



WATERLOO METRO QUARTER OVER STATION DEVELOPMENT

Environmental Impact Statement Appendix Q – Construction Environmental Management Plan

SSD-10438 Basement Car Park

Detailed State Significant Development
Development Application

Prepared for **Waterloo Developer Pty Ltd**

30 September 2020

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1. Glossary and abbreviations

Reference	Description
ACHAR	Aboriginal Cultural Heritage Assessment Report
ADG	Apartment Design Guide
AHD	Australian height datum
AQIA	Air Quality Impact Assessment
BC Act	Biodiversity Conservation Act 2016
BCA	Building Code of Australia
BC Reg	Biodiversity Conservation Regulation 2017
BDAR	Biodiversity Development Assessment Report
CEEC	critically endangered ecological community
CIV	capital investment value
CMP	Construction Management Plan
Concept DA	A concept DA is a staged application often referred to as a 'Stage 1' DA. The subject application constitutes a detailed subsequent stage application to an approved concept DA (SSD 9393) lodged under section 4.22 of the EP&A Act.
Council	City of Sydney Council
CPTED	Crime Prevention Through Environmental Design
CSSI approval	critical State significant infrastructure approval
CTMP	Construction Traffic Management Plan
DA	development application
DPIE	NSW Department of Planning, Industry and Environment
DRP	Design Review Panel
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	NSW Environment Protection Authority
EPA Regulation	Environmental Planning and Assessment Regulation 2000
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ESD	ecologically sustainable design

Reference	Description
GANSW	NSW Government Architect's Office
GFA	gross floor area
HIA	Heritage Impact Assessment
IAP	Interchange Access Plan
LGA	Local Government Area
NCC	National Construction Code
OSD	over station development
PIR	Preferred Infrastructure Report
POM	Plan of Management
PSI	Preliminary Site Investigation
RMS	Roads and Maritime Services
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SEPP 55	State Environmental Planning Policy No 55—Remediation of Land
SEPP 65	State Environmental Planning Policy No. 65 – Design Quality of Residential Apartment Development
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2009
SREP Sydney Harbour	State Regional Environmental Plan (Sydney Harbour Catchment) 2005
SSD	State significant development
SSD DA	State significant development application
SLEP	Sydney Local Environmental Plan 2012
Transport for NSW	Transport for New South Wales
TIA	Traffic Impact Assessment
The proposal	The proposed development which is the subject of the detailed SSD DA
The site	The site which is the subject of the detailed SSD DA
VIA	Visual Impact Assessment

Reference	Description
WMQ	Waterloo Metro Quarter
WMP	Waste Management Plan
WSUD	water sensitive urban design

2. Executive summary

This Construction Environmental Management Plan has been prepared by Waterloo Developer Pty Ltd to accompany a detailed State significant development (SSD), development application (DA) for the Basement Car Park over station development (OSD) at the Waterloo Metro Quarter site.

This report has been prepared to address the relevant conditions of the concept SSD DA (SSD 9393) and the Secretary's Environmental Assessment Requirements (SEARs) issued for the detailed SSD DA (SSD 10438).

This report concludes that the proposed Basement Car Park OSD is suitable and warrants approval subject to the implementation of the following mitigation measures.

- Integrated interface approach with the Integrated Station Development Contractor
- Set up of a secure and safe site compound minimising impacts to public and local community
- Clear understanding of site layout including work force accommodation and material handling
- Staged delivery of construction activities
- Traffic and Pedestrian control minimising impacts on the local road network and community
- Minimising the impact of the development to the Waterloo Congressional Church
- Robust procedures and systems in place for temporary works minimising site risks
- Active management of Noise and Vibration, Air Quality, Soil and Water quality to minimise impacts to local community and residents.
- Effective stakeholder management strategy to ensure clear communication and engagement.

Following the implementation of the above mitigation measures, the remaining impacts are appropriate.

3. Introduction

This report has been prepared to accompany a detailed State significant development (SSD) development application (DA) for the Basement Car Park over station development (OSD) at the Waterloo Metro Quarter site. The detailed SSD DA is consistent with the concept approval (SSD 9393) granted for the maximum building envelope on the site, as proposed to be modified.

The Minister for Planning, or their delegate, is the consent authority for the SSD DA and this application is lodged with the NSW Department of Planning, Industry and Environment (DPIE) for assessment.

The detailed SSD DA seeks development consent for the design, construction and operation of:

- 2-storey shared basement car park and associated excavation
- Ground level structure
- carparking for the commercial Building 1, residential Building 2, social housing Building 4, Waterloo Congregational Church and Sydney Metro
- service vehicle spaces
- commercial end-of-trip and bicycle storage facilities
- retail end-of-trip and bicycle storage facilities
- residential storage facilities
- shared plant and services.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 9 April 2020 and issued for the detailed SSD DA. Specifically, this report has been prepared to respond to the SEARs requirements summarised below.

Item	Description of requirement	Section reference (this report)
2.	Consistency with the Concept Approval	
	The EIS shall:	All Sections
	- demonstrate the proposal is consistent with the Concept Approval and provide details of consistency with any modification(s) to the concept approval if sought concurrently.	
	- include a staging and delivery plan (or be consistent with an approved plan) for the coordinated delivery of public domain, car parking and other common facilities and any public benefits such as social and affordable housing.	10. Construction Staging
10.	Noise and Vibration Impacts (Construction and Operation)	
	The EIS shall:	14. Noise & Vibration Management and

	<ul style="list-style-type: none"> - include an assessment of construction noise and vibration impacts. The assessment must also outline proposed noise and vibration mitigation and monitoring procedures having particular regard for potential impacts to the adjoining heritage listed 'Waterloo Congregational Church' site. 	EIS - Appendix K – Noise and Vibration Assessment
	<ul style="list-style-type: none"> - provide a quantitative assessment of any noise and vibration generating sources and activities during operation and outline mitigation measures (if necessary) to ameliorate and manage impacts including impacts on the adjoining heritage listed 'Waterloo Congregational Church' site. 	14. Noise & Vibration Management and EIS - Appendix K – Noise and Vibration Assessment
	<ul style="list-style-type: none"> - The noise and vibration impact assessment shall have regard to the recommendations of the Concept Acoustic Assessment Report, SLR consulting dated 9 November 2019. 	14. Noise & Vibration Management and EIS - Appendix K – Noise and Vibration Assessment
11.	Construction Impacts	
	<p>The EIS shall include a Construction Environmental Management Plan, developed in consultation with TfNSW and Council, providing:</p> <ul style="list-style-type: none"> - an assessment of potential impacts of the construction on surrounding buildings and the public domain, including air quality and odour impacts, dust emissions, water quality, stormwater runoff, groundwater seepage, soil pollution and construction and demolition waste, and proposed measures to mitigate any impacts. 	13. Waste Management & Recycling 10. Construction Staging 15. Air Quality and Odour Management
	<ul style="list-style-type: none"> - assessment of the potential cumulative impacts (noise, vibration, traffic, air quality etc) of the proposed development with regards to the works being carried out on site as part of the Sydney Metro Chatswood to Sydenham approval (CSSI 7400) and other developments in proximity to the site during the construction phase. 	17.Cumulative Impacts

Table 1 - SEARs requirements

This report has also been prepared in response to the following conditions of consent issued for the concept SSD DA (SSD 9393) for the OSD as summarised in the table below.

Item	Description of requirement	Section reference (this report)
	Construction Impact Assessment	
B21.	<p>Future development applications shall provide analysis and assessment of the impacts of construction works and include:</p> <p>(a) Construction Traffic and Pedestrian Management Plan, as per Condition B9</p>	09. Traffic & Pedestrian Management and EIS – Appendix J - Construction Traffic and Pedestrian Management Plan
	(b) Community Consultation and Engagement Plan(s)	19. Stakeholder Management & Communications
	(c) Noise and Vibration Impact Assessment	14. Noise & Vibration Management and EIS - Appendix K – Noise and Vibration Assessment
	(d) Construction Waste Management Plan	13. Waste Management & Recycling
	(e) Air Quality Management Plan	15. Air Quality and Odour Management
B22.	The plans above may be prepared as part of a Construction Environmental Management Plan prepared for implementation under the conditions of any consent for future development applications, having regard to the Construction Environmental Management Framework and Construction Noise and Vibration Strategy prepared for the Sydney Metro City and Southwest (CSSI 7400).	14. Noise & Vibration Management and EIS - Appendix K – Noise and Vibration Assessment
	Noise and Vibration Assessment	
B23.	<p>Future development applications shall be accompanied by a Noise and Vibration Impact Assessment that demonstrates the following requirements are met:</p> <p>(a) vibration from construction activities does not exceed the vibration limits established in British Standard BS7385-2:1993 Excavation and measurement for vibration in buildings. A guide to damage levels from ground borne vibration.</p> <p>(b) vibration testing is conducted before and during vibration generating activities that have the potential to impact on heritage items to identify minimum</p>	14. Noise & Vibration Management and EIS - Appendix K – Noise and Vibration Assessment

	<p>working distances to prevent damage. in the event the vibration testing and monitoring shows that the preferred values for vibration are likely to be exceeded, the Applicant must review the construction methodology and, if necessary, propose additional mitigation measures.</p> <p>(c) advice of a heritage Specialist has been incorporated on methods and locations for installed equipment used for vibration movement and noise monitoring of heritage-listed structures.</p>	
B24.	The Noise and Vibration Assessment must provide a quantitative assessment of the main noise generating sources and activities during operation. Details are to be included outlining any mitigating measures necessary to ensure the amenity of future sensitive land uses on the site and neighbouring sites is protected during the operation of the development.	14. Noise & Vibration Management and EIS - Appendix K – Noise and Vibration Assessment
B25.	The Noise and Vibration must address the conclusions and recommendations of the Concept Acoustic Assessment Report, SLR Consulting dated 9 November 2019.	14. Noise & Vibration Management and EIS - Appendix K – Noise and Vibration Assessment

Table 2 - Conditions of Concept Approval

4. The site

The site is located within the City of Sydney Local Government Area (LGA). The site is situated about 3.3 kilometres south of Sydney CBD and eight kilometres northeast of Sydney International Airport within the suburb of Waterloo.

The Waterloo Metro Quarter site comprises land to the west of Cope Street, east of Botany Road, south of Raglan Street and north of Wellington Street (refer to Figure 1). The heritage-listed Waterloo Congregational Church at 103–105 Botany Road is within this street block but does not form a part of the Waterloo Metro Quarter site boundaries.

The Waterloo Metro Quarter site is a rectangular shaped allotment with an overall site area of approximately 1.287 hectares.

The Waterloo Metro Quarter site comprises the following allotments and legal description at the date of this report. Following consolidation by Sydney Metro (the Principal) the land will be set out in deposited plan DP1257150.

