

WASTE STRATEGY REPORT

APPENDIX U





Sydney Metro City & Southwest: Victoria Cross Over Station Development:

Waste strategy report

| | |
|-----------------------|-------------------------------|
| Applicable to: | Sydney Metro City & Southwest |
| Author: | AECOM Australia Pty Ltd |
| Owner | Transport for NSW |
| Status: | Final |
| Version: | 4 |
| Date of issue: | 15 May 2018 |
| Review date: | 15 May 2018 |
| © Sydney Metro 2018 | |

Table of Contents

| | | |
|------------|--|-----------|
| 1.0 | Introduction | 4 |
| 1.1 | Purpose of this report | 4 |
| 1.2 | Overview of the Sydney Metro in its context | 4 |
| 1.3 | Planning relationship between Victoria Cross Station and the OSD | 6 |
| 1.4 | The Site | 8 |
| 1.5 | Overview of the proposed development..... | 9 |
| 1.6 | Staging and framework for managing environmental impacts | 12 |
| 2.0 | Scope of assessment..... | 14 |
| 2.1 | Limitations | 15 |
| 3.0 | References..... | 16 |
| 4.0 | Legislation, policy and guidelines | 17 |
| 4.1 | NSW State requirements | 17 |
| 4.2 | Local Government requirements | 19 |
| 4.3 | Industry standards | 21 |
| 4.4 | Sydney Metro City & Southwest Sustainability Strategy 2017-24..... | 21 |
| 5.0 | Method of assessment..... | 23 |
| 6.0 | Impact assessment | 24 |
| 6.1 | Environmental values and potential impacts | 24 |
| 7.0 | Construction waste management | 25 |
| 7.1 | Waste management objectives | 25 |
| 7.2 | Waste generation..... | 25 |
| 7.3 | Construction waste management strategy and mitigation measures..... | 26 |
| | 7.3.1 Implementation | 26 |
| | 7.3.2 Waste management measures..... | 27 |
| 8.0 | Operation waste management strategy and mitigation measures | 28 |
| 8.1 | Waste management objectives | 28 |
| 8.2 | Waste management strategy | 28 |
| 8.3 | Waste minimisation and cleaner production..... | 29 |
| 8.4 | Operations waste generation | 29 |
| 8.5 | Source separation..... | 31 |
| 8.6 | Waste Storage and Collection..... | 32 |
| | 8.6.1 Waste storage room bins | 32 |
| | 8.6.2 Waste storage rooms sizing | 33 |
| | 8.6.3 Other design considerations | 33 |
| | 8.6.4 Summary | 34 |
| | 8.6.5 Collection frequency | 36 |
| 8.7 | Waste Movement..... | 36 |
| 8.8 | Waste re-use, recycling and disposal..... | 36 |

| | | |
|------------------------|---|-----------|
| 8.9 | Waste monitoring and auditing..... | 37 |
| 9.0 | Conclusion..... | 38 |
| Appendix A..... | | 39 |
| | Construction and operation preliminary waste management plan..... | 39 |

1.0 Introduction

1.1 Purpose of this report

This report supports a concept State Significant Development Application (concept SSD Application) submitted to the Department of Planning and Environment (DP&E) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The concept SSD Application is made under Section 4.22 of the EP&A Act.

Transport for NSW (TfNSW) is seeking to secure concept approval for a commercial office tower above the Victoria Cross Station, otherwise known as the over station development (OSD). The concept SSD Application seeks consent for a building envelope and its use as a commercial premises (office, business and retail), maximum building height, maximum gross floor area, pedestrian and vehicular access, circulation arrangements and associated car parking, future subdivision (if required) and the strategies and design parameters for the future detailed design of development.

TfNSW proposes to procure the construction of the OSD as part of an Integrated Station Development (ISD) package, which would result in the combined delivery of the station, OSD and public domain improvements. The station and public domain elements form part of a separate planning approval for Critical State Significant Infrastructure (CSSI) approved by DP&E on 9 January 2017.

As the development is within a rail corridor, is associated with railway infrastructure and is for commercial premises with a Capital Investment Value of more than \$30 million, the project is identified as State Significant Development (SSD) pursuant to Schedule 1, 19(2)(a) of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP).

This report specifically respond to the Secretary's Environmental Assessment Requirements (SEARs) issued for the concept SSD Application on 30th November 2017 which states that the Environmental Impact Statement (EIS) should be accompanied by a waste strategy.

1.2 Overview of the Sydney Metro in its context

The New South Wales (NSW) Government is implementing *Sydney's Rail Future*, a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of customers in the future (Transport for NSW, 2012). Sydney Metro is a new standalone rail network identified in *Sydney's Rail Future*.

Sydney Metro is Australia's biggest public transport project, consisting of Sydney Metro Northwest (Stage 1), which is due for completion in 2019 and Sydney Metro City & Southwest (Stage 2), which is due for completion in 2024 (Refer to **Figure 1**).



Figure 1: Sydney Metro alignment map

Stage 2 of Sydney Metro includes the construction and operation of a new metro rail line from Chatswood, under Sydney Harbour through Sydney’s CBD to Sydenham and on to Bankstown through the conversion of the existing line to metro standards.

The project also involves the delivery of seven (7) new metro stations, including at North Sydney. Once completed, Sydney Metro will have the ultimate capacity for 30 trains an hour (one every two minutes) through the CBD in each direction - a level of service never seen before in Sydney.

On 9 January 2017, the Minister for Planning approved the Sydney Metro City & Southwest - Chatswood to Sydenham application lodged by TfNSW as a Critical State Significant Infrastructure project (reference SSI 15_7400), hereafter referred to as the CSSI Approval.

The CSSI Approval includes all physical work required to construct the CSSI, including the demolition of existing buildings and structures on each site. Importantly, the CSSI Approval also includes provision for the construction of below and above ground structures and other components of the future OSD (including building infrastructure and space for future lift cores, plant rooms, access, parking and building services, as relevant to each site). The rationale for this delivery approach, as identified within the CSSI application is to enable the OSD to be more efficiently built and appropriately integrated into the metro station structure.

The EIS for the Chatswood to Sydenham component of the City & Southwest project identified that the OSD would be subject to a separate assessment process.

Since the CSSI Approval was issued, Sydney Metro has lodged four modification applications with DP&E to amend the CSSI Approval as outlined below:

- Modification 1- Victoria Cross and Artarmon Substation which involves relocation of the Victoria Cross northern services building from 194-196A Miller Street to 50 McLaren Street together with inclusion of a new station entrance at this location referred to as Victoria Cross North. 52 McLaren Street would also be used to support construction of these works. The modification also involves the relocation of the substation at Artarmon from Butchers Lane to 98 – 104 Reserve Road. This modification application was approved on 18 October 2017.
- Modification 2- Central Walk which involves additional works at Central Railway Station including construction of a new eastern concourse, a new eastern entry, and upgrades to suburban platforms. This modification application was approved on 21 December 2017.
- Modification 3 - Martin Place Station which involves changes to the Sydney Metro Martin Place Station to align with the Unsolicited Proposal by Macquarie Group Limited (Macquarie) for the development of the station precinct. The proposed modification involves a larger reconfigured station layout, provision of a new unpaid concourse link and retention of the existing MLC pedestrian link and works to connect into the Sydney Metro Martin Place Station. It is noted that if the Macquarie proposal does not proceed, the original station design remains approved. This modification application was approved on 22 March 2018
- Modification 4 - Sydenham Station and Sydney Metro Trains Facility South which incorporates Sydenham Station and precinct works, the Sydney Metro Trains Facility South, works to Sydney Water's Sydenham Pit and Drainage Pumping Station and ancillary infrastructure and track and signalling works into the approved project. This modification application was approved on 13 December 2017.

