Australian Technology Park Development Project

DECEMBER 2015

Operational Waste Management Plan

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1. Introduction

This report supports a State Significant Development Application (SSDA) submitted to the Department of Planning and Environment pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Mirvac Projects Pty Ltd (Mirvac) is seeking to secure approval for the urban regeneration of the Australian Technology Park (ATP), including the redevelopment of three car parking lots within ATP for the purposes of commercial, retail and community purposes, along with an extensive upgrade to the existing public domain within ATP. Building heights of 4, 7 and 9 storeys are proposed across the 3 development lots.

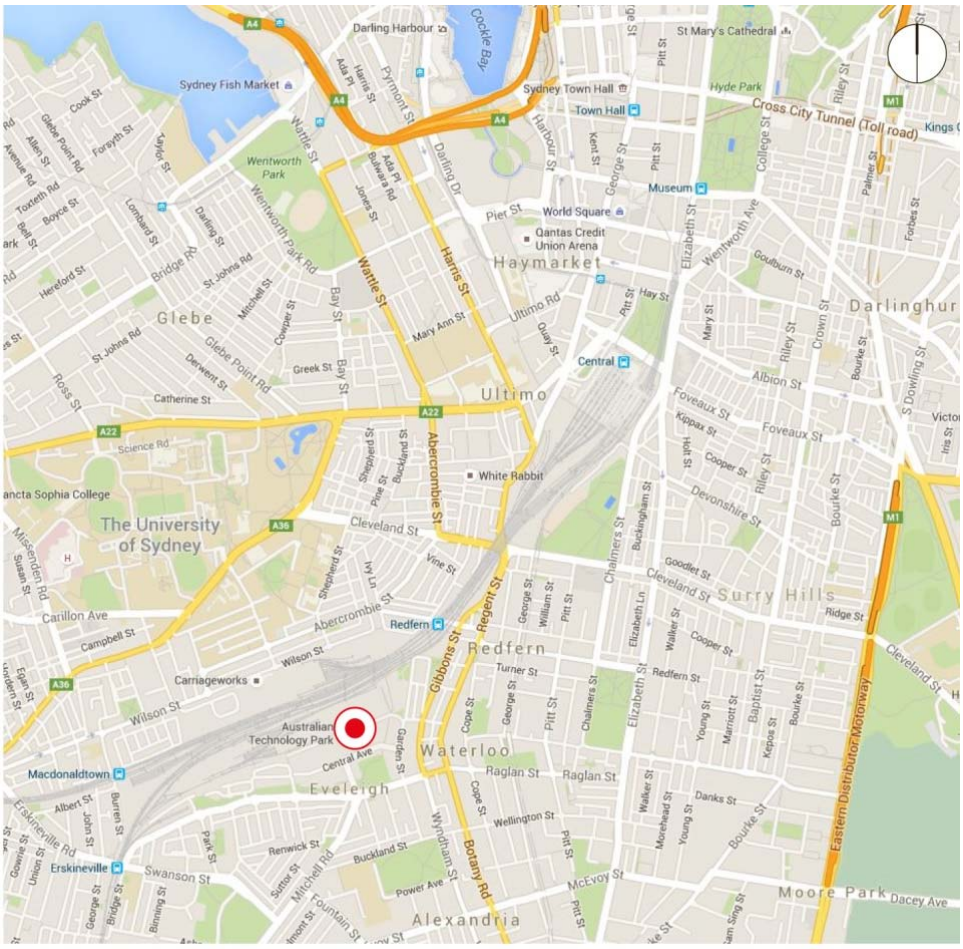
Australian Technology Park (ATP) has been continuously developed since its establishment in 1996, but has been underutilised as a technology and business precinct for quite some time. UrbanGrowth NSW Development Corporation (UGDC) has actively encouraged new development and employment opportunities at the Park for the past 15 years, and Mirvac intends to continue upon this and deliver upon the precinct's full potential, with the development of circa 107,400sqm for employment uses, which will facilitate the employment homes of an extra 10,000 staff everyday within ATP by development completion

1.1 Background

Mirvac has been announced by UrbanGrowth NSW as the successful party in securing ownership and redevelopment rights for the ATP precinct, following an Expression of Interest (EOI) and an Invitation to Tender (ITT) process which commenced in 2014. Mirvac has also secured the Commonwealth Bank of Australia (CBA) as an anchor tenant for the development and intends to immediately commence the urban regeneration of this precinct through the lodgement of this SSDA. CBA's commitment to the precinct is in the form of one of the largest commercial leasing pre-commitments in Australian history, occupying circa 95,000 square metres of commercial, retail, community and childcare NLA, which will house circa 10,000 technology focused staff by 2019 and 2020. Mirvac's redevelopment goes well beyond the development on the 3 development lots, as it includes the regeneration of the public domain within ATP, the addition of retail to activate the precinct and also the provision of community facilities such as a community centre, a gym and 2 x 90 child childcare facilities.