- 1368 Raglan Street (Lot 4 DP 215751)
- 59 Botany Road (Lot 5 DP 215751)
- 65 Botany Road (Lot 1 DP 814205)
- 67 Botany Road (Lot 1 DP 228641)
- 124-128 Cope Street (Lot 2 DP 228641)
- 69-83 Botany Road (Lot 1, DP 1084919)
- 130-134 Cope Street (Lot 12 DP 399757)
- 136-144 Cope Street (Lots A-E DP 108312)
- 85 Botany Road (Lot 1 DP 27454)
- 87 Botany Road (Lot 2 DP 27454)
- 89-91 Botany Road (Lot 1 DP 996765)
- 93-101 Botany Road (Lot 1 DP 433969 and Lot 1 DP 738891)
- 119 Botany Road (Lot 1 DP 205942 and Lot 1 DP 436831)
- 156-160 Cope Street (Lot 31 DP 805384)
- 107-117A Botany Road (Lot 32 DP 805384 and Lot A DP 408116)
- 170-174 Cope Street (Lot 2 DP 205942).

The detailed SSD DA applies to the Basement Car Park (the site) of the Waterloo Metro Quarter site. The site has an area of approximately 5,700sqm. The subject site comprises the following allotments and legal description at the date of this report.

- 1368 Raglan Street (Lot 4 DP 215751) (Part)
- 59 Botany Road (Lot 5 DP 215751) (Part)
- 65 Botany Road (Lot 1 DP 814205) (Part)
- 67 Botany Road (Lot 1 DP 228641) (Part)
- 124–128 Cope Street (Lot 2 DP 228641) (Part)
- 69–83 Botany Road (Lot 1, DP 1084919)

- 130–134 Cope Street (Lot 12 DP 399757) (Part)
- 136–144 Cope Street (Lots A-E DP 108312) (Part)
- 85 Botany Road (Lot 1 DP 27454)
- 87 Botany Road (Lot 2 DP 27454)
- 89–91 Botany Road (Lot 1 DP 996765)
- 93–101 Botany Road (Lot 1 DP 433969 and Lot 1 DP 738891) (Part).

The boundaries of the overall site are identified at Figure 1, and the subject site of the detailed SSD DA is identified at Figures 2 and 3. The site is reasonably flat with a slight fall to the south.

The site previously included three to five storey commercial, light industrial and shop top housing buildings. All previous structures except for an office building at the corner of Botany Road and Wellington Street have been demolished to facilitate construction of the new Sydney Metro Waterloo station. As such the existing site is predominately vacant and being used as a construction site. Construction of the Sydney metro is currently underway on site in accordance with critical State significant infrastructure approval (CSSI 7400).



Figure 1 - Aerial image of the site
Source: Urbis

The area surrounding the site consists of commercial premises to the north, light industrial and mixed-use development to the south, residential development to the east and predominantly commercial and light industry uses to the west.

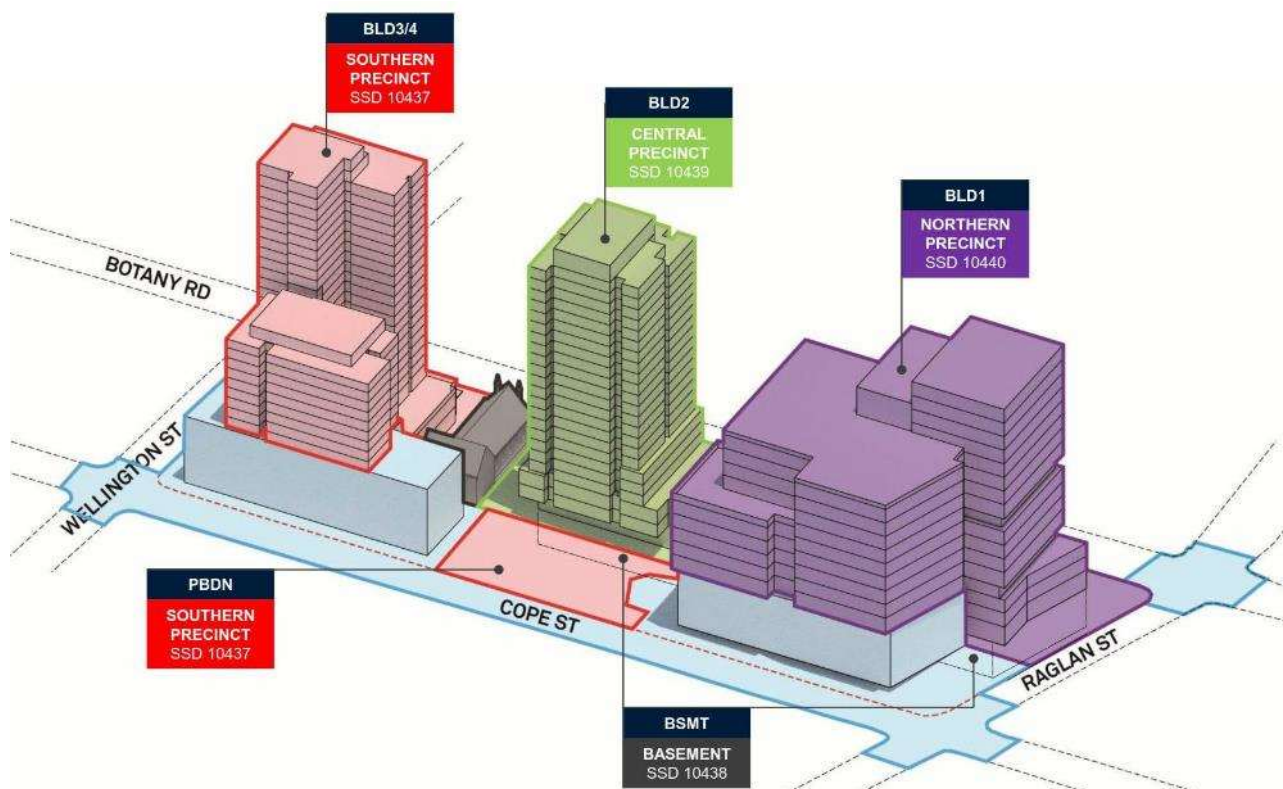


Figure 2 - Waterloo Metro Quarter site, with sub-precincts identified
Source: HASSELL

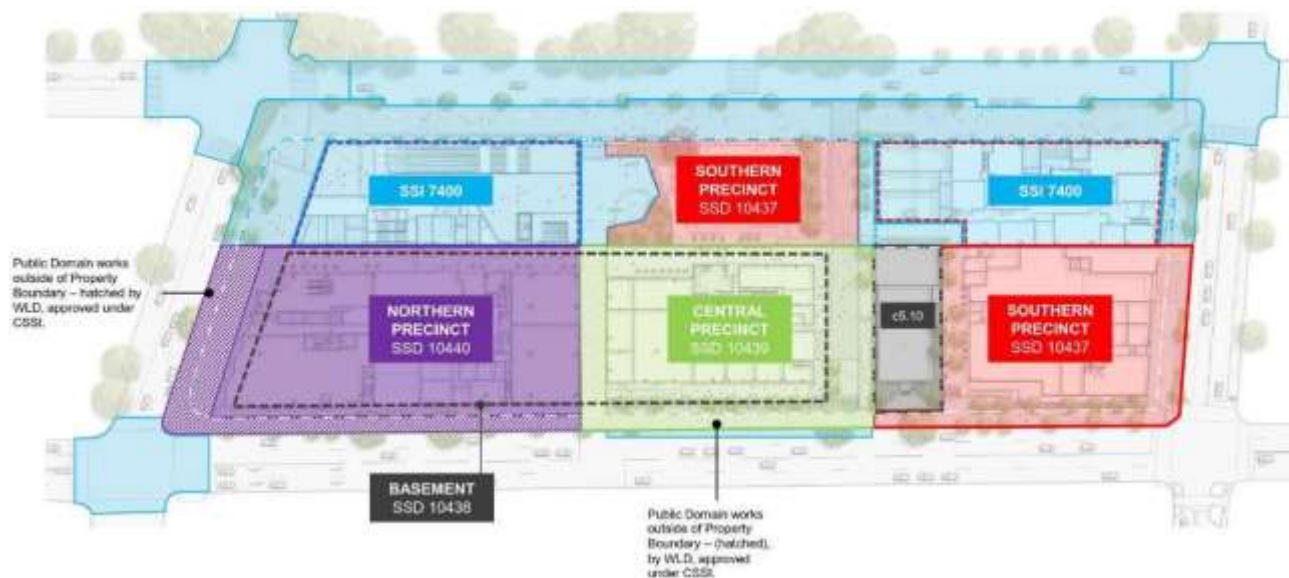


Figure 3 - Waterloo Metro Quarter site, with sub-precincts identified
Source: Waterloo Developer Pty Ltd

5. Background

5.1 About Sydney Metro

Sydney Metro is Australia's biggest public transport project. Services started in May 2019 in the city's North West with a train every four minutes in the peak. A new standalone railway, this 21st century network will revolutionise the way Sydney travels.

There are four core components:

5.1.1 Sydney Metro North West

This project is now complete and passenger services commenced in May 2019 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.

5.1.2 Sydney Metro City & Southwest

Sydney Metro City & Southwest project includes a new 30km metro line extending metro rail from the end of Metro Northwest 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 Crows Nest, Victoria Cross, Barangaroo, 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.

5.1.3 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.

The locations of seven proposed metro stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays.

The NSW Government is assessing an optional station at Pyrmont and further planning is underway to determine the location of a new metro station in the Sydney CBD.

5.1.4 Sydney Metro Greater West

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.

The Australian and NSW governments are equal partners in the delivery of this new railway.

The Sydney Metro project is illustrated below.

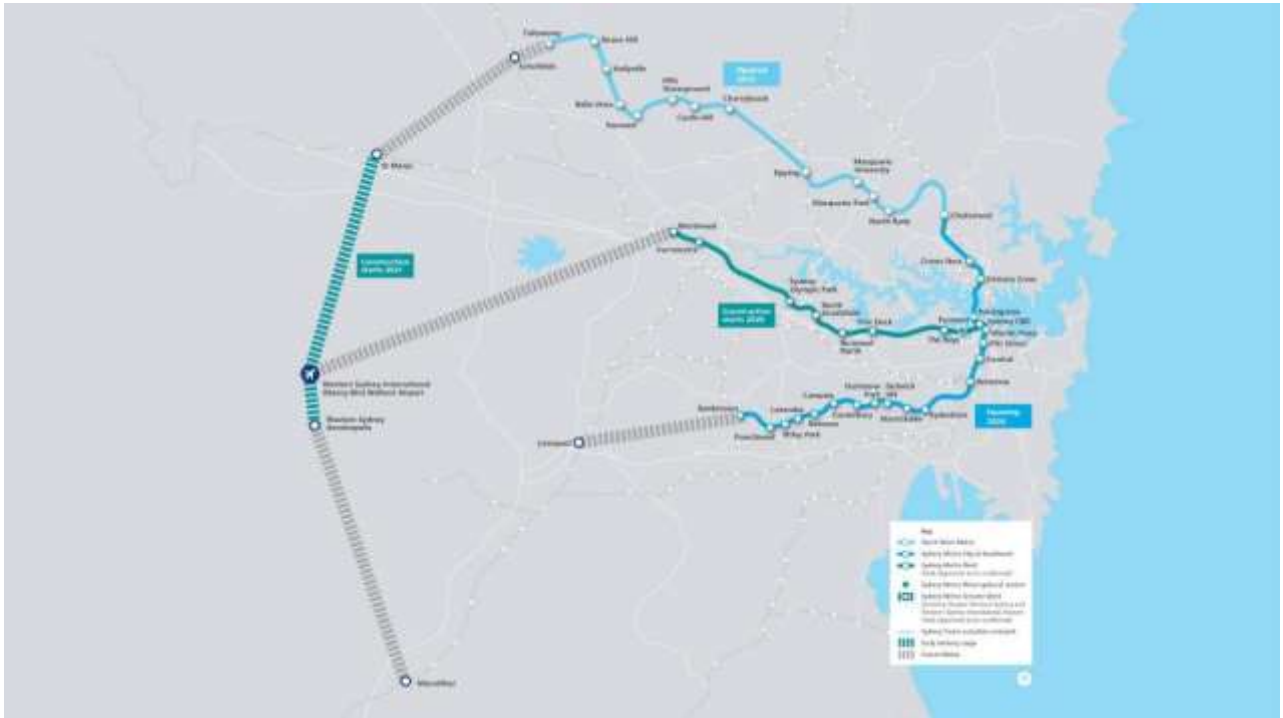


Figure 4-Sydney Metro alignment map
Source: Sydney Metro

5.2 Sydney Metro CSSI Approval (SSI 7400)

On 9 January 2017, the Minister for Planning approved the Sydney Metro City & Southwest - Chatswood to Sydenham project as a critical State significant infrastructure (CSSI) project (reference SSI 7400) (CSSI approval). The terms of the CSSI approval includes all works required to construct the Sydney Metro Waterloo Station. The CSSI approval also includes the construction of below and above ground works within the metro station structure for appropriate integration with the OSD.

