City & Southwest

Waste Management Plan

Detailed State Significant Development Application

Site C, Crows Nest over station development

April 2021 | Version: 1

Contents

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1 Introduction

1.1 Introduction

This report supports a State Significant Development (SSD) Application for the detailed design, construction and use of over station development (OSD) on Site C of the Crows Nest Station precinct. It is submitted to the Department of Planning, Industry and Environment (DPIE) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The detailed SSD Application for Site C OSD is classified as SSD pursuant to Clause 12 of *State Environmental Planning Policy (State and Regional Developments)* 2011 (SRD SEPP). Under Clause 12 of the SRD SEPP, any development application that is pursuant to a concept SSD Application is also classified as SSD whether or not that part of the development exceeds the minimum capital investment value specified in the relevant schedule of the SRD SEPP. In this regard, the proposed development on Site C is pursuant to the approved concept SSD Application and has not been delegated to Council under Section 4.37 of the EP&A Act. The proposed development is therefore, classified as SSD and is submitted to DPIE for assessment and determination.

1.2 The site

The Crows Nest Station precinct is located between the Pacific Highway and Clarke Street (eastern side of the Pacific Highway) and Oxley Street and south of Hume Street, Crows Nest. It is wholly located within the North Sydney local government area (LGA). It is also near the boundary of both the Willoughby and Lane Cove LGAs.

The Crows Nest Station OSD site comprises three sites (Figure 1). The following building envelopes and land uses were approved for each of the sites in the concept SSD Application:

- **Site A** (497-521 Pacific Highway, Crows Nest): 21 storey (RL 180m including a 4.4m rooftop building services zone) commercial office building with a maximum floor space of 40,300m2
- **Site B** (477-495 Pacific Highway, Crows Nest): 17 storey (RL 155m) residential accommodation building with a maximum floor space of 13,000m2
- **Site C** (14 Clarke Street, Crows Nest): 9 storey (maximum RL 132m including a 5m rooftop building services zone) commercial office building with a maximum floor space of 3,100m^2

This SSD Application relates only to the detailed design and delivery of Site C, with applications for Sites A and B to be undertaken separately in the future**Error! Not a valid bookmark self-reference.** applications.

Figure 1 Aerial photograph of Site C within the greater Crows Nest Station precinct

Site C is located at the north-western corner of Hume Street and Clarke Street, and comprises one allotment with the address of 14 Clarke Street, Crows Nest. It is legally described as Lot 1 in DP1123850.

The site is roughly rectangular in shape, and being located within the Crows Nest village centre. Adjoining Site C is a seven storey residential building (known as 'Wyndel Apartments') at 22-26 Clarke Street and a five storey commercial building at 20 Clarke Street.

The existing buildings on the site have been demolished to facilitate the construction of Crows Nest Station under the CSSI Approval. The demolition works are now complete, and the site is vacant and surrounded by construction hoarding. Once the station is completed as per the CSSI Approval, the entry within Site C will provide connection to the east towards Willoughby Road.

1.3 Sydney Metro

Sydney Metro is Australia's biggest public transport project (Figure 1). There are four core components:

- **Metro North West Line** (formerly the 36 kilometre North West Rail Link) - Services started in May 2019 in the city's North West between Rouse Hill and Chatswood, with a metro train every four minutes in the peak. The project was delivered on time and $1 billion under budget.
- **Sydney Metro City & Southwest** - The Sydney Metro City & Southwest project includes a new 30km metro line extending metro rail from the end of the Metro North West Line at Chatswood, under Sydney Harbour, through new CBD stations and southwest to Bankstown. It is due to open in 2024 with the ultimate capacity to run a metro train every two minutes each way through the centre of Sydney. Sydney Metro City & Southwest will deliver new metro stations at Barangaroo, Crows Nest, Victoria Cross, Martin Place, Pitt Street, Waterloo and new underground metro platforms at Central Station. In addition it will upgrade and convert all 11 stations between Sydenham and Bankstown to metro standards.

- **Sydney Metro West** - Sydney Metro West is a new underground railway connecting Greater Parramatta and the Sydney CBD. This once-in-a-century infrastructure investment will transform Sydney for generations to come, doubling rail capacity between these two areas, linking new communities to rail services and supporting employment growth and housing supply between the two CBDs. Sydney Metro West stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and the Sydney CBD. Further planning is underway to determine the locations of the Pyrmont and Sydney CBD stations.
- **Sydney Metro - Western Sydney Airport** - Metro rail will also service Greater Western Sydney and the new Western Sydney International (Nancy Bird Walton) Airport. The new railway line will become the transport spine for the Western Parkland City's growth for generations to come, connecting communities and travellers with the rest of Sydney's public transport system with a fast, safe and easy metro service. Six new stations will be delivered at St Marys, Orchard Hills, Luddenham, Airport Business Park, Airport Terminal and Western Sydney Aerotropolis. The Australian and NSW governments are partners in the delivery of this new railway.

