ENVIRONMENTAL IMPACT STATEMENT

Waterloo Metro Quarter
Over Station Development
Central Precinct
Detailed State Significant
Development Application

Prepared for
WL DEVELOPER PTY LTD
26 October 2020

URBIS

URBIS STAFF RESPONSIBLE FOR THIS REPORT WERE:

Director	Peter Strudwick
Associate Director	Danielle Blakely
Senior Consultant	Anna Wang

Reference	Description
Applicable SSD Applications	SSD-10439 - Central Building Detailed Design SSDA
Author	Urbis Pty Ltd Danielle Blakely
Reviewed	Waterloo Developer Pty Ltd Angela Kavanagh
Document Number	WMQ-BLD2-EIS-RPT-003
Status	Final
Version	5
Date of Issue	26 October 2020
© Waterloo Developer Pty Ltd 2020	

urbis.com.au

CONTENTS

FIGURES

TABLES

SIGNED DECLARATION

SUBMISSION OF ENVIRONMENTAL IMPACT STATEMENT

This Environmental Impact Statement has been prepared in accordance with Schedule 2 of the Environmental Planning and Assessment Regulations 2000.

Environmental Assessment prepared by:

Names:	**Peter Strudwick, Director** Bachelor of Town Planning, University of NSW **Danielle Blakely, Associate Director** Master of Urban and Regional Planning, University of Sydney Diploma of Law, Law Extension Committee, University of Sydney Bachelor of Science, University of NSW **Anna Wang, Senior Consultant** Bachelor of Planning (Hons 2), University of NSW
Address:	Urbis Pty Ltd Level 8, 123 Pitt Street Sydney NSW 2000
In respect of:	SSD-10439 - Waterloo Metro Quarter OSD - Central Building Detailed Design SSDA

Applicant and Land Details:

Applicant:	WL Developer Pty Ltd
Applicant address	Level 10, 54 Park Street Sydney NSW 2000
Land to be developed:	The Waterloo Metro Quarter site - land to the west of Cope Street, east of Botany Road, south of Raglan Street and north of Wellington Street. The heritage listed Waterloo Congregational Church located at 103–105 Botany Road is within this street block but is not part of the Sydney Metro Waterloo Quarter site boundaries.
Legal description:	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).
Project Summary	Detailed State Significant Development Application for the construction and operation of a mixed-use over station development (**OSD**) located in the Central Precinct of the Waterloo Metro Quarter site.

We certify that the content of the Environmental Impact Statement, to the best of our knowledge, has been prepared:

- In accordance with the requirements of the *Environmental Planning and Assessment Act 1979*, Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*, and *State Environmental Planning Policy (State and Regional Development) 2011*;
- Contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which that statement relates; and
- The information contained in this statement is neither false nor misleading.

Name/Position:	**Peter Strudwick, Director**	**Danielle Blakely, Associate Director**	**Anna Wang, Senior Consultant**
Signature:			
Date:	26 October 2020	26 October 2020	26 October 2020

GLOSSARY AND ABBREVIATIONS

Reference	Description
100 year ARI	1 in 100 year flood (average recurrence interval)
ACHAR	Aboriginal Cultural Heritage Assessment Report
ADG	Apartment Design Guide
AHD	Australian height datum
AMS	Archaeological Method Statement
AQIA	Air Quality Impact Assessment
ARD	Archaeological Research Design
BC Act	Biodiversity Conservation Act 2016
BCA	Building Code of Australia
BC Reg	Biodiversity Conservation Regulation 2017
BDAR	Biodiversity Development Assessment Report
CBD	Central Business District
CEEC	critically endangered ecological community
CIV	capital investment value
CEMP	Construction Environmental 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
CPTMP	Construction Pedestrian Traffic Management Plan
CSSI approval	critical State significant infrastructure approval
CTMP	Construction Traffic Management Plan
DA	development application
DAPS	Disability (Access to Premises - Buildings) Standards, 2010
DCP 2012	Sydney Development Control Plan 2012
DDA	Disability Discrimination Act 1992
DEEP	Design Excellence Evaluation Panel

Reference	Description
Design Guidelines	Waterloo Design Amenity Guidelines
DIR	Design Integrity Report
DPIE	NSW Department of Planning, Industry and Environment
DTS	Deemed-to-Satisfy
EP&A Act	Environmental Planning and Assessment Act 1979
EPA Regulation	Environmental Planning and Assessment Regulation 2000
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EIS	Environmental Impact Statement
EOI	Expression of Interest
EPA	NSW Environment Protection Authority
ESD	ecologically sustainable design
GANSW	NSW Government Architect's Office
GEM	Gust Equivalent Mean
GFA	gross floor area
GTP	Green Travel Plan
HCA	Heritage Conservation Area
HIA	Heritage Impact Assessment
HIS	Heritage Impact Statement
IAP	Interchange Access Plan
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
LGA	Local Government Area
MGB	1100L bin
MRV	Medium Rigid Vehicle
NCC	National Construction Code
OSD	over station development
PIR	Preferred Infrastructure Report
PMF	Probable Maximum Flood
POM	Plan of Management
PSI	Preliminary Site Investigation

Reference	Description
RL	Reduced Level
RMS	Roads and Maritime Services
SACL	Sydney Airport Corporation Limited
SDPP	Station Design and Precinct Plan
SDRP	NSW State Design Review Panel
SDRP SEPP	State Environmental Planning Policy (State and Regional Development) 2011
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SEPP 55	State Environmental Planning Policy No 55—Remediation of Land
SEPP 64	State Environmental Planning Policy No. 64 – Advertising and Signage
SEPP 65	State Environmental Planning Policy No. 65 – Design Quality of Residential Apartment Development
SLEP 2012	Sydney Local Environmental Plan 2012
SRV	Small Rigid Vehicle
SSD	State significant development
SSD 9393	Concept DA
SSDA	State significant development application
SSI	State significant infrastructure
SSI 15_7440	CSSI Approval
STA	State Transit Authority
TfNSW	Transport for New South Wales
The Church	Waterloo Congregational Church
The proposal	The proposed development the subject of the detailed SSDA
The site	The site the subject of the detailed SSDA
The Station Contractor	John Holland
TIA	Traffic Impact Assessment
Transport for NSW	Transport for New South Wales
VIA	Visual Impact Assessment
VPA	Voluntary planning agreement

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

EXECUTIVE SUMMARY

This Environmental Impact Statement (**EIS**) has been prepared to accompany a detailed State significant development application (**SSDA**) for the construction and operation of a mixed-use over station development (**OSD**) located in the Central Precinct of the Waterloo Metro Quarter (**WMQ**) site.

This EIS should be read in conjunction with the Secretary's Environmental Assessment Requirements (SEARs) dated 9 April 2020 and included at **Appendix A**, and the supporting technical documents provided at **Appendix B - Appendix RR.**

This EIS has been prepared in accordance with and meets the minimum requirements of Clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (**the Regulation**) and contains an assessment of the proposal against the relevant considerations under Section 4.15 of the E*nvironmental Planning and Assessment Act 1979* (**EP&A Act**).

SYDNEY METRO

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

Metro North West Line (formerly the 36 kilometre North West Rail Link)

Services started in May 2019 in the city's North West between Rouse Hill and Chatswood, with a metro train every four minutes in the peak. The project was delivered on time and $1 billion under budget.

Sydney Metro City & Southwest

The Sydney Metro City & Southwest project includes a new 30km metro line extending metro rail from the end of the Metro North West Line at Chatswood, under Sydney Harbour, through new CBD stations and southwest to Bankstown. It is due to open in 2024 with the ultimate capacity to run a metro train every two minutes each way through the centre of Sydney.

Sydney Metro City & Southwest will deliver new metro stations at Barangaroo, Crows Nest, Victoria Cross, Martin Place, Pitt Street, Waterloo and new underground metro platforms at Central Station. In addition it will upgrade and convert all 11 stations between Sydenham and Bankstown to metro standards.

Sydney Metro West

Sydney Metro West is a new underground railway connecting Greater Parramatta and the Sydney CBD. This once-in-a-century infrastructure investment will transform Sydney for generations to come, doubling rail capacity between these two areas, linking new communities to rail services and supporting employment growth and housing supply between the two CBDs.

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.

Sydney Metro - Western Sydney Airport

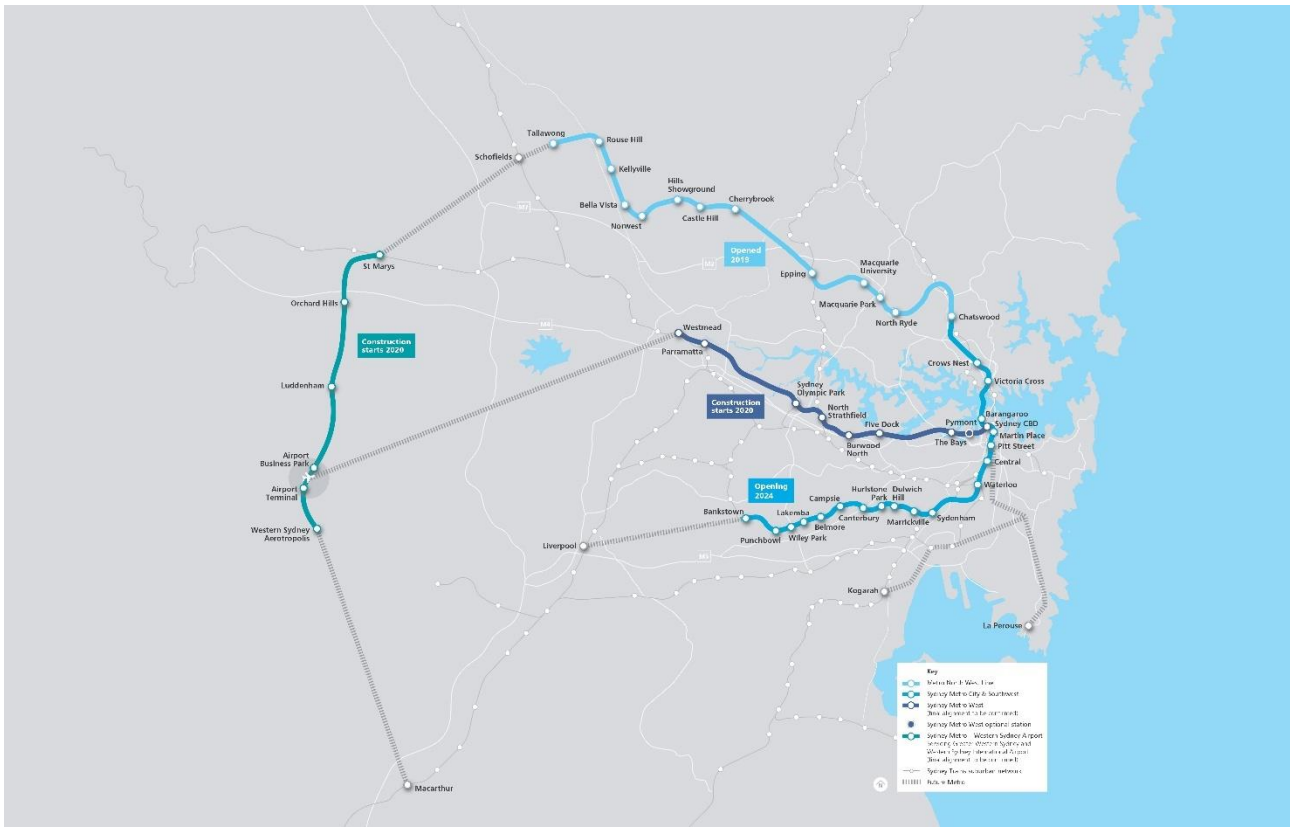
Metro rail will also service Greater Western Sydney and the new Western Sydney International (Nancy Bird Walton) Airport. The new railway line will become the transport spine for the Western Parkland City's growth for generations to come, connecting communities and travellers with the rest of Sydney's public transport system with a fast, safe and easy metro service. Six new stations will be delivered at St Marys, Orchard Hills, Luddenham, Airport Business Park, Airport Terminal and Western Sydney Aerotropolis. The Australian and NSW governments are partners in the delivery of this new railway.

In 2024, customers will benefit from a new fully-air conditioned Sydney Metro train every four minutes in the peak in each direction with lifts, level platforms and platform screen doors for safety, accessibility and increased security.

On 9 January 2017, the Minister for Planning approved the Sydney Metro City & Southwest - Chatswood to Sydenham project as a Critical State significant infrastructure project (reference SSI 15_7400) (CSSI approval).

The terms of the CSSI approval includes all works required to construct the Sydney Metro Waterloo Station, including the demolition of existing buildings and structures. The CSSI approval also includes construction of below and above ground structures associated with the metro station and structures required to facilitate the construction of over station development (**OSD**).

Figure 1 Sydney Metro Alignment Map



Source: Sydney Metro

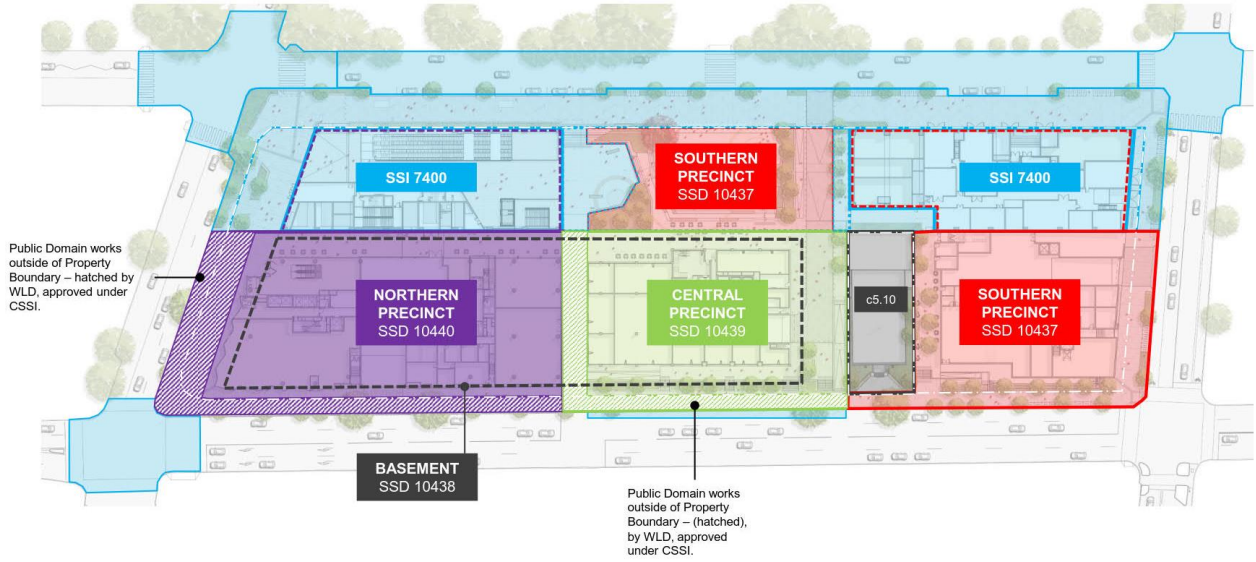
THE SITE

The site is located within the City of Sydney Local Government Area (**LGA**). The site is situated approximately 3.3 kilometres south of Sydney CBD and approximately 8 kilometres northeast of Sydney International Airport within the suburb of Waterloo.

The WMQ 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 2). The heritage listed Waterloo Congregational Church located at 103–105 Botany Road is within this street block but does not form a part of the WMQ site boundaries.

The WMQ site is a rectangular shaped allotment and has an overall site area of approximately 1.287 hectares. The detailed SSDA applies to the Central Precinct (**the site**) of the WMQ site, which comprise the Central Building and public domain area. The boundaries of the Central Precinct are illustrated at Figure 2.

Figure 2 WMQ Site Precinct Identification (SSDA Boundaries)



Source: WL Developer Pty Ltd

BACKGROUND

CSSI Approval – CSSI 7400

CSSI Approval 7400, as it relates to the Waterloo Station, includes:

- Demolition of existing buildings within the site.
- Excavation of the rail tunnel, concourse and platforms and therefore the setting of surrounding structural zones, services and accesses.
- Establishment of an aboveground station footprint (Metro station box and Metro service box).
- Space provision for future lift cores, access, minor associated parking provision, retail and building services for the future OSD.
- Station entry via Raglan Street and via the public plaza from Cope Street.
- Public domain works (including parts of the Raglan Street Plaza and the Cope Street Plaza).

The CSSI approval included indicative interface drawings for the below and above ground works at Waterloo metro station. Section 2.3 of the Preferred Infrastructure Report (**PIR**) noted that the integration of the OSD elements and the metro station elements would be subject to the design resolution process, noting that the detailed design may vary from the concept design assessed within the planning approval.

Condition E101 of CSSI 7400 approval requires that detailed station design and precinct plans to be coordinated and approved by the Secretary of the Department prior to the construction of above ground works.

Approval – SSD 9393

Development consent was granted on 10 December 2019 for the concept development application (SSD 9393) for Waterloo over station development 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.

This detailed SSDA seeks development consent for the over station development located in the Central Precinct of the site.

Proposed Concurrent Amending DA (SSD-10441)

An Amending SSDA (SSD – 10441) will be lodged concurrently with this DA in accordance with Section 4.22 of the *Environmental Planning and Assessment Act 1979* (**EP&A Act**). It seeks approval to amend the building envelope and description of development for the Northern Precinct and the podium design of the Central Building approved under SSD 9393.

Specifically, the amending DA seeks to modify the approved building envelope for the Northern Precinct (previously comprising 'Building A', 'Building B', 'Building C' and 'Building D' under SSD 9393) and the Central Precinct (previously comprising 'Building 2') through:

- Increasing the maximum building height for the southern portion of the building envelope from RL56.2 to RL72.60.
- Removing the 'tower component' of the northern precinct, reducing the overall height of the tower envelope from RL116.9 to RL90.40, to enable the redistribution of floor space to commercial office floor plates.
- Amending the description of development to refer to a mid-rise (17-storey) commercial office building, comprising approximately 34,125sqm of commercial office floor space within the northern portion of the site, rather than a third residential tower.
- Minor amendment to the podium design of Building 2 along the cope street plaza eastern façade to accommodate increased community GFA.
- Condition amendments to enable balustrades, pergola, solar panels and the like to be located outside of the approved building envelope and provide clarity on minor design items.

This detailed DA is consistent with the concept DA, as proposed to be modified.

DEVELOPMENT DESCRIPTION

The proposal seeks detailed development consent for the design, construction, and operation of a 23-storey (excluding plant level) mixed use building. Consent is specifically sought for the construction and use of:

- 23-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 wide amenities and shared basement carpark entry;
- Level 1 and Level 2 'Community Facility' (as defined in the SLEP) to be used 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 shared basement via a shared way from Cope Street, expanded footpaths on Botany Road and public domain upgrades;
- External licensed seating zone subject to a future approval;
- Signage zone locations;
- Utilities and service provision; and
- Stratum subdivision (staged).

The building will be situated along the western edge of the WMQ site orientated towards Botany Road and the new Cope Street Plaza. The proposed new building will comprise a mix of retail and community uses at the lower levels with a mix of affordable and private housing above.

Figure 3 Artist's Impression of the proposed development

Source: Hassell

PROJECT NEEDS AND BENEFITS

The Waterloo metro station is a key new station on the Sydney Metro network, comprising one of five metro stations in City of Sydney LGA, alongside Barangaroo Station, Martin Place Station, Pitt Street Station and Central Station (new underground platforms). The Station will be a key catalyst for the revitalisation of the Redfern-Waterloo Area and assist in reducing overcrowding at Redfern and Green Square Stations.

The primary objective of the proposal is to capitalise on the significant NSW Government investment into Sydney Metro by providing a combination of social housing and student accommodation above and adjacent the Sydney Metro network, with connections to the Sydney CBD and other strategic centres. In achieving this objective, the proposal also seeks to achieve the following:

- Maximise the opportunity to truly integrate transport and land use by integrating the Central Building OSD with the Metro station;
- Support the growing population in the Eastern City District by providing high-quality residential accommodation and a range of dwelling types;
- Positively contribute to housing affordability by providing appropriately priced and diverse affordable housing within close proximity to public transport, recreation, local shopping, facilities and services;
- Provide an integrated childcare centre to support the growth in residential and employment populations;

- Support the future renewal of Waterloo Estate; and
- Improve connectivity by providing pedestrian entry points from Botany Road and a pedestrian through-site link to Cope Street with activated retail use, to encourage pedestrian activity and enhance the public domain surrounding the Central Precinct.

PLANNING FRAMEWORK

As the proposal is for the purposes of a residential development associated with railway infrastructure and has a capital investment value of more than $30 million, it is classified as State significant development pursuant to Clause 8(1)(b), Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011*.

The Minister for Planning and Public Spaces, or their delegate, is the consent authority for the SSDA and the application is lodged with the NSW Department of Planning, Industry and Environment (**NSW DPIE**) for assessment.

This application constitutes a detailed staged application subsequent to an approved concept DA (**SSD 9393**) which granted consent for a maximum building envelope on the site, lodged under Section 4.22 of the EP&A Act. An amending DA to the approved concept DA has been lodged concurrently with this application.

This EIS considers the relevant regulatory framework applicable to the site and contains an assessment of the proposal against the following statutory controls and regulatory instruments:

- *State Environmental Planning Policy (State and Regional Development) 2011*
- *State Environmental Planning Policy (Infrastructure) 2007*
- *Biodiversity Conservation Act 2016*
- *State Environmental Planning Policy No. 55 – Remediation of Land*
- *State Environmental Planning Policy No. 64 – Advertising and Signage*
- *State Environmental Planning Policy No. 65 – Design Quality of Residential and Apartment Design Guide (SEPP 65)*
- *State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004*
- *State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017*
- *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005*
- *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017*
- *Draft State Environmental Planning Policy (Environment)*
- *Draft State Environmental Planning Policy (Remediation of Land)*
- *Sydney Local Environmental Plan 2012*
- *Sydney Development Control Plan 2012*

The proposal has also been assessment in accordance with its consistency with the key planning objectives, priorities and actions outlined within relevant strategic land use and transport planning policies including:

- *NSW State and Premier Priorities*
- *A Metropolis of Three Cities – The Greater Sydney Region Plan 2018*
- *Eastern City District Plan 2018*
- *Future Transport 2056 Strategy*
- *State Infrastructure Strategy 2018-2038*
- *Sustainable Sydney 2030*
- *Development Near Rail Corridors and Busy Roads – Interim Guideline*
- *Guide to Traffic Generating Development, Roads and Maritime Services*

- *Heritage Council Guidelines*
- *Better Placed – An Integrated Design Policy for The Built Environment of New South Wales*
- *Child Care Planning Guidelines 2017*
- *City of Sydney Development Contributions Plan 2015*
- *City of Sydney Local Strategic Planning Statement*
- *Waterloo Metro Quarter Design and Amenity Guideline and Design Excellence Strategy*

STAKEHOLDER CONSULTATION

To inform the detailed design of the development, consultation has been undertaken with the local community, government agencies including:

- City of Sydney Council
- Transport for NSW including Sydney Trains, Sydney Metro and Transport Coordination Office
- Sydney Water
- Ausgrid
- Office of Environment and Heritage
- Waterloo Congregational Church
- Relevant community organisations
- Relevant special interest or recreational groups
- Surrounding residents and businesses
- General public

Various strategies were implemented to ensure collaborative community involvement in the project. This included online forums, targeted emails to stakeholders, invitations to contact the Stakeholder Manager to discuss issues and opportunities relating to the design of the WQM site and construction impacts. A specific program to engage with Aboriginal stakeholders was also undertaken by Murawin, an Aboriginal placemaking consultancy.

Feedback received through the consultation has informed the detailed design of the proposed OSD and the public domain design.

IMPACTS AND MITIGATION MEASURES

This EIS has addressed the SEARs requirements issued for the development and includes an assessment against the relevant environmental planning instruments, policies, and guidelines and demonstrates that the proposed development does not result in any significant departures from applicable controls or unreasonable environmental effects.

Key items considered as part of this impact assessment include:

- Consistency with concept approval;
- Land use and gross floor area;
- Design excellence and built form;
- Visual and amenity impacts;
- Heritage;
- Ecologically sustainable development;
- Traffic, parking and access;
- Noise and vibration;

- Construction impacts;
- Public benefits;
- Contamination and remediation;
- Stormwater and flooding;
- Biodiversity; and,
- Consultation.

In considering each of the above key planning issues and potential impacts associated with the development, the EIS outlines the proposed mitigation measures to address each of these matters.

Each of these outstanding impacts have been addressed within this EIS.

CONCLUSION

The proposed development sought within the Detailed SSDA is considered appropriate for the site and warrants approval for the following reasons:

- The proposal contributes to the achievement of the objectives for development within the Sydney LGA as outlined within the relevant strategic plans and policies.
- The proposal results in an orderly and economic use of the land that leverages significant NSW Government investment in public transport to the site, specifically Sydney Metro.
- The proposed supports 14,923.7sqm of new GFA, which will deliver 24 affordable housing units and 126 private market housing units, which will contribute to the housing targets of the Eastern City district plan.
- The proposal satisfies the applicable state planning policies, and relevant environmental planning instruments that apply to the site.
- The proposed uses are permitted with consent and meet the objectives of the B4 mixed use zone in Sydney Local Environmental Plan 2012 (SLEP 2012).
- The proposal does not create a net additional solar impact to public places including Cope Street Plaza and Alexandria Park.
- The proposal complies with the maximum allowable car parking spaces for the site under the conditions of the concept SSDA.
- The proposed residential apartments satisfy the provisions and guidelines contained within SEPP 65 and the ADG.
- The proposal has no unacceptable traffic impacts.
- The proposal minimising pedestrian and vehicle conflicts, maximising legibility and accessibility to the Waterloo Station and Cope Street Plaza.
- The proposal is sympathetic to the heritage items in the vicinity of the site, including to the adjacent Waterloo Congregational Church.
- The proposal achieves design excellence as outlined through the Sydney Metro design review and design excellence process.
- The proposal will deliver more than 2,000sqm of GFA to support ‘community facilities’ on the site, which will positively contribute to the social needs of the Waterloo community. The proposed childcare centre will provide childcare services for the WQS precinct and the future growth of the wider area.
- The proposed detailed design of the OSD has considered and is integrated with the detailed design of the Sydney Metro Waterloo Station and its related works including the construction of the development up to the transfer slab and the public domain.
- The overall WMQ site will support 466 jobs during construction and 3,591 jobs during operation, which will provide economic benefits to the existing and future Waterloo community.
- The proposal satisfies the SEARs as demonstrated in this EIS and accompanying specialist reports.

In view of the above, it is submitted that the proposal is in the public interest and should be approved subject to appropriate consent conditions.

1. INTRODUCTION

This Environmental Impact Statement (**EIS**) has been prepared to accompany a detailed State significant development application (**SSDA**) which seeks consent for the construction and operation of a mixed use over station development (**OSD**) located in the Central Precinct of the Waterloo Metro Quarter (**WMQ**) site – the Central Building.

This report has been prepared by Urbis Pty Ltd on behalf WL Developer Pty Ltd, the applicant of the detailed SSDA. Following the completion of a competitive tender bid process, Sydney Metro appointed WL Developer Pty Ltd as the preferred development partner to deliver the Waterloo Station OSD.

Lodgement of this detailed SSDA follows the approval of a concept DA (SSD 9393) granted by the Minister for Planning on 10th December 2019.

In order to achieve the project outcomes, an amending DA to the concept DA has been submitted concurrently with this application. The amending DA seeks to amend the building envelope and description of development for the Northern Precinct and the podium design of the Central Building approved under SSD 9393.

Specifically, the amending DA seeks to modify the podium design of the Central Building along the Cope Street Plaza eastern façade. This detailed SSDA is consistent with the concept DA, as proposed to be modified.

This EIS is submitted to the NSW Department of Planning, Industry and Environment (**DPIE**) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (**EP&A Act**). The Minister for Planning and Public Spaces, or their delegate, is the consent authority for the detailed SSDA.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (**SEARs**) dated 9th April 2020 included within **Appendix A**, and should be read in conjunction with the supporting documents provided at **Appendix B – Appendix RR.**

1.1. PROJECT OVERVIEW

The proposal seeks subsequent 'Stage 2' detailed development consent for the design, construction, and operation of a mixed use building comprising:

- 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 wide amenities and shared basement carpark entry;
- Level 1 and Level 2 'Community Facility' (as defined in the SLEP) to be used 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 shared basement via a shared way from Cope Street, expanded footpaths on Botany Road and public domain upgrades;
- External licensed seating zone subject to a future approval;
- Signage zone locations;
- Utilities and service provision; and
- Stratum subdivision (staged).

The building will be situated along the western edge of the site orientated towards Botany Road and the new Cope Street Plaza. The proposed new building will comprise a mix of retail and community uses at the lower levels with a mix of affordable and private housing above.

The proposed development within the Central Building will comply with the height of building standard for the site prescribed by the *Sydney Local Environmental Plan 2012* and the concept envelope height. As mentioned above, an Amending DA has been lodged concurrently with this DA. It seeks approval to amend

the podium design of the Central Building approved under SSD 9393. This detailed SSDA is consistent with the concept DA, as proposed to be modified.

The proposed materiality and detailing will be sympathetic to the adjacent heritage listed church to the south of the site and the broader context of the area.

Vehicular access will be available from Cope Street and provide access to a shared basement car park located below the Central and Northern Precincts. The construction of the basement is subject to a separate SSDA (SSD 10438). Car parking spaces for the Central Precinct are provided in the basement, which will not exceed the maximum car parking provision prescribed by the Concept DA.

1.2. PROJECT OBJECTIVES

The objectives of the proposed development are to:

- Increase the supply and diversity of residential dwellings in an accessible location with amenities and public transport infrastructure in close proximity to the site;
- Provide affordable housing within a high-quality living environment;
- Provide community facility in the form of a childcare centre operated by a non-profit community organisation to service both the local community and the incoming residents and workers;
- Activated ground plane which integrates with Cope Street Plaza to the east, Grit Lane to the north and Church Square to the south. This is achieved by activated retail opportunities and community uses accessed via a thriving public domain space connecting the public and private realms;
- Achieve a high-quality built form that respects the local character of the area and positively contributes to the streetscape;
- Respect the curtilage of Waterloo Congregational Church and enhance the church's visual presence in the public domain by providing a new laneway access;
- Creating a building that is part of a fully integrated transport system;
- Enhance the site and its context through the delivery of a building as achieving design excellence by the Sydney Metro Design Excellence Evaluation Panel (**DEEP**) and Sydney Metro Design Review Panel (**DRP**) requirements;
- Provide a building envelope that is consistent with the concept DA (as amended); and
- Enable a building form that minimises overshadowing to public open space and nearby residential areas.

1.3. STRATEGIC NEED

As identified in the *A Metropolis of Three Cities – Greater Sydney Region Plan (2018)*, Sydney's population is forecast to grow to eight million by 2056. The new Sydney Metro responds to the transport demand that will accompany this growth with its plan to deliver a new standalone railway with 31 stations and more than 66 kilometres of new rail. Once completed, Sydney Metro, along with other signalling and infrastructure upgrades across the existing networks, will increase the capacity of Sydney's train services from approximately 120 per hour today up to 200 services beyond 2024 – a 60 per cent increase resulting in an extra 100,000 train customers per hour in the peak. The project has been endorsed by the NSW Government as a key component of Sydney's Rail Future: Modernising Sydney's Trains.

The NSW Government's *Future Transport Strategy 2056* guides transport over the longer term, delivered through a series of services and infrastructure plans. The Waterloo metro station is a key new station on the Sydney Metro network which feeds into the framework for the transport system and customer mobility in NSW. This new metro station will revitalise the Waterloo and Redfern precinct and support the extension of Sydney CBD. The new station will take pressure off Redfern and Green Square stations and will improve access to Central Sydney's highly skilled job market and education facilities.

This proposal capitalises on the introduction of Sydney Metro by providing for a mixed-use tower fully integrated with the future Waterloo metro station. Additional retail uses in this location will strengthen the Waterloo precinct's role as nurturing quality lifestyles through well-design housing close to transport and other infrastructure and will align with a key action in the *Eastern City District Plan (2018)* by maximising the land use opportunities provided by the new Waterloo metro station.

The Detailed SSDA proposal also responds to the need for housing a diverse population and sustainable development, renewal and design. As detailed in the *Sustainable Sydney 2030 (2019)*, the City of Sydney Council is seeking to make the City *'more green, global and connected'*. The overall Sydney Metro Waterloo OSD project will deliver sustainable transport options whilst contributing to housing supply for a range of lifestyle choices and household types, specifically through the provision of affordable housing and private market housing accommodation in the Central Building. This detailed proposal responds positively to Sustainable Sydney 2030 by providing a world-class mixed-use building in an ideal location directly above future high-frequency public transport.

Consistency of the proposal with key strategic plans, strategies and policies is discussed in detail in Section 5 of this EIS.

1.4. PROJECT ALTERNATIVES

This section discusses the consideration of feasible alternatives to the carrying out of the proposed development as per clause 7(1)(c), Part 3, Schedule 2 of the E*nvironmental Planning and Assessment Regulation 2000 (**EP&A Regulation**).* Three options for the proposal could be considered to address the project objectives and site constraints and opportunities, which include:

- Scenario 1 – 'do nothing';
- Scenario 2 – development of the project at an alternative location; and
- Scenario 3 – employment generating OSD land use (commercial).

1.4.1. Do Nothing

The 'do nothing' scenario, involving no OSD above the approved Waterloo metro station, is not a feasible development option for the site. OSD forms a key component of the overall Sydney Metro project which Transport for New South Wales (**TfNSW**) is committed to delivering.

It is also noted that demolition of the existing structures was approved under the CSSI Approval and has been completed on the site. Construction works are currently underway on site for the delivery of the Waterloo Station elements approved under the CSSI Approval.

No future OSD development on the site provides minimal placemaking benefits and would result in a net loss of floor space on the site. Ultimately a 'do nothing' scenario constitutes gross under-development of a valuable site within Waterloo.

Also, a 'do nothing' scenario could create further issues should the site be developed separately in the future. A separate, future, development would likely result in a less integrated development that does not maximise the opportunities of new transport infrastructure.

1.4.2. Development of the Proposal at Alternative Location

A second option for the proposal involves proposing the development at an alternative location. This would result in the community facilities and mixed tenure residential housing development that would otherwise not be classified as SSD due to not being associated with a rail corridor.

This option would also be inconsistent with NSW transport policy and State and local strategic objectives for the site. In particular, the proposal would not maximise opportunities to leverage off the significant investment in Sydney Metro for employment generating and housing uses.

In addition, the alternative location scenario would not include the significant development of community facilities and diversity of residential housing being developed above the Waterloo Station. The opportunity cost to the local community and broader metropolitan region would be significant and key economic, transport, housing and social benefits presented by the proposal not being realised.

1.4.3. Employment Generating OSD Land Use (Commercial)

The third option for the site involves proposing alternative land uses for the Central Precinct, other than the mix of retail, community facility, affordable housing and private residential uses proposed. From a development feasibility perspective, a viable alternative land use would be to develop the site for the purposes of commercial office tower.

Commercial use of the site would facilitate a high level of employment generating uses and usage of the Sydney Metro infrastructure for workers. However, the benefits of commercial use would not deliver the wider benefits of providing affordable housing and private residential accommodation as proposed within the Central Precinct, which will contribute to housing delivery and diversity in the wider LGA. More importantly, the Northern Precinct has been selected to provide commercial office tower, given its larger site area and the direct connection to Metro station box below. As such, this scenario does not provide a unique offering to the site and can be provided elsewhere within the WMQ.

Such an alternative land use would also conflict with the long-term strategic vision for Waterloo to provide opportunities for the intensity of land uses integrated with public transport. WMQ and associated strategic policies encourage a diversity of land uses for the OSD to provide opportunities for competitive residential floorspace and housing diversity whilst maximising on future public transport opportunities.

The WL Developer Pty Ltd assessed the Central Precinct site against a viable commercial office building development.

The footprint of the site (approximately 2,800sqm) is relatively small in comparison to the Northern Precinct (4,500sqm), and much of the central area on the ground plane is required for the establishment of the Cope Street Plaza (proposed as part of the Southern Precinct) and vehicle access for loading and servicing (off Cope Street). The Central Precinct is not sufficient in size to accommodate an appropriately sized and market relevant office lobby.

Typically, the traditional size of pre-commitment tenants is circa 10,000+ sqm. Tenants of this size require sufficient lead time (3-5 years) to relocate and will seek a discount to the market. Given the size of the floorplates, it is likely to be difficult to attract a tenant of this scale as their business would be accommodated over multiple floors. It is more realistic that a number of smaller users would be required to “piggy back” to reach pre-commitment threshold.

The small Central Precinct site area and floor plate size reinforces the likelihood of a building with a number of smaller users and not an attractive investment proposition.

Finally, commercial office for the Central Precinct does not provide diversity. As discussed above, the Northern Precinct has been selected to provide for commercial office towers. Having additional office premises in the Central Precinct would result in the WMQ site being dominated by commercial land uses. This is inconsistent with Sydney Metro’s objectives for vibrant place making and diversity of uses in support of the metro system.

Based on the land use assessment of the site for commercial use as described above and the understanding that this particular use will not promote a diversity of use, the suitability of employment-generating land use for the Central Precinct is less preferred. As such, pursuing an alternative land use such as commercial office within the Central Precinct is considered a less preferred alternative form of development for the site.

Accordingly, the Central Precinct has been designed as a mixed use development comprising retail, community facility, affordable housing and private residential accommodation which is consistent with the Eastern District Plan and the importance of including a mix of dwelling types, tenures, price points, sizes and universal design.

1.5. STRUCTURE OF THE EIS

The EIS provides the following sections:

- **Section 2:** provides background of the proposal and relevant approvals in relation to the site.
- **Section 3:** a description of the site and surrounding context, including identification of the site, existing development on the site and surrounding development.
- **Section 4:** a detailed description of the proposed development.
- **Section 5:** details the strategic context including the planning policies and guidelines relevant to the site and the proposal.
- **Section 6:** provides a detailed assessment of the State, regional and local strategic planning policies and the development contributions framework.
- **Section 7:** details the community and stakeholder engagement undertaken by the applicant as part of the preparation of this EIS.

- **Section 8:** provides a comprehensive assessment of the existing environment, potential impacts, and mitigation measures for each of the key criteria in the SEARs.
- **Section 9:** lists the recommendations and mitigation measures based on the technical studies undertaken as part of this application.
- **Section 10:** provides concluding statements and a recommendation for determination of the application.

1.6. SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

A request was made to the Minister for the issuance of SEARs, pursuant to clause 3(1), Part 2, Schedule 2 of the Regulation. SEARs were subsequently issued on 9 April 2020 (**Appendix A**) and have informed the preparation of this EIS and supporting technical documents. Table 1 provides a summary of the SEARs and identifies the section of this EIS where the relevant requirement is addressed.

Table 1 Summary of SEARs

Description / Requirement	Reference
GENERAL REQUIREMENTS	
The environmental impact statement (EIS) must be prepared in accordance with and meet the minimum requirements of clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (the Regulation).	Refer to Statement of Validity and throughout this report.
Notwithstanding the key issues specified below, the EIS must include an environmental risk assessment to identify the potential environmental impacts associated with the development.	Section 9 – Environmental Risk Assessment
Where relevant, the assessment of key issues below, and any other significant issues identified in the risk assessment, must include: ▪ Adequate baseline data ▪ Consideration of the potential cumulative impacts due to other developments in the vicinity (completed, underway or proposed); ▪ Measures to avoid, minimise and if necessary, offset predicted impacts, including detailed contingency plans for managing any significant risks to the environment; and ▪ A health impact assessment of local and regional impacts associated with the development, including those health risks associated with relevant key issues.	Section 9 – Environmental Risk Assessment
The EIS must also be accompanied by a report from a qualified quantity surveyor providing: ▪ A detailed calculation of the capital investment value (CIV) (as defined in clause 3 of the Regulation) of the proposal, including details of all assumptions and components from which the CIV calculation is derived. ▪ An estimate of jobs that will be created during the construction and operational phases of the proposed development; and ▪ Certification that the information provided is accurate at the date of preparation.	A Capital Investment Value Statement is provided at **Appendix B**. A Social and Economic Analysis report is provided at **Appendix AA** which summary of jobs that will be created by the development.

Description / Requirement	Reference
KEY ISSUES	
Environmental Planning Instruments, Policies and Guidelines ▪ State Environmental Planning Policy (State and Regional Development) 2011 ▪ State Environmental Planning Policy (Infrastructure) 2007 ▪ State Environmental Planning Policy No. 55 – Remediation of Land ▪ State Environmental Planning Policy No. 64 – Advertising and Signage ▪ State Environmental Planning Policy No. 65 – Design Quality of Residential and Apartment Design Guide (SEPP 65) ▪ State Environmental Planning Policy (Affordable Rental Housing) ▪ State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 ▪ State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017 ▪ Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 ▪ State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 ▪ Draft State Environmental Planning Policy (Environment) ▪ Draft State Environmental Planning Policy (Remediation of Land) ▪ Sydney Local Environmental Plan 2012 Any exhibited Planning Proposal or draft State Environmental Planning Policy related to the land.	Section 6 – Statutory Planning Context
The EIS shall address the provisions, goals and objectives of the following policies: ▪ NSW State and Premier Priorities ▪ A Metropolis of Three Cities – The Greater Sydney Region Plan 2018 ▪ Eastern City District Plan 2018 ▪ Future Transport 2056 Strategy ▪ State Infrastructure Strategy 2018-2038 ▪ Sustainable Sydney 2030 ▪ Development Near Rail Corridors and Busy Roads – Interim Guideline	Section 5 – Strategic Planning Context

Description / Requirement	Reference
▪ Guide to Traffic Generating Development, Roads and Maritime Services ▪ Heritage Council Guidelines ▪ Better Placed – An Integrated Design Policy for The Built Environment of New South Wales ▪ Child Care Planning Guidelines 2017 ▪ City of Sydney Development Contributions Plan 2015 ▪ City of Sydney Local Strategic Planning Statement ▪ Waterloo Metro Quarter Design and Amenity Guideline and Design Excellence Strategy	
2. Consistency with the Concept DA Demonstrate the proposal is consistent with the Concept DA and provide details of consistency with any modification(s) to the Concept DA 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.	Refer to Section 2.3 and Table 2 which demonstrates the proposal's consistency with the concept DA. Construction staging for the Central Precinct is discussed in the Construction Environmental Management Plan attached at **Appendix Q,** and is discussed in Section 4.9.2.
3. Land Use and Gross Floor Area Address the site specific SLEP 2012 provisions (under Part 6, Division 5) in relation to land use mix and floor space requirements. Include a table and plans identifying the proposed GFA, floor space ratio and land uses, including a floor-by-floor breakdown of gross floor area (GFA) and the overall residential GFA and non-residential GFA split proposed for the southern precinct. Include details of the proposed uses and/or operational details for the development, including but not limited to fit-out and operational details and preliminary operational management plan.	SLEP 2012 is addressed in Section 6.15. GFA, floor space ratio, land use and floor by floor break down is summarised in Table 4. Proposed uses and/or operational detail is disused in Section 4.5.
4. Design Excellence and Built Form Demonstrate compliance with the endorsed Design Excellence Strategy and submit a Design Integrity Report in accordance with the requirements of the Concept DA or as amended. Demonstrate compliance with the endorsed Design and Amenity Guidelines, dated March 2020 or any subsequent endorsed revision of the guidelines. Ensure that the podium building envelopes, as identified by the Concept DA, must be used for non-residential uses only.	Refer to Design Integrity Report attached at **Appendix Y.** Compliance with Design and Amenity Guidelines is discussed in Section 6.16. The podium component of the building is provided for a childcare centre.

Description / Requirement	Reference
5. Integration with Sydney Metro Station Infrastructure Identify the extent of the proposal that is State Significant Development (SSD) and how this relates to the approved Critical State Significant Infrastructure (CSSI) applications and any modifications to the CSSI. Address how the development supports the design objectives, principles and standards of the Station Design Precinct Plan and Interchange Access Plan under the CSSI. Show how the SSD will integrate with the CSSI infrastructure such as structural design, detailed architectural approach, access, wayfinding, public domain works and construction management.	Refer to Section 4.3.
6. Visual and Amenity Impacts Provide a detailed visual / view impact analysis of the proposed building when viewed from the public domain and key vantage points surrounding the site. This is to include a written description of the existing view, the likely impact and justification of the proposal and any required mitigation measures. The view locations and methodology for the analysis must be prepared in consultation with the Department and Council. Provide a visual impact assessment of the proposed buildings as viewed by a pedestrian from the future Cope Street Plaza and the surrounding public domain surrounding the site. Provide a solar access and overshadowing analysis, comparing the overshadowing impacts of the proposal to the existing situation and the approved envelopes having regard to the impact of the proposal on solar access to Alexandria Park and Alexandria Heritage Conservation Area. This shall include a statement on the benefits and issues of any alternative design options that was considered with respect to shadow impacts to Alexandria Park. Provide a reflectivity analysis demonstrating that external treatments, materials and finishes of the development do not cause adverse or excessive glare. Include a wind assessment, identifying the impact of the proposal on surrounding wind conditions having regard to the wind study criteria under the Concept DA and providing any required measures to ameliorate wind impacts at podium level, street level and at the locations of existing and future pedestrian crossings.	Refer to view impact assessment at **Appendix II** and Section 8.6. Refer to Solar Access Report attached at **Appendix NN** and discussed in Section 8.4.1. Refer to Overshadow Assessment attached at **Appendix LL** and discussed in Section 8.4.2. Refer to reflectivity analysis at **Appendix GG** and Section 8.15. Refer to wind assessment at **Appendix KK** and Section 8.6.
7. Heritage Include a detailed heritage impact statement (HIS) that identifies, considers and addresses any potential impact of the proposal to surrounding heritage items, including any built and landscape items, conservation areas, heritage views and settings, having particular	Refer to HIS at **Appendix H** and Section 8.2. Refer to Heritage Interpretation Strategy at **Appendix DD** and Section 8.2.

Description / Requirement	Reference
regard to the impact of the proposal on adjoining Waterloo Congregational Church and the and Cauliflower Hotel. Include a Heritage Interpretation Strategy, providing opportunities for the proposal to reflect on the heritage character and significance of the site and surrounding area. Demonstrate how the impacts are mitigated through selection of external materials and finishes, façade design and treatment, public domain design and landscaping, signage and public art strategy. Consider any archaeological impacts. Consider the extent of Aboriginal heritage impacts of the proposal on the site.	
8. Ecologically Sustainable Development (ESD) Detail how ESD principles (as defined in clause 7(4) Schedule 2 of the EP&A Regulation 2000) will be incorporated in the design, construction and operation of the development. Include a framework (or demonstrate consistency with an approved framework) for how the proposed development will reflect national best practice sustainable building principles to improve environmental performance, including energy and water efficient design and technology, use of renewable energy and best practice in waste management strategy including any opportunity for food scraps/composting strategies. Demonstrate sufficient waste and recycling management facilities storage and holding areas for servicing.	Refer to ESD Statement at **Appendix M** and Section 8.5.
9. Traffic, Parking and Access (Construction and Operation) The EIS shall include a traffic, parking and access assessment that provides, but is not limited to, the following: ▪ Details on the current and likely estimated future mode share for the various land uses (workers, visitors, etc) accessing the proposed development. ▪ Details of the current and likely estimated future daily and peak hour vehicle, public transport, point to point transport, pedestrian and bicycle movements to/from the site, including an indication of whether it relates to the station or OSD, and any associated impacts. ▪ Measures to mitigate impacts of the proposed development on the operation of existing and future traffic, public transport, pedestrian and bicycle networks, including any required upgrades. ▪ Justification for the car parking provision with measures to encourage users of the development to make sustainable travel choices, including a green travel plan, walking, cycling, public	Traffic, parking and access is discussed in Section 8.10. Traffic and parking impact assessment is provided at **Appendix I**. Draft Construction Pedestrian and Traffic Management Plan is provided at **Appendix J.**

Description / Requirement	Reference
transport and car sharing, adequate provision of bicycle parking and end of trip facilities and the minimisation of private car trips. ▪ Modelling and analysis of pedestrian and cyclist access to the proposed development in consultation with TfNSW, taking into account the existing and planned Sydney Bike Network. ▪ An assessment and details of proposed service vehicle access arrangements, including service vehicle parking, a draft Freight and Servicing Management Plan detailing loading dock and servicing provision, adequacy and management with consideration of precinct wide shared loading docks and/or remote or off-site loading zone hub facilities, ensuring all servicing and loading occurs on-site and does not rely on kerbside controls. ▪ Detailed queuing analysis to show that vehicles would not queue onto Botany Road from the loading dock. ▪ Details of measures to segregate hostile vehicles from public transport users and areas of people congregation. ▪ Demonstrate how pedestrian safety and amenity will be provided along Raglan Street, the shared laneway located between Raglan Street and Cope Street plaza will be designed to prioritise pedestrian movements, including any measures to protect pedestrians entering and exiting the building and retail outlets. ▪ A draft Construction Pedestrian and Traffic Management Plan to demonstrate the proposed management of impact. This Plan needs to include works zone location, vehicle routes, number of trucks, hours of operation, indicative construction program, access arrangements and traffic control measures for all demolition/construction activities.	
10. Noise and Vibration Impacts (Construction and Operation) 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. 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. The noise and vibration impact assessment shall have regard to the recommendations of the Concept Acoustic Assessment Report, SLR consulting dated 9 November 2019.	Refer to noise and vibration impact assessment (operation and construction) at **Appendix K** and Section 8.7.
11. Construction Impacts	Refer to Construction Environmental Management

Description / Requirement	Reference
The EIS shall include a Construction Environmental Management Plan, developed in consultation with TfNSW and Council, providing: 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. 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.	Plan at **Appendix Q** and Section 8.11.
12. Prescribed airspace for Sydney Airport The EIS shall identify any impacts of the proposal on the prescribed airspace for Sydney Airport.	Approval has been granted by the Department of Infrastructure, Regional Development and Cities as part of the Concept DA, for the controlled activity and intrusion into prescribed airspace for Sydney Airport to a maximum height of 116.9 metres AHD (approved attached at Appendix DD). The approved penetration of prescribed airspace is up to 55.9 metres. The proposed development has a maximum height of RL 98.46 (81.88m) measured to the top of the roof plant and PV zone. At a maximum height of RL 98.46 AHD, the proposed development penetrates the Obstacle Limitation Surface by approximately 37.56m, which is below the approved maximum intrusion height. The Central Building is below the approved airspace height and would not contribute any measurable adverse effect to the safety, regularity or efficiency of air traffic to and from Sydney Airport and or in the foreseeable future.

Description / Requirement	Reference
13. Public Benefits, Contributions and/or Voluntary Planning Agreement Public Benefits The EIS shall identify the provision of public benefit, services and contributions that will be delivered as part of the proposal in consultation with key stakeholders, such as the Department, Council and TfNSW, and address voluntary planning agreement (**VPA**) or other legally binding instrument agreed between a relevant public authority and the Applicant.	Development contribution in accordance with Sydney Council Contribution Plan is discussed in Section 5.12.
14. Utilities Identify and address the existing capacity to service the development proposed and any augmentation requirements for utilities in consultation with relevant agencies. Identify any potential impacts of the proposed construction and operation on the existing utility infrastructure and service provider assets, and demonstrate how these will be protected, or impacts mitigated.	Utilities is discussed in Section 8.13. Utilities report is provided at **Appendix T**.
15. Contamination and Remediation Address the provisions of SEPP 55. Demonstrate the suitability of the site for the proposed use having regard to contamination and remediation	Refer to Section 6.5.
16. Stormwater and Flood Impact Include an assessment of flood impact having regard to the requirements of Sydney LEP 2012 and the recommendations of the Concept Water Quality, Flooding and Stormwater Report dated 31 August 2018. Include a stormwater management strategy that considers the relevant local council stormwater management policy, including details of onsite stormwater capture, storage and re-use measures developed for the site.	Refer to Flood Impact Assessment at **Appendix O** and Section 8.14.
17. Biodiversity The EIS shall provide an assessment of the proposal's biodiversity impacts in accordance with Section 7.9 the Biodiversity Conservation Act 2016, the Biodiversity Assessment Method and document the findings in a Biodiversity Development Assessment Report (BDAR) where required under the Act.	A request seeking a waiver for the requirement for a BDAR was submitted to the NSW DPIE on 9 July 2020. The NSW DPIE granted a waiver on 28 July 2020 under Clause 7.9(2) of the BC Act, concluding that: The proposed development is not likely to have any significant impacts on biodiversity value. Therefore, a waiver under

Description / Requirement	Reference
	section 7.9(2) of the BC Act is granted for the proposed development at the Waterloo Metro Quarter site and a BDAR is not required to accompany the associated SSD applications. Overall, the proposal will not have any likely impact on the surrounding natural environment and abundance of species, habitat connectivity, threatened species movement and flight paths of protected animals, nor will it impact upon water quality surrounding the site (sustainability) and the site does not contain abundant vegetation. BDAR wavier is attached at **Appendix V.**
18. Pre-submission Consultation Statement The EIS shall include a report describing pre-submission consultation undertaken, including a record of the stakeholders consulted, the issues raised during the consultation and how the proposal responds to those issues. The statement must include evidence of consultation with the adjoining Waterloo Congregational Church on the following matters (but not limited to) car parking during large church events (funerals and weddings), waste servicing, building maintenance, design of the public domain around the curtilage of the church and design of the setback zones and edge interfaces so as to promote passive surveillance.	Refer to Consultation Report at **Appendix U** and Section 7.
Plans and Documents The EIS must include the following: site title diagrams and survey plan, showing existing levels, location and height of existing and adjacent structures/buildings	Refer to **Appendix C**
site analysis plan	Refer to **Appendix D**
schedule of proposed gross floor area per land use	Refer to **Appendix D**
social and economic analysis (including social needs, employment and retail studies)	Refer to **Appendix AA**

Description / Requirement	Reference
building envelopes showing the relationship with proposed and existing buildings in the locality	Refer to **Appendix D**
architectural and urban design statement, including illustrations and justification	Refer to **Appendix E**
showing how the buildings will relate the station entrances and enhance the surrounding public domains	Refer to **Appendix D**
visual and view impact analysis and photomontages	Refer to **Appendix HH**
design guidelines and design excellence strategy	Refer to **Appendix G**
staging plan and any associated activation and infrastructure delivery strategy	Refer to **Appendix Q**
solar access analysis report and diagrams: View from the sun diagrams are to be provided between 9am and 3pm during the winter solstice at 15minute intervals.	Refer to **Appendix NN**
wind impact assessment	Refer to **Appendix KK**
flood assessment/storm water management plan	Refer to **Appendix O**
public domain plans defining extent of works (if any proposed)	Refer to **Appendix JJ**
Landscape design statement and plans	Refer to **Appendix JJ** and **Appendix II**
heritage impact assessment	Refer to **Appendix H**
heritage interpretation strategy	Refer to **Appendix CC**
transport, traffic and parking assessment	Refer to **Appendix I**
construction traffic and pedestrian management plan	Refer to **Appendix J**
noise and vibration impact assessment	Refer to **Appendix K**
air quality management plan	Refer to **Appendix W**
access/DDA impact statement	Refer to **Appendix S**
flood impact assessment/storm water management strategy including any geotechnical assessment	Refer to **Appendix O**
physical and 3D digital model (generally in accordance with City of Sydney Council requirements)	Model will be submitted separately.
services and utilities infrastructure report	Refer to **Appendix T**
ESD statement (incorporating a sustainability framework)	Refer to **Appendix M**
tree removal plan and arborist report (where relevant)	N/A

Description / Requirement	Reference
	No trees are removed as part of this SSDA.
contamination and remediation report (including any site audits, soil specification where relevant)	Remediation works for the site have been undertaken as part of the CSSI approval to make the site suitable for a metro station. It is noted that the Central Precinct is built over the Basement, which is the subject of a separate detailed SSDA (SSD-10438) and has been submitted concurrently with this application that addresses any contamination and remediation requirements for the Central Precinct.
waste management plan	Refer to **Appendix L**
archaeological statement	Refer to **Appendix H**
reflectivity statement	Refer to **Appendix GG**
signage details (if proposed)	Refer to **Appendix D**
public art strategy	Refer to **Appendix MM**
operational noise and vibration report	Refer to **Appendix K**
CPTED assessment	Refer to **Appendix N**
construction management statement addressing how future stages will manage impacts to pedestrians, rail uses, bus services and taxis	Refer to **Appendix Q**
acoustic impact assessment	Refer to **Appendix K**
pre-submission consultation report	Refer to **Appendix U**
Consultation During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with: ▪ Transport for NSW ▪ Sydney Trains ▪ Sydney Metro	Refer to Consultation Report at **Appendix U** and Section 7.