With regards to CSSI related works, any changes to the 'metro station box' envelope and public domain will be pursued in satisfaction of the CSSI conditions of approval and do not form part of the scope of the concept SSD DA or detailed SSD DA for the OSD.

Except to the extent described in the EIS or Preferred Infrastructure Report (PIR) submitted with the CSSI application, any OSD buildings and uses do not form part of the CSSI approval and will be subject to the relevant assessment pathway prescribed by the EP&A Act.

The delineation between the approved Sydney Metro works, generally described as within the two 'metro station boxes' and surrounding public domain works, and the OSD elements are illustrated in Figure 5.

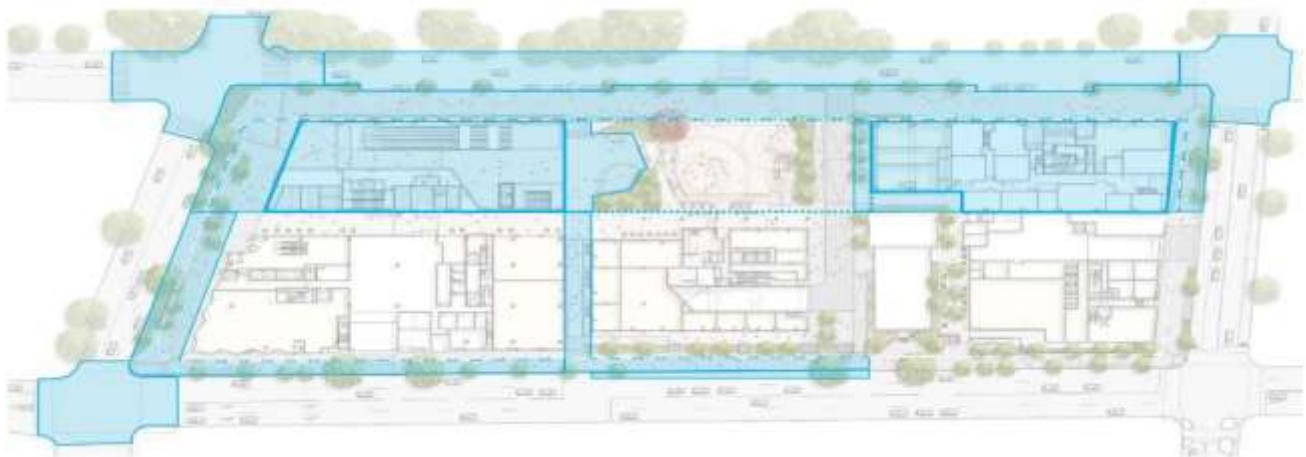


Figure 5 - CSSI Approval scope of works
Source: WL Developer Pty Ltd

5.3 Concept Approval (SSD 9393)

As per the requirements of clause 7.20 of the *Sydney Local Environmental Plan 2012* (SLEP), as the OSD exceeds a height of 25 metres above ground level (among other triggers), development consent is first required to be issued in a concept DA (formerly known as Stage 1 DA).

Development consent was granted on 10 December 2019 for the concept SSD DA (SSD 9393) for the Waterloo Metro Quarter OSD including:

- a maximum building envelope for podium, mid-rise and tower buildings
- a maximum gross floor area of 68,750sqm, excluding station floor space
- conceptual land use for non-residential and residential floor space
- minimum 12,000sqm of non-residential gross floor area including a minimum of 2,000sqm of community facilities
- minimum 5% residential gross floor area as affordable housing dwellings
- 70 social housing dwellings
- basement car parking, motorcycle parking, bicycle parking, and service vehicle spaces.

The detailed SSD DA seeks development consent for the OSD located within the Basement Car Park of the site, consistent with the parameters of this concept approval. Separate SSD DAs have been prepared and will be submitted for the Central Precinct, Southern Precinct and Northern Precinct proposed across the Waterloo Metro Quarter site.

A concurrent amending concept SSD DA has been prepared and submitted to the DPIE which proposed to make modifications to the approved building envelopes at the northern precinct and central building. This amending concept SSD DA does not impact the proposed development within the southern precinct.

6. Proposed development

6.1 Waterloo Metro Quarter Development

The Waterloo Metro Quarter OSD comprises four separate buildings, a basement carpark and public domain works adjacent to the Waterloo Metro station.

Separate SSD DAs will be submitted concurrently for the design, construction and operation of each building in the precinct;

- Southern precinct SSD-10437,
- Basement Car Park SSD-10438,
- Central precinct SSD-10439, and
- Northern precinct-SSD-10440.

An overview of the Development is included below for context. This detailed SSD DA seeks development consent for the design, construction and operation of the Basement Car Park:

6.1.1 Southern Precinct

The Southern Precinct comprises:

- 25-storey residential building (Building 3) comprising student accommodation, to be delivered as a mixture of studio and twin apartments with approximate capacity of 474 students
- 9 storey residential building (Building 4) above the southern station box to accommodate 70 social housing dwellings
- ground level retail tenancies including Makerspace and gymnasium lobby, and loading facilities
- level 1 and level 2 gymnasium and student accommodation communal facilities
- landscaping and private and communal open space at podium and roof top levels to support the residential accommodation
- new public open space including the delivery of the Cope Street Plaza, including vehicle access to the site via a shared way from Cope Street, expanded footpaths on Botany and Wellington Streets and public domain upgrades
- signage zone locations
- utilities and service provision
- stratum subdivision (staged).

6.1.2 Basement Car Park - Subject DA

The Basement Car Park comprises:

- 2-storey shared basement car park and associated excavation comprising
- Ground level structure
- Carparking for the Commercial Building 1, Residential Building 2, social housing Building 4, Waterloo Congregational Church and Sydney Metro
- Service vehicle bays
- commercial end of trip and bicycle storage facilities
- Retail end of trip and bicycle storage facilities

- residential storage facilities
- shared plant and services.

6.1.3 Central Precinct

The Central Precinct comprises:

- 24-storey residential building (Building 2) comprising approximately 126 market residential and 24 affordable housing apartments, to be delivered as a mixture of 1 bedroom, 2 bedroom and 3 bedroom apartments
- Ground level retail tenancies, community hub, precinct retail amenities and basement car park entry
- level 1 and level 2 community facilities (as defined in the SLEP) intended to be operated as a childcare centre
- landscaping and private and communal open space at roof top levels to support the residential accommodation
- new public open space including the delivery of the Church Square, including vehicle access to the basement via a shared way from Cope Street, expanded footpaths and public domain upgrades on Botany Road
- external licensed seating areas
- signage zone locations
- utilities and service provision
- stratum subdivision (staged).

6.1.4 Northern Precinct

The Northern Precinct comprises:

- 17-storey commercial building (Building 1) comprising Commercial floor space, with an approximate capacity of 4000 workers
- ground level retail tenancies, loading dock facilities serving the northern and central precinct including Waterloo metro station
- landscaping and private open space at podium and roof top levels to support the commercial tenants
- new public open space including the delivery of the Raglan Street Plaza, Raglan Walk and expanded footpaths on Raglan Street and Botany Road and public domain upgrades
- external licensed seating areas
- signage zone locations
- utilities and service provision
- stratum subdivision (staged).

7. Station Works Contractor Interface & Handover

Effective interface management is based on timely communication and engagement with all identified stakeholders including, Authorities, Councils, Interface Contractors and customers throughout the course of the project.

Waterloo Developer Pty Ltd (**WL Developer**) will ensure that effective communication channels are established and maintained through regular correspondence, engagement, meetings, reporting and evaluation on an ongoing basis.

Working within the boundaries of the interface agreements and deed interface requirements, the elected Interface Manager will actively engage with interface parties to ensure that their requirements, particularly with respect to the reliability of their operations, are proactively sought, managed and delivered by the project team.

With respect to the external interfaces, there are significant Interface Contractor's works that run through the OSD Development that will create complex interfaces with the Waterloo ISD works. These interfaces will have to be carefully managed throughout the design and construction phase of the Waterloo OSD project.

WL Developer will work with John Holland Pty Ltd (**Station Contractor**) to ensure that the delivery and handover of the Station box is integrated. WL Developer will also identify if any of the site constraints or conditions are different from those identified in the Station Contractors design and assurance documentation for the station handover.

Handover from the Station Contractor will be marked upon transfer of as-built documentation, engineering signoff and access to site is provided. The proposed interface with the Station Contractor will allow for early identification of changes in design so that change can be managed.

8. Site Establishment

8.1 Hoardings

Hoardings will be adjusted and installed by John Holland Building Pty Ltd (**OSD Contractor**) following handover of the Basement Car Park work areas by the Station Contractor.

The site will be surrounded by both A-Class and B-Class hoardings along the perimeter of the site. These hoardings will be erected along Raglan Street, Cope Street, Wellington Street and Botany Road in the stages handed over by the Station Contractor. Refer to Figure 6.

All hoardings will be designed, installed, and maintained to ensure segregation of pedestrians, workforce and vehicles. As required, hoardings will be designed to provide overhead protection.