1.2 Site Description

The ATP site is strategically located approximately 5km south of the Sydney CBD, 8km north of Sydney airport and within 200m of Redfern Railway Station. The site, with an overall area of some 13.2 hectares, is located within the City of Sydney local government area (LGA). Refer to **Figure 1** below for a graphic representation of the site location and context.



Three key sites remain undeveloped within the ATP site and are presently used for at-grade worker and special event car parking. These sites are:

- Lot 8 in DP 1136859 – site area circa 1,937m^2;
- Lot 9 in DP 1136859 – site area circa 8,299m^2; and
- Lot 12 in DP 1136859 – site area circa 11,850m^2.

Figure 2 provides an aerial image of the ATP site along with identifying the three development sites.

The SSDA works boundary excludes the Locomotive Workshop. Future development associated with the adaptive re-use of the Locomotive Workshop will be the subject of separate future applications.

1.3 Overview of Proposed Development

The development application seeks approval for the following components of the development:

- Site preparation works, including demolition and clearance of the existing car parking areas/ancillary facilities and excavation;
- Construction and use of a 9 storey building within Lot 9 (Building 1), comprising of parking, retail, commercial and childcare uses;
- Construction and use of a 7 storey building within Lot 12 (Building 2) comprising of parking, retail and commercial uses;
- Construction and use of a 4 storey community building within Lot 8 (Community Building) comprising of gym, retail, community, commercial and childcare uses;
- Extensive landscaping and public domain improvements throughout the precinct for the benefit of the local community; and
- Extension and augmentation of physical infrastructure/utilities as required.

A more detailed and comprehensive description of the proposal is contained in the Environmental Impact Statement (EIS) prepared by JBA.

1.4 Planning Framework

State Environmental Planning Policy (SEPP) Major Development 2005 is the principal environmental planning instrument applying to the ATP. Schedule 3, Part 5 of the Major Development SEPP sets out the zoning, land use and development controls that apply to development on the Site.

As the development has a capital investment value of more than $10 million it is identified as State Significant Development under the *State Environmental Planning Policy (State and Regional Development) 2011*, with the Minister for Planning the consent authority for the project.

This Waste Management Plan (WMP) has been prepared on behalf of Mirvac to accompany a Development Application for the Australian Technology Park development.

This development essentially consists of three buildings:

- Building 1 – retail, office, childcare
- Building 2 – office, retail
- Community Building – retail, gymnasium, office, childcare

Waste audit and management strategies are recommended for new developments to provide support for the building design and promote strong sustainability outcomes for the building. All recommended waste management plans will comply with council codes and any statutory requirements. The waste management plan has three key objectives:

1. ***Ensure waste is managed to reduce the amount of waste and recyclables to land fill*** by assisting staff and visitors to the buildings to segregate appropriate materials that can be recycled; displaying signage to remind and encourage recycling practices; and through placement of recycling and waste bins to reinforce these messages.
2. ***Recover, reuse and recycle*** generated waste wherever possible.
3. ***Compliance*** with all relevant codes and policies.

This Plan has been developed with reference to the City of Sydney's *Policy for Waste Minimisation in New Developments*.

2. Waste Generation

2.1 Waste Streams

Based on the development profile (as per Section 1), the following are the predominant waste streams that would be expected on a regular basis:

- Cardboard recycling;
- Paper recycling;
- Comingled (container) recycling (glass and plastic);
- Organics recycling; and
- General waste.

Paper and cardboard recycling will be consolidated into the one bin provided by the appointed contractor for recycling – this is to ensure that the system is economically viable. However, confidential document management will ensure that this stream (ie., materials), is not consolidated with other paper or the cardboard.

In addition to these five stream, other streams such as toner cartridge recycling will be implemented.

Other wastes may be generated, but these would be irregular in terms of when generated and as such the quantities not able to be estimated. These would be materials such as nappies from child care, office furniture, e-waste and other materials. This Waste Management Plan does however recommend systems that will enhance landfill diversion of these materials.

2.2 Waste Generation Estimates

Calculations for the types and quantities of waste that will be generated are based on averages for quantity of waste generated and composition as determined by industry data (ie., data/information provided by WACS' waste audits conducted in a broad range of sectors) as well as consideration of the waste generation rates as detailed in the City of Sydney's *Policy for Waste Minimisation in New Developments*. In addition, reference has also been made to the NSW Office of Environment and Heritage, Model Waste Not Development Control Plan 2008.

The following tables show the estimated waste generation for the development.

Tables 1 and 2 show the estimated waste generated from the development (by Building) – these estimates are based on averages for quantity of waste generated and composition as determined by industry data (ie., data/information provided by WACS' waste audits conducted in a broad range of sectors) as well as consideration of waste generation rates as detailed in the City of Sydney "*Policy for Waste Minimisation in New Developments, 2005*".

It is estimated that the development will generate a total of **125,016 litres** of waste and recyclables per week (this is total).

