Vertical First Pty Ltd

Commercial and hotel development above the Former Inwards Parcel Shed at 8-10 Lee Street, Haymarket

Waste Management Report

September 2020

Executive summary

The Waste Management Report describes the proposed construction and operational waste management aspects of the Project and addresses the SEARs requirements for the Developer Works. These comprise YHA accommodation in the lower levels (the Hotel) and commercial building for occupancy by Atlassian and other commercial tenants in the upper levels (the Office).

Construction and demolition wastes generated as part of the Developer Works have also been considered in the report. In addition to the Developer Works waste, operational waste generated by TOGA retailers has also been included in the report.

The Department of Planning, Industry and Environment provided the Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Statement for the proposed development. This report has been prepared to address the SEARs and relevant policy and legislation.

Methodology

The waste management systems proposed for the Developer Works aim to comply with waste minimisation and resource recovery strategies as outlined in guidance documents, including the City of Sydney Guidelines for Waste Management in New Developments.

To determine the spatial requirements for waste storage and collection, the waste streams anticipated to be generated by the Hotel, the Office and TOGA retailers were estimated. Waste types and generation were based on proposed floor space and development type and proposed construction staging.

Waste storage and handling for the Project considers the building layout. Collected waste would be transferred by service lift to the dedicated waste rooms located on the basement B2 level. Collection points within the loading zone are strategically placed to minimise manually handling distances and allow safe access for loading of waste collection vehicles.

Likely environmental effects

Environmental impacts associated with waste management during construction and operation are assessed in other relevant reports including:

- Noise and vibration assessment
- Statement of heritage impact
- Traffic and transport impact assessment
- Air quality and odour impact assessment
- Assessment of the stormwater, drainage, flooding and wastewater impacts
- Biodiversity waiver
- Soil and contamination report

Mitigation measures

The following mitigation measures would be implemented to manage waste generated by construction and operation of the development.

- Detailed design would include measures to minimise quantities of waste requiring off site disposal including minimising volume bulk excavations, careful procurement of construction materials to minimise excess waste materials.
- A Construction Waste Management Plan would be developed and implemented. The plan would adopt the waste management hierarchy principles contained in the *Waste Avoidance and Resource Recovery Act 2001* and will detail processes, responsibilities and measures to manage waste and minimise the potential for impacts during construction.
- All waste disposal would be in accordance with the NSW EPA Waste Classification Guidelines and the Remedial Action Plan (RAP).
- A detailed Operational Waste Management Plan would be developed and implemented that incorporates the requirements of relevant guidance documents, waste management hierarchy principles and details waste handling and storage procedures, responsibilities and management measures.

Environmental risk assessment

An environmental risk assessment has been completed to identify key issues for the Project relating to waste management based upon likelihood and consequence of potential adverse impacts. Key potential adverse impacts identified below were assessed as low risk based on implementation of proposed mitigation measures.

- Energy and water consumption associated with packaging
- Waste generation, handling and temporary storage on site during construction that produces dust, nuisance odour, windblown litter, sediment laden/contaminated runoff, leachate generation and noise
- Health and safety of site personnel and community handling hazardous and special wastes during construction
- Contamination of soils, groundwater or surface water from storage and disposal of liquid and contaminated wastes during construction and operation.
- Cross contamination of waste streams that leads to reduction in reuse of construction and demolition materials and contamination of recycling facilities/landfills
- Generation of dust, noise, traffic and odours associated to waste transportation during construction and operation
- Regulatory non-compliance due to non-classified or incorrectly classified waste transport and disposal
- Regulator non-compliance and potential illegal dumping of waste due to unlicenced waste contractors transporting waste.

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Glossary of key terms and abbreviations

Term	Definition
Atlassian Central	The Atlassian tower building (building only)
Atlassian Central development	The whole Atlassian development within the Atlassian Site including the tower and public domain works
Atlassian Site	8-10 Lee Street, Haymarket
Block B or “Dexus/Frasers Site”	14-30 Lee Street Haymarket. Adjoining land immediately to the south currently comprising three 8 storey commercial buildings.
Block C or Adina Hotel	2 Lee Street, Haymarket The Former Parcels Post Office The Adina Apartment Hotel Sydney Central
Central Sydney	Land identified as Central Sydney under the Sydney LEP 2012 and includes Sydney’s Central Business District
Central Walk West	The future western pedestrian entry to the new 19 metre wide underground concourse customers to suburban rail and Sydney Metro platforms.
Council	City of Sydney Council
Devonshire Street Tunnel	The pedestrian and cycle tunnel running between Chalmers Street and Lee Street
Habitat Level 1	Flexibly ventilated workspace areas
Link Zone	The publicly accessible landfill within the Site
Sub-precinct	Western Gateway Sub-precinct
The Hotel	The YHA levels of the building
The Office	The commercial levels of the building
The Project	Commercial and hotel development above the Former Inwards Parcel Shed at 8-10 Lee Street, Haymarket
The Site	8-10 Lee Street, Haymarket
The YHA	The Sydney Railway Square YHA

Abbreviation	Meaning
AS	Australian Standard
ATP	Australia Technology Park
BCA	Building Code of Australia
CDS	Container deposit scheme
CMP	Conservation Management Plan
Council	City of Sydney Council
DA	Development application
DCP	Development Control Plan
Devonshire Tunnel	Devonshire Street Pedestrian Tunnel
DPIE/Department	NSW Department of Planning, Industry and Environment
DP	Deposited Plan
EIS	Environmental Impact Statement
EPA	NSW Environment Protection Authority
ENM	Excavated natural material
ESD	Ecologically Sustainable Development
HIS	Heritage Impact Statement

Abbreviation	Meaning
LGA	City of Sydney Local Government Area
m	metre
MGB	Mobile garbage bin
NIA	Noise Impact Assessment
OWMP	Operational Waste Management Plan
Parcels Shed	Former Inward Parcels Shed
POEO Act	Protection of the Environment Operations Act 1997
RAP	Remediation Action Plan
SEARs	Secretary's Environmental Assessment Requirements
sqm	Square Metres
SSD	State Significant Development
SSDA	State Significant Development Application
Sub-precinct	Western Gateway Sub-precinct
Sydney LEP 2012	Sydney Local Environmental Plan 2012
TIA	Transport and Accessibility Impact Assessment
TfNSW	Transport for New South Wales
The Minister	The Minister for Planning and Public Spaces
VIA	Visual Impact Assessment
VENM	Virgin excavated natural material
WARR Act	Waste Avoidance and Resource Recovery Act 2001
WHS	Workplace Health and Safety
WMP	Waste Management Plan

1. Introduction

1.1 Purpose and scope of this report

GHD has been commissioned by Atlassian (the Applicant) to prepare this report in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the SSD-10405 for a commercial and hotel development above the Former Inwards Parcel Shed at 8 – 10 Lee Street, Haymarket.

Specifically, this report addresses the following SEARs:

SEARs	Report reference
[14] Address potential impacts of the construction on surrounding areas including the adjoining rail corridor and the public realm with respect to … construction waste.	Section 4
[14] Provide details of annual volume of materials to be extracted, processed or stored on site during construction and how the extracted material will be disposed of or reused.	Section 4.1 Section 4.2
[16] Identify and classify the likely waste streams to be generated during construction and operation of the development and describe measures to be implemented to minimise, manage, reuse, recycle and safely dispose of this waste with reference to relevant policies and guidelines	Section 3 Section 4 Section 5
[16] identify appropriate servicing arrangements (including but not limited to, waste management, loading zones and mechanical plant) for the site	Section 3.2
In addition, the EIS must include the following:.. • waste management plan	Sections 3 to 5

The Waste Management Report describes the proposed construction and operational waste management of the Project and addresses the requirements for the Developer Works comprising YHA accommodation in the lower levels (the Hotel) and commercial building for occupancy by Atlassian and other commercial tenants in the upper levels (the Office). Construction and demolition waste generated as part of the Developer Works will also be considered. In addition to the Developer Works waste, waste generated by TOGA retailers is also included in the report. Environmental impacts associated with waste management during construction and operation are assessed in other relevant reports including:

- Noise and vibration assessment
- Statement of heritage impact
- Traffic and transport impact assessment
- Air quality and odour impact assessment
- Assessment of the stormwater, drainage, flooding and wastewater impacts
- Biodiversity waiver
- Soil and contamination report

1.2 Description of the Site

The Site is known as 8-10 Lee Street, Haymarket. It is an irregular shaped allotment. The allotment has a small street frontage to Lee Street, however this frontage is limited to the width of the access handle.

The Site comprises multiple parcels of land which exist at various stratums. All the lots are in the freehold ownership of Transport for NSW, with different leasing arrangements:

- **Lot 116 in DP 1078271**: YHA is currently the long-term leaseholder of the Site which covers the areas shown in blue below.
- **Lot 117 in DP 1078271**: This is currently in the ownership of TfNSW and the applicant is seeking the transfer of the leasehold on this land to provide for an optimise basement and servicing outcome for the Site.
- **Lot 118 in DP 1078271**: This is currently in the ownership of TfNSW and the applicant is seeking the transfer of the leasehold for part of the air-rights above part of this allotment to allow for an optimised building envelope for the project. The proposal also uses a part of Lot 118 in DP 1078271 within Ambulance Avenue for Day 1 bike access, secondary pedestrian access and fire service vehicle access.
- **Lot 13 in DP 1062447**: This is currently in the ownership of TfNSW but TOGA (who hold the lease for the Adina Hotel) have a long-term lease of this space in the lower ground area.

The Site has an area of approximately 3,764sqm which includes 277sqm of air rights that apply from RL40.