Description / Requirement	Reference
▪ Transport Coordination Office within Transport for NSW ▪ Surrounding residents and businesses including the Waterloo Congregational Church ▪ Relevant community groups ▪ Relevant special interest or recreational groups The EIS must describe the consultation process and the issues raised and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.	

2. BACKGROUND

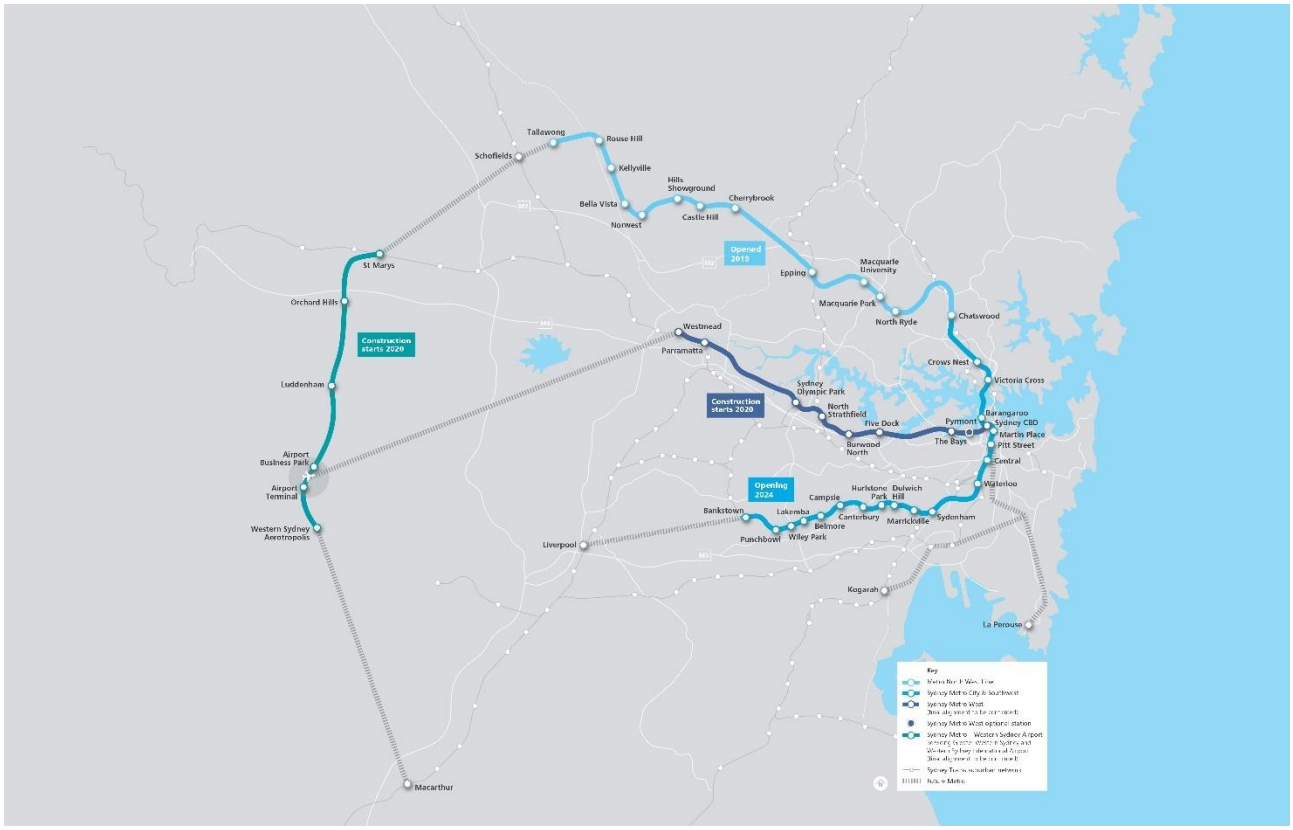
2.1. SYDNEY METRO

Sydney Metro is Australia's biggest public transport project. In 2024, Sydney will have 31 metro railway stations and a 66km standalone metro railway system – the biggest urban rail project in Australian history. The Sydney Metro project is illustrated in Figure 4 below.

Services commenced in May 2019 in the city's north west with a train every four minutes in the peak. Sydney Metro will be extended into the CBD and beyond to Bankstown in 2024. There will be new metro railway stations underground at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street, Waterloo and new metro platforms under Central.

On 9 January 2017, the Minister for Planning approved the Sydney Metro City & Southwest - Chatswood to Sydenham project as a critical State significant infrastructure project (reference SSI 15_7400) (**CSSI approval**). The terms of the CSSI approval includes all works required to construct the Sydney Metro Waterloo Station, including the demolition of existing buildings and structures. The CSSI approval also includes construction of below and above ground structures associated with the metro station and structures required to facilitate the construction of over station development (**OSD**).

Figure 4 Sydney Metro Alignment Map



Source: Sydney Metro

2.2. CSSI APPROVAL – CSSI 7400

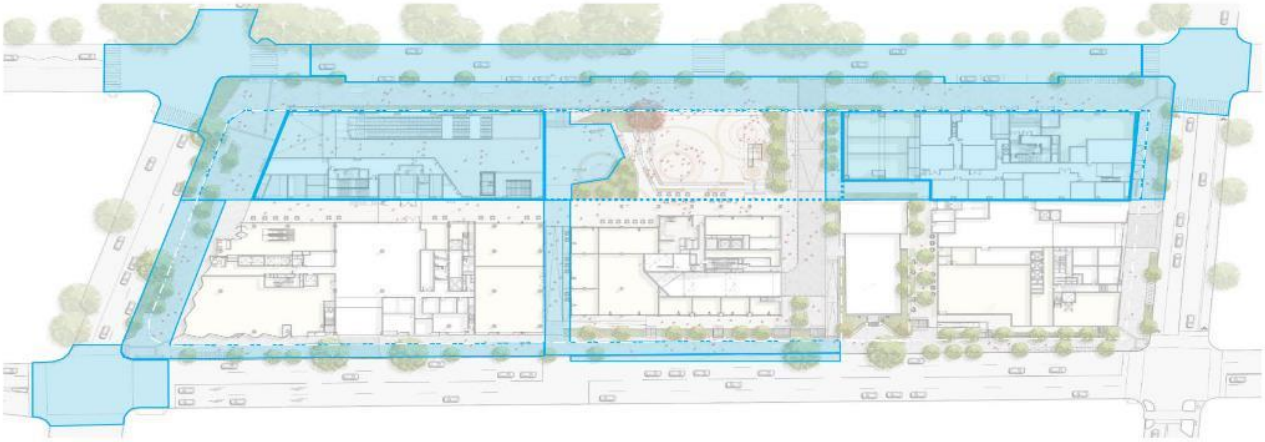
The CSSI approval (CSSI 7400), as it relates to the Waterloo metro station, includes:

- Demolition of existing development including vegetation removal.
- Excavation and remediation of the station box site undertaken in line with a Remediation Action Plan and Earthworks Management Plan.
- Design and construction of station box above existing ground level up to RL 33.1, including primary station works, structural works (base build), retail/commercial tenancies, structural and service provision for the OSD (e.g. structure, lift cores and mechanical services).

- Design and construction of station services box above existing ground level up to RL 35.1, including primary station works, structural works (base build), retail/commercial tenancies, structural and service provision for the OSD (e.g. structure, lift cores and mechanical services).
- Station structure including the concourse and platforms.
- Retail spaces within the station building.
- Public domain improvements, including the through site link from metro to bus stop adjacent to Building 2 (physical connection excluding awnings).
- Access arrangements including vertical transport such as escalators and lifts.
- Structural and service elements and relevant space provisioning necessary for constructing OSD, such as columns and beams, space for lift cores, plant rooms, access, parking, retail and building services.

In addition to the two station boxes themselves, a significant component of the public domain improvements to be delivered on and adjacent to the Waterloo Metro Quarter site will be delivered under the scope of the CSSI approval where this work is required to service the functionality of the metro station itself. This is clearly illustrated in the following figure. The remaining public domain works will be delivered under the terms of the relevant detailed SSDA for that precinct.

Figure 5 Scope of public domain and ground plane works to be completed under the CSSI approval



Source: Applicant

The CSSI Approval included Indicative Interface Drawings for the below and above ground works at Waterloo metro station – South. Section 2.3 of the Preferred Infrastructure Report (**PIR**) noted that the integration of the OSD elements and the metro station elements would be subject to the design resolution process, noting that the detailed design may vary from the concept design assessed within the planning approval.

Condition E101 of that approval requires that detailed Station Design & Precinct Plans to be coordinated and approved by the Secretary of the Department prior to the construction of above ground works.

2.3. CONCEPT DA – SSD 9393

Development consent was granted on 10 December 2019 for the Concept Development Application (SSD 9393) for Waterloo Over Station Development including:

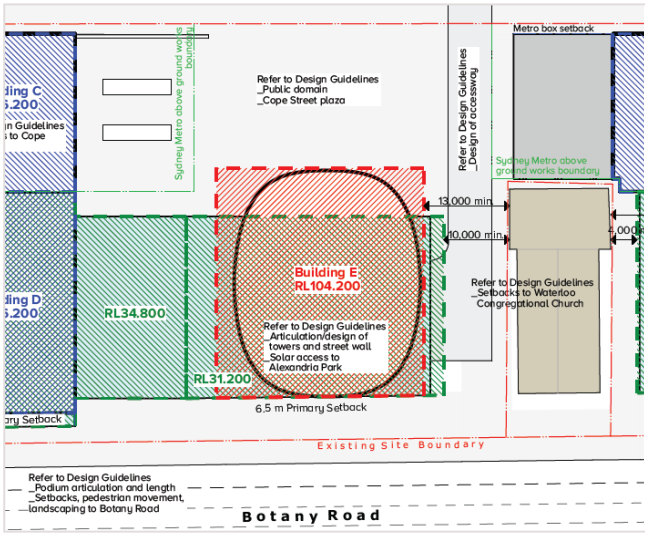
- A maximum building envelope for podium, mid-rise and tower buildings.
- A maximum gross floor area of 68,750sqm, excluding station floor space.
- Conceptual land use for non-residential and residential floor space.
- Minimum 12,000sqm of non-residential gross floor area including a minimum of 2,000sqm of community facilities.
- Minimum 5% residential gross floor area as affordable housing dwellings.

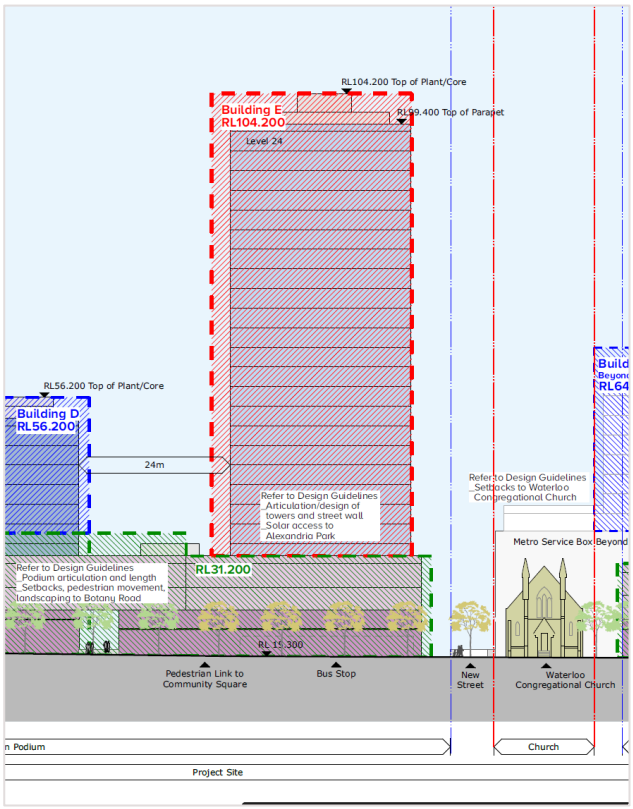
- 70 social housing dwellings.
- Basement car parking, motorcycle parking, bicycle parking, and service vehicle spaces.

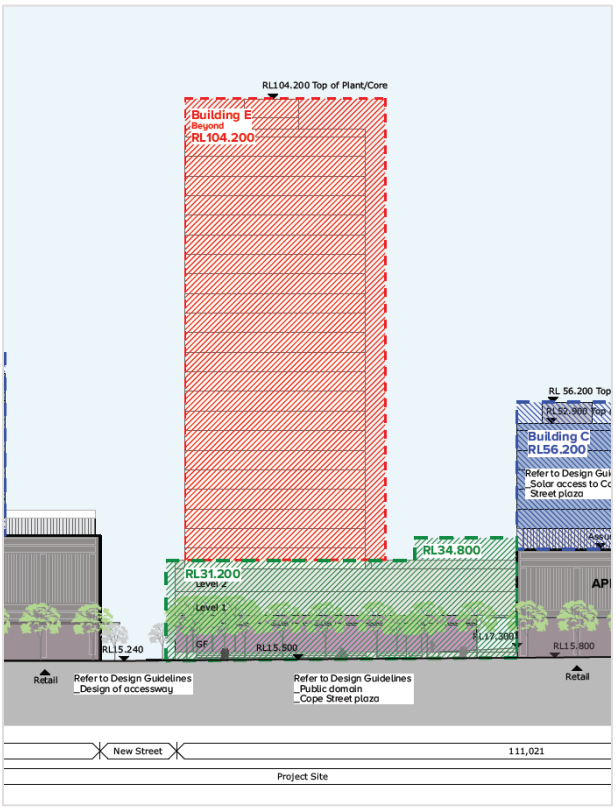
The Concept SSDA instrument of approval does not consent to any physical works commencing on site. Separate detailed SSDAs will be prepared concurrently for southern precinct (Buildings 3 and 4 and Cope Street Plaza), central precinct (Building 2), and the basement car park.

The approved concept for the SSDA building envelope in relation to this DA (as modified by Condition B7) is shown in Figure 6.

Figure 6 Approved Concept SSDA Building Envelope – Central Building (building E)







Botany Road Elevation
Source: Turner

Cope Street Elevation

The Development Consent for application SSD 9393 issued on 10 December 2019 included two components. 'Part A' related to the terms of the consent, whilst 'Part B' included the conditions to be satisfied in future detailed development application(s).

Table 2 below outlines the conditions to be satisfied as identified under Part B of the Concept Development Consent and how they relate to and/or are addressed within this EIS as part of the Detailed SSDA.

Table 2 Concept DA SSD 9393 Conditions of Consent to be Satisfied

Condition / Requirement	Document Reference
MAXIMUM BUILDING ENVELOPES	
B1. Future development applications must demonstrate that the buildings are wholly contained within the building envelopes consistent with the plans listed in Condition A2, as modified by the conditions of this consent.	The Central Building is largely consistent with the approved Concept Envelope. As part of the ongoing design development, modification to the Concept DA is now required to accommodate the detailed design. An Amending DA has been lodged concurrently with this DA. Specifically for the Central Building; the Amending DA seeks approval to modify the podium design along the Cope Street Plaza / eastern façade. This detailed SSDA is consistent with the concept DA, as proposed to be modified. Envelope amendments are discussed in detail in Section 8.1.2. The submitted Architectural Plans (attached at **Appendix D**) also indicate approved Concept DA envelope and Concept DA envelope as amended.
B2. Building height and gross floor area is to be measured in accordance with the definitions under Sydney Local Environmental Plan 2012.	Building height and gross floor area have been measured in accordance with the definitions under Sydney Local Environmental Plan 2012. Floor area schedule are provided in the Architectural Plans attached at **Appendix D**.
B3. The maximum achievable gross floor area for the non-station related floor space is 68,750sqm and this amount will only be achieved subject to demonstration of: a) Being wholly contained within the approved building envelopes; b) Compliance with the conditions of this Concept DA; c) Demonstration of design excellence; d) Consistency with the Design Guidelines (as amended by Condition A14).	The proposed Central Precinct gross floor area (**GFA**) is 14,923.7sqm, which contributes to the total WMQ site wide non station related GFA of 68,750sqm. Therefore, is compliant with the total maximum achievable GFA. The GFA are: ▪ Wholly contained within the approved building envelopes as amended for the Central and Northern Precinct. ▪ Compliance with the conditions of this Concept DA; ▪ Demonstration of design excellence; ▪ Consistency with the Design Guidelines as shown in Table 13.
B4. The approved podium building envelopes, as identified with green shading in the approved plans in	The approved podium building envelopes as amended are used for retail and a Community Facility in the form of a childcare centre.

Condition / Requirement	Document Reference
Condition A2 must be used for non-residential uses only.	
BUILT FORM AND URBAN DESIGN	
B5. The detailed development applications shall address compliance with: a) The Design Guidelines as endorsed by the Planning Secretary pursuant to Condition A14; b) The Design Excellence Strategy as endorsed by the Planning Secretary pursuant to Condition A15 c) The conditions of this consent.	The detailed development applications address compliance with: ▪ The Design Guidelines as endorsed by the Planning Secretary as shown in Table 13; ▪ The Design Excellence Strategy as endorsed by the Planning Secretary as discussed in Section 8.1.1; and ▪ The conditions of this consent as discussed throughout this table.
B6. The following elements are not inconsistent with the consent proposal but are subject to further assessment with the relevant detailed development application: i) Conceptual land uses, except for the approved minimum non-residential GFA, community facilities GFA, affordable housing rate and number of social housing dwellings approved. ii) Indicative signage zones, following preparation of a Signage Strategy. iii) Subdivision.	The proposed land uses for the Central Precinct are: ▪ Retail ▪ Community Facilities to be used as a childcare centre ▪ Affordable housing ▪ Market residential apartments The scope of the detailed SSDA seeks consent for signage zones/locations for the proposed retail tenancies and site identification signs for residential and childcare lobby entries. The detailed design of the proposed signage will be subject to separate future development applications. Subdivision is further discussed in Section 4.10.
B7. Future development applications shall address the following: a) Botany Road setback of 6.5m is to be extended to the north as identified in Response to Submissions (Figure 10, Page 139). The extended setback is to be incorporated into revised Building Envelope Plans to the satisfaction of the Planning Secretary prior to the lodgement of any future development application. b) Submission of a Design Integrity Report to the satisfaction of the Planning Secretary that demonstrates how design excellence and design integrity will be achieved in accordance with:	The proposed Central Building is setback more than 6.5m from Botany Road. Design Integrity Report is attached at Appendix Y, and has been prepared in accordance with condition B7 (b) and (c).

Condition / Requirement	Document Reference
i) The design objectives of the Concept Development ii) Consistency with the approved Design Guidelines as amended by Condition A14. iii) The DEEP's Design Excellence Report. iv) The advice of the SDRP (or approved alternative under Condition A15). c) The Design Integrity Report (DIR) as required by Condition B7 must include a summary of feedback provided by the SDRP (or alternative approved in accordance with Condition A15) and responses by the Applicant to this advice. The DIR shall also include how the process will be implemented through to completion of the approved development.	
CAR PARKING AND BICYCLE PARKING	
B8. Future development applications shall reduce total car parking provision to reduce private car ownership and promote use of active and public transport. Future development applications must demonstrate compliance with: a) The maximum number of car spaces to be provided for all residential accommodation within the development is limited to 170 spaces, including residents' spaces and residential car share spaces but excluding visitor spaces and service vehicle spaces. b) The allocation of residential car parking spaces, up to the maximum of 170 spaces must not exceed the following rates: i) 0.1 space per studio dwelling ii) 0.3 parking spaces per 1 bedroom dwelling iii) 0.7 parking spaces per 2 bedroom dwelling iv) 1 parking space per 3 bedroom or more dwelling v) Residential car share parking rate of 1 space per 50 residential car parking spaces provided c) Non-residential car parking to be provided in accordance with the following: i) A maximum of 1 space for 435sqm of GFA for any commercial uses.	The maximum car parking spaces proposed to support the residential accommodation is 75 spaces, 2 visitor spaces, and 4 car share spaces Refer to Section 8.10 for the breakdown of car parking spaces allocated to the various land uses proposed within the Waterloo Metro Quarter.

Condition / Requirement	Document Reference
ii) A maximum of 2 spaces for use of the Waterloo Congregational Church. iii) Non-residential car share parking at rate of 1 space per 30 non-residential car parking spaces.	
B9 Future development applications must include a Car Parking Strategy and Management Plan adopting the maximum residential parking cap and allocation rates above and demonstrating compliance with the following: a) Accessible car parking spaces provided as per Sydney DCP 2012 rates b) Motorcycle parking spaces provided as per Sydney DCP 2012 rates	Car Parking Strategy and Management Plan is attached at **Appendix I**. A total of 11 adaptable/accessible car parking is proposed, which is a reduction of adaptable unit car bays. This reduction is in line with the proposed ratio of general car parking and number of apartments for the overall Central Precinct. The reduction of adaptable unit car bays is a reasonable proposition given the immediate proximity of the Metro station, and precedence of reduction of adaptable unit car bays for other approved residential projects at Barangaroo and Darling Square. This is further discussed in Section 8.16.1. Motorcycle parking spaces are provided as per Sydney DCP 2012 rates. This is further discussed in Section 8.10.
B10 Bicycle parking and end-of-trip facilities for the OSD shall be in accordance with the rates specified within the Sydney DCP 2012 for the final land use mix in the future development application.	Bicycle parking and end-of-trip facilities for the OSD are provided in accordance with the rates specified within the Sydney DCP 2012 as discussed in Section 8.10.
CONSULTATION WITH WATERLOO CONGREGATIONAL CHURCH	
B11. Future development applications must demonstrate consultation with the owners and operators of Waterloo Congregational Church and project responses. Consultation is to include consideration of: a) Potential for church gathering space b) Wedding and funeral cars c) Waste and servicing d) Building maintenance e) Design of the public domain around and within the Church property including safe access and passive surveillance in the setbacks.	Waterloo Congregational Church was consulted throughout the application preparation process. Consultation focused on: ▪ ensuring access for vehicles for weddings and funerals ▪ enabling continued operations throughout construction ▪ security given no fences are proposed ▪ managing changes in levels around the Church. The Church custodian and the proponent have agreed to meet regularly throughout planning and construction phase of the project.

Condition / Requirement	Document Reference
	Consultation is further discussed in Section 7 and Pre Submission Consultation Report is attached at **Appendix U**.
HERITAGE IMPACT ASSESSMENT	
B12. Future development applications for aboveground works shall include a detailed Heritage Impact Statement and a Heritage Interpretation Strategy for the proposed works prepared in consultation with the City of Sydney Council.	Heritage Impact Statement and a Heritage Interpretation Strategy have been prepared by Urbis and are attached at **Appendix H** and **Appendix CC** respectively. Both documents have been prepared in consultation with City of Sydney Council. Heritage impact is discussed in Section 8.2.
WIND IMPACT ASSESSMENT	
B13. Future development applications for above ground works shall be accompanied by a Wind Impact Assessment including computer modelling of detailed building form and demonstrating compliance with the criteria in Pedestrian Wind Environment Study by Windtech dated 26 September 2019. B14. The Wind Impact Assessment must consider the locations of existing and future pedestrian crossings and apply outstanding criteria zones to match the width of crossings and the waiting zones for crossings, including on the opposite side of streets.	A Wind Impact Assessment has been prepared by RWDI Anemos and is included at **Appendix KK**. The report considers the wind study criteria in Pedestrian Wind Environment Study by Windtech dated 26 September 2019 and identifies specific measures to ameliorate wind impacts at podium level, street level and at the locations of existing and future public domain areas. The assessment also considers existing and future pedestrian crossings, public sidewalks and elevated terrace areas. Wind impact is further discussed in Section 8.6.
TRAFFIC, ACCESS AND PARKING ASSESSMENT	
B15. Future development applications shall be accompanied by a Traffic and Transport Impact Assessment.	A Traffic Impact Assessment (TIA) has been prepared by ptc. and is included at **Appendix I**. Traffic impact is further discussed in Section 8.10.
B16. Future development applications shall include a Construction Traffic and Pedestrian Management Plan (CTMP) prepared in consultation with the Sydney Coordination Office and City of Sydney, and to the satisfaction of the relevant road authorities. The CTMP shall include, but not be limited to: a) Construction car parking strategy b) Haulage movement numbers/routes including contingency routes c) Detailed travel management strategy for construction vehicles including staff movements. d) Maintaining property accesses	The Preliminary Construction Pedestrian and Traffic Management Plan (CPTMP) prepared by ptc. is included at **Appendix J.** The CPTMP has been prepared in accordance with the criteria under condition B16. The Final CPTMP will address the following: ▪ Haulage contingency routes ▪ Detailed travel management strategy including staff parking measures ▪ Identify temporary closure of bus stop and management measures

Condition / Requirement	Document Reference
e) Maintaining bus operations including routes and bus stops f) Maintaining pedestrian and cyclist links / routes g) Independent road safety audits on construction related traffic measures h) Measures to account for any cumulative activities / work zones operating simultaneously.	▪ Assess the impact on cyclist links / routes - provide management measures to ensure safety of cyclist ▪ Independent road safety audits on construction related traffic measures ▪ Measures to account for any work zones operating simultaneously.
B17. Independent road safety audits are to be undertaken for all stages of further design development involving road operations and traffic issues and cognisant of all road users. Any issues identified by the audits will need to be closed out in consultation with Sydney Coordination Office, RMS and/or City of Sydney to the satisfaction of the relevant roads authorities.	Independent road safety audits will be conducted by a suitably qualified consultant when required for further design development involving road operations and traffic issues, cognisant of all road users.
ENVIRONMENTAL PERFORMANCE / ESD	
B18. Future development applications must demonstrate how the principles of ecologically sustainable development (ESD) have been incorporated into the design, construction and ongoing operation of the proposal. This shall include preparation and implementation of Environmental Sustainability Strategies that incorporate low-carbon, high efficiency targets aimed at reducing emissions, optimising use of water, reducing waste and optimising car parking provision to maximise sustainability and minimise environmental impacts. B19. The minimum performance targets for environmental performance are: a. Precinct overall: i) 6 star Green Star Communities Rating Tool ii) Endorsed under One Living Planet Framework b) Commercial/office uses i) 5 star Green Star Design and As-Built Rating Tool ii) 5.5 Star NABERS Energy iii) 4.5 Star NABERS Water iv) Gold Certification: Shell and Core under WELL Building Standard c) Residential Uses: i) 5 Star Green Star Design and As-Built Rating Tool	An Ecological Sustainable Design Report has been prepared by Cundall Johnston and Partners Pty Ltd and is included at **Appendix M.** The report demonstrates that the proposed development is committed to achieving the following ESD targets: ▪ 5 Star rating – Green Star Design and As-Built rating tool v1.3 ▪ BASIX Energy score of ≥30 ▪ BASIX Water score of >40 The WMQ will also obtain the following site-wide certifications: ▪ 6 star rating – Green Star Communities rating tool v1.1 ▪ One Planet Community – recognition by BioRegional Australia ESD objectives and initiates are further discussed in Section 8.5.

Condition / Requirement	Document Reference
ii) More than BASIX 40 Water iii) BASIX 30 Energy. **SECURITY AND CRIME ASSESSMENT**	
B20. Future development applications shall be accompanied by a Security and Crime Risk Assessment prepared in consultation with NSW Police having regard to Crime Prevention Through Environmental Design (CPTED) Principles and NSW Police publication "Safe Place: Vehicle Management: A comprehensive guide for owns, operators and designers." The future development is to have regard to the recommendations contained within the submission by NSW Police on the Concept SSD.	A Crime Prevention Through Environmental Design (CPTED) Report has been prepared by Connley Walker Pty Ltd (**Appendix N**) to address the potential for anti-social and criminal behaviour within the public domain footprint and throughout the Central Precinct detailed OSD design. The report also includes assessment and mitigating crime risks by applying CPTED principles. Consultation with South Sydney Police was conducted to gain an understanding of the operational context and specific security threats. CPTED is further discussed in section 8.18.
CONSTRUCTION IMPACT ASSESSMENT	
B21. Future development applications shall provide analysis and assessment of the impacts of construction works and include: a) Construction Traffic and Pedestrian Management Plan, as per Condition B9 b) Community Consultation and Engagement Plan (s) c) Noise and Vibration Impact Assessment d) Construction Waste Management Plan e) Air Quality Management Plan.	The Preliminary Construction Pedestrian and Traffic Management Plan (CPTMP) prepared by ptc. is included at **Appendix J.** Construction Management Plan attached at **Appendix Q** has addressed: ▪ Community Consultation and Engagement ▪ Construction waste management ▪ Air quality. Community Consultation and Engagement Plan, Construction Waste Management Plan and Air Quality Management Plan will be prepared prior to the commencement of construction – consultant to check wording. Construction impact is further discussed in Section 8.11.
B22. The plans above may be prepared as part of a Construction Environmental Management Plan prepared for the 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 & Southwest (CSSI 7400).	
NOISE AND VIRBATION ASSESSMENT	
B23. Future development applications shall be accompanied by a Noise and Vibration Impact Assessment that demonstrates the following requirements are met: a) vibration from construction activities does not exceed the vibration limits established in British	A Noise and Vibration Impact Assessment Report has been prepared by Stantec Pty Ltd and is included at **Appendix K.** The addresses the impacts of construction noise, operational noise, mechanical noise and vibration and the intrusion

Condition / Requirement	Document Reference
Standard 8S7385-2:1993 Excavation and measurement for vibration in buildings. A guide to damage levels from ground borne vibration. b) vibration testing is conducted before and during vibration generating activities that have the potential to impact on heritage items to identify minimum 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. 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.	of ambient noise such as traffic and future rail corridor noise, into and out of the development. The Noise and Vibration Impact Assessment Report has demonstrated that the proposal can comply with the vibration requirements under condition B23. Concrete vibrators are expected be used in close proximity to the Waterloo Congregational Church when pouring the Level 01 slab. Mitigation measures to ensure vibration generated on the structure of the Waterloo Congregational Church does not exceed the project vibration requirements are provided in Noise and Vibration Impact Assessment Report. Noise and vibration is further discussed in Section 8.7.
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.	The Noise and Vibration Assessment has provided a quantitative assessment of the main noise generating sources and activities during operation, including mitigating measures to ensure the amenity of future sensitive land uses on the site and neighbouring sites is protected during the operation of the development.
B25. The Noise and Vibration Assessment must address the conclusions and recommendations of the Concept Acoustic Assessment Report, SLR Consulting dated 9 November 2019.	The Noise and Vibration Assessment has addressed the conclusions and recommendations of the Concept Acoustic Assessment Report, SLR Consulting dated 9 November 2019.
FLOODING AND STORMWATER ASSESSMENT	
B26. Future development applications shall be accompanied by a Flood and Stormwater Impact Assessment. The Assessment must demonstrate the conclusions and recommendations of the Concept Water Quality, Flooding and Stormwater Report dated 31 October 2018 prepared by AECOM.	WSP have prepared a Stormwater Management Plan and Flood Impact Assessment and is attached at **Appendix O**, which considers the flood risks and sets out the stormwater management works associated with the detailed design of the Central Precinct. The assessment includes the consideration of the conclusions and recommendations of the Concept Water Quality, Flooding and Stormwater Report dated 31 October 2018 prepared by AECOM. Stormwater and flooding are further discussed in Section 8.14.
REFLECTIVITY ASSESSMENT	
B27. Future development applications for aboveground works shall include a Reflectivity	RWDI Anemos Ltd have prepared a Solar Reflectivity Report attached at **Appendix GG**, to

Condition / Requirement	Document Reference
Assessment demonstrating that external treatments, materials and finishes of the development do not cause adverse or excessive glare.	assess the potential for hazardous glare from the façade of the proposed OSD developments affecting motorists, pedestrians and occupants of neighbouring buildings. The report assesses the reflectivity of glazing from Southern, Central and Northern Precincts collectively. Reflectivity is further discussed in Section 8.15.
ARCHAROLOGICAL AND ABORIGINAL CULTURAL HERITAGE ASSESSMENT	
B28. Future development applications shall demonstrate the recommendations and mitigation measures of the following Sydney Metro City & Southwest (CSSI 7400) reports are to be incorporated during the construction of the SSD project: (a) Artefact 2016, Sydney Metro City & Southwest, Chatswood to Sydenham: Aboriginal Cultural Heritage Assessment (b) Artefact 2016, Sydney Metro City & Southwest, Chatswood to Sydenham: Aboriginal Heritage - Archaeological Assessment.	The recommendations and mitigation measures of the Artefact reports are to be adhered to during the construction phase of the SSD project.
B29. Future development applications shall include an Archaeological Research Design (ARD) and subsequent Archaeological Method Statement (AMS) or updated/amended CSSI ARD and AMS that clearly applies to the SSD scope of works, informed by the results of the archaeological works undertaken for the CSSI works. This may include consultation with the Registered Aboriginal Parties for the project and may include further field study. The AMS must: (a) provide an assessment of the findings of the eastern clearance works and reporting (i.e. the CSSI works) (b) identify any new research questions, if required (c) make recommendations for any revised archaeological mitigation measures, if required (d) provide an assessment of benefits of completing archaeological testing, clearance and salvage and/or make a recommendation, if appropriate, that these measures are not required.	The Waterloo Metro Quarter site has identified potential for relatively intact archaeological resources to be located on WMQ site. The Archaeological Method Statement prepared by AMBS Ecology & Heritage is attached at **Appendix H** provides an updated assessment of the significance of the archaeological site and potential remains to be located on WMQ site since the completion of archaeological investigation works completed under the CSSI Approval. The recommendations of the Archaeological Method Statement are to be adhered to under the CSSI approval for the completion of the Waterloo Metro Quarter site developments, including the Central Precinct.
AIRSPACE PROTECTION	

Condition / Requirement	Document Reference
B30. Future detailed development applications for aboveground works must comply with the following requirements: a) buildings must not exceed a maximum height of 116.9 metres AHO. This includes all lift over-runs, vents, chimneys, aerials, antennas, lightning rods, and roof top garden plantings, exhaust flues, etc. b) the tallest building at the site (proposed Building A at the northernmost extent of the site as indicated in the Aeronautical Impact Assessment V2.1 dated 1 November 2018) must be obstacle lit by medium intensity steady red lighting during hours of darkness at the highest point of the building. Obstacle lights are to be arranged to ensure the building can be observed in a 360 degree radius as per subsection 9.4.3 of the Manual of Standards Part 139-Aerodromes (MOS Part 139). Characteristics for medium intensity lights are stated in subsection 9.4.7 of MOS Part 13A. c) the Proponent must ensure that the obstacle lighting has a built-in alarm system that will provide remote monitoring to notify the person responsible for the maintenance of the building's obstacle lighting. The designated person must be available 24 hours per day, 7 days per week. Immediate action must be taken to repair the obstacle lighting and notify Sydney Airport of any outage. Contact details for the person responsible for the obstacle lighting must be provided to Sydney Airport prior to the completion of the building construction and kept up to date. d) the proponent must advise Airservices Australia at least 3 business days prior to the controlled activity commencing by emailing ifp@airservicesaustralia.com and quoting YSSY-CA-146. e) as soon as construction commences, the Proponent must complete the Vertical Obstacle Notification Form for tall structures and submit the completed form to AirServices Australia. f) separate approval must be sought under the Airports (Protection of Airspace) Regulations 1996 for any construction equipment (i.e. cranes) required to construct the building. Construction cranes may be required to operate at a height	Approval has been granted by the Department of Infrastructure, Regional Development and Cities as part of the Concept DA, for the controlled activity and intrusion into prescribed airspace for Sydney Airport to a maximum height of 116.9 metres AHD (approved attached at **Appendix DD**). The approved penetration of prescribed airspace is up to 55.9 metres. The proposed development has a maximum height of RL 98.46 (81.88m) measured to the top of the roof plant and PV zone. At a maximum height of RL 98.46 AHD, the proposed development penetrates the Obstacle Limitation Surface by approximately 37.56m, which is below the approved maximum intrusion height. The Central Building is below the approved airspace height and would not contribute any measurable adverse effect to the safety, regularity or efficiency of air traffic to and from Sydney Airport and or in the foreseeable future. This SSDA will continue to conform to the Airspace Approval Conditions imposed by the Department of Infrastructure, Regional Development and Cities and condition B30.

Condition / Requirement	Document Reference
significantly higher than that of the proposed controlled activity and consequently, may not be approved under the Regulations. Therefore, it is advisable that approval to operate construction equipment (i.e. cranes) be obtained prior to any commitment to construct.	
g) Within 7 days of completion of each building, the Proponent must provide the airfield design manager at Sydney Airport with a written report from a registered surveyor on the finished height of the building	

2.4. AMENDING CONCEPT DA (SSD-10441)

Following Sydney Metro's appointment of WL Developer Pty Ltd as the preferred partner to deliver the Waterloo Metro OSD, and ongoing design development, minor modifications to the Concept DA are now required to accommodate the detailed design.

An Amending DA has been lodged concurrently with this DA in accordance with Section 4.22 of the *Environmental Planning and Assessment Act 1979* (**EP&A Act**). It seeks approval to amend the building envelope and description of development for the Northern Precinct and the podium design of the Central Building approved under SSD 9393.

Specifically, the amending DA seeks to modify the approved building envelope for the Northern Precinct (previously comprising 'Building A', 'Building B', 'Building C' and 'Building D' under SSD 9393) and the Central Precinct (previously comprising 'Building 2') through:

- Increasing the maximum building height for the southern portion of the building envelope from RL56.2 to RL72.60.
- Removing the 'tower component' of the northern precinct, reducing the overall height of the tower envelope from RL116.9 to RL90.40, to enable the redistribution of floor space to commercial office floor plates.
- Amending the description of development to refer to a mid-rise (17-storey) commercial office building, comprising approximately 34,125sqm of commercial office floor space within the northern portion of the site, rather than a third residential tower.
- Minor amendment to the podium design of Building 2 along the cope street plaza eastern façade to accommodate increased community GFA.
- Condition amendments to enable balustrades, pergola, solar panels and the like to be located outside of the approved building envelope and provide clarity on minor design items.

This detailed SSDA is consistent with the concept DA, as proposed to be modified. The design rational for podium extension is further discussed in Section 8.1.2.

2.5. WATERLOO METRO QUARTER DESIGN EXCELLENCE STRATEGY

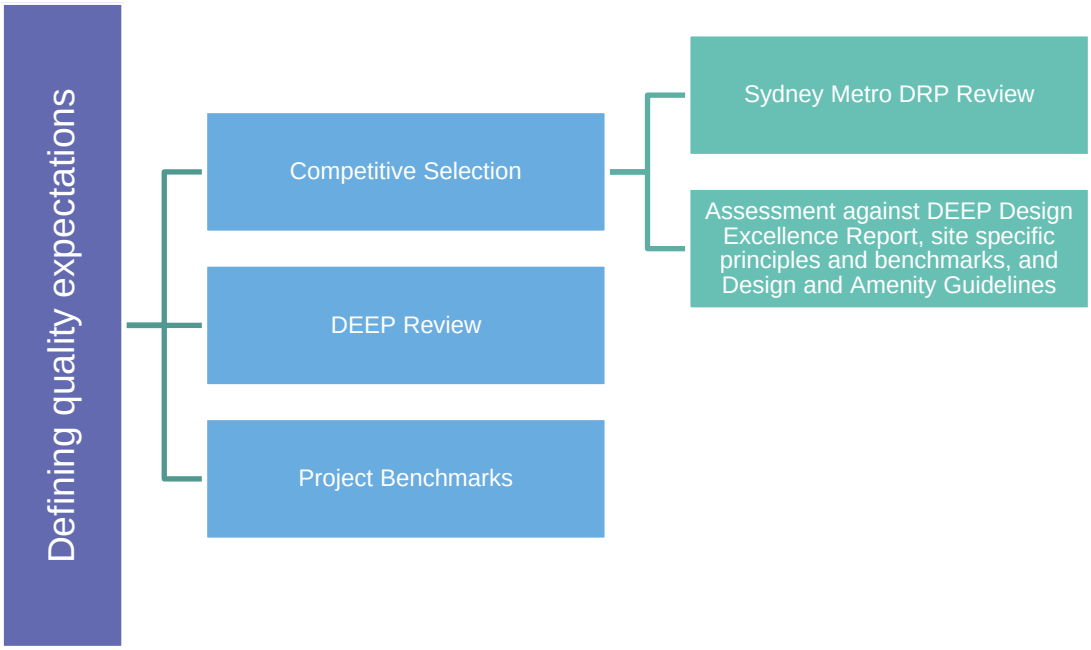
The Concept DA exercises the discretion available under clause 6.21(6) of *Sydney Local Environmental Plan 2012* (**SLEP**) to waive the requirement for a competitive design process under clause 6.21(5) as the concept design has been subject to the Sydney Metro Waterloo Design Excellence Strategy.

The Design Excellence Strategy and a set of specific Amenity and Design Guidelines for the Waterloo Station OSD were established to guide the detailed design of the future OSD and ensure a high quality of design is achieved for the site and other over station developments.

The endorsed Design Excellence Strategy is included at **Appendix G**. The Design Excellence Strategy comprises a multi-phase process including a competitive selection which involved an Expression of Interest

(**EOI**) and Request for Tender process, benchmarking studies and continued design review by a Design Excellence Evaluation Panel (**DEEP**) and subsequently the Sydney Metro Design Review Panel (**DRP**). A summary of the design excellence process undertaken is illustrated in Figure 7 below.

Figure 7 Summary of Design Excellence Process



A critical objective of the competitive tendering process was to review alternative approaches to the WMQ site and strive for design excellence for the OSD project. Following the approval of the Concept SSD Proposal and completion of the EOI and Request for Tender process, WL Developer Pty Ltd and its architect Woods Bagot and John McAslan & Partners were chosen as the successful development partner for the Sydney Metro Waterloo Station OSD.

The Design Excellence Strategy also requires DRP to review and provide feedback on the SSDAs prior to lodgement, including assessment against site specific principles, benchmarks, design guidelines and the DEEP report.

Since the selection of WL Developer Pty Ltd as the development partner for the Waterloo Station OSD, the applicant has presented to the Sydney Metro DRP 10 times. Throughout this process, the DRP has provided ongoing design review of the proposed Central Precinct proposal to ensure design excellence and integrity have been achieved.

The specific details of the consultation undertaken to achieve design excellence in accordance with the Design Excellence and Amenity and Design Guidelines are outlined at Section 6.16, with a detailed discussion of the proposal's design excellence included at Section 8.1.1.

3. SITE ANALYSIS

3.1. SITE CONTEXT AND LOCATION

The site is located within the City of Sydney Local Government Area (**LGA**). The site is situated approximately 3.3 kilometres south of Sydney CBD and 8 kilometres northeast of Sydney International Airport.

The WMQ comprises land to the west of Cope Street, east of Botany Road, south of Raglan Street and north of Wellington Street (refer to Figure 8). The WMQ is a rectangular shaped allotment with an overall area of approximately 1.287 hectares.

The WMQ site generally slopes to the south from the northern portion of the site (AHD 18m) to the southern portion of the Site (AHD 16m AHD). The surrounding area is also relatively flat.

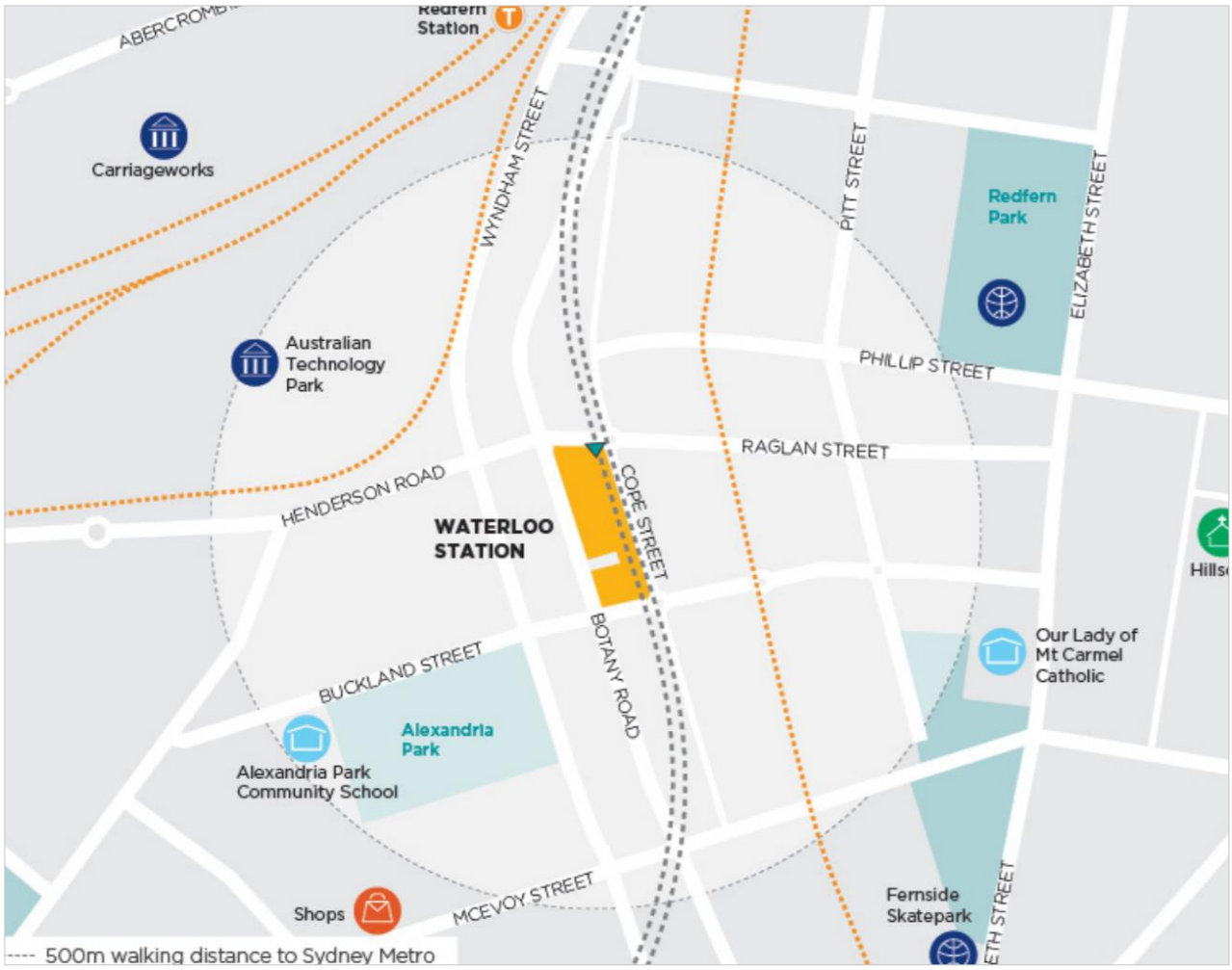
The heritage listed Waterloo Congregational Church located at 103–105 Botany Road is within this street block but is not part of the Sydney Metro Waterloo Quarter boundaries. The church directly adjoins the Southern Precinct, the subject of this SSDA.

The Central Precinct site (the **site**) is approximately 2,800sqm and has frontage to Botany Road to the west and is bounded by the Northern Precinct to the north, the Waterloo Congregational Church to the south, and Cope Street Plaza to the east.

Figure 8 Aerial of the Subject Site

Source: Urbis

Figure 9 Location Map of Subject Site



Source: Turner Studio

3.2. LEGAL DESCRIPTION

The WMQ comprises the following 16 allotments and as outlined within the Site Survey (refer to **Appendix C**).

- 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 site comprises the following allotments:

- 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)

3.3. EXISTING DEVELOPMENT

The site previously included three to five storeys 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 (below ground level) in accordance with Critical State Significant Infrastructure Approval CSSI 7400.

Figure 10 Photographs of existing site condition at Waterloo Metro Quarter site (dated 21 July 2020)

Source: Urbis

3.4. SURROUNDING DEVELOPMENT

The neighbourhoods adjoining the site are composed of a layered urban fabric, containing a mix of commercial, residential, civic uses and open space. An overview of surrounding development is provided below.

Waterloo Estate

Waterloo Estate located to the east of the site will be redeveloped over the next 15-20 years, and will seek to deliver a mix of social, affordable, and market housing.

The NSW Land and Housing Corporation has submitted a planning proposal to the City of Sydney requesting to redevelop the public and private lands in the southern part of the Waterloo Estate by changing the planning controls that currently apply to the precinct. This planning proposal is referred to as 'Waterloo South."

Waterloo Estate includes land bounded by Cope, Raglan, George, Wellington, Gibson, Kellick, Pitt and McEvoy streets, and has an approximate site area of 12.32 hectares (approximately 65% of the total estate). It currently comprises 749 social housing dwellings owned by the NSW Land and Housing Corporation, 125 privately owned dwellings, and some commercial properties on the south-east corner of Cope and Wellington streets.

With up to 3,000 new dwellings proposed, the redevelopment is sought to be delivered in a staged approach and is still the subject of a finalised master planning process. Waterloo Estate is set to see building heights of up to 30 storeys and will benefit from the delivery of improved public transport from the new metro station and the services provided within the Waterloo Metro Quarter OSD.

North

Immediately to the north of the site is the proposed Northern Precinct, which comprise commercial towers and the Metro Station box is located to the northeast of the site.

On the northern side of Raglan Street is a mix of one and two storey commercial buildings with ground floor retail. Further to the north is Redfern Station and Town Centre, which is characterised by a mix of residential, retail and student accommodation uses. Redfern Park is located approximately 500m north-east of the site and is a well-used recreational park with a grassy recreational outdoor space, sports fields, grandstand and children's playground.

East

Immediately to the east of the site is the Cope Street Plaza, which will be redeveloped as part of the Southern Precinct SSDA. On the east side of Cope Street is a mix of one and three storey residential flat buildings and attached dwellings.

Waterloo Estate located further to the east of the site will be redeveloped over the next 15-20 years, and will seek to deliver a mix of social, affordance and private housing. With up to 3,000 new dwellings proposed, the redevelopment is sought to be delivered in a staged approach and is still the subject of a finalised master planning process. The estate is set to see building heights of up to 30 storeys and will benefit from the delivery of improved public transport from the new metro station and the services provided within the Waterloo Metro Quarter OSD.

West

The site fronts Botany Road to the west. Beyond Botany Road to the west are two and three storey commercial and light industrial buildings, as well as a five-storey mixed use residential flat building. Council recently granted consent for an affordable housing development located at 74-88 Botany Road. The proposal includes ground floor retail fronting Botany Road.

Further to the west is the Alexandria Park Heritage Conservation Area (**HCA**). The HCA comprises a mix of late nineteenth-century houses including one to three storey terraces and cottages. The area also includes corner shop buildings, industrial and warehouse buildings. The Australian Technology Park is a business and technology centre in Eveleigh, located approximately 400m north-west of the site.

South

Immediately south of the site is a proposed shared way separating the site and the Waterloo Congregational Church to the south. To the south of the Waterloo Congregational Church is the proposed Southern Precinct,

which comprise social housing, student accommodation and community facilities. The Metro service box is located to the southeast of the site.

Land to the south of Wellington Street is characterised by a mix of low to mid rise industrial, commercial and residential buildings. Immediately to the south of the site on the opposite side of Wellington Street is the Cauliflower Hotel, a locally listed heritage item. Further to the south along Botany Road are a mix of residential apartments and row of terraces. Alexandria Park, a large area of public open space is located to the southwest of the site.

Green Square Station and Green Square Town Centre are located approximately 800m south of the site. The town centre comprises a mix of mid to high rise buildings containing retail, commercial, civic and residential uses. Existing surrounding buildings are shown in Figure 11 below.

Figure 11 Photographs of surrounding site context (dated 21 July 2020)

Picture 1 Raglan Street, north of the site, looking west.

Source: Urbis

Picture 2 Cope Street frontage, east of the site, looking north.

Source: Urbis

Picture 3 Waterloo Congregational Church immediately south of the Central Precinct

Source: Urbis

Picture 4 Developmets on the western side of Botany Road

Source: Urbis

3.5. BUILT HERITAGE

The site is not heritage listed or located within a heritage conservation area under the SLEP 2012. The site is located directly adjacent the Waterloo Congregational Church. The church is listed as a local heritage item. The site is also proximate to several local heritage items, as illustrated in Figure 12.

Local and state heritage items of particular significance to the proposal are detailed in Table 3.

Table 3 Heritage Items in Proximity to the Site

Item	Name and Address	Significance	Statement of Significance
I2069	Waterloo Congregational Church, 103-105 Botany Road	Local	*The Gothic church of rendered brick construction was constructed in 1883 to replace the congregation chapel built in 1865. The symmetrical design of the façade demonstrate high quality architectural traits of the building. It is one of the earliest worship venues in Waterloo.*
I2070	Cauliflower Hotel, 123 Botany Road	Local	*The Cauliflower Hotel is a good example of a mid-Victorian hotel in the Georgian style and was built in c1862 by George Rolfe who was a leaseholder and a market gardener. The hotel was under the ownership and operation by the Rolfe family until 1920s, and later by Tooheys and Tooth & Co. The name "Cauliflower Hotel" is associated with former market gardens on the site which were said to be used for cauliflower growing. The hotel has been continually licensed since its establishment. This Georgian style building and the unique cauliflower sign is the landmark on Botany Road.*
I5	Former CBC Bank, including Interior, 60 Botany Road	Local	It represents a good example of the Victorian Italianate style by prominent government architect Mansfield. It is a landmark building on a prominent corner site.
C3	Alexandria Park Heritage Conservation Area	Local	The Alexandria Park Conservation Area is significant for its ability to demonstrate the growth of the municipality of Alexandria in the second half of the nineteenth century and the first half of the twentieth century. The area developed in association with the industrial growth of Waterloo and the establishment of the Eveleigh Railway and Goods Yards, providing housing for workers. The housing stock reflects successive subdivisions of the Coopers freeholds and Park View Estate. The industrial development illustrates a later overlay reflecting the growing importance of the area as an industrial centre in the early twentieth century. Alexandria Park provides a focus for the community.

Potential impacts of the proposed development on the surrounding heritage items have been carefully considered in the detailed design of the proposal, to ensure the built form and heritage significance of these items continues to be respected.

Heritage assessment is discussed in further detail in Section 8.2 of this EIS and within the Heritage Impact Assessment in **Appendix H**.

Figure 12 Surrounding Heritage Items (WMQ is outlined in blue)

Source: Urbis / SLEP 2012

3.6. TRANSPORT AND ACCESSIBILITY

3.6.1. Public Transport

The site is well serviced by various forms of public transport, both existing and under construction.

Heavy Rail

The site is located approximately midway between Redfern Station (located approximately 650m north of the site) and Green Square Station (located approximately 900m south of the site).

Redfern Station currently services all Sydney Trains lines, excluding the T2 Airport Line, and some NSW Trainlink services. Green Square Station currently services the T2 Airport, Inner West and South Line. This line provides high frequency services between Macarthur and the City.

Waterloo Station will provide alternative access to the rail network, reducing pressure on Redfern and Green Square Station to accommodate residential and commercial growth in the area.

Bus

The site is located close to multiple bus stops operating the following State Transit bus services:

- Botany Road
  - Route 301, 302, 303 and 305 – Eastgardens to Redfern via Mascot, Eastgardens to Redfern via Kingsford, Sans Souci to Redfern via Mascot.
  - Route 309 – Central Station to Banksmeadow via Mascot.
- Raglan Street
  - Route 355 – Marrickville Metro to Bondi Junction via Moore Park and Erskineville.
- Henderson Street

– Route 308 – Redfern to Marrickville Metro via Eveleigh, Surry Hills and Erskineville.

Sydney Metro

The site is located directly above the future Waterloo metro station. Waterloo metro station is part of the NSW Government's Sydney Metro: City & Southwest transport project which is the second stage of the Sydney Metro project. The project will extend the Stage 1 Metro Line (Sydney Metro: Northwest) from Chatswood to Bankstown via Sydney CBD. Between Sydenham to Bankstown, the existing T3 line will be converted to metro standards.