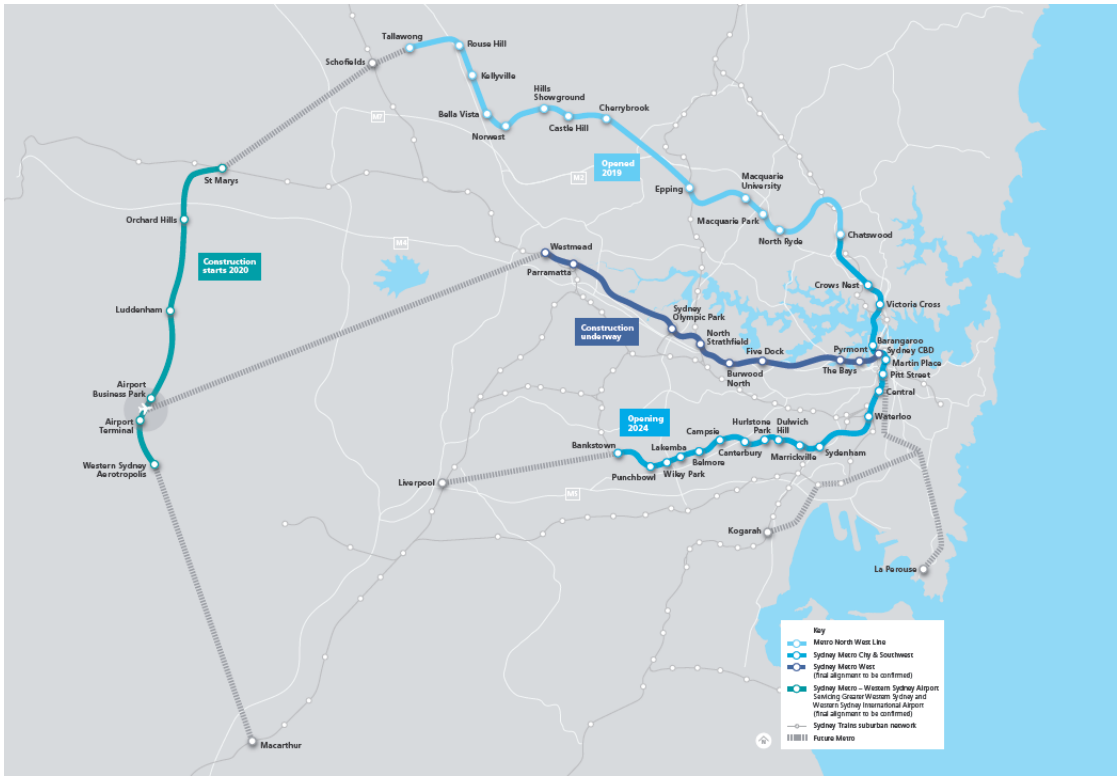

Figure 2 Sydney Metro network

1.4 Background and concept approval

Sydney Metro is seeking to deliver OSD above the approved Crows Nest Station. On 23 December 2020, the Minister for Planning and Public Spaces granted consent to the concept proposal for OSD at the Crows Nest Station including building envelopes, development parameters and strategies for a future development above the approved Crows Nest Station, and the use of the OSD spaces approved within the station under the CSSI Approval.

While the Crows Nest Station and OSD will form a single integrated station development (ISD), the planning pathways defined under the EP&A Act requires

separate assessment for each component of the development. In this regard, the approved station works (CSSI Approval) are subject to the provisions of Part 5.1 of the EP&A Act (now referred to as Division 5.2) and the OSD component is subject to the provisions of Part 4 of the EP&A Act.

The concept proposal for Crows Nest OSD complements the St Leonards commercial core and seeks to minimise overshadowing and amenity impacts and integrate with the broader Crows Nest village including Willoughby Road. It provides an opportunity for a mixed-use development that capitalises on its immediate access to Australia's biggest public transport project that delivers significant improvements to the amenity of the local area. This aligns with the vision for the area, as outlined in key strategic planning documents, including the Greater Sydney Commission's (GSC) North District Plan and the St Leonards and Crows Nest 2036 Plan prepared by DPIE.

In October 2018, DPIE released a draft Rezoning Proposal for the Crows Nest metro site. The Rezoning Proposal sought to increase the relevant planning controls applying to the site to be commensurate with the built form proposed in the concept SSD Application.

The release of the Rezoning Proposal was simultaneous to the release of the (then) draft strategic planning documents including the St Leonards and Crows Nest 2036 Draft Plan (2036 Draft Plan). The 2036 Draft Plan recommended significant changes to the planning controls for the immediate area surrounding the Crows Nest OSD site subject to consideration of community feedback to its exhibition.