Figure 1.1 Site location and dimensions

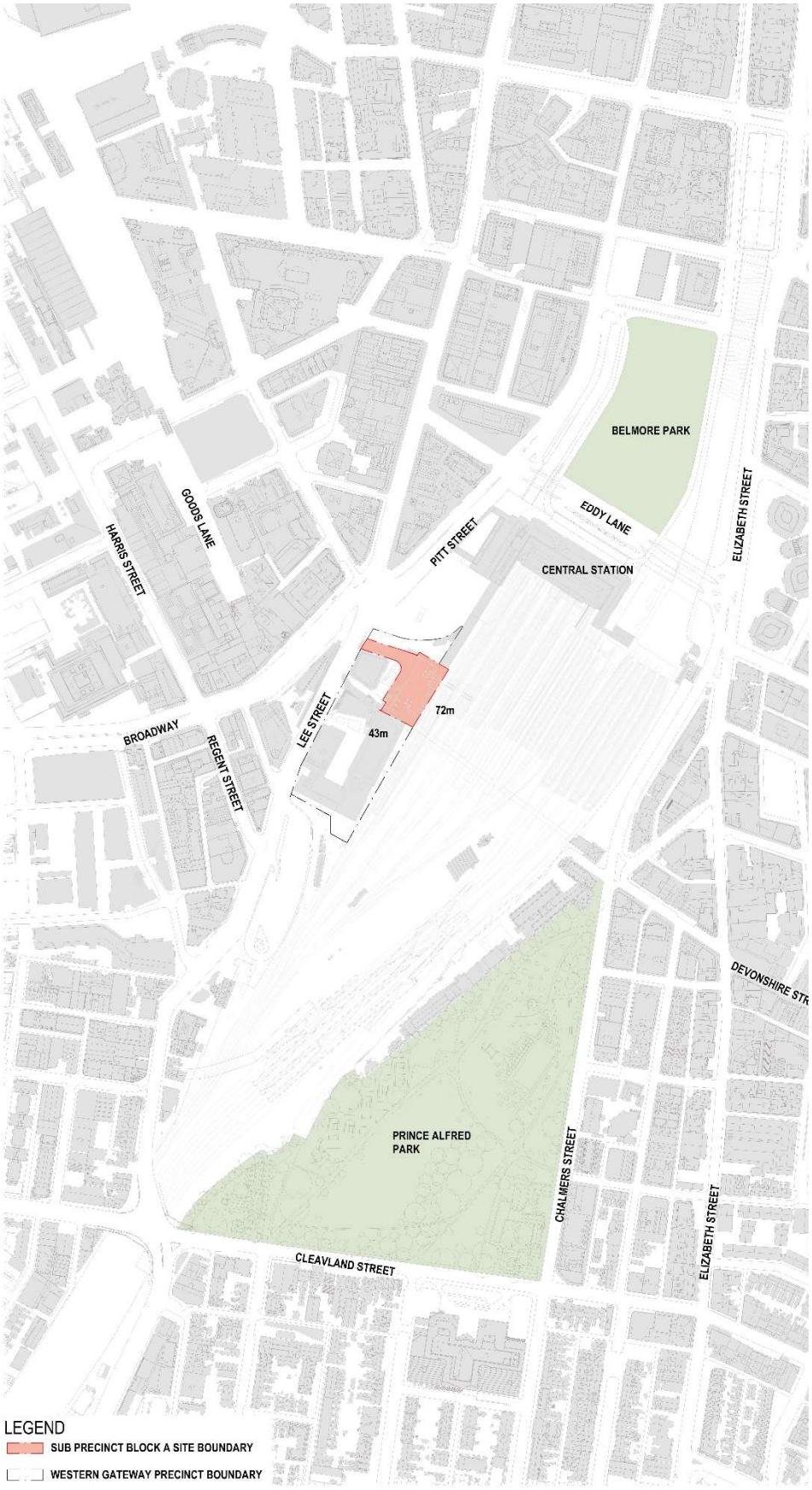


Image Source: BVN / SHoP

1.3 Site and surrounding context

The Site is directly adjacent to the Western Wing Extension of Central Station, and forms part of the 'Western Gateway Sub-precinct' of the Central Railway Station lands. It is situated between the existing CountryLink and Intercity railway platforms to the east and the Adina Hotel (former Parcel Post Office) to the west.

Existing vehicle access to the Site is via Lee Street, however the Lee Street frontage of the Site is only the width of the access handle.

Current improvements on the Site include the Parcels Shed, which operated in association with the former Parcels Post Office (now the Adina Hotel). The Site is currently used as the Railway Square YHA. The Site also includes the western entryway to the Devonshire Street Pedestrian, which runs east-west through Central Station under the existing railway lines.

The Site is situated in one of the most well-connected locations in Sydney. It is directly adjacent to Central Station Railway which provides rail connections across metropolitan Sydney, as well as regional and interstate connections and a direct rail link to Sydney Airport. The Site is also within close proximity to several educational institutes and is a city fringe location which provides access to key support services.

Central Railway Station is currently undergoing rapid transformation to allow for integration of rail, metro and light rail transport infrastructure. This will elevate the role of Central Station not only for transport but also enhance opportunities for urban renewal and revitalisation of the surrounding precinct. This is one of the key drivers for the identification of the Central SSP and the Western Gateway Sub-precinct to accommodate a new innovation and technology precinct.

The proximity of the Western Gateway Sub-precinct to the city, while still being located outside the core Sydney CBD, provides opportunity for it to evolve to attract technology and innovation companies. It has access to all required services while being sufficiently separate to the CBD to establish a distinct technology industry ecosystem. Its CBD fringe location will provide affordable commercial rents which will support Startups and entrepreneurs which are a key component of an innovation precinct.

1.4 Project description

The proposed SSDA will facilitate the development of a new mixed-use development comprising *'tourist and visitor accommodation'* (in the form of a 'backpackers') and commercial office space within the tower form. Retail, lobby and food and drink premises at the Lower Ground level and Upper Ground level.

Atlassian Central at 8-10 Lee Street will be the new gateway development at Central Station which will anchor the new Technology Precinct proposed by the NSW Government. The new building will be purpose-built to accommodate the Atlassian Headquarters, a new TfNSW Pedestrian Link Zone, and the new Railway Square YHA backpacker's accommodation, in addition to commercial floorspace to support Tech Start-ups.

The new development is to be built over the existing heritage former Inwards Parcels Shed (the Parcels Shed) located on the western boundary of Central Station with the Adina hotel to the west. The works includes a 38-storey mixed-use tower with basement loading dock facilities and EOT facilities accessed off Lee Street, 2 storey lobby utilising the Parcels Shed building, lower ground and upper ground retail, YHA hostel and commercial tower with staff amenities to the mid-level and roof top areas and a pedestrian Link Zone works for TfNSW.

The building design has been conceived to support the delivery of a site plan designed to connect with future developments to both the south and east and integrate with a cohesive

public realm for the broader Sydney community in accordance with NSW government strategic planning.

The tower design is a demonstration project for Atlassian, representing their commitment to environmental sustainability and contemporary workplace settings through tower form and construction systems along with a set of emblematic outdoor workplaces stacked in the tower form.

The existing Parcels Shed will be adaptively re-used in accordance with best practice heritage process and form the upper level of a 2-storey entry volume that connects visually with the 2 level Link Zone. Over the roof of the Parcels Shed, a new privately owned but publicly accessible landscaped area will be created as the first part of a new upper level public realm that may extend to connect to a future Central Station concourse or future Over Station Development.

The proposed mixed use tower directly adjoins a live rail environment to the east and public domain to the north, west and south. These works will consider these rail environments and have been designed to ensure that all TfNSW external development standards are achieved. This ensures there is no impact to the operation or safety of these TfNSW assets.

Interfaces from the overall site and especially the State works Link Zone have been designed in consultation with the adjoining stakeholders. These stakeholders include TfNSW to the north and south, Toga and the Adina Hotel operator to the west and the Dexus Fraser's site to the south. Connections via the Link Zone, through the basements, and off the proposed new Link Zone dive ramp will be designed to enable existing and future developments to function in both the day 1 scenario and end state when all developers have completed their works.

The overall project aspiration is to create a world class tech precinct with effective pedestrian links through the Atlassian site to the Central Station western forecourt to Central Walk west and adjoining stakeholder's sites.

1.5 Assessment methodology

The waste management assessment considered the types, amounts of waste to be generated during the operational and construction phase of the Project. The assessment was desktop based and involved:

- Review relevant legislation and policy framework for waste management
- Operation:
  - Review of the proposed operational activities to identify potential waste generating activities and identification of key waste streams
  - Estimate waste generation quantities and likely waste classifications
  - Identify waste handling and storage requirements including equipment, receptacles, manoeuvring, and clearances for waste collection
  - Assess proposed design against identified requirements for operation
- Construction:
  - Review the proposed construction methodology to identify potential waste generating activities and identification of key waste streams
  - Estimate waste generation quantities and preliminary waste classifications
  - Identify waste handling and temporary storage requirements during construction
- Identify mitigation measures to be implemented to minimise, manage, reuse, recycle and safely dispose wastes during operation and construction in accordance with relevant policies and guidelines.

1.6 Limitations

This report: has been prepared by GHD for Vertical First Pty Ltd and may only be used and relied on by Vertical First Pty Ltd for the purpose agreed between GHD and the Vertical First Pty Ltd as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Vertical First Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 3 and 4 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Vertical First Pty Ltd and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Policy and legislation

2.1 Relevant legislation

2.1.1 Waste Avoidance and Resource Recovery Act 2001

The *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) is the overarching waste management legislation in NSW. The objectives of the WARR Act include encouraging the most efficient use of resources, reducing environmental harm and ensuring resource management decisions are made against a hierarchy that gives preference to waste avoidance and resource recovery. The main provisions of the WARR Act relate to the preparation of waste strategies and extended producer responsibility schemes. The current statutory waste strategy is the NSW Waste Avoidance and Resource Recovery Strategy 2014–21 (refer Section 2.2.2).

Extended producer responsibility schemes may also be made under the WARR Act. Schemes for waste packaging, mobile phones, agricultural chemicals and containers, polyvinyl chloride, oils and lubricants and tyres are identified schemes in place in NSW.