Given the modifications, the CSSI Approval is now approved to operate to Sydenham Station and also includes the upgrade of Sydenham Station.

The remainder of Stage 2 of the City & Southwest project (Sydenham to Bankstown) proposes the conversion of the existing heavy rail line and the upgrade of the existing railway stations along this alignment to metro standards. This part of the project, referred to as the Sydenham to Bankstown Upgrade, is the subject of a separate CSSI Application (Application No. SSI 17_8256) which is currently being assessed by the DP&E.

1.3 Planning relationship between Victoria Cross Station and the OSD

While the Victoria Cross Station and OSD will form an Integrated Station Development, the planning pathways defined under the *Environmental Planning & Assessment Act 1979* require separate approval 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.

For clarity, the approved station works under the CSSI Approval include the construction of below and above ground structures necessary for delivering the station and also enabling construction of the integrated OSD. This includes but is not limited to:

- Demolition of existing development
- Excavation
- Station structure including concourse and platforms
- Lobbies
- Retail spaces within the station building
- Public domain improvements
- Pedestrian through-site link
- Access arrangements including vertical transport such as escalators and lifts
- Structural and service elements and the relevant space provisioning necessary for constructing OSD, such as columns and beams, space for lift cores, plant rooms, access, parking, retail and building services.

The vertical extent of the approved station works above ground level is defined by the ‘transfer slab’ level (which for Victoria Cross is defined by RL 82), above which would sit the OSD. This delineation is illustrated in **Figure 2**.

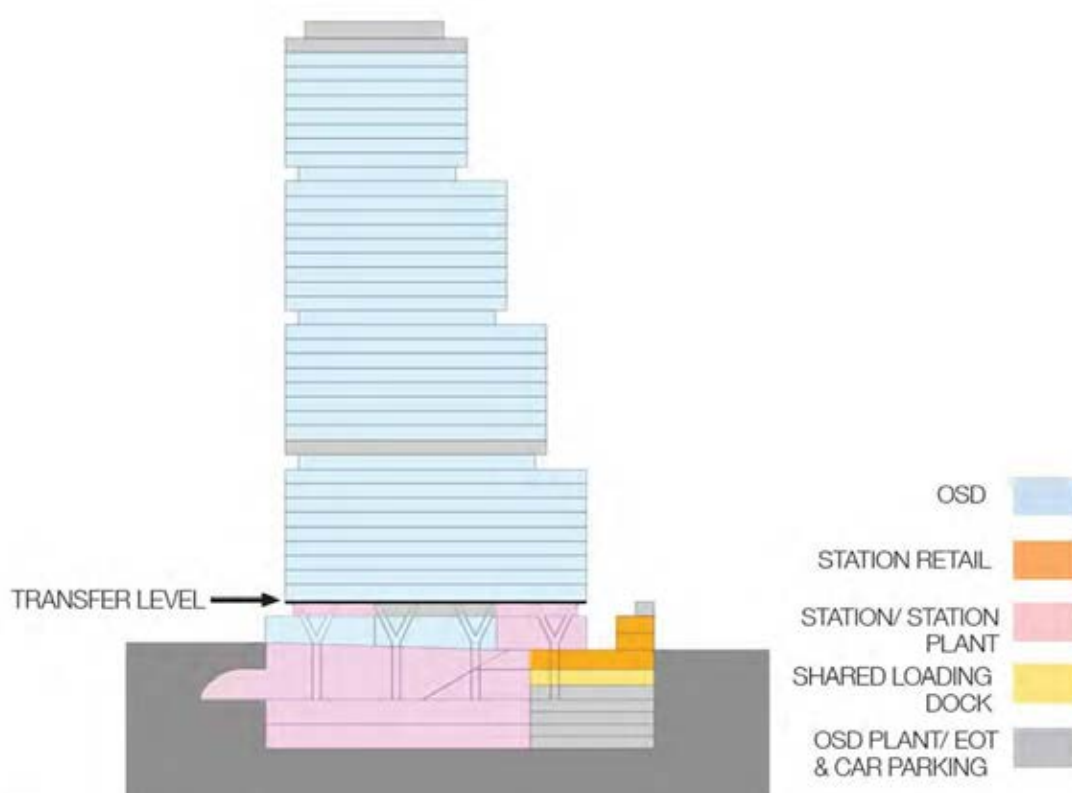


Figure 2: Delineation between the Metro station and OSD

The CSSI Approval also establishes the general concept for the ground plane of Victoria Cross Station including access strategies for commuters, pedestrians and workers. In this regard, pedestrian access to the station would be from Miller and Denison Streets and the commercial lobby would be accessed from Miller Street. Retail uses (approved under the CSSI Approval) would be located on the ground floor of the development at both the Miller Street and Denison Street levels activating the through-site link. Separate consent would be sought in the future for the fit-out and specific use of this retail space.

Since the issue of the CSSI Approval, TfNSW has undertaken sufficient design work to determine the space planning and general layout for the station and identification of those spaces within the station area that would be available for the OSD. In addition, design work has been undertaken to determine the technical requirements for the structural integration of the OSD with the station. This level of design work has informed the concept proposal for the OSD. It is noted that ongoing design development of the works to be delivered under the CSSI Approval would continue with a view to developing an Interchange Access Plan (IAP) and Station Design Precinct Plan (SDPP) for Victoria Cross Station to satisfy Conditions E92 and E101 of the CSSI Approval.

The public domain improvement works around the site would be delivered as part of the CSSI Approval.

1.4 The Site

The Victoria Cross OSD site is located at the southeast corner of the intersection of Miller and Berry Streets, North Sydney, above the southern portal of the future Victoria Cross Station (refer to **Figure 3**). The site is located in North Sydney CBD, which is identified as part of Sydney’s “Harbour CBD” (along with Sydney CBD) in the *Greater Sydney Region Plan (2018)*. It is the third largest office market in Sydney and is a key component of Sydney’s Global Economic Corridor.



Figure 3: Victoria Cross Station location plan

The site is located in the North Sydney Local Government Area approximately 3km north of Sydney CBD, 5km southeast of Chatswood and 2km southeast of St Leonards.

The site (refer to **Figure 4**) is irregular in shape, has a total area of approximately 4,815 square metres and has street frontages of approximately 37 metres to Berry Street, 34 metres to Denison Street and 102 metres to Miller Street.