Figure 13 Surrounding Public Transport and Cycle Routes Opportunities

Source: Sydney Metro.

3.6.2. Road Network

Arterial roads

The site is well connected by key regional roads. The site has a western frontage to Botany Road which is identified as a Classified State Road. Botany Road is a key corridor connecting the site to Sydney Airport. McEvoy Street and Henderson Road both run east-west, providing links between the inner west and the Sydney CBD or the eastern suburbs.

Cycleways

The site benefits from proximity to several dedicated cycleways. These include a combination of separate dedicated cycleways and bike lanes along Wellington Street and George Street. There is currently no dedicated cycleway along Botany Road given the high volumes of traffic along this road.

As part of the Alexandria to Moore Park Connectivity Upgrade, a shared path is proposed along the northern side of McEvoy Street west of George Street, continuing on the southern side of McEvoy Street east of George Street. Cyclists would be required to cross McEvoy Street at its intersection with George Street. If approved, the upgrade would facilitate east-west movements to and from the Waterloo Precinct.

Figure 14 Road network and cycling routes

Source: ptc.

3.6.3. Pedestrian Network

Pedestrians can access the site via dedicated footpaths on all street frontages. The surrounding street network comprises a grid pattern which facilitates high pedestrian permeability and activity. Due to the traffic volumes along Botany Road, east-west pedestrian movements from the site to adjoining neighbourhoods are limited.

The site is well located for residents to walk to Green Square Station and Redfern Station as well as various retail, community facilities and public spaces.

3.7. OPEN SPACE AND SPECIAL AREAS

The site is located in close proximity to the following public open space areas:

- **Raglan Street Basketball Courts** are located directly to the north of the site on the opposite side of Raglan Street.
- **Waterloo Park** is located approximately 280m south-east of the site. It comprises a playing field, skate park, basketball court and children's playground.
- **Alexandria Park** is located approximately 220m south-west of the site. It comprises a multipurpose sports field, tennis courts, a basketball court and children's playground. The playground is fenced and comprises equipment for children of all ages. Picnic shelters, bubblers and bike storage racks are also located within the park. An off-leash dog area is also located outside the oval, courts and playground.

- **Redfern Park** is located approximately 500m north-east of the site. It is a large, heritage listed park comprising a total of 4.8 hectares. It comprises an oval, grandstand and children's playground. Redfern Park underwent a refurbishment in 2007/08 which included upgrading of all paths, kerbs, lights and furniture and the restoration of the park's historic features.
- **Eveleigh Green** formerly known as the Vice Chancellor's Oval is an active recreational space that provides grassed lawn areas, playground equipment and sports courts. It adjoins Yerrabingin House which is a community building fitted with café, gym and public toilets.
- **Perry Park and Recreation Centre** – a new multi-purpose sports centre is proposed in Perry Park, Alexandria. The sports centre will comprise two indoor and two outdoor multi-purpose courts for sports such as netball, basketball and futsal.

The following recreation facilities is currently under construction and will be delivered in late 2020:

- **Gunyama Park Aquatic and Recreation Centre** – a new aquatic and recreation centre is proposed on Zetland Avenue, Zetland. It will be the largest pool built in Sydney since the 2000 Olympics. Outdoor recreational space will also be provided in the form of a playground, picnic facilities, a fitness training circuit and a 4,950sqm multipurpose sports field. The aquatic centre is due for completion in 2020.

3.8. PROXIMITY TO COMMUNITY SERVICES AND EDUCATION

The site is within walking distance to three community facilities and within 1km of 16 others. Community facilities located within walking distance include Alexandria Town Hall, Salvation Army Streetlevel and Counterpoints Factory Community Centre.

Carriageworks, The Aboriginal Dance Theatre Redfern and the Green Square Community and Cultural Precinct including Joynton Avenue Creative Centre, Banga Community Shed and Performing Arts Hub are all within 1km of the Waterloo Metro Quarter site.

There are two primary schools, four high schools and two combined primary and high schools within 1km of the site. This includes the Alexandria Park Community School, a combined primary and high school, which is currently being redeveloped to cater for 1,000 primary students and up to 1,200 secondary students.

There are 14 childcare facilities located within 1km of the site with a total number of 806 approved childcare places.

There are two health facilities located within walking distance to the site; Waterloo Medical Centre and Healthcare Family Medical Centre, and eight health facilities located within 1km of the site including the Redfern Community Health Centre and the Aboriginal Medical Service.

3.9. TOPOGRAPHY

The WMQ site generally slopes to the south from the northern portion of the WMQ site (AHD 18m) to the southern portion of the WMQ site (AHD 16m AHD). The WMQ site falls approximately towards the south with a high point on the northern edge along Raglan Street. The cross-fall on an east-west direction is of approximately 0.1m falling towards Botany Road. The Probable Maximum Flood level (PMF) across the WMQ site grades down from north to south along the edge of Botany Road.

The surrounding area is also relatively flat, partly due to the existing urbanised nature of the region and partly resulting from the natural state of the area.

3.10. UTILITIES AND INFRASTRUCTURE (SERVICES)

The site is located within an established urban area and currently contains all necessary services including electricity, gas, water, communications, drainage and sewerage. Furthermore, future development on the site can be connected to these services when required.

Section 8.13 provides a detailed discussion of the required utility and service infrastructure provisions associated with the detailed design and future use of the OSD.

4. PROPOSED DEVELOPMENT

4.1. DESCRIPTION OF THE PROPOSAL

The proposal seeks detailed development consent for the design, construction, and operation of a 23-storey (excluding plant level) mixed use building comprising:

- 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 wide amenities and shared basement carpark entry;
- Level 1 and Level 2 'Community Facility' (as defined in the SLEP) to be used 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 shared basement via a shared way from Cope Street, expanded footpaths on Botany Road and public domain upgrades;
- External licensed seating zone subject to a future approval;
- Signage zone locations;
- Utilities and service provision; and
- Stratum subdivision (staged).

The proposed building comprises a mix of activated retail and community facilities within the podium level. Affordable housing and market residential apartments are provided in the tower above with communal rooftop open space.

The proposal also includes a range of public domain works, including the delivery of Church Square. This open laneway provides a shared pedestrian and vehicular space and also provides substantial physical distancing between the Waterloo Congregational Church and the much larger buildings proposed to the north, including the Central Building. Additional public domain works includes landscaping along Botany Road frontage, integrating with the public domain improved approved under CSSI.

Parking for the Central Precinct will be provided within the shared basement below Northern and Central Precincts, as proposed under a separate Basement SSDA (SSD 10438) submitted concurrently with this SSDA. All excavation required for the basement are subject to the Basement SSDA, no excavation works are proposed for the Central Precinct.

The proposed design sits within the Concept approval SSD 9393 envelope for the tower element. The proposal breaches the envelope at ground and podium levels, extending towards the east of the site. This extension to the podium level reduces the tower cantilever over public space and allows for extra roof space and an eastern colonnade to create a better architectural interface with Cope Street Plaza. Envelope amendments are further disused in Section 8.1 of the EIS.

An Amending SSDA (SSD – 10441) has been lodged concurrently with this SSDA and it seeks to amend the podium design of the Central Building as approved under SSD 9393. This detailed DA is consistent with the concept DA, as proposed to be modified.

Figure 15 Photomontage of the proposed development

Source: Hassell

4.1.1. Numeric Overview

The key numerical aspects of the proposed detailed OSD design are summarised below in Table 4.

Table 4 Detailed SSDA Numerical Overview

Component	**Proposal**
Site area	2,800sqm
Proposed Use and OSD Gross Floor Area (**GFA**)	▪ Ground floor retail premises: 612.7sqm ▪ Ground floor community hub: 62sqm ▪ Community facility - Childcare Centre: 2,219.6sqm (including 40.5sqm of childcare lobby on the ground floor) ▪ Affordable Housing: 1,780.8sqm

Component	Proposal
	▪ Market Residential Apartments: 10,248.6sqm (including 58.2sqm of residential lobby on the ground floor, which is to be shared with affordable housing) Total GFA of detailed SSDA: 14,923.7sqm
Building Height	▪ RL 98.46 (81.88m) maximum height of building (including photovoltaic panels and rooftop plant) ▪ 24 storeys (including plant)
Unit Mix	▪ Affordable Housing: – 12 one-bedroom apartments (50%) – 12 two-bedroom apartments (50%) – Total: 24 apartments ▪ Market Residential Apartments: – 56 one-bedroom apartments (44%) – 64 two-bedroom apartments (51%) – 6 three-bedroom apartments (5%) – Total: 126 apartments
Setbacks (to glazing line)	**Ground:** ▪ 13m to the Church (southern setback) ▪ 6m o the Northern podium (northern setback) ▪ 6.8m to Botany Road boundary (eastern setback) ▪ Extending the Concept DA Envelope by 6.36m to the east to accommodate the colonnade. However, the glazing line of the building is generally consistent with the Concept DA. **Podium:** ▪ 10m to the Church (southern setback) ▪ 6m to the Northern podium (northern setback) ▪ 6.8m to Botany Road boundary (eastern setback) ▪ Extending the Concept DA Envelope by 6.36m to the east (Cope Street Plaza) **Tower:**

Component	Proposal
	▪ 13m to the Church (southern setback) ▪ 43m to the Southern Tower (southern setback) ▪ 24m to the Northern Commercial Tower (northern setback) ▪ 6.8m to Botany Road boundary (eastern setback)
Loading and Parking (Shared Basement subject to a separate SSDA SSD-10438)	▪ The Central Precinct is serviced by the shared loading dock on the ground floor of Northern Precinct, accessed off Botany Road. ▪ A total 55 (including 8 accessible) car parking spaces are proposed within the basement car park for residents of the market housing. ▪ A total of 12 (including 1 accessible) car parking spaces are proposed within the basement car park for residents of the affordable housing. ▪ 2 car parking spaces (both accessible) are provided for residential visitors within the basement car park. ▪ 1 long term car parking space for the childcare centre is provided within the basement car park. No car parking spaces are proposed for retail staff or visitors. ▪ 150 dedicated residential bicycle parking spaces are provided in the basement, including the provision bicycle storage cages. ▪ 16 residential visitor bicycle spaces are proposed within the public domain to support the Central Building. ▪ 6 retail and childcare staff bicycle parking spaces within the basement. ▪ 10 retail and childcare visitor bicycle parking spaces within the public domain.

4.2. LAND USE AND GROSS FLOOR AREA

The detailed SSDA seeks approval for the use of the proposed OSD, including retail premises, a community hub and community facilities in the form of a Community Childcare Centre within the podium level, affordable housing units on levels three to five, and market residential apartments on levels 6 to 22.

The Architectural Design Report at Appendix F includes a table which identifies the proposed land uses and a floor by floor breakdown of GFA and total GFA as required by the SEARs. A summary of the area schedule is provided below:

Table 5 Area Schedule

Land use/level	GFA
Ground – Retail (including community hub), community childcare centre lobby and residential lobby	773.4sqm
Level 1 - Community Childcare Centre	1,312.9sqm
Level 2 - Community Childcare Centre	866.2sqm
Levels 3 to 5 – Affordable Housing	1,780.8sqm (593.6sqm per level)
Levels 6 to 19 – Market Residential Apartments	8,584.8sqm (613.2sqm per level)
Levels 20 to 21 - Market Residential Apartments	1,250.6sqm (625.3sqm per level)
Level 22 – Market Residential Apartments	355sqm
Total GFA	14,923.7sqm

4.3. RELATIONSHIP BETWEEN OSD (SSD) AND STATION (CSSI) COMPONENTS

Condition A4 of the CSSI Approval states that:

> *"Except to the extent described in the EIS or any document listed in A1, any over station development or any development above or within the Sydney Metro Trains Facility South, including associated future uses, does not form part of this CSSI and would be subject to the relevant assessment pathway prescribed by the EP&A Act."*

Accordingly, the detailed SSDA seeks approval for integration of the proposed OSD building structure above the transfer slab level (including structures, services, lift cores etc.) on land central to the northern and southern metro station boxes.

This includes the use of retail tenancies, public domain works and landscaping, residential facilities and services, loading facilities, and access to services provisions. The construction of the actual 'Sydney Metro box' is provided under the CSSI approval and does not form part of this detailed SSDA.

4.3.1. Interface Areas

The SSDA Architectural Drawings (**Appendix D**) and Architectural Design Report (**Appendix F**) prepared by Hassell further delineate the integrated elements of the detailed SSDA and CSSI with extensive illustrative references. Effectively, this detailed SSDA seeks consent for the detailed design, construction and use of the OSD tower, as well as the use of OSD areas within the CSSI 'Sydney Metro box' as outlined below:

CSSI Approval (not the subject of this EIS):

- Demolition of existing development.
- Excavation and remediation of the station box site undertaken in line with a Remediation Action Plan and Earthworks Management Plan.
- Design and construction of station box including primary station works, structural works (base build), retail/commercial tenancies, structural and service provision for the OSD (e.g. structure, lift cores and mechanical services).
- Design and construction of station services box, including primary station works, structural works (base build), retail/commercial tenancies, structural and service provision for the OSD (e.g. structure, lift cores and mechanical services).
- Station structure including the concourse and platforms
- Retail spaces within the station building

- Public domain improvements
- Access arrangements including vertical transport such as escalators and lifts
- Structural and service elements and relevant space provisioning necessary for constructing OSD, such as columns and beams, space for lift cores, plant rooms, access, parking, retail and building services

Detailed SSDA (the subject of this EIS):

- Design, construction and operation of the Central Precinct OSD for affordable housing and market residential apartments, retail, and community uses;
- 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 on Botany Road and public domain upgrades;
- OSD residential tower lobby;
- Residential amenities; and
- Back-of-house facilities including building plant, waste and service rooms.

To further clarify the above, the majority of the public domain improvements to be delivered on and adjacent to the Waterloo Metro Quarter site will be delivered under the scope of the CSSI approval, where this work is required to service the functionality of the metro station itself. This is clearly illustrated in Figure 17. The remaining public domain works will be delivered under the terms of the relevant detailed SSDA for that precinct.

For the Central Precinct, this includes the delivery of Church Square, including vehicle access to the basement via a shared way from Cope Street, expanded footpaths on Botany Road and public domain upgrades as shown in Figure 16 and Figure 17.

In summary:

- **Blue shaded area**: Sydney Metro approved development. The design, construction, and use of which is subject to the terms of the CSSI approval and includes portion of the public domain works.
- **Green shaded area:** Central Precinct OSD tower and public domain works, including the delivery of Church Square and expanded footpaths on Botany Road, which are entirely the subject of the detailed SSDA.
- **Green hatched area**: public domain works approved under the CSSI, including the delivery of Grit Lane to the west of the site and bus stop public domain space along Botany Road. Interface between Grit Lane and the Central Precinct is shown in Figure 17.

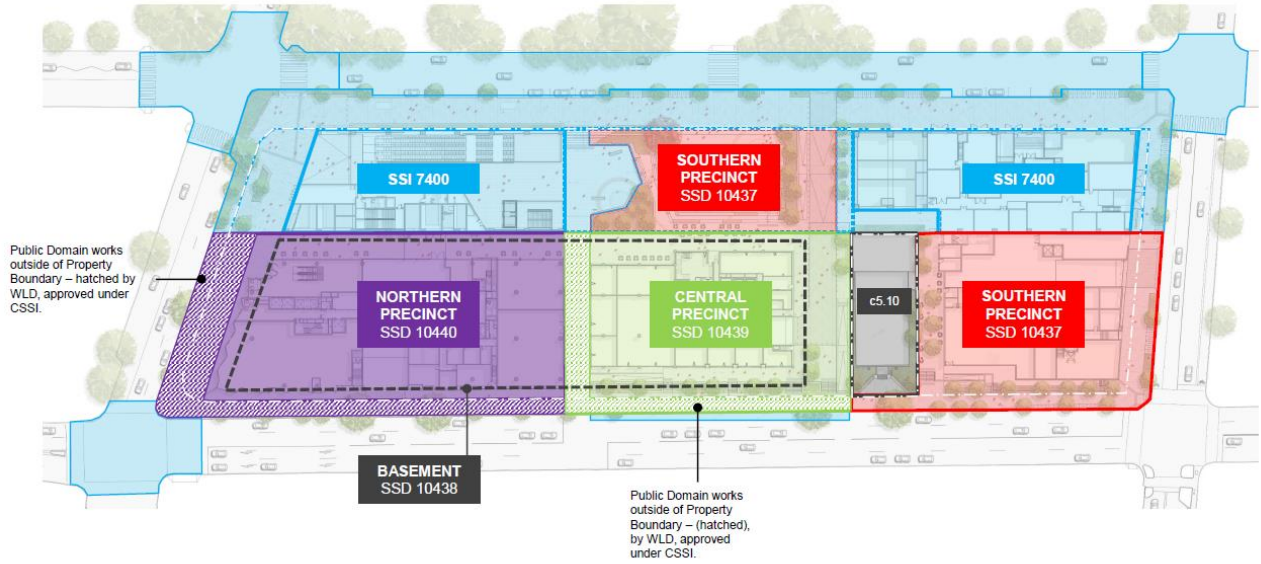
Further detailed discussion on the relationship between the CSSI public domain works and the public domain works proposed under this detailed SSDA is provided in Sections 4.5 and the Landscape and Public Domain report attached at **Appendix JJ**.

It is noted that the proposed development has been developed concurrently with Sydney Metro and the Waterloo Contractor, as well as alongside the evolution of the Station Design and Precinct Plan (**SDPP**) and the Interchange Access Plan (**IAP**) as required under the terms of the CSSI approval.

The majority of the public domain improvements to be delivered on and adjacent to the Waterloo Metro Quarter site will be delivered under the scope of the CSSI approval, where this work is required to service the functionality of the metro station itself. This is clearly illustrated in Figure 17. The remaining public domain works will be delivered under the terms of the relevant detailed SSDA for that precinct.

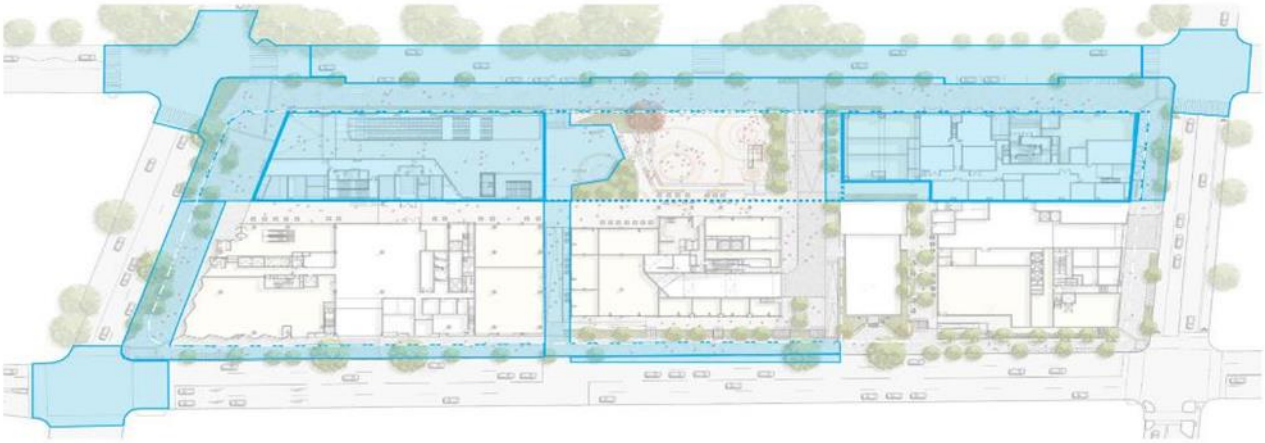
For the Central Precinct, this includes the delivery of Church Square, including vehicle access to the basement via a shared way from Cope Street, expanded footpaths on Botany Road and public domain upgrades.

Figure 16 Station Works and OSD Precincts Delineation Plan



Source: WL Developer Pty Ltd

Figure 17 Scope of public domain and ground plane works to be completed under the CSSI approval



Source: WL Developer Pty Ltd

4.3.2. Structural Integration

Given the Central Precinct is not directly located above or adjacent to the Sydney Metro box, there is no structural integration required for the Central Precinct and the proposal will not impact on the structural of the Metro infrastructure.

4.4. BUILT FORM AND DESIGN

The proposed OSD is detailed in the Architectural Drawings (**Appendix D**) and Architectural Design Report (**Appendix F**) prepared by Hassell. The following sections establish the design strategy, which underpin the detailed design of the OSD and describe the key design elements.

Detailed built form and context study is included in Section 8.1 of the EIS.

4.4.1. Overall Built Form Strategy

Prominently located in the centre of the WMQ precinct, facing the new Cope Street Plaza to the east and the bus interchange to the west, this building will play a significant role in how people engage and remember the overall WQM precinct.

The design vision of the Central Building is to create a vibrant and vertically connected neighbourhood with an active ground plane, community and childcare uses within the podium, affordable housing and market residential apartments in the tower above. The proposal aims to create a welcoming and engaging place that fuels social interaction between residents, workers and visitors.

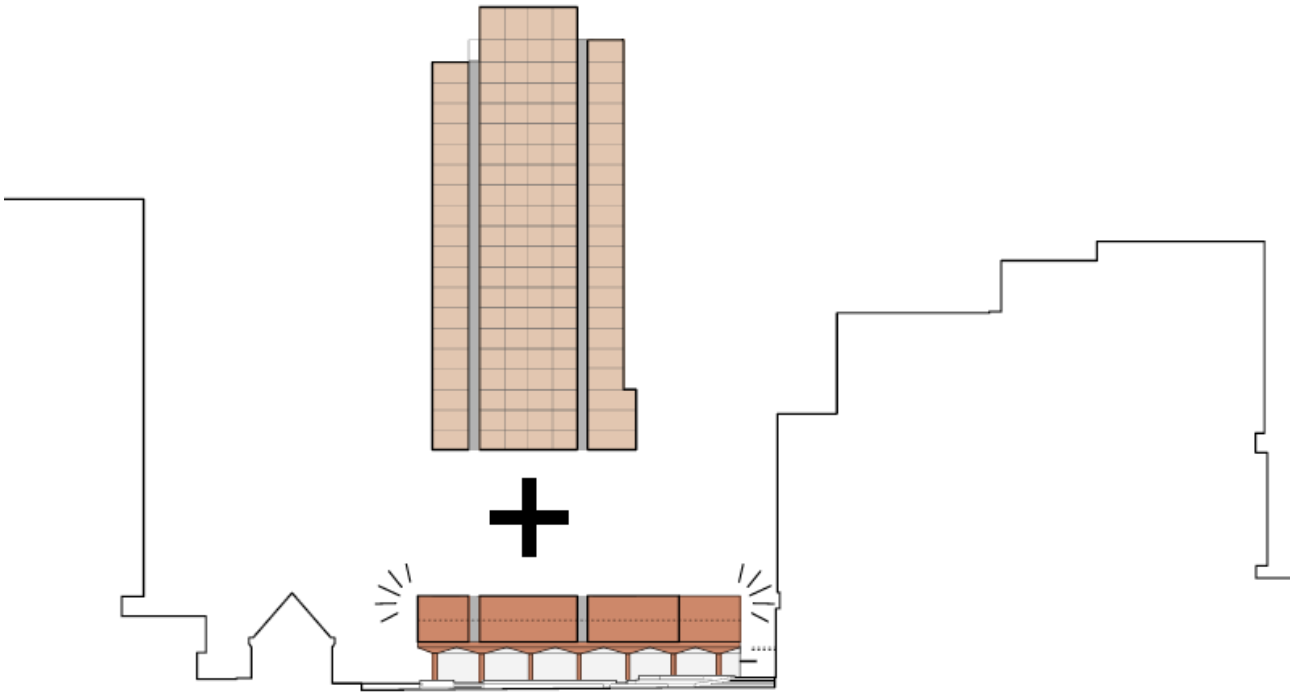
The built form will respect the adjacent Congregational Church by generously setting back the ground plane and podium level to the south to create Church Square. This laneway provides separation distance for visual relief and for a meaningful amount of space for public appreciation and interaction with this heritage item, which was never available before this development.

The development also draws inspiration from Waterloo's rich and diverse history and culture from Aboriginal connections, migrant and working class communities. This is integrated into the design of the Central Precinct through the use of colour, material, public art, landscape design and Heritage Interpretation Strategy.

The diverse composition of uses and building scale calls for two interrelated tailored architectural responses for the tower and podium forms that are brought together by carefully considered building massing (refer to Figure 19). The tower form is further setback from Grit Lane and Church Square to create a slender built form. The vertical articulation slots in the tower form is carried down into the architectural detail of the podium, breaking down its scale and connecting the tower to the ground.

The material palette of the building as a whole takes cue from the surrounding context. The robustness and authenticity of the material are articulated differently in the podium and tower to break up the form yet working harmoniously as a whole.

Figure 18 Built Form Strategy

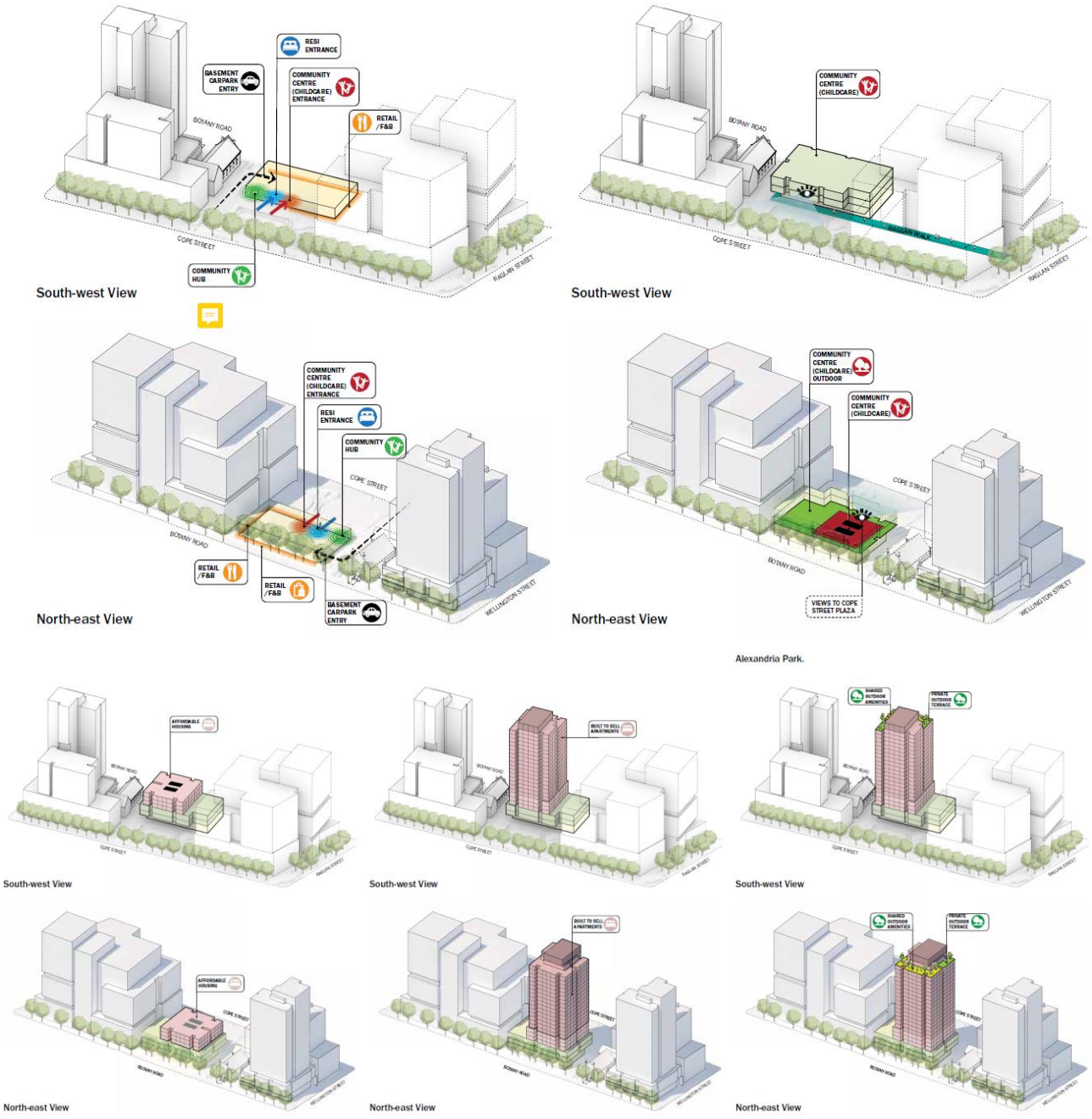


Source: Hassell

The mixed uses have also been considered when designing the massing of the building and the layout of each floor level (refer to Figure 20):

- Ground Plane: Active ground floor with retail along Botany Road, Grit Lane and Cope Street Plaza. Community retail is located at the south eastern corner of ground floor with activated frontage to both Cope Street Plaza and Church Square.
- Childcare Podium: Community Childcare is located within the podium level with indoor and outdoor play spaces. The Childcare levels extend beyond the ground floor providing continuous covered weather protection.
- Affordable Housing: Affordable housing is located on level 3 to level 5 above the podium. It is setback from the commercial building to the north to provide required separation and to maintain privacy and solar access.
- Market Residential Apartments: market residential apartments are located on level 6 to level 22. It is also setback from the commercial building to the north to provide required separation and to maintain privacy and solar access.
- Rooftop: the rooftop provides shared amenity for residents (affordable and built to sell) including an indoor resident's lounge, outdoor community gardens and a variety of seating to encourage social interaction between the residents. The top of the building is carefully considered to minimise overshadowing to Alexandria Park.

Figure 19 Massing and Use



Source: Hassell

The detailed design of the building floorplate is articulated further below.

4.4.2. Ground Floor

Ground floor of the development comprises retail tenancies orientated towards the Cope Street Plaza, Botany Road, Grit Lane and Church Square, creating activated edge along all street and public domain frontages.

The fine grain scale retail located on the ground floor creates an eclectic and diverse pedestrian experience along Grit Lane and Botany Road, marking the precinct from the main entry way to metro station (refer to Figure 21). Retail tenancies are also fronting Cope Street Plaza to provide activation and assist with casual surveillance around the public domain, which is further enhanced by the proposed licensed outdoor seating areas.

As an important east-west connector for pedestrians and vehicles accessing the underground basement carpark, Church Square has been designed as a shared way to enable safe and convenient access across the site and safely manage pedestrian and vehicle movements through this space. With the Church on the south and the activated community commercial use located along the southern façade of the ground floor, the square will have a unique civic character (refer to Figure 21).

Awnings are also provided along the retail frontages to Grit Lane and Botany Road to define the site and provide weather protection. While the colonnade along Cope Street Plaza frontage also provides weather protection for pedestrians and shading for community and retail use. the colonnade also acts as an anchor to the building, marking the building in the overall precinct.

The residential lobby addresses Cope Street Plaza. It is an intimate entry to maintain privacy for residents with a distinct façade identity to differentiate the space from retail or community entries. A separate lobby for the community facilities (childcare) is located more central of the building. Secure entry into the childcare centre will be limited to authorised person only, through the provision of an electronic security system and will be monitored by camera surveillance.

The childcare lobby design echoes the language of the podium facade by bringing the materiality of the podium down to the ground plane. This not only signifies the entry to the childcare but also help to create a diverse ground plane experience (refer to Figure 22).

Figure 20 Proposed streetscape and public domain frontages

View of Grit Lane, looking west towards Botany Road

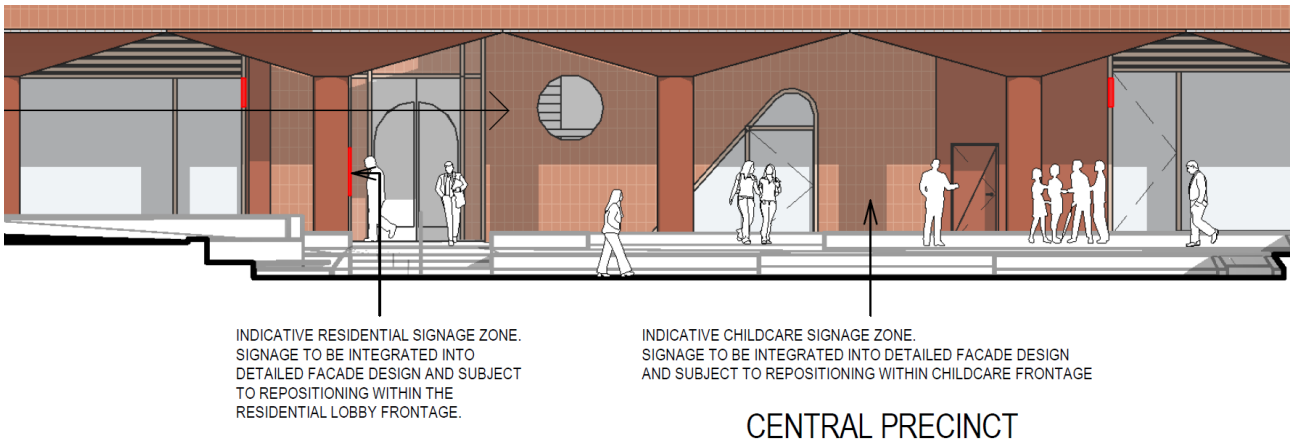
View from Botany Road

View from Cope Street Plaza

View from Church Square looking towards Botany Road

Source: Hassell

Figure 21 Residential and Childcare Entry Lobbies



Source: Hassell

4.4.3. Podium – Community Facilities (Childcare Centre)

The podium has been designed to accommodate the *'community facilities'* spaces as defined in the *Sydney Local Environmental Plan 2012*, which will comprise a Community Childcare Centre on level 1 and 2. This SSDA seeks for the use and general location of the Community Facility (in the form of childcare centre). Indicative internal floor plans have been provided for reference only, fit out and operational details shall be the subject of a future DA.

The childcare comprises:

- Internal space for 0-2year old's including areas for a cot room, kitchenette and WC.
- Internal space for 2-5 year old's.
- Simulated outdoor and outdoor space with partial overhang from structure above to provide shade.
- Back of house spaces including laundry, kitchen, admin and office areas.

On the first level, a double height ceiling has been provided for gathering space. The eastern façade also incorporate a large arched opening to clearly demarcates the entry point to the community childcare centre and create a strong address to the Cope Street Plaza (refer to Figure 23). Openings in the podium façade

have also been incorporated on every elevation to create visual separation from the tower and ground floor below. The textured laying of masonry brick and patterned masonry creates a dynamic pattern of light and shadow across the façade providing visual contrast and interest.

Considering the locational constraints of the integrated childcare centre, these façade openings also allows light and ventilation into the lower level of the childcare, especially to the simulated outdoor area. The openings have been balanced with patterned masonry screens to ensure safety and fabric shading to increase sun protection particularly through the summer months.

Over both levels, internal play rooms are wrapped in a continuous veranda of simulated outdoor play spaces, which vary in shape, size and height. Layering and depth provides interest and a sense of openness without directly looking into the internal rooms of the childcare.

Figure 22 Podium façade facing Cope Street Plaza

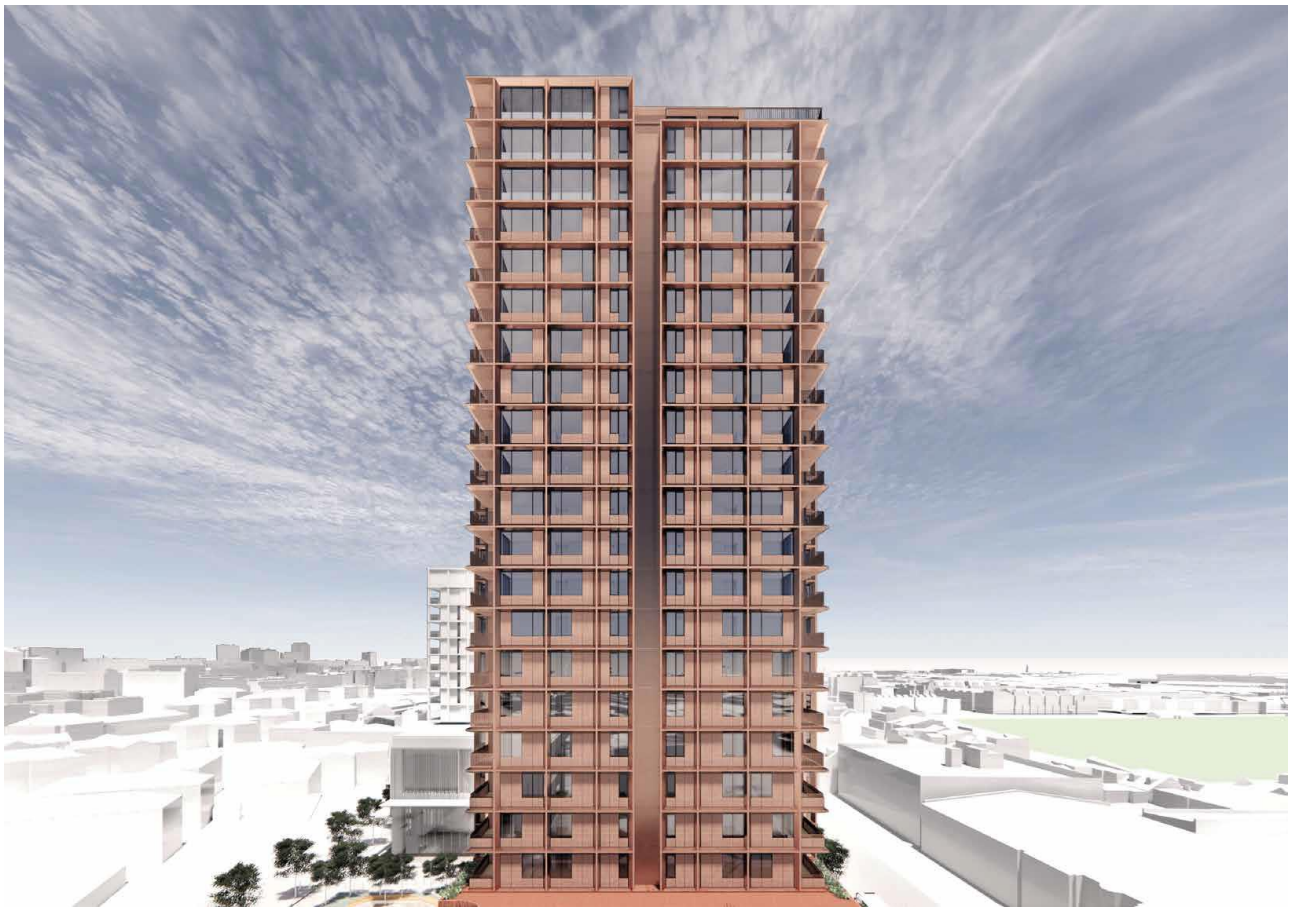
Source: Hassell

4.4.4. The Tower – Residential

The residential tower is setback from the podium edge to create a slender tower below the Concept approval height. The tower expresses a sense of individuality through a finer grain façade treatment, incorporating five façade topologies to create diversity and individuality. This also creates visual interest when viewed from the public domain and has individually considered views and solar access for each apartment to maximise residential amenity.

The façade treatment also accounts for privacy for the lower floor apartments and achieving greater view access on upper level apartments.

Figure 23 Tower façade treatment



Source: Hassell

The proposed tower comprises a total of 150 apartments including 24 affordable housing units and 126 market residential apartments. A number of principles are established to guide the planning of the apartments in order to provide the best possible amenity for the future residents.

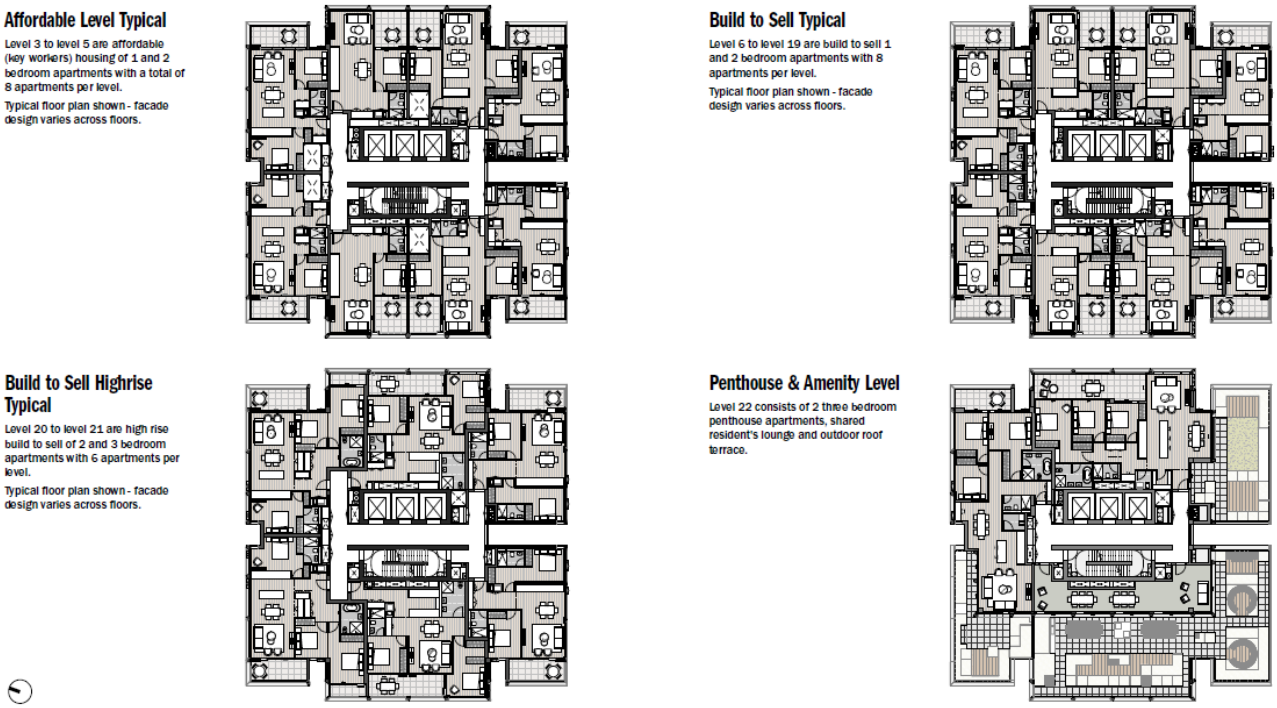
Orientation, solar amenity, access to view, cross ventilation and minimising acoustic impact are the key considerations that drive the apartment planning, which ultimately contributes to the overall tower form.

North east facing apartments have been maximised to allow solar access to apartments. It also provides the best outlook for apartments towards the city to the north east and Anzac Bridge to the north west.

The building is also designed to maximise corner apartments in order to provide better outlook and optimise cross ventilation. The west facade fronts Botany Road, therefore bedrooms are setback for improved acoustic performance.

The typical floor plates for the apartment level mixes are illustrated in Figure 25.

Figure 24 Typical floor plates for the apartment



Source: Hassell

4.4.5. Public Art

A WQM site wide Public Art Strategy has been developed by Aileen Sage Architects with art curators Tess Allas and Sebastian Goldspink and is attached at **Appendix MM.**

The Public Art Strategy demonstrates the commitment to the commissioning, implementation and management of high-quality public art to satisfy design criteria 3V Public art of the *Waterloo Metro Quarter Design Amenity Guideline.*

The strategy has been developed collaboratively and in close consultation with a team of art curators, architects, landscape architects and heritage consultant.

The public art opportunities have been inspired by the Aboriginal culture of Waterloo/Redfern and have been developed as part of the heritage interpretation process. The identified opportunities are (refer to Figure 27):

- Waterloo Station Artwork:

An artwork will be commissioned within the Waterloo metro station. The selection of this work is being co-ordinated and managed by Sydney Metro. The artist for this work will be appointed by Sydney Metro and contracted to Waterloo Developer. This work will respond to the brief that has been developed by Sydney Metro.

- Theme/Opportunity 1 Celebrating Country:

This artwork will be a two dimensional design or pattern that will be translated into the brick or concrete unit paving of Cope Street Plaza and Church Lane. The work will be highly graphic and abstract, clearly demarcating these important civic zones and creating a strong visual character and marker of these public domain areas.

- Theme/Opportunity 2 Celebrating Community & Language:

This commission will acknowledge the first language of the lands that has never been silenced and subsequent languages that have joined this community. It will work with poetry and storytelling to embed text within the site as illuminated.

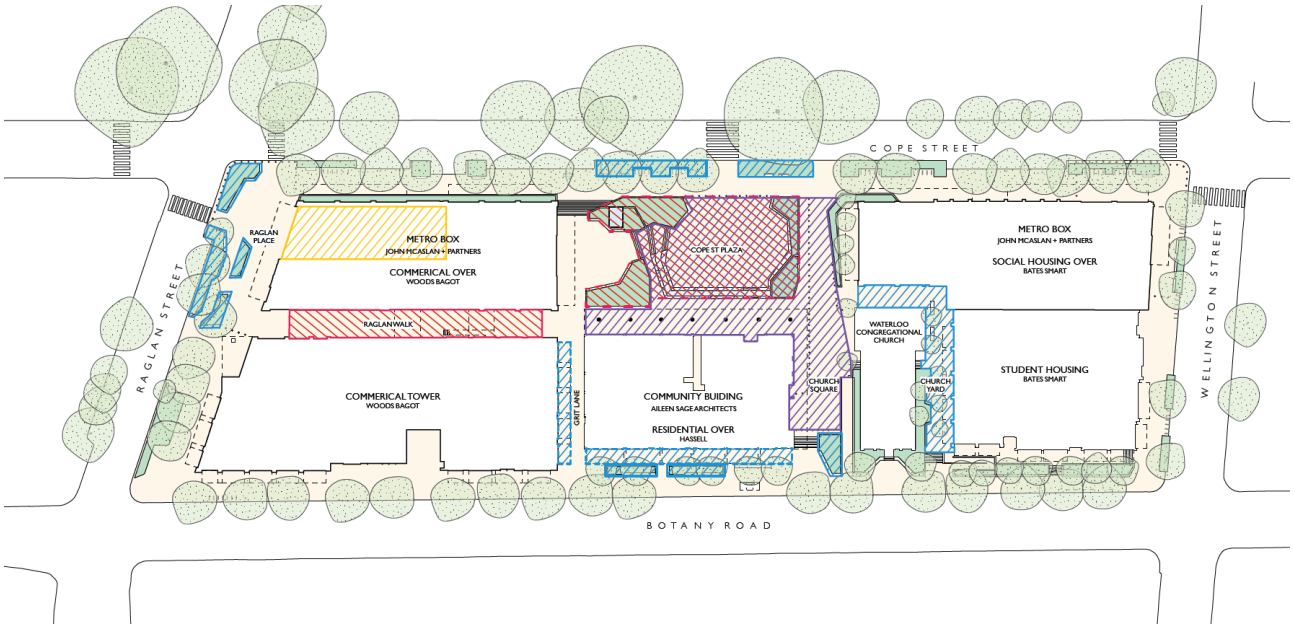
It will acknowledge the history of Aboriginal activism in the Waterloo /Redfern /Eveleigh area. The work will also be in the local Sydney language as well as selected migrant languages. As well as naming of local Aboriginal community leaders and heroes.

Acknowledgments of Country would be included at each entry point to the overall Precinct. The locations of the work will be carefully considered and judiciously placed during the detailed design phase.

- Opportunity/Theme 3 Celebrating Innovation & Knowledge:

It is proposed that a series of 3 dimensional sculptural elements integrated with the landscape and public domain areas of the site would be commissioned extending from Raglan Walk through to Cope Street Plaza. The work will celebrate the area's Aboriginal history and future with a focus on innovation, incorporating in particular ideas and practices celebrating Aboriginal knowledge of the skies.

Figure 25 Public Artwork Locations



Source: Aileen Sage Architects with Tess Allas & Sebastian Goldspink

The Public Art Strategy also outlines the methodology for artist selection and commissioning, which will commence post approval and as part of the detail design phase. The selection and commissioning process will be in consultation with the community and key stakeholders, including City of Sydney Council and Sydney Metro.

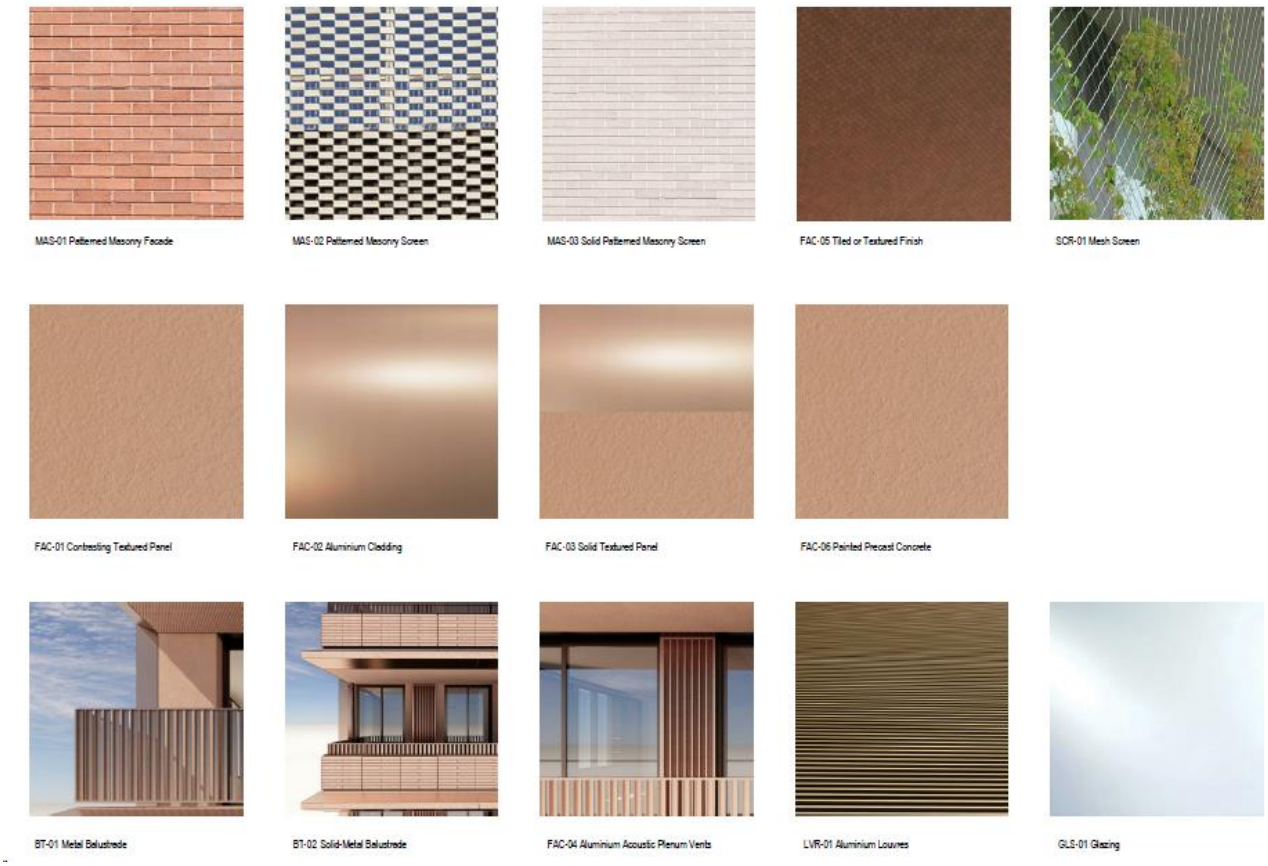
4.4.6. Materials and Finishes

As documented in the Architectural Design Report in **Appendix F**, the material selection draws on the warm, engaging and tactile materials found in and around Waterloo.

The robust material palette captures the spirit of a resilient and enduring place. The material palette proposes a combination of a bronze coloured aluminium, solid textured panels and a masonry podium as the primary materials (refer to Figure 27).

Sustainable materials with low embodied carbon, durable and low maintenance have also been strongly considered in the proposed palette.

Figure 26 Materials and Finishes Palette



Source: Hassell

The proposed materials and finishes demonstrate a highly considered approach towards ensuring the proposed materials and colour tones are sympathetic and blend in with the existing heritage values within the local area.

4.5. PUBLIC DOMAIN AND LANDSCAPING

The Landscape and Public Domain Report prepared by Aspect Studio is included in **Appendix JJ.** The report details the WQM site wide public domain strategy, including public domain works to be delivered as part of the Central Precinct, and also details landscape design for the Central Precinct.

Detailed planting palette is detailed within Public Domain and Landscape Report attached at **Appendix JJ.** Detailed public domain and landscape plans are attached at **Appendix II.**

4.5.1. Central Precinct Public Domain

As discussed in the Section 4.3, the public domain works for Church Square and along the Botany Road frontage of the Central Precinct will be delivered as part of the Central Precinct SSDA. The public domain works approved and delivered under the CSSI have been further developed and are integrated as part of the WQM precinct wide public domain design.

The extent of works proposed under this SSDA is outlined below:

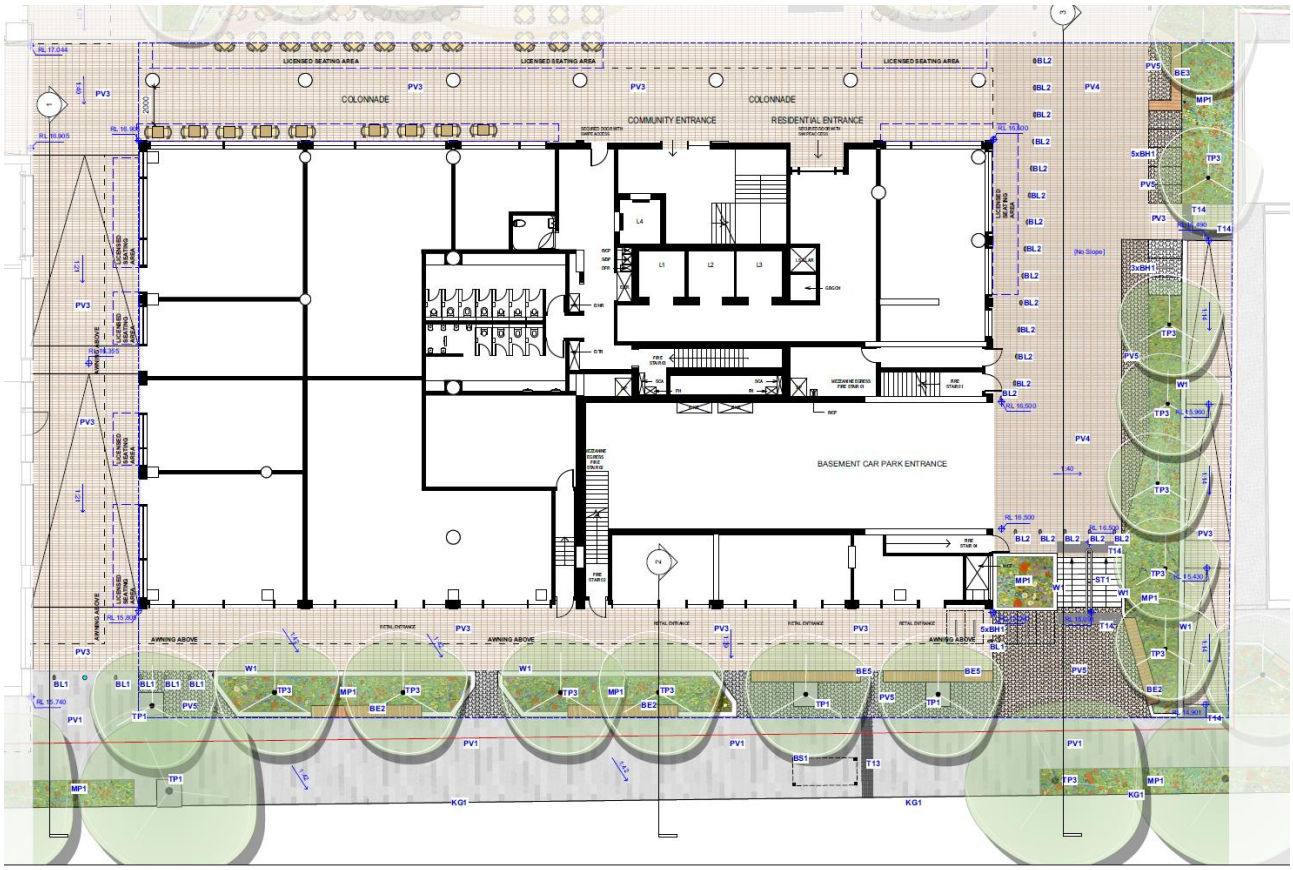
Figure 27 Public Domain Works to be delivered as part of this SSDA

Source: Aspect Studio

Specifically, the following landscape design have been incorporated for the proposed public domain areas:

- Tree planting is provided in deep soil zone in either permeable paving or raised planters along the Botany Road frontage to integrate with the street trees approved under the CSSI. Pedestrian routes to and from the bus stop have been enhanced by raised planters and seating elements along Botany Road. The raised garden beds closest to the bus stop are raised 450mm to provide an informal seating edge for patrons.
- Church Square is a generous shared zone for pedestrians and vehicles that connects to Cope Street Plaza and Church Yard. The Square features a generous planted buffer along the northern Waterloo Congregational Church boundary, with new tree planting in deep soil, seating opportunities and a singular paved surface.
- Concrete unit paver's in charcoal colour are extended across the site boundary to the building facades to create a continuous and generous streetscape.
- Planting typology within the Central Precinct varies between the landscape spaces. It is intended that all planting at ground level, including the planting on Botany Road public domain (as part of the CSSI), is comprised of native plant species selected for edible/usable properties.
- Tree and understorey planting throughout the site will provide a rich diversity of endemic species. The palette has been developed to create urban ecologies which may provide habitat or food sources for native birds, bees and insects.

