Waste & Recycling Management Plan

NSW Rugby League Centre of Excellence

Site 18, Dawn Fraser Avenue, Sydney Olympic Park

Report Number 610.16480

20 October 2016

NSW Rugby League (NSWRL) c/- JBA

173 Sussex Street

Sydney NSW 2000

Version: v1.1

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Site 18, Dawn Fraser Avenue, Sydney Olympic Park

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
610.16480	v1.1	20 October 2016	Tanya Henley I-hui Waung	Alan Dyer	Alan Dyer

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1 INTRODUCTION

1.1 Project Background

NSW Rugby League propose to develop Site 18 at Sydney Olympic Park into the NSW Rugby League (NSWRL) Centre of Excellence. The development will be the headquarters for Rugby League in NSW accommodating the administrative functions of the NSWRL and high performance pathway preparation facilities for players.

The project is jointly funded by grants from the NSWRL and the Sydney Olympic Park Authority (SOPA).

The project was declared to be State Significant Development (SSD). Assessment and approval is being pursued in accordance with the EP&A Act. The Secretary's Environmental Assessment Requirements (SEARs) for the project have been issued and set out the environmental assessment requirements for the project.

This Waste & Recycling Management Plan (WMP) has been prepared by SLR Consulting Australia Pty Ltd (SLR) to address the relevant SEARs in relation to the preparation of the EIS for the Project.

1.2 Secretary's Environmental Assessment Requirements

A Request for SEARs relating to the form and content of the EIS was submitted to the NSW Department of Planning and Environment (NSW DP&E) in July 2016. The SEARs were subsequently issued by the DP&E on 1 August 2016 (SSD 7745).

Table 1 presents the key waste management issues to be addressed in the EIS, and identifies where each requirement is addressed in this WMP.

Table 1 SEARs for the Proposed Development (SSD 7745)

Sections of Relevance to Waste Management	Relevant Section
3. Design excellence and built form: Detail how services, including but not limited to, waste management, loading zones, utilities and mechanical plant are integrated into the design of the development.	Section 6.7
5. Ecologically Sustainable Development (ESD): • Detail how ESD principles…will be incorporated in the design, construction and ongoing operation phases of the development; • Describe the measures to be implemented to minimise consumption of resources…	Section 5.5 to 5.12 Section 6.9 to 6.13
6. Major Events: • Adequately address the impact of major events as it relates to the proposed development (SOP Major Event Impact Assessment Guidelines); • Demonstrate that the proposed development and future operation will function without adverse impacts on amenity when in major event mode. This will require a clear understanding of the major event operating mode and implications…for the development;	Section 6.8.2
14. Construction Impacts: Provide a draft construction management plan, with consideration of likely impacts and associated management / mitigation measures, such as in relation to construction phasing,...disposal / reuse of excavation materials….;	Section 5
Additional items addressed within this WMP:	
Details of the quantities and classification of waste streams to be generated on site, in accordance with the current *EPA's Waste Classification Guidelines*.	Section 5.2 to 5.4 Section 6.2 to 6.4
Details of waste storage, handling and disposal.	Section 5.7 and Section 6.7
Details of the measures to be implemented to ensure the development is consistent with the aims, objectives and guidance in the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*.	Section 5.5 to 5.6 Section 6.9 to 6.10

1.3 Scope

This WMP applies to the construction and on-going operation of the proposed development. The minimum standards of this WMP must be implemented during all stages of the development, and may be subject to review upon expansion or changes in operational procedures.

- See Section 5 for the Construction WMP.
- See Section 6 for the Operational WMP.

1.4 Objectives

The principal objective of this WMP is to identify all potential wastes likely to be generated at the site during development and operational phases of the project, including a description of how waste would be handled, processed and disposed of (or re-used/recycled), in accordance with SEARs.

The specific objectives of this WMP are as follows:

- To encourage the minimisation of waste production and maximisation of resource recovery.
- To ensure efficient storage, access, collection of waste and quality design of facilities.
- To ensure the appropriate management of contaminated/hazardous waste.
- To ensure the appropriate management of medical/clinical or related waste.
- To identify procedures and chain of custody records for waste management.
- To assist in ensuring that any environmental impacts during the operational life of development comply with the development consent conditions and the conditions of other relevant regulatory authorities as outlined in the SEARs.

1.5 Environmental Guidelines for Sydney Olympic Park (SOPA 2008)

The Environmental Guidelines (2008) outline SOPA's commitment to the principles of Ecological Sustainable Development (ESD) and have been referred to during the preparation of this WMP.

SOPA aims to minimise waste from all new developments and activities, maximum use of recycled materials and promote a reduction in the amount of solid waste going to landfill.

SOPA's current waste management approach focuses on (in order of priority):

- reducing the creation of waste;
- reuse of waste; and
- recycling of any remaining wastes (where possible).

SOPA's waste management objectives for new developments are summarised as follows:

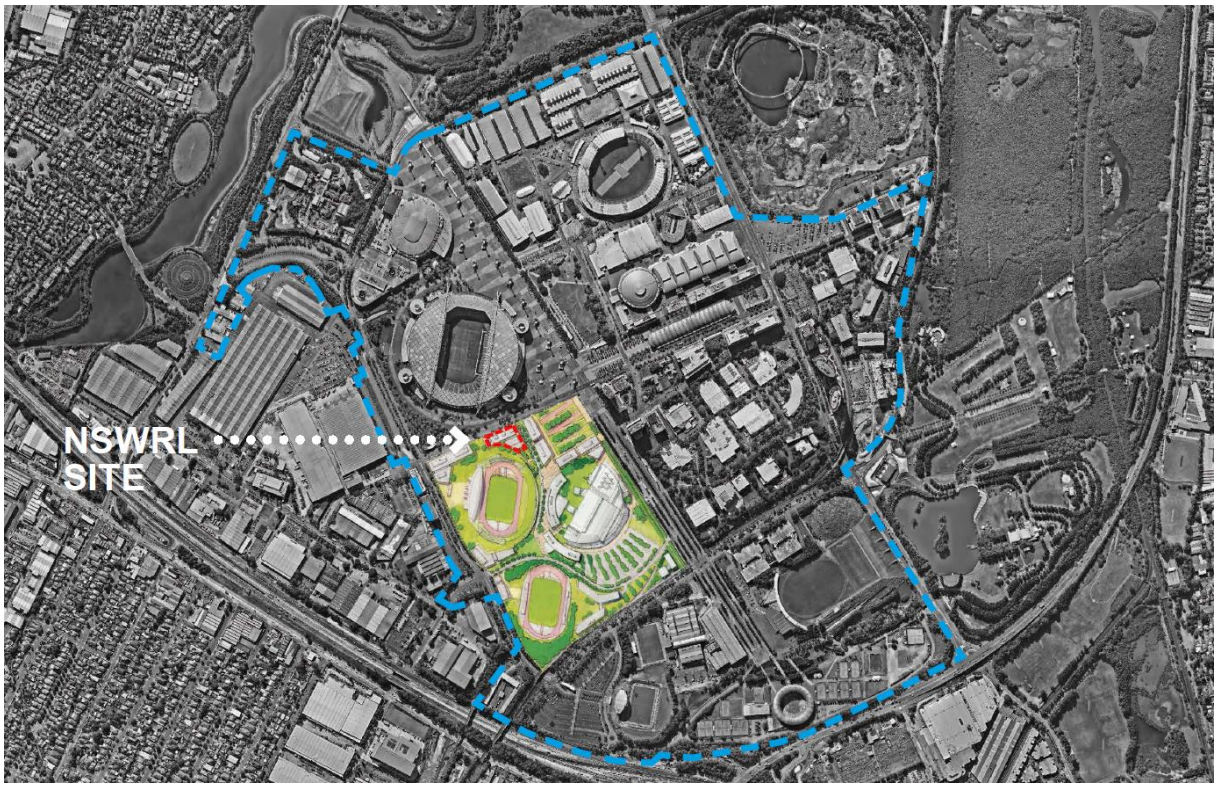
- Establish waste management performance and recycling targets throughout design, construction and operational activities, including a minimum of 80% of construction and demolition (C&D) waste to be recycled or re-used for each development.
- Encourage service providers to minimise where practical the packaging of foodstuffs for visitor consumption, and use non-toxic, recyclable, and biodegradable packaging and materials for their products.
- Educate visitors and workers on waste minimisation and management issues, working in cooperation with venues and businesses to minimise waste and maximise recycling.
- Maximise appropriate opportunities to improve the sustainability of leachate treatment and disposal methods.