The objects of the WARR Act are:

'(a) to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development,

(b) to ensure that resource management options are considered against a hierarchy of the following order:

i. avoidance of unnecessary resource consumption,

ii. resource recovery (including reuse, reprocessing, recycling and energy recovery),

iii. disposal

(c) to provide for the continual reduction in waste generation

(d) to minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste,

(e) to ensure that industry shares with the community the responsibility for reducing and dealing with waste,

(f) to ensure the efficient funding of waste and resource management planning, programs and service delivery,

(g) to achieve integrated waste and resource management planning, programs and service delivery on a State-wide basis,

(h) to assist in the achievement of the objectives of the *Protection of the Environment Operations Act 1997*.'

A waste management plan is a requirement for new developments in NSW and must be written with reference to the NSW Waste Avoidance and Resource Recovery Strategy 2014-21, made under the WARR Act.

2.1.2 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) governs the requirements for waste generators in terms of storage and lawful disposal of waste. The POEO Act establishes the waste generator as having responsibility for the correct management of waste, including final disposal.

The POEO Act also provides a range of controls about waste management requirements including the means of processing, handling, moving, storage and disposal of materials.

The POEO Act also provides classification of offences as Tier 1, 2 or 3 which have relevance to pollution and waste offences, with prescribed penalty notice amounts provided in the POEO (General) Regulations.

2.1.3 Protection of the Environment Operations (Waste) Regulations 2014

The *Protection of the Environment Operations (Waste) Regulations 2014 s*ets out obligations that would apply to waste managers, consigners, transporters and receivers dealing with waste coming from the Project.

The main provisions of the Regulation relate to the payment of a waste levy by licensed waste receivers, the requirements to track the transportation and disposal of certain types of waste, and specific requirements regarding the transportation and management of asbestos waste.

Schedule 1 of the Regulation lists types of waste that must be tracked during transport and disposal. Obligations to track these wastes apply to consigners, transporters and receivers. The responsibilities of consigners generally relate to ensuring that transporters and receivers of their waste hold the relevant licences to deal with the waste.

2.2 Relevant policies and strategies

2.2.1 National Waste Policy 2018

The 2018 National Waste Policy provides a national framework for waste and resource recovery in Australia. It outlines roles and responsibilities for collective action by businesses, governments, communities and individuals. The policy identifies five overarching principles underpinning waste management in a circular economy. These include:

- Avoid waste
- Improve resource recovery
- Increase use of recycled material and build demand and markets for recycled products
- Better manage material flows to benefit human health, the environment and the economy
- Improve information to support innovation, guide investment and enable informed consumer decisions.

2.2.2 NSW Waste Avoidance and Resource Recovery Strategy 2014-21

The current waste strategy under the NSW *Waste Avoidance and Resource Recovery Act 2001* is the NSW Waste Avoidance and Resource Recovery Strategy 2014–21 (WARR Strategy). The WARR Strategy sets objectives to avoid waste generation, increase recycling, divert waste from landfill, manage problem wastes, reduce litter and reduce illegal dumping. To achieve these objectives, the WARR Strategy assigns the following responsibilities to industry and business:

- avoid and reduce waste through efficiency measures and industrial ecology partnerships
- separate recycling streams at source to enable collection separate from residual waste
- work with suppliers to reduce packaging and waste in supply chains
- implement and maintain best practice resource recovery systems
- actively seek other businesses that may use waste as a resource
- ensure waste and recycling streams are taken to appropriate facilities by legitimate operators

- specify and purchase recycled materials
- work with other producers to take responsibility for management of problem wastes, and
- comply with regulations.

The WARR Strategy also elaborates on a waste management hierarchy which supports the objectives of the *Waste Avoidance and Resource Recovery Act 2001*.

2.2.3 City of Sydney Sustainable Sydney 2030 – Community Strategic Plan 2017-2021 and City of Sydney Environmental Action 2016-2021 – Strategy and Action Plan

These strategies and plans set bold targets, including a long-term goal of zero waste to landfill. According to the 2016 Environmental Action plan, businesses are responsible for collecting their own commercial and industrial waste and produce around 267,000 tonnes of waste annually or 80 % of the City of Sydney Council's (Council's) total waste.

A key objective of the Community Strategic Plan 2017-2021 is to manage waste as a valuable resource and minimise environmental impacts from generation and disposal through ultra-efficient new building design. The Environmental Action 2016-2021 plan targets were set for resource recovery of waste within the City of Sydney Local Government Area (LGA) by 2021:

- 70% of commercial and industrial waste
- 80% of construction and demolition waste

The Better Buildings Partnership facilitates waste management, monitoring and reporting in the commercial sector. A guide for excellence in new building design identifies the provision for on-site composting of kitchen and garden waste as a voluntary standard relevant to waste management.

2.2.4 City of Sydney Leave nothing to waste – Managing resources in the City of Sydney area: Waste strategy and action plan 2017-2030

This strategy and action plan focuses on managing Sydney's resources to 2030 by setting clear targets and recommendations to maximise diversion from landfill. It sets out priority areas that will integrate sustainable resource management within a dynamic and developing urban environment.

One priority area is sustainable design. Council is committed to focusing on sustainable waste management in new developments and these should provide safe and convenient facilities for residents and workers to store recyclables and unwanted waste items for collection and recovery.

2.2.5 City of Sydney Development Control Plan

The Sydney Development Control Plan (DCP) provides detailed planning and design guidelines to support the planning controls in local environmental plans within the LGA. Given the project is considered to be a state significant development, the requirements of the NSW Minister for Planning and Public Spaces development consent take precedence over the DCP.

The DCP refers to the Council's Guidelines for Waste Management in New Developments as outlined in Section 2.4.1 for the design and location of waste collection points and loading areas and preparation of Waste and Recycling Management Plans.

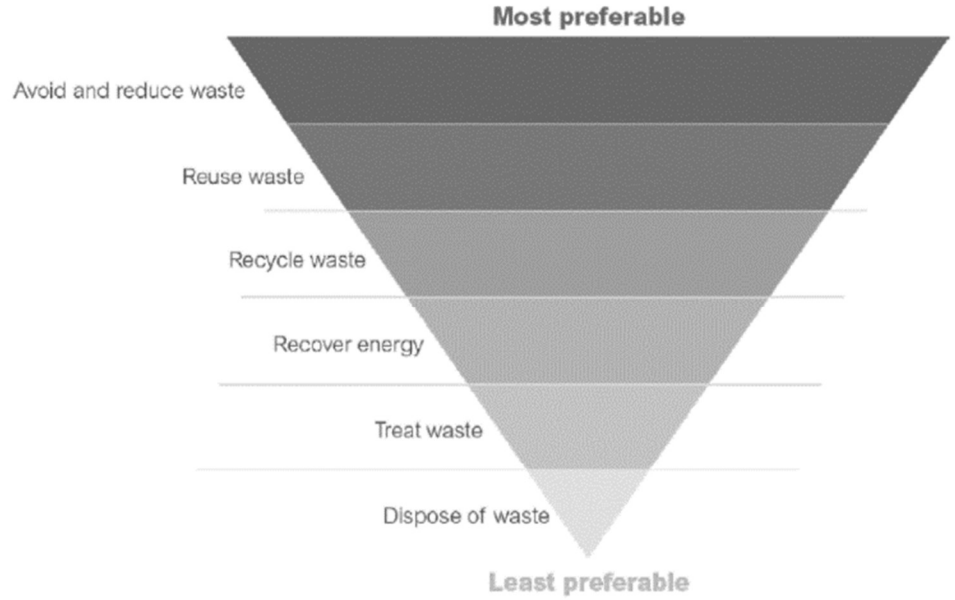
2.3 Foundational principles of waste management

2.3.1 Waste management hierarchy

The waste management hierarchy (Figure 2.1) is part of both the National Waste Policy 2018 and the NSW Waste and Resource Recovery Strategy 2014-21.

Under the waste management hierarchy, it is preferable to avoid or reduce waste by procuring only necessary materials, and consuming material with limited production or packaging requirements. Reusable or recyclable materials should be considered where waste cannot be avoided.

If waste cannot be reused or recycled, efforts should be made to recover energy to maximise its beneficial use prior to its eventual disposal. Waste with harmful characteristics should be treated prior to disposal to minimise its potential to affect human health and the environment.



Source: NSW Waste Avoidance and Resource Recovery Strategy 2014–21 (NSW EPA 2014a)

Figure 2.1 Waste management hierarchy

2.3.2 Other sustainable waste management principles

Other sustainable waste management principles are:

- **Polluter pays principle** - those who pollute should bear the costs of managing the pollution to prevent damage to human health and the environment
- **Extended producer responsibility and product stewardship** - the producer's responsibility for a product includes the management of that product after it has been used and discarded by its consumers
- **Proximity principle** - waste should be dealt with as near to its place of production as possible
- **Circular economy** - a circular economy is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems. This contrasts with the 'take-make-waste' linear model

2.4 Relevant guidelines

2.4.1 City of Sydney Guidelines for Waste Management in New Developments

The Council's Guidelines for Waste Management in New Developments promote the efficient storage, separation, collection and handling of waste to maximise resource recovery and provide safe and healthy spaces for people to live and work in.

It provides the minimum waste management requirements for all development and for completing Waste and Recycling Management Plans for development applications in the LGA.

All new developments that will generate demolition, construction and operational waste are required to submit a Waste and Recycling Management Plan. Operational waste is waste generated by occupants of developments as part of typical occupancy and use.

The Council's target is to divert 70 per cent of waste from operating businesses in the LGA away from landfill by June 2021.

Table 2.1 summarises the relevant requirement of the Council's Guidelines for Waste Management in New Developments.