The 2036 Plan and the associated Special Infrastructure Contribution (SIC) scheme were finalised by DPIE on 29 August 2020. The Rezoning Proposal was also finalised, and new planning controls gazetted, on 31 August 2020 applying new planning controls to the Crows Nest metro site.

1.5 Scope of the assessment

The following tasks were undertaken as part of this report:

- Review of relevant legislation, policies and guidelines associated with waste management
- Identification of waste streams that may be generated during the operation of the station and its associated retail spaces
- Estimation of indicative waste volumes which may be generated during the operation of the station and its associated retail spaces
- Recommendations for management strategies and mitigation measures, including methods for source separation of different waste streams and methods for storing, collecting and transporting waste streams
- Completion of preliminary details required for a Waste Management Plan (WMP) in accordance with the North Sydney Development Control Plan (NSDCP).

1.6 Assessment requirements

DPIE has issued the Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Statement for the proposed development. This report has been prepared having regard to the SEARs as follows:

SEARs Requirement	Section
19. Waste Management • *Identify, quantify and classify the likely waste to be generated during construction and operation* • *Describe measures to be implemented to minimise, reuse, recycle and safely dispose of this waste* • *Identify appropriate servicing arrangements*	Section 4 Section 5 This report

1.7 Definitions

Table 1-1: Terms and their definitions

Term	Definition
Attribute	Means any defined parameter within DOORS, associated with a requirement e.g. Design Verification Evidence
CN Contractor	Means an entity appointed by Sydney Metro to undertake the works associated with the construction of Crows Nest Station
CNDC	Means Crows Nest Design Consortium managed by SMEC and subconsultants Woods Bagot, Robert Bird Group, Norman Disney Young, Slattery, Oculus, Creative Road, Buro North, BCA Logic and others
Design Stage	Means each of Design Stage 1, Design Stage 2, Design Stage 3, Construction, Testing, and Operational Readiness phase as well as Finalisation and Asset Acceptance phase
DOORS	Means the software produced by IBM, referred to as DOORS (Dynamic Object-Oriented Requirements System)
Interface Contractor(s)	Means any one or more of the Sydney Metro City & Southwest contracts interfacing with Crows Nest Station that are required to complete works within the station including TSE, TSOM, L&E and LW contracts. (Refer table of acronyms contained within this document)
METRON	METRON is a joint venture of Arcadis and Mott MacDonald, with principal sub-consultants Robert Bird Group, Foster + Partners, Architectus, WT Partnership and McKenzie Group responsible for the Stage 1 design.
Principal	Means Sydney Metro
PSC	Means the Professional Service Contract which is the contract between Sydney Metro and the Service Provider

Service Provider	Means an entity appointed by Sydney Metro to provide professional services as described in the Services Brief
Sydney Metro	Sydney Metro means Sydney Metro (a New South Wales Government Agency constituted under the Transport Administration Act 1988 (NSW)) (ABN 12 354 063 515), the Principal under the Contracts
Sydney Metro City & Southwest	Means the proposed metro railway between Chatswood and Bankstown, including the Sydney Metro Harbour Crossing

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2 Legislation, policy and guidelines

The management of construction and operational waste from the Project would be undertaken in accordance with but not limited to the following state and local government requirements.

2.1 NSW State requirements

2.1.1 Protection of the Environment Operations Act 1997

The NSW waste regulatory framework is set out by the *Protection of the Environment Operations Act 1997* (PoEO Act). An objective of the PoEO Act is to:

- Reduce risks to human health and prevent the degradation of the environment by the use of mechanisms that promote the following:
- Pollution prevention and clearer production
- The reduction to harmless levels of the discharge of substances likely to cause harm to the environment
- The elimination of harmful wastes
- The reduction in the use of materials and the re-use, recovery or recycling of materials
- The making of progressive environmental improvements, including the reduction of pollution at source
- The monitoring and reporting of environmental quality on a regular basis.

The PoEO Act defines waste for regulatory purposes and establishes management and licensing requirements along with offence provisions to deliver environmentally appropriate outcomes. The PoEO Act also establishes the ability to set various waste management requirements via the Protection of the Environment Operations (Waste) Regulation 2014 (PoEO Waste Regulation).

2.1.2 Protection of the Environment Operations (Waste) Regulation 2014

The PoEO Waste Regulation came into effect on 1 November 2014. The PoEO Waste Regulation sets out provisions that cover the way waste is managed in terms of classification and transportation as well as reporting and record keeping requirements for waste management facilities.

2.1.3 Waste Avoidance and Resource Recovery Act 2007

The *Waste Avoidance and Resource Recovery Act 2007* (WARR Act) includes the majority of NSW's over-arching objectives and guiding principles to encourage beneficial re-use and resource recovery. The WARR Act promotes waste avoidance and resource recovery by providing a framework for the development of strategies and programs. It defines the waste hierarchy which is a set of priorities for the efficient use of resources which underpin the objectives of the WARR Act.