2 PROJECT DESCRIPTION

2.1 Subject Site

Site 18 is located on the southern side of Dawn Fraser Avenue, midway between Olympic Boulevard and Edwin Flack Avenue at Sydney Olympic Park. It is legally described as Lots 64 and 66 in DP 1191648. The site is located in the southern portion of Sydney Olympic Park, within the Sports and Education Precinct (see **Figure 1**).

Figure 1 Site Location



Source: Populous 2016

2.2 Proposed Site Layout

The main building area will comprise approximately 2,157 m^2 and include the following components:

- Ground Floor:
  - Reception, café, museum and retail tenancy;
  - Medical, physiotherapy and drug testing facilities;
  - Change rooms, hydrotherapy area, gym; and
  - Loading dock.
- First floor:
  - Press conference room and supporting facilities;
  - Players, coaches and officials change rooms and lounges;
  - Kitchen and dining room; and
  - Sports science partner and gym mezzanine areas.
- Second floor:
  - Offices, including meeting rooms and administration facilities.

The development will employ approximately 105 people, however this will vary throughout the year due to the seasonal nature of rugby league. Visitors to the centre will vary significantly.

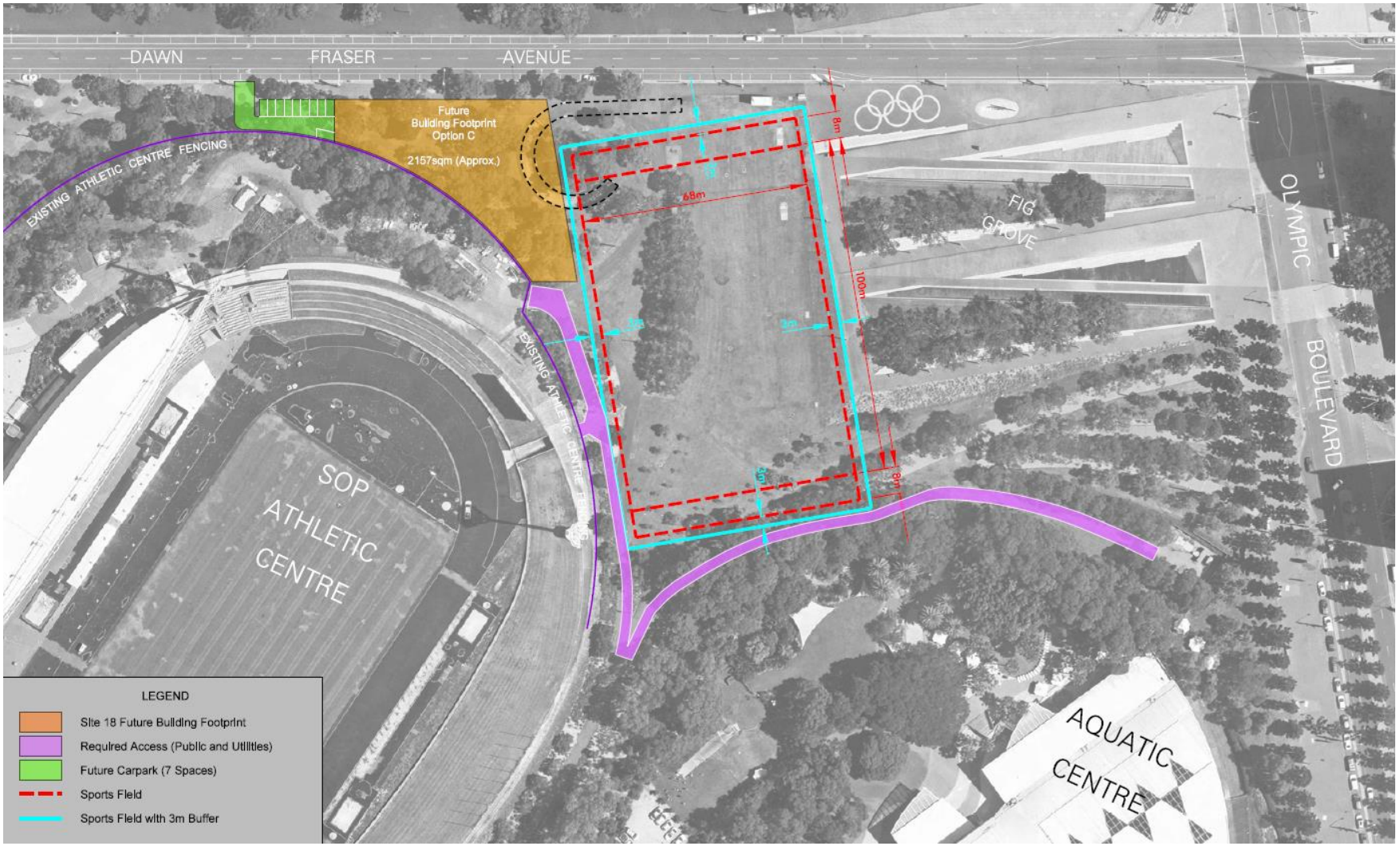
In addition, an elite playing field adjacent to the building site is currently under consideration by SOPA. However, this playing field does not form part of the scope of this WMP.

See **Figure 2** overleaf for a site layout plan.

2.3 Operational Hours

The proposed operational hours for the site are Monday to Friday, 8 am to 6 pm. However, extended hours and weekend work will be required to support regular special events such as match days.

Figure 2 NSWRL Site Layout



Source: Populous 2016

3 BETTER PRACTICE FOR WASTE MANAGEMENT AND RECYCLING

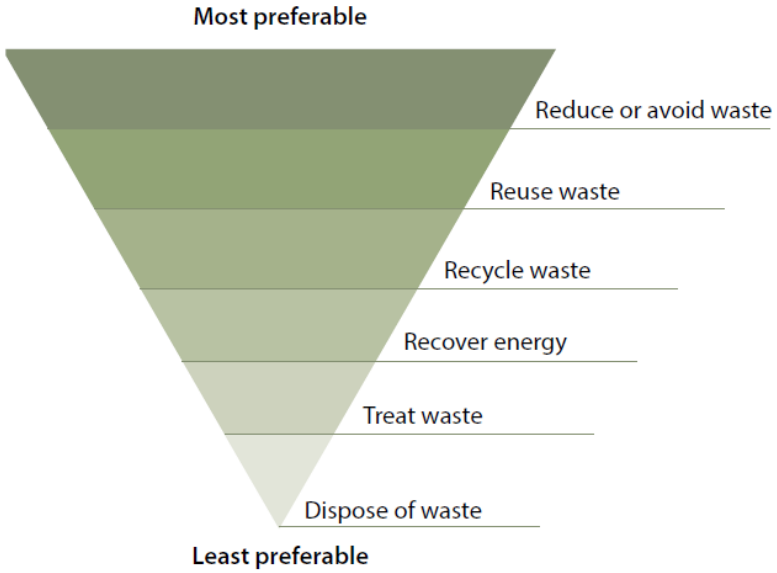
3.1 Waste Management Hierarchy

Where appropriate, this WMP aims to meet the principles of the waste management hierarchy, by promoting waste as a resource through the following in order of preference:

- Waste avoidance through prevention or reduction of waste generation. Waste avoidance is best achieved through better design and purchasing choices.
- Waste reuse, without substantially changing the form of waste.
- Waste recycling through the treatment of waste that is no longer usable in its current form to produce new products.
- Energy recovery through thermal treatment of residual waste materials and from green waste processing.
- Waste disposal, in a manner that causes the least harm to the natural environment.

The waste hierarchy pictured below demonstrates a classification of waste management options in order of their environmental impacts, as established under the Waste Avoidance and Resource Recovery Act 2001.

Figure 3 Waste Hierarchy



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

3.2 Benefits of Implementing Better Practice for Waste Management and Recycling

- Enhanced social and environmental reputation of an organisation.
- Reduced costs associated with waste disposal.
- Benefits to all stakeholders and the wider community.
- Improved environmental, health and safety, and biosecurity outcomes.

4 WASTE LEGISLATION AND GUIDANCE

The legislation and guidance outlined in **Table 2** below should be referred to during the construction and operational phases of the development.

