-West, B-East, C, D and E. The garbage chutes will run through all floors and will into which residents will place the appropriate material. Garbage will be collected in 660 L wheeled bins located in a dedicated room at the base of the chutes. A 240 L recycling bin will be positioned next to each chute door on each floor for the disposal of recyclables.

Recycling bins and any other waste stored in the interim bulky waste storage areas will be taken from each floor by cleaners or facilities management staff to the waste holding room and the communal bulky waste storage room.

6.3.6 Waste Storage Room Location

The design for the waste storage areas of the Project take into consideration better practice waste management and requirements from Council's DCP. The waste storage area location requirements are outlined in **Section 6.2**.

As per Council's DCP, the nominated collection areas are to be clearly nominated on site plans accompanying development applications. See **Figure 3** for the nominated waste storage room location. Further detail can be seen in the site plans in **Appendix A.**

6.4 Management

Regular cleaning of waste and recycling storage areas and transfer of bins to collection points will be undertaken by cleaners or facilities management staff.

Residents will take their garbage and recycling to the waste room on their floor and place garbage in the chute and recyclables in the bin located next to the chute. Residents will take bulky waste to the bulky waste storage area located on the floor where there will be bins or caged areas to store this material.

Garbage will fall down each chute and into a 660 L bin in a locked chute room at the base. Cleaners or facilities management staff will collect the recycling bins from their positions next to the chutes on each floor and take them to the residential waste storage room. Cleaners or facilities management staff will change full 660 L bins in the chute rooms for empty ones and take the full bins from each chute room to the residential waste room. All bins will be stored in the residential waste storage room until weekly collection from the garbage holding room adjacent to the loading dock.

6.5 Waste Avoidance, Reuse and Recycling Measures

6.5.1 Waste Avoidance

Waste avoidance measures include:

- Participating in take-back services to suppliers to reduce waste further along the supply chain
- Purchasing consumables in bulk to avoid unnecessary packaging
- Presenting all waste reduction initiatives to tenants as part of their induction program, and
- Investigating leased equipment and machinery rather than purchase and disposal.

6.5.2 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.

6.5.3 Recycling

Recycling opportunities include:

- Collecting and recycling e-waste
- Flatten or bale cardboard to reduce number of bins required
- Development of ‘buy recycled’ purchasing policy.

6.6 Communication Strategies

Waste management initiatives and management measures should be clearly communicated to building managers, owners, tenants 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 and tenants 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
- Tenants and cleaners should adhere to the WMP for compliance, in consultation with management, and
- Repair signs and labels promptly to avoid breakdown of communications.

6.7 Signage

As outlined in the DCP, 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 areas
- 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 EPA[8]. 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.

[8] NSW EPA waste signage and label designs http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm

Figure 4 Example of bin labels for operational waste

6.8 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 could be conducted every six months 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 Environment 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.