Table 1 – Building 1 Waste generation estimate

Waste Type	L
General Waste	21,630
Recycling	21,630
TOTAL	**43,260**

Table 2 – Building 2 Waste generation estimate

Waste Type	L
General Waste	38,128
Recycling	38,128
TOTAL	**76,256**

Table 3 – Community Building Waste generation estimate

Waste Type	L
General Waste	2,750
Recycling	2,750
TOTAL	**5,500**

Notes:

- Calculations are based on the activities and spatials as advised by Mirvac
- The volumes are based on that correct segregation of waste and recyclables occurs

3. Waste Management Calculations and Spacial Requirements

3.1 Waste Systems and Bin Requirements

The following table show the recommended systems required to manage the estimated waste profile as detailed in the above tables for the development. The systems refer to the bins for consolidation of wastes and recyclables and waste storage rather than the internal bins that may be used within the development.

While 1100 litre mobile garbage bins have been used for the calculations, other bins such as 240/660 could be implemented – this will depend on the preferences (and associated costs) in discussions with the appointed waste management service provider.

Due to the nature of the activities conducted within the childcare centre, it is recommended (and data calculated) on that there will be 1 x 240 litre MGB for general waste and 1 x 240 litre MGB for recyclables located within the centre. There will be a need to have space in the waste storage area for these bins when taken down for servicing and for replacement bins (this is factored into the total space required within the waste storage area).

Table 4 – Building 1 - Waste Systems (five clearances/week)

Waste Stream	Bin Size (MGB)	No. of Bins	Clearance Frequency/week	Capacity (weekly)	Estimated volume / week	Footprint per bin (m2)	Total Footprint
General Waste	1100	4	5	22,000	21,630	1.04	4.16
Recycling	1100	4	5	22,000	21,630	1.04	4.16
TOTAL		**8**		**44,000**	**43,260**		**8.3**

Table 5 – Building 2 - Waste Systems (five clearances/week)

Waste Stream	Bin Size (MGB)	No. of Bins	Clearance Frequency/week	Capacity (weekly)	Estimated volume / week	Footprint per bin (m2)	Total Footprint
General Waste	1100	7	5	38,500	38,128	1.04	7.28
Recycling	1100	7	5	38,500	38,128	1.04	7.28
TOTAL		**14**		**77,000**	**76,256**		**14.6**

Table 6 – Community Building - Waste Systems (five clearances/week)

Waste Stream	Bin Size (MGB)	No. of Bins	Clearance Frequency/week	Capacity (weekly)	Estimated volume / week	Footprint per bin (m2)	Total Footprint
General Waste	1100	1	5	5,500	2,750	1.04	1.04
Recycling	1100	1	5	5,500	2,750	1.04	1.04
TOTAL		**2**		**11,000**	**5,500**		**2.1**

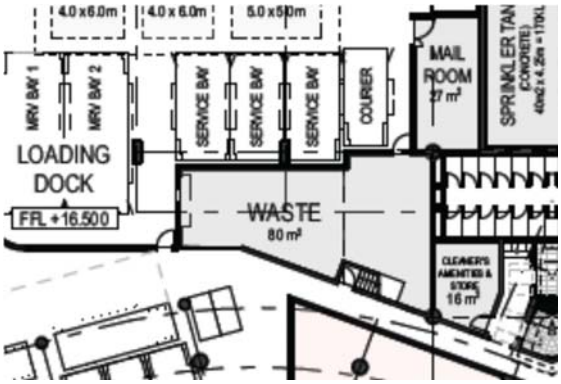
Based on the estimates of waste generation and the number of bins required (with a five per week collection schedule), as well as allowing 30% space for bin movement, the minimum size of the storage facilities should be approximately (and allowing for space for 240 litre MGB in Building 1 and the Community Building for waste and recyclables)[1]:

- Building 1 – 12.0 m^2
- Building 2 – 19.5 m^2
- Community Building – 3.5 m^2

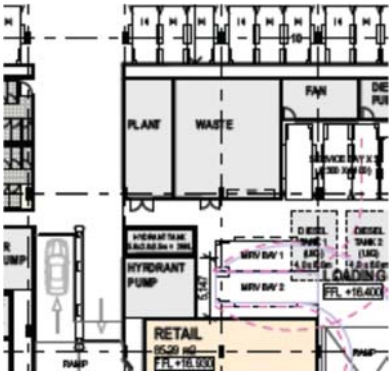
3.2 Waste Storage

The following diagrams illustrate the waste storage areas that are located in each building.