Table 2 Waste Legislation and Guidance

Legislation	Objectives
Waste Avoidance and Resource Recovery Act 2001	To promote extended producer responsibility in place of industry waste reduction plans with specific objectives including: • To encourage efficient use of resources. • 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. • To ensure that industry shares with the community the responsibility for reducing and dealing with waste. • To ensure the efficient funding of waste and resource management planning, programs and service delivery.
Protection of the Environment Operations Act (POEO) 1997 & Amendment Act 2011	Administered by the NSW Environmental Protection Authority (EPA) to enable the Government to establish instruments for setting environmental standards, goals, protocols and guidelines. *Important Note: The owner of a premises, the employer or any person carrying on the activity which causes a pollution incident is to immediately notify the relevant authorities when material harm to the environment is caused or threatened.* A list of each relevant authority is provided in the POEO Amendment Act and will be noted in the site's incident register.
POEO (Waste) Regulation 2014	Contains provisions relating to the waste levy, waste tracking and management requirements for certain waste types, payment schemes for councils, consumer packaging recycling and other miscellaneous provisions.
EPA's Waste Classification Guidelines (Part 1) 2014	To assist waste generators to effectively classify, 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 and is associated regulations.
Secretary's Environmental Assessment Requirements (SEARs) and State Environmental Planning Policies (SEPPs)	Including: • SEPP (State and Regional Development) 2011 • SEPP (Major Development) 2005; • SEPP (Infrastructure) 2007; • SEPP No. 55 – Remediation of Land; • Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005; and • NSW State Priorities (Litter Control).
Sydney Olympic Park Authority (SOPA) guidance as appropriate to this WMP	Sydney Olympic Park Master Plan 2012; Sydney Olympic Park Major Event Impact Assessment Guidelines; Sydney Olympic Park Urban Elements Design Manual; and Sydney Olympic Park Environmental Guidelines.
Auburn Council Development Control Plan (DCP) 2010	Council's DCP includes a dedicated Waste Part. Council's objectives are to ensure the efficient storage, access and collection of waste and quality of design of facilities, and that the principles of the waste hierarchy and ESD are incorporated.
EPA's Waste Avoidance and Resource Recovery (WARR) Strategy 2014-21	A key component of the State Government's vision for the environmental and economic future of the state that will be supported financially by the *Waste Less, Recycle More* funding initiative providing long-term targets for key result areas.
NSW EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012	The Better Practice Guidelines (EPA 2012) encourages efficient waste minimisation and resource recovery for commercial and industrial facilities and is used as a benchmark document when assessing waste production rates within Australia and details a range of waste management provisions.
Building Code of Australia (BCA) and relevant Australian Standards (AS)	The BCA (and AS) have the aim of achieving nationally consistent, minimum necessary standards of relevant health and safety, amenity and sustainability objectives efficiently.
Australian Packaging Covenant (APC)	Planned retail for the site should be encouraged to establish an Action Plan to demonstrate their contribution to the achievement of the APC's goals.

5 CONSTRUCTION WASTE MANAGEMENT

Demolition and construction stages of developments have the greatest potential for waste minimisation.

Key site preparatory and construction activities are outlined below:

- excavation of top soil from the site footprint;
- site infrastructure development;
- construction of new buildings, structures and roofing; and
- landscaping and refurbishment works.

5.1 Targets for Resource Recovery

The performance of each development contributes to overall NSW State recycling targets, which for the construction and demolition (C&D) sector, is 75% (increasing to 80% by the year 2021) of total C&D waste recycled (see NSW WARR Strategy 2014-21).

SOPA's Environmental Guidelines (2008) set a minimum target of 80% of C&D waste to be recycled or re-used for each development.

Waste minimisation measures that can be implemented to assist in achieving this resource recovery target are provided in the following sections. Waste audits will determine the actual percentage of wastes that were recycled and disposed of at landfill during the Project.

5.2 Waste Streams and Classifications

The construction phase of the development will generate the following broad waste streams:

- top soil and excavation materials;
- construction wastes;
- plant maintenance waste;
- packaging waste;
- work compound (on-site employee) waste; and
- sewage and waste water. (Note: Construction wastewater is not quantified in this WMP.)

Potential waste types along with their waste classification are provided in **Table 3**.

For further information on how to determine a waste's classification, refer to the Waste Classification Guidelines (EPA 2014).

Table 3 Potential Waste Generation with Classifications

Waste Types	NSW Classification	Proposed Reuse / Recycling / Disposal Method
Site Preparatory and Construction		
Cleared vegetation	General solid (non-putrescible) waste	Re-use / replanting on site, reuse for similar projects and/or disposal for composting at landfill
Excavated material (VEMN, EMN)	General solid (non-putrescible) waste	Reuse on-site where possible or reuse for similar projects. Sandstone may be incorporated in design or sold.
Sediment fencing, geotextile materials	General solid (non-putrescible) waste	Reuse at other sites where possible or disposal to landfill
Concrete (solids and washouts) and asphalt	General solid (non-putrescible) waste	Reuse on-site where possible or recycled off-site
Steel reinforcing, other metal (eg wire mesh)	General solid (non-putrescible) waste	Off-site recycling
Conduits and pipes	General solid (non-putrescible) waste	Off-site recycling
Timber / timber formwork	General solid (non-putrescible) waste	Reuse on-site or off-site recycling
Metals and bulk electrical cabling	General solid (non-putrescible) waste	Off-site recycling
Plasterboard	General solid (non-putrescible) waste	Off-site recycling or disposal
Bricks	General solid (non-putrescible) waste	Off-site recycling
Glass	General solid (non-putrescible) waste	Off-site recycling
Light bulbs	Hazardous waste	Off-site recycling
Plant Maintenance		
Empty oil and other drums / tins (e.g. fuel, chemicals, paints, spill clean ups)	Hazardous waste if the containers were previously used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and from which residues have not been removed by washing or vacuuming. General solid (non-putrescible) waste if the 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 Sydney Water.)[1]
Batteries	Hazardous waste	Off-site recycling
Packaging		
Packaging materials, including wood, plastic (including stretch wrap or LLPE), cardboard and metals	General solid (non-putrescible) waste	Off-site recycling
Wooden crates	General solid (non-putrescible) waste	Reused for similar projects, returned to suppliers, or off-site recycling
Work Compound and Associated Offices		
Recyclable beverage containers	General solid (non-putrescible) waste	Recycling at off-site licensed facility
Clean paper and cardboard	General solid (non-putrescible) waste	Recycling at off-site licensed facility
General domestic waste generated by workers (soiled paper and cardboard, food stuffs, polystyrene)	General solid (non-putrescible) waste mixed with putrescible waste	Disposal at landfill
Pump-out waste and septage (sewage)	Liquid (trade) waste	Off-site disposal at licensed facility or disposal direct to sewer where arranged with Sydney Water.

Note 1: Source: http://www.environment.nsw.gov.au/waste/envguidlns/index.htm

5.3 Construction Waste Generation Rates

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

Excavated materials will be estimated assuming the below:

Table 4 Assumed Material Generation Rates - Earthworks

Waste Material	Estimated Waste %	Volume/Weight Ratios (tonnes per m^3)
Soil / Rubble	100%	1.25 tonnes per m^3

Source: UK WRAP 2014

A guide/estimate of the potential waste percentages is provided based on published waste generation rates for construction and demolition projects, as indicated in **Table 5**. These figures have been referenced from a number of sources including the Inner Sydney Waste Board's Waste Planning Guide for Development Applications (1998), the UK's WRAP composition and conversion factors and the UK Department of Environment, Food and Rural Affairs (DEFRA) conversion factors. Conservative estimates have been made where indicative waste compositions were not available.

Table 5 Guideline to Waste Composition and Volumes – Building Construction

Material	Estimated Waste %	Conversion Factor (tonne per m^3)
Hard Material	32%	1.20
Timber	24%	0.34
Plastics	15%	0.25
Cement sheet	9%	0.50
Gypsum material	6%	0.20
Metals	6%	0.42
Paper/card	4%	0.40
Vegetation	3%	0.15
Soil	0.7%	1.20
Other (chemicals / paint)	0.3%	0.30

Source: UK WRAP 2014

The UK DEFRA and the UK Building Research Establishment (BRE) have developed a number of benchmark indicators to help determine approximate tonnages of waste produced during various construction projects including civil engineering and commercial retail works. The benchmarks include Environmental Performance Indicators (EPI) which measure the volume (cubic metres, m^3) of waste produced per 100 square metres (m^2).

The EPI indicators provided in **Table 6** have been used for the purposes of this WMP to estimate the amounts of construction wastes that could be generated by the Project.

Table 6 Environmental Performance Indicator for Waste Volumes from New Developments

Project Type	Average Volume (m3) of waste per 100 m^2
Commercial Offices	20.4
Civil Engineering	28.1

Source: UK BRE's www.smartwaste.co.uk

5.4 Estimation of Waste Volumes/Tonnages

5.4.1 Excavation Works

The volume and corresponding weight of excavated materials resulting from the proposed development site has been estimated based on the approximate area of each development area and a nominal excavation depth of 500 mm.

Excavated soils and/or rock may be re-used on the site, or used on similar sites, as fill material, provided no contamination is present and with approval from the EPA.

If sandstone is present, sandstone rock may be sold or used in the design of the building.