The waste hierarchy ensures that resource management options are considered against the following priorities:

- **Avoidance** including action taken to reduce the amount of waste generated, to maximise efficiency and avoid unnecessary consumption.
- **Resource recovery** including reuse, recycling, reprocessing and energy recovery. Where avoiding and reducing waste is not possible, the next most preferred option is to re-use the materials without further processing, avoiding the costs of energy and other resources required for recycling.

- **Disposal** including management of all disposal options in the most environmentally sensitive manner. Disposal is the least preferred option, and is appropriate for materials such as asbestos that cannot be safely reused or recycled.

2.1.4 Waste Avoidance and Resource Recovery Strategy 2014-2021

The *Waste Avoidance and Resource Recovery Strategy 2014-2021* (WARR Strategy) provides the strategic direction for future waste management and resource recovery activities in NSW. The priorities for waste reform were determined by the NSW Government in the NSW 2021: A plan to make NSW Number one.

The WARR Strategy aims to drive the efficient use of resources, reduce the environmental impact of waste and improve the well-being of the NSW environment, community and economy. The WARR Strategy sets out long-term targets and provides a framework for the development of various implementation plans. The WARR strategy sets the following targets for 2021-2022 which are applicable to the Project.

- Avoiding and reducing the amount of waste generated per person in NSW;
- Increasing recycling rates to 70% for commercial and industrial waste;
- Increasing waste diverted from landfill to 75%.

The WARR Strategy provides a clear framework for waste management to 2021-2022 and provides an opportunity for NSW to continue to increase recycling across all waste streams. The Project will aim to meet the objectives of the WARR Strategy and implement measures to manage waste in a way which minimises the impact waste has on the environment.

2.1.5 NSW Waste Classification Guidelines

Waste classification helps those involved in the generation, treatment and disposal of waste, and ensures the environmental and human health risks associated with their waste is appropriately managed in accordance with the PoEO Act and its associated regulations. Part 1 of the Waste Classification Guidelines (EPA, 2014) provides advice and direction on classifying waste so that appropriate management of all waste types is achieved.

Waste material from the operational works at the indicative OSD design would be classified in accordance with these guidelines. The following waste classifications are relevant to the operational works:

- Pre-classified waste including:
- General solid waste (putrescible);
- General solid waste (non-putrescible).

2.2 Local Government requirements

The Project is located within the North Sydney local government area (LGA), governed by the *North Sydney Local Environmental Plan 2013* (NSLEP 2013) and the NSDCP 2013 which supplements the LEP to provide more detailed provisions to guide development within the North Sydney LGA.

The NSDCP 2013 specifically outlines waste management guidelines for any waste or recycling produced during construction and operational works. The main waste management guidelines of the NSDCP 2013 relevant to the Project include:

- *Reduce the demand for waste disposal;*

- *Maximise reuse and recycling of building and construction materials, as well commercial waste;*
- *Assist in achieving Federal and State Government waste minimisation targets in accordance with regional waste plans;*
- *Minimise overall environmental impact;*
- *Require source separation, design and location standards which complement waste collection and management services offered by Council and private providers;*
- *Encourage building design and construction techniques which will minimise future waste generation*.

North Sydney Council also request that for the Project:

- Buildings are designed to encourage waste minimisation (source separation, re-use and recycling). Building design provisions include:
    - Appropriate space on each property for temporary storage of recyclables, garbage and compost;
    - Ensure space is easily accessible from each part of the building and from the collection point;
    - Include adequate access and maneuvering space, at least an area equivalent to the combined footprint of the bins;
    - Administrative arrangements for ongoing waste management, including signs;
    - Locate and design waste storage and recycling areas to complement the streetscape.
- All applications must be accompanied by plans which illustrate the location of the following:
    - A waste cupboard space;
    - A waste storage and recycling area;
    - A collection area;
    - Access for collection vehicles;
    - Location and design of communal facilities where relevant;
    - Management of hazardous waste where appropriate.

A WMP is to be completed for both the construction and operation works. The requirements of each plan are provided below:

- Construction WMP
    - The volume and type of waste to be generated, including excavation materials, green waste, brick, concrete, timber, plasterboard and metals;
    - How waste will be stored and treated on site;
    - How residual waste is to be disposed of.
- Operational WMP
    - The volume and type of waste to be generated;
    - The proposed on-site storage and treatment facilities;
    - The destination of waste materials;
    - Description of the proposed on-going management of waste and recycling.

The WMP for operation will be prepared as part of the detailed design. The WMP for construction will be prepared by the construction contractor.