6.9 Roles and Responsibilities

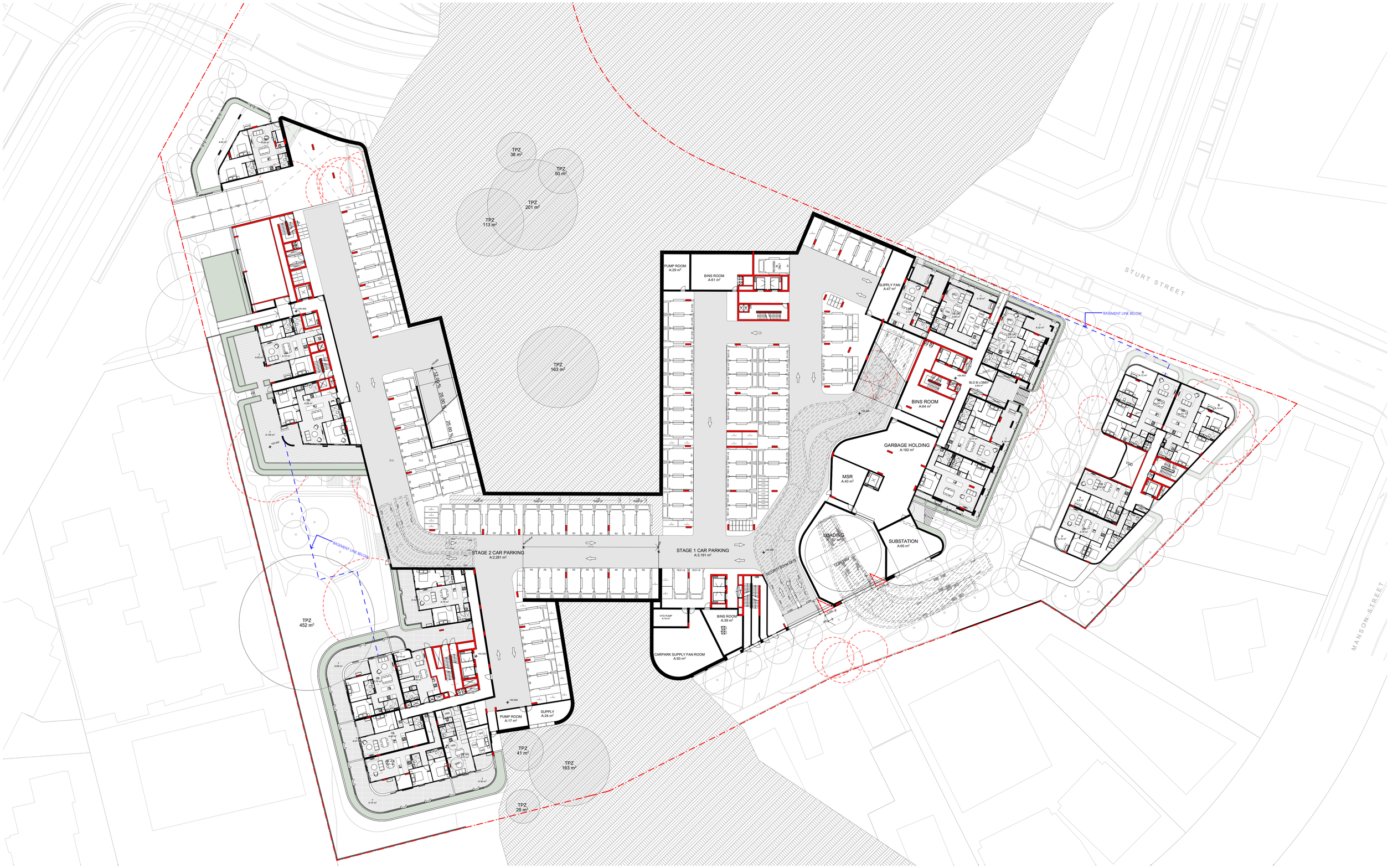
It is the responsibility of the Building Manager, or equivalent role, to implement this WMP and a responsibility of all warehouse tenants and staff to follow the waste management procedures set out by the WMP. SLR recommends that all subcontractors enlisted by the Client are to have roles and responsibilities identified and the Project's waste management system clearly explained. A summary of recommended roles and responsibilities are provided in **Table 11**.

Table 11 Operational waste management responsibility allocation

Responsible Person	General Tasks
Management	Ensure the WMP is implemented throughout the life of the operation.
	Update the WMP on a regular basis, for example annually, 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 on a weekly basis 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

Architectural drawings



DATE	Issue Name	BY	CHK	NO.
27/08/2020	DEVELOPMENT APPLICATION			B
4/11/2020	DEVELOPMENT APPLICATION			C
1/06/2021	FOR INFORMATION			1
4/06/2021	FOR INFORMATION	WS	DC	2
11/06/2021	FOR INFORMATION	WS, MA	DC	3
22/06/2021	FOR INFORMATION	WS, MA	DC	4
30/06/2021	FOR INFORMATION	WS, MA	DC	5

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Stage 1A Residential

DRAWING TITLE
LOWER GROUND FLOOR PLAN

SCALE	1:300 @A1
DATE	17/02/2020
PLOT DATE	7/07/2021
DRAWN	WS, DC, SH
CHECKED	DC
JOB NO.	20320
DRAWING NO.	PLA-AR-DA0099
REVISION	5

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