Table 7 Estimated Material Generation - Excavation Activities

Earthworks Site	Estimated Area (m^2)	Estimated Depth (m)	Estimated Volume (m^3)	Estimated Tonnes Generated
Building Footprint	2,157	0.5	1,079	1,348

It is estimated that approximately 1,348 tonnes of excavated materials will be generated at the site during the initial top soil excavation stage based on a conversation factor of 1.25 t/m^3 (see **Table 4**). Top soil will be reused at the site.

5.4.2 Construction of New Buildings

The estimated waste volumes and tonnes for each development area are presented in **Table 8** and **Table 9**, and have been based on the EPI estimates presented in **Table 6**. Actual waste tonnage and composition will vary however this estimate is provided to inform potential on-site or off-site re-use and recycling opportunities.

Table 8 Estimated Waste Generation for the Development - Construction

Building	Area (m^2)[1]	Estimated Waste (m^3)
Main Building	6,471	1,094

Note 1: Floor area including all 3 storeys.

Table 9 Estimated Waste Volumes and Materials for the Development - Construction

Material	Split (%)	Waste (m^3)	Conversion factor	Waste (tonnes)
Hard material	32%	350	1.20	420
Timber	24%	262	0.34	89
Plastics	15%	164	0.25	41
Cement sheet	9%	98	0.50	49
Gypsum material	6%	66	0.20	13
Metals	6%	66	0.42	28
Paper / card	4%	44	0.40	17
Bio-organic	3%	33	0.15	5
Soil	0.7%	8	1.20	9
Other (chemicals / paint)	0.3%	3	0.30	1
Total	**100%**	**1,094[1]**	**-**	**673[1]**

Note: Totals may not add up due to rounding.

It is estimated that greater than 80% of the predicted construction waste arisings from the project site could be re-used (on-site or at another development) or recycled off-site. As previously outlined, the SOPA target for C&D waste reuse and recycling is a minimum of 80%.

Waste minimisation measures that can be implemented to assist in achieving this resource recovery target are provided in the following sections. Waste audits will determine the actual percentage of wastes that were recycled and disposed of at landfill during the project.

It is noted that all waste generation rates are approximate only.

5.5 Waste Avoidance

The Construction Site Manager will identify opportunities for waste avoidance by:

- applying practical building designs and construction techniques;
- appropriate sorting and segregation of construction wastes to ensure efficient recycling of wastes;
- selecting construction materials taking into consideration to their long lifespan and potential for reuse;
- ordering materials to size and ordering pre-cut and prefabricated materials;
- reuse of formwork;
- planned work staging;
- use of naturally ventilating buildings to reduce ductwork;
- use of prefabricated components for internal fit outs;
- reducing packaging waste on-site by returning packaging to suppliers where possible and practicable, 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;
- careful on-site storage and source separation;
- subcontractors informed of site waste management procedures; and
- co-ordination and sequencing of various trades.

The Construction Site Manager will advise on material selection for the reduction of embodied energy and resource depletion. This includes:

- the use of recycled concrete and steel;
- the reduction of PVC use;
- the use of low VOC (volatile organic compounds) paints, floor coverings and adhesives;
- the use of low formaldehyde wood products and post-consumer reused timber or Forest Stewardship Council (FSC) certified timber where possible;
- the use of fittings and furnishings that have been recycled, are made from or incorporate recycled materials, and have been certified as sustainable or environmentally friendly by a recognised third party certification scheme; and
- the use of building materials, fittings and furnishings including structural framing, roofing and façade cladding chosen with consideration to their longevity, adaptation, disassembly, reuse and recycling potential.

Refer to SOPA's Urban Elements Design Manual and Park Elements Design Manual for performance standards, styles and materials for further ideas.

5.6 Re-use, Recycling and Disposal

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

Refer to **Table 3** for an outline of the proposed reuse, recycling and disposal methods for potential waste streams generated by the development.

The following specific procedures will also be implemented:

- concrete, tiles and bricks will be reused or recycled off-site;
- steel will be recycled off-site: all other metals will be recycled where economically viable;
- framing timber will be reused on-site or recycled off-site;
- windows, doors and joinery will be recycled off-site (where possible);
- waste oil will be recycled or disposed of in an appropriate manner;
- all used crates will be stored for reuse unless damaged;
- all glass that can be economically recycling will be;
- all solid waste timber, brick, concrete, rock that cannot be reused or recycled will be taken to an appropriate facility for treatment to recover further resources or for disposal to landfill in an approved manner;
- all asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements;
- provision for the collection of batteries, fluorescent tubes, smoke detectors and other recyclable resources will be provided on site; and
- all waste and recycling will be disposed of via a SOPA / Council approved system.

5.7 Waste Storage and Servicing

5.7.1 Waste Segregation

The project will be managed ensuring effective source separation and appropriate collection of waste during construction works.

For construction stages, consider minimum dedicated skips/bins/stockpiles for these materials:

- timber / wood;
- steel / scrap metal;
- bricks;
- concrete;
- general waste; and
- other waste (i.e. for the collection of materials that may be re-used on future projects).

Where limited room is available for segregation of construction materials, consultation with recycling facilities will be undertaken to determine which materials can be disposed of within the same skip and still be easily sorted post collection.

Separate receptacles for the safe disposal of hazardous waste types (e.g. batteries) will also be provided.

5.7.2 Space and Siting Requirements

Waste storage areas will be accessible and allow sufficient 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.

The positions of the designated waste holding areas on site will change according to building works and the progression of the development but must consider visual amenity, OH&S and accessibility in their selection. Appropriate siting of waste stockpile locations will take into account slope and drainage factors to avoid contamination of stormwater drains during rain events.

All waste placed in skips or bins for disposal or recycling shall be adequately contained or have secured lids 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.

5.7.3 Servicing and Transport

The frequency of the waste removal will, in most cases, be dictated by the volume of material being deposited into each of the dedicated skips. Skips/bins are to be checked on a daily basis by the Construction Site Manager to ensure that no overflow occurs. If skips/bins are reaching capacity, removal and replacement should be organised for the next 24 hours.

All skips/bins leaving the site will be covered with a suitable, secured tarpaulin to ensure that the spillage of wastes from the skips whilst in transit is eliminated.

All waste collection for construction works are to be conducted within the approved hours as per SOPA requirements. All site generated building waste collected in the skips and/or bins will leave the site and be deposited in the approved and appropriately licensed recycling centre, transfer station or landfill site.

5.7.4 Contaminated / Hazardous Waste

During the construction phases of the project, there must be a commitment to engage qualified and certified contractors to remove all contaminated/hazardous materials (e.g. asbestos) and dispose of all contaminated/hazardous waste at an appropriately licenced facility, if and where applicable.

In the event that any contaminated or hazardous materials are unexpectedly uncovered during demolition or excavation works, the Construction Site Manager is to stop work immediately and contact the relevant hazardous waste contractor prior to further works being undertaken in the area.

Handling, transport and disposal of asbestos will meet the requirements of the POEO (Waste) Regulation 2014. Consultation with WorkCover NSW concerning the handling of any asbestos waste should also be undertaken. Further details on contamination and hazardous materials waste management will be developed by the Construction Site Manager and relevant consultants.

5.7.5 Liquid Waste Management

Liquid waste is often produced from the washing down of plant and apparatus. Wash-down of equipment, plant and machinery and concrete delivery trucks will take place off-site or on-site within a specified and appropriately bunded, wash-down bay. There may be a local sewer that this waste water can be connected to; alternatively, this could be transferred into a localised waste water treatment facility or plant.

Any liquid wastes or dangerous goods wastes generated by the development (e.g. due to damage or leakage of containment) will be disposed of by a suitably qualified contractor to an appropriately licensed disposal facility.

5.7.6 Spills Management

Spills on the worksite are most likely to involve fuel, hydraulic oil or engine oil spilled from plant items, and paints and solvents. If a spillage occurs, immediately identify the spilled materials and notify the Site Manager. Then contain the spill as soon as possible so it doesn't spread.

Containment measures for spillages will be provided at appropriate locations and in close proximity to staff car park areas, dangerous goods stores areas and main project work areas (e.g. a spill kit containing non-combustible absorbent material). Material Safety Data Sheets (MSDS) will also be located nearby spill kit areas for advice on spillage clean-up and disposal.

5.8 Signage

Standard signage will be posted in all storage/waste collection areas and all skips/drums/bins are required to be labelled correctly and clearly to identify materials stored within.

Refer to the EPA's website for construction and demolition waste and recycling signs.

Figure 4 Australian Standard Signs

Source: http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm

5.9 Training and Awareness

All staff (including sub-contractors and labourers) employed during the construction stage of the project must undergo induction training regarding waste management for the project site.