2.3 Industry standards

Under the Green Star Targeted Points Schedule documented in the ESD report (Appendix Q), 1 Point is available under the operational waste credit title (Credit 8). The credit requirement includes:

- Provision of occupant waste storage containers for separation of all applicable waste streams; and
- Provision of dedicated waste storage area(s) for the collection of all waste. Facilities are to be sized to handle all waste streams and have best practice access requirements in accordance with prescriptive criteria (e.g. City of Sydney Policy for Waste Minimisation in New Developments).

Architects are to assess Policy requirements and incorporate sufficient spatial allowance for recyclable waste storage in addition to general waste near the loading dock, meeting access requirements.

2.4 Sydney Metro City & Southwest Sustainability Strategy 2017- 2024

Sydney Metro has a clear vision for the Sydney Metro City & Southwest project to demonstrate best-practice environmental, social and economic outcomes in delivery and operation. The sustainability strategy document outlines performance targets, initiatives and outcomes which will be adopted across key policy areas in the design, construction and operation stages of the metro-related aspects of the Sydney Metro City & Southwest project. The Strategy indicates that for OSD, Sydney Metro will be seeking to achieve site specific responses to the Project's sustainability objectives, which include minimising waste through the project life-cycle.

The objectives of the Sydney Metro City & Southwest Sustainability Strategy to minimise waste through the Project lifecycle have been considered when preparing this operational waste management plan (OWMP).

3 Methods of assessment

The waste management assessment involved an analysis of the waste characteristics for the concept proposal, identifying types and approximate quantities of waste streams likely to be produced during construction and operation. The assessment has been completed using the station along with the requirements of legislation and policy outlined in Section 4.0. An initial desktop waste classification has been undertaken in accordance with the Waste Classification Guidelines (EPA, 2014).

The management strategies for the Project have been prepared in accordance with the WARR Strategy, the NSDCP and to align with Sydney Metro City & Southwest Sustainability Strategy. As such, management strategies developed for each waste stream have been designed to be consistent with the waste management hierarchy, meet relevant legislation and policy, and achieve the environmental objectives of the operational works.

4 Construction waste management plan

4.1 Construction Waste Hierarchy

The following waste hierarchy will be used as a guiding principle:

- Avoid and Reduce - minimise the production of waste materials during construction 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 wherever possible, materials are reused by:
    - Identifying all waste products that can be reused
    - Putting systems in place to separate and store reusable items
    - Identifying the potential applications for reuse both onsite and offsite and facilitate reuse.
- Recycling - Identify all recyclable materials on site by:
    - Providing systems for separating and stockpiling recyclable material
    - Processing materials for recycling either onsite or offsite.
- 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 regulatory requirements
    - Implement regular bin collection.

4.1.1 Liquid Waste

Liquid waste may be produced on site for environmental control measures such as:

- Site cleaning and vehicle washdown, if required
- Dust control.

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

- Ensure water is used in moderation and no taps are left continuously running
- Only discharge clean water into storm water
- Vehicle washdown to be undertaken off-site where possible.

4.1.2 Stormwater Pollution Prevention

All actions will be undertaken to avoid pollution entering stormwater drains and for litter generation. The following will be initiated:

- Prior to commencement of any works a Safe Work Method Statement will be completed and reviewed to determine potential for stormwater pollution and/or litter generation
- The proponent (contractor), will need to develop a management strategy to manage the potential for these issues to be realised.
- Site inspections will be conducted during the working day to monitor potential for stormwater pollution generation and where identified, works will cease until appropriate controls are implemented
- Wastewater and storm water will be managed and disposed of in accordance with legislation and policy requirements.

4.1.3 Litter Management

- Daily site inspections will be conducted to identify litter, remedy the situation and investigate the cause to reduce the potential for the issue to occur in the future
- Enough bins (and/or bin space), will be made available to avoid dumping of materials outside bins
- All waste/recycling bins will have covers to ensure that wastes cannot be blown out during windy conditions. This will also apply to relevant stocks of materials to be used in construction
- Personnel will be allocated the role of litter management in that they will periodically inspect the site and surrounds for litter and if identified collect and dispose of it.

4.1.4 Waste Records

Records will be kept of all wastes and recyclables generated and either used on site, or transported offsite.

It will be a condition of appointment, that all waste/recycling contractors provide these records and that they also contain details of the types of materials weights/volumes and the facilities that the materials are transported to. These records will be made available to Council or any relevant government agency on request.

4.1.5 Onsite Waste and Recyclable Material Storage

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 to maximise the recovery of reusable/recyclable materials.

As demolition and construction activities progress, the designated bins may be relocated to maximise the collection of materials that will be diverted from landfill.

This will also involve relocating signage advising as to correct waste management. All locations where waste/recycling bins are located will be designed to avoid contaminating surface/stormwaters and have active litter control measures.

4.1.6 Onsite Waste and Recyclable treatment

There will be no treatment of wastes or recyclables on-site with the exception for possible sorting of materials and removal of contaminants prior to forwarding to off-site recyclers.