<u>Building 1:</u>

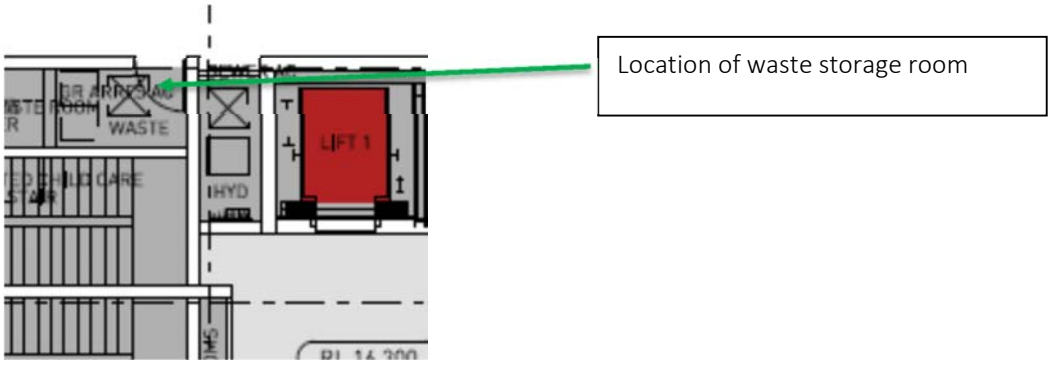


<u>Building 2:</u>



[1] There is also sufficient space within the waste storage areas for additional 240 litre MGB for waste or recyclables should different management systems be implemented (eg., providing these MGB for the retails/cafes or the gymnasium).

Community Building:



Based on the calculations for bin requirements (and space for bin movement), this space allocation is sufficient for bin storage and bin washing (including spare bins). In addition, there is space for additional waste materials should they be generated, as well as contingencies should a collection be missed.

Space allocations are:

- Building 1 – 80 m^2
- Building 2 – 80 m^2
- Community Building – 7 m^2

4. Waste Management Systems

4.1 Systems

The following summarises the recommended waste and recycling systems that will be implemented for the buildings. These recommendations are based on the City of Sydney's requirements and systems implemented for similar developments (and tenants).

4.2 Overview

All tenant's staff will be briefed on the proper use of waste management system and the recycling streams will be monitored and reported by cleaners/building management as it is imperative that the recycling stream remain free of contamination to ensure compliance with The City of Sydney's and/or contractor collection protocols. Tenants will be encouraged to maximise the separation of general waste and mixed recyclables to aid the proper disposal of all materials.

Waste and recycling collection services will be provided by a commercial waste contractor (TBA). Utilising a commercial waste contractor affords the development (tenants) greater flexibility regarding collection schedules and the appropriate collection frequencies will be determined in consultation with the waste contractor once appointed – at present, this is planned to be five per week – however once operational, collection schedules may need to be adjusted accordingly depending on actual waste generation.

Appendix A contains illustrations of bins (and other waste management equipment), that could be used within the buildings. The pictures provide examples of the different options for equipment such as MGB, bins placed within the office areas, tugs for transporting bins, trolley unit and a wheelie-safe trolley.

Signage will be a crucial element of the waste management system. Appendix B contains examples of signage. These are the type of signs that should be used throughout the buildings and waste storage area. Other signs can be accessed from the NSW EPA website at: http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm.

4.3 Storage

In keeping with best practice sustainability programs, all waste areas and waste and recycling bins will be clearly differentiated through appropriate signage and colour coding to Australia Standards to reflect the materials contained.

There will be a need to ensure that there is sufficient space to allow for bin movement. As a general rule, it is recommended that an additional 30%of the estimated footprint for bins be allocated to this and this has been factored into the waste storage area space calculations.

The waste areas will be accessed by cleaning staff only.

The waste and recycling bins will be colour coded and clearly signed. Each stream will be located in a designated area. This will assist in easy identification of correct bins by those with authorised access.

Photographs 1 & 2 - Examples of waste room colour coding

The waste room will contain the following to minimise odours, deter vermin, protect surrounding areas, and make it a user-friendly and safe area:

- waste room floor to be sealed with a two pack epoxy;
- waste room walls and floor surface is flat and even;
- all corners coved and sealed 100mm up, this is to eliminate build-up of dirt;
- a water facility with hose cock must be provided for washing the bins;
- any waste water discharge from bin washing must be drained to sewer in accordance with the relevant water board;
- tap height of 1.6m;
- storm water access preventatives (grate);
- all walls painted with light colour and washable paint;
- equipment electric outlets to be installed 1700mm above floor levels;
- the room must be mechanically ventilated;
- light switch installed at height of 1.6m;
- waste rooms must be well lit (sensor lighting recommended);
- optional automatic odour and pest control system installed to eliminate all pest types and assist with odour reduction – this process generally takes place at building handover – building management make the decision to install;
- all personnel doors are hinged and self-closing;
- waste collection area must hold all bins – bin movements should be with ease of access;
- conform to the Building Code of Australia, Australian Standards and local laws; and
- childproofing and public/operator safety shall be assessed and ensured.

Occupational Health and Safety issues such as slippery floors in waste rooms and the weight of the waste and recycling receptacles will need to be monitored. Cleaners will monitor the bin storage area and all spills will be attended to immediately by cleaners.

4.4 Summary of management process

The following summarises the management system for the wastes and recyclables for the buildings.

All wastes and recyclables that are collected from the Ground Floor will be transported to the waste storage areas (for each building), by buildings and/or cleaning staff via the lift.