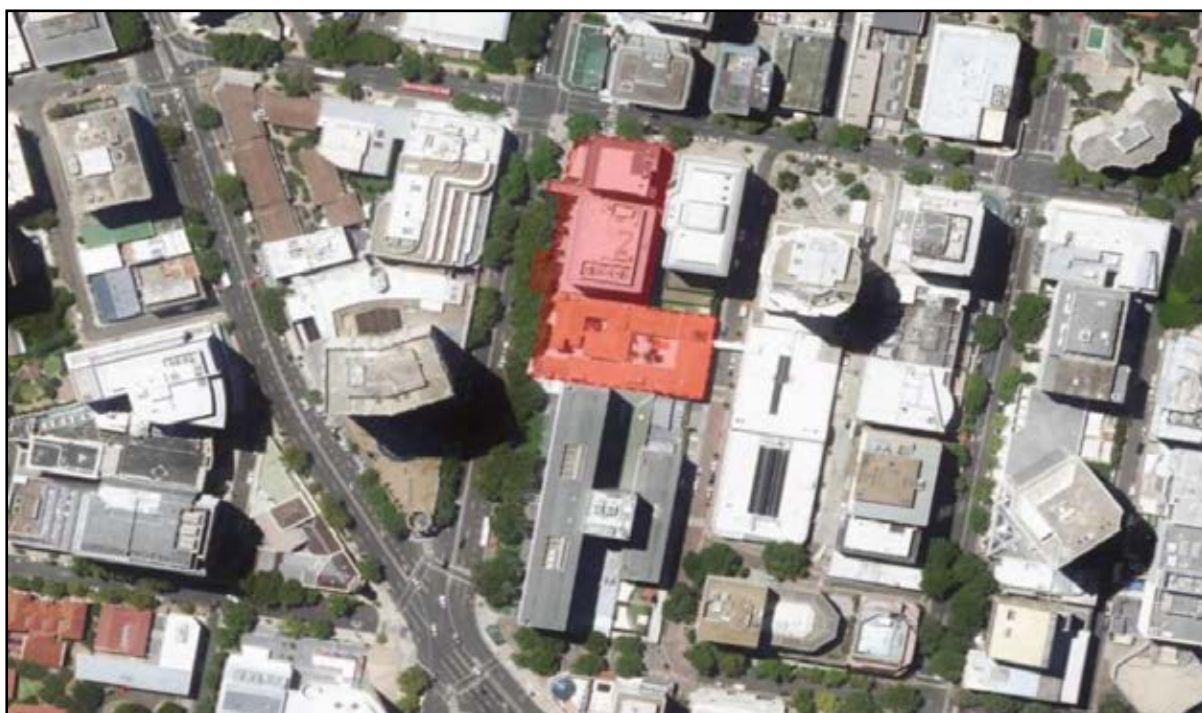


Figure 4: The Site

The site comprises the following properties:

- 155–167 Miller Street SP 35644 (formerly Tower Square)
- 181 Miller Street Lot 15 in DP 69345, Lot 1 & Lot 2 DP 123056 and Lot 10 in DP 70667
- 187 Miller Street Lot A in DP 160018
- 189 Miller Street Lot 1 in DP 633088
- Formerly part 65 Berry Street Lot 1 in DP 1230458

1.5 Overview of the proposed development

This concept SSD Application comprises the first stage of the Victoria Cross OSD project. It will be followed by a detailed SSD Application for the design and construction of the OSD to be lodged by the successful contractor who is awarded the contract to deliver the Integrated Station Development.

This concept SSD Application seeks approval for the planning and development framework and strategies to inform the future detailed design of the OSD. It specifically seeks approval for the following:

- A building envelope as illustrated in **Figure 5**
- A maximum building height of RL 230 or 168 metres (approximately 42 storeys, comprising 40 commercial storeys and 2 additional storeys for the roof top plant) for the high rise portion of building envelope and RL 118 or 55 metres (approximately 13 storeys) for the lower rise eastern portion of the building envelope
- A maximum gross floor area (GFA) of 60,000 square metres for the OSD component, which is equivalent to a floor space ratio of 12.46:1
- Use of the building envelope area for commercial premises including commercial office, retail and business premises
- Use of the conceptual OSD space provisioning (both above and below ground) within the approved Victoria Cross Station (CSSI Approval), including the OSD lobby and associated retail space, basement parking, end-of-trip facilities, services and back-of-house facilities
- Car parking for a maximum of 150 parking spaces over four basement levels with an additional 11 parking spaces allocated to the station retail approved under the terms of the CSSI Approval
- Loading, vehicle and pedestrian access arrangements from Denison Street
- Strategies for utility and services provision
- Strategies for the management of stormwater and drainage
- A strategy for the achievement of ecologically sustainable development
- Indicative signage zones
- A strategy for public art
- A design excellence framework
- The future subdivision of parts of the OSD footprint (if required).

The total GFA for the Integrated Station Development including the station GFA (i.e. retail, station circulation and associated facilities) and the OSD GFA is 67,000 square metres and is equivalent to a FSR of 13.9:1.

A drawing illustrating the proposed building envelope is provided in **Figure 5**. The concept SSD Application includes an indicative design for the OSD to demonstrate one potential design solution within the proposed building envelope (refer to **Figure 6**).

Victoria Cross Station is to be a key station on the future Sydney Metro network, providing access to the growing North Sydney Central Business District (CBD). The proposal combines the Metro station with a significant commercial office tower, contributing to the North Sydney skyline. The OSD would assist in strengthening the role of North Sydney as a key component of Sydney's global economic arc and would contribute to the diversity, amenity and commercial sustainability of the CBD.

It is noted that Victoria Cross northern services building and new station entrance at Victoria Cross North do not form part of the concept SSD Application.