Table 2.1 Requirements of the City of Sydney Guidelines for Waste Management in New Developments

Requirement
GENERAL – ALL DEVELOPMENTS
Waste and recycling storage areas
All waste and recycling is to be wholly located in a dedicated room or storage area.
Storage areas are to provide adequate capacity for storing all the waste and recycling likely to be generated between collection cycles, based on expected waste generation and selected bin types and accommodate likely peak demand for waste storage capacity.
Indicative waste and recycling generation rates for residential and various non-residential sector premises are listed in the Waste and Recycling Generation Rates reference section.
1.2 Storage areas should reflect the equipment, infrastructure, manoeuvring space and potential future needs of the development.
1.3 The storage area(s) is to be detailed on DA plans and drawings submitted to Council.
1.4 More than one storage area may be required in order to provide sufficient storage or to meet criteria for the access and transfer of waste and recycling.
1.5 Waste and recycling areas are to be located in a position that is convenient for both users and waste collection staff and that promotes source separation and reduces contamination.
1.6 The layout of the storage area is to be designed to encourage easy recycling and separation of different waste types by all users.
1.7 Storage areas are to be provided within the premises in reasonable proximity to the vehicle entrance, and no lower than one level below street level.
1.8 Storage areas are not to be located adjacent to a habitable room.
Space for bulky, problem, food waste and compostable material
2.1 Separate dedicated space such as a room or screened area (in or attached to the waste and recycling storage area) is to also be provided for the storage and recycling of bulky waste and problem waste for collection (refer to relevant sections for specific size requirements according to development type.)
2.2 Food waste and compostable material management options can include providing space for:
2.2.1 Composting and worm farming, on an unpaved earth surface or within a bunded and drained area, for developments with external space or in private courtyards that is to be managed by the development.

Requirement
2.2.2 On-site food waste processing system (refer to reference section Management and treatment of food waste).
Waste and recycling collection points
A waste and recycling collection point is the designated position or area where waste or recyclables are loaded onto the collection vehicle.
3.1 The collection point is to be level, free of obstructions and with sufficient height clearance to enable the safe mechanical pick up and set down of bins.
3.2 The location of the proposed waste and recycling collection point(s) is to be detailed on the DA plans. Collection points for residential and non-residential loads may be shared.
3.3 Collection and vehicle access points are not to be located adjacent to a habitable room.
3.4 Residential developments are to provide on-site collection of waste, recycling and bulky items by Council vehicles. Waste collection and loading is to be accommodated within new developments in order of preference: In the building's basement At grade within the building in a dedicated collection or loading bay At grade and off-street within a safe vehicular circulation system where, in all cases, vehicles will enter and exit the premises in a forward direction
3.5 Residential waste from developments with six residential units or less are permitted to have kerbside collection in the following circumstances: • Where the space required for presentation at kerb does not exceed one-third of the width of the property frontage • Where collection activity does not create an obstruction of the pathway or roadway or cause an illegal hazard • Where the collection point is to be located so as to minimise the impacts from noise and odour during collection • Where collection complies with the City's Waste Management Local Approvals Policy
3.6 All collection of non-residential waste is to be conducted on-site. Consideration will be given to smaller developments where this is not possible.
3.7 All externally located on-site collection points are to be constructed within 15 metres from the property boundary at which access is provided for collectors.
3.8 The following allowances are to be made for the nominated collection point: • Vehicle access for collection and loading will provide for a maximum grade of 1:20 for the first 6 metres from the street, then a maximum of 1:8 with a transition of 1:12 for 4 metres at the lower end • A minimum vertical clearance of 4 metres, including clearances of all ducts, pipes and other services • A minimum width of driveway of 3.6 metres • A minimum turning circle radius of 10.5 metres or provision for changing the facing direction of a waste or recycling collection vehicle. • Each collection point is to be easily accessible from the nominated waste and recycling storage area. The access pathway for wheeling bins between a storage point and the collection point is to be level and free of steps or kerbs. The maximum manual handling distance between the storage point and the collection point for bins is: o 10 metres for bins including 120 L, 240 L, 660 L and 1,100 L MGBs o 3 metres for 1,500 L and 2,000 L bulk bins • Any proposed variations require further assessment and discussion with relevant Council officers.
3.10 The path for wheeling bins between a storage point and the collection point is not to exceed a grade of 1:14 at any point.
3.11 The collection point is to be located where the waste or recycling collection vehicle(s) can stand safely.

Requirement
3.12 Entry and exit of a collection vehicle from a site is to be in a forward direction. It is acceptable to use a vehicle turntable to accomplish this. If a vehicle turntable is used, it is to have a 30-tonne capacity.
3.13 Collection vehicles are to be able to service the development with minimal reversing. If a collection vehicle needs to reverse to complete a collection run, this needs to be detailed in the development's traffic management plan.
3.14 Waste and recycling storage containers are to be stored at all times within the boundary of the development.
Management
4.1 Responsibility for regular cleaning of waste and recycling storage areas (including MGBs) and transfer of bins rests with the managing body and is to be detailed in the Waste and Recycling Management Plan.
4.2 Standard signage on how to use the waste management system for residential dwellings and what materials are acceptable in the recycling is to be posted in all waste and recycling storage areas, including chute rooms. Signage indicating acceptable materials that are suitable for residential dwellings is available from Council.
4.3 All waste and recycling storage areas, chute rooms and access paths are to be kept clean and free of obstructions at all times.
4.4 All storage containers for waste and recycling are to be kept in serviceable condition and at the agreed bin numbers at all times. Bin cleaning will be conducted on a regular basis by the managing body.
4.5 'DANGER' warning signs and other appropriate Workplace Health and Safety (WHS) signage are to be prominently displayed at any point of entry to an area of waste chute discharge, or where balers, crushers or compactors operate.
4.6 A Domestic Waste Management Charge will be levied by Council on every residential rateable property. Current waste service charges are as listed on Council's Schedule of Fees and Charges at www. cityofsydney.nsw.gov.au.
Bin requirements
5.1 All waste and recycling containers are to be clearly and correctly labelled to identify which materials are to be placed into which container. MGBs will be designed and colour-coded in accordance with the Australian Standard 4123: Mobile Garbage Containers.
5.2 Waste and recycling containers will have a fixed tightfitting lid and a smooth, washable internal surface.
5.3 All residential waste and recycling awaiting collection is to be stored in the largest suitable Council approved container (such as a MGB up to 1100 L capacity), the details of which are outlined in the Council Residential Waste and Recycling Services reference section.
5.4 Non-residential waste collection containers are to display contractor information in accordance with the provisions in the Council's Waste Management Local Approvals Policy.
Other
6.1 No waste incineration devices are permitted.
6.2 All waste and recycling systems are to comply with the Building Code of Australia and all relevant Australian Standards.
6.3 Heritage conservation considerations may alter some requirements of the Guidelines for the refurbishment of an existing building on agreement with Council.
NON-RESIDENTIAL DEVELOPMENTS
Space
1.1 There is to be space dedicated for storing bulky waste and problem waste for recycling of at least:
1.1.1 2 m^2 for developments under 100 m^2
1.1.2 4 m^2 for developments between 100 m^2 and 2,000 m^2
1.1.3 An additional 4 m^2 is required for each retail, accommodation or entertainment development over 2,000 m^2 and for every 20,000 m^2 of office space.

Requirement
1.2 Dedicated space (in or attached to the waste and recycling storage area) is to be provided for the storage and recycling of food waste for collection.
1.3 Space is to be provided on-site in reasonable proximity to retail or commercial premises to store re-usable commercial items such as crates, pallets, kegs, stripout waste and similar items so that storage in a public place is completely avoided.
1.4 Kitchens, office tearooms, and service and food preparation areas are to be designed with sufficient, dedicated space to collect and recycle food waste; this is to be indicated on plans.
1.5 Secure space is to be allocated for the separate storage of each waste stream including liquid wastes, commercial cleaning products, chemicals, paints, solvents, and motor and cooking oil. These areas for liquid waste storage are to be bunded, and drained to a grease trap, in accordance with legislation and the requirements of State government authorities and agencies.
1.6 The use of cardboard balers/compactors and glass crushers for developments with a high generation of cardboard and glass recyclable waste should be considered. The space allocation for storage of recycling in MGBs may be reduced if alternative systems demonstrate the need for less storage space.
1.7 Space should be provided for the separate collection of beverage containers suitable for redemption under the NSW Container Deposit Scheme.
1.8 Separate dedicated space such as a room or screened area should be provided for the separate interim storage and management of stripout waste for re-use or recycling. Alternatively, this space is not required if the removal of old furniture and material is conducted by a professional stripout service or by the company hired for installing new items. Refer to Better Buildings Partnership, Stripout Waste Guidelines at www.betterbuildingspartnership.com.au.
Access
2.1 Where collection takes place inside a building, appropriate clearances need to be allowed for the collection vehicle to enter the premises, clear the waste and recycling containers, and exit the premises.
Note that some systems require the container to be lifted above the collection vehicle in order to be emptied (such as front-lifted bulk bins or hook lift bins).
Collection
3.1 The location of collection points for waste will be located wholly within the boundary of a development and in an area that minimises any noise or odour impacts on the amenity of nearby premises.
3.2 Commercial waste collection vehicle specifications should be matched to Council waste collection vehicle specifications as set out in Design requirements for collection vehicle access.
Management
4.1 Businesses, commercial building tenants and building managers should have written evidence of a valid and current contract (held on-site) with a collector for waste and recycling collection for disposal or processing. If glass crushers will be used, recycling contracts that accept crushed glass would need to be provided.
4.2 All businesses should include provisions in their waste contracts that allow for the collection and recycling of high-grade and low-grade office paper, cardboard packaging, paper from secure document destruction, soft plastics, food waste and other recyclable resources from the waste stream.
4.3 Contracts with cleaners, building managers and tenants are to clearly outline the waste management and collection system, and are to clearly allocate responsibilities.
4.4 Waste management systems should preference onsite weighing of materials.
4.5 Where communal composting or worm farming is proposed, it is to be managed and well maintained by the building (preferably by a caretaker, gardener or facilities management) and located in an accessible and visible area to increase awareness and to ensure minimal impacts from any potential odours and that potential run-off is away from site drainage points.