4.2 Construction Materials

The following summarises the types, quantities and management systems for construction materials that may be generated during the construction phase of the development.

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.

The table below details the estimated composition by cubic metre of construction waste to be generated for the total site. 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 (e.g. 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.

Waste management systems during construction are as follows:

Material use on site			**Destination of materials moving offsite**	
Type of Material	**Estimated Volume**	**On-Site (Reuse or Recycle**	**Off Site (Detail Contractor and Recycling Contractor)**	**Disposal (Detail of Contractor and Landfill Site)**
Concrete	1,796 m^3	Separated on site and crushed for use in pavement construction where possible	Collected by contractor and disposed at concrete recycling facility	Facility TBC upon appointment of contractor
Timber	8,496 m^3	Managed by the formwork contractor	Collected by subcontractor for recycling	Facility TBC upon appointment of contractor
Ferrous metals	439 Tonnes	No on-site reuse	Collected by specialist metal subcontractor for recycling	Facility TBA upon appointment of contractor

5 Operational waste management plan

In order to manage potential waste impacts during operation, this OWMP is developed in consultation with the detailed design stage.

This OWMP is specific to waste generated by Site C OSD. The OWMP does not include provisions for waste generated by Site C retail and the Site C entrance to the station, which form part of the CSSI Approval. Waste generated from these areas will be managed separately. Waste rooms for the Site C retail and station entrance will not be shared with the proposed Site C OSD. The Site C OSD bin room is located on the ground level and is referred to as the 'Waste Management Room'.

A brief summary of Site C OSD is as follows:

- Commercial spaces would be furnished with general waste and commingled recycling bins to hold a minimum one days' worth of waste.
- Staff/cleaners would dispose of waste to the appropriate bin within the Waste Management Room at a maximum of once per day.
- Building management would be responsible for the transfer of bins to the required collection point.

5.1 Waste management objectives

The objectives for the management of waste generated by the station from the operational works are to:

- Maximise recycling of waste generated during operations;
- Minimise the generation of waste;
- Efficiently store, handle, transport and dispose of waste correctly in an environmentally friendly manner.

5.2 Waste management strategy

The reduction, re-use and recycling of operational waste would be achieved by complying with a OWMP along with the adoption of the waste management hierarchy as a framework for prioritising waste management practices to achieve the best environmental outcome.

The preferred order of adoption is as follows:

- **Avoid** the potential of waste by identifying appropriate materials and procuring them;
- **Reduce** - waste by optimising operation;
- **Re-use** - waste by identifying sources that can utilise the waste;
- **Recycle** - waste by identifying facilities that are able to recycle waste;
- **Recovery** - of waste materials;
- **Disposal -** of waste when there is no reuse or recycling potential at an appropriate facility.

To deliver effective waste management across the Project, a number of strategies would be adopted. These are discussed below.

5.3 Waste minimisation and cleaner production

Waste prevention and minimisation would be addressed, where feasible, through the use of efficient operation techniques to minimise generation of residual waste not suitable for reuse or recycling. During the initial planning and conceptual design phases for the operational works, waste minimisation measures have been

considered and would continue to be developed and implemented during the detailed design stage.

Focusing on measures to minimise waste, the following cleaner production techniques have been identified as being applicable to the operational works:

- Improved operation and maintenance practices to reduce the quantity of resources used and to minimise the amount of waste generated;
- Application of most efficient processes to ensure resourcefulness in the use of energy, water, and natural resources;
- Identification and selection of energy efficient equipment at procurement;
- Minimisation of waste generated in day-to-day operations and ensuring that process residues are re-used where possible or recycled;
- Safe storage and disposal of residual waste and process residues ensuring least amount of harm to surrounding environment;
- Promotion of safe handling procedures of products in line with regulations and industry best practices.

5.4 Waste Generation

It is expected that garbage waste and co-mingled recyclables would be generated during the operation of the office. E-waste may be generated in small volumes from the office use and as such as been accommodated within this OWMP. Weekly waste generation rates are provided in Table 5-1. Waste generation rates have been adopted based on office uses and were sourced from the City of Melbourne document Waste Generation Rates (2015), as these rates are considered the most recent in the industry, therefore superseding all other Development Control Plans. E-waste is also expected to be generated by the development. E-waste will be accommodated through the provision of a 240L mobile bin for the collection of e-waste.

Table 5-1: Waste generation rates

USAGE	Rate per Week (L/100m^2)	
	GARBAGE	RECYCLING
Commercial (office)	70	70

An assessment of the volumes of waste and recyclables generated was carried out in accordance with the requirements of the North Sydney Development Control Plan 2013 Appendix 3 Waste Handling Guide and is provided in Table 5-2.