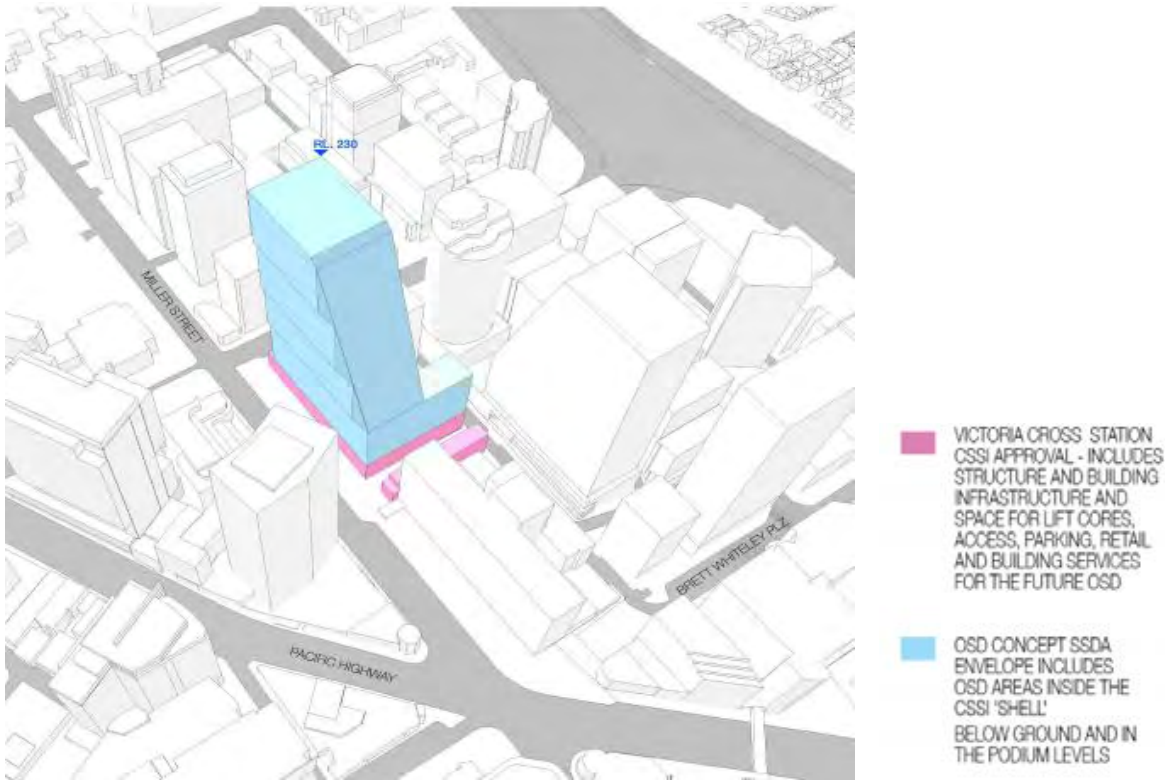


Figure 5: Proposed Victoria Cross OSD building envelope

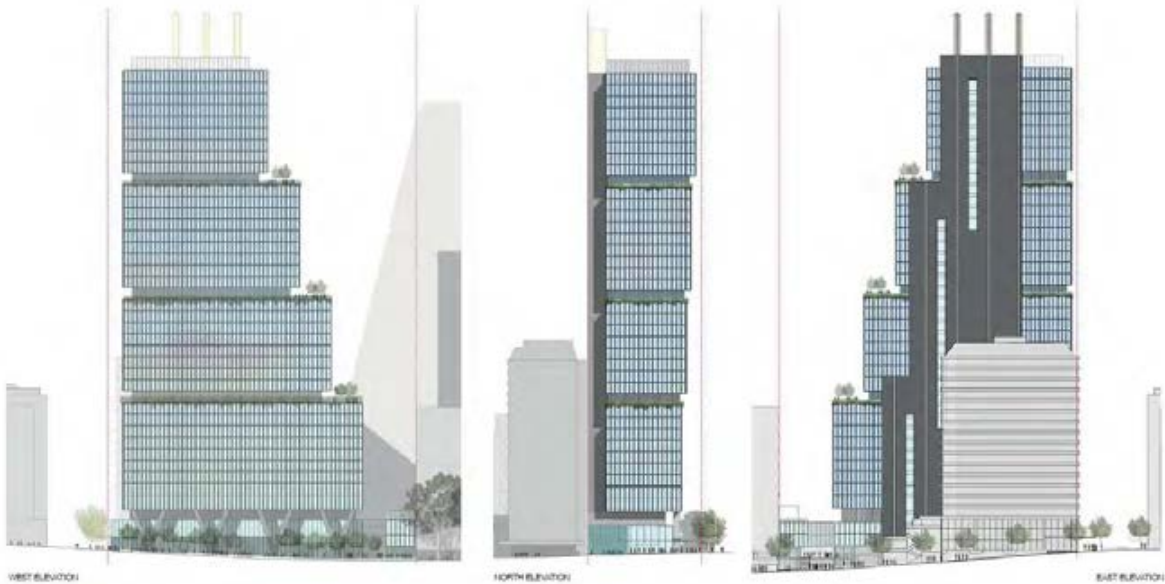


Figure 6: Victoria Cross indicative OSD design

1.6 Staging and framework for managing environmental impacts

TfNSW proposes to procure the delivery of the Victoria Cross Integrated Station Development in one single package, which would entail the following works:

- station structure and fit-out, including mechanical and electrical
- OSD structure and fit-out, including mechanical and electrical.

Separate delivery packages are also proposed by TfNSW to deliver the excavation of the station boxes/shafts ahead of the Integrated Station Development delivery package, and linewise systems (e.g. track, power, ventilation) and operational readiness works prior to the Sydney Metro City & Southwest metro system being able to operate.

Three possible staging scenarios have been identified for delivery of the Integrated Station Development:

1. Scenario 1 – the station and OSD are constructed concurrently by constructing the transfer slab first and then building in both directions. Both the station and OSD would be completed in 2024.
2. Scenario 2 – the station is constructed first and ready for operation in 2024. OSD construction may still be incomplete or soon ready to commence after station construction is completed. This means that some or all OSD construction is likely to still be underway upon opening of the station in 2024.
3. Scenario 3 – the station is constructed first and ready for operation in 2024. The OSD is built at a later stage, with time yet to be determined. This creates two distinct construction periods for the station and OSD.

Scenario 1 represents TfNSW's preferred option as it would provide for completion of the full Integrated Station Development and therefore the optimum public benefit at the site at the earliest date possible (i.e. on or near 2024 when the station is operational). However, given the delivery of the OSD could be influenced by property market forces, Scenarios 2 or 3 could also occur, where there is a lag time between completion of the station (station open and operational) and a subsequent development.

The final staging for the delivery of the OSD would be resolved as part of the detailed SSD Application(s).

For the purposes of providing a high level assessment of the potential environmental impacts associated with construction, the following have been considered:

- Impacts directly associated with the OSD, the subject of this SSD Application
- Cumulative impacts of the construction of the OSD at the same time as the station works (subject of the CSSI Approval).

Given the integration of the delivery of the Sydney Metro City & Southwest metro station with an OSD development, TfNSW proposes the framework detailed in **Figure 7** to manage the design and environmental impacts in relation to waste management, consistent with the framework adopted for the CSSI Approval.

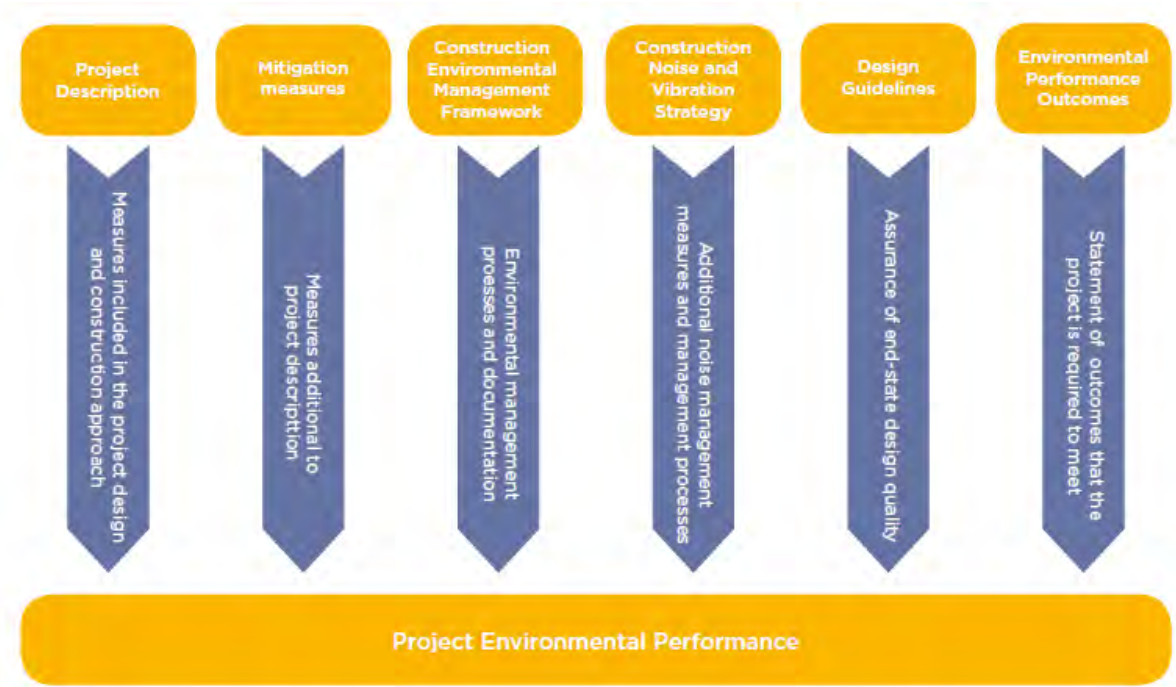


Figure 7: Project approach to environmental mitigation and management

This approach would be implemented until such time as completion of the station works (i.e. works under the CSSI Approval) is achieved. Beyond that point, standard construction environmental management practices would be implemented by the developer in accordance with relevant guidelines and any conditions of approval.