Requirement
4.6 Fittings should be deconstructed or demolished by methods that permit re-use or storage of items such as workstations, and allow for the separation of valuable resources such as metals for recycling.
OFFICES
5.1 Provision is to be made on each floor, and in the waste and recycling storage area or any interim holding area, for the separation and storage of all recyclable items (including mixed containers, cardboard, paper and paper products) likely to be produced from the premises.
5.2 Provision is to be made in cleaning contracts for this material to be transferred to a central waste and recycling storage area at least once daily. Refer to the Better Buildings Partnership Best Practice Operational Waste Guidelines at www.betterbuildingspartnership.com.au for examples of best practice waste management in commercial office.
5.3 Storage of paper and cardboard is to be in a dry, vermin-proof area. Paper and cardboard is not to be stored for more than two weeks to prevent breeding of vermin in the stored material.
5.4 Rooms or areas designated for printing or photocopying are to provide space for the interim storage of waste paper (in MGBs up to 240 litres) and used toner and/or printer cartridges for recycling.
5.5 Each tenancy and common areas should have centrally located bin stations for each stream to remove the need for individual waste bins under desks.
5.6 If the development includes more than 20,000 m^2 of office space, an area for a cardboard baler or compactor is to be provided within or in close proximity to the waste and recycling storage area.
FOOD RETAILER AND PRODUCERS
Food retailers and producers can include restaurants, cafes, grocery stores, supermarkets, pubs, clubs and commercial kitchens.
5.7 Food premises are to comply with the requirements of AS 4674-2004 Design, construction and fit-out of food premises, including the general waste and recyclable materials requirements. These Guidelines are not intended to alter obligations under that Standard, and in the event of any conflict between these Guidelines and the Australian Standard, the Standard prevails.
5.8 The following waste is to be collected daily or stored in a refrigerated waste room until collection (refer to reference section Waste and Recycling Storage Area construction): • 50 litres of seafood, poultry, and/or meat waste in total each day of operating • Waste that contains 20 per cent fish, poultry or meat by weight or volume
5.9 Premises preparing food for wholesale distribution or retail should include waste separation systems within or in close proximity to the preparation area to allow for plastic and cardboard waste to be collected and handled separately from food waste. If within the preparation area, all waste is to be removed daily.
5.10 Waste oils should be kept separate from food and other wastes.

Based on review of the relevant requirements in Table 2.1, the following requirements have been identified for the Project:

- Dedicated 16 sqm storage area for storing bulky waste and problem waste for recycling
- Allowance for storage of return an earn containers under the NSW Container Deposit Scheme (CDS).
- An area for cardboard baler or compacter within the waste and recycling storage room
- Daily collection (if required) of seafood, poultry and/or meat waste

2.4.2 EPA (2012) Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities

This guide provides advice to help architects, developers, council staff and building managers to incorporate better waste management practice into the design, establishment, operation and ongoing management of waste services in commercial and industrial developments. This guide covers the many different situations in which waste and recyclable materials are generated, stored and collected in and from commercial and industrial buildings.

The key objectives of this guide are to:

- increase the consideration of waste management early in the building design process
- make collection of recyclables more efficient and effective
- improve waste minimisation and collection
- increase convenience for occupants and building managers
- increase the yield and quality of recyclable material
- reduce contamination in recyclable material.

2.5 Relevant building rating schemes for waste management

2.5.1 NABERs Waste

NABERS Waste measures how well a building manages waste generation, recycling and resource recovery, and supply chain management.

A NABERS Waste Rating is an independent benchmark of the recycling and resource recovery performance of an office building, expressed on a star rating scale. The Waste Rating assesses buildings on how well they separate and divert waste generated in the building into streams that can be re-used and recycled, and whether those materials are likely to go to a facility that will recover the materials.

The NABERS Waste rating is based on a buildings recycling rate:

$$Recycling\ Rate = \frac{total\ recycling\ weight}{total\ waste\ weight}$$

The calculation is also affected by two audit types:

- A contamination audit. This audit determines the weight of materials in a waste stream that have not been placed in the correct bin and would be placed in landfill at the next stage of the waste management process.
- A site density audit. This audit is used to convert the number of bins collected from a site into an estimated weight, in cases where weight data has not been provided.

The rating requires 12 months of operational data for all mandatory waste types – which includes general waste, dry waste, mixed recycling, cardboard, paper, organics and glass.

The office base building rating scale is as follows:

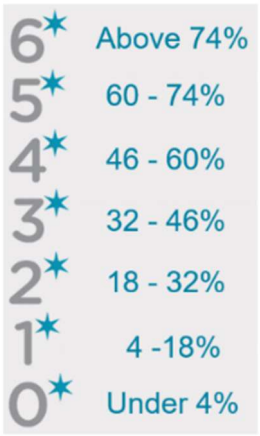


Figure 2.2 NABERS Waste – office base building rating scale

2.5.2 Green Star Design and As Built

Operational Waste - Credit 8

This credit aims to recognise projects that implement waste management plans that facilitate the re-use, upcycling or conversion of waste to energy, and stewardship of items to reduce the quantity of outgoing waste.

There are two options available in this credit: a 'Performance Pathway' that relies on specialised waste management solutions or a 'Prescriptive Pathway' that outlines specific best practice requirements – as described in Table 2.2. The Project will adopt a performance pathway. An Operational Waste Management Plan (OWMP) will be developed that details waste handling and separation of waste streams, dedicated storage areas and access to waste storage areas and collection points.

Table 2.2 Green Star Credit Criteria for Operational Waste

Credit	Pathway	Description
8A	Performance pathway: Specialist Plan	1 point is available where a waste professional prepares and implements an OWMP for the project in accordance with best practice approaches and this is reflected in the building's design
8B	Prescriptive pathway: Facilities	1 point is available where facilities are in place to collect and separate distinct waste streams, and where these facilities meet best practice access requirements for collection by the relevant waste contractor

2.5.3 LEED Credit

LEED v4.1 provides a rating system for the design, construction and operation of high-performance green buildings developed by the US Green Building Council (USGBC). The LEED levels of certification are:

- Platinum – 80 + points earned
- Gold – 60 – 79 points earned
- Silver – 50 -59 points earned
- Certified – 40 -49 points earned

Relevant LEED credits for waste management that apply to commercial interiors, retail and hospitality include:

Material and resource prerequisite: storage and collection of recyclables

The intent of the prerequisite is to reduce the waste that is generated by building occupants and transported to landfill for disposal. The projected waste generation for the project has been estimated as part of the assessment. A dedicated waste storage area for the Office, the Hotel and TOGA retailers would be provided for the collection and storage of the identified key waste streams. The LEED prerequisite requires separation and storage of at least the top four recyclable waste streams. The proposed waste storage room allows for segregation and storage of co-mingled recyclables, electronic waste, CDS eligible containers, organic waste, bulky and problem waste such as batteries.

Material and resource prerequisite: construction and demolition waste management planning

The intent of the prerequisite is to reduce construction and demolition waste disposed of in landfills through resource recovery, reuse and recycling materials. A construction and waste management plan is required to be developed that sets waste diversion goals and identifies at least five materials for diversion from landfill. The plan will also detail waste handling and management for the segregation and reuse of recyclable materials. Construction waste generation, waste types and handling has been described in section 4. A detailed Construction Waste Management Plan would be developed for the project that adopts the WARR Act principles.

Material and resource credit: construction and demolition waste management

There are two credit points available for construction and demolition waste management. There are two main options identified for the management approach; diversion (1-2 points) or reduction of total waste material (2 points). The options involves the diversion of at least 50% (1 point) to 75% (2 points) of the total construction and demolition material or recovery and reuse of 75% of demolition waste. The Construction Waste Management Plan would provide a detailed breakdown on the handling of construction and demolition waste.

3. Operational waste

3.1 Waste generation and classification

3.1.1 The Hotel

The Hotel includes food and beverage outlets, communal kitchen and commercial kitchen and office. The waste generating activities and expected key waste streams are identified in Table 3.1.

Table 3.1 Waste types - the Hotel

Activity	Waste stream	Likely waste classification
Operation of food and beverage outlets, communal and commercial kitchens	Food scraps	General solid waste (putrescible)
	Used cooking oils	Liquid waste
	Grease trap waste	
	Beverage and other containers (plastics, aluminium cans, steel cans, glass bottles, liquid paperboard cartons etc)	General solid waste (non-putrescible)
	Soft plastics and plastic wraps	
Hotel operation	Paper, cardboard and magazines	General solid waste (non-putrescible)
	Batteries	Hazardous waste
Hotel maintenance and cleaning	Light bulbs (LEDs)	General solid waste (non-putrescible)
	Electrical/ electronics	
	Batteries	Hazardous waste
	Cleaning products (.e.g. lubricants, oils)	Liquid waste
Garden maintenance	Garden organics (trimmings)	General solid waste (non-putrescible)
Hotel office operation	Paper and cardboard	General solid waste (non-putrescible)
	Printer/toner cartridges	
	Beverage and other containers (plastics, aluminium cans, steel cans, glass bottles, liquid paperboard cartons etc)	
	Soft plastics and plastic wraps	
	Food scraps	General solid waste (putrescible)
Hotel office maintenance and cleaning	Electrical/ electronics	General solid waste (non-putrescible)
	Office furniture	
	Light bulbs (LEDs)	
	Cleaning products (.e.g. lubricants, oils)	Liquid waste
	Batteries	Hazardous waste

Waste volumes

The total waste volumes were estimated based on expected generation rates as identified in the Council's Guidelines for Waste Management in New Developments. The relevant rates applied for the Hotel are presented in Table 3.2. The rates are based on data from the Commercial Waste Data Review commissioned by the City of Sydney (dated 22 February 2017).

Table 3.2 Basis of waste generation estimate - the Hotel

Component		Units	Source
YHA hotel floor area	8,015	sqm	Proposed concept design
Backpacker expected waste generation rate Landfill Comingled Organic	 30 30 20	L/100sqm/day	City of Sydney Guidelines for Waste Management in New Developments
YHA office floor area	600	sqm	Proposed concept design
Commercial office expected waste generation rate Landfill Comingled Organic	 15 25 5	L/100sqm/day	City of Sydney Guidelines for Waste Management in New Developments

The estimated waste generation volumes for the Hotel are summarised in Table 3.3 below.