Table 5-2: Waste generation assessment

USAGE	Area (m^2)	Waste per Week (L)	
		GARBAGE	RECYCLING
Commercial (office)	2,600	1,820	1,820

5.5 Bin Quantity, Size, Colour and Collection Frequency

Details of the number, size and collection frequency of bins for both general waste and commingled recycling are presented in Table 5-3.

Table 5-3: Bin Size and Collection Frequency

Waste Type	Collections per Week	Bin Size (L)	No. Bins	Total Capacity (L)	Waste Generated Per Collection (L)	Surplus Capacity (L)
General Waste	2	1,100	1	2,200	1,820	380
Commingled Recycling	2	1,100	1	2,200	1,820	380
E-waste	As required	240	1	240	240	0

Bin dimensions are provided in Table 5-4.

Table 5-4: Bin Dimensions

Capacity (L)	Width (mm)	Depth (mm)	Height (mm)	Area (m2)
1,100	1240	1070	1330	1.33

5.6 Bin Storage and Movement

The following bin storage requirements have been met in the design of the waste storage spaces:

- There is sufficient space in the bin store to accommodate the number of bins required by the development.
- That there is side or rear access of a suitable grade and distance to each bin store area.

Bins required to manage the office waste would be permanently stored in the Waste Management Room, provided on the ground/concourse level. Office and community staff/cleaners would be responsible for transporting waste generated by the office and community spaces via the OSD service lifts to the Waste Management Room at the end of each day.

The cumulative space requirements and provision of the waste areas in the proposed development is detailed in

Table 5-5.

Table 5-5: Waste Area Space Provisions

Stream	Space Required (excluding circulation)	Space Provided
General Waste	1.33 m^2	26.00m^2
Commingled Recycling	1.33 m^2	
E-waste	0.43 m^2	
TOTAL	**2.66 m^2**	**26.00m^2**

As detailed in

Table 5-5 and shown in the scaled drawings (provided in Appendix A), the waste storage area is sufficient in size.

The bin rooms should also incorporate the following:

- Bin lids must always remain closed (ideally locked) to reduce the risk of wind-blown litter
- A water tap located in the store area to facilitate regular washing of bins
- If the wash down area is within the bin store area, then the floor must be graded to a waste outlet to sewer
- Alternative to a bin wash area, a third-party bin washing service can be engaged to perform this service. Bin washing suppliers must retain all waste water to within their washing apparatus so as to not impact on the drainage provisions of the site.
- Designed to prevent access to vermin, and vermin control
- Adequate lighting
- Ventilation would be provided in accordance with Australian Standard AS1668.
- All waste areas would meet EPA, BCA and AS2107 acoustic requirements as appropriate within operational hours assigned to minimise acoustic impact on surrounding premises.

5.7 Waste Collection

The collection service would be provided by private contractor, as follows:

- One 1,100L garbage bin collected twice per week.
- One 1,100L commingled recycling bin collected twice per week.

General waste and recyclable collections would occur via an 8.8m Medium Rigid Vehicle (MRV) with an operating height of 2.5 m.

A vehicle swept path analysis demonstrating sufficient access for waste collection vehicles is shown in Appendix B. The collection vehicle prop at the on rolled kerb provided on Clarke Lane, as shown in Appendix B. When propped to perform collection, waste vehicle operators would ferry the bins from the refuse room to the collection vehicle via internal corridors and return upon emptying.

Building management would ensure:

- Waste collection vehicles have access to the loading dock and Refuse Room.
- Bin are not overloaded.

5.8 Noise and Odour Management

Waste management must be undertaken in accordance with the recommendations contained in NSW EPA Noise guide for Local Government 2012 whereby collections should be restricted to the hours 7am – 10pm, Monday to Saturday.

Waste-related odours are mainly associated with the bin store area and as such the bin store should be adequately ventilated in accordance with Australian Standard AS1668 to mitigate any odours. There should also be a suitable location within close proximity of the bin store area for cleaning bins. The bin wash down area needs to be equipped with water tap and the floor graded to a waste outlet connected to the sewer system. Alternatively, a third-party bin washing service can be engaged to perform this service. Bin washing suppliers must retain all waste water to within their washing apparatus so as to not impact on the drainage provisions of the site.

Monitoring and cleaning of the bin store area should be regularly undertaken (bin washing services may be included as part of the collection contract).

6 Operational waste management plan (Greenstar)

A commitment to operational waste minimisation initiatives will be observed by the subject site. All reporting and required agreements there in are the responsibility of the occupier.

6.1 Operational Waste Targets

A commitment to operational waste minimisation initiatives will be observed across the development. All reporting and required agreements therein are the responsibility of the occupiers (building management or equivalent). All streams are subject to comprehensive waste audit for benchmarking.

Waste generation and diversion targets throughout the development are provided in Table 6-1.