2.0 Scope of assessment

This report is based on the OSD design drawings provided by TfNSW (hereafter referred to as the indicative OSD design). The report presents an assessment of waste management requirements relating to the construction and operation of the indicative OSD design. This report identifies and quantifies the various waste streams which may be generated from the construction and operational works at the indicative OSD design. Relevant management strategies for effective storage, re-use/recovery, treatment and/or disposal of waste generated from the concept development have been proposed, in accordance with applicable guidelines and regulatory requirements specifically to address the requirements of the Secretary's Environmental Assessment Requirements issued for the concept SSD Application on 30th November 2017, which state that the Environmental Impact Statement (EIS) should be accompanied by a waste strategy. Demolition works will be undertaken as part of the Critical State Significant Infrastructure approval, therefore have not been included in this plan.

This report has been prepared at a conceptual level to align with the objectives of the Greater Sydney Region Plan and the North District Plan and the North Sydney Development Control Plan (2013) (NSDCP) and in accordance with the Sydney Metro Services Brief Section 2.1 suitable to support a Concept State Significant Development Application for the Project.

This Preliminary Waste Management Plan (WMP) forms the framework for the waste management measures for the future detailed design and planning stages of the development.

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 construction and operation of the OSD;
- Estimation of indicative waste volumes which may be generated during the construction and operation of the OSD;
- 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; and
- Completion of preliminary details required for a WMP in accordance with the NSDCP.

It is important to note that our scope of work outlined above does not cover waste management measures within the proposed Victoria Cross Station. However, this report has been extended to include a waste management strategy for the retail spaces which have been conceptually approved in the CSSI Approval.

2.1 Limitations

This Waste Management Plan (WMP) has been prepared in accordance with relevant industry guidelines, practices and information on the development at the time of preparing the concept design.

3.0 References

Table 1 lists documents that have been referred to in producing this Preliminary WMP.

Table 1: Reference sources

| Item | Reference |
|---|--|
| OSD details and the entry / exit points of trucks and cars | <ul style="list-style-type: none"> Victoria Cross_Area Schedule_METRO_OSD.pdf TfNSW Victoria Cross OSD, drawing no. B03.005, Revision 1, issued 22.02.18 |
| Transport for NSW Design Guidelines | Sydney Metro City & Southwest Chatswood to Sydenham Design Guidelines June 2017 |
| Waste generation rates | City of Melbourne*, Waste Generation Rates, January 2015 |
| Industry Guidelines | Green Star Design & As-Built Manual v1.2 |
| North Sydney Development Control Plan | North Sydney Development Control Plan, 2013 |
| Sydney Metro City & Southwest Sustainability Strategy 2017-24 | Sydney Metro City & Southwest Sustainability Strategy 2017-24 |
| Construction Environmental Management Framework | Sydney Metro, Construction Environmental Management Framework |

**The North Sydney DCP does not provide waste generation rates for proposed developments. The City of Melbourne rates have been used as they provide a detailed breakdown of waste generation rates by industry type and were published relatively recently in 2015.*

4.0 Legislation, policy and guidelines

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

4.1 NSW State requirements

Protection of the Environment Operations Act 1997

The NSW waste regulatory framework is set 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 cleaner 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; and
 - 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).

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.

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:

1. **Avoidance** including action taken to reduce the amount of waste generated, to maximise efficiency and avoid unnecessary consumption.
2. **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.
3. **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.

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 2021–22 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 recycling rates to 80% for construction and demolition waste; and
- Increasing waste diverted from landfill to 75%.

The WARR Strategy provides a clear framework for waste management to 2021-22 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.

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 construction and 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); and
 - General solid waste (non-putrescible).

4.2 Local Government requirements

The indicative OSD design is located within the North Sydney Local Government Area (LGA), governed by the *North Sydney Local Environmental Plan 2013* (NSLEP 2013) and the NSDCP which supplement one another in order to provide more detailed provisions to guide development within the North Sydney LGA.

The NSLEP 2013 aims to promote an appropriate balance between development and management of the environment, ensuring that it is ecologically sustainable, socially equitable and economically viable. The NSDCP is to be read in conjunction with the NSLEP 2013 and was made in accordance with the EP&A Act and the *Environmental Planning and Assessment Regulation 2000*. The NSDCP outlines provisions to guide and facilitate high quality future development, such that impacts on the community and environment are minimised, ensuring sustainable development control within the North Sydney LGA.

The NSDCP specifically outlines waste management guidelines for any waste or recycling produced during construction and operational works, and the future OSD would align with these objectives. The main waste management guidelines of the NSDCP relevant to the Project include:

1. Reduce the demand for waste disposal.
2. Maximise reuse and recycling of building and construction materials, as well commercial waste.
3. Assist in achieving Federal and State Government waste minimisation targets in accordance with regional waste plans.
4. Minimise overall environmental impact.
5. Require source separation, design and location standards which complement waste collection and management services offered by Council and private providers.
6. 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 manoeuvring space, at least an area equivalent to the combined footprint of the bins;
 - Administrative arrangements for ongoing waste management, including signs; and
 - 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; and
 - 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; and
- 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; and
- Description of the proposed on-going management of waste and recycling.

The WMP for construction and operation will be prepared as part of the detailed design. A preliminary WMP based on the indicative OSD design has been provided in **Appendix A**.

4.3 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.

Under the Green Star Targeted Points Schedule, 1 Point is available under the construction and demolition waste credit title (Credit 22). This credit includes a minimum requirement that must first be met to qualify for points and two alternative pathways to demonstrate reductions in waste going to landfill, as noted below:

- 22.0 – Reporting Accuracy – The minimum requirement is met where the waste contractors and waste processing facilities serving the project demonstrate compliance with the Green Star Construction and Demolition Waste Reporting Criteria
- 22A- Fixed benchmark – 1 point is available where the construction waste going to landfill is reduced by minimizing the total amount of waste sent to landfill when compared against a typical building
- 22B Percentage Benchmark – 1 point is available where the construction waste going to landfill is reduced by diverting a significant proportion from going to landfill.

Refer to **Section 7.0** for the construction waste management objectives and example measures proposed to divert construction waste from going to landfill.

4.4 Sydney Metro City & Southwest Sustainability Strategy 2017-24

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 preliminary WMP.

5.0 Method 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 indicative OSD design prepared by TfNSW 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.

6.0 Impact assessment

6.1 Environmental values and potential impacts

Waste has the potential to impact environmental values, ecological function and services, biodiversity, water quality, social value and human health. However, if suitable resource recovery options are available and utilised, waste can be considered a resource.

If not managed responsibly, waste generated by the future OSD has the potential to cause the following impacts:

- Land and water (surface and groundwater) contamination as a result of inappropriate storage, handling, transportation and disposal of wastes;
- Increased population of vermin and spread of disease from inappropriate storage and handling of wastes;
- Ecological impacts caused by windblown wastes or contaminated land/contaminated water following inappropriate storage, handling, transportation and disposal of wastes;
- Odours caused by improper storage and treatment of solid and putrescible wastes;
- Visual amenity impacts caused by inappropriate storage of waste; and
- Inefficient and careless use of resources.