Table 3.3 Waste volumes – the Hotel

Component	Landfill	Comingled	Organic	Total waste	Units
YHA hotel	2,405	2,405	1,603	6,412	L/day
YHA offices	90	150	30	270	L/day
Total Hotel	***2,495***	***2,555***	***1,633***	***6,682***	***L/day***

3.1.2 The Office

The Office levels are expected to generate typical office waste streams in addition to wastes from the commercial kitchen and food retailers. The waste types and waste classifications are summarised in Table 3.4

Table 3.4 Waste types - the Office

Activity	Waste stream	Likely waste classification
Operation of commercial kitchen for staff meals and retailers	Food scraps	General solid waste (putrescible)
	Used cooking oils	Liquid waste
	Grease trap waste	
	Beverage and other containers (plastics, aluminium cans, steel cans, glass bottles, liquid paperboard cartons etc)	General solid waste (non-putrescible)
	Soft plastics and plastic wraps	
	Paper and cardboard	
	Packing materials – e.g. packing foam, polystyrene, pallets	
Office operation	Paper and cardboard	General solid waste (non-putrescible)
	Batteries	Hazardous waste
Office operation	Paper and cardboard	General solid waste (non-putrescible)
	Printer/toner cartridges	
	Beverage and other containers (plastics, aluminium cans, steel cans, glass bottles, liquid paperboard cartons etc)	

Activity	Waste stream	Likely waste classification
	Soft plastics and plastic wraps	
	Food scraps	General solid waste (putrescible)
Office maintenance and cleaning	Light bulbs (LEDs)	General solid waste (non-putrescible)
	Electrical/ electronics	
	Office furniture	
	Batteries	Hazardous waste
	Cleaning products (.e.g. lubricants, oils)	Liquid waste
Garden maintenance	Garden organics (trimmings)	General solid waste (non-putrescible)

Waste volumes

The basis for the Office waste generation estimate is outlined in Table 3.5. The waste generation rates for the office area and retail space were based on the rates provided in the Council's Guidelines for Waste Management in New Developments. The estimate for organic waste is based on EPA (2012) 'Better Practice Guide for Waste Management and Recycling in Commercial and Industrial Facilities' waste generation rates for restaurants.

Table 3.5 Basis of waste generation estimate – the Office

Component		Units	Source
Atlassian office floor area	51,826	sqm	Proposed concept design
Commercial office expected waste generation rate Landfill Comingled Organic	 15 25 5	L/100sqm/day	City of Sydney Guidelines for Waste Management in New Developments
Commercial kitchen meal preparation floor area	7,120	meals/day	4,000 staff per day, 2 meal services per day and 89% consumption
Retail (general) floor area	401	sqm	Proposed concept design
Retail (general) expected waste generation rate Landfill Comingled Organic	 25 200 5	L/100m^2/day	City of Sydney Guidelines for Waste Management in New Developments
Retail (café) floor area	195	sqm	Proposed concept design
Retail (café) expected waste generation rate Landfill Comingled Organic	 100 500 100	L/100sqm/day	City of Sydney Guidelines for Waste Management in New Developments

The estimated waste volumes are summarised in Table 3.6 below.

Table 3.6 Waste volumes – the Office

Component	Landfill	Comingled	Organic	Total waste	Units
Atlassian offices floor area	7,774	12,957	2,591	23,322	L/day
Commercial kitchen	10,253	6,408	3,987	20,648	L/day
Retail (café)	195	975	195	1,365	L/day

Component	Landfill	Comingled	Organic	Total waste	Units
Retail (general)	49	390	10	449	L/day
Total Office	**18,270**	**20,730**	**6,783**	**45,783**	**L/day**

3.1.3 TOGA

The TOGA retail premises within the Adina Precinct on the lower ground area are expected to generate typical retail and café waste streams as identified in Table 3.7.

Table 3.7 Waste types – TOGA retailers

Activity	Waste stream	Likely waste classification
Operation of food and beverage outlets, communal and commercial kitchens	Food scraps	General solid waste (putrescible)
	Used cooking oils	Liquid waste
	Grease trap waste	
	Beverage and other containers (plastics, aluminium cans, steel cans, glass bottles, liquid paperboard cartons etc)	General solid waste (non-putrescible)
	Packing materials – e.g. packing foam, polystyrene, pallets	
	Paper and cardboard	
	Soft plastics and plastic wraps	
Retailer maintenance and cleaning	Light bulbs (LEDs)	General solid waste (non-putrescible)
	Cleaning products (.e.g. lubricants, oils)	Liquid waste

Waste volumes

The basis for the TOGA retailers waste generation estimate is outlined in Table 3.8. The waste generation rates for the food outlets and retail space were based on the rates provided in the Council's Guidelines for Waste Management in New Developments.

Table 3.8 Basis of waste generation estimate – TOGA retailers

Component		Units	Source
Retail (general) floor area	1,426	sqm	Existing floor area
Retail (general) expected waste generation rate Landfill Comingled Organic	 25 200 5	L/100sqm/day	City of Sydney Guidelines for Waste Management in New Developments
Retail (café) floor area	410	sqm	Existing floor area
Retail (café) expected waste generation rate Landfill Comingled Organic	 100 500 100	L/100sqm/day	City of Sydney Guidelines for Waste Management in New Developments

The estimated waste generation volumes are summarised in Table 3.9**Error! Reference source not found.** below.

Table 3.9 Waste volumes – TOGA retailers

Component	Landfill	Comingled	Organic	Total waste	Units
TOGA (general retail)	357	2,852	71	3,280	L/day
TOGA (restaurant/eating)	410	2,050	410	2,870	L/day
Total TOGA retailers	**767**	**4,902**	**481**	**6,150**	**L/day**

3.2 Waste storage and handling

The operation waste assessment is based on an indicative design prepared for the concept proposal, in order to demonstrate that the integrated development can satisfactorily accommodate the waste services requirements for the Hotel, the Office and TOGA retailers.

Core waste streams

Waste receptacles would be strategically located throughout the working floors of the Office, in guest rooms and in communal areas for source separation of garbage (general waste) and comingled recyclables. Recycling stations throughout the Office would promote further source separation of plastics and paper and cardboard. In communal and commercial kitchens, organics waste collection points would be established for food waste.

The cleaning contractor, retailer or Hotel staff would empty the receptacles periodically during the day and transfer the waste via the service elevators to the corresponding waste rooms located in the basement. The source separated waste streams would be segregated and placed into appropriate bins. The waste contractor would manually transfer mobile bins to the collection point for daily transfer of core waste streams to landfill for disposal or off site for further processing. There is an option to increase the frequency of collection of comingled recycling to twice daily to reduce compaction requirements.

Food waste

There are a number of small scale modular onsite food waste processing technologies and options available. Based on the estimated waste generation rate, provision for two organics processing units with a capacity of up to 1,100 kg per day has been allowed for within the proposed Office waste room. One unit would be installed initially but the system may be scaled up once organic waste quantities are confirmed. Organics processing options include anaerobic digestors, dehydrators, food macerators or rapid composter units.

Decomposers and dehydrators are scalable and rapidly decompose or dehydrate food waste by heating and agitating the waste over 24 hours. This can occur with or without the addition of bacterial starter cultures. They reduce the volume of food waste by removing most of the water it holds. They do not produce compost but only dehydrate waste. Generally these containers need a sewer connection to dispose of the waste water and/or a filter for the vapours vented to the air. This may require additional Council approval. Furniture and homewares retailer IKEA located in Richmond, Victoria implemented a food waste diversion program in April 2018. The enrich360 Program involves processing and reuse of food waste from the onsite café as fertiliser diverting over 80 tonnes of food waste from landfill. The program was found to reduce food waste by up to 93% which reduced food waste collection at the site to 2-3 days per week. The outputs from these unit would be sent to a lawful facility such as a commercial composting facility. The organic matter captured from these containers cannot be directly applied to land without an environment protection licence or a Resource Recovery Order and Resource Recovery Exemption.

Food macerators pulp food and store it in a tank at the source. They are commonly found in commercial premises and have the potential for use in residential buildings. When the tank is

full, the contents are collected by truck and taken to a treatment facility, such as an anaerobic digester.

On-site anaerobic digesters are systems that use bacteria to break down food waste in an oxygen-free environment. The resulting biogas that is produced during this process can be used as an on-site energy source. Although anaerobic digester technology isn't new, an on-site closed loop system to treat a building's food waste is a relatively new development in Australia. Some trials are currently underway across the country and viable systems will become more commonplace in the future.

The type and model of onsite organics processing units would be confirmed as part of detailed design.

CDS containers

Eligible containers for the NSW Container Deposit Scheme from the Office would be source separated, collected and temporarily stored in recycling bins in the Atlassian waste room. Adequate signage and training would be provided to provide education on eligibility criteria for beverage containers redeemable under the scheme. Containers must be empty, uncrushed and have the original label attached so that the barcode can be scanned and container counted.

The containers would be collected by a waste contractor and transferred off site to an automated counting and sorting centre. Eligible containers return a 10-cent refund. This would provide an ongoing revenue stream that can be donated to support local charities.

Bulky and problem waste

Storage space would be allocated within the waste rooms for bulky and problem waste storage in accordance with the spatial requirements set out by the Council's Guidelines for Waste Management in New Developments. These items would have a lower collection frequency than core waste streams. The caged area would allow for temporary storage of recyclable electronic goods, computers and computer screens, pallets and other bulky items.

Washroom facilities

A waste contractor would be engaged for collection of sanitary bins located in washroom facilities.

Green waste

Green waste generated by seasonal garden maintenance would be collected and managed by maintenance staff and transferred off site for disposal or for further processing.