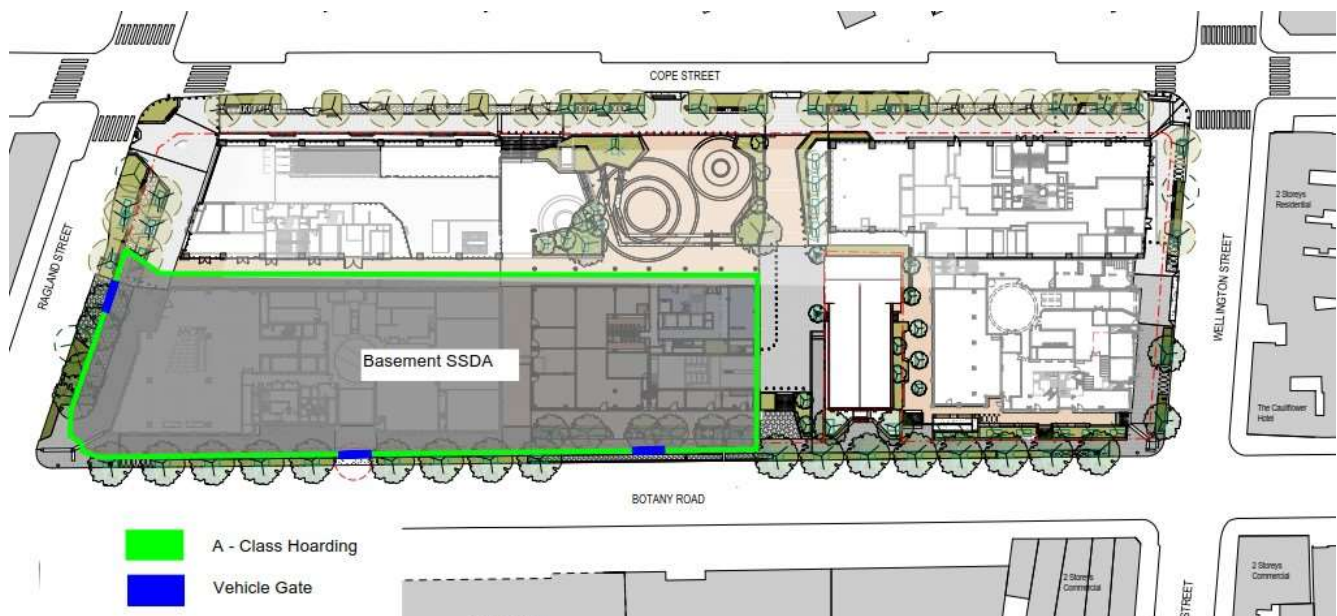


Figure 6 - Site Establishment Plan

8.2 Site Security & Gates

The site perimeter will be secured at all times with no unauthorised access permitted. Out of hours security patrols will be utilised strategically during the project. The focus will be on the back end of the project, as the potential for theft and vandalism increases. Shutdown periods (Christmas and Easter) will also be monitored by external security services.

Construction worker access to the site will be strictly controlled through a secured gate system and individuals will require personalised identity swipe cards. This creates a live record of the workers on-site at any given time, which can be accessed in case of an emergency or during an evacuation.

The Basement Car Park site shall have A-Class or similar hoarding to delineate between the Station Contractors site and the Basement Car Park works to ensure that Station Contractor and the Basement Car Park workforce cannot access the opposing work areas.

8.3 Project Office

The project office will be located within one block of the site and will include accommodation for project management staff.

8.4 Workforce Accommodation

Accommodation and amenities (Lunch sheds, office sheds, first aid sheds, change rooms, toilets) for the construction workforce will be provided in stages. Initial site accommodation sheds will be erected on top of the B class hoarding along the surrounding streets (Wellington Street, Botany Road and/or Raglan Street). As the works are progressed accommodation will be relocated into the basement and or lower floors of the buildings.

Hours of Construction

The site working hours have been defined in section 4.1.2 of the Noise and Vibration report referred to in B25. The following Construction Hours are proposed, in accordance with City of Sydney standard hours: Construction hours are detail below.

- Monday to Friday: 7:00am – 6:00pm
- Saturday: 7:30am – 3:30pm
- Sunday: No work

There will be times when out of hours works may be required. An out of hours protocol for the assessment, management and approval of work outside of the standard construction hours will be prepared and submitted as required.

9. Traffic & Pedestrian Management

Taking into consideration that the site is surrounded by local residents and a main arterial traffic route (Botany Road), managing the flow of materials and equipment in and out of the construction site while maintaining the continuity of the development will be critical in a successful delivery of the project. Our planning will consider and successfully manage the maintenance of pedestrian and vehicular traffic flow to the surrounding buildings and roads. This will be detailed in an overall Construction Traffic Management Plan (CTMP) and, specific Traffic Control Plans detailing each management of pedestrian, vehicular construction and operational traffic at each stage of works. A Construction Traffic and Pedestrian Management Plan has been prepared by PTC and is referenced in the EIS Appendix I. An overview of the key traffic and pedestrian management strategies is provided below.

9.1 Traffic Management

Traffic Control will be provided at the various access, egress gates & work zones to manage all vehicle deliveries, loading/unloading and general access/security of the gates during construction work hours. This will allow for a coordinated movement of traffic around site minimizing impacts to the community.

9.2 Pedestrian Management

The OSD Contractor will ensure that nearby stakeholders, residents, commuters and visitors to the Waterloo area are suitably informed of any required footpath closures, and we work with the City of Sydney Council to provide alternate travel paths, as required, throughout the delivery of the project.

During construction, pedestrians will have safe and functional access around the external perimeter of the site with overhead protection provided as required.

On completion, functional and safe footpaths around the perimeter of the site will be provided in accordance with the Separable Potion obligations detailed under the PDA, namely;

- Functional and safe footpaths will be provided with a clear width of at least
 - a) 3.5 metres width along Raglan St
 - b) 3.5 metres width along Botany Road; and
 - c) 1.3 metres along Wellington Street for passing pedestrians, to facilitate safe interchange and access to the Station Lot.

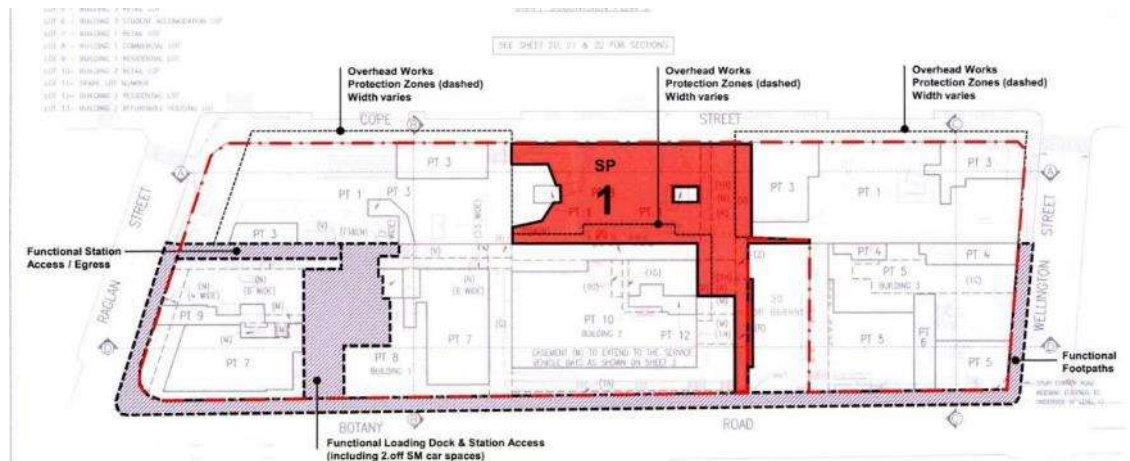


Figure 7 – Ground Level at Completion of SP1

9.3 Work Zones

Please refer to figure 7 below for proposed Work Zones for the Basement Car Park works.

It is understood separate approval/s are required for these Work Zones from City of Sydney Council's Construction Regulation Unit (CRU) and/or the Roads & Maritime Services (RMS) (As applicable).

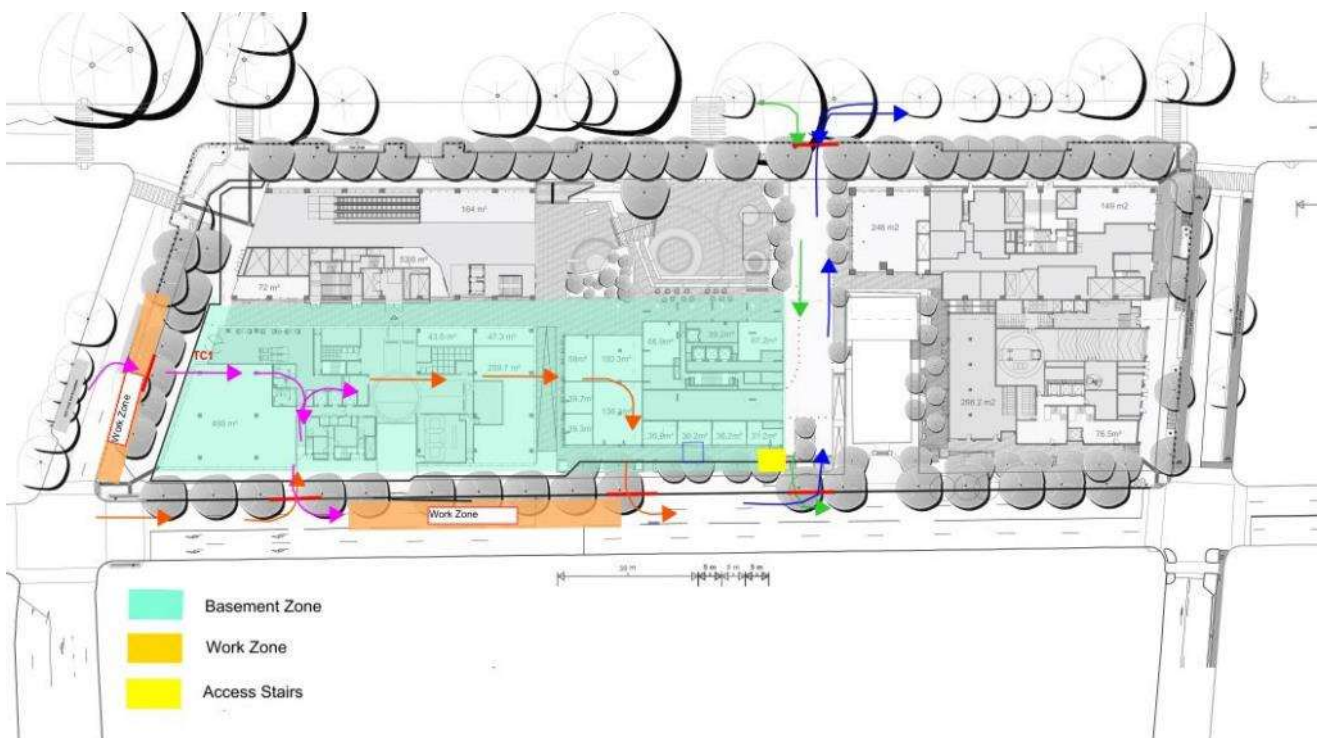


Figure 8 - Proposed Work Zone Locations

9.4 Public Transport

The site is in close proximity to the public transport network with approximately 10 bus stops within walking distance (200 meters) from the site. Redfern Station is also a mere 10 minute walk from the site, making public transport highly accessible for commute to and from the site. All staff, consultants and subcontractors will be encouraged to adopt a green travel plan or similar for the project to promote the use of public transport to and from site. There will be no parking on the site.