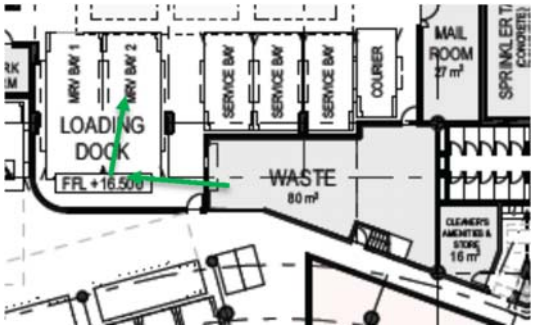
Table 7 – Waste systems

Stream	System	Comment
Cardboard recycling	1100L MGBs	Tenants separate paper/cardboard materials to deposit directly into bins. Cleaners to transfer bins/liners from the points of generation to the waste storage area for collection.
Comingled Recycling	1100L MGBs	Tenants separate comingled materials and then deposit directly into 240L MGBs. Cleaners to transfer bins/liners from the points of generation to the waste storage area for collection.
General Waste	1100L MGBs	Tenants separate general waste and then deposit directly into 240L MGBs. Cleaners to transfer bins/liners from the points of generation to the waste storage area for collection.

Movement of waste/recyclables from the waste storage area to the point of collection by the appointed contractor are illustrated in the following diagrams for each building. Transport routes are shown as green arrows.

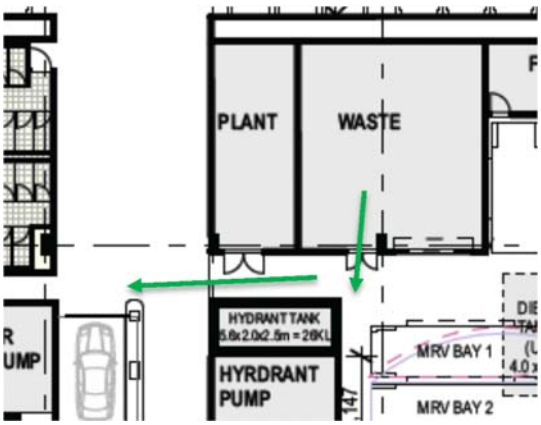
4.4.1 Building 1:

Movement



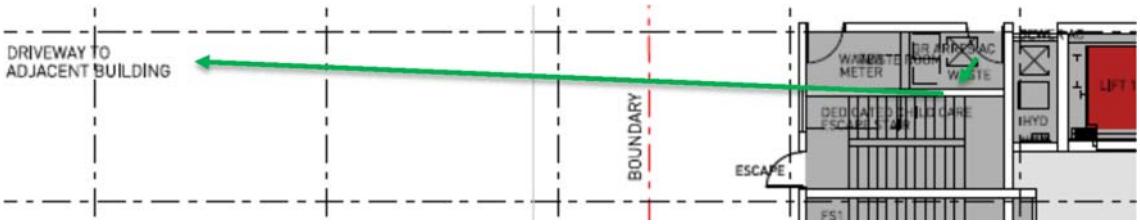
4.4.2 Building 2:

Movement



4.4.3 Community Building:

Movement



Waste/recyclables from the Community Building will be transported to the driveway prior to collection and the bins returned following collection.

4.5 Bin Requirements

Containers located within the development for waste and recycling should be consistent. The following table outlines the colour coding that has been developed by Standards Australia.

Table 8 – Standards Australia waste/recycling container colour coding

Waste Stream	Bin Body Colour	Lid Colour
Paper Recycling	Blue	Blue
Cardboard Recycling	Green	Blue
Food Organics	Burgundy	Burgundy
Commingled Recycling	Green	Yellow
General Waste	Green	Red

5. Education

All tenants and cleaning staff will receive information regarding the waste collection systems including how to use the system, which items are appropriate for each stream and collection regimes. Appropriate signage and updated information will also be provided.

All waste receptacles will be appropriately signed and additional room signage is usually provided from most waste contractors during implementation of the waste contract. Examples of signage is included in Appendix B.

It is recommended that all signs should;

- Clearly identify the waste/recycling stream;
- Use correct waste/recycling stream colour coding;
- Identify what can and cannot be disposed of in the receptacle; and
- Include highly visual elements to accommodate for individuals with inadequate English literacy.
- As part of the staff induction process, a waste and recycling toolkit will be provided. This toolkit will include the details of each of the systems in place; acceptance criteria for each stream and how each stream is managed.

On a monthly basis waste and recycling performance reports will be reported back to tenants so that they are aware of their performance and areas for improvement. An active waste monitoring program will be employed. The waste and cleaning contracts will ensure that contractors actively participate in the waste reduction program for the site and meet monthly to identify performance and new opportunities for diversion and avoidance.

6. Other Systems

In addition to the diversion system that will be implemented, other waste diversion and minimisation practices may also be implemented.

Fluorescent Light Tubes

A fluorescent light tube recycling stream may be required depending on the contractual arrangements for replacing light tubes. Recycling of used fluorescent light tubes could be a contractual requirement of the electrician responsible for servicing the lights. Alternatively if lights are services using in-house staff a fluorescent light tube recycling receptacle should be located in the recycling area.