Compaction and size reduction

Compactors are used to compress the waste into collection containers to reduce the volume. The bin compactors proposed for this Project typically achieve a compaction ratio of approximately 2:1. The number and size of the proposed bins assumes that each waste room will be equipped with a compactor for the landfill waste stream.

Based on the waste generation estimate for the Office as outlined in section 3.1.2, small scale compaction of recycled material is proposed. A baler would compress bulky materials such as cardboard and soft plastics and tie them into bales so that they remain compacted. In addition, a bin compactor would compress comingled recycling. This would reduce the storage capacity requirements for comingled recycling waste streams.

3.2.1 Storage requirements

The Hotel

Table 3.10 shows the number of bins required to store the estimated waste generated by the Hotel based on the following assumptions.

- Daily collection of core waste streams
- Collection by rear loader
- Source separation of core waste streams:
  - Comingled recycling
  - Paper (e.g. secure) and cardboard
  - Organics (food)
  - Landfill (general waste)
- Provision for sources separation of bulky and problem wastes (in accordance with City of Sydney Guidelines)
- Receptacles: 240 L MGBs for all Hotel waste streams
- Compaction of landfill waste

Table 3.10 Waste storage requirements – the Hotel

Bins	Waste type	Number of bins
240 L MGB	Landfill	7
	Comingled recycling	12
	Organics	8
	Total	**27**

Table 3.11**Error! Reference source not found.** outlines the space requirements for residual waste and recycling to accommodate the number of bins. Provision has been provided in the design for this space requirement.

Table 3.11 Waste and recycling space requirements – the Hotel

Waste storage room	Minimum storage area required	Unit
Bins area	11.5	sqm
Manoeuvring for 240 L MGBs	11.5	sqm
Bulky waste area	4.0	sqm
Compaction equipment (1 x 240 L bin compactor)	2.0	sqm
Total	**29.0**	**sqm**

The Office

Table 3.12 shows the number of bins required to store the waste generated by the Office based on the following assumptions.

- Daily collection of core waste streams with option for twice daily co-mingled recycling collection
- Collection by rear loader
- Source separation of core waste streams:
  - Comingled recycling
  - Paper (e.g. secure) and cardboard

– Organics (food)

– Landfill (general waste)

- Provision for sources separation of:

  – Bulky and problem wastes (in accordance with City of Sydney Guidelines)

  – Return and Earn eligible containers (in accordance with City of Sydney Guidelines)

- Receptacles:

  – 1100 L MGBs for Office landfill (general waste, paper, cardboard and comingled recycling) or smaller, and

  – 240 L MGBs for Office secure paper, and

  – 240 L for Office organics (food) or smaller

- Compaction:

  – Landfill waste bin compactor;

  – Comingled recycling bin compactor; and

  – Recycling baler for cardboard, soft plastics etc.

- Onsite food organics collection, onsite processing and subsequent offsite collection

Table 3.12 Waste storage requirements – the Office

Bin	Waste type	Number bins
240 L MGB	Landfill	2 (retail)
	Comingled recycling	4 (retail)
	Organics	2 (retail) + 15 (Office)
	Total	**23**
1,100 L MGB	Landfill	9
	Comingled recycling	9
	Organics	0
	Total	**18**

Table 3.13**Error! Reference source not found.** outlines the space requirements for residual waste and recycling to accommodate the number of bins. Provision has been made in the design for this space requirement.

Table 3.13 Waste and recycling space requirements – the Office

Waste storage room	Minimum storage area required	Unit
240 L MGBs bins area	9.8	sqm
Manoeuvring for 240 L MGBs	9.8	sqm
1100 L MGBs Bins area	30.7	sqm
Manoeuvring for 1100 L MGBs	30.7	sqm
Bulky and problem waste area	16	sqm
Baler	2	sqm
Onsite organics processing	35	sqm
Return and earn (allowance)	3	sqm
1,100 L bin compactor	7	sqm
Total	**143.3**	**sqm**

TOGA Retailers

Table 3.14 shows the number of bins required to store the waste generated by the TOGA retailers based on the following assumptions.

- Daily collection of core waste streams
- Collection by rear loader
- Source separation of core waste streams:
  - Comingled recycling
  - Paper (e.g. secure) and cardboard
  - Organics (food)
  - Landfill (general waste)
- Provision for sources separation of:
  - Bulky and problem wastes (in accordance with City of Sydney Guidelines)
  - Return and Earn eligible containers (in accordance with City of Sydney Guidelines)
- Receptacles: 240 L MGBs for all TOGA waste streams
- Compaction of landfill waste only.
- Collection of organics for offsite processing

Table 3.14 Waste storage requirements – TOGA retailers

Bin	Waste Type	Number bins
240 L MGB	Landfill	2
	Comingled recycling	21
	Organics	3
	Total	**26**

Table 3.15**Error! Reference source not found.** outlines the space requirements for residual waste and recycling to accommodate the number of bins. Provision has been made in the design for this space requirement.

Table 3.15 Waste and recycling space requirements – TOGA retailers

Waste storage room	Minimum storage area required	Unit
Bins area	11.1	sqm
Manoeuvring for 240 L MGBs	11.1	sqm
Compaction (1 x 240L bin compactor)	4.0	sqm
Total	**26.2**	**sqm**

3.2.2 Access and waste collection

All waste storage estimates and bin sizing is based on the assumption of daily collection of core waste streams. Other waste stream collection frequencies are expected to be lower and would be reviewed on an ongoing basis.

Assumed collection frequencies for each waste stream are shown in Table 3.16.

Table 3.16 Waste collection frequencies

Waste stream	Collection frequency – Hotel	Collection frequency – Office	Collection frequency – TOGA
Landfill	Daily	Daily	Daily
Comingled recycling	Daily	Daily	Daily
Organic	Daily	Daily	Daily
CDS eligible containers	Weekly	Weekly	Weekly
Processed food waste	Weekly	Weekly	Weekly
E-waste	As required	As required	As required
Bulky and problem waste	As required	As required	As required

Collection vehicle required to service core waste streams are required to be compatible with 240 L MGBs and 1,100 L MGBs. Collection vehicle details are outlined in Table 3.17, with associated dimensions and clearance requirements. The dimensions and clearance distances identified are in line with the typical dimensions for rear loading vehicles in the City of Sydney Guideline for Waste Management in New Developments.

Table 3.17 Collection vehicle details

Waste stream	Bin type	Collection vehicle	Dimensions and clearance
Landfill	240 L MGB	Rear loading vehicle	Maximum length: 10 m
Comingled recycling	1,100 L MGB		Width: 2.6 m
Organic	240 L MGB		Travel height: 3.8 m
CDS eligible containers	1,100 L MBG Recycling cage		Turning circle radius: 10.5 m Maximum vertical clearance during loading: 4.0 m
Processed food waste	22 L Envirocrate	Truck / van	Maximum length: 10 m Maximum height: 4.0 m
E-waste	Designated storage area		
Bulky waste			

The waste storage rooms would be located on basement level B2 and accessed via service lifts. The Atlassian and YHA waste rooms are located within 10 metres of their corresponding service lifts. The TOGA retailers waste room is located approximately 15 metres from the TOGA service lift. The TOGA retailers waste room is located such that there is no requirement to transfer bins across the link zone.

Lightweight roller shutter doors are proposed for the waste rooms in addition to a close-fitting and self-closing door so that waste collectors can access the waste room other than through the roller door. An access pathway connects the collection point and waste storage rooms.

There are three parking bays available on basement level B2 for medium rigid vehicle for waste collection. In addition, there is a small rigid vehicle space available outside the YHA waste room for waste collection. A two metre clearance would be available between the parking space and wall for loading of the bins where collection vehicles reverse into the parking space. There is no allocated bin storage area within the loading zone, therefore bins would be returned to the relevant waste room once unloaded. Manoeuvring and turning of vehicles has been considered in the traffic impact assessment.

A vehicle turn table would be installed during the first stage of the development that would allow for entry and exit of the collection vehicles in a forward direction.

3.3 Management

3.3.1 Responsibilities

The cleaning contractor / Hotel cleaning staff / TOGA retailer would be responsible for:

- Operation and general maintenance of waste equipment and storage areas;
- Collection of waste and transfer to the waste room via the services lift; and
- Operation of the food waste processing equipment and audit of the incoming food waste. (the Office only).

The waste contractor would be responsible for:

- The transfer of bins to and from the waste to the collection point;
- Transport of the waste streams off site for disposal or further processing; and
- Waste monitoring, reporting and audits

3.3.2 Signage

Clear and easy to read standard signage on how to use the waste management system and what material are acceptable in the recycling and organics bins would be posted in the waste room, kitchens and at recycling stations on each floor.

Adequate signage identifying the central waste storage rooms and e-waste/bulky waste storage areas are also to be prominently displayed. All waste receptacles are to be clearly and correctly labelled to identify which materials are to be placed in which bin and colour-coded in accordance with the Australian Standard 4123: Mobile Garbage Containers. 'DANGER' warning signs and other appropriate Workplace Health and Safety (WHS) signage are displayed where balers and compactors operate.

3.3.3 Stakeholder engagement

The waste contractor would facilitate engagement with stakeholders to provide training and education to cleaning contractors and tenants. Useful tools for engagement with tenants include:

- Educational videos playing in lifts
- Cleaner toolbox sessions
- Foyer displays
- Newsletters, and
- Education sessions.

3.3.4 Waste audits

It is recommended that the waste contractor would submit monthly reports on waste equipment and volumes for the Project. Regular review of waste collection data will assist to optimise waste collection frequency and timing.

4. Construction waste

4.1 Waste generation and classification

A preliminary construction programme is provided in the Preliminary Construction Management Plan for the project. Key waste generating activities and likely waste types are identified in Table 4.1.