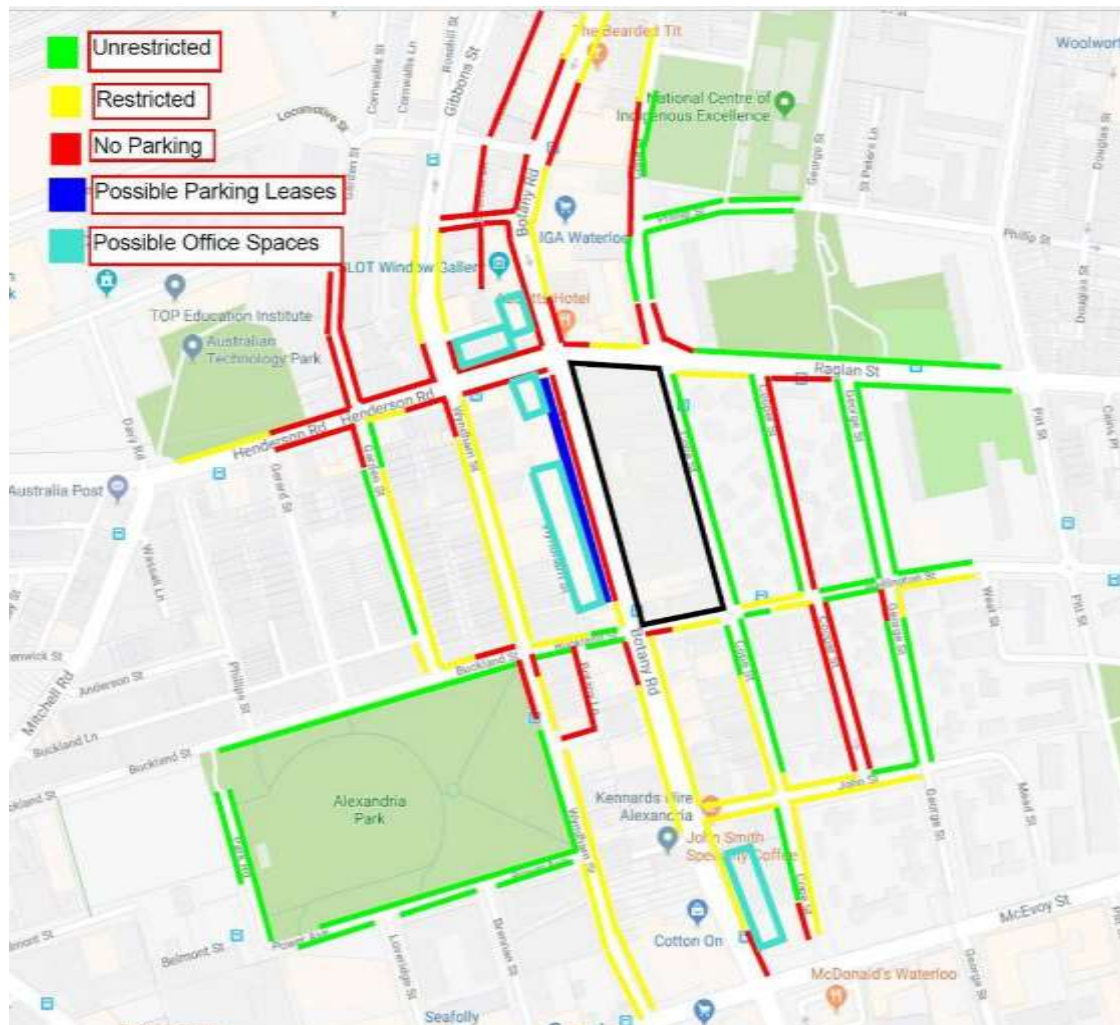


Figure 9 – On street Vehicle Parking

10. Construction Staging

10.1 Demolition

Demolition activities include localised levelling, removal of existing concrete hardstand areas and an existing basement slab at Lot SP75492, located approximately 1.2m below ground level.

10.2 Contamination/Remediation

Management of known contamination and remediation is subject to a separate approval process (being the CSSI consent). This will be completed prior to commencement of the Basement Car Park. In conclusion, no further remediation assessment is considered warranted for the proposed development. If unknown contamination is encountered at the Basement Car Park site this would be managed through an unexpected finds procedure developed for Construction activities which will be included in the further developed site CEMP.

10.3 Archaeological Investigations

Early investigations by AMBS Ecology and Heritage who were engaged by the Tunnel and Station Excavation (TSE) Sydney Metro Contractor to undertake archaeological investigation works for the Waterloo Station box (i.e. the adjacent site) identified the presence of archaeology findings. These findings have been detailed in EIS Appendix H - Heritage Impact Statement.

Based on the findings identified by AMBS it is expected that archaeology will be present in the areas identified in figure 10. Investigations in this area are subject to a separate approval process (being the CSSI consent). In conclusion, no further archaeological assessment is considered warranted for the proposed development.

EIS Appendix H - Heritage Impact Statement outlines the method that will be completed in this location prior to commencement of the Basement Car Park works.

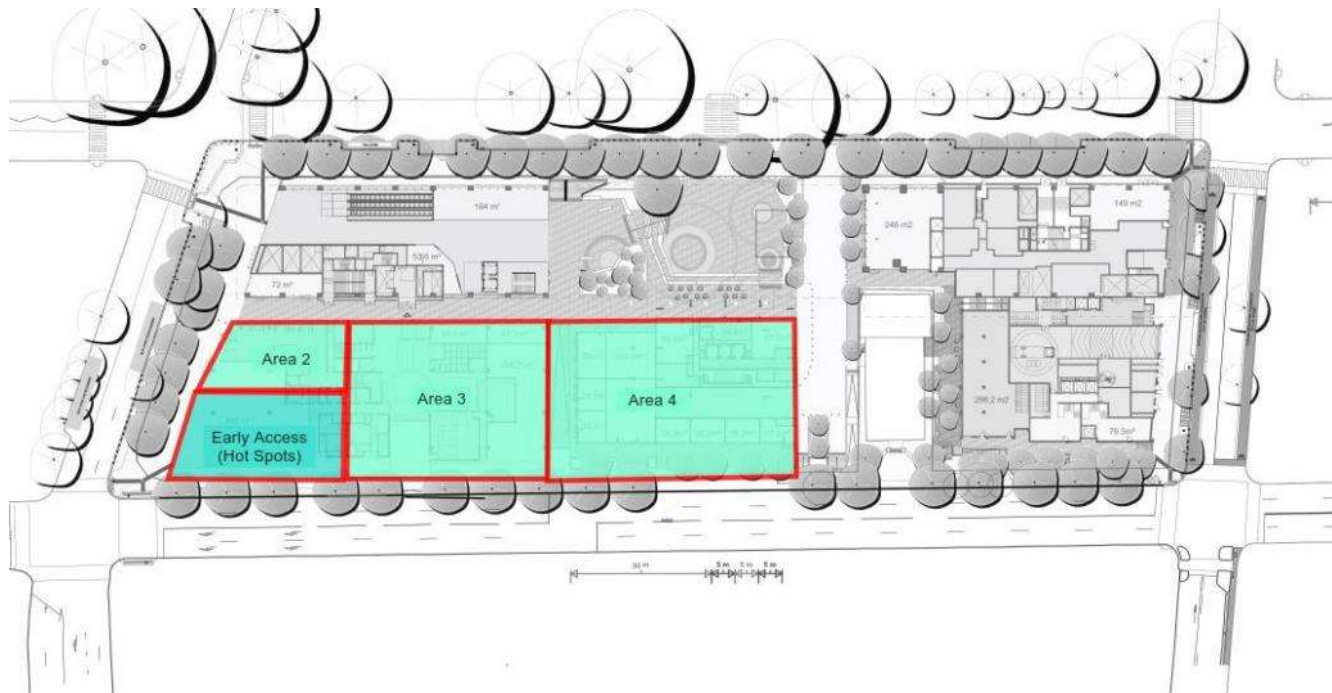


Figure 10 - Archaeological Investigation Staging

10.4 Excavation & Shoring

10.4.1 Shoring Wall Piling

The proposed construction sequence for the shoring wall retention piling is as follows

- Dismantle and erection of hoardings
- Excavate localised perimeter trench, including removal of concrete hardstand at localised locations
- Guidewall construction including backfill
- Secant piling or similar in a suitable sequence
- Capping beam construction, and
- Archaeological investigation works

10.4.2 Station Box anchors within OSD basement

Existing anchors supporting the Station Box shoring wall extend through the OSD Basement Car Park, these may need to be removed during the OSD bulk excavation phase. Refer to below drawing for typical section detail through OSD basement and shoring wall.

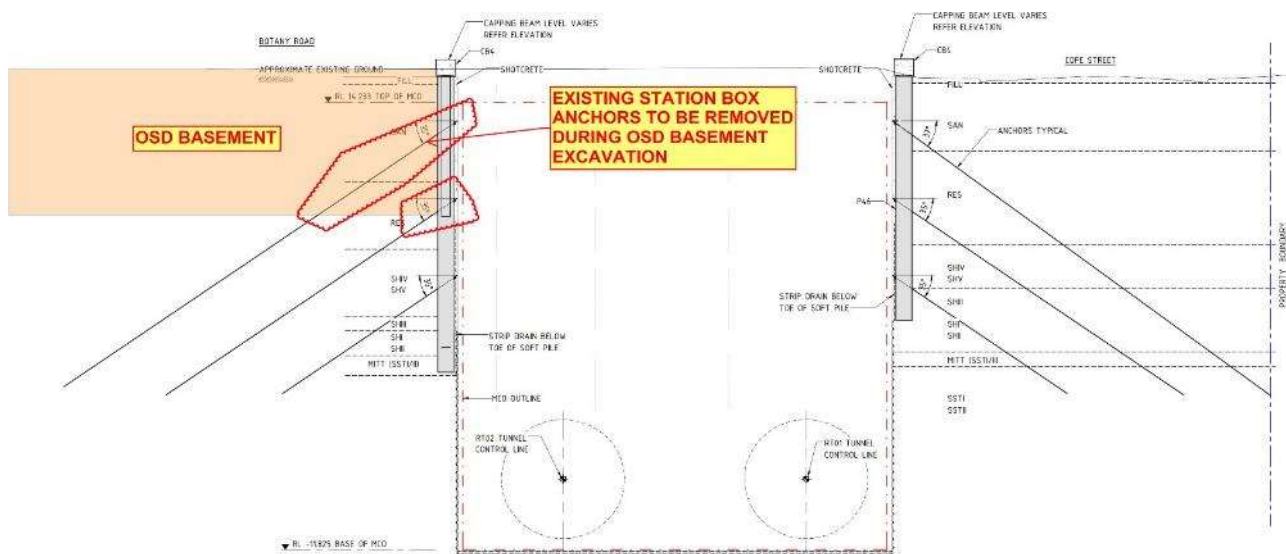


Figure 11 - Typical Section through OSD Basement / Station Shoring Wall – Anchors in OSD Basement

10.4.3 Bulk Excavation

The OSD Basement Car Park consists of several basement levels, excavation sequence will be from North to South and will commence upon completion of archaeological investigation works.

Groundwater inflow is expected to be minimal, based on the use of secant pile shoring wall or similar, and observations during adjacent TSE excavation works.

Temporary earth batters / slopes will be maintained to allow for foundation piling rigs to enter the base of excavation to commence foundation piles.

Excavation material will be removed from north-south direction, expediting work areas for foundation works at the northern end of basement.