Diversion targets have been formulated based upon typical composition of commercial data provided in EPA NSW document 0341 - *Reducing business waste; Industry Fact Sheet – Commercial Offices (n.d.).*

Table 6-1: Office Material Generation Minimisation Targets

Usage	Waste Stream	Expected Waste (L/Week/ 100m^2)	Expected Diversion (% Total)	Target Waste (L/Week/ 100m^2)	Target Diversion (% Total)	Change (L/Week/ 100m^2)
Commercial	Garbage	70L	50%	12.6L	9%	57.4L
	Recyclables	70L	50%	127.4	91%	+57.4L
	TOTAL	**140L/100 m^2**	**100%**	**140L/100m^2**	**100%**	**-**

The weekly total landfill diversion calculation is provided within Table 6-2. Target diversion will be achieved through the provision of adequate separate systems and education programs. Further landfill minimisation can be achieved through the use of innovative technologies such as food organics composting.

Table 6-2: Weekly Landfill Diversion Totals

Expected (L/Week)		Expected Diversion (% Total)	Target (L/Week)		Target Diversion (%Total)	Diversion Change (L/Week)
Garbage	Diversion (Recyclables)		Garbage	Diversion (Recyclables)		
1,820	1,820	50%	328L	3,312L	91%	±1,492L

6.2 Responsibilities

Maintenance of the bins store area and appropriate signage will be the responsibility of the staff and cleaners. Maintenance will include, but not limited to:

- Washing of the communal bin store areas (either completed by staff/cleaners or engagement of third-party washing service);
- Replacing/updating appropriate signage material, as required;
- Vermin control measures;
- Odour control measures;

- Maintenance, repair or replacement of any damaged waste infrastructure, as required.

Building management would be responsible for overseeing waste management within the development. Responsibilities would include:

- Educating staff/cleaners of the waste management methods on site;
- Inspecting waste stores;
- Reviewing contamination within bins; and
- Investigating incidents of inappropriate waste storage (or aggregation).
- Building management would ensure anyone found responsible for inappropriate waste disposal would be appropriately educated and made aware of correct waste disposal techniques.

6.3 Education and Training

A waste education program may be implemented to identify responsibilities for staff/cleaners regarding appropriate use of bins. The program would ensure staff/cleaners are familiar with and understand the waste management requirements of the development.

6.4 Waste Reduction and Diversion from Landfill

There are a range of opportunities to reduce the amount of waste disposed in landfills and the development may wish to consider implementing. An education program would assist in reducing contamination in the waste streams and increasing diversion from landfill.

Waste reduction and landfill diversion opportunities for the retail spaces may include:

- Maintain a decluttered and organised storage space for perishable items;
- Avoid overloading fridges and freezers to maintain the freshness of foods;
- Order food stock as required – avoid over ordering;
- Where possible -order stock through paperless avenues;
- Ask suppliers to deliver stock in reusable crates that can be returned upon emptying;
- Encourage the use of reusable food containers;
- Encourage the use of reusable drink bottles and provide refill station as required;
- Provide opportunities to recycle alternative waste streams such as printer cartridges and e-waste.

6.5 Operational Waste Performance Measurement Procedures

Quarterly reports produced by facilities management will provide analysis regarding current landfill diversion rates, specified by stream. Reports are to be provided to stakeholders as deemed appropriate by the occupier. Data will be accumulated based on the number of bin tips performed each week for each stream as follows:

- Garbage (general waste);
- Fully Commingled Recycling; and
- E-waste.

A baseline value is to be established within the first three months of operation via a waste audit conducted by an occupier nominated party.

Management/cleaners should implement a recording system to analyse the number of bin tips per week.

The waste collectors and maintenance staff will provide data regarding bin weights and collections, which are measured and recorded in electronic form as standard practice at the point of collection. This should be compared to the bin tip record to ensure accuracy.

The following performance metrics are recommended to be present in each report:

- Litres of waste, per stream, per week; and
- Percentage recovery rate relative to total landfill volume.

Waste collectors should also make note of any contamination in the commingled recycling and provide feedback to facilities management to address such issues where appropriate.

It will be the responsibility of facilities management to analyse the metrics to provide required actions going forward regarding either increasing or maintaining performance.

6.6 Ongoing Monitoring and Review

Facilities management will be responsible for the delivery and review of this Operational Waste Management Plan on an annual basis in accordance with Green Star Criteria. The review process should include (but not limited to) the following:

- Address any feedback or issues that have been raised in regards to waste management within the previous reporting period;
- A summary of waste volumes generated and comparison to landfill diversion targets;
- Identify areas for potential improvement in regards to waste management systems and increased recycling rates; and
- Revise and set landfill diversion minimisation targets based on past performance and current best practice for upcoming reporting periods.

7 Summary

This waste management report shows that the Site C development can comply with relevant Council and legislative requirements for waste management. This waste management plan forms the framework for the provision of waste management measures for the future stages of the development. A full waste management plan shall be prepared prior to construction of the development.