Site induction training is to cover, as a minimum, an outline of the WMP including:

- legal/compliance obligations;
- emergency response procedures on site;
- waste storage locations and separation of waste;
- litter management (both in transit and on site);
- the implications of poor waste management practices;
- correct use of general purpose spill kit; and
- responsibility and reporting (including identification of personnel responsible for waste management and individual responsibilities).

It is the responsibility of the Contractor or site operative to notify SOPA of the appointment of waste removal, transport or disposal contractors to ensure *POEO (Waste) Regulation 2014* requirements associated with waste tracking and disposal are complied with.

5.10 Monitoring and Reporting

The following measures will be undertaken to improve construction waste management and to provide more reliable waste generation figures:

1. Compare projected waste quantities with actual waste quantities produced.
2. Conduct waste compositional / visual audits of current projects (where feasible).
3. Note waste generated and disposal methods.
4. Look at past waste disposal receipts.
5. Record this information to track waste avoidance, reuse and recycling performance and to help in waste estimations for future waste management plans.

Records of waste volumes recycled, reused or contractor removed are to be maintained. Additionally, dockets / receipts verifying recycling and/or disposal in accordance with the WMP must be kept and maintained for presentation to SOPA / Council / the EPA, if and when required.

Daily visual inspections of waste storage areas will be undertaken by site personnel and inspection checklists / logs recorded for reporting to the Construction 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 Construction Site Manager to gauge the effectiveness and efficiency of waste segregation procedures and recycling / reuse initiatives, and to check progress against SOPA reuse and recycling targets for the development. Where audits show that the above procedures are not carried out effectively, additional staff training will be undertaken and signage re-examined.

5.11 Incident Response

Likely incidents to occur during the construction stage of the project may involve fuel or chemical spills, seepage or mishandling of hazardous waste, or unlicensed discharge of pollutants to the environment.

All environmental incidents are to be dealt with promptly to minimise potential impacts. An incident register must be maintained on-site at all times and include the contact details of the 24 hour EPA Pollution line.

5.12 Roles and Responsibilities

All personnel have a responsibility for their own environmental performance and compliance with all legislation.

The Construction Site Manager will ensure:

- the SOPA's regular waste services are not used and rubbish is not burned or buried at the site;
- compliance with the waste management procedures; and
- the site induction includes a briefing on waste segregation and disposal requirements.

Where possible, an Environmental Management Representative (EMR) should be appointed for the project. Suggested roles and responsibilities are provided in **Table 11**.

Table 10 Building Contractor - Suggested Roles and Responsibilities

Construction Site Manager	• Compliance with waste management procedures. • 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 check waste sorting and storage areas for cleanliness, hygiene and OH&S issues, contaminated waste materials, and also ensuring that all monitoring and audit results are well documented and carried out as specified in the WMP. • Ultimately responsible for achieving SOPA's reuse and recycling targets for the development.
Environmental Management Representative (EMR) or equivalent role	• Checking progress against SOPA's reuse and recycling targets for the development. • Approaching and establishing the local commercial reuse of materials where reuse on-site is not practical. • Establishing separate skips and recycling bins for effective waste segregation and recycling purposes. • Ensuring staff and contractors are aware of site requirements. • Provision of training of the requirements of the WMP and specific waste management strategies adopted for the Project. • Contaminated waste management and approval of off-site waste transport, disposal locations and checking licensing requirements. • Approval of off-site waste disposal locations and checking licensing requirements. • Assessment of suspicious potentially contaminated materials, hazardous materials and liquid wastes. • Monitoring, inspection and reporting requirements.

Daily visual inspections of waste storage areas may be delegated to other, appropriately trained 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.

It is the responsibility of the Construction Site Manager or site operative to notify the Principal Certifying Authority of the appointment of waste removal, transport or disposal contractors.

6 OPERATIONAL WASTE MANAGEMENT

Ineffective waste management for commercial premises can lead to environmental pollution, offensive odours, litter, attraction of vermin and occupational safety and hygiene problems.

Effective waste management reduces costs through the reuse of resources and minimisation of fees associated with removal, transportation and disposal of waste, and improves environmental outcomes locally, regionally and globally.

Effective waste management is achieved through the implementation of a WMP for the operational life of the development.

6.1 Targets for Resource Recovery

The performance of each development contributes to overall NSW State recycling targets, which for the commercial and industrial (C&I) sector, represents 57% (increasing to 70% by the year 2021) of total residential waste recycled (see NSW WARR Strategy 2014-21).

NSWRL will aim to achieve a resource recovery target of 70% (encompassing waste reduction, reuse and recycling elements) during the operation of the site.

6.2 Waste Streams and Classifications

The operation of the Project will generate the following broad waste streams:

- commercial wastes generated on each level of the premises (i.e. general waste, paper/cardboard, co-mingled recycling);
- medical / clinical wastes generated by medical facilities on the ground floor;
- chemical packaging wastes and filter media associated with the maintenance of hydrotherapy pools;
- bulk packaging wastes including polystyrene and cardboard boxes;
- hazardous wastes such as e-waste and fluorescent tubes / light bulbs;
- additional bulky wastes such broken furniture;
- garden organic wastes from landscaped areas;
- stores, plant and general maintenance wastes; and
- sewage and waste water. (Note: Operational waste water is not quantified in this WMP.)

Potential waste types along with their waste classification are provided below in **Table 11**.

For further information on how to determine a waste's classification, refer to the Waste Classification Guidelines (EPA 2014).

Table 11 Potential Waste Generation with Classifications

Waste Types	NSW Classification	Proposed Reuse / Recycling / Disposal Method
General Operations		
General garbage (including non-recyclable plastics)	General solid (putrescible and non-putrescible) waste	Disposal at landfill or energy recovery where possible / feasible
Recyclable beverage containers (glass and plastic bottles, aluminium cans), tin cans	General solid (non-putrescible) waste	Co-mingled / container recycling at off-site licensed facility
Food organics	General solid (putrescible) waste	Dispose to landfill with general waste. Alternatively, separate collection for recycling where feasible.
Clean paper / cardboard	General solid (non-putrescible) waste	Off-site recycling
Confidential shredding (paper)	General solid (non-putrescible) waste	Off-site treatment and recycling
Medical wastes	Clinical waste	Collection and off-site treatment by a licensed contractor
Bulk cardboard	General solid (non-putrescible) waste	Cardboard recycling at off-site licensed facility
Bulk polystyrene	General solid (non-putrescible) waste	Disposal at landfill or packaging recycling at off-site licensed facility
E-waste, batteries, printer toners and ink cartridges	Hazardous waste	Off-site recycling (free options available for printer toners and ink cartridges under National Product Stewardship scheme)
Crates, pallets	General solid (non-putrescible) waste	Return to suppliers for re-use
Maintenance		
Spent Smoke Detectors[1]	General solid (non-putrescible) waste OR Hazardous waste (some commercial varieties)	Disposal at landfill OR offsite disposal at licensed facility
Glass (other than containers)	General solid (non-putrescible) waste	Off-site recycling
Fluorescent tubes and light bulbs	Hazardous waste	Off-site recycling (Australia Post options available)
Cleaning chemicals, solvents, area wash downs, empty oil / paint drums / chemical containers	Hazardous waste if containers used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and residues have not been removed by washing or vacuuming. General solid (non-putrescible) waste if containers cleaned by washing or vacuuming.	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility. (Note: Discharge to sewer subject to Trade Waste Agreement with Sydney Water.)[1]
Air-conditioning parts and filters, pool filter media	General solid (non-putrescible) waste	Disposal to landfill
Operational backwash wastewater (Hydrotherapy pools)	Liquid (trade) waste	Potential treatment and reuse on site or discharge to the sewer in accordance with trade waste agreement with local Council / Sydney Water).
Garden organics (lawn mowing, tree branches, hedge cuttings, leaves etc)	General solid (non-putrescible) waste	Reuse on site or contractor removal for recycling at licensed facility

Source: http://www.environment.nsw.gov.au/waste/envguidlns/index.htm

Note 1: The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) require that when more than 10 smoke alarms (particularly americium-241 sources) are collected for bulk disposal they must be treated as radioactive waste and the requirements of the National Health and Medical Research Council's *Code of practice for the near-surface disposal of radioactive waste in Australia (1992)* must be met. Contact ARPANSA for more information. http://www.arpansa.gov.au/radiationprotection/factsheets/is_smokedetector.cfm

6.3 Industry Waste Generation Rates

Average waste generation rates provided by EPA audit data have been used to calculate the anticipated waste amounts for the proposed development and are presented in **Table 12**.