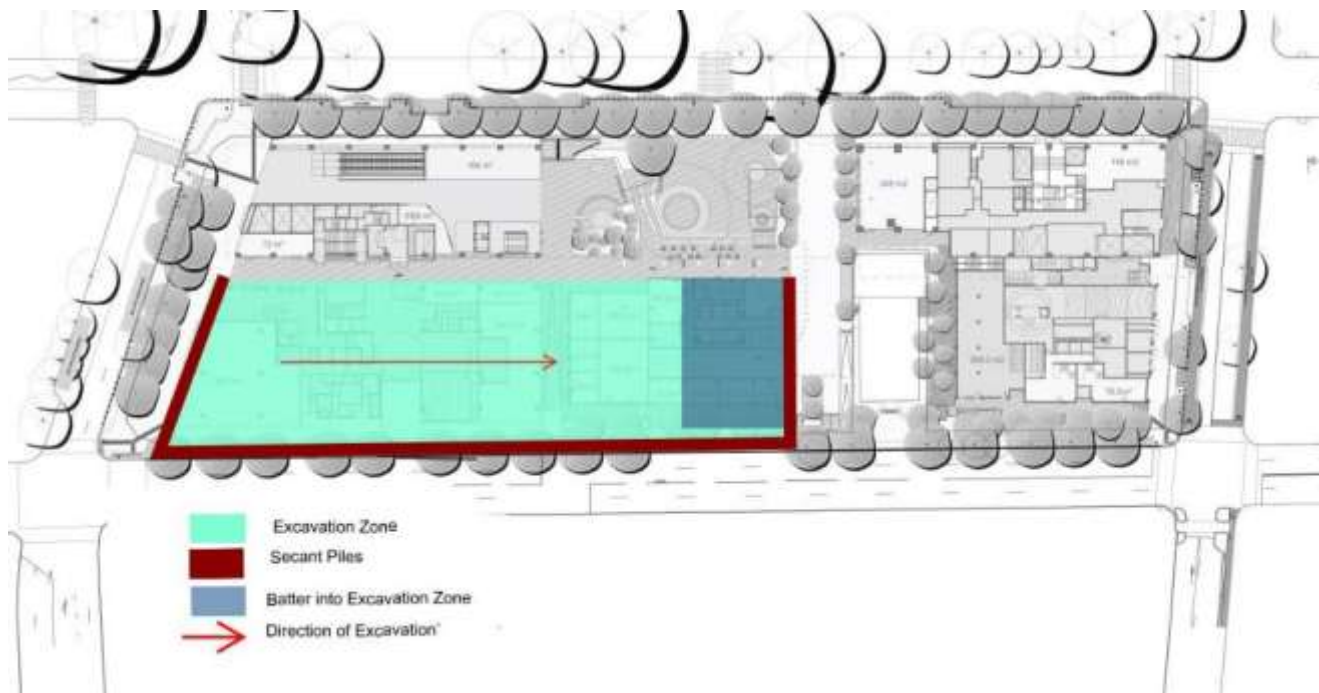


Figure 12 - OSD Basement Excavation Plan

10.4.4 Basement Car Park Management System

The OSD Basement Car Park structure has been designed as a fully tanked, hydrostatic basement. During construction this will (likely) require the utilisation of a dewatering system to maintain a relatively dry excavation surface for construction works.

10.4.5 Detailed Excavation

Detailed excavation will be required for the in-ground services below the basement hydrostatic slab. Pile caps and lift pits will also require detailed excavation in a staged manner to ensure sufficient workspace for the works.

10.5 Substructure

10.5.1 Foundation Piling, Pile Caps

Foundation piles for OSD Basement Car Park will be completed with piling rigs commencing from the North working towards the South. Priority will be given to foundation piles at lift core locations allowing the lift pit construction to commence as early as possible.

Piling method is most likely via a bored pier method, foundation piling will be undertaken from the basement bulk excavation level. Piling platforms will be provided at suitable locations in line with the piling sequence.

Pile Caps may utilise prefabricated or conventional formwork systems depending on sequence.

Refer figure 12 below which details pile set out.

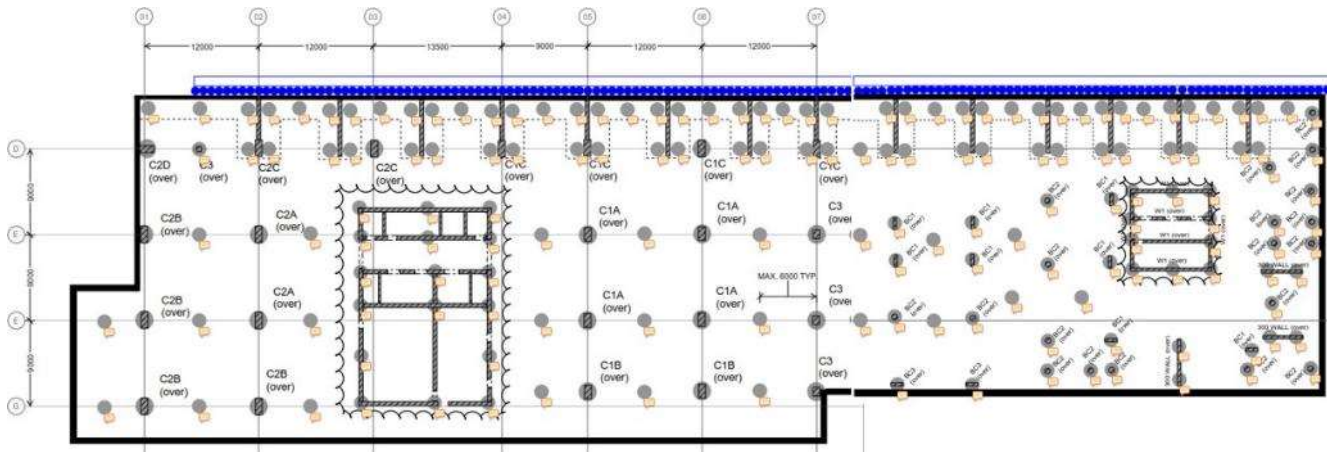


Figure 13 - OSD Basement – Foundation Plan

10.5.2 Existing Station Box anchors

The existing Station box anchors to the East of the site will encroach below the OSD basement, and as a result may clash with the foundation piles. These anchors will be destressed, however will still exist within the ground. Piles can pass through existing anchors by utilising hollow casing or similar, to core through the anchor where a clash occurs.

10.5.3 Station Box Zone of Influence

The Station requires the external OSD development to be independent of the Station Box. As part of this requirement foundation piles may need to extend and terminate beneath the zone of influence and potentially no load from piles can be transferred to the Station structure, therefore piles may need to be sleeved.

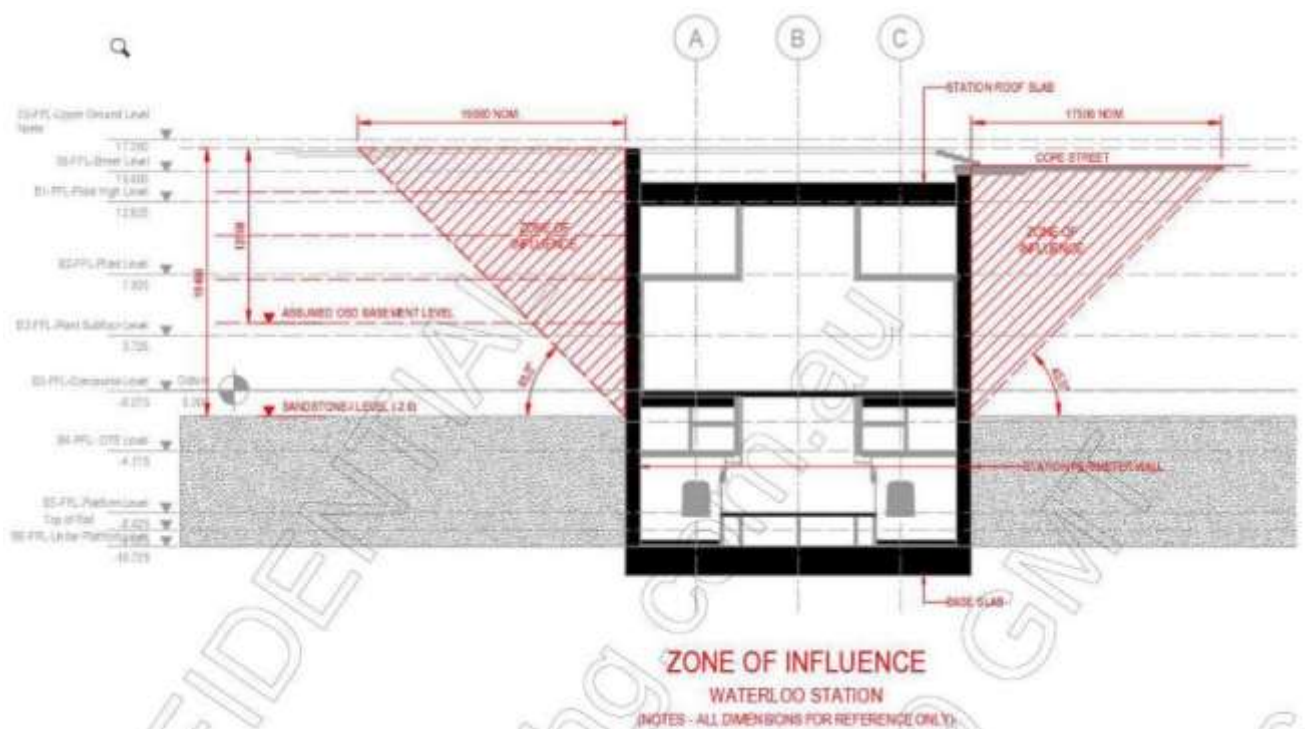


Figure 14 - Station Box Section

10.6 Basement Car Park Structures

10.6.1 Core Structures (Lift Pits)

Lift pits will be constructed following completion of pile trimming to lift pit foundation piles.

10.6.2 Basement Car Park Hydrostatic Slab on Ground (SOG)

Concrete blinding and waterproofing membrane will be laid to form hydrostatic waterproof seal to the underside of SOG prior to laying rebar. Slab sequence will progress from North to South direction. Refer figure 13 below.