7.0 Construction waste management

7.1 Waste management objectives

The following objectives for the management of waste during the construction works are based on the broader objectives of the Sydney Metro City & Southwest Sustainability Strategy and Sydney Metro Construction Environmental Management Framework:

- Minimise waste throughout the project life-cycle.
- Waste management strategies will be implemented in accordance with the Waste Avoidance and Resource Recovery Act 2001.
- Maximise the recycling and reuse of recyclable construction and demolition waste.
- Maximise the recycling and reuse of office waste generated during the construction phase.

7.2 Waste generation

The primary waste generated during the construction would be associated with general solid waste (non-putrescible), with minor quantities of general solid waste (putrescible) and liquid waste.

Estimates, where available of the quantity, classification and primary source of major waste streams generated during the construction and operational works are summarised in **Table 2**.

Table 2: Construction waste generation estimates

| Waste Type | Estimated Approximate Quantity | Classification ¹ | Primary Source |
|---|--------------------------------|---------------------------------------|--|
| Construction | | | |
| Mixed Construction Material (non-ferrous metals, glass and timber) | Minor | General Solid Waste (Non-Putrescible) | Glazed performance glass from office areas |
| Hard Waste (hardwood, tiles, and carpet) | Minor | General Solid Waste (Non-Putrescible) | Remaining tiles and carpet from floor finishes |
| Concrete | Minor | General Solid Waste (Non-Putrescible) | Concrete from the construction of new building bases, floors, paving of external services, carparks and hardstands |
| Ferrous Metal (sheet metal and steel) | Minor | General Solid Waste (Non-Putrescible) | Sheet metal wall cladding |
| Packaging Materials | Minor | General Solid Waste (Non-Putrescible) | Excess paper/cardboard from packaging material |
| General Municipal Waste - Food Waste | Minor | General Solid Waste (Putrescible) | Construction Staff/Contractors |
| General Municipal Waste - Paper - Cardboard - Glass - Plastic | Minor | General Solid Waste (Non-Putrescible) | Construction Staff/Contractors |
| Sewerage Effluent | Minor | Liquid Waste | Construction Staff/Contractors |

7.3 Construction waste management strategy and mitigation measures

7.3.1 Implementation

As per the Sydney Metro Construction Environmental Management Framework, the Principal Construction Contractors will develop and implement a Waste Management Plan, which will include as a minimum:

- The waste management and recycling mitigation measures as detailed in this plan.
- The responsibility of key project personnel with respect to implementation of the plan.

¹ Waste classification would be confirmed prior to disposal in accordance with the *Waste Classification Guidelines* (EPA, 2014)

-
- Waste management and recycling monitoring requirements.
 - Procedures for the assessment, classification, management and disposal of waste in accordance with the NSW EPA Waste Classification Guidelines (EPA, 2014).
 - Compliance record generation and management.

7.3.2 Waste management measures

Suitable construction waste management and recycling measures include:

- The adoption of industry best practice construction techniques to ensure that minimum waste volumes are generated during construction works.
- Provision of resource efficiency and waste minimisation procedures in contracts to encourage construction contractors consider environmental management objectives.
- Careful source separation of off-cuts to make re-use, recycling and resale of material easy.
- Procurement of pre-fabricated materials to eliminate off-cuts on-site, and the re-use of concrete where feasible.
- Provision of separate waste containers/skips to ensure waste material segregation and maximise the opportunities for re-use and recycling.
- Weekly inspections will include checking on the waste storage facilities on site.
- All waste removed from the site will be appropriately tracked using waste tracking dockets.

8.0 Operation waste management strategy and mitigation measures

In order to manage potential waste impacts during operation, a WMP would be produced during the detailed design stage.

In accordance with the NSDCP, a Preliminary WMP for operation has been provided based on the indicative OSD design for consideration (refer to **Appendix A**).

The Preliminary WMP shows the following:

- Type of waste to be generated;
- Expected volume per week;
- Proposed on-site storage and treatment facilities;
- Destination of waste; and
- Information about the ongoing management of waste on-site.

The Preliminary WMP aims to meet legislative waste minimisation requirements and council objectives and would generally be based on the following overarching objectives, principles and strategies to deliver effective waste management across the indicative OSD design.

In addition to the Preliminary WMP, this section of the report aims to detail the broader waste management strategy for the Project and should inform the future design and planning stages of the development.

8.1 Waste management objectives

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

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

8.2 Waste management strategy

The reduction, re-use and recycling of operational waste would be achieved by complying with a WMP 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; and
- **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.

8.3 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 re-use 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; and
- Promotion of safe handling procedures of products in line with regulations and industry best practices.

8.4 Operations waste generation

The key activities associated with the operational works expected to generate waste based on the indicative OSD design include:

- OSD: Office and retail; and

- Non-station spaces conceptually provided for the CSSI approval: Retail operations, including retail (non-food), retail (food) and other retail.

Indicative estimates of the quantity, classification and primary source of waste streams generated from the Project are summarised in **Table 3**.

Table 3: Estimated waste generation rates - operations

| Waste Type | Estimated Approximate Quantity | Classification ² | Primary Source |
|---|--------------------------------|---------------------------------------|--|
| Residual Waste | 25.9 kL/day | General Solid Waste (Putrescible) | Offices and retail areas |
| Recyclables including mixed and paper and cardboard | 13.2 kL/day | General Solid Waste (Non-Putrescible) | Offices and retail areas |
| Packaging Materials | Minor | General Solid Waste (Non-Putrescible) | Excess plastics (such as expanded and rigid polystyrene), plastic film and cardboard from packaging material |

Table 4 provides a breakdown of the estimated volume of waste generated per day based on the type of waste generator.

Table 4: Estimated daily residual waste and recyclables generated during operations

| Generator Category | Section | Net Lettable Area (m ²) | Daily Residual Generated (L/day) | Daily Recycling Generated (L/day) |
|--------------------|------------------|-------------------------------------|----------------------------------|-----------------------------------|
| Office | Offices | 54,000 | 5,400 | 5,400 |
| | Sub-total | 54,000 | 5,400 | 5,400 |
| Retail | Non-food | 978 | 489 | 489 |
| | Food | 2,750 | 18,152 | 5,501 |
| | Other retail | 522 | 1,826 | 1,826 |
| | Sub-total | 4,250 | 20,467 | 7,816 |
| | Total | | 25,867 | 13,216 |

Waste generation estimates have been modelled based on the net lettable area with an allowance for future design development. The following waste generation rates have been used to estimate daily waste generation provided in **Table 4**.

² Waste classification would be confirmed prior to disposal in accordance with the *Waste Classification Guidelines* (EPA, 2014)

Table 5: Waste generation rates
 Source: City of Melbourne*, Waste Generation Rates, January 2015

| Type | Unit | Office | Retail (food) | Retail (non food) | Other Retail** |
|----------------|------------------------------------|--------|---------------|-------------------|----------------|
| Residual Waste | L/100m ² floor area/day | 10 | 660 | 50 | 350 |
| Recycling | L/100m ² floor area/day | 10 | 200 | 50 | 350 |

* The North Sydney DCP does not provide waste generation rates for proposed developments. The City of Melbourne rates have been used as they provide a detailed breakdown of waste generation rates by industry type and were published relatively recently in 2015.

**The use of the 'other retail' floor area has not been determined at this stage. To be conservative the estimated waste generation rates for a 'childcare' have been used to represent a high waste generating retail occupant.

It is important to note that the use of the non-station floor space within the station box and conceptually approved in the CSSI Approval has not yet been confirmed and is subject to separate approval. Additional waste streams may be considered when this has been confirmed.