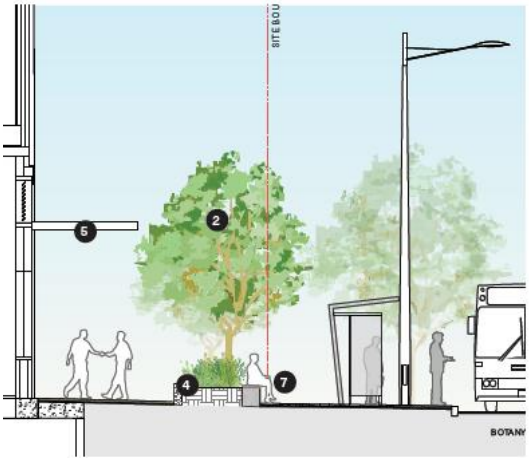
Figure 28 Landscape Plan – Ground Floor



KEY

1	Driveway entrance / exit
2	Grit Lane (min 6m wide)
3	Seating edge Planters
4	Botany Road Bus Stop
5	DDA Access Ramp
6	Verge Planting and Street Trees
7	HVM Rated Bollard - pedestrian protection
-------	Central Precinct Boundary
———	WMQ Site Boundary

Church Square Section



KEY

1	Proposed verge planting
2	Proposed Street Trees
3	Waterloo Congregational Church
4	Seating Edge Planter
5	Awning
6	Proposed trees
7	Bus Stop Bench Seating
----------	OSD Site Boundary

Source: Aspect Studio

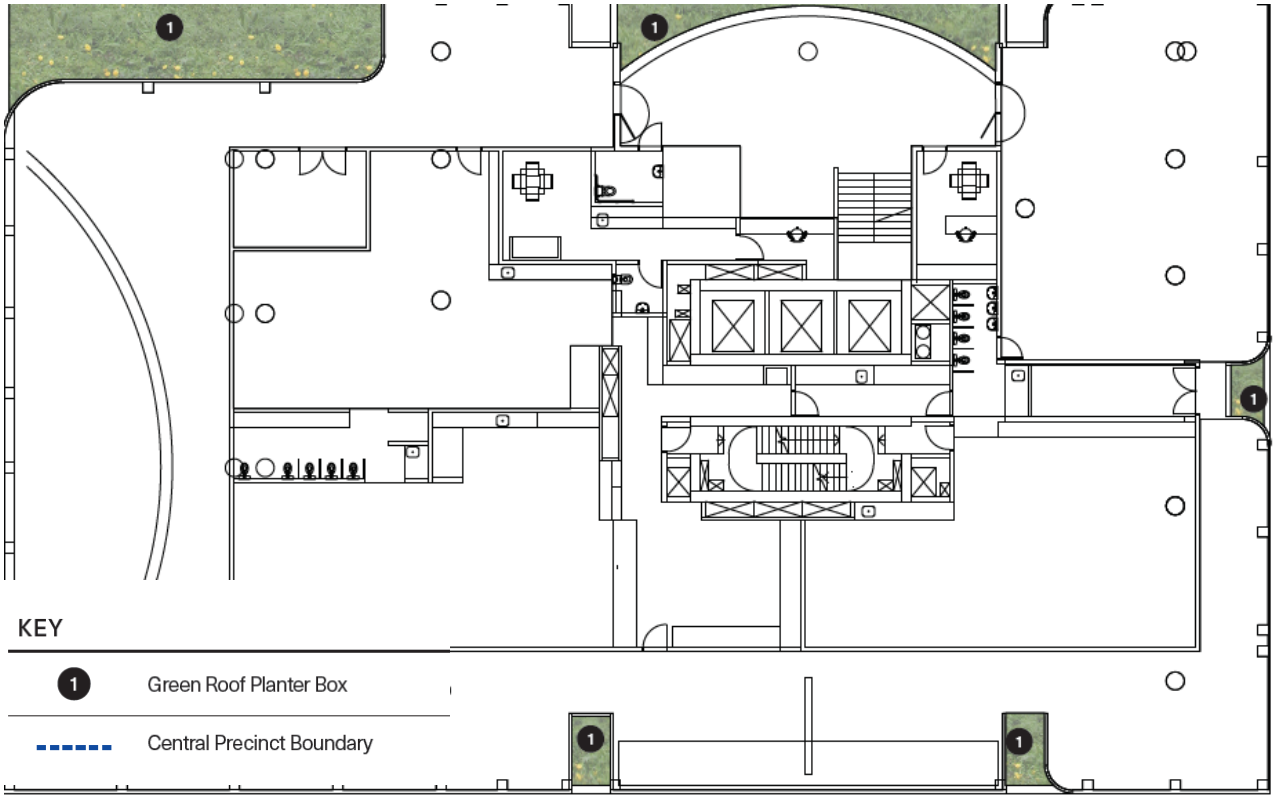
4.5.2. Landscaping

Level 01

To provide a greener outlook to the eastern, southern and western façades of the podium level, a series of small low maintenance landscaping proposed on the roof space. The incorporation of the planting to the building façade will soften the built form and create a connection to Cope Street Plaza.

This habitat area will be a mix of low ground covers and grasses that can thrive in challenging urban conditions and with minimal soil volume.

Figure 29 Level 1 Landscaping



Source: Aspect Studio

Level 22:

A communal rooftop terrace and two private penthouse terraces are located on level 22 (refer to Figure 31).

The communal rooftop terrace allows for a range of communal activities through the provision of outdoor furniture, including outdoor bench, group seating area and communal table.

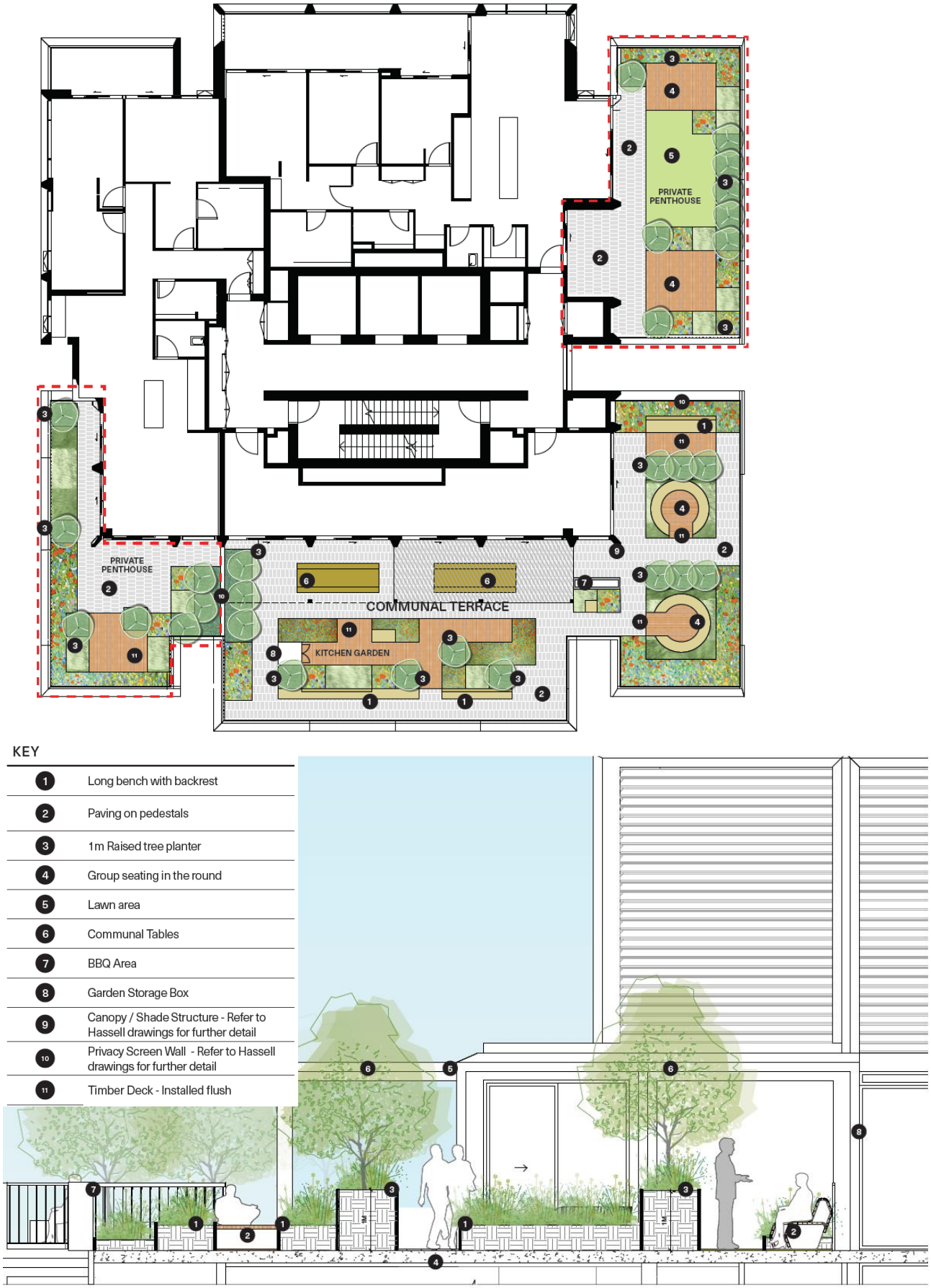
The material palette for the communal roof terrace comprises warm tone concrete paver's set on pedestals and grey tones planters. Where seating is integrated into the planters, a timber bench and backrest provide comfortable and low maintenance seating. A pergola structure is also provided to provide shade.

Planting across the roof terraces include a range of native species with a focus on flowering and bird attracting shrubs, small trees and shade tolerant species. Fragrant herbs will also be planted, which can be used by the residents.

The penthouse terraces incorporate a variety of landscape spaces, both open and intimate. Allowing residents to connect directly to the outdoors while creating privacy buffers from the communal terrace. Generous garden spaces and small tree plantings with a mix of native, exotic and flowering species are also proposed within the penthouse terraces.

The roof design will provide sufficient soil volumes to support the proposed small trees and shrubs to ensure they are able to grow at an adequate rate as healthy specimens.

Figure 30 Level 22 Landscape Plan



Source: Aspect Studio

In summary, the proposed landscaping strategy provides a range of diverse outdoor working, living and recreational space that have been designed to provide:

- A high level of privacy and screening from the neighbouring tower developments;
- Appropriate responses to address the wind and solar access impacts of the affecting the private and communal open space areas; and
- Diversity and unique spaces that suit the internal spaces from these space adjoining with appropriately selected furniture, plant and trees types and views to districts and precincts (where available).
- Provide communal spaces for residents of the building to connect and socialise.

4.6. OPERATION

4.6.1. Retail Use

This SSDA seeks approval for the use of the retail tenancies on the ground floor. To allow for the future operation of a range of retail premises as defined under the *Sydney Local Environmental Plan (**LEP**) 2012*, including but not limited to food and drink premises and shops.

This includes a space at the south-eastern corner of the ground floor which is proposed to support a wide range of community related uses. While this space will support a diverse range of uses to support community needs and interests, its land uses is best defined as a 'r*etail premises*'.

The fit-out and operation detail of the retail premises are subject to future complying development certificates and development applications.

To support the operation of the Metro, extended trading hour is proposed for all retail tenancies from 5am to 10pm.

4.6.2. Community Facility

On the podium level, a community childcare centre is proposed, which will be operated by a non-profit community organisation and is to service the Waterloo community.

The operation of the community childcare centre is consistent with the definition of a '*community facility*' as defined under *Sydney LEP 2012,* and will deliver the required community facility floor space as required under the Concept DA:

> *community facility means a building or place—*
>
> *(a) owned or controlled by a public authority or non-profit community organisation, and*
>
> *(b) used for the physical, social, cultural or intellectual development or welfare of the community,*
>
> *but does not include an educational establishment, hospital, retail premises, place of public worship or residential accommodation.*

This SSDA is only seeking consent for the use and general location of the childcare centre. Detailed fit-out and operation of the childcare centre will be subject to a future development application. Indicative internal plans have been included in the Architectural Package for reference.

The childcare is proposed to provide space for 146 children and approximately 30 staff.

The proposed operation hours are:

- Monday to Friday: from 7am to 7pm. Hour of operation may extend till midnight (subject to demand). The extension of hour will be further considered as part of the future DA.
- Saturdays: from 9am to 3pm

For reference, a preliminary Childcare Centre Management Plan is provided in **Appendix RR** and will be revised to accompany the future DA.

4.6.3. Affordable Housing

The affordable housing will provide for very low, low and moderate income households as defined by the *State Environmental Planning Policy No. 70 – Affordable Housing (Revised Schemes)* for a minimum of 10 years. These would also be managed by a Tier 1 Community Housing Provider and designed to be 'tenure blind'.

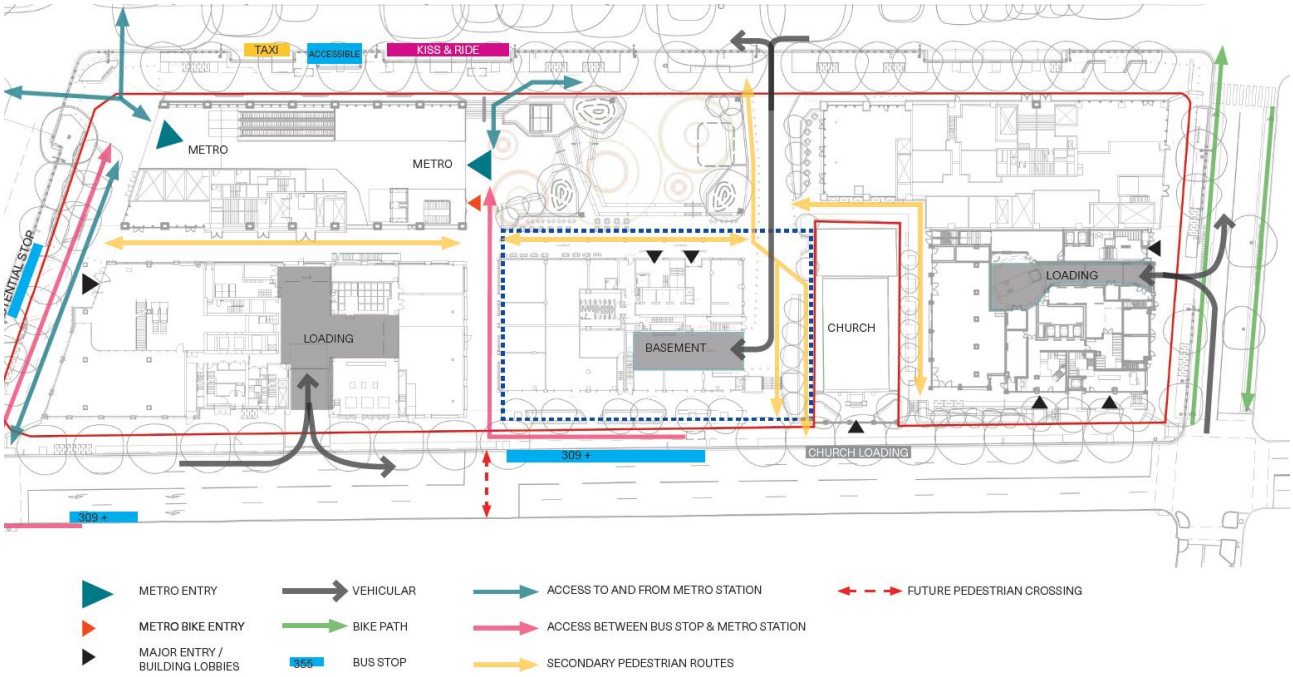
4.7. PARKING AND ACCESS

4.7.1. Pedestrian Access

Proposed access and circulation routes are shown on Figure 32. A new pedestrian crossing on Botany Road will be provided directly west of the Central Precinct (as part of the CSSI), providing connection to Grit Lane located to the north of the Central Precinct. This connection provides primary pedestrian access to the bus stop, the overall WMQ site and the Metro Station.

Secondary pedestrian routes are provided around the WMQ site, which provides safe circulation between the various developments and provides pedestrian connection to the public domain areas, including Cope Street Plaza, Church Square and the Metro Station.

Figure 31 Access and Circulation



Source: Aspect Studio

4.7.2. Bicycle and Motorcycle Parking

A total of 150 dedicated bicycle parking spaces are proposed within the basement car park to support the residents of the Central Building, in addition to basement storage cages.

Residential bicycle parking is provided in the form Class 1 bike lockers. The residential bicycle parking is located on level P1 of the basement. Six retail and childcare employee bicycle parking area provided in the form of Class 2 bike facilities, which are also located within level P1 of the basement (refer to Figure 33).

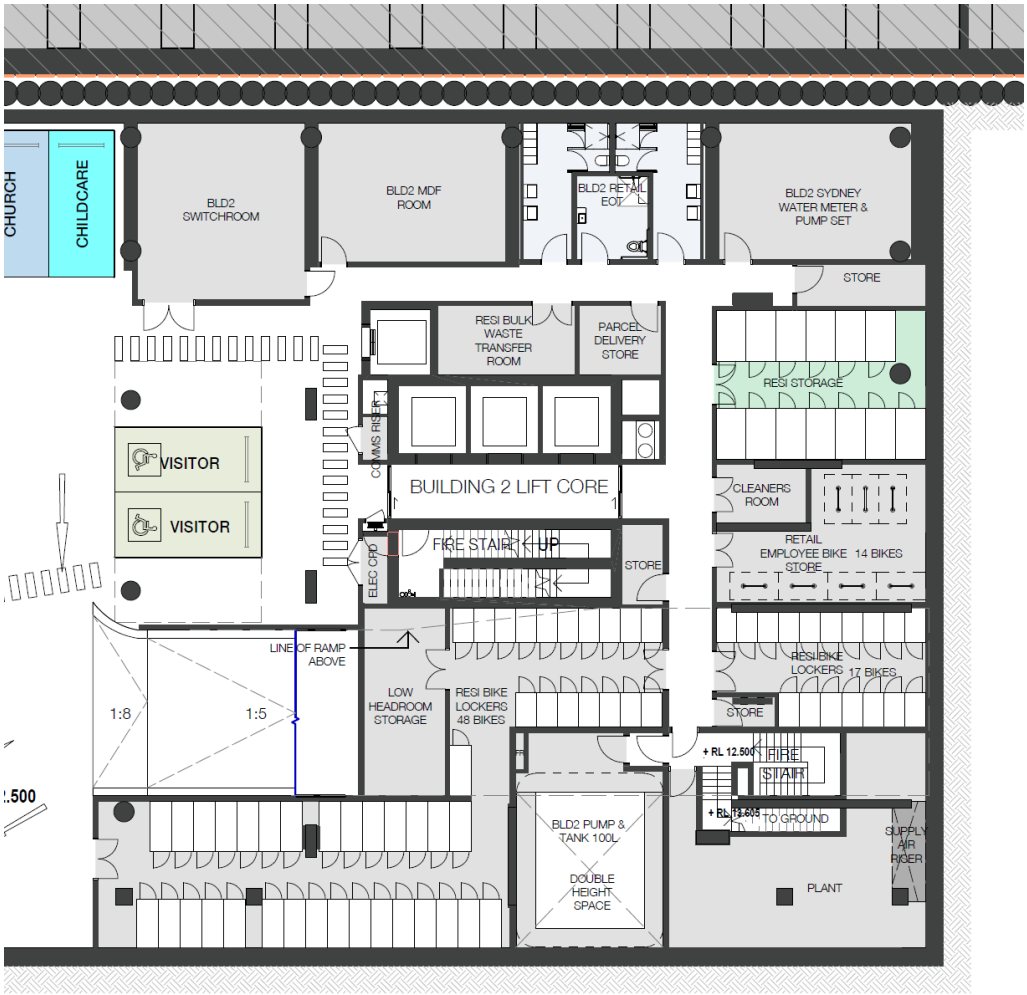
The retail end of trip facilities is also provided within the same basement level (refer to Figure 33).

26 visitor bicycle parking is provided in the form of Class 3 bike rails located within the public domain

Bicycle parking is proposed to be accessed via the Central Building lift core.

6 motorcycle spaces are also provided within the basement meeting the minimum requirement of the Sydney Development Control Plan (**DCP**).

Figure 32 Proposed bicycle facilities and end of trip facility within level P1 of the basement



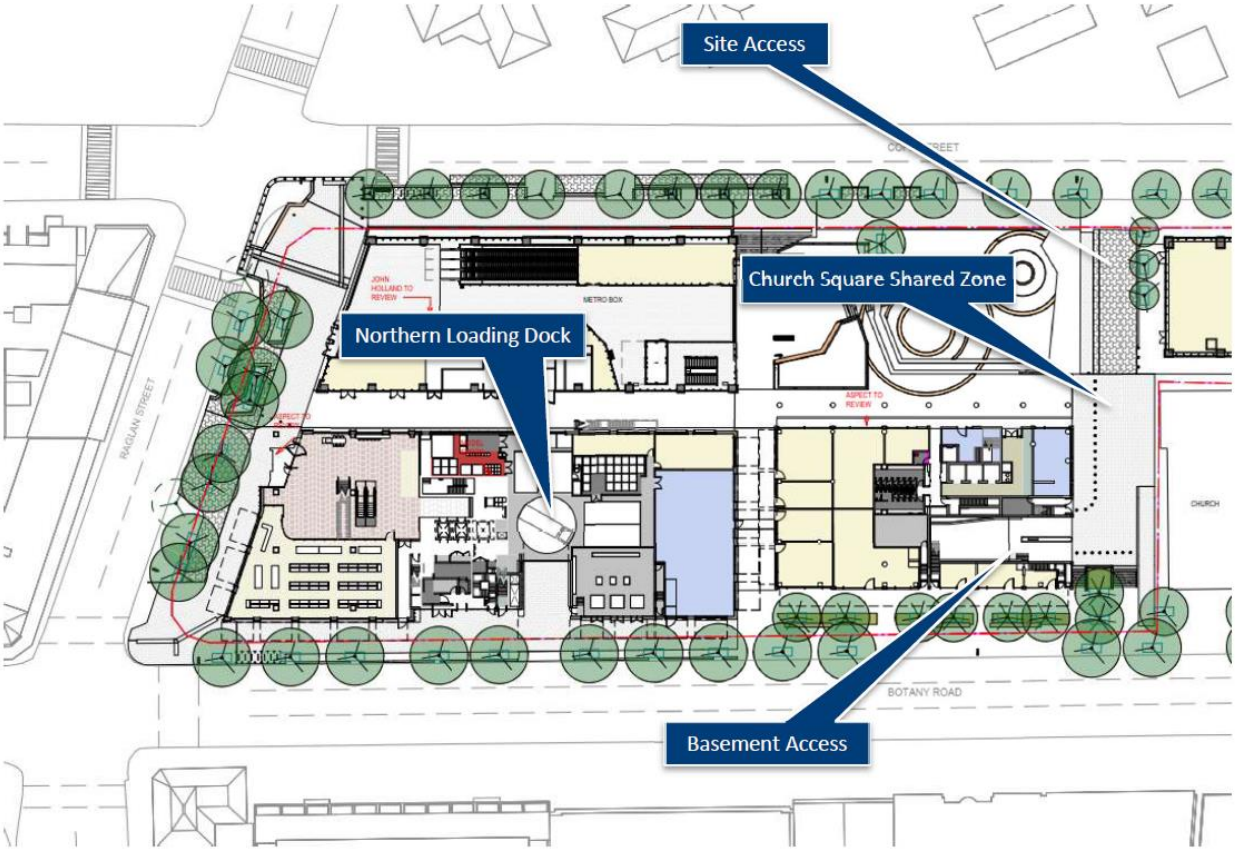
Source: Woods Bagot

4.7.3. Vehicular Access and Parking

Vehicular access will be available from Cope Street to the shared zone on Church Square and provide access to a shared basement car park (refer to Figure 75). The basement is located below both the Central Precinct and Northern Precinct and is proposed under a separated SSDA (SSD 10438).

67 car parking spaces are provided within the basement car park for the affordable housing and market residential apartments, which does not exceed the maximum car parking provision prescribed by the Concept DA. Details of the parking provisions for the uses within the Central Precinct are discussed further in Section 8.10.

Figure 33 Vehicular Access to Basement and Shared Loading Dock



Source: ptc.

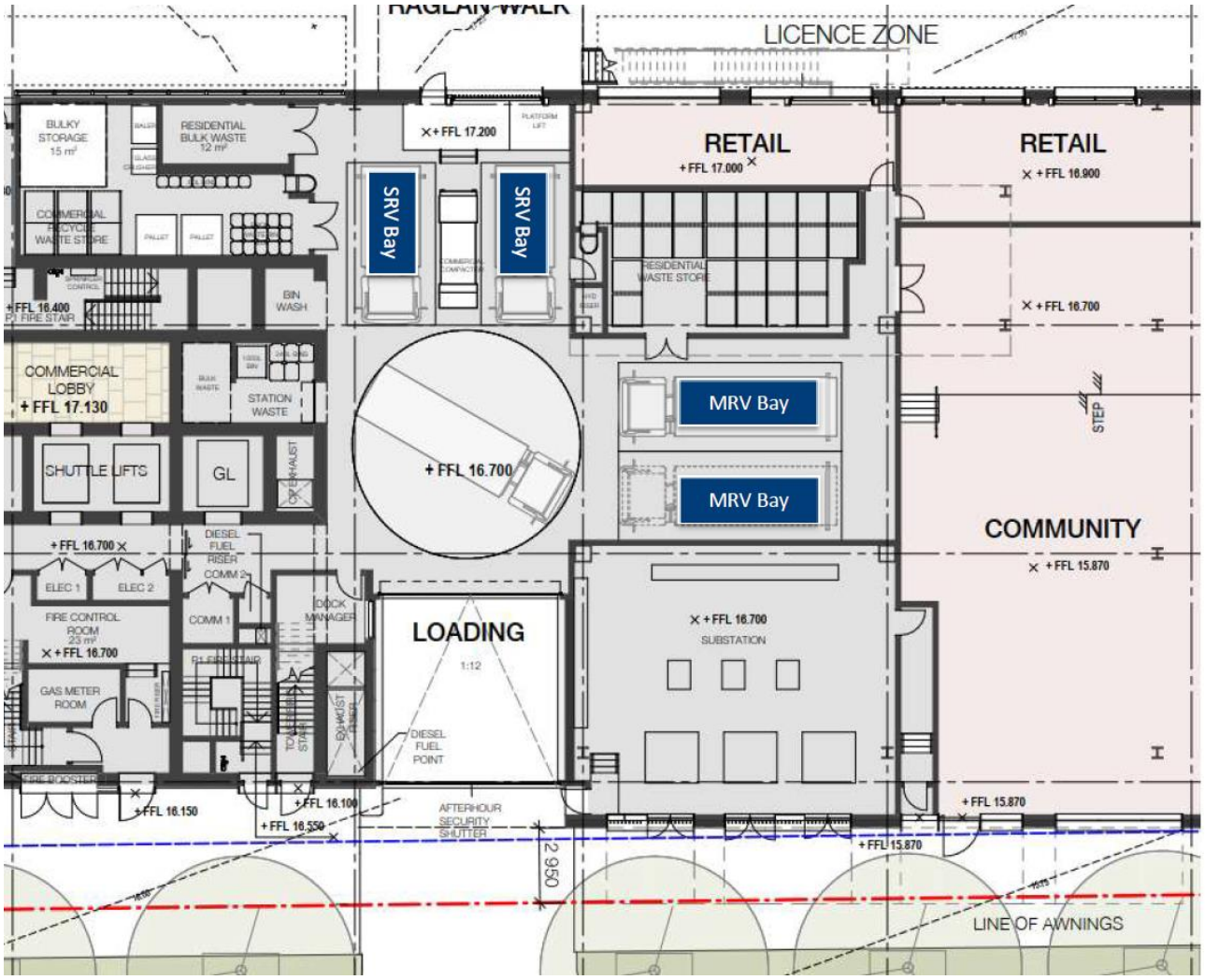
4.7.4. Loading, Unloading and Servicing

A shared loading dock is proposed at the ground floor of the Northern Precinct and can be accessed off Botany Road as shown in Figure 71. The loading dock can accommodate 2 MRV bays and 2 SRV bays.

Access to the loading docks will be managed by a Loading Dock Management Plan (attached at **Appendix I**), which will set the process and procedures for vehicles using the docks.

Five service parking bays are also provided within level P1 of the shared basement car park. These service bays will be shared between the Northern and Central Precincts. Access will be coordinated through the implementation of a Loading Dock Management Plan.

Figure 34 Loading Dock at the Northern Precinct



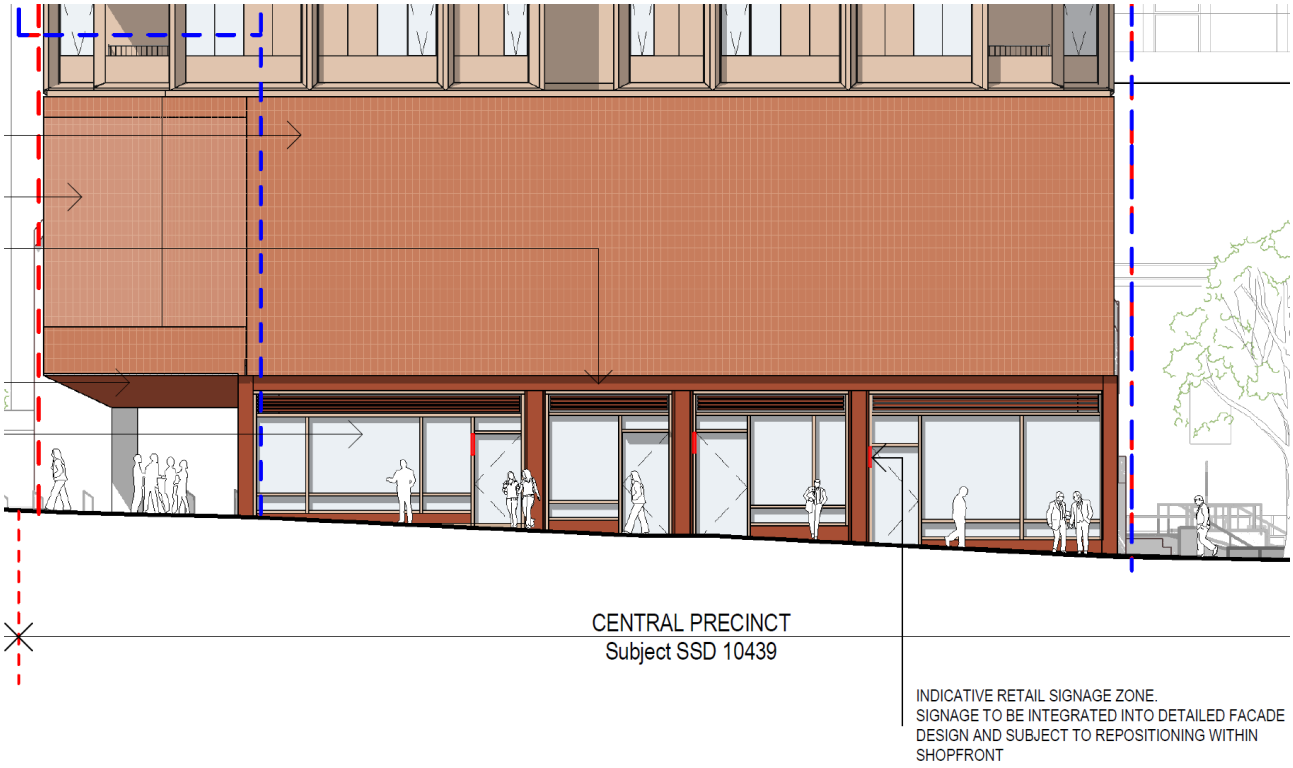
Source: Woods Bagot

4.8. SIGNAGE ZONES

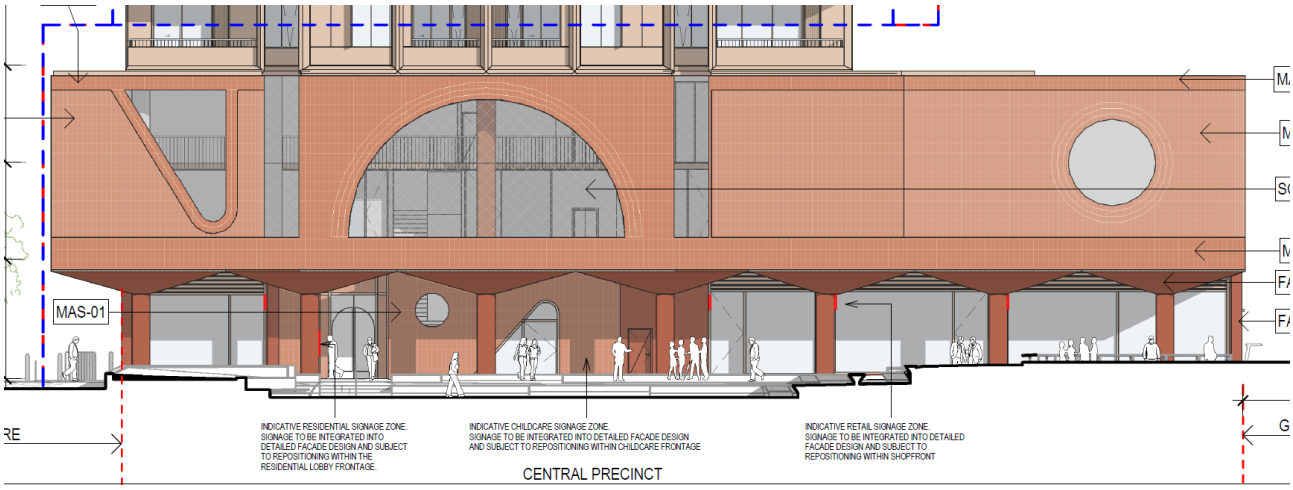
The scope of the detailed SSDA seeks consent for signage zones/locations for the proposed retail tenancies and site identification signs for residential and childcare entry lobbies. Signage zones have been included on the ground floor of the northern, southern, eastern and western (Botany Road) elevations as shown on the elevations attached at Appendix D and Figure 35.

The proposed signage zones have been designed to integrate with the rhythm of the façade and provide wayfinding between the mix of uses. The detailed design and location of the sign within the signage zone are subject to future applications.

Figure 35 Proposed Signage Zone (identified in red outline)

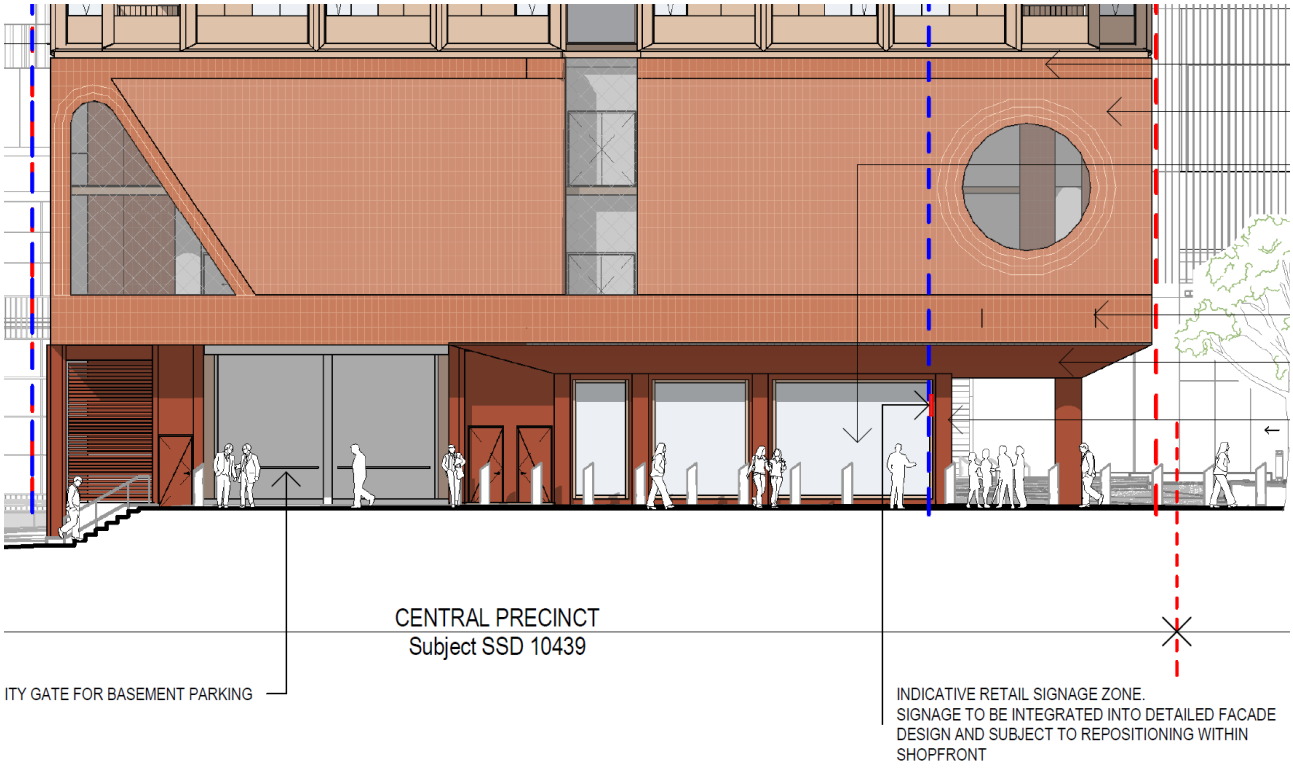


Northern Elevation



Eastern Elevation

Western Elevation



Southern Elevation

Source: Hassell

4.9. CONSTRUCTION HOURS AND STAGING

4.9.1. Construction Hours

Construction hours for the site have been established in accordance with the Concept DA and the construction hour outlined in the approved Noise and Vibration Report prepared by SLR Consulting dated 9 November 2019:

- Monday to Friday: 7am – 6pm
- Saturday: 8.00am – 1pm
- Sunday: no works

It is proposed to retain these hours for the construction of the OSD with the exception of extending Saturday construction hours from 7.30am to 3.30pm.

The proposed construction hours are:

- Monday to Friday: 7am – 6pm
- Saturday: 7.30am – 3.30pm
- Sunday: no works

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.

Justification and potential impact for extended construction hours has been discussed in the Acoustic Report attached at **Appendix K** and discussed in Section 8.7.2.

4.9.2. Construction Staging

The construction sequence of the Central Precinct is summarised in the order below:

- Podium from Ground Floor
- Structure Core
- Floor plate construction
- External envelope
- Services and commissioning.

The construction of each of these zones is described in the CEMP provided at **Appendix Q.**

4.10. SUBDIVISION

The SSDA seeks for the staged stratum subdivision of the OSD. Preliminary subdivision plans for the Central Precinct is included at **Appendix Z.**

The CSSI Approval provides consent for the subdivision and creation of the Station allotment (Lot 1) while also creating the amalgamated development (Lot 2). Further subdivision of Lot 2 is to take place through subsequent SSDA stages set out below:

- Southern Subdivision Stage
- Central Subdivision Stage
- Northern Subdivision Stage

It is proposed that the stratum lots be created in a staged manner. The staged subdivision consent is to allow for the sequential creation / registration of allotments to occur as is required to coincide with the construction and occupation program for the Integrated Station Development without the need for separate ongoing subdivision applications.

The Central Subdivision Stage once complete will be subdivided into the following stratum lots:

- Lot 8A - Part of the building 1 commercial stratum lot, which includes Church Square and the public domain areas to the west and east of Building 2. It is the intention that Lot 8A will be consolidated with its parent Lot during or at the end of the staged subdivision process.
- Lot 11 - Building 2 retail lot, including podium community facility
- Lot 12 - Building 2 residential lot
- Lot 13 – Building 2 affordable housing lot

The sequencing of lot numbers will need to comply with the requirements of the NSW Land Registry Services and as such the final sequencing may vary subject to the staging of subdivisions.

The anticipated Stage 1 titling relates to works associated with the station construction, public domain, and community facilities. This includes allotments for public domain including Church Square, retail and podium community facility. The anticipated subsequent titling relates to land associated with the affordable and market residential tower and the air space around the tower.

5. STRATEGIC CONTEXT

The strategic planning policies and design guidelines identified in the SEARs that need to be addressed include:

- NSW State and Premier Priorities
- A Metropolis of Three Cities – The Greater Sydney Region Plan 2018
- Eastern City District Plan 2018
- Future Transport 2056 Strategy
- State Infrastructure Strategy 2018-2038
- Sustainable Sydney 2030
- Development Near Rail Corridors and Busy Roads – Interim Guideline
- Guide to Traffic Generating Development, Roads and Maritime Services
- Heritage Council Guidelines
- Better Placed – An Integrated Design Policy for The Built Environment of New South Wales
- Child Care Planning Guidelines 2017
- City of Sydney Development Contributions Plan 2015
- City of Sydney Local Strategic Planning Statement

Each of these plans is considered in the following subsections as they apply to the Central Precinct SSDA.

5.1. NSW STATE AND PREMIER PRIORITIES

The NSW Premier's Priorities is the State Government's and Premier's plan to guide policy and decision making across the State. The proposed development is consistent with the relevant key objectives contained within the plan. These include:

> *Greener Public Spaces: Increase the proportion of homes in urban areas within 10 minutes' walk of quality green, open and public space by 10 per cent by 2023.*

The project will help to increase housing supply in a location that is within 10 minutes' walk of a number of quality green, open and public spaces. The site will deliver 24 additional affordable housing and 126 residential units in a highly accessible location with excellent connectivity to public spaces and public transport links to Greater Sydney.

The proposed development is consistent with the goals and objectives set out within the NSW State Priorities.

5.2. GREATER SYDNEY REGION PLAN: A METROPOLIS OF THREE CITIES

The *Greater Sydney Regional Plan: A Metropolis of Three Cities* is a bold vision for three, integrated and connected cities that will rebalance Greater Sydney – placing housing, jobs, infrastructure and services within greater reach of more residents, no matter where they live. Setting a 40-year vision (to 2056) and establishing a 20-year plan to manage growth and change for Greater Sydney in the context of social, economic and environmental matters.

The vision for the plan is built on these 30-minute cities within Greater Sydney, the Western Parkland City, Central River City and Eastern Harbour City, providing improved access through different modes of transport to various job opportunities, services, entertainment and cultural facilities across the metropolitan area. The Eastern Harbour City is well-established, well-serviced and highly accessibly by its radial rail network, with half a million jobs and the largest office market in the region.

The proposed Central Precinct responds to the Harbour CBD's focus on innovation and global competitiveness to underpin its continued growth, backed up by the significant Sydney Metro City &

Southwest project. In accordance with Objective 10 and Objective 18, the proposal aligns explicitly with the regional plan by:

- Providing a considerable amount of high quality, high density residential accommodation in a highly accessible location; and
- Maximises opportunities presented by the Waterloo Station to improve the home and work connections and support the 30-minute city.

5.3. OUR GREATER SYDNEY 2056: EASTERN CITY DISTRICT PLAN

The *Eastern City District Plan* covers the LGAs of Sydney, Woollahra, Waverly, Randwick, Bayside, Inner West, Burwood, Strathfield, and Canada Bay. Planning Priorities that directly relate to the proposed Central Precinct include:

E1 - Planning for a city supported by infrastructure

The proposal directly benefits from the development of the Waterloo metro station by providing a childcare centre above a transport infrastructure. The development facilitated by the Detailed SSDA aligns with the place-based infrastructure service which encourages active transit methods such as walking and cycling and the Waterloo metro station.

E5 - Providing housing supply, choice and affordability with access to jobs, services and public transport

The OSD provides premium affordable housing and private residential units within a highly accessible location, close to jobs, services and public transport.

E10 - Delivering integrated land use and transport planning and a 30-minute city

By locating additional affordable housing and private residential units above Waterloo metro station, the proposal contributes to the vision for a 30-minute city. Further, the proposal is considered sustainable as it is likely to result in a high proportion of trips by public transport, walking and cycling trips to reduce emissions and heath.

5.4. FUTURE TRANSPORT 2056 STRATEGY

The *NSW Government's Future Transport Strategy 2056* sets the 40-year vision, directions and outcomes framework for the transport system and customer mobility in NSW, which are divulged for Regional NSW and Greater Sydney. It will guide transport investment over the longer term delivered through a series of services and infrastructure plans and other supporting plans.

The strategic location of affordable housing and private residential units above Waterloo metro station delivers economic benefits for Sydney by enhancing connectivity between businesses, dwellings and people. The proposal provides an opportunity to boost the city's productivity by allowing residents to access jobs faster and more reliably. The Central Precinct boasts proximity to future public transport opportunities for site users/visitors, which encourages the use of existing active transport networks to reduce automobile reliance, to decrease congestion and to reduce environmental impacts.

5.5. STATE INFRASTRUCTURE STRATEGY 2018-2038

The *NSW State Infrastructure Strategy 2018 - 2038* sets out the NSW Government's vision for infrastructure over the next 20 years, focussing on aligning investment with sustainable growth. For metropolitan NSW, the primary goal is to provide residents with access to jobs and services within 30 minutes, known as the '30-minute city' model.

The Strategy sets out six directions for infrastructure in NSW, of which the following are relevant:

Better integrating land use and infrastructure

The proposal will deliver additional jobs and residential dwellings in coordination with the new metro station beneath so that capital investment keeps pace with new employment and housing demands.

Delivering infrastructure to maximise value for money

The development directly assists in the timely delivery of the new metro station and in achieving the priority to provide infrastructure projects on-time and on-budget. Through the provision of bicycle storage facilities

and the provision of minimal residents' car parking, the proposal will assist in promoting the use of the existing walking and cycling network, as well as the heavy and light rail metro network.

Optimising asset management

The proposal has been designed with consideration of the life cycle of the asset so that the integrated station and OSD solution is 'future-proofed', and that the life, availability and use of railway infrastructure on the site are appropriately safeguarded.

Making our infrastructure more resilient

The proposal has been designed having regard to flooding and other environmental considerations, to ensure that the development is not vulnerable to hazards.

Using innovative service delivery models

The proposal brings together the best skills of the private sector in delivering the Waterloo metro station. It represents an innovative approach that supports the NSW Government in funding the cost of this step-change piece of public transport infrastructure and delivering a range of public benefits.

5.6. SUSTAINABLE SYDNEY 2030

Sustainable Sydney 2030 is a long-term plan prepared by the City of Sydney to achieve a green, global and connected city. It contains ten strategic directions, of which the following are relevant and will be delivered by the proposal:

- A globally competitive and innovative city;
- Integrated transport for a connected city;
- A city for walking and cycling;
- A lively and engaging city centre; and
- Housing for a diverse community.

The proposal will facilitate the delivery of the Waterloo metro infrastructure and additional housing in a highly accessible city centre, encouraging walking and cycling. Specifically, the proposal will address the three key pillars of Sustainable Sydney 2030 as follows:

Green

> *The city's places and spaces will support the community's resilience to social, economic and environmental changes, including changing climate.*
>
> *Excellence in the design of the city's places, spaces and buildings will attract people, encourage them to stay and make high density places healthy and enjoyable.*

Comment: The detailed SSDA will help to realise the vision for a greener global city that will improve the places, spaces and buildings serving the greater community and the residents that it serves by providing an energy-efficient building, providing residents with access to public transport with minimal private car parking spaces and the location allows residents to walk and cycle to places of interest including Alexandria Park and nearby cultural and entertainment hubs.

Global

> *The Council seeks to ensure that "Sydney will remain Australia's most significant global city, home to globally aware people, jobs and businesses and an international gateway with world-class tourism attractions and sustained investment in cultural infrastructure, icons, amenities and public spaces."*
>
> *In economic orientation and partnerships, an open-minded outlook, and a diverse community.*

Comment: The delivery of the Waterloo metro and the OSD development as proposed in the detailed Central Precinct SSDA will help to realise the Council vision, in which the partnership between the NSW Government and private developers, such as Sydney Metro and the WL Developer Pty Ltd in collaboration will help to deliver the infrastructure and housing to serve a diverse and growing community.

Connected

The Council vision for connectedness includes:

physically by walking, cycling and high-quality public transport, through culture, place and social wellbeing, and to those with interest in the city.

Comment: The detailed SSDA will help to realise the Council vision for a more connected city with the delivery of high-quality public transport and housing integrated within one development that will promote the place, social well-being and opportunities to access services, and places by walking or cycling.

5.7. DEVELOPMENT NEAR RAIL CORRIDORS AND BUSY ROADS – INTERIM GUIDELINE

The *Development Near Rail Corridors and Busy Roads – interim guideline* assists in the planning, design and assessment of development which is in or adjacent to rail corridors and busy roads. The application of the guideline shares a close relationship with the *State Environmental Planning Policy (Infrastructure) 2007* (**Infrastructure SEPP**), supporting specific rail and road provisions contained within.

The guidelines relates to development impacted by rail corridors and busy roads, in terms of noise and vibration and air quality, as well as the potential impact of adjacent development on roads and railways, with regards to safety and design issues and excavation, earthworks and other construction-related issues. The Waterloo Station OSD proposal capitalises on concentrating residential dwellings within easy walking distance above the future Waterloo metro station, thus improving access and opportunities for increased rail patronage.

The guideline is also required to be considered for residential amenity in Section 3L of the Waterloo Metro Quarter Design and Amenity Guideline for closed windows

A Noise and Vibration Assessment Report (**Noise Report**) prepared by Stantec (Australia) Pty Ltd is attached at **Appendix K**, which assess the required maximum apartment internal noise levels prescribed by the Interim Guideline and the application of clause 102 of the Infrastructure SEPP. The Noise Report also recommend mitigation measures to comply with the noise criteria.

The Noise Report concluded that glazing for the residential spaces has been designed to achieve internal noise levels in accordance with the requirements of this Interim Guideline. An open windows assessment has been conducted in accordance with the requirements of the Interim Guideline and alternative means of ventilation for noise affected apartments were also recommended.

The Report also assess vibration criteria to the Sydney Metro Infrastructure and concluded that there is not expected to be any exceedance in the vibration criteria with regards to human comfort and structural damage.

Noise and vibration is further discussed in Section 8.7.

A Transportation Air Quality Assessment has been prepared by RWDI Anemos Ltd and is attached at **Appendix W**. Roadway emissions were assessed and it was found that compliance is achieved at the kerb of Botany Road (the worst-case of the surrounding roadways) for carbon monoxide (CO), nitrogen dioxide (NO2), and inhalable particulate matter (PM10) under the proposed peak hour traffic volume at mid-block on Botany Road. Therefore, the development is able to comply with air quality as required under the Interim Guideline.

Air quality assessment is further discussed in Section 8.8.

5.8. GUIDE TO TRAFFIC GENERATING DEVELOPMENT, ROADS AND MARITIME SERVICES

The RMS' *Guide to Traffic Generating Development* outlines all aspects of traffic generation considerations relating to developments. The Guide establishes the grounds for traffic impact assessment in terms of daily traffic volumes and peak traffic volumes for residential and retail land uses.

This detailed SSDA is accompanied by a Transport Impact Assessment prepared by ptc. (**Appendix I**), which considers the strategic context of this guideline and the statutory context of the Infrastructure SEPP as the basis for assessment. Traffic generation impacts are also discussed in further detail in Section 8.10.3.

5.9. HERITAGE COUNCIL GUIDELINES

This SSDA is supported by Heritage Impact Statement prepared by Urbis attached at **Appendix H** and a Heritage Interpretation Strategy attached at **Appendix CC**. The heritage assessment report provides a comprehensive assessment of key heritage impacts and establishes the heritage management framework for the development of the site. Heritage impacts are further discussed in Section 8.2.

5.10. BETTER PLACED – AN INTEGRATED DESIGN POLICY FOR THE BUILT ENVIRONMENT OF NEW SOUTH WALES

Better Placed (2017) is an integrated design policy for the built environment, prepared by the Government Architect of NSW, to create a transparent approach to ensure good design outcomes are achieved to deliver desired architecture, public places and environments throughout NSW (September 2017). The policy includes seven applicable objectives:

- Better fit – contextual, local and of its place
- Better performance – sustainable, adaptable and durable
- Better for the community – inclusive, connected and diverse
- Better for people – safe, comfortable and liveable
- Better working – functional, efficient and fit for purpose
- Better value-creating and adding value
- Better look and feel – engaging, inviting and attractive.

The detailed design has been subject to an extensive design review that involved a collaborative, cyclical and iterative process. The final design outcome will accommodate a built form that is sustainable, functional, sensitive to its context and visually distinctive as encouraged by objectives of Better Placed, in line with the modified Concept SSDA.

5.11. CHILD CARE PLANNING GUIDELINES 2017

Under this SSDA development consent is sought for the use and general location of the childcare centre. The fit-out and operational details shall be the subject of a future DA.

Under SEPP Education and Child Care, a consent authority must take into consideration the DPIE *Child Care Planning Guideline 2017* (**the Childcare Guideline**) when assessing a DA for a childcare facility.

Part 3 of the Childcare Guideline includes matters which must be considered by the consent authority when assessing a DA for a childcare facility. Part 4 of the Childcare Guidelines provides the requirements for internal and external areas of Childcare facilities as per the National Quality Framework (**NQF**).

Given this SSDA is only seeking consent for the use and general location childcare centre, detailed assessment against Part 3 and Part 4 of the Childcare Guidelines will be undertaken as part of the future childcare fit-out DA.

Notwithstanding, Part 3 'Matters for Consideration' and Part 4 *'Applying the National Regulations to development proposals'* has been considered and assessed when designing the podium level floor plate, to ensure a high quality and compliant childcare centre can be accommodated in the future.

High level compliance check has been undertaken and is summarised in Table 10 and Table 11 in Section 6.10. A preliminary amenity compliance assessment has also been undertaken by Dr Brenda Abbey - a childcare specialist to demonstrate that the childcare centre is able to comply with the Guideline (attached at **Appendix RR).**

5.12. CITY OF SYDNEY DEVELOPMENT CONTRIBUTIONS PLAN 2015

The OSD is subject to the City of Sydney Council's contributions requirements under the *City of Sydney Development Contributions Plan 2015* (**Construction Plan 2015**). The levy aims to assist the funding of public facilities such as facilities, amenities and services required to meet the needs of an increasing workforce population.

As per the terms of the Contributions Plan 2015, development contributions are not payable for the delivery of social or affordable housing. The balance of the proposed development will be the subject of development contributions payable by either monetary contribution or works provided in kind.

In accordance with the Concept Conditions of Consent and SLEP 2012, public benefits will be delivered to the satisfaction of the Secretary.