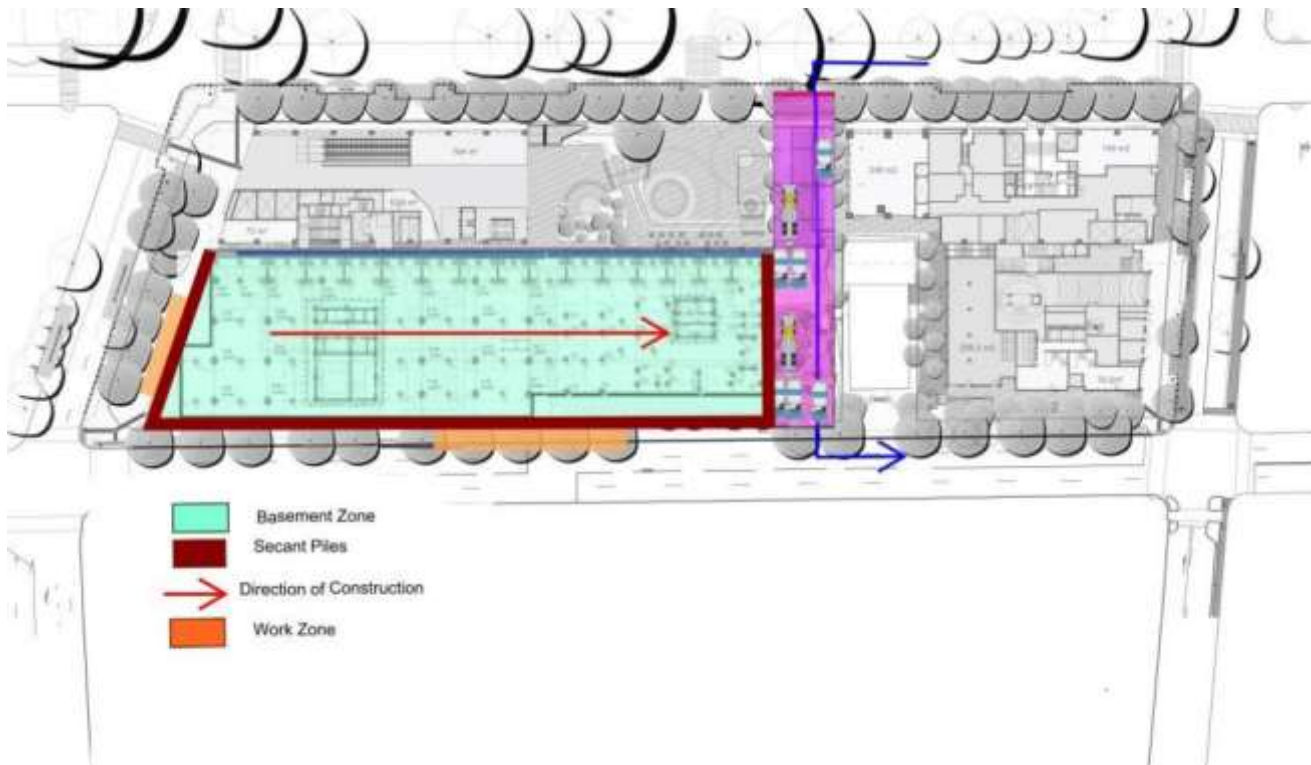


Figure 15 - Basement 2 SOG Pour Sequence

10.6.3 Buttress Walls and Perimeter Walls

Due to Station box design requirements the OSD Basement Car Park has the potential need to construct buttress walls integrated within the OSD Basement Car Park structure to resist loads imposed onto the Station box. The perimeter walls of the Basement Car Park may require hydrostatic sealing to the shoring wall as part of the overall performance of the basement structure.

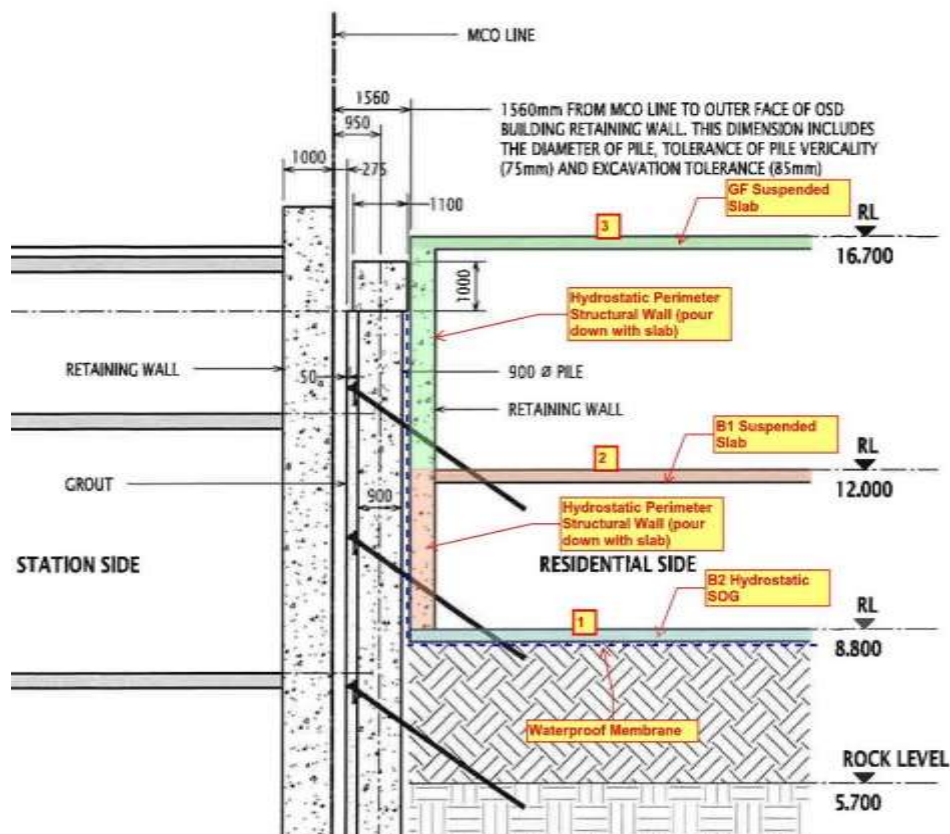


Figure 16 - Typical Basement Section and Construction Sequence

10.6.4 Suspended Slabs

The Basement Car Park consists of several suspended slabs that will be formed up upon completion of the basement SOG. The construction sequence will be similar to the basement SOG to allow for efficiencies in vertical structure cycle / construction.

The OSD Basement Car Park will be constructed to Ground Floor level as part of the scope for this development application.

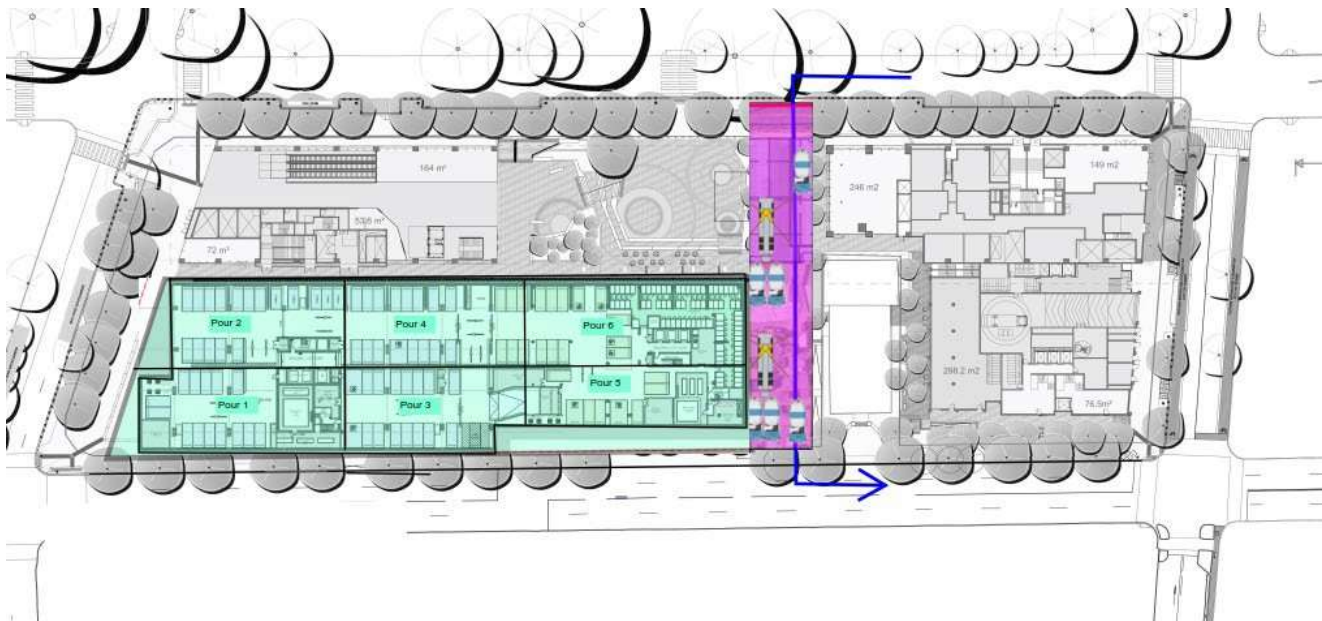


Figure 17 - Basement 1 Suspended Slab Pour Sequence

10.6.5 Commissioning and Testing

A commissioning plan will be developed for commission and testing purposes by the OSD Contactor. This will detail the guidelines to be followed for the commissioning of the building. It will typically involve individual systems testing and an overall integrated system testing.

11. Temporary Works

The OSD Contractor has procedures around temporary works design, independent sign-off and verification. These procedures are employed to ensure the efficient and effective operation of temporary structures and to maintain the safety of workers and the general public.

12. Material Handling

Efficient material handling is essential to the successful construction of the Basement Car Park. There are several pieces of equipment that are critical to efficient material handling across the job, namely, tower cranes, hoists, concrete booms and loading platforms. The selected strategy and layout of this equipment is detailed further under the below subheadings.

12.1 Tower Cranes

A total of Two (2) Cranes are proposed to be utilised to service the Basement, refer below for layout.

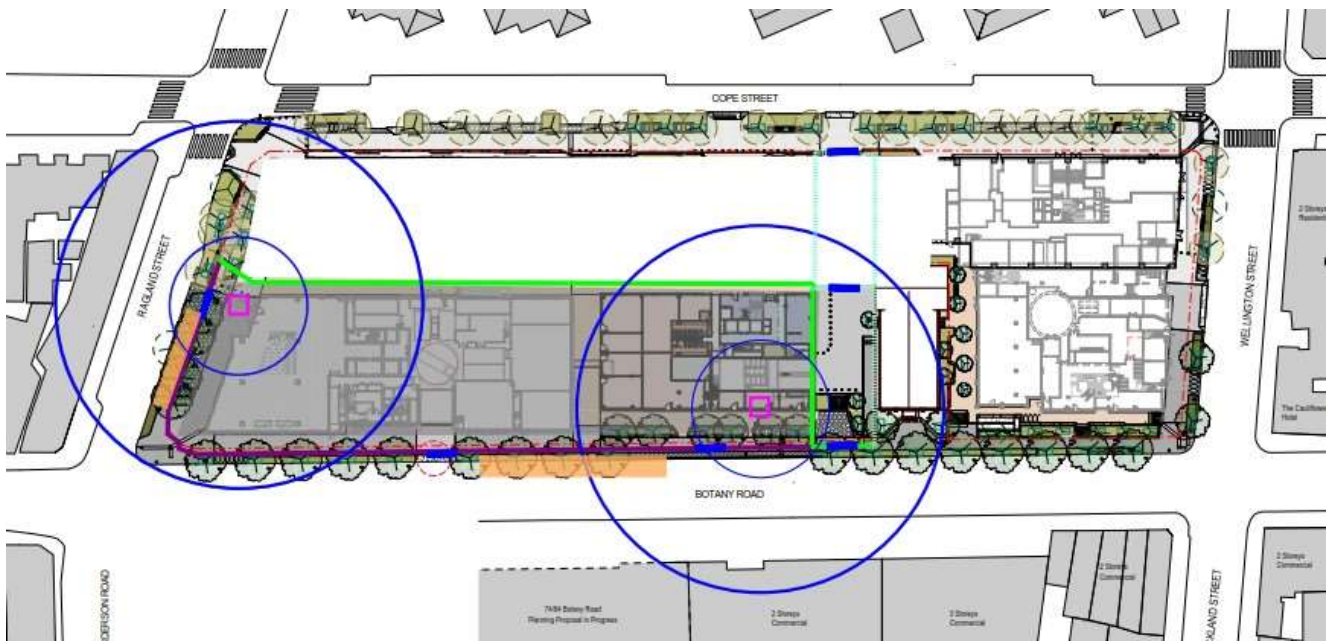


Figure 18 - Crane Layout

12.2 Access and Egress

Access scaffold stairs will be utilised in several locations to enable safe access and egress to and from the Basement Car Park excavation and work areas. Scaffold stairs will be craneable so that access and egress points can be easily relocated as required by the changing work site.