The use of a baler for recyclable paper and cardboard is recommended to reduce the number of bins and floor space required to store waste. The estimated volume of compacted recycling is provided in **Table 6** below.

Table 6: Daily recycling volumes after compaction

| Generator Category | Source | Daily Recycling Volume after Compaction (L/day) |
|--------------------|--------------|---|
| Office | Offices | 3,600 |
| Retail | Non-food | 326 |
| | Food | 3,667 |
| | Other retail | 1,217 |
| | Total | 5,211 |

8.5 Source separation

The identification and separation of solid waste would be carried out at the point of generation to aid the maximum re-use and recycling of materials. All waste materials generated during the operation would be identified and classified in line with the *Waste Classification Guidelines* (EPA, 2014) prior to separation.

Appropriate containers and bins would be provided on all levels across the OSD during operation for residual waste and reusable/recyclable materials. These containers would be clearly marked and identifiable to OSD occupants and staff to encourage correct waste separation. All containers and bins would be placed in allocated waste holding areas.

8.6 Waste storage and collection

The following waste storage rooms are to be provided within Basement 1 (as illustrated in the indicative OSD design):

- OSD Waste Storage Room 1 (34 m²)
- OSD Waste Storage Room 2 (120 m²)
- OSD Waste Storage Room 3 (48 m²)
- Retail Waste Storage Room (80 m²)

Provided below are the options for office and retail waste storage that are appropriate to the function and the volume of waste generated by the indicative OSD design.

A commercial waste service must be provided for the Project as Council do not provide a commercial waste service. As such, bin types and size and collection vehicle dimensions have been selected in accordance with better practice guides and typical local waste contractor standards.

8.6.1 Waste storage room bins

The most common capacities of mobile garbage bins (MGBs) in commercial applications in Australia are 660 L and 1,100 L. Exact measurements differ between suppliers however typical bin dimensions are provided in **Table 7**. These dimensions have been used to estimate collection frequency and bin room size.

Table 7: MGB dimensions³

| Dimensions | Bin Type | |
|-------------------------------------|-----------|-------------|
| | 660 L MGB | 1,100 L MGB |
| Height (mm) | 1,250 | 1,470 |
| Width (mm) | 1,370 | 1,245 |
| Depth (mm) | 850 | 1,370 |
| Approx. Footprint (m ²) | 1.16 | 1.5 |

The indicative number of waste bins, based on 1,100 L MGBs, recommended for each storage room is provided in **Table 8**. The number of bins is based on the daily generation of waste without compaction and assumes a daily collection frequency.

A waste compactor could potentially be used to reduce the volume of residual waste stored in each MGB. A 1,100 L MGB bin compactor unit is approximately 1.5 m by 1.1 m (or 1.65 m²).

³ NSW EPA (2012) *Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities*

Table 8: Estimated number of waste bins required and minimum area

| Waste Room | Collected Once a Day | | Minimum area required for MGBs* |
|----------------------------|----------------------|---------------------------|---------------------------------|
| | Residual Storage | Waste Recyclables Storage | |
| Office Waste Storage Rooms | 5 x 1,100 L MGBs | 5 x 1,100 L MGBs | 22 m ² |
| Retail Waste Storage Room | 19 x 1,100 L MGBs | 7 x 1,100 L MGBs | 57 m ² |

* The area required for MGBs has been calculated with a 20% additional area contingency on the dimensions of a 1,100 L MGB. This additional space allows for access and movability.

8.6.2 Waste storage rooms sizing

Space would be provided for the storage of waste handling equipment, and waste bins required to store waste generated by the OSD between collections. As noted above, the Office Waste Storage Rooms and Retail Waste Storage Room would incorporate the following:

- Sufficient area for residual MGBs (as shown in **Table 8**);
- Sufficient area for MGBs for mixed recycling and compacted cardboard and paper (as shown in **Table 8**)
- An area of approximately 2.5 m by 1.5 m for a baler for paper and cardboard;
- Appropriate access for 1,100L MGBs – it will be important to ensure the doors to the storage room are designed to accommodate these MGBs; and
- An area for the storage of bulky waste, e-waste and fluorescent and LED lighting.

The proposed location for the waste storage facilities is shown in **Appendix A**.

The area provided for office waste and recycling as shown in **Appendix A** is considered sufficient, based on the number of bins, equipment (e.g. baler) and bulky waste storage required. The collection frequency for office waste and recycling could be decreased based on the area available for office waste storage.

8.6.3 Other design considerations

In order to minimise the hazards and impacts associated with the usage of the waste storage facilities, the following should be taken into consideration in the detailed design SSD Application:

- Adequate sizing to accommodate all waste from the building;
- Ensuring Work, Health and Safety (WHS) requirements for waste contractors are met;
- Ventilate fully enclosed waste facilities by natural or artificial means complying with AS 1668;
- Provide wash down facilities for garbage storage areas and also for the disinfection of containers on-site;

- Locate hot and cold water hose cocks within the waste rooms or nearby;
- Provide adequate signage within the storage room, with a description of storage facilities within the area;
- Ensure lighting in the waste facility room is in accordance with AS 1680; and
- Ensure appropriate access and space for collection.

8.6.4 Summary

A summary of the waste storage area requirements is provided in **Table 9**. The area required for residual and recycling is based on net lettable area and daily collection.

The area provided for retail waste storage and indicative OSD design waste storage is considered adequate (refer to **Figure 8**).

Table 9: Reconciliation of waste storage areas required

| Room | Waste Type | Area (minimum) | Required | Area Available |
|--------------|------------------|----------------------------|----------|--------------------------|
| Retail Waste | Residual | 41 m ² | | 80 m ² |
| | Recycling | 16 m ² | | |
| | Baler | 3.75 m ² | | |
| | Bulky Waste | 16 m ² | | |
| | Sub-total | 76.75 m² | | |
| OSD Waste | Residual | 11 m ² | | 202 m ² |
| | Recycling | 11 m ² | | |
| | Baler | 3.75 m ² | | |
| | Bulky Waste | 12 m ² | | |
| | Sub-total | 37.75 m² | | |
| Total | | 114.5 m² | | 282 m² |

8.6.5 Collection frequency

Residual waste and recyclables are to be collected once a day from the waste collection areas, shown in **Figure 8**. The frequency of waste collection can be amended based on the actual waste generation once the detailed design of the indicative OSD design is developed.

8.7 Waste movement

Waste from the point of generation would be transported to Basement 1 by a caretaker via the service lifts to the Office Waste Storage Room or the Retail Waste Storage Room at the end of each day.

Bins from the Office Waste Storage Room or the Retail Waste Storage Room would be transported to the loading docks by the caretaker using a bin tug for collection each day. Provisions should be made to allow for the safe transfer of bins from the storage rooms to the loading dock (e.g. ramps with suitable gradients, signage, unobstructed passageway, etc.).

Waste collection would be via a shared ramp and loading dock which are being designed, approved and constructed as part of the CSSI Approval.

Waste would be transported off-site by a private contractor(s) for recycling or disposal, and it is anticipated that rear loading medium rigid vehicle (MRV) collection vehicles will be used to collect waste from the indicative OSD design. The vehicle used for collection of waste will need to be used as a basis for the SSD detailed design.