5.13. CITY OF SYDNEY LOCAL STRATEGIC PLANNING STATEMENT

City Plan 2036 is the draft Local Strategic Planning Statement (**LSPS**) for the City of Sydney and links the state and local strategic plans with the planning controls to guide future development and the Local Environmental Plan review. The City Plan sets 13 priorities to achieve the City's Green, Global, Connected vision and guide future changes to the City's planning controls, of which the following are notably relevant:

1. Movement for walkable neighbourhoods and a connected city

The proposed development is co-located with the Waterloo Metro and will directly facilitate the development of a place-base infrastructure service which encourages active transit methods such as walking and cycling and the Waterloo metro station.

By locating additional affordable housing and private residential units above Waterloo metro station, the proposal contributes to the vision for a 30-minute city. Further, the proposal is considered sustainable as it increases the proportion of trips by public transport, walking and cycling trips to reduce emissions and heath.

6. New homes for a diverse community

The proposed affordable housing and private residential units within the development is providing high-quality, diverse dwellings within a highly accessible location. The mixed tenant scheme delivers more diverse tenure options for residents within Sydney, designed to suit the evolving needs of incoming residents who value additional communal facilities that meet changing needs. The childcare facility provides greater opportunities for early child education closer to work and home.

6. STATUTORY CONTEXT

As outlined in the SEARs, the statutory provisions contained in the planning instruments listed below have been addressed for the Detailed SSDA:

- *Environmental Planning and Assessment Act 1979*
- *State Environmental Planning Policy (State and Regional Development) 2011*
- *Biodiversity Conservation Act 2016*
- *State Environmental Planning Policy (Infrastructure) 2007*
- *State Environmental Planning Policy No. 55 – Remediation of Land*
- *State Environmental Planning Policy No. 64 – Advertising and Signage*
- *State Environmental Planning Policy No. 65 – Design Quality of Residential and Apartment Design Guide (SEPP 65)*
- *State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004*
- *State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017*
- *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005*
- *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017*
- *Draft State Environmental Planning Policy (Environment)*
- *Draft State Environmental Planning Policy (Remediation of Land)*
- *Sydney Local Environmental Plan 2012*
- *Sydney Development Control Plan 2012*

The proposals compliance with the relevant statutory provisions is outlined in the following sections.

6.1. ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Pursuant to Section 4.36(2) of the *Environmental Planning and Assessment Act 1979* (**EP&A Act**):

> *(2) A State environmental planning policy may declare any development, or any class or description of development, to be State significant development*

The proposal is classified as SSD as detailed in Section 6.3 below.

In accordance with Section 4.5 of the EP&A Act, the Independent Planning Commission is designated as the consent authority if there is a Council objection to the DA or there are more than 25 submissions, unless otherwise declared by the Minister as a State Significant Infrastructure related development.

Unless otherwise declared, the Minister will be the consent authority for the detailed SSDA (refer Clause 8A of the SRD SEPP and Instrument of Delegation dated 11 October 2018).

Table 6 below provides an assessment of the proposal against the objectives contained within Section 1.3 of the EP&A Act.

Table 6 Objectives of the EP&A Act

Objectives	**Comment / Response**
To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	The proposal promotes the social and economic welfare of the community and a better environment through the delivery of an integrated transport-oriented development above the Waterloo metro station.

Objectives	Comment / Response
To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about the environmental planning and assessment.	The ESD commitments are consistent with those included within the Concept DA This detailed proposal is committed to achieving high standards of ecologically sustainable development as outlined in the ESD Report in **Appendix M**. ESD measures are also discussed in Section 8.5 of the EIS.
To promote the orderly and economic use and development of land.	The proposal promotes the orderly and economic development of the land by providing residential accommodation, non-residential retail and community uses, and vibrant public domain within an OSD development.
To promote the delivery and maintenance of affordable housing.	The proposal will deliver 24 affordable housing units which promotes the delivery of affordable housing in Waterloo.
To protect the environment, including the conservation of threatened and other species of native animals and plants, ecologically communities and their habitats.	The OSD is located within an established urban environment. A BDAR waiver has been issued from the DPIE which determined the proposal will have no impact on threatened species or their habitats (**Appendix V**).
To promote sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	The proposal respects the significance of surrounding built heritage, including the Waterloo Congregational Church as supported by the Heritage Impact Assessment (**Appendix H**). A detailed assessment of the heritage impacts of the proposal is provided within Section 8.2 of the EIS.
To promote good design and amenity of the built environment.	The detailed design of the OSD exhibits design excellence and mitigates adverse amenity impacts. The endorsed Design Excellence Strategy to which the building responds to is attached at **Appendix G** and discussed in further detail in Section 8.1 of the EIS.
To promote proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Construction impact assessment and management are discussed in Section 8.11 of the EIS. A Construction Environmental Management Plan is attached at **Appendix Q**.
To promote the sharing of responsibility for environmental planning and assessment between different levels of government in the State.	Relevant Government agencies have been consulted throughout the concept and detailed design processes. It is noted that the Minister for Planning and Public Spaces is the consent authority for SSDAs.

Objectives	Comment / Response
To provide increased opportunity for community participation in environmental planning and assessment.	An inclusive public consultation strategy has been implemented throughout the project design process (refer to Section 7 of the EIS and **Appendix U**)

Overall, the proposed development is consistent with the objects and general terms of the EP&A Act.

6.2. BIODIVERSITY CONSERVATION ACT 2016

The purpose of the *Biodiversity Conservation Act 2016* (**BC Act)** is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and in the future, consistent with the principles of ecologically sustainable development.'

In accordance with Clause 7.9 of the BC Act*,* any State Significant Development Application is to be accompanied by a Biodiversity Development Assessment Report (**BDAR**) unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity value.

A request seeking a waiver for the requirement for a BDAR was submitted to the NSW DPIE on 9 July 2020. This was accompanied by an assessment of the proposal development against the relevant provisions of the *BC Act* and the *Biodiversity Conservation Regulation 2017.* The assessment determined the proposal is unlikely to have a significant impact on the eight biodiversity values as defined in Section 1.5 of the BC Act and clause 1.4 and clause 6.1 of the *Biodiversity Conservation Regulation 2017.* Accordingly, a request to waive the requirement for a BDAR was made.

The NSW DPIE granted a waiver on 28th July 2020 under Clause 7.9(2) of the BC Act, concluding that:

> *I have reviewed your requests having regard to sections 1.5 and 7.3 of the BC Act and clause 1.4 of the Biodiversity Conservation Regulation 2017, and have determined that the proposed development (SSD 10437, SSD 10438, SSD 10439, SSD 10440 and SSD 10441), as described in your waiver requests, is not likely to have any significant impacts on biodiversity values.*
>
> *The delegated Environment Agency Head in the Office of Environment and Heritage has also determined that the proposed development is not likely to have any significant impacts on biodiversity values in a letter dated 24 July 2020 and a copy is attached.*
>
> *Therefore, a waiver under section 7.9(2) of the BC Act is granted for the proposed development at the Waterloo Metro Quarter site and a BDAR is not required to accompany the associated SSD applications.*

Overall, the proposal will not have any likely impact on the surrounding natural environment and abundance of species, habitat connectivity, threatened species movement and flight paths of protected animals, nor will it impact upon water quality surrounding the site (sustainability) and the site does not contain abundant vegetation.

6.3. STATE ENVIRONMENTAL PLANNING POLICY (STATE AND REGIONAL DEVELOPMENT) 2011

The *State Environmental Planning Policy (State and Regional Development) 2011* (**SRD SEPP**) has the purpose of identifying development that is SSD, State Significant Infrastructure (**SSI**) (including critical) and regionally significant development.

The Concept DA was classified as SSD under Section 4.36 of the EP&A Act as the development has a CIV in excess of $30 million, and is for the purpose of residential accommodation associated with railway infrastructure under clause 8(1)(b) of S*tate Environmental Planning Policy (State and Regional Development) 2011* (**SRD SEPP**).

In accordance with clause 12 of the SRD SEPP, subsequent detailed DAs under the Concept DA are considered SSD regardless of CIV, as follows:

> *12 Concept development applications*

If—

a) development is specified in Schedule 1 or 2 to this Policy by reference to a minimum capital investment value, other minimum size or other aspect of the development, and

b) development the subject of a concept development application under Part 4 of the Act is development so specified,

any part of the development that is the subject of a separate development application is development specified in the relevant Schedule (whether or not that part of the development exceeds the minimum value or size or other aspect specified in the Schedule for such development).

Accordingly, all subsequent detailed DAs to be sought for the Sydney Metro Waterloo Quarter site are considered SSD. For clarity this includes applications for the following:

1. Early Site Works
2. Southern Precinct – Cope Street Plaza; Social Housing; Student Accommodation; Gym; Retail Premises
3. Central Precinct – Community Facilities; Affordable Housing; Market Housing; Retail Premises
4. Basement – to support the Northern Precinct and Central Precinct
5. Northern Precinct – Commercial Office; Retail Premises

6.4. STATE ENVIRONMENTAL PLANNING POLICY (INFRASTRUCTURE) 2007

The aim of *State Environmental Planning Policy (Infrastructure) 2007 (**Infrastructure SEPP**)* is to facilitate the effective delivery of infrastructure across NSW, by identifying matters to be considered in the assessment of development adjacent to particular types of infrastructure such a classified roads and prescribing consultation requirements for certain development.

The relevant provisions of the Infrastructure SEPP in relation to the proposed development are considered in the following table.

Table 7 Relevant Provisions of the Infrastructure SEPP

Clause	Response	Referral Agency
Part 3, Division 5 Electricity transmission or distribution, Subdivision 2 Development likely to affect an electricity transmission or distribution networks	The application is subject to clause 45 of Infrastructure SEPP as the development is expected to affect an electrical transmission or distribution network. Existing Ausgrid infrastructure has been confirmed to be sufficient to supply for the OSD. However, additional connections will be required. Early consultation has occurred between the applicant and Ausgrid to determine an appropriate location, as described in **Appendix U**.	Ausgrid
Part 3, Division 15 Railways, Subdivision 2 Development in Rail corridors	The proposed development is on land adjacent to a rail corridor, and as such pursuant to clause 85 of the Infrastructure SEPP. DPIE will refer this application to the relevant rail authority for the rail corridor. As the proposal relates to the Sydney Metro City & Southwest Corridor, it will be	TfNSW

Clause	Response	Referral Agency
	referred to TfNSW for comment as part of the SSDA exhibition process.	
Part 3, Division 17 Roads and traffic, Subdivision 2 Development in or adjacent to road corridors and road reservations Clause 102 Impact of road noise or vibration on non-road development	A Noise and Vibration Assessment Report prepared by Stantec (Australia) Pty Ltd is attached at **Appendix K**, which assess the required maximum apartment internal noise levels prescribed under this clause and recommend mitigation measures to comply with the noise criteria. The Report concluded that glazing for the residential spaces has been designed to achieve internal noise levels in accordance with the requirements of this clause. An open windows assessment has been conducted in accordance with the requirements of the clause. Alternative means of ventilation for noise affected apartments were also recommended and have been incorporated into the design to ensure acoustic amenity within apartments achieves these requirements. Noise and vibration is further discussed in Section 8.7.	No referral is required, noise impact from busy road has been considered. Refer to Section 8.7 and Nosie and Vibration Impact Assessment Report attached at **Appendix K**.
Part 3, Division 17 Roads and traffic, Subdivision 2 Development in or adjacent to road corridors and road reservations Clause 104 Traffic- Generating development and Schedule 3 Traffic-generating development to be referred to Roads and Maritime Services	The proposed development will create 150 residential dwellings with access to Botany Road, which is a classified State Road. Therefore, the proposal is a traffic Generating Development and is required to be referred to TfNSW (Roads Division) or consideration. TfNSW will be notified as an agency as part of the SSDA exhibition process.	TfNSW

6.5. STATE ENVIRONMENTAL PLANNING POLICY NO 55—REMEDIATION OF LAND AND DRAFT REMEDIATION OF LAND SEPP

State Environmental Planning Policy No.55 – Remediation of Land (**SEPP 55**) provides a State-wide approach to the remediation of contaminated land, and primarily promotes the remediation of contaminated land for the purpose of reducing the risk of harm to human health.

Remediation works for the site have been undertaken as part of the CSSI approval to make the site suitable for a metro station. However, Douglas Partners have prepared a Contamination Site Strategy to ensure that the site can be made suitable for the proposed OSD uses. Within the Central Precinct this includes residential and non-residential uses (retail and community uses) and public domain spaces.

It is noted that the Central Precinct is built over the Basement, which is the subject of a separate detailed SSDA (SSD-10438) and has been submitted concurrently with this application that addresses any contamination and remediation requirements for the Central Precinct.

6.6. STATE ENVIRONMENTAL PLANNING POLICY NO. 64 – ADVERTISING AND SIGNAGE

State Environmental Planning Policy No.64 – Signage (**SEPP 64**) sets out planning controls for advertising and signage in NSW. The SEPP requires signage to be compatible with the future character of an area, provide effective communication in suitable locations, and be of high-quality design and finish.

Clause 8 and clause 13 of SEPP 64 prevent development consent from being granted to signage unless the consent authority is satisfied that it is consistent with the objectives of SEPP 64 and has satisfied the assessment criteria specified in its Schedule 1.

The scope of the detailed SSDA seeks consent for signage zones/locations for the proposed retail tenancies and site identification signs for residential and childcare lobby entries.

As shown on the Architectural Plans attached at **Appendix D** and discussed in Section 4.8, signage zones have been included on the ground floor of the northern, southern, eastern and western (Botany Road) elevations. The detailed design and location of the sign within the signage zone are subject to future applications.

An assessment of the indicative signage zone in accordance with SEPP 64 is included below.

Table 8 SEPP 64 Compliance Table

Control	Proposal	Compliance
3 – POLICY AIMS AND OBJECTIVES		
Clause 3(1)(a) – to ensure that signage: ▪ Is compatible with the desired amenity and visual character of an area; ▪ Provides effective communication in suitable locations; and ▪ Is of high-quality design and finish	The detailed design of the signage will be subject to separate applications. The proposed signage zone on the northern, southern, eastern and western (Botany Road) elevations have been designed to integrate with the architectural design of the facades.	Subject to detailed design.
SCHEDULE 1 – ASSESSMENT CRITERIA		
1 – Character of the Area		
Is the proposal compatible with the existing or desired future character of the area or locality in which it is proposed to be located?	The proposed signage zone on the northern, southern, eastern and western (Botany Road) elevations have been designed to integrate with the architectural design of the facades.	Subject to detailed design.
Is the proposal consistent with a particular theme for outdoor advertising in the area or locality?	No advertising is proposed as part of the development. The signage zone is consistent with other developments within the Waterloo area.	Yes
2 – Special Areas		
Does the proposal detract from the amenity or visual quality of any	While the detailed design of the signage will be subject to separate applications, the	Yes

Control	Proposal	Compliance
environmentally sensitive areas, heritage areas, natural or other conservation areas, open space areas, waterways, rural landscapes or residential areas?	proposed signage zone on Botany Road has considered the architecture of the building, while responds to the scale and character of adjacent heritage items including the Congregational Church. It should be noted that the signage proposed near the south eastern corner of the building is separated by the Church Square laneway and will not impact the heritage value of the Church.	
3 – Views and Vistas		
Does the proposal obscure or compromise important views?	The proposed signage is contained wholly within the building façades. As such, the proposed signage will not adversely impact important views or view corridors.	Yes
Does the proposal dominate the skyline and reduce the quality of vistas?	The proposed signage is contained wholly on the building façades and therefore will not dominate the skyline or reduce the quality of vistas.	Yes
Does the proposal respect the viewing rights of other advertisers?	Not applicable.	N/A
4 – Streetscape, Setting or Landscape		
Is the scale, proportion and form of the proposal appropriate for the streetscape, setting or landscape?	The proposed signage is contained wholly within the building façades.	Yes
Does the proposal contribute to the visual interest of the streetscape, setting or landscape?	The proposed signage zone on the northern, southern, eastern and western (Botany Road) elevations have been designed to integrate with the architectural design of the facades.	Subject to detailed design.
Does the proposal reduce clutter by rationalising and simplifying existing advertising?	There are no existing advertising signs on the site.	N/A
Does the proposal screen unsightliness?	Not applicable.	N/A
Does the proposal protrude above buildings, structures or tree canopies in the area or locality?	The proposed signage is contained wholly on the building façades and does not protrude above the building or structures.	Yes
Does the proposal require ongoing vegetation management?	No.	N/A
5 – Site and Building		

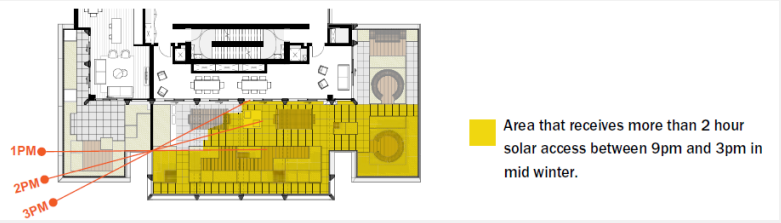
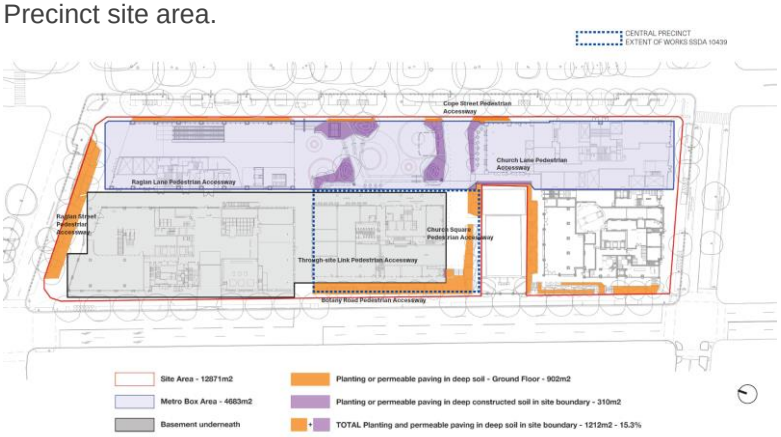
Control	Proposal	Compliance
Is the proposal compatible with the scale, proportion and other characteristics of the site or building, or both, on which the proposed signage is to be located?	The proposed signage has been nominated by the design architect of the proposed building.	Yes
Does the proposal respect important features of the site or building, or both?	The proportion of the proposed signage aligns with the height of façade articulation.	Yes
Does the proposal show innovation and imagination in its relationship to the site or building, or both?	The proposed signage has been considered in the context of the building, achieving design excellence and its role in identifying the site and future retail use within the WQM development.	Yes
Associated devices and logos with advertisements and advertising structures ▪ Have any safety devices, platforms, lighting devices or logos been designed as an integral part of the signage or structure on which it is to be displayed?	The detailed design of the signage will be subject to separate applications.	
7 – Illumination		
▪ Would illumination result in unacceptable glare? ▪ Would illumination affect safety for pedestrians, vehicles or aircraft? ▪ Would illumination detract from the amenity of any residence or other form of accommodation? ▪ Can the intensity of the illumination be adjusted, if necessary? ▪ Is the illumination subject to a curfew?	The detailed design of the signage will be subject to separate applications.	
8 – Safety		
Would the proposal reduce the safety for any public road?	The proposed signage zones located on the Botany Road façade will have a limited impact on the public road, pedestrians, or cyclists.	Yes
Would the proposal reduce the safety for pedestrians or bicyclists?		
Would the proposal reduce the safety for pedestrians, particularly children, by obscuring sightlines from public areas?		

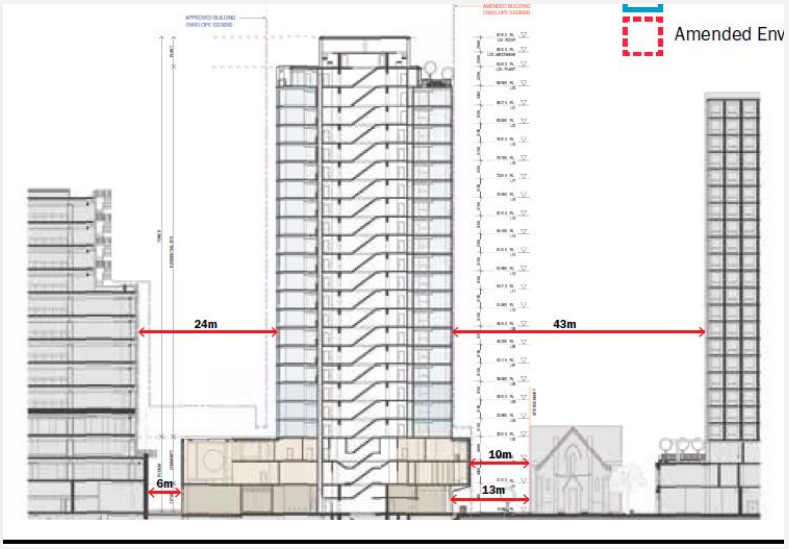
6.7. STATE ENVIRONMENTAL PLANNING POLICY NO. 65 – DESIGN QUALITY OF RESIDENTIAL APARTMENT DEVELOPMENT AND APARTMENT DESIGN GUIDE

State Environmental Planning Policy No 65 (Design Quality of Residential Apartment Development) **(SEPP 65**) applies to development for the purposes of a building that comprises three or more storeys and four or more self-contained dwellings.

Hassell have provided a response to the nine Design Quality Principles and provided detailed SEPP 65 assessment within the Design Report (refer to **Appendix F**). Detailed amenity diagrams, including solar and ventilation are also included in the report. The following table provides an overview of SEPP 65 assessment of the proposed apartments (including affordable housing units) against the key controls of the Apartment Design Guide (**ADG**).

Table 9 Apartment Design Guide Key Numeric Requirements

ADG Criteria	Proposed	Compliance
Communal open space 25% of site area Achieve a minimum of 50% direct sunlight to the principal usable part of the communal open space for a minimum of 2 hours between 9 am and 3 pm on 21 June (mid-winter)	185sqm of rooftop communal open space is proposed = 7.5% site area. Refer to Section 6.7.1 for justification. At least 60% of the rooftop communal open space receives more than 2 hours solar access between 9pm and 3pm in mid-winter (21 June). Detailed solar access study is included in the Design Report attached at **Appendix F.** 	Non-compliant. Refer to Section 6.7.1 for justification. Complies
Deep soil 7% of site area and minimum 3m wide	The overall WQM site achieves 1,212sqm of deep soil landscaping, which equates to 15.3% of the overall WQM site area (excluding the station box area). Of these landscaping areas, 269sqm is provide within the Central Precinct, which equates to 9.9% of the Central Precinct site area. 	Complies

ADG Criteria	Proposed	Compliance
Building separation Up to 12m (4 storeys): Habitable room: 6m Non habitable room: 3m Up to 25m (5-8 storeys) Habitable room: 9m Non habitable room: 4.5m	The residential tower is setback 24m to the commercial building to the north. 13m to the Church and 43m to the affordable housing building to the south. Therefore, the building is compliant with the separation requirement. The facade design of the northern elevation further considers visual privacy to the commercial building. Windows are located towards the east and west to direct views away from the commercial building while solid portion of the facade blocks views into the residential apartments. 	Complies
Solar access Living rooms and private open spaces of at least 70% of apartments in a building receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at mid-winter.	It is important to note that the site is constrained by the existing Botany Road alignment. The site boundary is orientated 17.04 degrees off the north point. The building envelope and site wide precinct grid are in alignment to the western property boundary which results in the building orientation being approximately 17 degrees off north. It is critical for building massing to follow the alignment of the site-wide precinct to ensure alignment in the public realm (footpaths, awnings etc), basement structure and Sydney Metro Station and associated infrastructure. While this alignment is necessary for a co-ordinated delivery of the OSD on the site, this orientation has become a site constraint when designing the apartments to comply with solar access design criteria within the ADG standard hour (9am to 3pm), especially for the western facing apartments. 57% of apartments (85 apartments) receive more than two hours of direct sunlight to living room and balcony between 9am and 3pm in mid-winter. It is also important to note that 65% (97 apartments) of apartments receive sufficient sunlight to living space windows between 9:00 am and 3:00 pm, and 59% (89 apartments) of apartments receive sufficient sunlight to balcony between 9:00 am and 3:00 pm.	Technical non-compliance Refer to Section 8.4.1.

ADG Criteria	Proposed	Compliance
	As discussed above, the afternoon sun in mid-winter is approximately 17 degrees off north and due to the orientation of the site, this precludes the possibility of solar access to windows and or private open space for the western aspect apartments in mid-winter at 1:00 pm. Due to site orientation constraint, by extending the solar period for 30min, an additional 35 western facing apartments will receive 2 hours of direct sunlight in between 1:30pm and 3:30pm. This results in 80% of apartments overall (120 apartments) receiving more than two hours of direct sunlight to living room and balcony between 9am and 3.30pm mid-winter. While this requires an extended solar access window, extending the solar access window results in an exceedance of the ADG requirement of 70%. Due to the orientation of the site, the proposal is unable to comply with solar access within the prescribed hours of the ADG design criteria. However, apartments have been designed to receive 2 hours of direct sunlight 30 minutes outside the ADG requirement (afternoon sun), which is a reasonable period where residents will use the living area and balcony areas to enjoy sunlight. Despite the non-compliance, the proposal is in accordance with solar access objective of the ADG which are to maximise solar access within future apartments. Further, only 12.7% of apartments within the building receive no direct sunlight between 9am and 3pm in mid-winter, which is compliant with the ADG design criteria. It is also noted that all apartments within the Central Building will receive direct sunlight to living space windows and private open space between 9am and 4pm in mid-winter. Therefore, the development is considered to enjoy a reasonable level of solar access and be in accordance with the intent of the ADG and as such provides a satisfactory level of amenity for future residents. Detailed solar access study is included in the Design Report attached at **Appendix F.** A Solar Access Report has been prepared by RWDI Anemos Ltd and is submitted at **Appendix NN.** Solar access is further discussed in Section 8.4.1.	
No solar A maximum of 15% of apartments in a building receive no direct sunlight between 9 am	12.7% of apartments receive no direct solar between 9am and 3pm. Detailed solar access study is included in the Design Report attached at **Appendix F.**	Complies

ADG Criteria	Proposed	Compliance
and 3 pm at mid-winter		
Cross ventilation At least 60% of apartments are naturally cross ventilated	36 of the 48 apartments (75%) on levels 3 to 8 are noise affected apartments due to their frontage to Botany Road. 30 of these apartments are also noted as having the design provisions (opposite or adjacent openings) to enable natural cross ventilation to be provided. Given that 36 apartments are noise affected apartments, where natural ventilation could not be achieved, alternative measures have been incorporated to enable these apartments to achieve natural ventilation and the internal noise criteria. The alternative mean is the provision of acoustic ventilators to meet the internal noise limits and achieve natural ventilation. The details of the acoustic plenum are provided in the Noise and Vibration Report (attached at **Appendix K**) and discussed in Section 8.7. This alternative measure is supported by the ADG, as section 4J of the ADG states that for apartments facing busy road and achieving the design criteria in the ADG may not be possible due to noise and pollution, alternatives may be considered for natural cross ventilation. As a result of incorporating the plenum, 75% (36/48) of the residential apartments on levels 3 to 8 are considered to be naturally cross ventilated, achieving the objectives of ADG control by incorporating an alternative design solution. In addition, due to the Botany Road frontage 76 the west facing apartments on levels 9 to 21 are also provided with plenums to achieve noise criteria and natural ventilation. Natural ventilation is further discussed in Section 8.4.3 and the Natural Cross Ventilation Report attached at **Appendix PP.**	Complies
Ceiling heights Habitable rooms 2.7m Non-habitable 2.4m	Habitable rooms to all apartments within the proposed development exceed the 2.7m ceiling height requirement.	Complies
Apartment sizes 1 bedroom 50sqm 2 bedroom 70sqm 3 bedroom 90sqm	Apartments have been designed to comply or exceeds the minimum area required. The range of apartment sizes are outlined below: ▪ 1 Bedroom $50m^2$ - $58m^2$ ▪ 2 Bedroom $76m^2$ - $90m^2$ ▪ 3 Bedroom $102m^2$ - $124m^2$	Complies

ADG Criteria	Proposed	Compliance
Private open space 1 bedroom apartments: 8sqm, width 2m 2 bedroom apartments: 10sqm width 2m 3+ bedroom apartments: 12sqm, width 2.4m	All apartments are provided with balconies that adjoins living spaces, which complies or exceeds the minimum depth and size required. Four 3-bedroom apartments on levels 20 and 21 are provided with a smaller 4sqm balcony and a bigger 10sqm balcony, which cumulatively exceeds the AGD requirement for private open space. Where minimum depth is not achieved (at the smaller balcony), functionality of the balcony is carefully considered, and an additional balcony area is provided. Overall these units are provided with a total of 14sqm of private open space and is consistent with the objective of the guideline.	Minor minimum depth non-compliance for the smaller 3-bedroom balconies. Overall these units are provided with a total of 14sqm of private open space and is consistent with the objective of the guideline.
Common circulation The maximum number of apartments off a circulation core on a single level is eight	All levels have 8 apartments or less per level.	Complies
Storage 1 bedroom apartments: 6sqm 2 bedroom apartments: 8sqm 3+ bedroom apartments:10sqm	Adequate storage is provided internally of the apartment units and provided by the secured storage located in the basement. Refer to storage schedule included in the Design Report attached at **Appendix F.**	Complies

As demonstrated above, the proposed residential units accords with the key requirements of the ADG.

Technical non-compliance with solar access is addressed in Section 8.4.1.

The non-compliances with regards to communal open space is discussed in detail below.

6.7.1. Communal Open Space

The ADG requires a minimum 25% of the site area to be provided as communal open space. The proposal provides 185sqm of outdoor communal open space which equates to 7.5% of the site area. Communal open space is provided in the form of an outdoor rooftop terrace on level 22.

It should be noted that for the purposes of this calculation, the applicable site area of Central Building is 2,460sqm, which excludes the public domain area including Church Square.

Whilst the proposed development seeks a departure from the requirement for a communal area equal to 25% of the site, the proposal achieves the objective of the control which is to:

> *Objective 3D-1 An adequate area of communal open space is provided to enhance residential amenity and to provide opportunities for landscaping*

The proposed location and quantity of communal open space is considered appropriate on merit for the following reasons:

- It is located on Level 22 and benefits from excellent solar access and view amenity.
- It provides direct and accessible access for all residents, including affordable housing residents from a common circulation area.
- The communal terrace will provide shade and space for undercover activities, landscaped planters and a community garden.
- Within the immediate vicinity of the proposed building, residents have access to high quality public spaces and amenities both within the WMQ site and surrounding neighbourhood.

Consideration has been given to the design guidance provided in the ADG. An assessment of the proposal against these design guidelines is provided below.

Table 10 ADG Design Guidance – Communal Open Space

Design Guidance	**Proposed**	**Achieves**
Communal open space should be consolidated into a well-designed, easily identified and usable area	Communal open space has been consolidated into a well-designed, easily identified and usable area on Level 22. A canopy and pergola provide shading and shelter enabling the roof terrace to be used all year round.	✓
Communal open space should have a minimum dimension of 3m, and larger developments should consider greater dimensions	The communal rooftop terrace has a minimum dimension of 3m.	✓
Communal open space should be co-located with deep soil areas.	The communal terrace is located on the level 22 rooftop. Due to the rooftop location it is difficult to comply with the deep soil landscaping requirements. Notwithstanding this, a comprehensive landscape strategy for the rooftop terrace has been prepared and submitted at **Appendix JJ.**	✓
Direct, equitable access should be provided to communal open space areas from common circulation areas, entries and lobbies	The rooftop terrace is accessible via the primary lift core and provides direct and accessible pedestrian access from all levels of the building, including affordable housing residents.	✓
Where communal open space cannot be provided at ground level, it should be provided on a podium or roof.	Careful consideration has been given to the location of the outdoor communal open space. Given the delivery of Church Square, there is no opportunity to provide communal open space at ground level. The podium levels are designed to accommodate a	✓

Design Guidance	Proposed	Achieves
	childcare centre, which is required to have its own outdoor/simulated outdoor play space. Accordingly, the communal open space has been located on the rooftop in accordance with the ADG design guidance, which provides better amenity for residents in terms of solar access, views, visual and acoustic privacy.	
Where developments are unable to achieve the design criteria, such as on small lots, sites within business zones, or in a dense urban area, they should: • provide communal spaces elsewhere such as a landscaped roof top terrace or a common room • provide larger balconies or increased private open space for apartments • demonstrate good proximity to public open space and facilities and/or provide contributions to public open space	A landscaped roof terrace has been provided in accordance with the above design guidance. All apartments have access to private open space in the form of a balcony, which either meets or exceeds the minimum private open space requirements of the ADG. The site is also located in close proximity to a number of high-quality open space areas including Alexandria Park. Residents will also have access to Cope Street Plaza, which directly adjoins the Central Building and provides high-quality open space for enjoyment by local residents. Large terraces are also provided for the penthouse units on level 22.	✓

Accordingly, for the reasons outlined above the proposal communal open space area is considered appropriate on merit having regards to the WMQ site context and the additional public open space area on the ground floor.

6.8. STATE ENVIRONMENTAL PLANNING POLICY (AFFORDABLE RENTAL HOUSING)

The *State Environmental Planning Policy (Affordable Rental Housing) 2009* **(ARH SEPP)** aims to facilitate the delivery of new affordable housing through incentives such as expanded zoning permissibility and floor space ratio bonuses. The ARHSEPP applies to in-fill affordable housing, secondary dwellings, boarding houses and supportive accommodation.

The proposal provides 24 affordable housing dwellings. Clause 1.9 of the *Sydney Local Environmental Plan 2012* excludes the WMQ from the application of the ARH SEPP. Therefore the proposed affordable housing dwellings are not required to be assessed under ARH SEPP and will be assessed together with market residential apartments under SEPP 65 as discussed in the previous Section 6.7.

6.9. STATE ENVIRONMENTAL PLANNING POLICY (BUILDING SUSTAINABILITY INDEX: BASIX) 2004

The State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 (**BASIX SEPP**) requires all residential development in NSW to achieve a minimum target for energy efficiency, water efficiency and thermal comfort.

The proposed residential units have been assessed in accordance with the relevant requirements, and a formal BASIX Certificate has been issued. Additionally, the BASIX Certificate confirms the achievement of

the project-specific BASIX commitments made in the Concept SSDA. The proposal can satisfy Condition B19 of the Concept DA for achieving more than BASIX 40 for Water and BASIX 30 for Energy.

The certificate confirms that the proposed development achieves the minimum water and thermal performance ratings required. The BASIX Report is attached at **Appendix OO.**

6.10. STATE ENVIRONMENTAL PLANNING POLICY (EDUCATIONAL ESTABLISHMENTS AND CHILD CARE FACILITIES) 2017

The State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017 **(SEPP Education**) aims to ensure that early education and care facilities are established effectively and consistently. It incorporates standardised planning provisions relating to childcare centres, schools, universities and TAFEs.

Under SEPP Education, a consent authority must take into consideration the DPIE *Child Care Planning Guideline 2017* (**the Childcare Guideline**) when assessing a DA for a childcare facility.

Part 3 of the Childcare Guideline includes matters which must be considered by the consent authority when assessing a DA for a childcare facility. Part 4 of the Childcare Guidelines provides the requirements for internal and external areas of Childcare facilities as per the National Quality Framework (**NQF**).

It is noted that the Childcare Guidelines take precedence over the *City of Sydney Development Control Plan* (**DCP**), except for controls relating car parking rates.

Under this SSDA development consent is sought for the use and general location of the childcare centre for 146 children (based on test fit of the proposed floor plan). The fit-out and operational details shall be the subject of a future DA. Detailed assessment against Part 3 and Part 4 of the Childcare Guidelines will be undertaken as part of the future childcare fit-out DA.

Notwithstanding, Part 3 'Matters for Consideration' and Part 4 *'Applying the National Regulations to development proposals'* have been considered when designing the podium level floor plates, to ensure a high quality and compliant childcare centre can be accommodated in the future.

A Preliminary Childcare Compliance Report prepared by Childcare by Dr Brenda Abbey is attached at **Appendix RR.** The report concludes that the proposed Community Childcare Centre meets or will be able to meet the relevant state and council regulatory requirements, including the *Education and Care Services National Regulations 2011 (**National Regulations**).*

High level compliance check has been undertaken and is summarised in Table 10 and Table 11 below.

Table 11 Part 3 - Matters for Consideration

Matters for Consideration	Proposed	Complies
3.1 Site Selection and location:		
Objective: To ensure that appropriate zone considerations are assessed when selecting a site.	The Site is zoned 'B4 Mixed Use'. A 'centre based childcare centre' is permitted with consent in the B4 zone.	Yes
Objective: To ensure that the site selected for a proposed childcare facility is suitable for the use.	The childcare centre is located within a new OSD precinct, comprising additional residential dwelling and commercial developments, which could benefit from the childcare facility. Accordingly, the Site is suitable for a childcare facility.	Yes
Objective: To ensure that sites for childcare facilities are appropriately located.	The childcare will be a complementary land use to the mixed use OSD having access to a new residential community, ease of access to Metro Station, safe access and other local retail and commercial services.	Yes

Matters for Consideration	Proposed	Complies
Objective: To ensure that sites for childcare facilities do not incur risks from environmental, health or safety hazards.	The Site is not located in close proximity to any environmental, health or safety hazards. The adjoining land uses are predominantly residential and commercial and as such to not pose any health or safety risk to the proposed development. The childcare will be on the same site as the Metro Station and Metro Services Box, however, is sufficiently separated from this infrastructure.	Yes
3.2 Local character, streetscape and the public domain interface		
Objective: To ensure that the childcare facility is compatible with the local character and surrounding streetscape.	The childcare centre is located on the podium level and is integrated within a mixed use OSD development. The location of the childcare centre is compatible in relation to proposed land uses, including the future residential development on the level above.	Yes
Objective: To ensure clear delineation between the childcare facility and the public spaces	The childcare facility is located on the podium levels and is not connected to any public space. The childcare centre entry is located on the ground floor and is well defined through architectural design to mark the entry.	Yes
Objective: To ensure that front fences and retaining walls respond to and complement the context and character of the area and do not dominate the public domain.	The childcare centre will be contained within the podium levels, designed to complement the surrounding context.	Yes
3.3 Building orientation, envelope and design		
Objective: To respond to streetscape and site, while optimising solar access and opportunities for shade.	The façade of the podium incorporates large openings to allow sun to penetrate the outdoor play areas in mid-winter and allow views of the sky and surrounding landscape year-round. These are balanced with patterned masonry screens to the periphery to allow dappled light into these zones and fabric shading to reduce summer sun.	Yes
Objective: To ensure that the scale of the childcare facility is compatible with adjoining development and the	The scale of the childcare is consistent with the scale of other development within the WMQ and surrounding Waterloo area. It has been designed to be architecturally integrated with	Yes

Matters for Consideration	Proposed	Complies
impact on adjoining buildings is minimised.	the overall Central Precinct development while also punctuated as a different land use within the playful façade treatment. Noise emissions from the childcare centre are tempered by the extension of the concrete roof over the level 2 outdoor play areas. The podium is separated from the residential tower above and generously setback from the student housing to the south	
Objective: To ensure that setbacks from the boundary of a childcare facility are consistent with the predominant development within the immediate context.	The childcare centre is located within the podium of level of the building and are setback more than 6.5m from Botany Road.	N/A
Objective: To ensure that the build form, articulation and scale of development relates to its context and buildings are well designed to contribute to an area's character	The childcare centre will form an integral part of the mixed use development, providing key community facilities to support the existing and incoming Waterloo community, and be wholly contained in the building envelope.	Yes
Objective: To ensure that buildings are designed to create safe environments for all users.	Security and safety measures will be included in a Plan of Management submitted with a future DA to ensure the safety of staff and children.	Subject to future DA.
Objective: To ensure that childcare facilities are designed to be accessible by all potential users.	Pedestrian access to the childcare centre is accessed via an entrance along Cope Street Plaza and a dedicated lift that services childcare centre. The shared basement car park will provide one dedicated parking space for the childcare centre.	Yes
3.4 Landscaping		
Objective: To provide landscape design that contributes to the streetscape and amenity.	Detailed landscape design will be incorporated as part of the future DA, which will create a unique simulated indoor play area.	Subject to future DA.
3.5 Visual and acoustic privacy		

Matters for Consideration	Proposed	Complies
Objective: To protect the privacy and security of children attending the facility. *Objective: To minimise impacts on privacy of adjoining properties.* *Objective: To minimise the impact of childcare facilities on the acoustic privacy of neighbouring residential developments.*	The location of the childcare centre is separated from residential properties with limited opportunity for overlooking to and from adjoining developments. The Acoustic Report prepared by Stantec (Australia) Pty Ltd has undertaken preliminary noise assessment for the future childcare centre (attached at **Appendix K**). The assessment states that the proposed childcare centre can comply with the unrestricted Association of Australian Acoustical Consultants criteria at nearby sensitive receiver subject to the implementation of the following measures: • Children are to play outside within their group at one time (i.e. 3-5 to play out at once, alone) • No children to play outside after the hours of 6p. These mitigation measures will be incorporated into the Plan of Management for the future Childcare centre. Noise impacts are further discussed in Section 8.7.	Yes Refer to Noise Report attached at **Appendix K**.
3.6 Noise and air pollution		
Objective: To ensure that outside noise levels on the facility are minimised to acceptable levels. *Objective: To ensure air quality is acceptable where childcare facilities are proposed close to external sources of air pollution such as major roads and industrial development.*	Acoustic panels are fixed to the internal walls of planted recesses at the first floor. Concrete blade walls and concrete soffits are proposed within the façade to minimise noise from Botany Road. The site will not be affected by transportation pollution from Botany Road. Transportation Air Quality assessment has been prepared by RWDI Anemos Ltd and is attached at **Appendix W** and air quality assessment is further discussed in Section 8.8.	Yes
3.7 Hours of operation		
Objective: To minimise the impact of the childcare facility on the amenity of neighbouring residential developments.	The proposed childcare facility will operate in accordance with the following hours of operation: • Monday to Friday: from 7am to 7pm. • Saturdays: from 9am to 3pm	Extension of hour is subject to future DA.

Matters for Consideration	Proposed	Complies
C29 of the guidelines states: *Hours of operation within areas where the predominant land use is residential should be confined to the core hours of 7.00am to 7.00pm weekdays. The hours of operation of the proposed childcare facility may be extended if it adjoins or is adjacent to non-residential land uses.* *C30 Within mixed use areas or predominantly commercial areas, the hours of operation for each childcare facility should be assessed with respect to its compatibility.*	• Extended hour may also be sought for Monday to Friday to midnight (subject to demand). This will be further considered as part of the future DA. No children will play in the outdoor area during after hour to minimise acoustic impacts. In accordance with C30, the site is located in a mixed-use area and accordingly has been considered to be compatible with surrounding context.	
3.8 Traffic, parking and pedestrian circulation		
Objective: To provide parking that satisfies the needs of users and demand generated by the centre.	One dedicated space is provided for the childcare centre within the shared basement. This is supported by a Traffic and Parking assessment (attached at **Appendix I)**. It is expected that the Child Care Centre will be used predominately by residential occupants of the development or staff within the commercial offices in the Northern Precinct. Therefore, trips would be undertaken as part of a combined trip, utilising parking already provided within the development or by public transport. Additional parking for drop off or pick up is therefore not required. Staff of the Child Care Centre would also be able to use public transport to access the centre and therefore a zero-parking provision is proposed for staff.	Able to satisfy demand.
Objective: To provide vehicle access from the street in a safe environment that does not disrupt traffic flows.	The childcare centre can be accessed via an entrance fronting Cope Street Plaza, which will be pedestrian only. A lift will service the childcare to the podium level.	Yes
Objective: To provide a safe and connected environment for pedestrians both on and around the site.	The public domain on the ground floor will provide a safe and well-connected environment for pedestrians.	Yes

Table 12 Applying the National Regulations to development proposals

Regulations	Proposed	Complies
4.1 Indoor space requirements		

Regulations	Proposed	Complies
Regulation 107 Every child being educated and cared for within a facility must have a minimum of 3.25m^2 of unencumbered indoor space.	Number of Children: 146 Required Indoor Space: 474.5sqm Provided Indoor Space: 486.6sqm	Yes
4.2 Laundry and hygiene facilities		
Regulation 106 There must be laundry facilities or access to laundry facilities; or other arrangements for dealing with soiled clothing, nappies and linen, including hygienic facilities for storage prior to their disposal or laundering. The laundry and hygienic facilities must be located and maintained in a way that does not pose a risk to children. Childcare facilities must also comply with the requirements for laundry facilities that are contained in the National Construction Code.	The internal fit out of the childcare centre will provide for laundry and hygienic facilities.	Subject to future DA.
4.3 Toilet and hygiene facilities		
Regulation 109 A service must ensure that adequate, developmentally and age appropriate toilet, washing and drying facilities are provided for use by children being educated and cared for by the service; and the location and design of the toilet, washing and drying facilities enable safe use and convenient access by the children. Childcare facilities must comply with the requirements for sanitary facilities that are contained in the National Construction Code.	The internal fit out of the childcare centre will provide for age appropriate toilet, washing and drying facilities.	Subject to future DA.
4.4 Ventilation and natural light		
Regulation 110 Services must be well ventilated, have adequate natural light, and be maintained at a temperature that ensures the safety and wellbeing of children. Childcare facilities must comply with the light and ventilation and minimum ceiling height requirements of the National Construction Code. Ceiling height requirements may be affected by the capacity of the facility.	The large apertures and perforated facades will encourage natural ventilation across the internal and external areas.	Yes
4.5 Administrative space		

Regulations	Proposed	Complies
111. Administrative space A service must provide adequate area or areas for the purposes of conducting the administrative functions of the service, consulting with parents of children and conducting private conversations.	The internal fit out of the childcare centre will provide for administration office.	Subject to future DA.
4.6 Nappy change facilities		
Regulation 112 Childcare facilities must provide for children who wear nappies, including appropriate hygienic facilities for nappy changing and bathing. All nappy changing facilities should be designed and located in an area that prevents unsupervised access by children. Childcare facilities must also comply with the requirements for nappy changing and bathing facilities that are contained in the National Construction Code.	The internal fit out of the childcare centre will provide for hygienic facilities for nappy changing and bathing.	Subject to future DA.
4.7 Premises designed to facilitate supervision		
Regulation 115 A centre-based service must ensure that the rooms and facilities within the premises (including toilets, nappy change facilities, indoor and outdoor activity rooms and play spaces) are designed to facilitate supervision of children at all times, having regard to the need to maintain their rights and dignity. Childcare facilities must also comply with any requirements regarding the ability to facilitate supervision that are contained in the National Construction Code.	The future fit out of the childcare centre will allow for supervision of children at all times.	Subject to future DA.
4.8 Emergency and evacuation procedures		
Regulations 97 and 168 Regulation 168 sets out the list of procedures that a care service must have, including procedures for emergency and evacuation. Regulation 97 sets out the detail for what those procedures must cover including: • instructions for what must be done in the event of an emergency	The centre will be designed will ensure that the building is compliant with all fire safety regulation. A fire safety report will be provided for the future fit-out DA to ensure compliance. The preliminary internal design also provide for a performance solution for fire egress and includes the provision of a fire isolated refuge space within the Childcare entry, adjacent to the lift	Subject to future DA.

Regulations	Proposed	Complies
• an emergency and evacuation floor plan, a copy of which is displayed in a prominent position near each exit • a risk assessment to identify potential emergencies that are relevant to the service.	and stair. The centre will also have an emergency evacuation plan in place that complies with AS3745 and fire emergency drills will be conducted every three months.	
4.9 Outdoor space requirements		
Regulation 108 An education and care service premises must provide for every child being educated and cared for within the facility to have a minimum of 7.0m^2 of unencumbered outdoor space.	Number of Children: 146 Required Indoor Space: 1,022sqm Provided Simulated Outdoor Space: 1,026sqm Given that the proposal relies on the use of simulated outdoor play space, the future fit-out DA will need to seek a waiver from strict compliance with Section 108 of the Regulation. Under Clause 22(1)(b) of the *Educational Establishment and Child Care Facilities SEPP 2017*, concurrence with Regulatory Authority is required for a proposal that does not strictly meet the outdoor unencumbered space requirements of Section 108 of the Regulation. The relevant Regulatory Authority is NSW Secretary of Education. The *Childcare Planning Guideline* published by Department of Planning, Industries and Environment outlines the requirements for simulated outdoor environments and identifies that simulated outdoor play space is a preferred alternate solution where unencumbered outdoor space requirements cannot be met. The future DA will need to demonstrate that the simulated outdoor area can provide a superior outdoor play experience.	No Subject to concurrence with the NSW Secretary of Education as part of a future fit out DA.
4.10 Natural environment		
Regulation 113 The approved provider of a centre-based service must ensure that the outdoor spaces	Detailed landscape design will be incorporated as part of the future DA,	Subject to future DA.

Regulations	Proposed	Complies
allow children to explore and experience the natural environment.	which will allow children to explore and experience the natural environment.	
4.11 Shade		
Regulation 114 The approved provider of a centre-based service must ensure that outdoor spaces include adequate shaded areas to protect children from overexposure to ultraviolet radiation from the sun. <u>Design Guidance:</u> Outdoor play areas should: • have year-round solar access to at least 30 per cent of the ground area, with no more than 60 per cent of the outdoor space covered. • provide shade in the form of trees or built shade structures giving protection from ultraviolet radiation to at least 30 per cent of the outdoor play area • have evenly distributed shade structures over different activity spaces Shade structures should allow adults to view and access the children's play areas, with a recommended head clearance of 2.1 metres.	Solar access diagrams are included in the Urban Design Report attached at **Appendix E.** Less than 5% of the ground outdoor play area receive direct solar access for 2 hours in mid-winter (from 10am to 12pm). The proposal cannot comply with the design guidance of providing more than 30% of sun due to location restrictions. However, the proposal can provide adequate shade to the centre. While there is minimal direct solar access, shade for young children is a bey requirement particularly during the summer months and the design achieves a satisfactory level of shade. Accordingly, while the design does not meet the design guidance, it is consistent with the National Regulation.	Complies with the Regulation but annotate it does not comply with the design guideline.
4.12 Fencing		
Regulation 104 Any outdoor space used by children must be enclosed by a fence or barrier that is of a height and design that children preschool age or under cannot go through, over or under it. Childcare facilities must also comply with the requirements for fencing and protection of outdoor play spaces that are contained in the National Construction Code.	Masonry screens are provided on the façade to enclose the simulated outdoor play space and provide a safe environment.	Yes
4.13 Soil assessment		
Regulation 25 Subclause (d) of regulation 25 requires an assessment of soil at a proposed site, and in some cases, sites already in use for such purposes as part of an application for service approval.	Potential site contaminants will be addressed in accordance with the relevant conditions of the CSSI approval, and the site will be remediated before the construction of the Central Precinct. Therefore, the site will be determined prior	Yes

Regulations	Proposed	Complies
With every service application one of the following is required: • a soil assessment for the site of the proposed education and care service premises • if a soil assessment for the site of the proposed childcare facility has previously been undertaken, a statement to that effect specifying when the soil assessment was undertaken • a statement made by the applicant that states, to the best of the applicant's knowledge, the site history does not indicate that the site is likely to be contaminated in a way that poses an unacceptable risk to the health of children.	to approval to be suitability for the childcare centre use.	

6.11. STATE REGIONAL ENVIRONMENTAL PLAN (SYDNEY HARBOUR CATCHMENT) 2005 (SREP SYDNEY HARBOUR)

The *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* (**SREP**) is a regional planning instrument that aims to ensure the catchment, foreshores, waterways and islands of Sydney Harbour are recognised, protected, enhanced and maintained as a natural and public asset of national significance.

The WMQ is located outside the Sydney Harbour Catchment, as indicated on the Sydney Harbour Catchment Map published in Gazette No 38 of 7 April 1989 at page 1841.Therefore, the SREP does not apply to the site and the SSDA.

6.12. STATE ENVIRONMENTAL PLANNING POLICY (VEGETATION IN NON-RURAL AREAS) 2017

The *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017* (**Vegetation SEPP**) works together with the *Biodiversity Conservation Act 2016* and the *Local Land Services Amendment Act 2016* to create a framework for the regulation of clearing of native vegetation in NSW. The Vegetation SEPP applies to the Sydney Metropolitan areas and land zoned for urban purposes.

The site is within an established urban area and has been cleared of all vegetation, buildings and structures under a separate CSSI approval. As such, no further consideration of the Vegetation SEPP is required.

6.13. DRAFT STATE ENVIRONMENTAL PLANNING POLICY (ENVIRONMENT)

The Draft State Environmental Planning Policy (Environment) (**Draft Environment SEPP**) is the new SEPP seeking to consolidate, repeal and replace the following seven existing SEPPs:

- *State Environmental Planning Policy No. 19 – Bushland in Urban Areas*
- *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011*
- *State Environmental Planning Policy No. 50 – Canal Estate Development*
- *Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment*
- *Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (No.2-1997)*
- *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005*

- *Willandra Lakes Regional Environmental Plan No. 1 – World Heritage Property.*

Public exhibition of the Draft Environment SEPP was completed in January 2018. The Draft Environment SEPP will deliver a policy instrument that contains a single set of planning provisions for catchments, waterways, bushland and protected areas.

The site is not subject to any of the changes proposed within the draft SEPPs, nor it is identified as being attributed to any catchments, waterways, bushland or protected areas.

6.14. DRAFT STATE ENVIRONMENTAL PLANNING POLICY (REMEDIATION OF LAND)

The *Draft State Environmental Planning Policy (Remediation of Land)* (**Draft Remediation SEPP**) is the proposed new land remediation SEPP set to replace SEPP 55. Public exhibition of the 'explanation of intended effect' for the Draft Remediation SEPP and draft planning guidelines was completed in April 2018.

The Draft Remediation SEPP will retain the objectives of SEPP 55 and reinforce the successful aspects of the framework. In terms of relevant changes applicable to development applications, clause 7 of SEPP 55 is proposed to be incorporated into the Draft Remediation SEPP. In addition, the list of potentially contaminating activities and the purpose of a 'preliminary site investigation' (**PSI**) and 'detailed site investigation' (**DSI**) will be integrated into clause 7 of the Draft Remediation SEPP.

As discussed in Section 6.5, remediation works for the WMQ will be undertaken under the CSSI approval to make the site suitable for a metro station. However, Douglas Partners have prepared a Contamination Site Strategy to ensure that the site can be made suitable for the proposed OSD uses. Within the Central Precinct this includes residential and non-residential uses (retail and community uses) and public domain spaces.

It is noted that the Central Precinct is built over the Basement which is the subject of a separate detailed SSDA (SSD-10438) which has been submitted concurrently with this application and addresses any contamination and remediation requirements for the Central Precinct.

6.15. SYDNEY LOCAL ENVIRONMENTAL PLAN 2012

The *Sydney Local Environmental Plan 2012* (**SLEP 2012**) is the principal local planning instrument applying to the site, establishing the permissible land uses, key development standards, visual impact, views and heritage conservation requirements.

6.15.1. Zoning and Permissibility

The site is zoned as B4 Mixed Use in SLEP.

The proposed tower development within the Central Precinct is best defined as '*residential accommodation'*, 'which is defined in SLEP as:

> ***residential accommodation*** *means a building or place used predominantly as a place of residence, and includes any of the following:*
>
> *(a) attached dwellings,*
>
> *(b) boarding houses,*
>
> *(c) dual occupancies,*
>
> *(d) dwelling houses,*
>
> *(e) group homes,*
>
> *(f) hostels,*
>
> *(g) multi dwelling housing,*
>
> *(h) residential flat buildings,*

(i) rural workers' dwellings,

(j) secondary dwellings,

(k) semi-detached dwellings,

(l) seniors housing,

(m) shop top housing,

but does not include tourist and visitor accommodation or caravan parks.

Land use proposed within the ground floor of the Central Precinct are defined as '*retail premises*. This includes a space at the south-eastern corner of the podium which is proposed to support a wide range of community related uses. While this space will support a diverse range of uses to support community needs and interests, its land uses is best defined as a '*retail premises*'.