Toner Cartridges

A toner cartridge recycling bin/box should be placed in key printing areas to capture used cartridges. These can be recycled on an as-needed basis.

E-Waste

Electronic equipment should be recycled on an as-needed basis.

Mobile Phones

Mobile phones can be collected in secure receptacles at centralised collection points. Alternatively, boxes containing postage satchels can be placed in centralised areas for use as needed.

Used Cooking Oil

Used cooking oil will be decanted into the original container and transported to the basement by tenants. This will then be collected by cleaners and transported to the central building storage area. These containers will either be stored or the oil decanted into a drum awaiting collection.

7. Ongoing Management

Having suitable systems in place is only one element of an effective waste management system. Compliance by all stakeholders is essential.

Cleaners are a key element in the effectiveness of the systems in place. Prior to acceptance of the cleaning contract, the contractor will be required to demonstrate how the management of waste and recycling will be carried out so as to ensure that segregated materials are placed in the correct systems. This process will be agreed and a training program implemented by the cleaning contractor to ensure full understanding by all cleaners. Monitoring of the system will be carried out by the cleaning supervisor and site management throughout the term of the contract.

In addition, cleaners will be required to feed back to site management any non-compliance issues they observe during their cleaning activities. This may include contamination of recycling; non-participation in the recycling system, or missing or damaged bins. In this way issues can be promptly dealt with by management.

Waste and recycling contractors will be required to report actual volumes collected by stream so that site management can monitor performance and feed this back to stakeholders.

It is highly recommended that a reporting program be set up at the site which would include bin tally sheets that detail the number of bins collected and how full they are at the time of collection, in addition to communication procedures to allow waste contractors to provide feedback regarding contamination and leakage.

All staff should be educated and made aware of any changes to the existing waste systems.

If a public place recycling system was implemented it would need to be accompanied by clear signage and colour coding to help differentiate the systems. It is likely that staff would also be required to inform the public about the systems and to guide their waste disposal practices.

8. Public Place Recycling

With public open spaces, consideration needs to be taken regarding public place recycling (PPR). General waste and recycling facilities will be provided in public realm areas throughout the precinct. The final number of bins will be determined in consultation with Sydney City Council and Building management.

Simple, colour-coded and consistent representation of common recycling and waste streams makes it easier for people to know how and what to recycle - whether at work, school or a public event. Introducing a public recycling system has environmental, social and financial benefits including:

- Responding to community expectations to 'Do the Right Thing'.
- Reducing the amount of waste sent to landfill and recovering valuable resources to be made into new products.
- Financial benefits over time as materials are diverted from landfill and into recycling.
- Improving the competitive edge of the buildings (and tenants – specifically the retail and cafes), in the eyes of users and other stakeholders.
- Contributing to triple bottom line reporting.

It is important that general waste and recycling bins are always located together in order to make recycling as accessible as general waste disposal. Recycling bins should never be located on their own in isolation from a general waste bin as patrons are likely to contaminate the recycling bin with general waste if there is no other option to dispose their general waste.

The implementation of organics recycling bins is not recommended in public places due to the high levels of contamination commonly observed in such systems.

All bins should be clearly signed and appropriately colour-coded to ensure the streams are readily identifiable. Signage for PPR should be:

- Colour-coded: red for general waste and yellow for recycling
- Large and easily viewed from all angles: this may mean that signs are placed on all sides of the bin or above the bin.
- Simple: don't use jargon (words such as PET, comingled, HDPE and even the recycling triangle can be confusing as this symbol can appear on a number of items that are not necessarily recyclable.
- Unambiguous and uses visual imagery

All public domain waste and recycling bins will be managed and collected by the appointed waste contractor as part of their existing waste and recycling operations.

9. Construction Waste Management Plan

This Plan details the management of waste during the construction phase of the Australian Technology Park development.

The aim of this Plan is to ensure that all waste resulting from construction activities is managed in an effective and environmentally aware manner. Specifically,

- To minimise the generation of waste to landfill
- To maximise waste material avoidance and reuse on site
- To ensure that where practicable, an efficient recycling procedure is applied to waste materials
- To ensure efficient storage and collection of waste

The testing and classification of any excavated material is not covered in this report. Where necessary separate specialist testing will be conducted by JBS&G.

If acid sulphate soils are present on site, a separate management plan will need to be prepared for handling and disposal of such soil. However, from the information/data received form UrbanGrowth, from previous site testing, no acid sulphate soils are present.

9.1 Estimated Waste Profile

9.1.1 Waste sources

The principles outlined above are applied to the expected waste sources for the development as follows:

Excavation Material

Earthworks will be completed over the site as required to achieve proposed levels. Any surplus material from the works will be used as fill material within the site, excavated material on site will be reused as fill material within the site. Where possible, excess material that cannot be reused on-site shall be transported to a landfill (licenced to accept this material). It is expected that if excess excavation materials is generated, it will be mainly from Building 2 excavation works.