Table 12 Estimated Waste & Recycling Generation Rates

Type of Premises	Development Area	General Waste Generation (Average)	Recycling Generation[1] (Average)
Café	Café	215 L/100 m^2/day	130 L/100 m^2/day
Coffee Lounge	Staff / player kitchen areas	90 L/100 m^2/day	30 L/100 m^2/day
Offices	Office / reception areas	8 L/100 m^2/day	6 L/100 m^2/day
Showroom	Gym / conference	10 L/100 m^2/day	25 L/100 m^2/day
Medical	Medical facilities	35 L/100 m^2/day	10 L/100 m^2/day
Non-food Retail	Retail tenancy	40 L/100 m^2/day	50 L/100 m^2/day

Source: NSW EPA's Better Practice Guidelines for Waste Management and Recycling in C&I Facilities 2012, Randwick City Council Waste Generation Rates and NSW Boards Fact Sheet "Buying into waste Management".

Note 1: Recyclable waste generation includes paper and cardboard waste, as well as mixed recyclables (bottles, cans etc)

6.4 Estimation of Waste Volumes/Tonnes

Using the above assumed waste generation rates and floor areas provided by architectural drawings, waste generation volumes for the proposed development have been calculated and are presented in **Table 13**. The estimated volumes have been converted into tonnes per day by applying conversation rates taken from Victoria's Ecorecycle Waste Wise Events toolkit for 'garbage' (0.15 tonnes per 1,000 L) and 'co-mingled containers' (0.063 tonnes per 1,000 L).

Table 13 Anticipated Operational Waste Generation Rates (L/day)[1]

Activity Area Type	Approximate Area	Garbage Generation	Recycling Generation	Garbage Generation	Recycling Generation
	m^2	Average L/day	Average L/day	Average L/wk	Average L/wk
Medical	137	48	14	336	96
Staff Kitchen / Lounge	252	227	76	1,588	529
Café	67	144	87	1,008	610
Retail	67	27	34	188	235
Gym	1,495	150	374	1,047	2,616
Office / Admin	1,093	87	66	612	459.06
Conference	97	10	24	68	170
Totals	**3,208**	**692**	**673**	**4,846**	**4,714**
Estimated Tonnages				**37.8**	**15.4**

Using the above waste generation rates, it is estimated that the site will generate approximately 37.8 tonnes of general waste and 15.4 tonnes of recycling per year (a total of approximately 53.2 tonnes per year). It is noted that all waste generation rates are approximate only.

It is recommended that scheduled waste audits be undertaken approximately one month into the operational phase of the development to quantify actual waste generation rates generated by the development. The assessment of generated waste volumes will be influenced by management and employee attitude to recycling and disposal, and the adequacy of signage and education provided for staff and visitors to the site.

6.5 Waste and Recycling Equipment

6.5.1 General Bins

Bins which encourage source separation of recyclables will be utilised where possible within all public walkways, offices, administration and kitchen areas for use by employees, players and visitors to the site. General waste and recycling bins should be placed together to encourage source segregation of recyclables (i.e. milk bottles, containers, paper etc) from landfill wastes where possible. This will have two benefits; increased recycling rates and potential cost savings with diversion of waste from general (landfill) waste bins.

In the office areas, under desk bins will be replaced with bin stations (paper/cardboard recycling and general waste bins teamed together) located by each work station area rather than by desk. Separate collection of clean office paper and cardboard, and printer toner and ink cartridges will also be undertaken in office areas containing printers. Where water cooler stations are provided, disposable cup options will not be provided to limit the generation of unnecessary waste. Reusable cups will instead be promoted. Printing policies should include default double-sided and black and white printing to avoid significant paper and printer toner / ink waste production.

In kitchen areas, source separation bins (ideally 60 L to 120 L) will be utilised in staff / player kitchen areas for placement of landfill waste and recyclable containers.

In the gym, players will be encouraged to bring reusable water bottles to minimise the amount of waste generated at the site. Container recycling bins will also be provided to encourage recycling of any remaining beverage containers.

Additionally, bins will be located at entry / exit points to buildings for use by visitors and at reception / lobby areas where staff movements may be limited.

Figure 5 Example of Workstation / Office Source Separation Bins

Source Separation Systems

Planet Ark Free Printer Cartridge Recycling

EcoBin Source Separation Bins and Desktop Bins

6.5.2 Mobile Garbage Bins

It is anticipated that the development will utilise 240 L, 660 L and/or 1100 L MGBs to store waste and recycling generated by the site. MGBs will be stored in bin storage room located adjacent to the loading dock area.

Typical dimensions for MGB sizes planned for use by the development are as follows:

Table 14 Typical Dimensions for MGBs

Bin Type	Height (mm)	Depth (mm)	Width (mm)	Approx. Footprint (m^2)
240 L	1,080	735	580	0.43 (allow 0.5)
660 L	1,250	850	1,370	1.16 (allow 1.4)
1100 L	1,470	1,245	1,370	1.70 (allow 2.0)

Source: Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012
Note 1. Allowance = MGB footprint + 15%.

240 L MGB have been recommended in cases where transfer distances are greater than 10 m or storage within the development is required.

6.5.2.1 Estimated Number of Bins and Space Allocation

As a guideline to determine bin storage space requirements, **Table 15** outline the estimated waste storage area requirements for waste and recycling bins associated with the development.

Please note that these calculations refer to the footprint required for storage of bins only. Access and bin transfer requirements, as well as bin cleaning station areas will still need to be factored into waste storage areas to ensure convenient access to empty bins by cleaners / caretakers and space for bin cleaning.

Table 15 Estimated Number of Bins and Bin Storage Space Requirements – 240 L and 660 L MGBs

Waste Type	Bin Type	Bin Numbers		
		Per Day	Twice Per Week	Per Week
General waste (Café)	240 L	1	-	-
Recycling (Café)	660 L	1	1	1
General waste (Centre)		1	4	7
Recycling (Centre)		1	4	7
Total Number of 240L		**1**	***1***	***1***
Total Number of 660L		**3**	**9**	**15**
Total Bin Space Allocation (m^2)		**4.7**	**13.1**	**21.5**

Daily collections of the Café's general waste bins are recommended to where the food waste comprises more than 20% by weight or volume of fish, poultry or meat in order to mitigate potential nuisance odour impacts.

Where this is the case it is estimated that the site will need to utilise up to 1 x 240 L MGB and 9 x 660 L MGBs for the storage of waste and recycling requiring a space allocation of 13.1 m^2. A contingency of an additional 1 x 240 L (general waste) MGB is recommended for the Café and space provision is available in the kitchen store area for this additional bin.

Where a lesser amount of these types of food waste are generated, the Café may consider using a 660 L MGB and adopting twice weekly collections with the rest of the waste. In this case it is estimated that the site will need to utilise 10 x 660 L MGBs requiring a space allocation of 14.0 m^2.

It should be noted that approximately 2 x 240 L office paper recycling and 1 x 240 L confidential shredding MGBs bins will need to be situated on Level 3 for the disposal of clean office paper and confidential documents, and 1 x 660L bin may be required for cardboard / packaging recycling within the loading dock. This is equivalent to roughly 2 x 660 L therefore a lesser number bins may actually need to be stored in the waste storage room on a daily basis.

It is recommended that a visual waste audits be undertaken within one month of operations to ensure efficient use of the bins provided and to determine Café waste generation rates for billing purposes. The potential for contamination in recycling bins and bin space use efficiency will be influenced by management and employee attitude to recycling and disposal, and the adequacy of signage and education provided for staff and visitors to the site.

6.5.3 Medical / Clinical Waste Bins

Careful segregation of clinical and all related waste is required to protect personnel from injury and potential infection, and to ensure correct containment of waste in order to comply with the provisions of the POEO Act and associated Waste Regulation. Special medical and clinical waste receptacles will be provided for sharps storage and other clinical waste storage.

All clinical and related wastes are to be disposed of in colour coded receptacles, and MGBs and trolleys should be used when transporting wastes to decrease spills, minimise collector contact with waste and to minimise manual handling. MGBs and trolleys must be made of a rigid material, lidded, lockable, leak proof and washable. These receptacles will be supplied by suitably licensed contractors and will be stored in convenient locations within the medical examination / drug testing rooms as required.

Figure 6 Medical Waste Receptacles

Example Clinical Waste Bin

Example Medical Waste Bin

Example sharps containers

See **Appendix B** for indicative and recommended source separation and MGB locations throughout the development.

6.6 Collection Frequencies

Collection frequencies will ultimately be determined in consultation with SOPA and private waste contractors engaged for waste collection and treatment / disposal. Collection frequencies will be coordinated to ensure no conflicts arise during delivery of goods / other waste and recycling pickups.