Retail premise is defined in SLEP as:

retail premises means a building or place used for the purpose of selling items by retail, or hiring or displaying items for the purpose of selling them or hiring them out, whether the items are goods or materials (or whether also sold by wholesale), and includes any of the following—

(a) (Repealed)

(b) cellar door premises,

(c) food and drink premises,

(d) garden centres,

(e) hardware and building supplies,

(f) kiosks,

(g) landscaping material supplies,

(h) markets,

(i) plant nurseries,

(j) roadside stalls,

(k) rural supplies,

(l) shops,

(la) specialised retail premises,

(m) timber yards,

(n) vehicle sales or hire premises,

but does not include highway service centres, service stations, industrial retail outlets or restricted premises.

The podium levels include '*community facilities*' in the form of a childcare centre on levels 1 and 2.

Community facility is defined in SLEP as:

***community facility** means a building or place—*

(a) owned or controlled by a public authority or non-profit community organisation, and

(b) used for the physical, social, cultural or intellectual development or welfare of the community,

but does not include an educational establishment, hospital, retail premises, place of public worship or residential accommodation.

On the podium level, a community childcare centre is proposed, which will be operated by a non-profit community organisation and will provide affordable childcare services the Waterloo community. The childcare is also indented to incorporate initiatives which support the existing Waterloo community, such as employing a local Aboriginal workforce. Through the inclusion of these initiatives, the operation of the community childcare centre is therefore consistent with the definition of a '*community facility*' as defined under Sydney LEP 2012.

The childcare centre space on Levels 1 and 2 provides 2,219.6sqm which meets the 'community facilities' community facility floor space as required under the Concept approval. The additional community space at ground level is not provided to meet the requirements of the Concept Plan, but rather to support a broader range of spaces and uses to service community needs across the WMQ site.

Overall, the Detailed SSDA seeks consent for a mixed use development consisting of residential accommodation, retail premises and community facilities, which are all permissible with consent in the B4 Mixed use zone.

The relevant objectives of the B4 Mixed Use zone are:

- *To provide a mixture of compatible land uses.*
- *To integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.*
- *To ensure uses support the viability of centres.*

The detailed SSDA is consistent with the zone objectives as it:

- Provides an appropriate mix of compatible land uses including retail, residential and community facility that will support the viability of the neighbourhood;
- Maximises public transport patronage by locating residential development directly above the Waterloo metro station;
- Encourages walking, cycling and public transport usage by providing adequate on-site bicycle parking and end of trip facilities and reducing on-site car parking;
- Provides a diverse mix of residential and non-residential uses to activate the site out of business hours and ensure the viability of the centre; and
- Provide a mix of spaces to accommodate community uses to service the needs of the existing and incoming Waterloo community.

6.15.2. Key Development Standards

The proposed development has been assessed against the relevant development standards contained within the SLEP 2012 and is discussed in Table 12 below.

Table 13 SLEP 2012 Compliance of Development Standards

Clause	Control	Proposal/Compliance
4.3 Height of buildings	The maximum height of building control for the site is mapped as RL 104.2.	**Complies** The proposed development has a maximum height of RL 97.96 (81.88m).

Clause	Control	Proposal/Compliance
4.4 Floor space ratio	6:1 (across the WMQ site)	**Complies** The overall WMQ site has a GFA of 68,750sqm = 5.34:1
5.10 Heritage Conservation	A heritage management document may be required to be prepared for land that is within the vicinity of a heritage item. The document is to assess the extent to which the carrying out of the proposed development would affect the heritage significance of the heritage item.	**Complies** A Heritage Impact Statement has been prepared by Urbis and is attached at **Appendix H.** The Statement supports the proposal and concludes that: *"The proposed central building has been designed with a dominant masonry podium form extending to three storeys in height, The use of masonry in the majority of podium building references the masonry materiality of the adjoining Waterloo Congregational Church, as well as a reference to the previous industrial development which used to occupy this site.* *The masonry sections of the podium have a high solid to void ratio, with the limited inclusion of geometric shaped cut out windows along the western Botany Road facing elevation and the southern church facing elevation. These windows, while not direct references to the more ecclesiastical window shapes of the church, provide a reference to the traditional ecclesiastical design of churches which generally contain a high solid to void ratio and the inclusion of a small number of windows.* *The detailed design has sought to mitigate the visual impacts to the Church through the adoption of appropriately scaled podium forms and generous setbacks, which consider view lines, meaning that the proposed central building will not adversely impact significant existing views towards the church.* *Therefore, proposed central building works as outlined in this report are considered acceptable from a heritage perspective."*

Clause	Control	Proposal/Compliance
		Heritage impact is further discussed in Section 8.2.
6.21 Design excellence	Deliver the highest standard of architectural, urban and landscape design. Development consent must not be granted to the following development to which this clause applies unless a competitive design process has been held in relation to the proposed development— (a) development in respect of a building that has, or will have, a height above ground level (existing) greater than— (i) 55 metres on land in Central Sydney, or (ii) 25 metres on any other land, (b) development having a capital investment value of more than $100,000,000, (c) development in respect of which a development control plan is required to be prepared under clause 7.20, (d) development for which the applicant has chosen such a process	**Complies** The Concept DA exercises the discretion available under clause 6.21(6) of SLEP to waive the requirement for a competitive design process under clause 6.21(5) as the concept design has been subject to the Sydney Metro Waterloo Design Excellence Strategy. The Design Integrity Report at **Appendix Y** confirms that the detailed SSDA meets the design excellence requirements established for the site, in accordance with the Endorsed Design Excellence Strategy at **Appendix G** and has received feedback from the Design Review Panel. Further discussion of design excellence has been addressed in Section 8.1.1.
6.45 Waterloo Metro Quarter - General	The consent authority must not consent to development on land at the Waterloo Metro Quarter unless it is satisfied that the development is consistent with the following objectives: ▪ 12,000 sqm of GFA below podium for land uses other than residential accommodation or passenger transport facilities. ▪ 2,000 sqm of GFA for the purpose of community facilities. ▪ 2,200 sqm of land for publicly accessible open space. Further, the consent authority must not consent to the construction of one or more dwellings on land at the Waterloo Metro Quarter unless:	**Complies** Collectively, the detailed SSDAs for the Northern, Central and Southern Precincts will deliver: ▪ A total of 11,347.6sqm GFA is proposed within the indicative scheme to be located at or below the podium (3 storeys for Buildings 2 and 3, and 4 storeys for Building 1) for land uses other than residential accommodation or passenger transport facilities across the Waterloo Metro Quarter. This figure excludes residential lobbies, however, includes the communal facilities within the podium of Building 3. Further approximately 720sqm retail GFA will be delivered within the ground level of the two station boxes under the CSSI approval which in total will exceed the minimum 12,000sqm non-

Clause	Control	Proposal/Compliance
	▪ It is satisfied that at least 5% of the GFA used affordable housing ▪ It is satisfied that no dwelling used for the purposes of affordable housing will have a GFA less than 50 square metres It is satisfied that land uses other than residential accommodation or passenger transport facilities will be evenly distributed throughout the Waterloo Metro Quarter.	residential GFA proposed at or below the podiums of development at the Waterloo Metro Quarter site. ▪ Non-residential GFA is proposed to be located across all four buildings proposed on the Waterloo Metro Quarter site. While numerically the proportion of non-residential GFA is weighted towards the northern precinct given the location of the commercial office building, it is noted that the podium levels of all buildings will include a variety of non-residential land uses including community facilities, retail, future community uses, commercial office, and recreation facilities (gymnasium). ▪ A total of 2,219sqm GFA is to be provided for the purposes of community facilities within Building 2. Under the detailed SD DA for Building 2 it is proposed that this community facility will be used for the purposes of not-for-profit, community centre-based childcare. Furthermore it is noted that an additional 630sqm of ground level GFA is proposed to be used for a variety of community uses including for instance a medical/health centre, enterprise café, Makerspace, community hub etc, however with the specific uses to be determined at a future stages. ▪ A minimum 2,200sqm of land is proposed to be provided within the boundaries of the Waterloo Metro Quarter site, with additional publicly accessible open space to be delivered outside of the property boundaries through widened footpaths and the delivery of the full scope of Raglan Plaza. The Waterloo Metro Quarter site will provide 70 social housing dwellings and 24 affordable housing dwellings which exceeds 5% of the proposed residential GFA. Social housing is proposed to be located within Building 4, whereas affordable housing is to be located within Building 2.

Clause	Control	Proposal/Compliance
		The proposed affordable housing dwellings within Building 2 have a minimum area 50sqm (GFA).
6.46 Waterloo Metro Quarter - State public infrastructure	Development consent must not be granted for development for the purposes of residential accommodation on land at the Waterloo Metro Quarter that results in an increase in the number of dwellings on that land, unless the Planning Secretary has certified in writing to the consent authority that satisfactory arrangements have been made to contribute to the provision of designated State public infrastructure in relation to the land.	**Complies** As per the Assessment Report for the Concept DA (SSD 9393), it has been confirmed that an arrangement has been made for the contribution to the provision of designated State public infrastructure.
Clause 7.20 Development requiring or authorising preparation of a development control plan	A DCP is required for sites outside of Central Sydney if the site area is more than 5,000 sqm or if the development will result in a building with a height greater than 25m above existing ground level. However, this obligation can be satisfied by the approval of a staged development application for the site.	**Complies** A staged development application has been approved for the site (SSD 9393), therefore clause 7.20 has been satisfied.
7.3 Car parking not to exceed maximum set out in this Division	The LEP sets a maximum provision of car parking based on site area. The site is located on Category A land and the following rate applies: ▪ 0.1 spaces for each studio dwelling ▪ 0.3 spaces for each 1 bedroom dwelling ▪ 0.7 spaces for each 2 bedroom dwelling ▪ 1 space for each 3 or more bedroom dwelling	**Complies** Based on 150 apartments, 80 car parking spaces is allowed for the residential component of the development. 67 car parking spaces are provided within the basement for the affordable housing and market residential apartments, which does not exceed the maximum car parking provision under clause 7.3. No retail employee parking is provided. Detail parking provision is further discussed in Section 8.10.
7.14 Acid Sulfate Soils	Ensure development does not disturb, expose or drain acid sulfate soils and cause environmental damage.	**Complies** The site is classified as containing Class 5 acid sulfate soils. No works are proposed within 500 metres of adjacent Class 1, 2, 3 or 4 land.

Clause	Control	Proposal/Compliance
7.15 Flood Planning	Minimise flood risk to life and property associated with the use of land and significant adverse impacts on flood behaviour and the environment.	**Complies** WSP have prepared a Stormwater Management Plan and Flood Impact Assessment and is attached at **Appendix O**, which considers the flood risks for the Central Precinct. Detailed flood risk assessment and mitigation measures are discussed in Section 8.14.2.
7.16 Airspace Operations	Provide for the effective and on-going operation of the Sydney (Kingsford-Smith) Airport by ensuring that such operation is not compromised by proposed development that penetrates the Limitation or Operations Surface for that airport.	**Complies** The proposed development has a maximum building height of RL 98.46 (including rooftop plant and PV zone) and does not exceed the existing airspace height approval to the maximum height of 116.9m AHD. Airspace compliance is further discussed in Section 8.9.
7.17 Development in areas subject to aircraft noise	Applies to development that is on land that— (i) is near the Sydney (Kingsford-Smith) Airport, and (ii) is in an ANEF contour of 20 or greater, and (b) the consent authority considers is likely to be adversely affected by aircraft noise.	The WQM site is not located directly under the flight path and is not directly impacted by aircraft noise.
7.26 Public Art	Consent must not be granted for public art unless the consent authority is satisfied that the development— (a) will not involve the display of an advertisement, and (b) will not increase the gross floor area of any building, and (c) will not have a significant adverse impact on any heritage conservation area, heritage item or other object or place of heritage significance, and (d) will not have a significant adverse impact on the amenity of the public domain, including by overshadowing, wind or noise impacts, and	**Complies** A WQM site wide Public Art Strategy has been developed by Aileen Sage Architects with art curators Tess Allas and Sebastian Goldspink and is attached at **Appendix MM.** The Strategy will ensure compliance with clause 7.26 of the LEP and deliver positive public art outcome for the site.

Clause	Control	Proposal/Compliance
	(e) if it is to be carried out on land to which a plan of management (within the meaning of the Local Government Act 1993) applies, will be in accordance with the plan of management.	
7.27 Active Street Frontages	Development consent must not be granted to the erection of a building, or a change of use of a building, on land to which this clause applies unless the consent authority is satisfied that, after its erection or change of use— (a) all premises on the ground floor of the building that face the street will be used for the purposes of business premises or retail premises, and (b) those premises will have active street frontages	**Complies** The site has a western frontage to Botany Road and a northern frontage to Grit Lane. All ground floor premises on the western and northern elevations are retail premises with glazing and entries from Botany Road and Grit Lane, to enable an activated street frontage. The proposal will deliver truly active and integrated street edge throughout the entire Central Precinct.

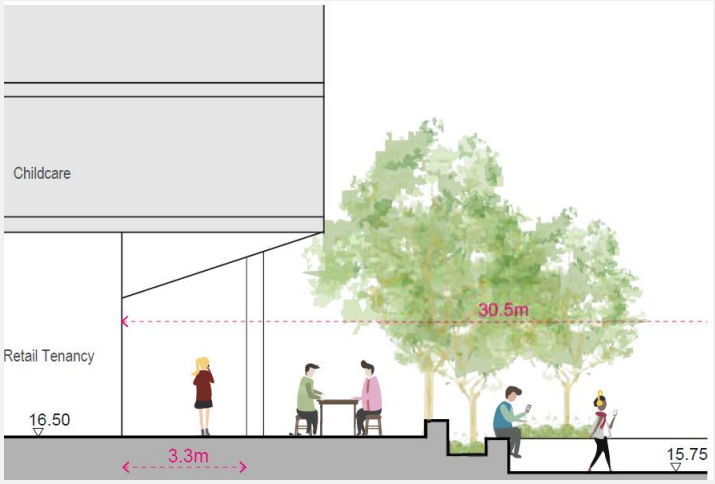
6.16. WATERLOO METRO QUARTER DESIGN AND AMENITY GUIDELINE

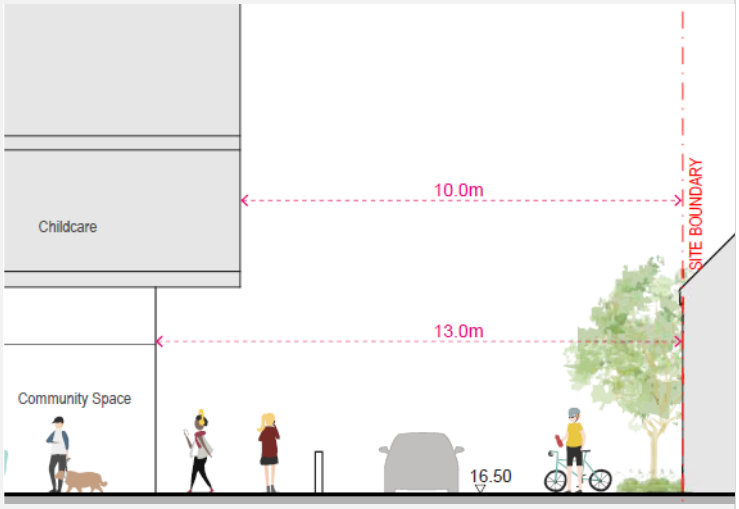
To satisfy Condition B5 of the Concept SSDA, Sydney Metro has revised the Waterloo Metro Quarter Design and Amenity Guideline (March 2020) (**Design and Amenity Guideline**), which have guided the detailed design of the proposed residential tower and OSD project.

An assessment of how the proposed development is consistent with the Waterloo Metro Quarter Design and Amenity Guideline is set out in the following table.

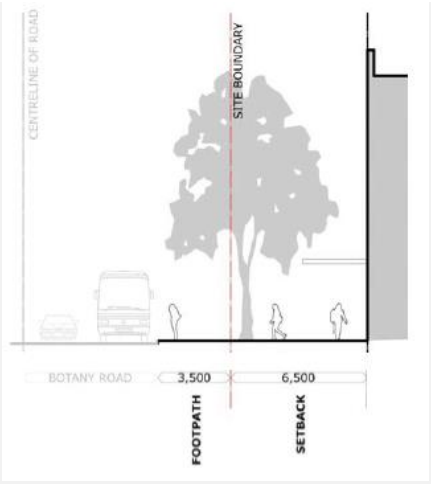
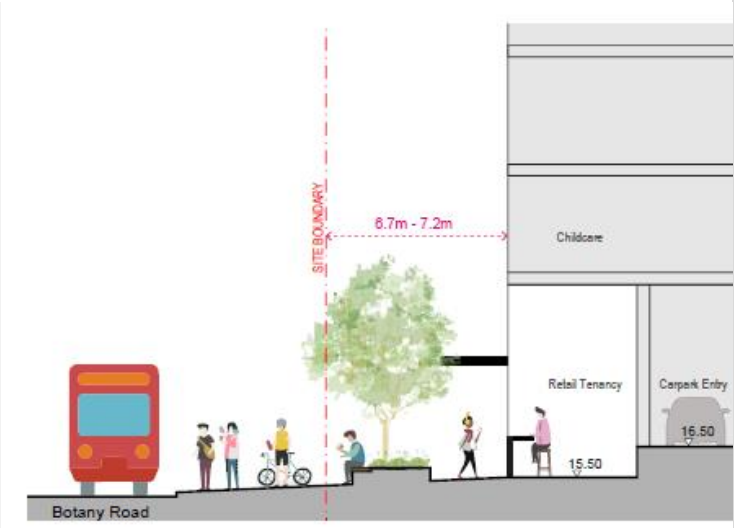
Table 14 Waterloo Metro Quarter Design and Amenity Guideline

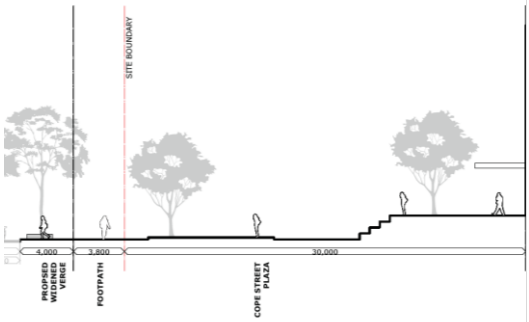
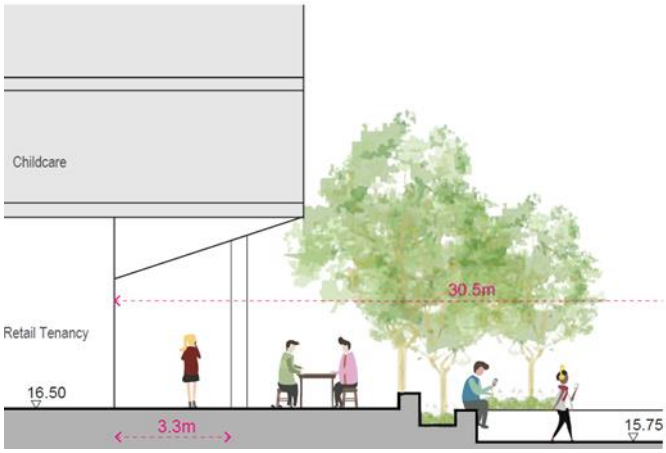
Design Criteria	Detailed SSDA design response
3C Public Domain	
Provide 2,200m2 of publicly accessible open space within the precinct comprising the Cope Street Plaza and the Raglan Street Plaza. Space beneath cantilevered buildings can be included in the calculation of publicly accessible open space.	Collectively, the WMQ site provides a total of 2,680sqm of publicly accessible space which exceeds the minimum requirement including the following: ▪ Cope Street Plaza: 1,341sqm ▪ Church Yard: 184sqm ▪ Raglan Plaza: 1,155sqm In addition, a series of public spaces and through-site links are proposed which will positively contribute to the public permeability of the WMQ site.
Design of all buildings which overhand Cope Street Plaza are to include treatment to the soffit to provide interest and reduce visual bulk.	The ground floor of the Central Building has a minimum of 30m setback from the glass line of the retail tenancies to Cope Street site boundary. The proposed colonnade along Cope Street Plaza frontage as a result of building overhang from the level above provide

Design Criteria	Detailed SSDA design response
	weather protection for pedestrians and shading for community and retail use. 
Design of the Cope Street Plaza space underneath any building overhang is to incorporate wind mitigation.	As discussed in the Wind Impact Assessment provided at **Appendix KK,** Cope Street Plaza area will satisfy the required sitting criteria for between 85-92% of the time, marginally below the required 95% requirement. The inclusion of younger tree planting will provide greater separation between the foliage of each tree to allow for future growth. As these trees mature, they will continue to grow in height and canopy width, which will further ameliorate the wind impacts and enhance conditions for the Plaza. Wind impact is further discussed in Section 8.6.
At least 50 percent of the area of the Cope Street plaza receives at least two hours sunlight between 9am and 3pm on 21 June.	As discussed in the Overshadowing Analysis provided at **Appendix LL**, at least 57.3% of the total area of Cope Street Plaza receives at least two hours of sunlight between 9am and 3pm on 21 June. Overshadow impact is further discussed in Section 8.4.2.
The public domain and landscaping design should meet the requirements of City of Sydney Urban Forest Strategy 2013 (adopted February 2013).	The public domain and landscaping design have been designed in accordance with City of Sydney Urban Forest Strategy 2013 (adopted February 2013).
The Cope Street plaza, Raglan Street plaza and through-site links are to be publicly accessible 24 hours a day.	Cope Street Plaza, Raglan Street Plaza and through-site links will be publicly accessible 24 hours a day.
Publicly accessible areas are to be designed to allow access as required by DDA requirements with consideration of use for people of all abilities.	Morris Goding Access Consulting has assessed the proposed development with regards to the DDA requirements and confirmed that accessibility requirements, pertaining to external site linkages, building access,

Design Criteria	Detailed SSDA design response
	common area access and sanitary facilities can be readily achieved (refer to **Appendix S**). MGAC will continue to work with the project team as the scheme progresses to ensure appropriate outcomes are achieved in building design and external domain design. Accessibility is further discussed in 8.16.1.
Awnings are provided along all street frontages for wind and weather protection (except on the southern side of the central podium where a 10 metres setback is required to the Waterloo Congregational Church).	Awnings are proposed along Botany Road, Grit Lane and Cope Street Plaza (through cantilever building above). Awning is not been provided for the Church Square elevation to allow 10m setback to the Waterloo Congregational Church. Weather protection is provided through cantilever building above, which is setback 10m from the Church and complies with the setback requirement for the upper level. 
Awnings located above Council footpaths are to be designed in accordance with Section 3.2.4 of Sydney DCP 2012.	Continuous awning is provided along Botany Road and is compliant with Section 3.2.4 of Sydney DCP 2012.
Public domain lighting in areas under Council's control shall be in accordance with City of Sydney's Sydney Lights Code (March 2015).	Lighting across the site to be designed to achieve a balance of safety and ambience, utilising a combination of pole mounted, building mounted, and feature lighting in accordance with City of Sydney's Sydney Lights Code (March 2015).
Lighting provided to the plazas and publicly accessible spaces within the development should comply with AS4282-1997.	Proposed lighting will be able to comply with AS4282-1997.
3D Streets, lanes and footpaths	

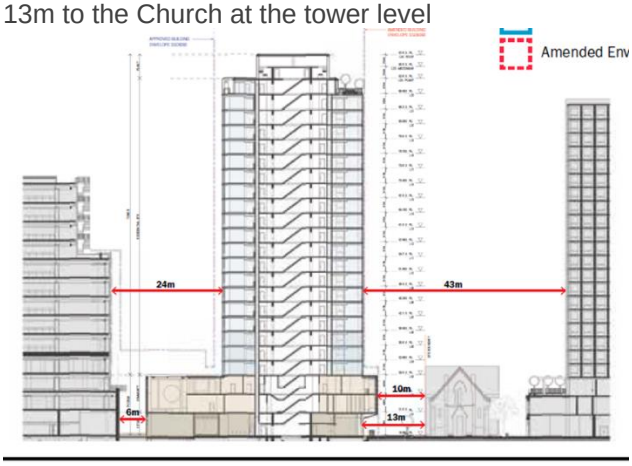
Design Criteria	Detailed SSDA design response
Provide a through-site pedestrian link from Cope Street to Botany Road that provides a clear, safe, direct and convenient connection from the metro station to the bus interchange.	The proposed Grit Lane (as part of the CSSI approval) provides clear, safe and direct connection from Cope Street to Botany Road. The proposed Church Square provides secondary pedestrian site through link from Cope Street to Botany Road.
The through-site link should: ▪ Have a minimum width of 6m and have a clear height of at least 6m. ▪ Align with breaks between buildings so that views are extended and there are is less sense of enclosure. ▪ Be clearly distinguished from vehicle access ways. ▪ Include materials and finishes such as paving materials, tree planting and furniture generally consistent with adjoining streets and public spaces and be graffiti and vandalism resistant. ▪ Be clear of obstructions or structures, such as service vents etc. ▪ Be fully accessible 24 hours a day. ▪ Be at ground level and lined with active uses. ▪ Be open at each end.	The Grit Lane through-site link is designed to: ▪ 6m width and have a clear height of more than 6m. ▪ Aligned with breaks between buildings so that views are extended and there are is less sense of enclosure. ▪ Is clearly distinguished from vehicle access ways. ▪ Include materials and finishes such as paving materials, tree planting/landscaping designed at each end and is generally consistent with adjoining streets and public spaces and be graffiti and vandalism resistant. ▪ Clear of obstructions or structures. ▪ Fully accessible 24 hours a day. ▪ Located at ground level and lined with active retail uses to both sides of the laneway. ▪ Is open at each end.
Provide wide footpaths and a 5m minimum building setback on the southern side of Raglan Street between the metro station and the Botany Road intersection (refer to Figures 13 and 14).	Not applicable to this Detailed SSDA.
Provide adequate footpath widths and building setbacks between 2.5m and 6.5m along Botany Road in the vicinity of the bus interchange to provide capacity for pedestrians (refer to Figures 17).	The Central Building is setback more than 6.5m from Botany Road footpath, and adequate footpath is provided as part of the CSSI approval.

Design Criteria	Detailed SSDA design response
	
Construct footpaths in accordance with the Sydney Streets Design Code. Design footpaths so that pedestrians, regardless of mobility impairments, are able to move comfortably and safely.	Footpath are designed to ensure pedestrian can move comfortably and safely. Generous footpath widths are incorporated.
Provide a new laneway along the southern edge of the Cope Street Plaza that: ▪ Prioritises pedestrian movement but also provides access to bicycle parking and resident car parking. ▪ Uses brick paving or other materials that integrate with the public domain and differentiate it from public roads.	Church Square is proposed along the southern edge of the Cope Street Plaza and has been designed to: ▪ Prioritises pedestrian movement but also provides vehicle access to car parking within the basement. ▪ Uses brick paving that integrate with the public domain and differentiate it from public roads. ▪ Planting buffer is provided along the northern side of the Church
The new laneway prioritises walking and cycling and is designed to accommodate a low volume of car vehicles and low traffic speed - 10kph.	Church Square has been designed to prioritises walking and cycling and is designed to accommodate a low volume of car vehicles and low traffic speed at 10kph.
Development adjacent to the lane is to: ▪ Include active uses at ground level to encourage pedestrian activity. ▪ Include lighting appropriate to the scale of the lane. ▪ Enhance pedestrian access and activity. ▪ Avoid projections over the lane which overshadow the lane, obstruct a view or vista or impede pedestrian activity at ground level.	Central Precinct is designed with: ▪ Active community uses at the ground level fronting Church Square to encourage pedestrian activity. ▪ Lighting that is appropriate to the scale of Church Square. ▪ Pedestrian access and activity is enhanced by active frontages. ▪ The cantilever building above does not overshadow or obstruct view to the lane at ground level. ▪ Access is ensured.

Design Criteria	Detailed SSDA design response
▪ Ensure access rights of the public and other owners of property abutting the lane. ▪ Provide access for service vehicles as necessary and design to avoid or minimise any conflict with pedestrian and cyclist functions.	▪ Church Square does not provide access for service vehicles to minimise conflict with pedestrian and cyclist.
The buildings are setback from the property boundary in accordance with Figures 12. 	The ground floor of the Central Building has a minimum of 30m setback from the glass line of the retail tenancies to Cope Street site boundary. Therefore complies with the setback requirement. 
Respond to and complement the City of Sydney's public domain requirements for works on Council land.	The public domain proposed under SSDA have been designed to respond and complement the City of Sydney's public domain works, through the use of material and landscaping.
Consultation is to be undertaken with the City of Sydney for any works in, under or over the public footpaths.	Consultation with the City of Sydney will be undertaken for any works in, under or over the public footpaths.
Street furniture is to be consistent with the Sydney Streets Design Code.	Street furniture has been designed in accordance with Sydney Streets Design Code.
Integrate new and relocated utilities underground within the street reservation, with services located underground and in a manner that facilitates tree planting.	New utilities will be located underground where it is possible to facilitates tree planting.
Where feasible, incorporate water sensitive urban design techniques such as landscaped swales to improve the quality of groundwater and water entering the waterways and tree bays.	Water sensitive urban design has been incorporated to improve the quality of groundwater and water entering the waterways and tree bays along Cope Street.
In designing that portion of the cycleway adjacent to the site, consider its	A key initiative of the ESD Strategy submitted at **Appendix M** is to use water efficiently, protecting local water resources

Design Criteria	Detailed SSDA design response
relationship with the design (if available) of the regional cycleway on Wellington Street from Botany Road to George Street, including how it would integrate with these other elements.	and reducing flooding, drought and water pollution. Water sensitive urban design (WSUD) to reduce stormwater run-off and water pollution will be implemented in accordance with the City of Sydney Development Control Plans.
3E Tree canopy cover & 3F Tree planting specifications	
Design Criteria – Tree Canopy Cover Design Criteria - Tree planting specifications	The Landscape Design Report at **Appendix JJ** outlines in detail the consistency of the proposal with the 3E and 3F design criteria. In summary, the WQM development achieve 30% overall canopy cover and 55% street canopy cover. Where new street trees and new trees within the site are proposed, they have been designed to comply with the City of Sydney's Street Tree Master Plan 2011 (updated 2015), Park Tree Management Plans and the Landscape Code. Refer to Landscape Plans and Landscape Design Report at **Appendix JJ and Appendix II.**
3G Wind	
Mitigate wind impacts on the public domain and achieve the following targets: At least 50% of the publicly accessible open space meets the wind comfort standard for sitting. Outdoor dining and casual seating areas should correspond with these areas. Waiting areas at bus stops and pedestrian crossings is to meet the wind comfort standard for standing. Development must not exceed the wind safety standard of 24m/s (gust - 0.1% exceedance).	A Wind Impact Assessment has been prepared by RWDI and submitted at Appendix KK. The assessment confirms: ▪ Wind conditions for all of the ground level areas within and around the WMQ Precinct were noted to satisfy the Wind Safety Standard of 24 m/s. ▪ The majority of the ground level areas throughout the WMQ precinct are noted to satisfy the sitting or standing criteria throughout the year, this includes wind conditions along Botany Road (where future bus stop is proposed), laneways including Raglan Walk and Grit Lane. ▪ Cope Street Plaza area will satisfy the required sitting criteria for between 85-92% of the time, marginally below the required 95% requirement. Wind impact is further discussed in Section 8.6.
3H Building uses	
Provide 70 social housing dwellings and 5% of the residential floor space as affordable housing.	The Waterloo Metro Quarter site provides 70 social housing dwellings (with Southern Precinct) and 24 affordable housing dwellings (within Central Precinct) which exceeds 5% of the proposed residential GFA.
The social housing and affordable housing is to be not readily distinguishable from the market housing.	The affordable housing apartments has been designed to not be readily distinguishable from the market housing

Design Criteria	Detailed SSDA design response
	through apartment layouts and integration within the building facades.
Provide a minimum of 2,000m2 of floor space for community facilities in accordance with LEP 2012.	As discussed in Section 6.15.2, a total of 2,219.6sqm GFA is to be provided for the purposes of community facilities within the Central Building. It is proposed that this community facility will be used for the purposes of not-for-profit, community centre-based childcare. Furthermore. a space at the south-eastern corner of the ground floor is proposed to support a wide range of community related uses. While this space will support a diverse range of uses to support community needs and interests, its land uses is best defined as a 'retail premises'. The specific uses to be determined at a future stage.
The community facilities can be located within the podium and should have an identity, connection and presence to Cope Street Plaza.	The community childcare centre is located within the podium and has district entry lobby fronting Cope Street Plaza.
The entrance to the community facilities should be easily identifiable and accessible from the plaza.	The childcare centre entry is easily identifiable through signage and is accessible from Cope Street Plaza.
A Noise Management Plan is required to ensure compatibility of late night premises uses and residential uses.	Noise emissions from the retail tenancies located on the ground floor are based on many factors, such as the type of tenancy and number of occupants within the tenancy under normal or extended operation hour. This information would typically be provided as part of a fit-out development application for the tenancy and hence, the noise emissions from the retail tenancies and outdoor licensed seating area will be assessed as part of future fit-out DAs.
3I Street activation	
Provide fine grain activation at ground level along all street frontages including Botany Road.	The building is proposed with activated ground floor uses fronting Botany Road, Grit Lane, Cope Street Plaza and Church Square.
Provide fine grain retail surrounding the Cope Street Plaza and along through site links.	The fine grain scale retail is provided along all street frontages to provide an eclectic and diverse pedestrian experience along Grit Lane and Botany Road. Retail tenancies facing Cope Street Plaza helps to provide activation and buzz around the public domain.
Provide frequent building entries that face and open towards the street.	Multiple retail and building entries are provided facing Botany Road, Grit Lane, Cope Street Plaza and Church Square.

Design Criteria	Detailed SSDA design response
Building and ground floor entries are to be located and spaced to maximise street level activation.	Multiple retail and building entries are provided facing Botany Road, Grit Lane, Cope Street Plaza and Church Square, and are spaced to maximum street activation.
Provide wider footpaths along Botany Road adjacent to the bus stops that accommodate pedestrians and encourage retail activation.	Wider footpaths are provided along Botany Road adjacent to the bus stops to accommodate pedestrians and encourage retail activation.
3J Podium and street wall	
Articulate the podiums as a separate element from the towers above and use accessways or building cut-outs to break up the overall length of the podium.	The podium is articulated through the use of material, cut-out and colour to separate from the tower element above and to provide visual interest to break up the overall length of the podium.
Materials and finishes are to be used in the podium that respond to the local character and the surrounding built environment with articulation that expresses a fine vertical grain.	The podium comprises a patterned masonry façade that is composed of patterned masonry and masonry. The textured laying pattern creates a dynamic pattern of light and shadow across the façade providing visual contrast and interest. Materials and finishes that are used in the podium are responsive to the local character and the surrounding built environment with articulation that expresses a fine vertical grain. Refer to Architectural Report attached at **Appendix F**.
The height, proportion, scale and architectural articulation of the Botany Road podium must consider the proportion, scale and architecture of the Church.	The podium is a 2-storey scale to align with the height of the Church. See Section 8.1.2 for further discussion.
The following setbacks apply to the podium to increase the church's visual presence within the streetscape: ▪ A minimum of 10 metres from the Botany Road street alignment on either side of the church. ▪ A minimum of 6.5 metres from the northern face of the church at ground level. ▪ A minimum of 4 metres from the southern face of the church at ground level. ▪ A minimum of 10 metres from northern face of the church at the tower level.	The proposed building has a compliant setback to the Church and is setback: ▪ 10m to the Church on the ground floor, front Botany Road alignment on the northern side of the Church. ▪ 13m to the Church at the tower level 

Design Criteria	Detailed SSDA design response
▪ A minimum of 14 metres from the southern face of the church at the tower level. ▪ A minimum of 3 metres at the tower level from the street wall on Wellington Street.	
Encourage active uses at the southern setback of the church and opportunities for Church users to meet.	Not applicable to this SSDA.
Promote safe access and passive surveillance in and around the setback areas between the Metro Quarter and the Church consistent with crime prevention through environmental design (CPTED) principles.	The community facility located on level one will provide casual surveillance in and around the setback areas between Church Square and the Church.
3K Built form above the podium	
The three tower buildings must not be identical in appearance and architectural diversity is encouraged through the design excellence process.	The proposed towers are differentiated by built form design, façade treatment, material and colour to create diversity.
The residential towers must have a maximum floorplate size of 900m2 (gross building area).	Each residential floorplate has a maximum GFA ranging between 355sqm to 652.3sqm, with the Central Building having a floorplate ranging from 594sqm to 625sqm.
The built form of the towers, including any articulation, must be in accordance with any building envelopes approved by SSD-9393.	The Central Building is largely consistent with the approved Concept Envelope, as part of the ongoing design development, modification to the concept DA is now required to accommodate the detailed design. An Amending DA has been lodged concurrently with this DA. Specifically for the Central Building the Amending DA seeks approval to modify the podium design along the Cope Street Plaza / eastern façade. This detailed SSDA is consistent with the concept DA, as proposed to be modified. The design rationale of the amendment is further discussed in Section 8.1.1.
Design of residential mid-rise buildings and towers will need to be in accordance with the NSW Apartment Design Guide.	The Central Building has been designed in accordance with thee AGD. Refer to Section 6.7.
Wind mitigation is to be achieved through building form with reliance on devices such as impermeable canopies, awnings,	As discussed in the Wind Impact Assessment at **Appendix KK.** The wind tunnel study found that the inclusion of the awnings detailed on the architectural drawings and tree

Design Criteria	Detailed SSDA design response
pergolas and trees as secondary measures.	planting outlined in the landscape design enable the ground plane areas to satisfy the required wind comfort conditions for the WMQ precincts, including the Central Precinct. Refer to Section 8.6 and Wind Impact Assessment included at **Appendix KK**.
Identify opportunities to improve solar access to Alexandria Park through redistribution of floorspace and building bulk and scale between the hours of 9am and 10am in midwinter (21 June) when compared to the shadow cast by the indicative scheme lodged with the Response to Submissions.	Overshadow is discussed in **Appendix LL** and Section 8.4.2.
3L Residential amenity	
Noise amenity to be confirmed against the following requirements: ▪ Clause 3.6 of the Development Near Rail Corridors and Busy Road - Interim Guideline for Noise Criteria for all uses including windows closed and. ▪ Clause 4.2.3.11 of Sydney DCP 2012 for windows and doors open.	The Noise and Vibration Impact Assessment submitted at **Appendix K** has assessed the development against Clause 3.6 of the Development Near Rail Corridors and Busy Road - Interim Guideline for Noise Criteria for all uses including windows closed and Clause 4.2.3.11 of Sydney DCP 2012 for open and windows and doors requirement. Noise impact is further discussed in Section 8.7.
Refer to part 4J of the NSW Apartment Design Guide and clause 3.8 of Development Near Rail Corridors and Busy Road - Interim Guidelines for general guidance on how to reduce the impact of noise, noting that these measures may not be sufficient to meet the required noise criteria.	The Noise and Vibration Impact Assessment has considered the noise affected apartments referred in part 4J of the *NSW Apartment Design Guide* and clause 3.8 of *Development Near Rail Corridors and Busy Road - Interim Guidelines* for general guidance and proposed alternative measures to reduce the impact of noise. Noise impact is further discussed in Section 8.7.
Residential apartments are to fully comply with the requirements of the NSW Apartment Design Guide for natural ventilation, solar amenity, communal open space and private open space.	The proposed affordable housing and apartment units fully comply with the NSW Apartment Design Guide for natural ventilation with the provision of plenum to achieve both natural ventilation and internal noise criteria for noise affected apartments fronting Botany Road. While technical non-compliance with private open space, solar amenity and community open space is justified and further discussed in Section 6.7 and 8.4.
The design must consider potential wind impacts and incorporate appropriate mitigation measures to provide amenity and comfort.	A Wind Impact Assessment has been prepared to consider potential wind impacts of the proposed development. The report provides specific mitigation measures to provide

Design Criteria	Detailed SSDA design response
	amenity and comfort. Refer to Section 8.6 and **Appendix KK** for further discussion.
3M Solar access and amenity	
Development does not result in any additional overshadowing of Alexandria Park after 10am on 21 June.	The proposed development and adjoining buildings within the WMQ do not result in any additional overshadowing of Alexandria Park after 10am on 21 June. Refer to Overshadowing Analysis at **Appendix LL** and further discussed in Section 8.4.2.
No more than 30% of Alexandria Park excluding the oval (as shown in Figure 21) is overshadowed by the development as measured at any time after 9am on 21 June.	No more than 30% of Alexandria Park excluding the oval is overshadowed by the development as measured at any time after 9am on 21 June.
Proposed apartments in a development and neighbouring developments must achieve a minimum of 2 hours direct sunlight between 9am and 3pm on 21 June onto at least 1m² of living room windows and a minimum 50% of the required minimum area of private open space area. Note: This applies to at least 70% of the apartments in a development in accordance with the NSW Apartment Design Guide.	It is important to note that the site is constrained by the existing Botany Road alignment. The site boundary is orientated 17.04 degrees off the north point. The building envelope and site wide precinct grid are in alignment to the western property boundary which results in the building orientation being approximately 17 degrees off north. It is critical for building massing to follow the alignment of the site-wide precinct to ensure alignment in the public realm (footpaths, awnings etc), basement structure and Sydney Metro Station and associated infrastructure. While this alignment is necessary for a co-ordinated delivery of the OSD on the site, this orientation has become a site constraint when designing the apartments to comply with solar access design criteria within the ADG standard hour (9am to 3pm), especially for the western facing apartments. 57% of apartments (85 apartments) receive more than two hours of direct sunlight to living room and balcony between 9am and 3pm in mid-winter. It is also important to note that 65% (97 apartments) of apartments receive sufficient sunlight to living space windows between 9:00 am and 3:00 pm, and 59% (89 apartments) of apartments receive sufficient sunlight to balcony between 9:00 am and 3:00 pm. As discussed above, the afternoon sun in mid-winter is approximately 17 degrees off north and due to the orientation of the site, this precludes the possibility of solar access to windows and or private open space for the western aspect apartments in mid-winter at 1:00 pm.

Design Criteria	Detailed SSDA design response
	Due to site orientation constraint, by extending the solar period for 30min, an additional 35 western facing apartments will receive 2 hours of direct sunlight in between 1:30pm and 3:30pm. This results in 80% of apartments overall (120 apartments) receiving more than two hours of direct sunlight to living room and balcony between 9am and 3.30pm mid-winter. While this requires an extended solar access window, extending the solar access window results in an exceedance of the ADG requirement of 70%. Due to the orientation of the site, the proposal is unable to comply with solar access within the prescribed hours of the ADG design criteria. However, apartments have been designed to receive 2 hours of direct sunlight 30min outside the ADG requirement (afternoon sun), which is a reasonable period where residents will use the living area and balcony areas to enjoy sunlight. Despite the non-compliance, the proposal is in accordance with solar access objective of the ADG which are to maximise solar access within future apartments. Further, only 12.7% of apartments within the building receive no direct sunlight between 9am and 3pm in mid-winter, which is compliant with the ADG design criteria. It is also noted that all apartments within the Central Building will receive direct sunlight to living space windows and private open space between 9am and 4pm in mid-winter. Therefore, the development is considered to enjoy a reasonable level of solar access and be in accordance with the intent of the ADG and as such provides a satisfactory level of amenity for future residents. Detailed solar access study is included in the Design Report attached at **Appendix F.** A Solar Access Report has been prepared by RWDI Anemos Ltd and is submitted at **Appendix NN.** Solar access is further discussed in Section 8.4.1.
New development does not create any additional overshadowing onto a neighbouring dwelling where that dwelling currently receives less than 2 hours direct sunlight to habitable rooms and 50% of the private open space between 9am and 3pm on 21 June.	An Overshadowing Analysis has been prepared and submitted at **Appendix LL** and further discussed in Section 8.4.2. The solar access simulations model indicate that under the SSDA scheme it is primarily the areas immediately south of the proposed development where the impact can occur, and that no areas within the Heritage Precinct currently receive 2 hours of direct sunlight experience a reduction to below 2 hours. The SSDA scheme also reduced the total impacted area compared to the Concept DA envelope by approximately

Design Criteria	Detailed SSDA design response
	1,330 m², or approximately 12%. Therefore, the proposal SSDA is an improvement from the concept DA. An assessment of the grade level conditions in the surrounding neighbourhood and Alexandria Heritage Precinct indicated that the proposed development would have a minimal impact on solar access to the residences in the Heritage Precinct and other neighbouring buildings, including residents on Botany Road and Wellington Street.
3N Pedestrian and cycle network	
Provide generous footpath widths that can accommodate the forecast pedestrian flows from the metro station.	As illustrated in the Public Domain Plans and Report submitted at **Appendix II** and **Appendix JJ.** Footpaths with a minimum width of 2m are proposed to accommodate the forecast pedestrian flows from the metro station.
Provide marked pedestrian crossings at the Raglan Street and Cope Street intersection and at the Wellington Street and Cope Street intersection in accordance with the Interchange Access Plan.	Not relevant to this SSDA.
Provide on-site bicycle parking for residents at a minimum rate of 1 space per dwelling and 1 visitor space per 10 dwellings.	The proposal complies with the minimum bicycle rates in accordance with SDCP 2012. See Section 8.10.6 and **Appendix I.**
Provide bike parking spaces within the precinct for Metro customers in accordance the CSSI Approval.	Metro customer bike parking is provided within the Station public domain area on Cope Street and the station portion of Wellington Street. Metro customer bike parking is shown on the Precinct Wide landscape plan attached at **Appendix II.**
3O Carparking and access	
The maximum number of residential carparking spaces is in accordance with the Category A rate for residential flat buildings under the City of Sydney LEP 2012 as follows: ▪ 0.1 spaces for each studio dwelling ▪ 0.3 spaces for each 1 bedroom dwelling ▪ 0.7 spaces for each 2 bedroom dwelling	The proposal complies with the minimum bicycle rates in accordance with SDCP 2012. See Section 8.10.6 and **Appendix I.**

Design Criteria	Detailed SSDA design response
▪ 1 space for each 3 or more bedroom dwelling	
Design basement car parking including depth and setback form property boundaries to ensure adequate soil volume and depth for street tree planting.	The basement has been setback from Raglan Street to the north and from Botany Road to the west (particularly in front of the Central Precinct) to enable deep soil planting zones which include appropriate soil volumes. Please refer to the Architectural Design Report provided at **Appendix F** for further details.
Vehicular access to the site should be located and designed to minimise potential conflicts with metro customers and pedestrians and disruption to the active frontages.	Vehicle access to the basement is provided off Cope Street via the Church Square shared zone. Consolidating basement services in the one basement with a single accessway minimises potential vehicle and pedestrian conflicts and minimises street frontage disruption to maximise active ground floor uses. Church Square has been specifically situated away from the northern and southern metro entrances.
Car share parking spaces are to be provided in addition to the maximum number of car parking spaces permitted in the development and be in accordance with the following rates: ▪ 1 per 50 car spaces provided for residential development (i.e. Category A rate). ▪ 1 per 30 car spaces provided for office premises, business premises or retail premises (i.e. Category D rate).	As detailed in the Traffic Impact Assessment prepared by ptc. (**Appendix I**), the proposed development provides car share parking for the residential and commercial land uses in accordance with the guidelines and concept DA (SSD 9393) conditions of consent. Notably, the basement incorporates two car share parking for the Central Precinct, consistent with the rate.
3P Service vehicles and waste collection	
Service vehicles and waste collection design guideline. Service vehicles and garbage trucks must access and egress the site in a forward direction. Mechanical turntables can be provided in the loading areas.	The Traffic Impact Assessment attached at **Appendix I** outlines in detail the consistency of the proposal with the 3P design criteria. In summary, the five service bays provided within the basement to be shared between the Northern and Central Precinct. They have minimum dimensions of 2.4m x 5.4m with a minimum headroom clearance of 2.2 metres, in accordance with relevant Australian Standards. It is noted that the primary loading area for the site is provided within the ground floor of the Northern Precinct. This area facilitates a mechanical turntable and parking for 2 x SRV and 2 x MRV service vehicles.
Separate parking spaces are to be provided for service vehicles and are not	The five service vehicle parking bays provided in the basement to be shared between the Northern and Central

Design Criteria	Detailed SSDA design response
to be shared with parking provided for any other purpose.	Precinct. They are dedicated solely for this purpose and can accommodate utes and small vans.
Waste collection and loading are to be in accordance with the City of Sydney's Guidelines for Waste Management in New Developments.	A central residential and commercial waste room is located on the ground level which is near the loading dock with capacity to store all waste and recycling likely to be generated by the development in the period between normal collection time. It will be constructed and managed in accordance with the City of Sydney's *Guidelines for Waste Management in New Developments*. A Waste Management is attached **Appendix L** and further discussed in Section 8.12.
Waste collection and loading areas are to be accommodated wholly within the development in the following order of preference: ▪ In the building's basement. ▪ At grade within the building in a dedicated collection or loading bay. ▪ At grade and off street within a safe vehicular circulation system where in all cases vehicles will enter and exit the premises in a forward direction.	The primary loading and waste collection area for the site is provided at-grade and off street at the ground floor of Northern Precinct, accessed off Botany Road. A Waste Management is attached **Appendix L** and further discussed in Section 8.12.
The waste collection and loading points are to be designed to: ▪ Allow waste collection and loading operations to occur on a level surface away from vehicle ramps. ▪ Provide sufficient side and vertical clearance to allow the lifting arc for automated bin lifters to remain clear of any walls or ceilings and all ducts, pipes and other services.	The loading and waste collection area is provided at-grade on level surface at the ground floor of Northern Precinct. This is separated and suitably distance from the basement area and access. It is noted that the loading area has been designed and assessed to ensure compliance with the relevant policies. A Waste Management Plan is attached **Appendix L** and further discussed in Section 8.12.
3Q Integration with the metro station	
OSD structural elements, building grids, column loadings, building infrastructure and services to coordinate/interface with the metro station.	Given the Central Precinct is not directly located above the Sydney Metro box, there is no structural integration required for the Central Precinct and the proposal will not impact on the structural of the Metro infrastructure
Coordinate OSD future lift cores, access, parking and building services with the metro station.	Not relevant to this SSDA.

Design Criteria	Detailed SSDA design response
The station and over station development must have functional autonomy and be designed to ensure that: ▪ All building services required for the OSD's use, operation and maintenance are located entirely within the OSD and must not pass through the station unless specifically required by relevant authorities. ▪ All pathways required for emergency egress and access for the station are located within the station and independent of the development. ▪ All pathways required for maintenance access of the station are located within the station are independent of the development with the exception of shared loading docks. ▪ The utility services for the station must not pass through the OSD.	
Provide adequate clearance zones to ensure that the location of air intakes and exhaust outlets, including cooling tower discharges, eliminates the potential for cross contamination of air flows for exhaust and smoke discharge (in event of fire).	Outside air relief intake for the retail and childcare is via façade louvres along the permitter of the building. Outside air intake is to be compliant with AS1668 Part 2. BCA and the ESD requirements. Exhaust air system is to be compliant with AS 1668 Part 2, BCA and ESD requirements.
3R Sustainability	
Comply with the performance targets specified in development consent SSD-9393	An ESD Strategy and Sustainability Framework is included at **Appendix M.** The proposal complies with the performance targets specified in development consent SSD-9393. Refer to Section 8.5 for further discussion.
Water sensitive urban design (WSUD) measures are incorporated to improve stormwater quality flowing into waterways.	Water Quality Targets and WSUD requirements have been addressed in the Stormwater Management Plan and Flood Impact Assessment and is attached at **Appendix O**.
3S Stormwater and flooding	
Provide a total on-site detention volume of approximately 480m³. On-site detention should be situated above the 100 year ARI flood level to facilitate discharge into potentially fully charged stormwater pipes.	As discussed in Section 8.14, the Sydney Water requirements for the WMQ and Central Precinct are referenced in the Water Quality, Flooding and Stormwater Report prepared by AECOM dated October 2018. The report recommended the development provide a combined OSD tank volume of 480m^3 however did not

Design Criteria	Detailed SSDA design response
	clarify why the OSD tank volume increased from the Sydney Water requirement of 208m^3 to 480m^3. 208m^3 of On-Site Detention have been provided in the stormwater management plan for the Central Building. For further discussion, refer to Section 8.14 and **Appendix O**.
The development should implement measures to achieve the following water quality targets: ▪ Reduction of baseline annual pollutant load for litter and vegetation larger than 5mm by 90%. ▪ Reduction of baseline annual pollutant load for total suspended solids by 85%. ▪ Reduction of baseline annual pollutant load for total phosphorous by 65%. ▪ Reduction of baseline annual pollutant load nitrogen by 45%.	These requirements have been adopted as they provide the highest level of water quality treatment and are consistent with the City of Sydney requirements.
The building floor levels are to be generally consistent with the flood planning levels below: ▪ Residential habitable rooms: 100 year ARI flood level + 0.5m of the PMF (whichever is the higher). ▪ Residential non-habitable rooms: 100 year ARI flood level. ▪ Retail floor levels: 100 year ARI flood level with stepped up zone inside property for shelter in place evacuation for emergency response. ▪ Below ground car parking: 100 year ARI flood level + 0.5m of the PMF (whichever is the higher). ▪ Areas contiguous with the metro station (including station entrances) are to be compliant with the CSSI approval.	WSP have prepared a Stormwater Management Plan and Flood Impact Assessment and is attached at **Appendix O**. Flooding is also discussed in detailed in Section 8.14.2. An assessment has been undertaken to compare the proposed ground floor levels with the maximum water levels and minimum project requirements. The assessment concluded that all the identified areas are able to comply with the required minimum flood planning levels (FPLs), expect for Area 11. Retail Area 11 as indicated above has floor levels below the minimum FPLs required. It was not possible to achieve the minimum FPLs required for the following reasons: ▪ The tenancies are of minimal size: 21sqm, 28sqm and 18sqm respectively. Consequently, the occupants for each shop will be limited. ▪ It is not possible to provide a raised area within these small tenancies as it would occupy a significant portion of the shop making the space unsuitable for retail. ▪ Provision of an escape corridor was considered; however, such a corridor would reduce the retail tenancies size to be commercially unviable. ▪ The Design Review Panel has recommended the retail shop fronts to remain at footpath level and not be

Design Criteria	Detailed SSDA design response
	elevated to ensure an appropriate urban design outcome for the Precinct. ▪ Flood gates are not proposed as they prevent evacuation of the affected tenancies, and they a are not supported by the City of Sydney. The following mitigation measures are proposed: ▪ Emergency Planning ▪ Safe Refuge / Emergency Response
3T Waste management	
Comply with the City of Sydney's Guidelines for Waste Management in New Developments.	The Waste Management Plan attached at **Appendix L** outlines in detail the consistency of the proposal with the City of Sydney's Guidelines for Waste Management in New Developments.
Provide space inside each dwelling for separate storage of at least two days' volume of general waste, recyclables and compostable material.	Waste storage space is provided inside each dwelling for separate storage of at least two days' volume of general waste, recyclables and compostable material.
Provide a centralised waste and storage area(s) near the collection point with capacity to store all waste and recycling likely to be generated in the building(s) in the period between normal collection time.	A residential and commercial waste room for the Central Precinct is located on the ground level which is near the loading dock with capacity to store all waste and recycling likely to be generated by the development in the period between normal collection time.
Provide a separate space (attached to the waste and storage area) for the storage and recycling of bulky waste, textile waste and problem waste for collection.	A separate space for storage of recycling of bulky waste, and food waste is attached to the waste storage area.
If a chute system is used, a dual chute system (i.e. one chute for waste and one for recycling) is to be provided for buildings with more than nine storeys.	A dual chute system is provided for waste and recycling.
A chute room is required on each habitable floor that has a chute system. The chute room is to be designed in accordance with the City of Sydney's Guidelines for Waste Management in New Developments.	A chute room is located on each habitable floor. Refer to the Waste Management Plan attached at **Appendix L** and further discussed in Section 8.12.
3U Culture	
Develop measures in response to Transport for NSW's Reconciliation Action	A Place Story has been developed for the site, to provide strategic guidance to the project team and inform strategies

Design Criteria	Detailed SSDA design response
Plan 2019-2021 to improve employment, empowerment and economic development opportunities for Aboriginal and Torres Strait Islander peoples.	for public art, wayfinding, retail, place naming and activation. The Place Story is summarised by a concise value proposition that is both memorable, and easily communicated.
Participation of Aboriginal artists, designers and landscapers is encouraged as part of the creative development of place-making and built form to incorporate and reflect Aboriginal cultural values.	The Place Story describes Waterloo Metro Quarter as a place of 'unconventional potential', an opportunity to bring diverse mindsets together, celebrate difference, and explore a new economic tomorrow. Four "place pillars" describe the unique attributes that the Waterloo ISD can ‘own’ - defined by their evolving stories. These pillars are drawn from an understanding that starts with ‘the First Story, first’. The Waterloo-Redfern area is culturally and historically significant for the Aboriginal people of Sydney, New South Wales and the country. These, and the contemporary narratives that follow, provides a foundation for the place story we are writing today Ongoing collaborations will generate a meaningful sense of ownership and belonging, whilst unlocking community potential.
3V Public art	
The Sydney Metro Public Art Strategy will be used to deliver public art for the station.	Noted.
Deliver public art that is coordinated with the design and considers opportunities to: ▪ Connect and orientate the Metro Quarter to its neighbouring villages, supporting pedestrian movement and experience. ▪ Support an active street life, public access and personal safety. ▪ Integrate public art with the planning and delivery of landscaping and way finding. ▪ Provide art works within the station entrance that are publicly visible and enhance the entry experience. ▪ Deliver public art in locations that correspond with high movement corridors, sight lines, key entry and activation areas.	A detailed Public Art Strategy has been prepared by Aileen Sage Architects and submitted **Appendix MM**. Public Art is further discussed in Section 4.4.5.