Green Waste

All green waste material will remain onsite and be reused in landscape areas around the development.

Bricks, Tiles, Concrete

Bricks will be stockpiled and reused wherever possible. Surplus, unused bricks if possible will be crushed onsite and then reused in pavement construction or for temporary access tracks etc if possible. Unusable bricks will be collected and recycled at an appropriate brick/rubble recycling facility to be used in aggregate gravel products.

Plasterboard

To reduce the amount of waste produced, use of pre-cut and pre-measured sheets will be encouraged.

- Prior arrangements can be made with suppliers to collect and dispose of plasterboard waste product.
- Where possible, plasterboard waste should be stockpiled and crushed for reuse in landscaping on site.
- Where on site reuse is not practical, plasterboard waste should be stockpiled and transferred to a recycling facility.

Timber

Recyclable timber (untreated) will be collected and recycled at appropriate timber yard. Unrecyclable (treated) timber will be disposed at landfill.

Metals

Metal waste may result from the following:

- Use of metal material in construction
- Delivery of materials in drums or other metal packaging (e.g. paint)

All metal materials should be reused or recycled as follows:

- Metal drums and packaging to be returned to the supplier
- Any metal suitable for recycling should be separated and stored in a designated scrap metal bin for transport to a metal recycling facility

Paper and cardboard

Cardboard and paper will be produced mainly from packaging materials and office paper waste. These should be disposed of into a designated bin and collected regularly as required.

Liquid Waste

Liquid waste will be produced on site both as part of the construction process and for environmental control measures such as:

- Site and vehicle cleaning
- Brick/tile/concrete wash down areas
- Paint wash out areas
- Dust control waste

The following measures should be taken to minimise the impact of liquid waste:

- Ensure water is used in moderation and no taps are left continuously running
- Use any grey water produced on site for irrigation or for dust suppression
- Only discharge clean water into storm water

Waste water and storm water will be managed and disposed of in accordance with Sydney Water requirements.

9.1.2 Construction

The quantity of waste materials to be generated onsite are estimates and therefore the systems that will be put in place need to incorporate flexibility to allow for variation in the total quantities generated. Active site management during the construction phase will ensure all waste/recyclable

materials are disposed of appropriately and that all waste receptacles are of sufficient capacity to manage onsite activities.

Table 9 below details the estimated composition by m^3 of construction waste to be generated for the total site.

Table 9 – Estimated composition of construction waste by m^3

Material	Volume (m^3)
Timber	1,881
Concrete	3,056
Masonry	881
Mixed waste (recyclable)	10,392
Mixed waste (non-recyclable)	647
Total	**16,857**

Note that this site is large enough to ensure that dedicated bins are located so that correct segregation occurs. There will not be "one" specific waste storage area, rather appropriate bins (and size), will be located at required locations during construction. In addition, supplier of waste management services also separates mixed materials at their site and forwards materials to appropriate recyclers.

9.2 Waste Management Strategy

9.2.1 Waste management principles

Avoid and Reduce

Minimise the production of waste materials in the construction process by:

- Assessing and taking into consideration the resultant waste from different design and construction options
- Purchasing materials that will result in less waste, which have minimal packaging, are pre-cut or fabricated.
- Not over ordering products and materials

Reuse

Ensure that where ever possible, materials are reused either on site or offsite:

- Identify all waste products that can be reused
- Put systems in place to separate and store reusable items
- Identify the potential applications for reuse both onsite and offsite and facilitate reuse

Recycling

Identify all recyclable waste products to be produced on site:

- Provide systems for separating and stockpiling of recyclables
- Provide clear signage to ensure recyclable materials are separated

- Process the material for recycling either onsite or offsite

Note: In some cases it may be more economical to send the unsorted waste to specialised waste contractors who will separate and recycle materials at an offsite location.

Disposal

Waste products which cannot be reused or recycled will be removed and disposed of. The following will need to be considered:

- Ensure the chosen waste disposal contractor complies with Council requirements
- Implement regular collection of bins

9.3 On-site and off-site systems

Finalisation of the system(s) that will be implemented for the recovery of materials and for disposal of others to landfill will occur following appointment of contractor(s). A component of the appointment will be that contactors will be required to provide data as to the disposal pathway (eg., materials, volumes and final disposal site), as well as a validation process for this information.

The appointed contractor(s) will also be responsible for sourcing speciality recycling facilities for the materials that cannot be reused on site.