The following collection frequencies are anticipated for the development site:

Table 16 Anticipated Collection Frequencies

Waste Receptacle Type	Anticipated Collection Frequency
General Waste	Twice weekly
Cardboard / Co-mingled Recycling	Twice weekly
Clean Office Paper Recycling	Monthly
Confidential Shredding	Monthly
Printer Toner / Ink Cartridge Recycling Boxes	Quarterly
Medical Bins	As required
Grease Arrestor Tank	Monthly
Bulky Waste (broken furniture etc)	Annually
E-waste Recycling	Annually
Fluorescent Tubes / Light Bulbs Recycling Boxes	As required
Crates / Pallets Return	Upon goods delivery

6.7 Waste and Recycling Storage

Space will be provided for the storage of all waste and recycling generated by the development at the ground level adjacent to the loading area. A designated bin room has been planned nearby the loading dock.

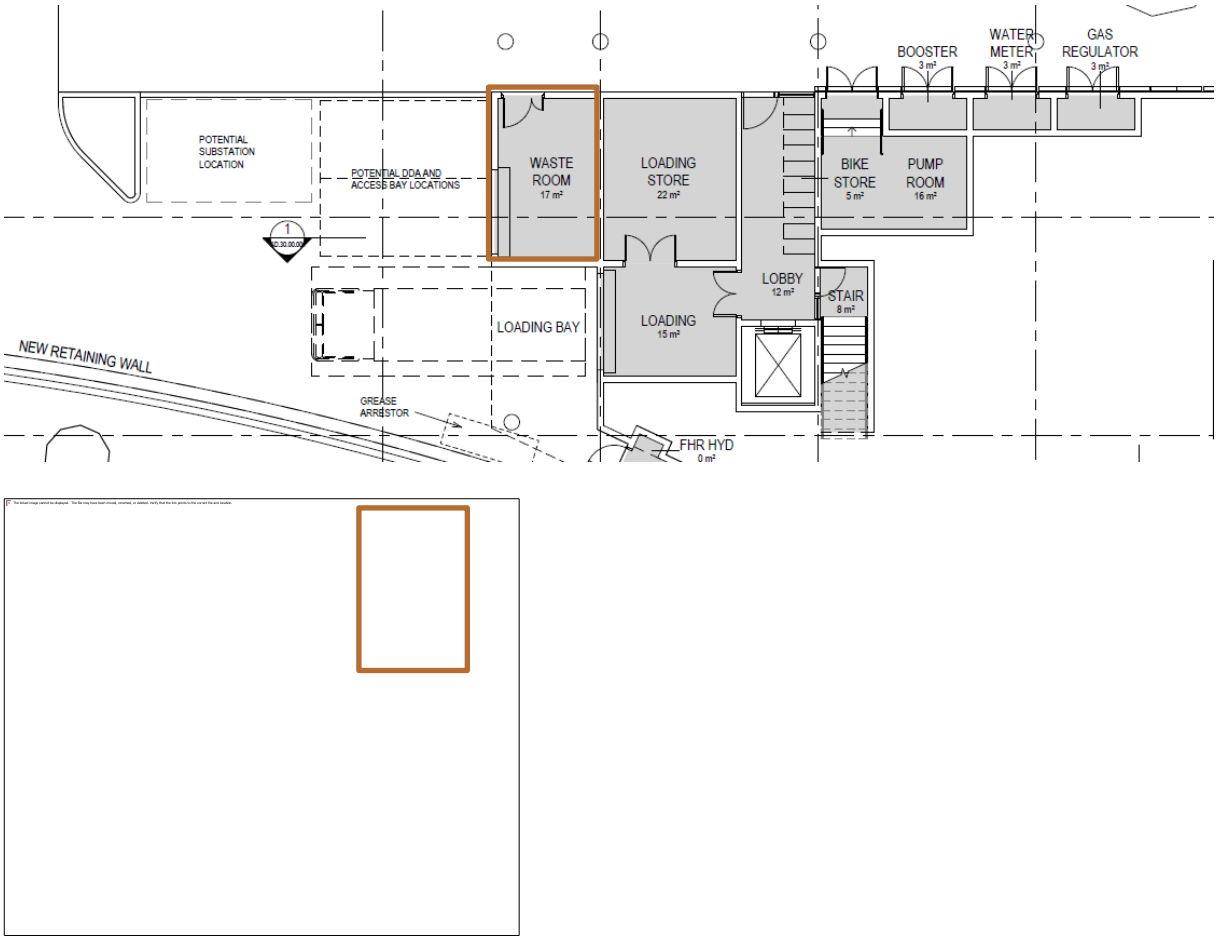
Table 17 Dimensions of Waste and Recycling Storage Rooms

Width x Length (m)	Height (m)	Approx. Footprint (m^2)
5.4 x 3.2	> 2 m	> 17

Review of **Table 17** above indicates that sufficient space is planned for the anticipated number of required bins in each waste and recycling storage room, assuming twice weekly waste collections of the general waste and cardboard / co-mingled recycling.

Bin storage arrangements for the development are illustrated overleaf in **Figure 7**.

Figure 7 Indicative Bin Layout – Ground Level Waste Storage Room



Source: Populous 2016

6.7.1 General Amenity / Design Considerations

The design of waste collection and storage areas has incorporated the following measures to ensure best practice waste management:

- Adequate ventilation provided to prevent nuisance odour.
- Robustness of construction of storage areas, ensuring impervious floors, walls and ceilings.
- Areas to be vermin proof with close fitting doors.
- Adequate and suitable lighting provided.
- Storage areas to be undercover, concealed and secure (lockable).
- Good signage provided pertaining to waste sorting, reporting and OH&S.
- Nearby bin washing facilities connected to appropriate drainage systems (i.e. floors of waste storage areas are bunded, graded and drained, and finished to a smooth even surface).
- Water supply to the bin washing station should be provided (hot and cold) to allow for appropriate cleaning.

All waste sorting and storage areas are to be kept clean and odour and vermin free. It is the responsibility of the Building Manager and cleaners to check each waste sorting and storage area for cleanliness, hygiene, and health and safety issues.

6.7.2 Construction of Waste and Recycling Storage Rooms

The waste and recycling storage room will be constructed to the following requirements:

- The waste storage rooms will be constructed in accordance with the requirements of the BCA ensuring impervious floors, walls and ceilings.
- The floors of waste rooms and recycling rooms must be constructed of concrete at least 75 mm thick or other approved material graded and drained to a Sydney Water Corporation approved drainage fitting located in the rooms.
- The floor must be finished to a smooth even surface coved at the intersection with walls and plinths and provided with a ramp to the doorway where necessary.
- The walls of the waste and recycling rooms must be constructed of approved solid impervious material and shall be cement rendered internally to a smooth even surface coved at all intersections.
- The ceilings of waste and recycling rooms must be finished with a rigid smooth faced non-absorbent material capable of being easily cleaned.
- The waste and recycling rooms must be provided with an adequate supply of hot and cold water mixed through a centralised mixing valve with hose cock which is fitted with an aerator to increase water efficiency.
- A close fitting and self-closing door openable from within the room must be fitted to all waste and recycling rooms.
- Waste rooms and recycling room(s) must be constructed in such a manner as to prevent the entry of vermin.
- Waste and recycling rooms must be located for convenient access by users and must be well ventilated and well lit.
- Smoke detectors will be fitted in accordance with Australian Standards and connected to the fire prevention system of the building.
- Clear and easy to read signs and warning signs must be fixed to the external face of each waste and recycling room where appropriate.

6.7.3 Bulky / Hazardous Waste Storage

Sufficient space will be provided within the various back of house store areas for the storage of larger bulky items, recyclable electronic equipment (e-waste) including tvs, printers, computers, batteries, fluorescent tubes / light bulbs and smoke detectors, that cannot be disposed of in the general or recyclable waste stream.

- All hazardous wastes (i.e. fluorescent tubing, batteries, e-wastes) should be recycled at an appropriately licensed facility.
- Fluorescent tubes and other light globes can be recycled via prepaid packs suitable for Australia Post to recycling facilities in Australia.
- E-waste (electronic waste such as computers, mobile phones, printer toners and ink cartridges) and batteries contain heavy metal contaminants and should be recycled at an appropriately licensed recycling facility.
- Commercial-use smoke detectors should be returned to the supplier for disposal (it is a condition of the supplier's licence to sell smoke detectors) and not disposed of with general landfill waste as they contain small amounts of radioactive material. Contact the supplier and/or the EPA or ARPANSA for information on how to return used smoke detectors.

Space will also be allocated within the loading area to store reusable items such as crates and pallets so that storage in high transit areas is avoided.

6.8 Waste Transfer and Servicing

6.8.1 Transfer of Waste and Recycling to the Ground Level Storage Room

Cleaners will collect all waste and recycling generated in the non-tenanted areas of the development via service trolleys at the end of each day. Collected waste and recycling will be transferred via lift for disposal into suitable MGBs stored in the waste storage room on the ground level.

Tenants will be responsible for transferring their own waste between tenancy areas and the waste storage room.