Table 4.1 Construction waste types

Activity	Waste stream	Likely waste classification
Stage 1 - Enabling works and shed disassembly (Q2 2021 – Q3 2021) Disassembling of existing YHA Shed and other heritage items per the heritage strategy General decommissioning and demolition works	Construction and demolition waste: Concrete Metal Glass Plastics Paper Bricks Timber Asphalt waste Internal fit out materials (plasterboard, tiles etc)	General solid waste (non-putrescible)
	Asbestos waste Synthetic fibre waste Lead paint and lead dust	Hazardous waste
Stage 2 – Dive structure and earthworks (Q3 2021 – Q4 2021) Demolition of existing upper ramp to TOGA's basement Piling and bulk earthworks for construction of the dive ramp and substructure Dewatering of the site if required	Construction and demolition waste: Concrete Metal Glass Plastics Paper Bricks Timber Asphalt waste	General solid waste (non-putrescible)
	Virgin excavated natural material (VENM) / Excavated natural material (ENM)	
Stage 3 – Podium structure (Q4 2021 – Q2 2022) Detailed excavation work for basements and link zone construction	Contaminated soils	Hazardous waste / restricted solid waste / general solid waste (non-putrescible)
	Asbestos waste Synthetic fibre waste Lead paint and lead dust	Hazardous waste

Activity	Waste stream	Likely waste classification
Demolition of current overhead slab at Henry Deane Plaza	Wastewater from dewatering activities (if required)	Liquid waste
Stage 4 – Tower Structure and Stage 5 – Fit out commissioning and completion (Q2 2022 – Q4 2024) Excess construction materials	Construction and demolition waste: Concrete Metal Glass Plastics Paper Bricks Timber	General solid waste (non-putrescible)
Operation and maintenance of site office and amenities	Food scraps	General solid waste (putrescible)
	Paper and cardboard Beverage and other containers (plastics, aluminium cans, steel cans, glass bottles, liquid paperboard cartons etc) Printer/toner cartridges Soft plastics and plastic wraps	General solid waste (non-putrescible)
	Batteries	Hazardous waste
Site office maintenance and cleaning	Electrical/electronics Light bulbs (LEDs) Office furniture	General solid waste (non-putrescible)
	Cleaning products (.e.g. lubricants, oils)	Liquid waste

The majority of extracted material would be generated during Stage 2 works in Q3 to Q4 2021. The expected material quantities are outlined in Table 4.2.

Table 4.2 Estimated spoil volumes

Material	Volume extracted
General solid waste	2,700 m^3
Restricted solid waste	2,700 m^3
Hazardous waste	600 m^3
Virgin excavated natural material (VENM)/ Excavated natural material (ENM)	24,000 m^3

4.2 Waste storage and handling

Construction waste storage and handling would be the responsibility of the Contractor. General procedures for waste management during construction are outlined below.

Bulk earthworks

Excavators would be used for the bulk excavation works to construct the substructure. Spoil would be sampled, analysed and characterised according to the Waste Classification Guidelines: Part 1 Classification of Waste (NSW EPA, 2014). Appropriate controls would be in place for the handling and segregation of spoil material classified as restricted solid waste or

hazardous waste in accordance with the Remedial Action Plan (RAP). This material would be disposed of to a licenced facility. VENM and ENM extracted during construction would be transferred off site for reuse or further processing.

Extracted materials will be segregated to prevent cross contamination. Stockpiles will be managed to contain sediment laden runoff during wet weather periods through implementation of appropriate sediment and erosion control measures.

Space for stockpiling on site is limited, excess spoil would be transferred directly from site by dump trucks as soon as truck turn around can be achieved. The dump trucks would enter and exit the site via Ambulance Avenue.

Demolition

During demolition works, construction and demolition wastes would be separated from materials identified as hazardous waste by excavator where possible. The recoverable waste would be transferred off site to a recycling facility. Heritage items would be handled in accordance with the conservation management plan (CMP).

Hazardous waste encountered during the works will be managed in accordance with the RAP.

Construction and fit out

During Stage 4 and 5 construction materials would be delivered to site via Ambulance Avenue and the dive ramp. Any excess materials generated on site would be segregated using different skip bins for recycling and waste with separate bins for difference recyclable materials. The waste materials would be removed from site to appropriately licenced facilities.

Site office and amenities

Office waste including food scraps, co-mingled recyclable material would be stored in receptacles located throughout the site office. The waste would be collected by an authorised waste contractor and recycled off site. Residual waste that cannot be recycled would be collected and transported off site for disposal at a licenced waste facility.

4.3 Management

During construction, waste generated on site would be managed and minimised by a combination of waste planning and on site controls.

4.3.1 Waste planning

Waste planning activities would include:

- Designing the building to minimise on site cutting of components, and maximising on site assembly tasks
- Careful ordering of materials such as sand and building products to match quantities with amounts required, and on time ordering rather than having materials stored on site for months before being used
- Segregating materials and providing weather protection for stored materials on site, to maximise their fitness for use
- Identification of recycling opportunities for construction and demolition waste
- Encouraging bulk handling and use of reusable and returnable containers
- At the time of tendering, advise contractors and sub-contractors and suppliers of the requirements to minimise waste on site

- Include provision in the tender documentation for the client to monitor the use of waste and recycling bins on site
- Development of a Construction Waste Management Plan by the main site contractor, which includes all of the above elements

4.3.2 Onsite controls

On site controls would include:

- Implementation by the main site contractor of the Construction Waste Management Plan
- Segregating wastes generated on site, using different skip bins for recycling and waste, with separate bins for different recyclable materials
- Discussion about the site's waste management and recycling policies and practices with employees and subcontractors during site inductions and tool box talks
- Ensuring all waste disposal bins are clearly marked
- Keeping records of quantities of waste and recycled materials disposed of, and the destinations of these materials
- Ensuring that wastes are only disposed to licenced facilities

5. Mitigation measures

The following mitigation measures would be implemented to manage waste generated by construction and operation of the development.

- Detailed design would include measures to minimise quantities of waste requiring off site disposal including minimising volume bulk excavations, careful procurement of construction materials to minimise excess waste materials.
- A Construction Waste Management Plan would be developed and implemented. The plan would adopt the waste management hierarchy principles contained in the *Waste Avoidance and Resource Recovery Act 2001* and will detail processes, responsibilities and measures to manage waste and minimise the potential for impacts during construction.
- All waste disposal would be in accordance with the NSW EPA Waste Classification Guidelines and the RAP.
- A detailed Operational Waste Management Plan would be developed and implemented that incorporates the requirements of relevant guidance documents, waste management hierarchy principles and details waste handling and storage procedures, responsibilities and management measures.

6. Environmental risk assessment

Risk comprises the likelihood of an event occurring and the consequences of that event. For the proposal, the following descriptors were adopted for 'likelihood' and 'consequence'.

Table 6.1 Risk descriptors

Likelihood		Consequence	
A	Almost certain	1	Widespread and/or irreversible impact
B	Likely	2	Extensive but reversible (within 2 years) impact or irreversible local impact
C	Possible	3	Local, acceptable or reversible impact
D	Unlikely	4	Local, reversible, short term (<3 month) impact
E	Rare	5	Local, reversible, short term (<1 month) impact

The risk levels for likely and potential impacts were derived using the following risk matrix.

Table 6.2 Risk Matrix

	LIKELIHOOD					
CONSEQUENCE		A	B	C	D	E
	1	High	High	Medium	Low	Very Low
	2	High	High	Medium	Low	Very Low
	3	Medium	Medium	Medium	Low	Very Low
	4	Low	Low	Low	Low	Very Low
	5	Very Low	Very Low	Very Low	Very Low	Very Low

The key risks for the Project relating to waste management are summarised in Table 6.3.

Table 6.3 Environmental risk assessment

Aspect	Potential impact	Likelihood	Consequence	Risk rating	Mitigation measures	Residual risk rating
Generation of waste, including demolition, excavation and handling during construction	Energy and water consumption associated with packaging Environmental impacts associated with generation and handling on site, including dust, odour, sediment laden/contaminated runoff, leachate generation and noise	B	3	Medium	Preliminary investigation to likely extracted materials to inform material handling requirements Stockpile management and sediment and erosion control measures	Low (D3)
Storage and segregation of waste on site during construction	Sediment laden/contaminated runoff and leachate generation Odours and dust Health and safety of site personnel and neighbouring community Windblown litter Site access restrictions Cross contamination of wastes Reduction in reuse of materials Contamination of recycling facilities	B	3	Medium	Stockpile management and sediment and erosion control measures Security fencing would be installed to restrict public access to the site. Segregation of construction and demolition waste types using dedicated storage areas and labelled bins	Low (D3)
Storage and segregation of waste during operation	Odours Cross contamination of waste streams Contamination of recycling facilities/landfills	C	4	Low	Waste rooms would be ventilated Collection of organic waste would be daily Staff training on waste source separation Waste receptacles and bins would be clearly labelled Regular waste audits Allowance for storage, compaction equipment and manoeuvring space in waste rooms	Low (D4)

Aspect	Potential impact	Likelihood	Consequence	Risk rating	Mitigation measures	Residual risk rating
Storage and disposal of liquid and/or contaminated waste during construction and operation	Odours Contamination of soils, groundwater and surface water	C	2	Medium	During construction hazardous waste and restricted solid waste would be handled in accordance with the RAP All wastes would be stored within the dedicated waste rooms and segregated to prevent cross contamination	Low (D2)
Waste transportation during construction and operation	Dust, noise, traffic and odours Mud tracking on road	B	4	Low	Sediment and erosion control measures during construction One main entrance to the site from Ambulance Avenue during construction Dedicated loading zones for waste collection located next to waste rooms during operation	Low (C,4)
Non-classified or incorrectly classified waste transport and disposal	Regulatory non-compliance Contamination of recycling facilities/landfills Contamination of soils, groundwater and surface water	C	3	Medium	Waste classification would be in accordance to the Waste Classification Guidelines: Part 1 Classification of Waste (EPA, 2014) Regular waste audits	Low (D3)
Unlicensed waste contractors transporting waste	Regulatory non-compliance Potential illegal dumping of waste	C	2	Medium	Licensed waste contractor to be identified in Construction Waste Management Plan and Operational Waste Management Plan	Low (D,2)

7. References

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