Design Criteria	Detailed SSDA design response
▪ Allow artists to respond to the site and be embedded into the early stages of the design process.	
Any artworks proposed on Council owned land will require consultation and approval from the City of Sydney.	Noted. No public art is proposed on land owned by the City of Sydney.

It is noted that the amending concept DA proposes to amend the Waterloo Metro Quarter Design and Amenity Guidelines to introduce additional objectives and criteria relating to the proposed amendment to the mix of land uses proposed across the precinct. The proposed design of the Central Building is assessed against the proposed new Design and Amenity Guidelines as follows:

Table 15 Additional Design and Amenity Guideline Criteria

Design Criteria	Detailed SSDA design response
3C Public domain ▪ Provide opportunities for seating in the public domain, especially at the edges of Cope Street Plaza, near Metro entries and bus stops. ▪ Provide for a diversity of awning expressions, with scale, materiality and character related to context and use.	Retail tenancies are positioned fronting each street and through-site link frontage across the precinct to ensure activation adjacent to public open space. Opportunities for outdoor seating and indicative licensed seating zones are nominated immediately to the east of the Central Building ground plane. The proposed development includes an awning strategy designed by Woods Bagot and Hassell, to ensure that a diversity of awning expressions are provided across the precinct.
3D Streets, lanes and footpaths ▪ East-west laneways open to the sky ▪ Create a 6m wide north-south public link between Raglan Street and Cope Street Plaza	The proposed development enables Grit Lane to be open to the sky. A 6m wide north-south through-site link is proposed within Building 1 that aligns with the proposed podium colonnade of the Central Building. The link is activated by retail and articulated architecturally to encourage north-south pedestrian movement through the site.
3J Podium and street wall ▪ Consider the expression of contextual typologies (such as terrace houses, workshops and factories) in the form and expression of podium buildings ▪ Provide a richness of detailing and materiality in retail shopfronts ▪ To improve permeability and safety, provide a publicly accessible connection along the eastern side of the church	The podium of Building 3 has been articulated to reflect the scale and materiality of buildings within the locality. As outlined within the Architectural Design Report at **Appendix F** the proposal includes a diversity of materiality and a fine grain at the street level. The detailed SSDA for the Southern Precinct includes a publicly accessible connection along the eastern side of the church.

Design Criteria	Detailed SSDA design response
3K Built form above the podium ▪ Articulate the upper levels of the northern building to break down the building mass, improve amenity and allow for flexibility for a range of tenants	Not relevant for this application.

6.17. SYDNEY DEVELOPMENT CONTROL PLAN 2012

In accordance with clause 11 of the SRD SEPP, the provisions of *Sydney Development Control Plan 2012* (**SDCP 2012**) do not apply to this development. Notwithstanding this, the SDCP 2012 has been considered as a reference point for the detailed design of the proposed development. A summary of key SDCP 2012 provisions relevant to the site are discussed in Table 14.

Table 16 Consistency of the Proposed Development with Key Provisions of the SDCP 2012

Section	Response
2. Locality Statements	The site is located in the Regent Street / Botany Road locality. The proposal is consistent with the principles of the Regent Street / Botany Road. The development delivers a mixed use building comprising retail use, community facilities, residential use and public domain spaces. The building has been designed with articulation and presents an active edge to Botany Road. The residential uses within the tower and the community and retail uses in the podium create an appropriate transition between the adjacent residential areas to the south and commercial building to the north.
3.1.1 Streets, lanes and footpaths	The proposed shared way prioritises pedestrians, cycling and transit use.
3.1.5 Public Art	A WQM site wide Public Art Strategy has been developed by Aileen Sage Architects with art curators Tess Allas and Sebastian Goldspink and is attached at **Appendix MM.** The Public Art Strategy demonstrates the commitment to the commissioning, implementation and management of high-quality public art to satisfy design criteria 3V Public art of the Waterloo Metro Quarter Design Amenity Guideline. The strategy has been developed collaboratively and in close consultation with a team of art curators, architects, landscape architects and heritage consultant.
3.2.1.1 Sunlight to publicly accessible spaces	An Overshadowing Report has been prepared by RWDI Anemos Ltd and submitted at **Appendix LL.** The report determine the effect of the overall WQM developments, including the Central Precinct on the contribution of additional shadowing to Alexandria Park, Alexandria Heritage Conservation Area and Cope Street Plaza. The assessment also assessed shadow impact on nearby residential building, specifically residences on Wellington Street and Botany Road. Sunlight to public spaces are further discussed in Section 8.4.2.

Section	Response
3.2.1.2 Public Views	A View and Visual Impact Analysis has been prepared and provides an assessment of impacts on public views resulting from the proposed OSD, as discussed in Section 8.3**.**
3.2.2 Addressing the street and public domain	The proposal has been designed to positively address the street with number of retail entrances, residential and childcare lobbies proposed from Botany Road and Cope Street Plaza. This is detailed in the Architectural Design Report in **Appendix F.** An assessment of the proposed development with respect to the adjoining Waterloo Congregational Church has been provided in the Heritage Impact Statement (**Appendix H**) and Heritage Interpretation Strategy (**Appendix CC).** Urban design and context is further discussed in Section 8.1.2.
3.2.3 Active frontages	The development has frontage to Botany Road, which is activated by a range of retail and commercial land uses along this frontage. Frontages to Cope Street Plaza and Grit Lane are also activated through the inclusion of a series of smaller tenancies which can provide a range of convenience retail for users of the Metro Station and residents of Waterloo. Urban design and context is further discussed in Section 8.1.2.
3.2.6 Wind effects	A Pedestrian Wind Assessment has been prepared and provides an assessment of wind impact at the pedestrian level of the proposed development. The report is attached at **Appendix KK** and assessment is discussed at Section 8.6.
3.2.7 Reflectivity	A Reflectivity Report has been prepared and provides an assessment of the impacts of reflectivity from the OSD. The report is attached at **Appendix GG** and reflectivity is assessed at Section 8.15.
3.3 Design Excellence and Competitive Design process	The proposal has been informed by the completion of a Design Excellence Process as described in Section 8.1.1 and an endorsed Design Excellence Strategy attached at **Appendix G**.
3.4 Hierarchy of Centres, City South	The site is located within the Green Square Town Centre Primary Trade Area. The proposed development contains predominantly residential land uses that will complement the Green Square Town Centre as the primary retail, community and entertainment centre. Social and Economic impacts of the proposal have been considered as part of the SSP and concept approval process which the proposed Central Precinct development responds to. Social and Economic is addressed in Section 8.17 and is submitted at **Appendix AA**.
3.5 Urban Ecology	Landscape Design is discussed in Section 4.5 and Landscape Design Report is submitted at **Appendix JJ.**

Section	Response
3.6 Ecologically Sustainable Development	An ESD report has been prepared and provides an assessment of the BASIX, NABERS and Green Star ratings of the proposed development and is attached at **Appendix M.** ESD measures are outlined in Section 8.5.
3.7 Water and Flood Management	The management of water and potential flooding impacts have been addressed by the Flood and Stormwater Management Plan report provided in **Appendix O**. The report demonstrates that with appropriate management measures, the site can suitably be addressed through flood and stormwater management practices. Section 8.14 of the EIS provides a detailed assessment of the stormwater and flooding management proposed for the site.
3.8 Subdivision, Strata Subdivision and Consolidation	Preliminary subdivision plans are included at **Appendix Z.** It is proposed that the stratum lots be created in a staged manner.
3.9.1 Heritage Impact Statements	The site adjoins Waterloo Congregational Church, which is a locally listed heritage item. A Heritage Impact Statement (**HIS**) has been prepared and is provided at **Appendix H.** The HIS identifies the existing heritage items within proximity of the site and the potential impacts of the OSD proposal on the local and state heritage items. Section 8.2 provides a detailed assessment of the heritage impacts.
3.11 Transport and Parking	Transport, traffic and parking assessment is discussed in Section 8.10 and a Traffic Impact Assessment is provided at **Appendix I.**
3.11.2 Car share scheme parking spaces	The site is located on land identified as Category A. 1 car share space per 50 car spaces is to be provided in residential development. 2 car share space is provided and is compliant with the car share rate for residential development.
3.11.3 Bike parking and associated facilities **Residential accommodation** ▪ Residents: 1 per dwelling ▪ Customers/visitors: 1 per 10 dwellings **Retail**	150 dedicated residential bicycle parking spaces to be delivered within the basement, in addition to basement storage cages. 16 residential visitor bicycle spaces are proposed within the public domain to support the Central Building. 6 retail and childcare staff bicycle parking spaces within the basement. 10 Class 3 retail and childcare visitor bicycle parking spaces are also proposed. Residential bicycle parking is provided in the form Class 1 bike lockers. Residential bicycle parking are located on level P1 of the basement. Retail and childcare employee bicycle parking area provided in the form of Class 2 bike facilities, which are also located within level P1 of the basement.

Section	Response
▪ Shop/restaurant/café staff bicycle parking: 1 per 250sqm area ▪ Customers/visitors: 2 plus 1 per 100sqm over 100sqm GFA **Childcare centre** ▪ Staff:1 per 10 staff ▪ Visitor: 2 per centre **Bike parking facility** ▪ Class 1 bike lockers for occupants of residential buildings; ▪ Class 2 bike facilities for staff/employees of any land use; and ▪ Class 3 bike rails for visitors of any land use	Bicycle parking is addressed in detail in Section 8.10.6.
End of trip facilities for non-residential uses	The basement level P1 accommodates commercial EOTF for the Northern Precinct and retail EOTF for Northern and Central Precinct.
3.12 Accessible design	The OSD has been assessed against the relevant accessibility requirements of the *Building Code of Australia access requirements; and Disability Discrimination Act 1992*. The assessment concludes that the proposed design generally meets the requirements of the applicable legislation, where strict compliance has not been achieved a deemed to satisfy solution has been proposed. Accessible design is provided in Section 8.16. BCA assessment report is provided at **Appendix R**. Accessibility Report is provided at **Appendix S**.
3.13.1 Crime Prevention Through Environmental Design	A detailed CPTED assessment of the proposed development has been undertaken. The report is provided at **Appendix N.** Further discussion and assessment of the proposed development against CPTED principles is undertaken in Section 8.18.
3.14 Waste	Waste generation and minimisation initiatives have been addressed in the accompanying Waste Operational Management Plan at **Appendix L.** The proposal satisfactorily addresses the requirements of the SDCP 2012. Further impacts of the waste generated, and management practices are discussed in Section 8.12 of this EIS.

Section	Response
3.16 Signs and Advertisements	The scope of the detailed SSDA seeks consent for signage zones/locations for the proposed retail tenancies and site identification signs for residential and childcare lobby entries. Signage zones have been included on the ground floor of the northern, eastern and western (Botany Road) elevations. The proposed signage zone has been designed to integrate with the rhythm of the façade and provide way-finding between the mix of uses. The detailed design of the proposed signage will be subject to separate development application and will consider the detailed signage controls outlined in the DCP.
4.2.1 Building height	The proposed development has a maximum height of 81.88m which complies with SLEP 2012.
4.2.1.2 Floor to ceiling heights and floor to floor heights	Floor to floor height is more than 4.5m on the ground floor. Habitable rooms in residential apartment have a floor to ceiling height of at least 2.7m.
4.2.3 Amenity	Residential dwellings have been designed with a focus on achieving a high level of amenity by providing private balconies to each unit and a communal rooftop open space area. Bicycle lockers and storage are also provided for each unit.
4.2.3.1 Solar access	It is important to note that the site is constrained by the existing Botany Road alignment. The site boundary is orientated 17.04 degrees off the north point. The building envelope and site wide precinct grid are in alignment to the western property boundary which results in the building orientation being approximately 17 degrees off north. It is critical for building massing to follow the alignment of the site-wide precinct to ensure alignment in the public realm (footpaths, awnings etc), basement structure and Sydney Metro Station and associated infrastructure. While this alignment is necessary for a co-ordinated delivery of the OSD on the site, this orientation has become a site constraint when designing the apartments to comply with solar access design criteria within the ADG standard hour (9am to 3pm), especially for the western facing apartments. 57% of apartments (85 apartments) receive more than two hours of direct sunlight to living room and balcony between 9am and 3pm in mid-winter. It is also important to note that 65% (97 apartments) of apartments receive sufficient sunlight to living space windows between 9:00 am and 3:00 pm, and 59% (89 apartments) of apartments receive sufficient sunlight to balcony between 9:00 am and 3:00 pm. As discussed above, the afternoon sun in mid-winter is approximately 17 degrees off north and due to the orientation of the site, this precludes the possibility of solar access to windows and or private open space for the western aspect apartments in mid-winter at 1:00 pm. Due to site orientation constraint, by extending the solar period for 30min, an additional 35 western facing apartments will receive 2 hours of direct sunlight

Section	Response
	in between 1:30pm and 3:30pm. This results in 80% of apartments overall (120 apartments) receiving more than two hours of direct sunlight to living room and balcony between 9am and 3.30pm mid-winter. While this requires an extended solar access window, extending the solar access window results in an exceedance of the ADG requirement of 70%. Due to the orientation of the site, the proposal is unable to comply with solar access within the prescribed hours of the ADG design criteria. However, apartments have been designed to receive 2 hours of direct sunlight 30min outside the ADG requirement (afternoon sun), which is a reasonable period where residents will use the living area and balcony areas to enjoy sunlight. Despite the non-compliance, the proposal is in accordance with solar access objective of the ADG which are to maximise solar access within future apartments. Further, only 12.7% of apartments within the building receive no direct sunlight between 9am and 3pm in mid-winter, which is compliant with the ADG design criteria. It is also noted that all apartments within the Central Building will receive direct sunlight to living space windows and private open space between 9am and 4pm in mid-winter. Therefore, the development is considered to enjoy a reasonable level of solar access and be in accordance with the intent of the ADG and as such provides a satisfactory level of amenity for future residents. Detailed solar access study is included in the Design Report attached at **Appendix F.** A Solar Access Report has been prepared by RWDI Anemos Ltd and is submitted at **Appendix NN**. Solar access is further discussed in Section 8.4.1.
4.2.3.7 Private open space and balconies	All apartments are provided with balconies that adjoins living spaces, which complies or exceeds the minimum depth and size required. Four 3-bedroom apartments on levels 20 and 21 are provided with a smaller 4sqm balcony and a bigger 10sqm balcony. Where minimum depth is not achieved (at the smaller balcony), functionality of the balcony is carefully considered, and an additional balcony area is provided. Overall these units are provided with a total of 14sqm of private open space and is consistent with the objective of the ADG guideline.
4.2.3.8 Common open space	185sqm of rooftop communal open space is proposed = 7.5% site area Refer to Section 6.7.1 for justification.
4.2.3.9 Ventilation	36 of the 48 apartments (75%) on levels 3 to 8 are noise affected apartments due to their frontage to Botany Road. 30 of these apartments are also noted as having the design provisions (opposite or adjacent openings) to enable natural cross ventilation to be provided. Given that 36 apartments are noise affected apartments, where natural ventilation could not be achieved, alternative measure have been

Section	Response
	incorporated to enable these noise apartments to achieve natural ventilation and the internal noise criteria. The alternative mean is the provision of acoustic ventilator to meet the internal noise limits and achieve natural ventilation. The details of the acoustic plenum are provided in the Noise and Vibration Report (attached at **Appendix K**) and discussed in Section 8.7. This alternative measure supported by the ADG, as section 4J of the ADG states that for apartments facing busy road and achieving the design criteria in the ADG may not be possible due to noise and pollution, alternatives may be considered for natural cross ventilation. As a result of incorporating the plenum, 75% (36/48) of the residential apartments on levels 3 to 8 are considered to be naturally cross ventilated, achieving the requirement and the objective of the ADG control. In addition, due to the Botany Road frontage 76 the west facing apartments on levels 9 to 21 are also provided with plenums to achieve noise criteria and natural ventilation. Natural ventilation is further discussed in Section 8.4.3 and the Natural Cross Ventilation Report attached at **Appendix PP.**
4.2.3.11 Acoustic privacy	A Noise and Vibration Impact Assessment is submitted at **Appendix K** and is further discussed in Section 8.7.
4.2.3.12 Flexible housing and dwelling mix	The total number of apartments is 150. The development provides a good diversity of apartment types. The mix of apartments is as follows: ▪ 1 Bedroom 45% ▪ 2 Bedroom 51% ▪ 3+ Bedroom 4%
4.2.4 Fine Grain, Architectural Diversity and Articulation	Architectural articulation is detailed in the Architectural Design Report in **Appendix F.** Built form and context is further discussed in Section 8.1.2.
Schedule 7 – Transport, Parking and Access	
7.6 Green Travel Plan requirements	A Green Travel Plan has been prepared and submitted at **Appendix I.** Green travel plan is further discussed in Section 8.10.7.
7.8 Minimum service vehicle requirements:	A shared loading dock is provided at the ground floor of the Northern Precinct and can be accessed off Botany Road. The loading dock can accommodate 2 MRV bays and 2 SRV bays. It should be noted that the MRV spaces are sized to accommodate the City of Sydney 9.25m waste collection vehicle.

Section	Response
	The access and use of the loading dock and service bays will be coordinated through the implementation of a Freight and Servicing Management Plan attached at **Appendix I**. Parking is further discussed in Section 8.10.
7.8.4 Motorcycle parking spaces	The proposed development provides 6 motorcycle spaces bays within the basement, therefore meeting the minimum requirement of the DCP Parking is further discussed in Section 8.10.
7.8.5 Accessible car parking spaces *One accessible car parking space is to be provided for every adaptable residential unit.* *One space for every 20 car parking spaces or part thereof is to be allocated as accessible visitor parking.* *For residential development, accessible car parking spaces are to be allocated to adaptable units, or as visitor parking. Accessible car parking spaces allocated to adaptable dwelling units are to be a part lot to an adaptable unit in the strata plan.*	A total of 23 adaptable units are proposed. 9 accessible car parking is proposed and 2 residential accessible visitor space is proposed (a total of 11 accessible car parking spaces), which is a shortfall from the DCP rate. The proposed number of accessible spaces is supported by access consultant Morris Goding and is justified in the Accessibility Statement attached at **Appendix S**. The assessment concluded that the reduction of accessible car space is in line with the proposed ratio of overall car parking and apartments proposed for the overall Central Precinct. The reduction of accessible car space is a reasonable proposition given the immediate proximity of the railway station, and precedence with regards to the reduction of accessible car space for other approved residential projects at Barangaroo and Darling Square. Therefore the proposal is considered reasonable in this regard. Parking is further discussed in Section 8.10.

7. COMMUNITY AND STAKEHOLDER ENGAGEMENT

7.1. COMMUNITY CONSULTATION

Community consultation has been undertaken with the relevant community groups, including the Waterloo Congregational Church, local community and surrounding landowners/occupiers. This has occurred throughout all stages of the development process, including CSSI, concept SSDA, and the subject detailed SSDA.

The timeframe for engagement coincided with the restrictions imposed to respond to the COVID 19 pandemic. Accordingly, engagement activities were modified to comply with restriction requirements to minimise community exposure and transmission.

Whilst opportunities to conduct face to face engagement were limited, Mirvac and John Holland hosted a series of online events for the surrounding community to respond to emerging ideas and designs for the over-station development.

Various strategies were implemented to ensure collaborative community involvement in the project. This included online forums, targeted emails to stakeholders, invitations to contact the Stakeholder Manager to discuss issues and opportunities relating to the design of the WQM site and construction impacts. A specific program to engage with Aboriginal stakeholders was also undertaken by Murawin, an Aboriginal placemaking consultancy.

Specific community consultation actions are summarised in Table 17 below.

Table 17 Summary of community consultation activities

Activity	Content	Date
Aboriginal Yarning Circle	Aboriginal Yarning Circle.	11 May 2020
One on one stakeholder meeting	Meeting with City of Sydney, Community Infrastructure Team.	5 June 2020
One on one stakeholder meeting	Meeting with landowner – 60 Botany Road, Waterloo. .	16 June 2020
One on one stakeholder meeting	Meetings with: ▪ Licensee, Cauliflower Hotel. ▪ Custodian, Waterloo Congregational Church. ▪ Waterloo Redevelopment Group (including Inner Sydney Voice). ▪ Body Corporate – Botany Road, Waterloo (opposite site).	17 June 2020
One on one stakeholder meeting	Meeting with REDWatch.	18 June 2020
One on one stakeholder meeting	Meetings with: ▪ Land and Housing Corporation. ▪ Department of Community Justice – Family and Community Services.	19 June 2020
Webinar	General community webinar with Wellington Street residents.	20 June 2020

Activity	Content	Date
One on one stakeholder meeting	South Sydney Business Chamber.	23 June 2020.
One on one stakeholder meeting	Ethics Communities Council – Cope Street.	1 July 2020
One on one stakeholder meeting	Sydney Local Health District	8 July 2020
Webinar	General community webinar.	14, 15 & 18 July 2020 22 & 24 June 2020
Forum	Aboriginal forums	14-15 July 2020

The above events were notified by:

- Emails to approximately 1700 subscribers;
- Flyers distributed to 5000 properties within 500 metres of the site, incorporating residents, landowners, businesses and community groups; and,
- Invitations to community-based groups and organisations.

The community consultation strategy and all content (responses) received throughout the engagement phase are included at **Appendix U.** A summary of the matters raised by the community during the consultation that relate to the SSDA and the proposal's response is included in Table 18**.**

Table 18 Summary of responses to community consultation matters

Matters Raised	Proposals Response / Document Reference
Traffic, Transport and Pedestrian Access	
Suggested that CCTV be placed throughout the WMQ site.	CCTV will operate within the station and throughout the WMQ site.
Encouraged a strategic approach to planning for pedestrian movement including the need to: ▪ See detailed modelling for vehicular and pedestrian traffic. ▪ Consider cumulative impacts of the development upon pedestrian flows and traffic flows. ▪ Facilitate pedestrian flows across Botany Road for commuters travelling to and from Eveleigh, Redfern Station and the south via Wellington/Buckland Streets.	▪ Enhanced pedestrian crossings will be provided at the intersections of Cope Street and Wellington Street and Cope Street and Raglan Street. ▪ Provision is also made for a potential midblock crossing on Botany Road. ▪ The WMQ site links directly into the regional cycle network via the bike path on Wellington Street. The Wellington Street bike path is a City of Sydney / TfNSW requirement.
Congestion of surrounding streets particularly Botany Road.	▪ Refer to Transport, Traffic and Parking Assessment at **Appendix I** and Section 8.10.

Matters Raised	Proposals Response / Document Reference
	▪ The traffic modelling undertaken demonstrated that the external road network should operate at acceptable levels of service or at a level of service less than the approved concept DA. Therefore, the development should not have a detrimental effect on the network operation.
Feedback about buses noted that more consideration should be given to planning for: ▪ A layby for northbound buses to accommodate increased numbers of buses queuing along Botany Road between Raglan and Wellington Streets. ▪ Protection and shelter for bus patrons.	▪ Suggestions for improvements to Botany Road and bus operations will be passed onto TfNSW. ▪ Within the WMQ site there are two new bus stops on Raglan and Botany Road. Widened footpaths around the perimeter of Botany Road will enable waiting bus passengers to safely queue whilst also allowing pedestrians to pass. ▪ Within the Central Precinct, awnings on Botany Road will provide weather protection for bus patrons.
More parking should be provided on site. Others felt parking within the new development should be limited.	▪ Carparking is in accordance with City of Sydney requirements. ▪ Bike parking is provided throughout the WMQ site to promote active transport and discourage reliance on cars with 80 racks on surrounding footpaths and 320 undercover bike spaces within the station.
Concerns regarding loss of carparking along Cope and Wellington streets. Retention of longer stay and disability parking spaces in Cope Street for older people and people with disability who regularly access the services of the Ethnic Communities Council.	The kiss and ride area is an essential part of enabling access to the station and the WMQ site. It was envisaged in the CSSI approval.
When the WMQ site is operational, implement measures to ensure no commuter, workers or residents park in surrounding streets.	As an integrated station development, public and active transport is the dominant and preferred mode of access to both the station and the proposed WMQ developments. On street parking regulation and enforcement is the responsibility of the City of Sydney. This feedback will be passed onto Council.
Requested additional detail regarding how parking for construction workers would be managed.	Refer to Constructional Environmental Management Plan at **Appendix Q**.
Design Considerations – WMQ site wide	

Matters Raised	Proposals Response / Document Reference
Reduction in height from concept DA was well received. Others felt the buildings were too tall, would cast shadows, were dominant and would result in loss of amenity, views, and privacy.	Building height is lower than what is permitted in the approved concept DA.
Some of the responses that were more frequently heard included: ▪ The need for building design that pushes the envelope and is unique to, and reflective of, Waterloo. ▪ Greenery and landscaping to soften the appearance of the buildings and plaza. ▪ The designers should not be afraid of some colour on the buildings. ▪ A palette of warmer natural materials was preferable to harder industrial materials and finishes. ▪ Incorporation of public art across the WMQ site is important to telling the story of this area.	▪ All buildings have been developed to the same level of design resolution. ▪ Buildings and public domain have benefited from an extensive DRP process and the team has focused on developing highly distinctive buildings while also ensuring the precinct remains cohesive. ▪ A diverse palette of building materials and finishes have been employed to provide visual interest with a focus on highly detailed podium structures. ▪ The proponent has also made a significant contribution to public art that will be integrated throughout the WMQ site. ▪ The public art strategy has been informed by a deep understanding of the area and development of individual works will entail additional community engagement. Refer to **Appendix MM.**
Concerns about amenity impacts arising from the development included: ▪ Measures to reduce the heat island effect. ▪ Minimising wind impacts within the plaza and around the WMQ site. ▪ Measures to attenuate noise from servicing and plant for the station. ▪ Overshadowing and loss of sunlight to Wellington Street and the Alexandria heritage area. ▪ Noise from people congregating on balconies. ▪ Loss of privacy and outlook for residents to the north of the WMQ site in the Cope Street apartments.	▪ The Central Building is able to comply with ADG separation distance requirements. ▪ Deep balconies and use of solid concrete balustrades will also reduce noise transmission. ▪ Refer to Wind Impact Assessment at **Appendix KK** and Section 8.6. ▪ Refer to Overshadowing Analysis at **Appendix LL** and Section 8.4.2.
Social, Student and Affordable Housing	
Consideration of ensuring some social and affordable housing be targeted to Aboriginal people who are being forced out of this area by the high cost of dwelling ownership.	The delivery of social housing was a requirement of the bid and is permitted under the approved concept plan. Student housing is also a permitted use under the concept plan.

Matters Raised	Proposals Response / Document Reference
Community Uses and Facilities	
Suggested a Health One centre, new school facilities, community library or learning centre, small movie theatre or farmer's market.	A community childcare centre is proposed onsite.
Officers of the City of Sydney noted consideration should be given to providing a medical hub or a Health One facility on WMQ site.	Preliminary discussions are underway with Sydney Local Health District to explore opportunities for providing health services within the WMQ site.
Officers of the City of Sydney noted the importance of working with local organisations to explore: ▪ Activities within the Makerspace. ▪ An ongoing program of community, recreational and cultural events. ▪ Providing services and amenities that respond to changing demographics and community needs including affordable retail.	In addition to public art there will be a contribution to placemaking, activation and events within the WMQ site. Details of the nature and operation of the Makerspace will be developed in consultation with the community over the three year construction period.
Secure economic opportunities for Aboriginal people and residents of social housing who live within the Waterloo area. This should not just cover participation in construction but extend to working with employers locating to the WMQ site.	There is a program for Aboriginal participation in construction. Consideration will also be given to ways to promote Aboriginal enterprise and employment opportunities within the WMQ site.
Retail and Services	
Consideration whether a supermarket is needed or desirable. Other suggestions included: ▪ Smaller local offers with no chains. ▪ Good quality cafes and food. ▪ Butchers, delis and a bakery. ▪ A small specialty gift shop that showcases the work of local artisans and producers. ▪ Not competing with established local retailers on Regent Street. ▪ Affordable retail to respond to the needs of people on low incomes. ▪ Positioning of retail in the station building on the corner of Cope and Wellington Streets was supported.	The feedback is noted and will inform the retail and procurement strategy that will be implemented closer to the time when the station and WMQ site is ready to operate. The intention is for retail to support the varied needs of: ▪ Metro customers ▪ Workers and residents within the precinct ▪ The surrounding community. Activation of the frontages along Cope Street and Botany Road is a key feature of the Central Precinct and the overall WMQ development.
The Plaza and Public Domain	

Matters Raised	Proposals Response / Document Reference
Concerns regarding adequacy of open space provided. Suggested rooftops and podium areas be landscaped to extend the amount of planting and available open space across the WMQ site. Others noted that green walls would help to provide room for nature.	Provision of open space was addressed in the CSSI and concept DA approval. Cope Street Plaza is consistent with these approvals. The community facility proposed for the Plaza has been removed to increase open space and secure unobstructed access to and from the station.
Supported reduction in height of Northern Building. Would like more detail on the extent of sunlight to Cope Street Plaza at different times of the year.	The reduction in height of the Northern Building will increase sunlight to Cope Street Plaza. The amount of sunlight Cope Street Plaza receives is consistent with City of Sydney requirements. Overshadow is further discussed in Section 8.4.2.
Other suggestions were: ▪ Minimising hard surfaces, planting trees, making the public spaces safe. ▪ Including areas to sit, managing anti-social behaviour, infrastructure to support events and activation of Cope Street Plaza. ▪ Introducing water features, considering the final design of Cope Street Plaza in the context of the park across the road as envisaged in the Waterloo Estate masterplan, using endemic trees and plants as part of the Aboriginal story of the area. ▪ Providing awnings around the perimeter of the WMQ buildings and particularly near the bus stop on Botany Road.	▪ Durable hard surfaces are required to withstand the significant foot traffic that Cope Street Plaza will receive. ▪ Visual interest will be provided by an inground artwork that will extend throughout the Cope Street Plaza area. ▪ Extensive plantings and advanced trees will be provided to soften the appearance of the proposed buildings and provide shade. Endemic plants will be featured across the WMQ site and their significance to Aboriginal people will be interpreted. ▪ Vertical gardens are not proposed due to issues of maintenance and public health. ▪ Additional seating has been incorporated into planter boxes and within the Cope Street Plaza. It is required to be provided around all street frontages. ▪ Awnings are provided along the Botany Road frontage for the Central Building.
Public Art	
The commitment to public art was considered to add a distinctive dimension to the precinct. Suggestions included: ▪ A sculpture that acknowledges Aboriginal people's links to the land. ▪ Works that speak to the contemporary Aboriginal culture of the area.	The Public Art Strategy (**Appendix MM**) provides for a series of significant works to be commissioned throughout the WMQ sit. These works will be in a range of media and scales. The strategy has been developed by Aboriginal curator Tess Allas and Sebastian Goldspink and informed by the work of

Matters Raised	Proposals Response / Document Reference
▪ Street art in laneways. ▪ Bold largescale works like in Madrid Airport. ▪ Bring colour into the area particularly the station. ▪ Works that reference the rich and diverse multicultural nature of the area. ▪ Ongoing arts events and production not just large fixed public art works.	Murawin, a specialist placemaking consultancy. A key focus of the strategy is responding to the links Aboriginal people have, and continue to have, with Country as well as the contemporary stories of Waterloo. One theme that will be explored will be the diversity people who have come to Waterloo from other countries and the areas to represent the multicultural history. One of the selection criteria for public artists involves their capacity and willingness to engage with the community in development of works. This will create further connections between the community and the WMQ site and ensure the work is reflective of the character and stories of this very diverse community. Sydney Metro is also commissioning a large-scale public artwork which will be located within the station. There is a PDA commitment to establish a placemaking fund to run events and activations. A Place Manager will also be employed to coordinate activities within the WMQ site. As the WMQ site is being constructed, the applicant will be working with local organizations to explore: ▪ The nature of this program; ▪ How it would be curated; and, ▪ Opportunities for local creatives.
Precinct Operation and Governance	
▪ Prohibit drinking of alcohol (outside of licensed areas). ▪ Train management and security to deal with challenging behaviour in a sensitive way. ▪ Security and centre managers will also have to build relationships with local health services and community service providers to assist in difficult situations. ▪ Clear WMQ site governance about who is responsible for maintaining the area given multiple	▪ Cope Street Plaza has been designed as both a gathering place and access way to the station. Design of the public domain is compliant with all requirements for disability access. ▪ Retail uses around the edges of the Cope Street Plaza and residential balconies will provide passive surveillance throughout the day. ▪ Cope Street Plaza is a publicly accessible open space and managed by Mirvac.

Matters Raised	Proposals Response / Document Reference
ownership and that different parts of the WMQ would fall under the responsibility of Sydney Metro, Mirvac, City of Sydney, Land and Housing Corporation and a community housing provider. ▪ More information was sought about emergency management. Some were concerned that the "crowded nature" of the site and surrounding streets could make it difficult for services to access the station.	Mirvac's intention is to designate the Cope Street Plaza itself an alcohol-free area with exemptions for licensed restaurants and small bars surrounding the Plaza and to host events such as food festivals. ▪ Footpaths around the WMQ site are under control of the City of Sydney. Mirvac and John Holland will pass on this community feedback for Council to consider. ▪ CCTV will operate within the station and throughout the WMQ site. ▪ Security within the station and at entrances to the station will be responsibility of Sydney Metro. The applicant will pass on this community feedback for Sydney Metro to consider. ▪ The Place Manager will also build networks with local first responders and mental health services to appropriately manage difficult situations. ▪ Responsibility for maintaining areas within and around the WMQ site is outlined below. – Station area: Sydney Metro – Wider WMQ site: Plaza, Laneways, Interfaces with Precinct Buildings: Mirvac – Footpaths and local streets: City of Sydney. ▪ A structure will be developed for these different parties to liaise with each other, share information and where required, coordinate response.
Precinct Activation	
▪ Support for reducing the number of residential apartments and creating more commercial space. ▪ Programming and events in Cope Street Plaza, community hub and Makerspace to activate the WMQ site. ▪ Suggestions included: farmers markets, spaces for affordable retail and social enterprises, opportunities	Cope Street Plaza has been designed: ▪ As a welcoming and inclusive community gathering space. ▪ For community events appropriate to a space of its size. ▪ To facilitate ready and unencumbered access to the station.

Matters Raised	Proposals Response / Document Reference
for Aboriginal enterprises and workshops to make and repair things. ▪ The use of the Makerspace for artist studios was not supported as it was felt this would not provide any extended community benefit.	▪ While the station is constructed over the next few years, engagement will occur with community organisations to identify locally relevant activations for publicly accessible areas and facilities when the WMQ site is operational.
Cultural Heritage	
Some community members noted the significance of Redfern and Waterloo to new Australians who had settled in the area and that diversity is strongly reflected in the social housing community. The Ethnic Communities Council building in Cope Street was the birthplace of SBS and played a key role in the evolution of multiculturalism as a tenet of civic life within Australia. The ECC noted that this contribution should be celebrated within the WMQ site and offered to provide details of this history to inform the heritage and cultural strategy.	These points are noted. The Public Art Strategy and Placemaking Strategy has a strong emphasis on recognition and celebration of Aboriginal culture and the multicultural diversity of the area.
Construction Management	
Community members in proximity to the site noted that: ▪ While there have been amenity impacts from works to date these have generally been well managed and complaints have been addressed. ▪ The contractor will need to continue to work with the community and keep them informed. ▪ Night works should be minimised.	These comments are noted. For further detail of how impacts will be managed please refer to the CTMP at **Appendix Q**. A comprehensive community relations program will also be implemented to keep the neighbours informed of the construction program and provide ready channels for receiving feedback and responding to queries.
Aboriginal **Perspectives**	
Aboriginal stakeholders raised the following concerns: ▪ Waterloo Station should be distinctive and highlight the contemporary Aboriginal culture of Redfern and Waterloo. ▪ The Gadigal language and local heroes of the Aboriginal community should be celebrated. ▪ Support for Murawin's cultural landscapes approach of telling the First People's stories first and using this foundation then tell the stories of colonial and multicultural immigration to the area. ▪ Opportunities for Aboriginal participation should not just be limited to public art. There should also be	These points are noted. The Public Art Strategy and Placemaking Strategy have a strong emphasis on recognition and celebration of Aboriginal culture, as well as the multicultural and social diversity of the area.

Matters Raised	Proposals Response / Document Reference
opportunities for Aboriginal enterprise, procurement, and employment. Other points included: ▪ The extent of change within the area is displacing Aboriginal people. ▪ A proportion of affordable housing should be targeted to Aboriginal people who are being forced out of the area. ▪ The public plaza and surrounding areas should be welcoming to Aboriginal people. It was also noted that Sydney Metro needs to: ▪ Run programs to recruit, train and employ Aboriginal staff. ▪ Require consultant teams working for them to provide employment for Aboriginal professionals. ▪ Consult Aboriginal people in the early stages of a project rather than when designs are fully developed.	
Waterloo Congregational Church	
Given the proximity of the Waterloo Congregational Church to the Central Precinct and the WMQ site, the Waterloo Congregational Church was a key stakeholder. Discussions with the Waterloo Congregational Church focused upon: ▪ Ensuring access for vehicles for weddings and funerals. ▪ Enabling continued operations throughout construction ▪ Security given no fences are proposed. ▪ Managing changes in levels around the Church. The Church custodian and the proponent have agreed to meet regularly throughout planning and construction stages of the project.	An initial meeting was held on the 17 June 2020 with the Church custodian. Construction activities will be planned to avoid or minimise disruption of Church operations as much as possible. As the existing vehicle zone will be retained on Botany Road, there is no disruption envisaged to the church. The Church will have a dedicated relationship manager, who will be the sole point of contact and the interface with the construction team to resolve any issues. The existing dedicated wedding and funeral vehicle zone on Botany Road, immediately outside the church, will be retained. This was presented to the Transport Coordination Office on 25 June 2020 and agreed by all parties present at the session. The public domain has been designed to integrate the Church seamlessly into the Waterloo Metro Quarter precinct. Bollards, vehicle mitigation devices and planting are proposed to control movement of vehicles and pedestrians in the vicinity of the church. The

Matters Raised	Proposals Response / Document Reference
	landscape design has been integrated with the existing Church levels to ensure access via the side doors is retained. The custodian of the Church and the developer have agreed to meet regularly throughout planning and construction.

7.2. GOVERNMENT AGENCIES

The applicant and its consultants have engaged with the relevant Government agencies and City of Sydney Council throughout the preparation of the detailed SSDA, as outlined in Table 19 below.

Table 19 Summary of responses to Agency feedback

Agency / Meeting Details	Matters Raised	Response / Reference
Department of Planning, Industry and Environment 3 February 2020 4 June 2020 23 June 2020 29 July 2020	**3 February 2020** – An initial scoping meeting was held on the 3rd February 2020 to discuss the objectives and overall vision for the WMQ OSD, notably the proposal to increase commercial office floor space on the site. The following matters were discussed: Splitting the WMQ Precinct into separate multiple detailed applications. Appropriate planning pathway to amend the concept envelope (i.e. either a Section 4.55 (2) Modification or an Amending DA). The DPIE confirmed an Amending DA would be required. **4 June 2020** – The indicative agenda for this meeting was as follows: Demarcation between the CSSI approval and scope of each detailed SSDA. The Waterloo Metro Quarter Amenity and Design Guidelines and specifically questions and comments regarding: Apartment Design Guide Overshadowing calculations Traffic and transport The Amending DA regarding: Envelope modifications Deliverables	Separate detailed SSDA's have been lodged for each precinct. An Amending DA has been prepared and is submitted separately, as per the DPIE's recommendation. An assessment of the proposal against the Waterloo Metro Quarter Amenity and Design Guidelines is provided in Section 6.16. A detailed assessment of Building 2 against the Apartment Design Guide is provided in Section 6.7. An Overshadowing Report has been prepared by RWDI and included at **Appendix LL**. The assessment concludes the proposed development complies with the design criteria in the Waterloo Metro Quarter Design and Amenity Guidelines. Refer to Section 8.4.2. A Transport, Traffic and Parking Assessment has been prepared by pct. and included at **Appendix I**. Refer to Section 8.10. The traffic modelling undertaken demonstrates that the external road network should operate at acceptable levels of service or at a

Agency / Meeting Details	Matters Raised	Response / Reference
	Structure of reports that apply across the whole site, and clarification of SEARs. **23 June 2020** – The DPIE provided feedback on the matters presented at the previous meeting held on the 4th June 2020. The discussion focused on the proposed demarcation between the CSSI/SSDA including notably the planning pathway for archaeological studies on the site and remediation. **29 July 2020** – A meeting was held on the 29th July 2020 to discuss the progress of the development and strategy for lodging four detailed SSDA's concurrently. The DPIE proposed their preference was to stagger the lodgement of the detailed SSDAs.	level of service less than the approved concept DA (SSD 9393) and therefore, the development should not have a detrimental effect on the network operation. The concept SSDA establishes the building envelope and the indicative integration between the proposed OSD envelope with the approved CSSI Waterloo metro station. Section 4.3 clearly delineates between the works included within the CSSI approval and the components sought for approval under the detailed SSDA. To meet Sydney Metro commitments, the proposed detailed SSDA's must be lodged concurrently. This will also enable the community to review all detailed SSDA's concurrently and assist with understanding the total vision for the WMQ precinct and cumulative impacts.
City of Sydney Council 4 March 2020 8 April 2020 28 April 2020 28 April 2020 6 May 2020 19 May 2020 26 May 2020 22 July 2020	Sustainability - Matters raised included: Opportunity with the precinct-wide renewal to achieve carbon neutrality. BASIX would apply to student housing. City of Sydney would like to see: Separation of organics and use of City of Sydney Guidelines for Waste Management in New Developments. Initiatives that support the circular economy and local community needs. Five per cent development energy targets for use of renewables. Measures to optimise thermal performance and comfort of the student housing building through use of natural ventilation strategies. Glazing and insulation use.	The sustainability strategy was developed over several sessions with City of Sydney. Refer to **Appendix F** - Architectural Design Report, **Appendix L** - Waste Management and **Appendix M** – Ecologically Sustainable Development Report.

Agency / Meeting Details	Matters Raised	Response / Reference
	NABERS for apartments rating and the incorporation of energy metering to facilitate these assessments.	
	The City cited a recent study that showed limited demand for childcare within the area. Requested consideration be given to locating health services or a Health One facility on site.	Being located above the metro station means the facility will offer good accessibility for families and demand is likely to be boosted by the affordable nature of the proposed childcare facility. While vacancies in the surrounding childcare centres indicate demand is currently limited, the development of the wider Waterloo precinct is likely to boost demand for childcare in the area over the next 15-20 years. This is reflected by the WL Developer reportedly being in discussions with an operator for a 150 place centre. It is also understood that the podium where childcare is proposed has been designed so that if demand for childcare is not sufficient to make this facility viable in the future, it could accommodate another community use. The Social and Economic assessment is attached at **Appendix AA** and is further justified in Section 8.17.
	Noted the importance of working with local organisations to explore: The nature of activities provided within the Makerspace to complement what is already occurring within the area. An ongoing program of community, recreational and cultural events. Works that reference the rich and diverse multicultural nature of the area. Ongoing arts events and production not just large fixed public art works.	There is a commitment to establish a placemaking fund to run events and activations. A place manager will also be employed to coordinate activities on site. As the site is being constructed, the developer will be working with local organisations to explore: The nature of this program. How it would be curated. Opportunities for local creatives. The intention is for retail to support the varied needs of the metro

Agency / Meeting Details	Matters Raised	Response / Reference
	Providing services and amenities that respond to changing demographics and community needs including affordable retail particularly affordable fresh food. Opportunities for social procurement and local procurement beyond “Aboriginal Participation in Construction.” Any social enterprises should have a strong local connection.	customers, workers and residents within the precinct and surrounding community. In addition to the Aboriginal Participation in Construction program, we will also look at ways to promote Aboriginal enterprise and employment opportunities within the precinct, as part of the retail strategy and the placemaking activation program.
	Traffic and Transport – Council had minor comments on the traffic and transportation components of the development, presented on 5 May 2020.	The applicant confirmed traffic and pedestrian modelling is being undertaken collaboratively across the precinct. For more detail refer to **Appendix I.**
	Urban Design and Built Form – The urban design and built form components presented on 28 April 2020. City of Sydney supported the southern precinct scheme and encouraged additional rationale be demonstrated in the Architectural Design Report, with respect to the objectives of building separation. City of Sydney acknowledged the voluntary setback alignment with the church and desire to maximise sunlight access to Alexandria Park.	Refer to the Architectural Design Report at **Appendix F.**
	Noise, vibration and natural ventilation - Minor comments on the noise, vibration and natural ventilation requirements, particularly on the residential dwellings impacted by Botany Road.	The noise attenuation strategy employed on the residential buildings, includes the use of acoustic plenums to achieve natural ventilation. Refer to Noise and Vibration Assessment at **Appendix K.**
Sydney Trains 4 August 2020	Discussion with Sydney Trains staff on 4 August 2020 focused on the following: Wayfinding to support ease of movement between Sydney Trains at Redfern Station, buses and the metro. Positive responses to precinct design, landscaping and public art particularly Aboriginal artwork and cultural elements.	Wayfinding and signage will be implemented close to completion of the station. Connections to Redfern Station will be highlighted. Student allocation remains unchanged. The applicant has committed to regularly updating and liaising with Sydney Trains. Attendees invited to opt in to receive email

Agency / Meeting Details	Matters Raised	Response / Reference
	Student housing allocation to respond to changes in demand due to COVID-19.	correspondence, including notifications and newsletters.
Transport Coordination Office (TCO) 17 June 2020 25 June 2020 5 August 2020	Consultation with the TCO occurred on 17 and 25 June, and 5 August 2020. Discussions focused primarily on the location and operation of the loading docks in the commercial building (northern precinct) and student accommodation building (southern precinct) and the capacity of the bus stop on Botany Road to accommodate a higher frequency of services given Waterloo's status as an interchange station.	Issues surrounding the loading dock were resolved to the satisfaction of the TCO at the meeting on 25 June 2020. Additional detail can be found in the relevant section of SSD-10438 Basement Car Park. The Botany Road bus stop has been designed to accommodate a number of buses at any one time with ample room for customers to queue without blocking pedestrian access along Botany Road. Detailed pedestrian modelling work was undertaken to ensure sufficient pedestrian movement at the bus stop, particularly in peak periods. Provision for the church vehicle zone (for wedding and funeral vehicles), currently located immediately outside the church on Botany Road, was discussed and agreed that it would remain in place. The retention of this dedicated zone has no impact on the increased bus movements anticipated at the new bus interchange.
NSW Fire 16 April 2020 20 April 2020 13 May 2020	Correspondence and meetings with Fire Rescue NSW occurred as follows: 16 April 2020 - emails and phone discussion to agree on the content of the Fire Engineering Strategy 20 April 2020 - emails and phone discussion to agree on the presentation date and attendees for the Fire Engineering Strategy 13 May 2020 - virtual meeting to present the Fire Engineering Safety Strategy for WMQ. Fire Rescue NSW provided general positive feedback.	Refer to the Fire Strategy Report at **Appendix EE.**

Agency / Meeting Details	Matters Raised	Response / Reference
Sydney Water 28 May 2020 29 June 2020	Correspondence and meetings with Sydney Water occurred as follows: 8 May 2020 - Sydney Water Statements of Flow and Pressure issued and received for WMQ water mains 22 May 2020 - submission of application for Feasibility Notice of Requirements for WMQ 28 May 2020 - emails and phone calls to confirm acceptance of application for Feasibility Notice of Requirements for WMQ 29 June 2020 - virtual meeting to discuss options and status on the Feasibility Notice of Requirements for WMQ 8 July 2020 - emails to follow up on agreements and actions from virtual meeting 21 July 2020 - emails from Sydney Water providing status on Feasibility Notice of Requirements for WMQ 31 July 2020 - Feasibility Notice of Requirements issued for WMQ	Refer to Services and Utilities Infrastructure Report at **Appendix T.**
Ausgrid 22 May 2020 25 May 2020 22 June 2020 8 July 2020 6 July 2020 6 July 2020 9 July 2020	Correspondence and meetings with Ausgrid occurred as follows: 22 May 2020 - email, confirm and accept application for power for Buildings 3 and 4 mini chambers 25 May 2020 - email, confirm and accept application for power for Building 1 chamber 22 June 2020 - virtual meeting, confirm appointment of Ausgrid contestable project coordinator 8 July 2020 - virtual meeting, discuss AN21263 Building 3 mini substation flood planning and position 6 July 2020 - email and virtual meeting, AN21263 PDS received 6 July 2020 - email and virtual meeting, AN21264 PDS received 9 July 2020 - virtual meeting, Buildings 3 and 4 substation flood planning levels.	Refer to Services and Utilities Infrastructure Report at **Appendix T.**

Agency / Meeting Details	Matters Raised	Response / Reference
NSW Police 13 July 2020 – Meeting	Correspondence and meetings with NSW Police (South Sydney Police Area Command) occurred as follows: 13 July 2020 - present the scheme, discuss local crime issues and items of consideration for the Waterloo precinct. 4 August 2020 - further consultation to understand the operational context and specific security threats.	Refer to the CPTED Assessment at **Appendix N.**
Jemena 17 June 2020 18 June 2020 1 July 2020	Correspondence and meetings with Jemena occurred as follows: 17 June 2020 - email to confirm contact details in Jemena's Network Development Team 18 June 2020 - email, response to WMQ gas connection assessment and request for estimated design load for assessment from the design team 1 July 2020 - email to confirm WMQ gas connection capacity based on the information provided to Jemena as per its previous request.	Refer to Services and Utilities Infrastructure Report at **Appendix T.**
Department of Communities and Justice – Family and Community Services 19 June 2020	Virtual meeting with Department of Communities and Justice – Family and Community Services Waterloo housing estate client liaison and assets management representatives. There have been regular discussions with LAHC department staff and these will continue about the over-station development. During consultation the following was noted: Disability access to the station. Interest in social housing finishes and external elements. Concerns about the impact to McEvoy Street and surrounding areas from development of the site. Interest in over-station building design and future community facilities.	Design of the station's public areas complies with all requirements for disability access. Social housing internal and external finishes will be as agreed in the PDA and are outlined in the SSD-10437 Southern Precinct. As an integrated station development, public transport will be the dominant and preferred mode of travel to and from the station precinct. Ample bike parking facilities will also help to encourage cycling as a mode of travel to the station precinct. This will reduce vehicular traffic on local roads, including McEvoy Street. Community facilities are in the Southern and Central Precinct, including a Makerspace, community hub and childcare centre.

Agency / Meeting Details	Matters Raised	Response / Reference
Sydney Local Health District 8 July 2020	Preliminary discussions have been had with the Sydney Local Health District to explore opportunities for providing health services from the precinct.	Preliminary discussions are still underway.

Under section 4.55(2)(b) of the EP&A Act, the consent authority must consult with the relevant Minister, public authority or approval body in respect of a condition imposed as a requirement of concurrence to the consent. We, therefore, anticipate that the NSW DPIE will further consult with government agencies such as Ausgrid and TfNSW as part of the assessment of the detailed SSDA.

For further discussion of one-on-one stakeholder briefings, refer to the Pre-submission Consultation Report at **Appendix U.**

7.3. SYDNEY METRO DESIGN REVIEW PANEL

To inform the preparation of the detailed SSDA, the scheme has been presented to the Design Excellence Evaluation Panel (**DEEP**) and Design Review Panel (**DRP**) 10 times since the appointment of WL Developer Pty Ltd as the development partner, to seek feedback and to confirm design integrity.

The matters raised by the DEEP and DRP that relate to the detailed architecture of the building are outlined below:

Table 20 Summary of responses to DEEP and DRP comments

Meeting Details	Matters Raised	Response / Reference
Design Excellence Evaluation Panel 29 January 2019 19 February 2019 26 March 2019 7 May 2019	Refer to Design Integrity Report submitted at **Appendix Y**. Further design resolution was recommended to be considered through the design integrity process, including further consideration to: The approach to flooding, retail levels and the impact on Botany Road interface and public domain needs reconsideration, including setbacks. Expand the public art strategy and embed Aboriginal culture and local community identity into the design of the station, buildings and public realm. More considered response to the local context in the design of the podiums, laneways and facades (e.g. grain, materials and character). Additional technical testing and studies on the resulting wind impact and noise mitigation strategies for all buildings.	Refer to Design Integrity Report submitted at **Appendix Y**. As presented to the DRP, these items were further considered through the design integrity process, including lowering retail floor levels to achieve a more activated streetscape along Botany Road, further development of the public art strategy, and refining the architectural treatment of the podium and towers to respond to the local context. The proposed maximum height of the towers has been reduced to improve solar access to Alexandria Park and the Alexandria Park Heritage Conservation Area. Further, additional technical testing and studies regarding wind and noise mitigation are included within the detailed SSDAs for the detailed

Meeting Details	Matters Raised	Response / Reference
	Any opportunities to improve solar access to public spaces and increase deep soil planting.	design of the proposed development.
Design Review Panel 18 February 2020 17 March 2020 31 March 2020 9 April 2020 21 May 2020 4 May 2020 19 May 2020 1 June 2020 12 June 2020 30 July 2020	The refinement of the SSDA also benefitted from an exhaustive Design Review Panel (DRP) process led by the NSW Government Architect. This panel convened ten times to iteratively review and advise on the emerging design that was being developed within the parameters of the 2017 and 2019 approvals. A key focus of the panel's guidance was to optimise integration of the station and the public spaces and buildings throughout the precinct.	Details of this process and responses to issues raised by the DRP are contained in the Design Integrity Report at **Appendix Y.**

8. ENVIRONMENTAL IMPACT ASSESSMENT

The EIS accompanying this Detailed SSDA is required to consider and assess impacts from the proposal pertaining to the natural and built environment and the social and economic landscape while determining the suitability of the site and the overall public interest associated with the proposal. These aspects are assessed accordingly in the following components of this EIS.

The following sections of the EIS provide an assessment of the key natural and built environment impacts associated with the detailed SSDA proposal. Where appropriate, technical consultant inputs and reports are discussed by summarising key components of the applicable methodology, existing environment, assessment and mitigation measures associated with a specific impact.

8.1. BUILT FORM

8.1.1. Design Excellence

The Design Excellence Strategy (**Appendix G**) endorsed by the Planning Secretary on 29 June 2020 establishes the framework within which Sydney Metro and their partners will deliver design excellence for the Waterloo Metro Quarter ISD.

The Design Excellence Strategy approved under the concept SSDA (SSD 9393) was proposed as an alternative to the completion of a competitive design process otherwise required by the SLEP 2012 for the Waterloo Metro Quarter site. This alternative strategy was supported by the DPIE as the completion of a competitive design process, as defined under the City of Sydney Competitive Design Policy, was considered not reasonable or necessary under the circumstances of this development.