Transfer pathways and cleaning schedules will be organised to ensure waste management practices do not conflict with visitors / pedestrian access ways and player / staff use of the facilities. Outdoor transfer pathways will be undercover to protect staff during rain.

Examples of the type of bin trolleys that may be used for transfer of waste and recycling are provided below.

Figure 8 Example Waste Trolleys

Source: Source Separation Systems

The following waste servicing and access requirements will be implemented:

- Arrangements will be in place so that the waste storage room is not accessible to the general public.
- All doors will be openable from both inside and outside and must be wide enough to allow for the easy passage of waste and recycling bins.
- Convenient and step-free access between each transfer point / waste and recycling storage areas(s) and the collection point will be provided.
- The gradient of the waste and recycling storage rooms and any associated access ramps will be sufficiently level so that access for the purpose of emptying containers can occur in accordance with WorkCover NSW Workplace Health and Safety requirements. The EPA's Better Practice Guide (2012) recommends that the bin transfer grade should not exceed 1:30 for bins of greater than 360L capacity.
- The transfer of waste and waste bins will be undertaken during off-peak visitation periods wherever possible and avoid conflicts with visitors along public pathways.

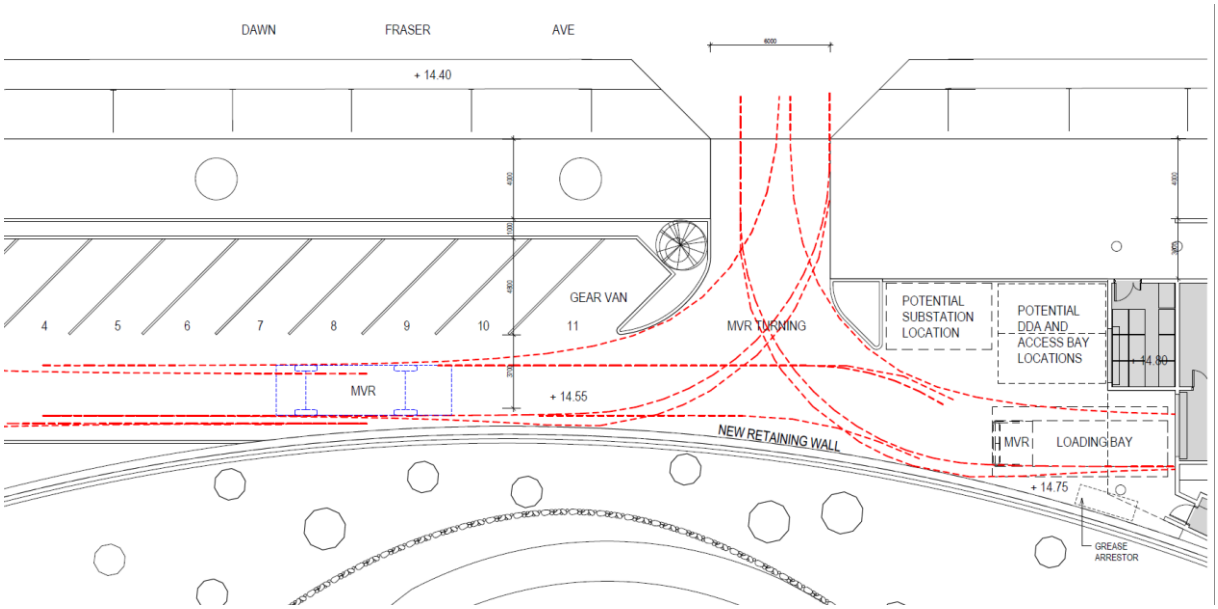
6.8.2 Access to Waste Storage Rooms and the Collection Point

The location of the waste storage area allows access by waste collection vehicles to enter and exit public roads in a forward direction and ensures adequate provisions are in place for collection vehicles to service the development efficiently and effectively, with limited need to reverse.

Access driveways will be of sufficient strength to support the collection vehicles. It is typically a requirement that access to waste storage areas should be assessed for medium rigid vehicles (MRV). Swept path diagrams have demonstrated that the access driveway can cater for the turning circle requirements of a MRV.

Figure 9 provides an overview of loading dock access arrangements.

Figure 9 Site Access by MRV



Source: Populous 2016

Bins will be stored indoors to ensure the public cannot access these bins. Waste collection schedules will be organised in consultation with SOPA to avoid conflicts with major events and resultant road traffic where ever possible.

6.8.3 Waste Collection Contractors

Written evidence of a valid and current contract/s with licensed waste collector/s will be held at the premises. Waste and recycling must only be collected by appropriately licensed and EPA approved waste contractors. Liquid wastes / wastewater must only be collected by licensed waste contractors as approved by Sydney Water and the EPA.

6.9 Guidelines for Minimisation of Packaging Waste

A Purchasing Policy will be implemented for the café and retail tenancy, and will include strategies for waste minimisation such as:

- Source materials (i.e. napkins and takeaway containers, cups and utensils) that use recycled content or are compostable.
- Bulk purchasing or the purchase of items that use minimal packaging.
- Investigation of supply chain options that ship products in reusable packaging and/or return to supplier options for packaging such as polystyrene boxes.
- Avoid use and distribution of plastic bags, particularly light single use plastic bags that are likely to become a source of windblown litter at the site.

6.10 Re-use, Recycling and Disposal

The following measures will be implemented on site:

- green waste collected from gardens and landscaped areas within the site will be reused where appropriate as mulch for landscaping at the site or recycled off-site;
- co-mingled recycling / beverage container recycling, paper and cardboard recycling will be carried out at the site;
- office paper recycling bins will be provided on-site for employee use in office and printer areas;
- printer toner / ink cartridge recycle boxes (free register for Planet Ark's Close the Loop program servicable by Australia Post) will be provided in all printer rooms;
- provision for the collection of batteries and other recyclable resources (such as e-waste, fluorescent tubes, light bulbs) will be provided on site;
- recycling bins will be co-located with general waste bins where possible to provide customer and employees with an option for recycling;
- clear signage will be provided for customer and employee waste bins to identify the materials that can be deposited in the bins;
- signage and/or bins will be colour-coded using Australian Standard bin colours to identify different waste and recycling streams; and
- all garbage will be disposed of via a SOPA / Council / EPA approved system.

Cleaning contracts will also set out what cleaners must do to keep the waste management system and equipment in good order, and outline the recycling policy.

6.11 Communication Strategies

Waste management initiatives and management measures should be clearly communicated to building managers, players, employees, visitors and cleaners.

Benefits of providing this communication include:

- improved satisfaction with services;
- improved amenity and safety;
- improved knowledge and awareness through standardisation of services;
- increased ability and willingness to participate in recycling;
- reduced contamination of recyclables stream;
- increased awareness or achievement of environmental goals and targets;
- increased recovery of recyclables and organics (where implemented) material; and
- greater contribution to state-wide targets for waste reduction and resource recovery.

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

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

The full set of signage can be found on the EPA's website:

- http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm
- http://www.cityofsydney.nsw.gov.au/live/waste-and-recycling/collection-days-and-bins

6.12 Monitoring and Reporting

Audit and/or visual assessment of bins prior to collection should be undertaken by Management within the first month of becoming operational, and once peak operations have been realised, to ensure the Waste Management System is sufficient for the development's needs and cleaners / tenants are disposing of waste and recycling appropriately. Visual audits should also on a half-yearly basis to ensure WMP provisions are being maintained.

Where audits show that recycling is not carried out effectively, additional staff training should be undertaken by Management and signage re-examined.

6.13 Roles and Responsibilities

It should be the responsibility of Management to implement the WMP and a responsibility of the employees and cleaners to ensure that they comply with the guideline at all times.

Management should routinely check waste sorting and storage areas for cleanliness, hygiene and OH&S issues, and also ensure all monitoring and audit results are well documented and carried out as specified in the WMP.

An outline of waste management responsibilities are presented in **Table 18**.

Table 18 Waste Management Responsibility Allocation

Responsible Person	General Tasks
Management / Building Manager	Ensure the WMP is implemented throughout the life of the operation.
	Update the WMP on a regular basis (e.g. 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/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.
	Ultimately responsible for the management of all waste management equipment, cleaning requirements, waste transfer and collection arrangements.
Tenants	Removal of general waste and recyclables from tenanted areas for transfer to the ground level waste storage room on a daily basis or as required.
Cleaners	Emptying of bins within the development and transfer of waste and recycling to the ground level waste storage room on a daily basis or as required.
	Monitor bins to ensure no overfilling occurs.
	Transport of bins to the collection point as required.
	Cleaning of bins and the waste storage room on a weekly basis or as required.
	Compliance with the provisions of this WMP.
Gardening Contractor	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.