The waste management systems proposed in the table below are (note that disposal sites and/or contractors will be determined once the contractor(s) have been appointed) – such a contractor (eg., Dial-a-Dump), will be appropriately licenced:

Table 10 Waste Management Systems – construction

Materials on site		Destination		
Type of material	Estimated volume (m^3)	On-site (Reuse or recycle)	Off-site (Recycling contractor)	Disposal (Contractor and landfill site)
Timber	1,881	Formwork or landscaping	Unused material separate and stockpiled onsite. Collected by Dial-a-Dump for recycling. Facility TBA upon appointment of contractor.	TBC if required
Plasterboard	Included in mixed waste (recyclable)	Unused material taken back by supplier for reuse where possible	Non-returnable material to be separate and stockpiled onsite.	TBC if required

Materials on site		Destination		
Type of material	Estimated volume (m^3)	On-site (Reuse or recycle)	Off-site (Recycling contractor)	Disposal (Contractor and landfill site)
			Collected by the waste subcontractor on a weekly basis (or as required) for recycling. Facility TBA upon appointment of contractor.	
Concrete	3,056	Separated on site and crushed for use in pavement construction where possible	Collected by waste contractor and disposed at concrete recycling facility	TBC if required
Bricks	881	Undamaged bricks separated on site and stockpile for reuse at designated area or crushed and used in pavement construction	Unusable bricks collected by waste contractor and disposed at brick recycling facility	TBC if required
Metal	Included in mixed waste (recyclable)	No on-site reuse/recycling	Unused material separate and stockpiled onsite. Collected by specialist metal subcontractor for recycling. Facility TBA upon appointment of contractor.	TBC if required
Carpet	Included in mixed waste (recyclable	No on-site reuse/recycling	Collected by specialist carpet subcontractor for recycling if possible. Facility TBA upon appointment of contractor – possible Boral or Dunlop.	TBC if required
Mixed waste (recyclable)	10,392	No on-site reuse/recycling	Separate onsite into dedicated receptacles.	No disposal to landfill

Materials on site		Destination		
Type of material	Estimated volume (m^3)	On-site (Reuse or recycle)	Off-site (Recycling contractor)	Disposal (Contractor and landfill site)
			Collected by the waste subcontractor for recycling. Facility TBA upon appointment of contractor.	
Mixed waste (non-recyclable)	647	No on-site reuse/recycling	No reuse/recycling off-site	Collected by contractor and disposed at appropriate landfill
Total	16,857			

Note: The quantities of construction waste materials have been estimated using industry guides for predicting waste quantities[2]. The figures in Table 2 above are estimates and are used as a guide for designing the waste management systems on site. These figures will be adjusted according to the final building material selection and quantities. The waste management systems will be adjusted as necessary.

9.4 Waste/recyclables storage (on-site)

All waste and recycling materials will be stored in bins provided by the appointed contractor(s). These bins will be appropriately coloured and signed to indicate what materials are to be deposited into them and located so as to maximise the recovery of reusable/recyclable materials.

9.5 Waste/recyclables treatment (on-site)

There will be no treatment of wastes or recyclables on-site except for possible removal of contaminants prior to forwarding to off-site recyclers.

[2] McGregor Environmental Services (2000) Predicting C&D waste quantities in the Inner Sydney Waste Board

9.6 Contracts and purchasing

Each sub-contractor working on the site will be required to adhere to this Waste Management Plan.

The Head Contractor will ensure each subcontractor:

- Takes practical measures to prevent waste being generated from their work
- Implements procedures to ensure waste resulting from their work will be actively managed and where possible recycled, as part of the overall site recycling strategy or separately as appropriate
- Ensures that the right quantities of materials are ordered, minimally packaged and where practical pre-fabricated. Any oversupplied materials are returned to the supplier
- Implements source separation of off cuts to facilitate reuse, resale or recycling.

The Site Manager will be responsible for:

- Ensuring there is a secure location for on-site storage of materials to be reused on site, and for separated materials for recycling off site.
- Engaging appropriate waste and recycling contractors to remove waste and recycling materials from the site
- Co-coordinating between sub-contractors, to maximise on site reuse of materials
- Monitoring of bins on a regular basis by site supervisors to detect any contamination or leakage
- Ensuring the site has clear signs directing staff to the appropriate location for recycling and stockpiling station/s. And that each bin/skip/stockpile is clearly sign posted
- Proving training to all site employees and subcontractors in regards to the WMP as detailed below.

Should a sub-contractor cause a bin to be significantly contaminated, the Site Manager will be advised by a non-conformance report procedure. The offending sub-contractor will then be required to take corrective action, at their own cost. The non-conformance process would be managed by the Head Contractors' Quality Management Systems

9.7 Training and education

All site employees and sub-contractors will be required to attend a site specific induction that will outline the components of the WMP and explain the site specific practicalities of the waste reduction and recycling strategies outlined in the WMP.

All employees are to have a clear understanding of which products are being reused/recycled on site and where they are stockpiled. They are also to be made aware of waste reduction efforts in regards to packaging.

The site manager will post educational signage in relation the recycling activities on site in breakout areas, lunch rooms etc.

Toolbox sessions will be used to highlight waste management issues and provide feedback on compliance.

Appendix A – Waste Management Equipment

The following diagrams illustrate colours and sizes of different bins that could be used within the development.

Figure 1 – MGB bin

Figure 2 – MGB bin

Figure 3 – Indicative size of MGB

Figures 4, 5, 6 and 7 – Bin movers and tugs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Appendix B – Example Signage

Example wall posters

Example bin lid stickers