The typical dimensions for rear loading garbage MRV are as follows:

Table 10: Rear loading MRV dimensions

| Dimension | Specification |
|------------------|---------------|
| Length Overall | 8.8 m |
| Width Overall | 2.5 m |
| Clearance Height | 4.5 m |
| Weight (payload) | 8 tonnes |

8.8 Waste re-use, recycling and disposal

Waste would be re-used and recycled where possible. Where practical and considering potential health and hygiene issues, waste would be collected and segregated on-site and stored in suitable containers to maximise re-use and recycling before being transported to licensed facilities. Waste would be handled and disposed of in a manner that causes the least environmental harm.

Residual waste would be transported to a local licensed landfill for disposal in line with regulatory requirements, while restricted, hazardous or special wastes would be handled by

a licensed waste contractor and transported to an appropriate licensed waste facility, if required.

It is anticipated that the OSD developer will utilise existing local waste management facilities and would employ licenced waste management companies to manage the identified waste streams arising from the Project.

During the detailed design additional opportunities for re-use, recycling and disposal will be identified.

8.9 Waste monitoring and auditing

Throughout the operational works, on-site waste monitoring and auditing procedures would be developed for each waste stream, volumes produced, and waste management practices adopted.

The objectives of these procedures would be to provide:

- An assessment of the actual waste quantities and their classification;
- Monitor the potential environmental impacts;
- Review the waste transportation records and disposal routes;
- Enable positive actions to be taken in the event of incidents or accidents occurring on-site;
- Recommend future actions to improve waste management practices; and
- Monitor the implementation of the principles of waste management hierarchy.

New waste streams would be addressed as they arise and assessed to determine the most suitable management measures to use when handling, storing, transporting and disposing of the waste. Waste streams unable to be readily classified would be sent for testing in an accredited laboratory to confirm their classification and assess the risks associated with handling and disposal of the waste.

9.0 Conclusion

The indicative OSD design is capable of complying with the key legislation detailed in **Section 4.0** during both construction and operation. This Preliminary Waste Management Plan forms the framework for the waste management measures for the future detailed design and planning stages of the development.

The area provided for retail waste and recycling and office waste and recycling as shown in **Figure 8** is considered sufficient, based on the number of bins, equipment (e.g. baler) and bulky waste storage required for the indicative OSD design.

The future detailed design of the proposal should comply with the minimum waste area requirements provided in **Table 9**.

Appendix A

Construction and operation preliminary waste management plan

1. Preliminary Details of Waste Management – Construction Phase

| TYPE OF WASTE TO BE GENERATED | ESTIMATED APPROXIMATE QUANTITY | PROPOSED INDICATIVE OSD DESIGN STORAGE AND TREATMENT FACILITIES | DESTINATION |
|---|--|---|--|
| <p>Please specify e.g. non-ferrous metals, concrete, glass, timber etc.</p> | <p>Minor, Medium or Significant</p> | <p>e.g. waste storage and recycling area, and contractor or recycling outlet</p> | <p>Recycling Disposal Specify contractor</p> |
| <p>Mixed Construction Material (non-ferrous metals, glass, timber and hard waste)</p> | <p>Minor</p> | <p>Waste would be collected on-site in dedicated skip bins and stored in designated locations. Skips would be closed during rainfall events to prevent land and water contamination. For re-use, contracts would be utilised for the take-back of surplus materials. For recyclables, they would be collected in appropriate storage containers and transported by a licensed contractor to a recycling facility.</p> | <p>Recyclables would be transported to a Construction and Demolition Waste recycling facility. (final destination to be determined) Non-recyclables or non-reusable waste would be transported by a licensed contractor to a licensed landfill. (final destination to be determined)</p> |
| <p>Concrete</p> | <p>Minor</p> | <p>Waste would be collected on-site in dedicated skip bins and stored in designated locations. Skips would be closed during rainfall events to prevent land and water contamination. For recyclables, they would be collected in appropriate storage containers and transported by a licensed contractor to a recycling facility.</p> | <p>Recyclables would be transported to a Construction and Demolition Waste recycling facility. (final destination to be determined)</p> |
| <p>Ferrous Metal (sheet metal and steel)</p> | <p>Minor</p> | <p>Metal and steel would be segregated and stored within designated areas on-site and transported by a licensed contractor to an off-site recycling facility.</p> | <p>Scrap Metal Recycling Facility (final destination to be determined)</p> |

| TYPE OF WASTE TO BE GENERATED | ESTIMATED APPROXIMATE QUANTITY | PROPOSED INDICATIVE OSD DESIGN STORAGE AND TREATMENT FACILITIES | DESTINATION |
|--|--|--|--|
| <p>Please specify e.g. non-ferrous metals, concrete, glass, timber etc.</p> | <p>Minor, Medium or Significant</p> | <p>e.g. waste storage and recycling area, and contractor or recycling outlet</p> | <p>Recycling Disposal Specify contractor</p> |
| <p>Packaging materials</p> | <p>Minor</p> | <p>Paper and cardboard waste would be segregated and stored within the designated waste management area. Typical storage by use of a compactor would be considered and then the compacted waste would be transported for recycling, to a Materials Recovery Facility (MRF). Other non-recyclable packaging material would be placed in the general waste garbage bins for disposal off-site.</p> | <p>Materials Recovery Facility (final destination to be determined) Minimal to landfill (final destination to be determined)</p> |
| <p>General Waste (Including Recyclables)</p> | <p>Minor</p> | <p>Garbage waste would be collected on-site in designated waste collection bins. Recyclables would also be collected on site in designated recycling bins or crates. Designated bins would be closed to prevent land and water contamination and access for vermin. A licensed waste contractor would pick up the garbage bins and take them off-site to a licensed off-site facility while recycling waste would be transported to a licensed off-site MRF.</p> | <p>Garbage to landfill or Advanced Waste Treatment (AWT) facility (final destination to be determined) Recyclables to Materials Recovery Facility (final destination to be determined)</p> |

2. Preliminary Details of Waste Management – Operation Phase

| TYPE OF WASTE TO BE GENERATED | EXPECTED PER WEEK | VOLUME | PROPOSED INDICATIVE TREATMENT FACILITIES | OSD DESIGN STORAGE AND | DESTINATION |
|---|--------------------------------|--------|--|------------------------|--|
| Please specify e.g. food waste, glass, paper, metal, off cuts etc. | Litres or m³ | | e.g. waste storage and recycling area, garbage chute, on-site composting compaction equipment | | Recycling Disposal Specify contractor |
| Residual waste | Approx. 170, 271 L * | | Residual waste would be collected on-site in designated waste collection bins. No recyclable or contaminated materials are to be placed in this bin. Designated bins would be closed to prevent land and water contamination and access for vermin. A waste contractor would pick up the bin(s) and take them off-site as required to a licensed off-site waste disposal facility. | | To landfill (final destination to be determined) |
| Recycling | Approx. 81,710 L * | | Paper, cardboard, glass and plastic waste would be collected on-site in designated recycling collection bins. Designated bins would be closed to prevent land and water contamination and access for vermin. A waste contractor would pick up the bin(s) and take them off-site to a licensed recycling facility for reprocessing. | | For recycling (final destination to be determined) |
| Packaging Materials | Minor | | Paper and cardboard waste would be segregated and stored within the designated waste management area and then transported for recycling. Polystyrene will be recycled where possible depending on the quantity and transported by a licensed contractor to a recycling facility. Remainder would be sent to landfill. | | For recycling (final destination to be determined) |

*Generation based on Offices operating five days per week and retail operating seven days per week.

3. On-going management of waste

Describe how you intend to ensure ongoing management of waste on-site (e.g. lease conditions, caretaker/manager on-site)?

Information to be provided during detailed design phase.

This page has intentionally been left blank