12.3 Concrete Pumping Zones

Concrete pumping zones for mobile boom pumps will be located to the North and South of the Basement Car Park.

Once the structure is suitably progressed concrete placement booms will be utilised to ensure efficient supply of concrete to the appropriate structural element within the Basement Car Park.

The use of static booms will reduce the need for mobile booms and therefore cut down on unnecessary people/plant interaction. The permanent feed location for the static boom will also assist with consistency in heavy vehicle movements around site.

13. Waste Management & Recycling

OSD Contractor will ensure that the project supply chain is responsible and accountable for maintaining a clean, clear and safe working environment. This will be documented in further detail in the Waste Management Plan (**WMP**) completed by a separate party appointed by the developer and submitted separately to this report. Typically, the head contractor of the site will be responsible for removing all construction-related waste offsite in a manner that meets all authority requirements. Bins will be provided for work areas and will be regularly removed to a suitable skip bin location for collection and transport from the site to the waste recycle facility.

Bins will be moved using the man and materials hoists and also by tower cranes, dependant on where they are loaded from, and the waste material being removed from site. Crane lifted steel bins will be used where structure trades will be working. The site skips will be suitably located to ensure easy pick-up by the waste subcontractor.

Excess materials generated throughout construction will be separated at an approved waste management facility. Auditable records will be kept of quantities of all materials both recycled and disposed to landfill. Records will be monitored to ensure any applicable recycling targets can be achieved. This information will be collected and reported in compliance with the WMP over the duration of the project. It is intended to engage a licenced entity for the purpose of waste management and recycling.

The EPA waste hierarchy, which sets priorities for the efficient use of resources, will be implemented during construction to minimise unnecessary waste generation.

The waste hierarchy is:

- avoidance including action to reduce the amount of waste generated by households, industry and all levels of government
- resource recovery including re-use, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources
- disposal including management of all disposal options in the most environmentally responsible manner.

To implement the waste hierarchy the following will be implemented, where practical and appropriate:

- Order materials in appropriate quantities and request minimal packaging;
- Give a high priority to using non-hazardous products where practical;
- Investigate packaging takeback schemes with suppliers during the procurement phase;

13.1 Waste types and classification

Waste will be classified according to the EPA's Waste Classification Guidelines 2014, prior to disposal. Spoil excavated is expected to be classified as excavated natural material (ENM) or as identified in a remediation action plan prepared for the site.

14. Noise & Vibration Management

Noise and vibration generated from construction activities occurring on site and its impact on site operations and workers will be managed to minimise adverse impact on neighbouring residents, businesses and associated building structures. Special consideration will be given to the neighbouring Waterloo Congregational Church during the construction of the Substructure and Basement levels. All noise generating activities are proposed to occur during the approved Standard Construction Hours. Primary source of noise generated will be associated with vehicle movements, generators, heavy machinery, hand-held machinery and tools.

Any noise activities proposed outside the nominated site operating hours will require prior written consent from the nominated approval authority. Noise limits during the construction works will meet the maximum allowable noise contribution.

During construction, the OSD Contractor will utilise existing noise impact assessment data, where required, to determine noise sources and confirm ambient background levels or alternatively will conduct baseline noise monitoring prior to construction work commencing. OSD Contractor may engage an acoustic consultant to monitor construction noise level during its activities, routine inspections of plant and equipment will be conducted to ensure performance relative to compliance requirements.

When planning for construction work that includes vibration, all practical efforts to protect vibration sensitive buildings and the amenity of adjoining stakeholders (specifically the church) will be considered. A practical and economical combination of vibration control measures will be applied to manage vibration impacts such as:

- Substitution by an alternative process
- Restricting times when work is carried out
- Screening or enclosures
- Consultation with affected residents
- Utilisation of temporary supports where deemed necessary

Stantec (Australia) Pty Ltd have been engaged by WL Developer to produce the Acoustic and Vibration Impact Assessment for the Basement, provided in EIS Appendix K. The EIS Appendix K - Acoustic and Vibration Impact Assessment (Operational and Construction) and the conditions contained therein will be adhered to for the duration of the project.

15. Air Quality and Odour Management

The major sources of air emissions from the proposed construction works at the site are primarily associated with traffic movements, excavation / stockpiling and handling of soils on site.

The generation of dust, air emissions or odours from the site can be a nuisance to adjacent land users, create unsafe working conditions on site and result in environmental degradation if not managed appropriately.

The minimisation of air borne pollution is an important component for the Construction Phase CEMP for the site. Construction phase air quality impacts shall be minimised or avoided by incorporation of appropriate dust suppression (e.g. sprinklers, misting and stabilised/cover stockpiles) and air quality control measures at various stages of the project.

Construction site layout and placement of plant would consider air quality impacts to nearby receivers, pedestrian, commercial receivers, public and road traffic.

16. Soil and Water Quality Management

16.1 Stormwater runoff

Water courses within the Project site catchment are heavily urbanised, with stormwater collected by developed stormwater networks. Environmental protection during construction will involve the installation, use and maintenance of a number of temporary erosion and sediment control measures as required in accordance with the following principles:

- Before undertaking excavation work implement all soil and water management controls required to minimise pollution of waters
- All erosion and sediment controls will be installed in accordance with NSW Blue Book Volumes 1 and 2D (Landcom, 2004 and DECC, 2008)
- Minimisation of soil erosion and mobilisation of sediment during rain events
- Use of suitable sediment retention structures and control measures to filter or retain mobilised sediment generated during rain events over surface disturbances
- Maximum sediment capture through effective positioning of temporary erosion and sediment control structures
- Regular inspection and maintenance of all erosion and sediment controls to ensure they are effective
- Ensure that any road, footpath, shared path or cycleway is at all times kept free of mud, dirt, dust, deleterious material, debris, obstructions and trip hazards
- Site exit controls may include wheel wash facilities. These measures would be put in place to mitigate the risk of any loss of fuels, lubricants, load or other substances
- Any spillage or build-up of such material or debris would be cleaned up as soon as practicable.

An erosion and sediment control plan will be developed for the site prior to the commencement of excavation. This will be prepared in accordance with the NSW Blue Book requirements. All stormwater will be managed to prevent off site pollution.

16.2 Groundwater Seepage

Groundwater inflow is expected to be minimal, based on the use of secant pile shoring wall or similar, and observations during adjacent TSE works for the Station Box. The management of groundwater seepage is described in Section 10.4.4.

16.3 Soil

Soil pollution and management requirements is described in Section 10.2. Where soil pollution occurs as a result of spills or leaks, the impacted soil will be removed and disposed at an appropriately licenced facility. All known areas of contamination will be managed prior to commencement of the Basement and is subject to a separate approval process (being the CSSI consent).

17. Cumulative Impacts

The cumulative assessment considers the Waterloo Station works that are programmed to be occurring during the Basement construction. The timing for other external developments (e.g. renewal of the social housing estate) are not planned to be undertaken concurrently with any of the Basement work at this stage, therefore, specific impacts are not able to be assessed as part of this CEMP.

The CEMP that is further developed prior to commencement of construction would address any further Cumulative Impacts as a result of other developments in proximity to the Basement Car Park works.

In accordance with the SEARS requirements, an assessment of the potential cumulative impacts of the proposed development with regards to the Station works (CSSI 7400) is provided in Table 3.

Aspect	Impact	Mitigation Measure
Noise & Vibration	Disruption to the community from construction and additional traffic, including out of hours activities	Implementation of noise and vibration management requirements are detailed further in Noise and Vibration Plan. Site inspections and monitoring to confirm noise and vibration levels are being met will be implemented by the construction manager, environmental officers and supervisor
Traffic	Disruption to the community and road users from increased traffic	Implementation of traffic management requirements are detailed further in the CTMP
Air quality	Dust generation is expected to be minimal due to the stage of work and limited ground disturbance	Air quality will be managed in accordance with the CEMP developed prior to commencement of construction.
Soil and Water	Minimal cumulative impacts are expected based on limited ground disturbance work at the site.	Soil and Water will be managed in accordance with the requirements stipulated within this CEMP
Odour	Minimal cumulative impacts are expected based on the ground disturbance work will be limited to the Basement location at the site	Odour will be managed in accordance with the requirements stipulated within this CEMP

Table 3 – Cumulative Impact

18. Program Management

OSD Contractor has standardised processes and procedures to ensure that project planning and scheduling is consistent, transparent, efficient, and integrated across the delivery cycle of the project. This provides a greater level of certainty in delivery through robust benchmarked baseline programs, and ensures that project controls are accurate and up-to-date.

The project team will have regular planning meetings to track, plan and disseminate information regarding the upcoming or ongoing activities. After implementation of the program, a structured cycle of monitoring and review will be maintained. Progress updates with the client will also be done periodically. These updates will be done by the project team members in charge of the works-activities.

19. Stakeholder Management & Communications

A stakeholder management plan will be developed prior to project commencement and community members/stakeholder will be engaged to address the implementation of project specific mitigation and management strategies in order to minimise the potential for negative impacts on the community in and around the construction site.

The WL Developer is committed to respecting and valuing all stakeholders and engaging positively with the community, government and non-government stakeholders.

In order to achieve this, we propose to implement the following strategies.

- Establish and maintain effective and open communication with community members, stakeholders' groups and the WLD project partners
- Be open and accessible to the community, stakeholders and customers
- Listen and respond to what the community and stakeholders have to say
- Provide timely, informative communications material that clearly explains the project works and any potential impacts
- Identify and address key risks, impacts and opportunities
- Ensure there are "no surprises" for stakeholders, the community and WLD partners
- Conduct ourselves professionally in all that we do
- Actively look for opportunities to incorporate the community and stakeholder suggestions in the design, construction and delivery phases of the project

Identified below are some of the key stakeholders for the development:

- Waterloo Congregational Church
- Public Utility Authorities e.g. (Sydney Water, Jemena, Ausgrid, Telstra, Optus, NBN)
- Transport for New South Wales
- Roads and Maritime Services
- Sydney City Council
- Sydney Trains
- Police, Fire Brigade, Ambulance, Local Area Command Emergency Response Group
- Office of Environment and Heritage
- NSW Environmental and Protection Authority
- Local Government representatives
- Bus companies e.g. Sydney Buses
- Local residents
- Road users and Pedestrians
- Surrounding Business
- Community Interest Groups