The DPIE accepted as per clause 6.21(6) of the SLEP 2012, that discretion be afforded to the development to propose an alternative design excellence process, as formalised through the endorsement of the Design Excellence Strategy. The Design Excellence Strategy includes several rigorous steps to inform and evaluate the design quality of the proposed development, including:

- Establishing design quality expectations – Sydney Metro DRP
- Competitive selection – Design Excellence Evaluation Panel (DEEP)
- Design Integrity – State DRP or alternative

The Design Excellence Strategy draws from the NSW Government Architect's Better Placed and is consistent with the underlying principles of the NSW Government Architect's draft Design Excellence Competition Guidelines.

Following contract award, the Sydney Metro DRP is convened for the design integrity process, whereby the DRP reviews and provides advice on the detailed building design to ensure the achievement of design excellence, having regard to the Waterloo Metro Quarter Design and Amenity Guidelines.

The Design Integrity Report provided at **Appendix Y**, and the summary provided at Section 7.3 outlines the comments received from the DRP on the design evolution of proposed development including the refinements to the building envelopes. As outlined within the Design Integrity Report, the DRP has reviewed and provided comments on the revised building envelopes and the detailed design of the proposed buildings within the Waterloo Metro Quarter. The proposal achieves design excellence in accordance with the terms of clause 6.21(4) of the SLEP 2012 and Design Integrity Report.

The consent authority may therefore be satisfied that the proposal demonstrates design excellence in accordance with the design Excellence Strategy as endorsed by the Secretary of the DPIE pursuant to conditions A14 and A15 of the concept SSDA.

8.1.2. Built Form and Urban Design

The proposed OSD is detailed in the Architectural Drawings (**Appendix D**) and Architectural Design Report (**Appendix F**) prepared by Hassell. In conjunction with the Concept proposal, the ongoing detailed design development has established a vision for the site to be the new thriving hub in Waterloo. Through the delivery of an integrated mixed use development and public domain works, which seamlessly interacts with the Sydney Metro public infrastructure.

Overall, the proposed development delivers a built form that is responsive to the context of the existing and future desired character of the site and the surrounding area of Waterloo including, the Waterloo Congregational Church. Further, the design of the OSD responds to the site-specific constraints and opportunities of the site and features of the surrounding area, which are evolving over time.

Key impacts associated with the built form are discussed in further detail in the following sections.

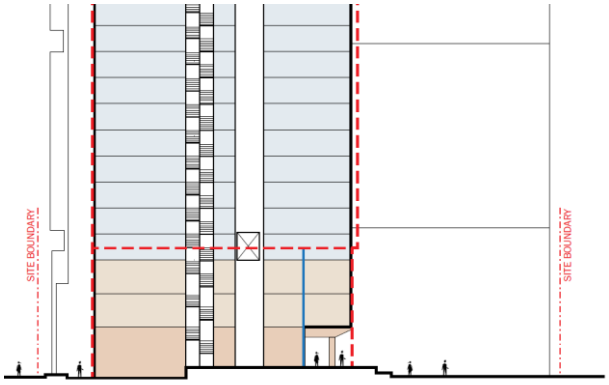
Built Form Principles

The following built form principles have informed the design and sitting of the proposal:

Envelope

The Concept DA SSD 9393 sets out the podium and tower massing envelope. The proposed detailed design is generally consistent with the approved envelope, with the exception of the podium level extension to the east. The extension at the podium level will reduce the residential tower cantilever over the public space, therefore creating a better public domain interface.

The rational is further discussed in the section below.



Bulk & scale

The podium and ground plane have a more human scale interface with the public domain. The massing of the podium also allows for better visual and physical interaction with the public domain and providing additional street activation.

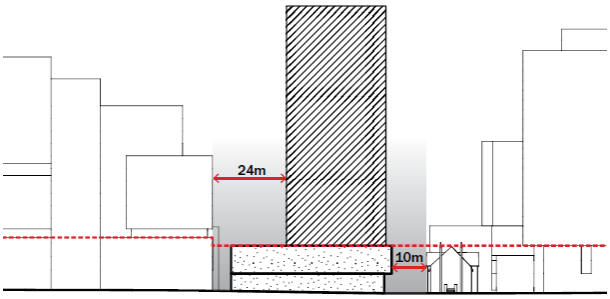
The tower massing is broken up vertically to create a more slender expression. The rhythm of the massing is also a reflection of the internal apartment planning and provide high quality liveable spaces.

Building alignment and setback

The building is setback 6.5m from Botany Road. A 13m setback is provided on the ground floor to the south, to create the Church Square laneway. The height of the podium aligns with the Congregational Church to the south and provides a 10m setback at the podium level to provide visual relief.

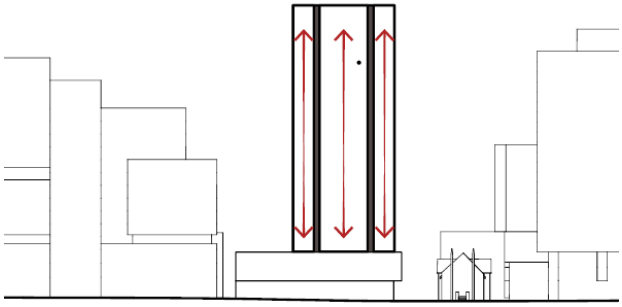
Tower massing is setback 24m to the northern commercial building. A 6m laneway is also created at the ground floor to provide through site pedestrian access to and from the Metro Station.

The building setback and podium street wall is therefore consistent with the Design and Amenity Guideline and achieves the desired massing outcome.

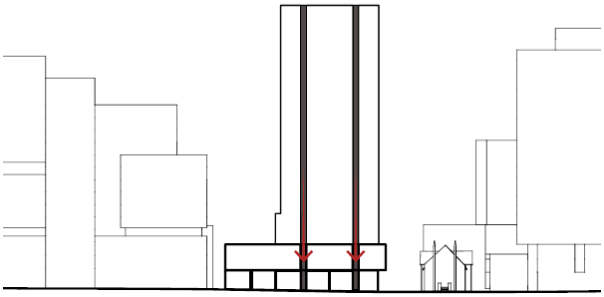


Verticality to the built form

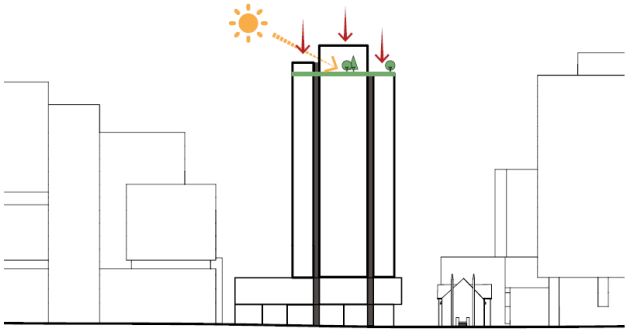
The articulated slots in the tower carry down to the podium and ground in both form and materiality expression. This creates a unique architectural expression for the Central Precinct. The expression of the ground plane takes cues from the existing context of Waterloo to allow a fine grain and human scale pedestrian experience.

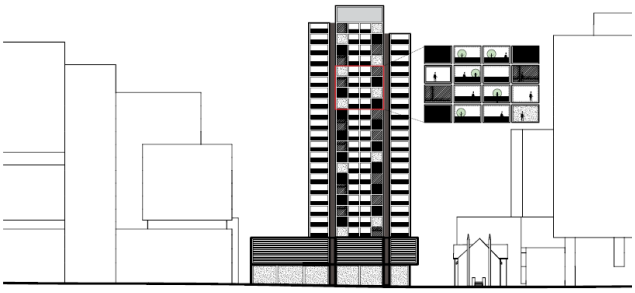


High quality amenity & minimise overshadowing to Alexandria Park
The massing of the top of building is carefully considered to minimise overshadowing to Alexandria Park. It is also important to note that the tower is below the approved Concept SSD envelope height.



Individuality & diversity
An ordered frame contains many façade typologies, to create a sense of diversity and individuality.





Envelope and Massing

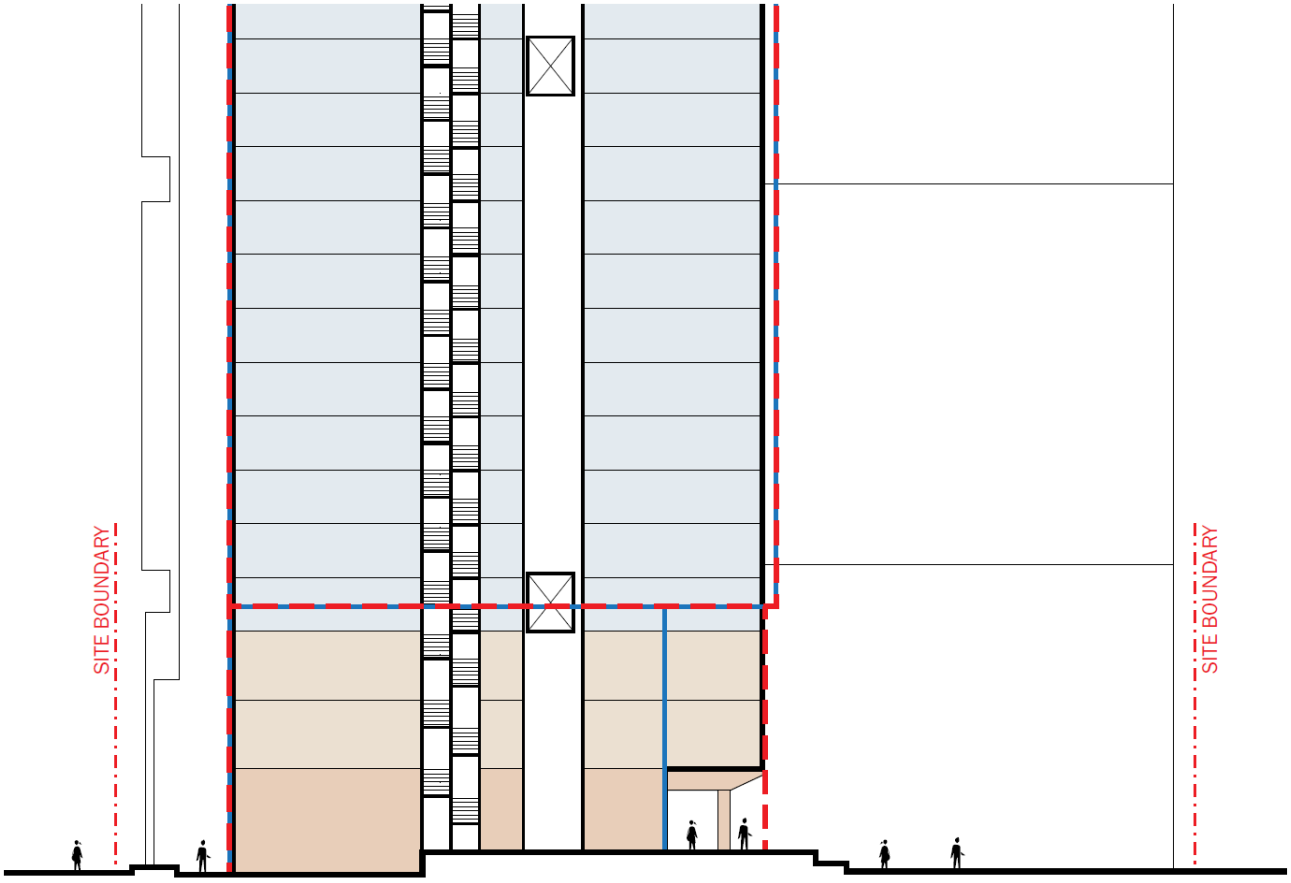
As mentioned above, the Central Building is largely consistent with the approved Concept Envelope, as part of the ongoing design development, modification to the Concept DA is now required to accommodate the detailed design.

An Amending DA has been lodged concurrently with this DA. Specifically for the Central Building, the Amending DA seeks approval to modify the podium design along the Cope Street Plaza / eastern façade. This detailed SSDA is consistent with the concept DA, as proposed to be modified.

The approved envelope shows the tower form cantilevering over three podium levels, with Cope Street Plaza extending to the building line of the podium levels. This configuration would result in emphasising the scale of the tower form, which could have an overbearing effect when viewed from the ground plane (refer to Figure 37).

The amended envelope proposes to extend the podium levels towards the Cope Street Plaza. This provides greater opportunity for community uses within the podium levels without compromising the open space outcomes. The residential building would now sit in line with (not project in front of) the podium levels, giving the podium and community childcare centre a greater presence and identity. This also create a better integration of the podium with the tower above, Cope Street Plaza and surrounding pedestrian connections (Figure 37).

Figure 36 Eastern Façade Comparison



Source: Hassell

The amended envelope also allows for a colonnade space to be created on the ground floor of the Central Building, with the levels above extending to the line of the tower. The colonnade space aligns directly with Raglan Walk, ensuring a clear and legible connection from Raglan Street to the Central Precinct and Cope Street Plaza (refer to Figure 38). This colonnade space is of a human scale, providing a sense of enclosure and weather protection.

Compared to the approved envelope, the extent of publicly accessible space (i.e. from street edge to ground floor building line) is maintained. The Cope Street Plaza can easily exceed the minimum space required, with more than 1,500 sqm provided (against a minimum requirement of 1,325 sqm in the Concept approval). The colonnade creates an additional public accessible area of at least 150sqm.

Accordingly, the extension of the podium levels and the creation of a colonnade space provides better connectivity and integration with adjacent buildings and public domain spaces, without comprising the amenity of the Plaza or the adjacent building and can be supported from an urban design and amenity perspective.

Further design justification is provided in the Amending DA SSD-10441.

Figure 37 Central Building colonnade fronting Cope Street Plaza

Source: Hassell

Botany Road Streetscape

The design of the OSD along Botany Road has been significantly influenced by the interface with Botany Road Bus Interchange and the heritage value of the Waterloo Congregational Church located to the south.

The Central Building is setback a minimum of 6.5m along Botany Road to provide wider footpaths adjacent to the bus interchange and create a pedestrian friendly environment. The landscaping along Botany Road has been designed to integrate with street seating and provide safe spaces for pedestrians to wait for the bus.

A generous ground floor setback to the north and south is also provided to create Grit Lane and Church Square to enhance site circulation and provide visual break between the buildings within WMQ.

Retail uses with generously glazed shopfronts are proposed on the ground floor to activate the new public domain spaces and provide casual surveillance. A continuous awning is also provided to enhance retail character and to provide weather protection for pedestrians.

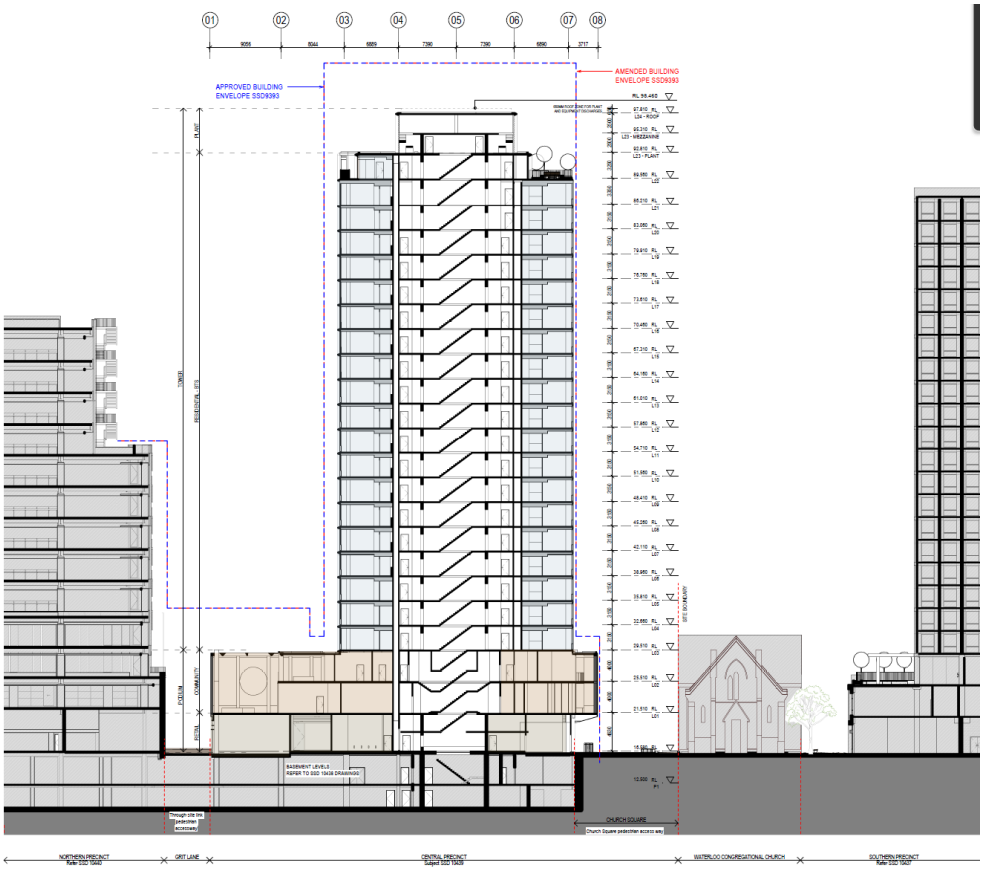
Given the central location of the Site, the Central Building creates a strong podium design with height aligned to the Church and the podium of the Northern Building. The height alignment creates a consistent streetscape outlook and responds to the scale of the Church, while providing a buffer to the Northern Building. The podium also provides a 10 metre setback to the Church and a 6 metre setback to the podium of the Northern Building to provide visual break and comply with the Design and Amenity Guidelines.

The use of a masonry façade with large cut outs will enhance visual interest and differentiate the Central Building within the WQM precinct. More importantly the use of material and colour also responds to the architectural value of the heritage Church and the wider Heritage Conservation area.

The massing and form have been carefully considered to minimise overshadowing to Alexandria Park and the wider public domain. The façade expression creates a sense of individuality and diversity through a finer grain facade module to create visual interest in the skyline.

Figure 38 Botany Road Elevation

View from Botany Road pedestrian path looking south



Source: Hassell

Cope Street Plaza Streetscape

Consistent with the setback design criteria in the Design and Amenity Guideline, the ground floor of the Central Building has a minimum of 30 metres setback from the Cope Street boundary, to allow for the creation of Cope Street Plaza. Cope Street Plaza is located at the heart of the WQM Precinct, activated retail and outdoor seating is provided on the ground floor to encourage pedestrian activities. The residential and community childcare centre lobbies are also centrally aligned to the Plaza to provide visual and physical connection from Cope Street, to the Plaza and the Central Building.

The Cope Street Plaza elevation adopts the similar architectural response as the Botany Road Elevation, while providing visual connection to the public domain. When viewed from Cope Street Plaza, the podium connects the building to the public domain by using dark material and large façade openings to mark its presence. While the tower incorporates lighter colour and finer grain details to minimise bulk and scale.

Figure 39 Montage as viewed from Cope Street

Source: Hassell

Conclusion

The proposed built form has been designed to respond to the characteristics of the site and surroundings, including the low scale heritage item and the future buildings on Botany Road. The proposed tower also marks the central location of the site and the location of the community facilities hub. The proposed development achieves this through a strong podium design and finer grain tower façade to create visual interest and breaks up the architectural pattern.

The proposed built form has also sought to improve the public domain interface by reducing the residential tower cantilever over the public space to great a better design outcome, while staying consistent with the approved concept height to maintain amenity. The proposed development therefore has an acceptable built form that is contextually responsive and appropriate.

8.2. HERITAGE IMPACT

A Heritage Impact Statement (**HIS**) has been prepared by Urbis and is attached at **Appendix H**. The HIS identifies and assesses the potential impacts associated with the proposed Central Precinct on the significant characteristics of neighbouring heritage items, their context and setting.

The HIS provides a comprehensive assessment of key heritage impacts and establishes the heritage management framework for the development of the site. The assessment of heritage impacts has been prepared in accordance with the condition B28 of SSD 9393, the SEARs and the relevant provisions of the applicable planning instruments and Waterloo Design and Amenity Guidelines.

In particular, the assessment provides a discussion of the potential impacts of the development on the adjoining Waterloo Congregational Church.

As discussed previously, the site is located within the vicinity of a number of locally listed heritage items under the SLEP 2012. The HIS has been prepared in accordance with the Heritage NSW's (former Heritage Office) guidelines 'Assessing Heritage Significance', and 'Statements of Heritage Impact'. The philosophy and process adopted is that guided by the Australia ICOMOS Burra Charter 1999 (revised 2013).

Site constraints and opportunities have been considered with reference to the Waterloo Metro Quarter Design and Amenity Guidelines (March 2020).

Waterloo Congregational Church

The Waterloo Congregational Church on Botany Road is the only heritage item directly adjoining the proposed Central Precinct, to the south of the site. This significant heritage item will be wholly retained as it does not form part of the site area. No physical works to this heritage item are proposed as part of this SSDA. All significant fabric, landscaping and other elements associated with the building will be retained and conserved.

The proposed Central Building has been designed with a dominant masonry podium form extending to three storeys in height. The podium comprises predominantly glazed ground floor with retail spaces, topped by a heavy masonry mostly solid second and third storey above. The use of masonry in the majority of podium references the masonry materiality of the adjoining Waterloo Congregational Church, as well as a reference to the previous industrial development that previously occupy this site.

The masonry sections of the podium have a high solid to void ratio, with the limited inclusion of geometric shaped cut out along the Botany Road elevation, Cope Street Plaza elevation and the southern elevation (facing the Church). These windows, while not direct references to the more ecclesiastical window shapes of the Church, provide a reference to the traditional ecclesiastical design of churches which generally contain a high solid to void ratio and the inclusion of a small number of windows.

Views towards the Church will inevitably be altered as a result of the proposed Central Building. However, the detailed design has sought to mitigate these visual impacts through the adoption of the appropriately scaled podium and generous setbacks to the south (13m on the ground floor and 10m on the podium level), which improves view lines. Accordingly, the Central Building will not adversely impact significant existing views towards the Church. Outward views from the Church will also not be altered.

The design has also responded to specific requirements in the Design and Amenity Guideline (March 2020), including the following:

- The height of the Central Building podium is lower in height compared to the height of the Church pinnacles. The height of the podium is aligned with the bulk of the Church building.
- The front setback aligns with the setback of the Waterloo Congregational Church.
- Church Square provides a mixed use pedestrian and vehicular space and also acts to provide substantial physical distancing between the low scale church heritage item and the much larger scaled Central Building.

- Church Square also provide for a meaningful amount of space for public appreciation and interaction with the heritage item, which was never available before this development. The design of this laneway ensures that the church building would be accessible visually to pedestrians.

The increased exposure of the Church to the public will assist in providing important historical layering to the site, that can be accessed by site users.

Alexandria Park Heritage Conservation Area

The scale and design of the proposed Central Precinct is not considered to have any detrimental impacts on the Alexandria Park Heritage Conservation Area. This conservation area is identified to be significant for its collection of nineteenth century terrace and cottage building stock, which would not be physically affected by the proposed development. This conservation area generally consists of single and two storey small scale dwellings with minimal setbacks and street trees throughout. This creates an insular streetscape with minimal views beyond the immediate context.

Cardno have prepared a Visual Impact Assessment (**VIA**) attached at Appendix HH and is further discussed in Section 8.2. This VIA identifies the visual changes from the Concept DA built form and the proposed detailed built form, including view from Alexandria Park.

Distant views along view corridors within the conservation area are rare towards the site and the location of the proposed development. As such, the proposed Central Building would have a negligible, if any, visual impact on the conservation area.

Overall, the Central Precinct will not have a material difference in visual impact on the Alexandria Park Heritage Conservation Area.

Other heritage items in the vicinity

The Central Precinct is not located within the immediate vicinity of any other listed heritage items. The Central Precinct will have no adverse heritage impacts on any other heritage items in the vicinity of the site. The broader heritage items at Raglan Street and Buckland Street are substantially distanced from the site, and will be wholly retained and unaffected by this SSDA.

Archaeological Impacts

It is beyond the scope of the HIS report to assess the archaeological potential of the site or provide assessment on the potential archaeological impacts of the proposal. However, the HIS has made reference to other consultant historical archaeology reports, including the ones approved as part of the Concept SSD, which outline assessments of archaeological significance and identify recommendations.

The historical (non-Aboriginal) archaeological potential and significance of the WMQ site has been previously assessed in detail as part of the CSSI approval in the following reports:

- *Archaeological & Heritage Management Solutions (AHMS) 2015, Central to Eveleigh Corridor: Aboriginal and Historical Heritage Review, Final Report.*
- *Archaeological & Heritage Management Solutions (AHMS) 2015, Opportunities for Interpretation in the Central to Eveleigh Corridor, Final Report.*
- *Artefact 2016, Sydney Metro City & Southwest, Chatswood to Sydenham: Historical Archaeological Assessment and Research Design.*
- *AMBS 2017, Sydney Metro, City & Southwest Archaeological Method Statement for Waterloo Station.*
- *AMBS 2018, Summary report on the historical archaeological Investigations at the Waterloo Station Site.*

Tables 6 and 7 of the HIS provides a summary of the outcomes and recommendations of the above studies. Adoption of these recommendations will ensure that the potential archaeological impacts of the proposed works are managed appropriately.

It is important to note that this SSDA is not subject to any excavation works, therefore will not disturb the grounds of the site. Excavation is proposed under the Basement SSDA, which will appropriately adopt the recommendations.

Heritage Interpretation Strategy

A separate Heritage Interpretation Strategy has been prepared by Urbis (attached at Appendix CC). It addresses particular historic themes and narratives for the WMQ site and explores opportunities for heritage interpretation within the Central Precinct.

This interpretation will work hand in hand with broader strategies which reflect the tangible and intangible values of the place, including the public art strategy and the landscaping strategy. Adoption of the recommendations within these individual technical reports will ensure that the heritage values of the site are appropriately managed and interpreted for future users of the site.

Conclusion

Overall, the proposed works within the Central Precinct are considered acceptable from a heritage perspective and are recommended for approval, subject to adoption of the following key recommendations:

- Recommendations for test excavation, investigations, reporting, monitoring, and obtaining permits in relation to archaeological potential of the place, should be adopted as outlined in the respective technical reports that apply to the subject site.

8.3. VIEW AND VISUAL IMPACT

A Visual Impact Assessment Report has been prepared by Cardno and is provided at Appendix HH. The report has been prepared to assess the visual impact of the development when viewed from the public domain and key vantage points surrounding the site. The visual impact assessment also considers views by pedestrian from the future Cope Street Plaza and the surrounding public domain.

A total of eight local views and 10 regional views were selected. Views from surrounding heritage conservation areas have also been considered and forms part of the discussion in the HIS. For each of the selected views, the report provides a qualitative assessment of:

- The existing visual environment;
- The capacity of the visual environment to absorb change;
- The amount of change that would be experienced as a result of the implementation of the proposal (carried out with the aid of survey accurate photomontages prepared from agreed critical viewing points); and,
- The visual quality of the changed visual environment in comparison with the environment prior to development.

The assessment of impacts on views from the public domain has been informed by relevant planning principles for assessment of such impacts set by the Land and Environment Court of NSW, specifically in *Rose Bay Marina Pty Ltd v Woollahra Council and [2013] NSWLEC 1046*.

The assessment has also been based on the comparison between the Concept DA envelope montage and the detailed proposal montage as amended. The detailed montage comparison is included in the report.

Local Views

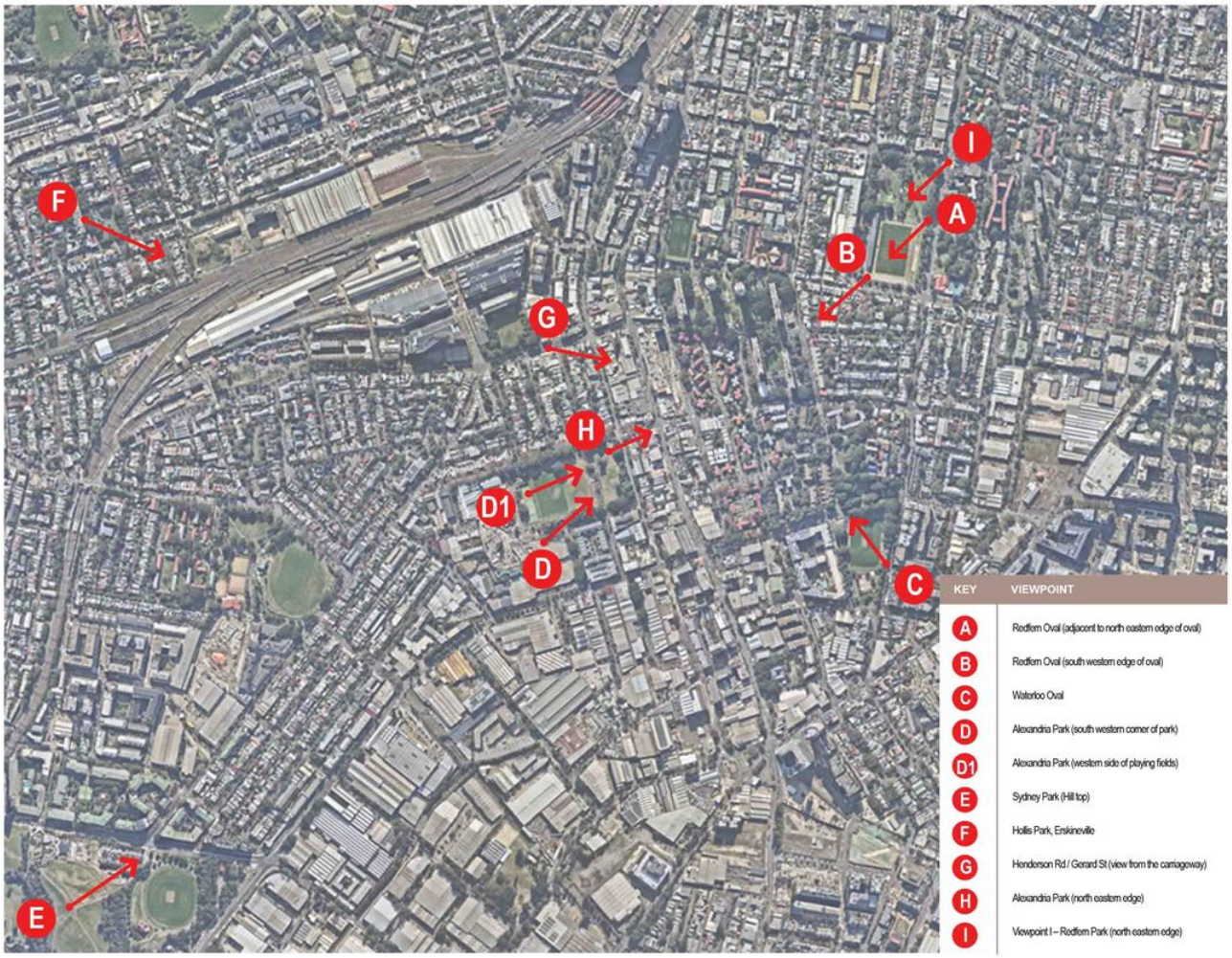
Local viewpoints were selected from within the greater Waterloo Precinct and along Botany Road to provide an accurate representation of views to the Central Precinct from local streets and the surrounding public domain (see Figure 41).

Figure 40 Local view points

Source: Cardno

Selected regional viewpoints are provided in Figure 42.

Figure 41 Regional view points



Source: Cardno

Heritage Conservation Areas

Selected viewpoints from surrounding Heritage Conservation include:

- The Redfern Estate (Viewpoint A, B and I);
- The Alexandria Park Conservation Area (Viewpoint D, D1, H); and,
- The Waterloo Conservation Area (Viewpoint C).

The Visual Impact Assessment was carried out for the following categories of views:

- Close views – streets adjacent to the site;
- Medium distant views – streets and open spaces within the Waterloo Precinct;
- Medium distant views - streets and parks outside of the Waterloo Precinct and between 200 and 700m of the development site; and,
- Distant views – significant viewpoints up to 2kms from the site.

Close Views

Existing Environment

The visual environment immediately surrounding the site is characterised by Botany Road and streets adjacent to Waterloo Estate. The heritage listed Waterloo Congregational Church is the only structure of significance remaining on the Botany Road frontage. The visual environment of this portion of Botany Road is of low quality, dominated by vehicular traffic, buildings of low architectural quality and low pedestrian amenity.

Streets on the other boundaries of the WMQ are of a significantly different character to Botany Road. They are less urban and are influenced by their proximity to residential and traditional fine grain retail uses. Vehicular traffic is recessive and there is a relatively high level of pedestrian amenity. Street trees are also significant components of the visual environment. It is noted that the only interface the Central Precinct has with surrounding streets is Botany Road and Cope Street across the Cope Street Plaza

Capacity to absorb change

Botany Road has a high capacity for change and the proposed development represents an opportunity for major improvement to visual quality at street level. The primary constraint for the Botany Road frontage is ensuring the development responds appropriately to the heritage values of the Waterloo Congregational Church.

The streets to the north, south and west of the WMQ site reflect built form and landscape elements that contribute to a relatively intact visual character of medium quality. The streets are considered to have a moderate capacity to absorb change.

Changes to close views resulting from the proposal

When compared to the approved concept envelope montage, the proposed montages indicate a further improvement in visual quality in direct views to the site from Botany Road (viewpoints 1, 2, and 3) – refer to Figure 43 and Figure 44.

In these close views the Central Building is visible as part of the overall WQM site, sitting in between the Northern and Southern Precincts. The proposal improves the visual quality of the site through the articulation in façade design and the implementation of good urban design practices, including clear delineation between base, middle and top in the built form.

In views from Cope Street to the east (viewpoint 6) (refer to Figure 45), the Central Building is visible across the proposed Cope Street Plaza. From this view the Central Building appears as a well-articulated, slender tower with generous separation between the proposed buildings to the north and south.

The visual relationship of the proposed building with the adjacent Waterloo Congregational Church is also enhanced by a significant offset resulting from the proposed Church Square laneway. The building is also situated within a generous ground plane of public open space. These factors demonstrate good urban design practices and further improve the impacts of the building on the local visual environment.

Figure 42 Viewpoint 1 – Botany Road near the intersection with Henderson Rd and Raglan St facing south-east

Existing

Approved Concept envelope montage

Source: Cardno

Proposed detailed design montage

Source: Cardno

Figure 43 View Point 2 - Corner Botany Rd and Raglan St facing south-west

Existing

Approved concept envelope montage

Source: Cardno

Proposed detailed design montage

Source: Cardno

Figure 44 Viewpoint 6 – Cope St opposite proposed Cope St Plaza facing west

Existing

Proposed detailed design montage

Source: Cardno

Medium distant views

Existing visual environment

The Waterloo Estate incorporates a number of elements that contribute to its existing visual character. These include a mix of residential buildings including 29-storey, 6-storey and 3-storey apartment blocks, wide streets lined with large street trees, buildings that are well set back from the streets resulting in a feeling of spaciousness and large “forest scale” trees.

Capacity to absorb change

The assessment concludes Waterloo Estate has a moderate capacity to absorb change, contingent on:

Retention and improvement of the existing streetscape quality and open character with buildings set back from the street. This constraint is of less significance at the interface of the Precinct with the more urban character of Botany Road and its environs.

The Central Precinct has the capacity to support tall buildings, provided that they do not result in continuous skyline elements and that they exhibit architectural design excellence.

Changes to medium distant views within Waterloo Estate

Viewpoint 4 (refer to Figure 46): The Central Building would be wholly contained within the approved concept envelope. Only the top portion of the Central Building would be visible as the lower and ground levels, which are screened by existing foreground buildings and the substantial stock of tall, forest scale trees in this part of the Waterloo Precinct. The prominent building visible from this view is the Southern Precinct building group. The detailed built form of the Central Building represents an improvement to the visual impact of the proposal when compared to the concept envelope.

Viewpoint 5 (refer to Figure 47): From the corner of George Street and John Street facing north-west, the Central Building would be visible as part of the overall WQM site. The visibility of the Central Building would again be substantially mitigated by existing foreground tree stock and buildings.

Figure 45 Viewpoint 4 – Corner George St and Wellington St facing north-west

Existing

Approved Concept envelope montage

Source: Cardno

Proposed detailed design montage

Source: Cardno

Figure 46 Viewpoint 5 – Corner George St and John St facing north-west

Existing

Approved Concept envelope montage

Source: Cardno

Proposed detailed design montage

Source: Cardno

Medium distant views – outside the Waterloo Estate

Visual environment

Views towards the site from the suburban environments in the medium distance generally include the existing Waterloo towers and residential blocks as prominent visual elements. Substantial areas of open space in close proximity to the Waterloo Precinct include:

- Redfern Oval and Park;
- Waterloo Park (north and south); and
- Alexandria Park.

These open space areas provide visual relief and contrast in the densely developed environment. They are critical to the visual amenity and character of the region.

Capacity to absorb change

Due principally to the dominance of the existing large scale development within the Waterloo Precinct, views from locations at middle distances from the Central Precinct are considered to have a high capacity to absorb change.

The Alexandria Park Heritage Conservation Area is located near to the western edge of the Central Precinct. As an urban form, the area is comprised of a mosaic of traditional terrace housing on a grid street pattern and parklands (principally Alexandria Park).

Large forest scale trees constitute a further significant element in the landscape. Views out of and into the Conservation Area are contained by this structure of dense housing and mature trees so that the area has a high capacity to absorb change in its surroundings. Specifically, views in the direction of the Central Precinct are substantially screened by these elements.

Changes to medium distant views outside the Waterloo Precinct resulting from the proposal

The amount of likely change to medium distant views outside the Waterloo Precinct resulting from the proposal was assessed via preparation of montages from viewpoints A, B, C, D, D1, G, H and I. In summary, the detailed building montages as amended illustrate the proposal sits wholly within the approved concept envelope. Compared to the Concept DA envelope, the Central Building is visibly shorter and less bulky, which result in a greater visibility of open sky and an overall improvement to the visual impact

Anticipated change to the existing visual environment is summarised below with reference to each viewpoint.

Views from the north

Assessment of views from the Redfern Park and the Redfern Estate Heritage Conservation Area provide an indication of the general visibility of the WMQ, including the Central Precinct. From the eastern side of Redfern Oval (viewpoint A) the montage indicates that Central Precinct would be completely screened by the existing large apartment blocks in Waterloo and would not be visible. In this view the only building visible would be the very top portion of the proposed Southern Precinct tower.

At the southern edge of Redfern Oval and the northern eastern edge of the adjoining Redfern Park (Viewpoints B & I) also indicate that the Central Precinct and the entire WMQ site would sit below the line of sight and would not be visible.

In other areas within the Redfern Estate Heritage Conservation Area, the developed site resulting from implementation of the amended concept would be similarly screened by other buildings on the WMQ site and or within the Redfern Estate.

The visual impacts of the Central Precinct on this Conservation Area would be minimal.

Views from the south

The proposed development will not be visible from locations adjacent to the southern boundary of the Waterloo Precinct, including Waterloo Oval and its environs.

Views from the west

The Alexandria Park Conservation Area includes land to the west of the WMQ site. The impacts of the proposal on views from this area have been assessed via selected viewing points within Alexandria Park and along Henderson Road, at the southern and northern edges of the Conservation Area respectively.

From the western edge of Alexandria Park (Viewpoints D & D1), the developed WQM site would read as three new tower elements on the skyline above a foreground of large established trees. In this context, the Central Building appears as a consolidated building group substantially screened by existing large trees on the park boundary. These proposed buildings appear as sculptural elements in the view and do not result in continuous skyline elements (refer to Figure 48).

From the north eastern point of the Park (Viewpoint H) only a portion of the Central Building would be visible behind the substantial stack of existing tall, forest scale trees and buildings.

The impact of the proposed Central Precinct on views from Alexandria Park and the Alexandria Park Conservation Area is considered acceptable, contingent on achievement of design excellence in the proposed tower elements.

In views towards the site from nearby roads (Viewpoint G), the taller buildings of the WMQ site would be the only element visible above the existing foreground buildings. The Central Building appears as part of the consolidated building group comprising the overall Metro Precinct proposal.

By decreasing the amount of visible sky and introducing sculptural forms on the skyline, it is considered that with high quality design the Central Building tower element will not impact negatively on visual quality. Rather, the WMQ buildings will function as visual markers that will enhance wayfinding in the neighbourhood and contribute to the presentation of the WMQ as a new regional node of activity.

Figure 47 Viewpoint D – Alexandria Park (south western corner of park)

Existing

Approved Concept envelope montage

Source: Cardno

Proposed detailed design montage

Source: Cardno

Views from the east

There are no views to the Central Precinct available from the parks and streets in the Waterloo Conservation Area. The development will have no impact on views from these locations to the east.

Distant Views

Visual environment

Given the highly developed regional environment, opportunities for panoramic long views towards the site are limited. The only open distant view from a public place is from the hilltop at Sydney Park. The Sydney Park hilltop provides a relatively rare publicly available 360 panorama that includes the Sydney CBD. This view is considered to be critically important at a regional level.

Capacity to absorb change

In distant views, notably from Sydney Park, the Central Precinct forms a small component of this broad and expansive view and a change on the site would only impact on this small portion of the panorama. With the Waterloo building wall as a backdrop, it is considered that the view has a high capacity to absorb change.

Changes on distant views resulting from the proposal (refer to Figure 49*)*

Sydney Park view line is the most representative publicly available regional view that includes the development site. The assessment of distant views is therefore constrained to Viewpoint E.

The concept approval and proposed built form montages indicate that the three tall towers of the Northern, Central and Southern Precincts are the only new elements in this view post construction. The proposed montage, when compared against the Approved Concept Envelope montage, illustrates that the Central Precinct proposal sits wholly within the approved envelope and results in a reduction in tower height and bulk.

The buildings of the Northern, Central and Southern Precinct will be foreground elements in the highly built portion that incorporates high rise housing within the WMQ and further to the north east in Redfern. Forest scale trees within Alexandria Park and on the western side of the WMQ read as a continuous bank of foreground vegetation, which softens the impact of the built wall behind and would also screen lower level of the development.

In the context of this highly built component of the very broad and expansive view available from the Sydney Park hill, Central Precinct would be an acceptable addition to the view.

In response to a request from City of Sydney Council, impact of the proposal from Hollis Park were also assessed. The Park supports a continuous row of mature trees along its eastern and north eastern borders and these screens all skyline views in eastern and north eastern directions, including the entire WMQ developments (refer to Figure 50).

In summary, the impact of the Central Precinct on distant views would be acceptable.

Figure 48 Viewpoint E – Sydney Park (Hill top)

Existing

Approved Concept envelope montage

Source: Cardno

Proposed detailed design montage

Source: Cardno

Figure 49 Viewpoint F – Hollis Park, Erskineville

Existing

Approved Concept envelope montage

Source: Cardno

Proposed detailed design montage

Source: Cardno

Mitigation Measures

The following mitigation measures are recommended to ensure a high-quality development that will have an acceptable impact on the visual character of the proposed development and its surrounds:

- Prepare and implement an integrated public domain plan that includes deciduous planting of trees that will reach mature heights to provide tree canopies consistent with the existing local tree canopy.
- With respect to visual character, the objective of the tree planting scheme should be to break up continuous built form and provide human scale. Tree canopy studies for the WMQ site have been carried out and are outlined in the Landscape and Public Domain Plan (attached at **Appendix JJ**). Based on the landscape plan, it is concluded that trees with mature heights between 8 and 15m would be expected to break up continuous built form and provide human scale.

Following the implementation of the above mitigation measures, the remaining impacts are appropriate and it is considered the proposal will have an acceptable visual impact on the existing visual environment of the site and its locality.

Conclusion

In summary, in comparison to the approved concept, the detailed proposal for the Central Precinct will have a substantially lesser impact on the local visual environment.

The proposal will impact on views from streets immediately surrounding the Central Precinct and from street blocks to the east. A healthy growth of forest scale trees in the street and other proposed public places will be an important mitigation measure to address the visual impacts on surrounding streets.

In distant regional views, the proposal will appear in the context of the existing tall and visually bulky buildings and screened by the substantial tree canopy within and adjacent to the Waterloo Precinct.

The Central Precinct has also been found to have an acceptable impact on the conservation values of all local Conservation Areas including the Redfern Estate, the Alexandria Park Conservation Area and the Waterloo Conservation Area.

Accordingly, the proposal is considered worthy of support with regard to its impact on the existing visual environment of the site and its locality.

8.4. AMENITY

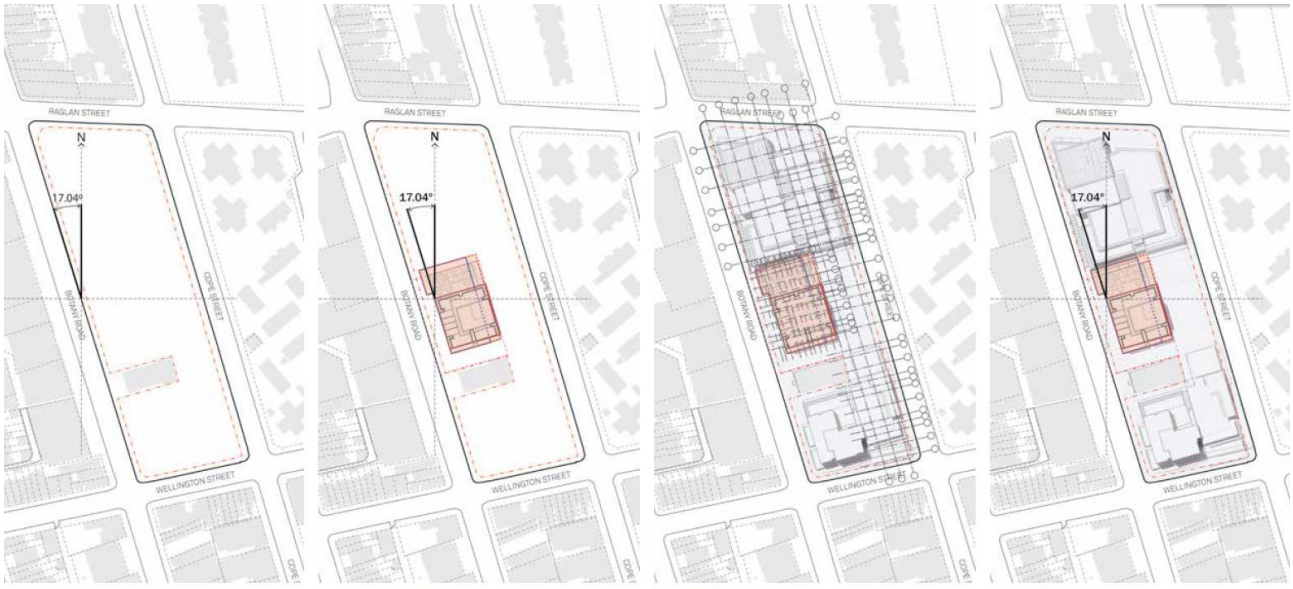
8.4.1. Solar Access

A Solar Access Report has been prepared by RWDI Anemos Ltd and is submitted at **Appendix NN.** The report assesses the ability for the proposed residential apartments to access direct sunlight. The analysis was based on computational 3D modelling of the proposed development and its surrounding context combined with meteorological data for Sydney.

It is important to note that the site is constrained by the existing Botany Road alignment. The site boundary is orientated 17.04 degrees off the north point. The building envelope and site wide precinct grid are in alignment to the western property boundary which results in the building orientation being approximately 17 degrees off north (refer to Figure 50).

It is critical for building massing to follow the alignment of the site-wide precinct to ensure alignment in the public realm (footpaths, awnings etc), basement structure and Sydney Metro Station and associated infrastructure. While this alignment is necessary for a co-ordinated delivery of the OSD on the site, this orientation has become a site constraint when designing the apartments to comply with solar access design criteria within the ADG standard hour (9am to 3pm), especially for the western facing apartments. Assessment and justification is provided below.

Figure 50 Site orientation and solar



Source: Hassell

Assessment

Considering the site orientation constraint above, the apartment planning has sought to maximise solar access to living areas and balconies.

57% of apartments (85 apartments) receive more than two hours of direct sunlight to living room and balcony between 9am and 3pm in mid-winter.

It is also important to note that 65% (97 apartments) of apartments receive sufficient sunlight to living space windows between 9:00 am and 3:00 pm, and 59% (89 apartments) of apartments receive sufficient sunlight to balcony between 9:00 am and 3:00pm.

As discussed above, the afternoon sun in mid-winter is approximately 17 degrees off north and due to the orientation of the site, this precludes the possibility of solar access to windows and or private open space for the western aspect apartments in mid-winter at 1:00pm.

Due to site orientation constraint, by extending the solar period for 30min, an additional 35 western facing apartments will receive 2 hours of direct sunlight in between 1:30pm and 3:30pm. This results in 80% of apartments overall (120 apartments) receiving more than two hours of direct sunlight to living room and balcony between 9am and 3.30pm mid-winter. While this requires an extended solar access window, extending the solar access window results in an exceedance of the ADG requirement of 70%.

Due to the orientation of the site, the proposal is unable to comply with solar access within the prescribed hours of the ADG design criteria. However, apartments have been designed to receive 2 hours of direct sunlight 30min outside the ADG requirement (afternoon sun), which is a reasonable period where residents will use the living area and balcony areas to enjoy sunlight. Despite the non-compliance, the proposal is in accordance with solar access objective of the ADG which are to maximise solar access within future apartments.

Of the 150 apartments within the Central Building, only 12.7% of apartments (19 apartments) received no direct sunlight to living space windows and private open space between 9am and 3pm. This is compliant with the ADG control (maximum of 15% with no solar). In addition, all apartments can receive direct sunlight to living space windows and private open space between 9am and 4:00pm with all apartments having at least a secondary orientation to the east or west.

Conclusion

Given the site orientation constraint, the apartments within the Central Building have been designed to achieve the primary objective of the ADG solar access controls, which are to maximise solar access to apartments. While the site orientation presents a key constraint for western facing apartments to receive 2 hours of solar access between the hours of 9am and 3pm in mid-winter, with the modest extension of this solar access window to 3:30pm, 80% of apartments within the building will receive 2 hours of solar access.

Further, only 12.7% of apartments within the building receive no direct sunlight between 9am and 3pm in mid-winter, which is compliant with the ADG design criteria. It is also noted that all apartments within the Central Building will receive direct sunlight to living space windows and private open space between 9am and 4pm in mid-winter.

Therefore, the development is considered to enjoy a reasonable level of solar access and be in accordance with the intent of the ADG and as such provides a satisfactory level of amenity for future residents.

8.4.2. Overshadowing

Assessment

An Overshadowing Report has been prepared by RWDI Anemos Ltd and submitted at **Appendix LL** to determine the effect of the overall WQM developments, including the Central Precinct on the contribution of additional shadowing to Alexandria Park, Alexandria Heritage Conservation Area and Cope Street Plaza. The assessment also assessed shadow impact on nearby residential building, specifically residences on Wellington Street and Botany Road.

The analysis was based on computational 3D modelling of the proposed WQM developments and its surrounding context combined with climate data for Sydney.

In order to undertake a complete assessment of the overshadowing impacts, the cumulatively impact from the entire WMQ development have been assessed, which includes the Central Precinct.

In accordance with the Waterloo Design Amenity Guidelines, the following design criteria must be met:

- At least 50 percent of the area of the Cope Street Plaza receives at least two hours sunlight between 9am and 3pm on 21 June.

- Identify opportunities to improve solar access to Alexandria Park through redistribution of floorspace and building bulk and scale between the hours of 9am and 10am in midwinter (21 June) when compared to the shadow cast by the indicative scheme lodged with the RtS.
- The development does not result in any additional overshadowing of Alexandria Park after 10am on 21 June.
- No more than 30% of Alexandria Park excluding the oval is overshadowed by the development as measured at any time after 9am on 21 June.
- Proposed apartments in a development and neighbouring developments including the Alexandria Heritage Precinct must achieve a minimum of 2 hours direct sunlight between 9am and 3pm on 21 June onto at least 1m² of living room windows and a minimum 50% of the required minimum area of private open space area. Note: This applies to at least 70% of the apartments in a development in accordance with the NSW Apartment Design Guide.
- The new development does not create any additional overshadowing onto a neighbouring dwelling where that dwelling currently receives less than 2 hours direct sunlight to habitable rooms and 50% of the private open space between 9am and 3pm on 21 June.

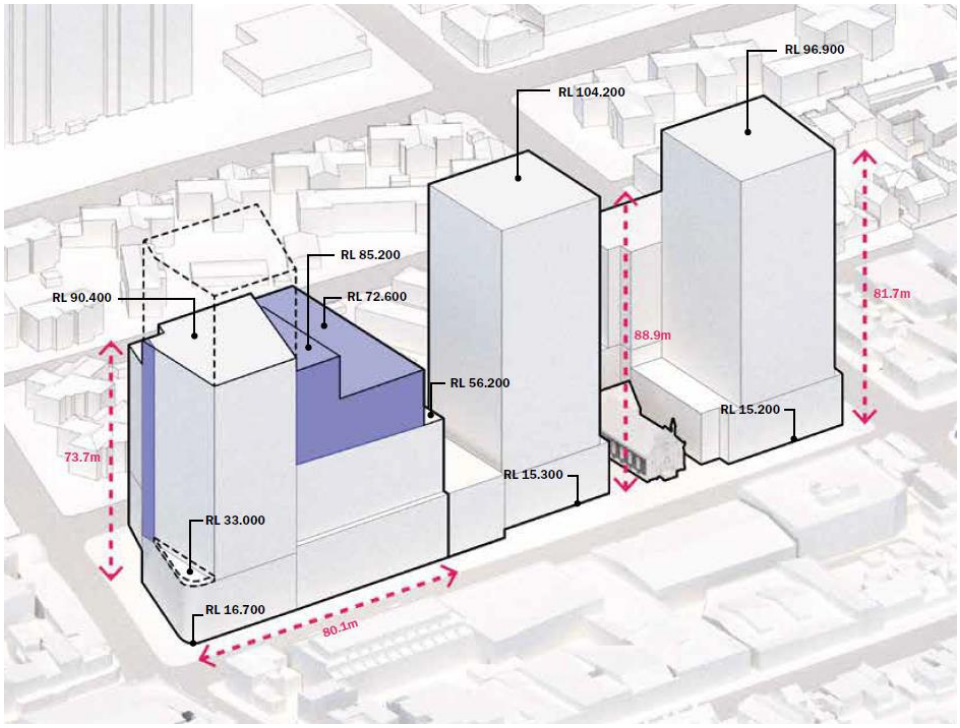
Improved solar access in comparison to indicative Concept DA scheme

In comparison to the indicative Concept DA scheme, the proposed detailed design scheme for the overall WQM developments have been refined to improve overshadow to Alexandria Park and nearby residents t to the west (within the Alexandria Heritage Conservation Area).

This is achieved through the following:

- A reduction in height of Central Building as compared to the approved envelope, by approximately 6m on the eastern side and approximately 12m on the western and southern sides; and,
- A reduction in height of Building 3 (Southern Precinct) as compared to the approved envelope by approximately 3.5m on the eastern side and approximately 10m on western and southern sides.

Figure 51 Concept DA envelope and detailed design envelope comparison



Source: RWDI Anemos Ltd

Alexandria Park

The simulations predict that the proposed development will not create new shadowing on Alexandria Park between 10:00am and 3:00pm on 21 June. Minor additional shadowing is predicted on Alexandria Park

before 10:00am. This shadowing is expected to be at a maximum at 9:00am, amounting to 29.94% of the Park area and reducing rapidly (see Figure 52).

No more than 30% of Alexandria Park excluding the oval is overshadowed by the development as measured at any time after 9am on 21 June.

Furthermore, the overshadowing caused by the proposed scheme is significantly less than that caused by the approved Concept DA envelope. Therefore, the proposed development complies with the criteria stipulated for Alexandria Park.

Table 21 Shadow percentage of Alexandria Park (excluding the oval)

Time	Approved envelope (21 June)	Proposed development (21 June)
9:00	41.5%	29.94%
9:15	27.41%	18.39%
9:30	14.86%	7.67%
9:45	4.99%	0.62%
10:00-15:00	0.00%	0.00%

Figure 52 Comparison of 21 June 9:00am Overshadowing on Alexandria Park between approved Concept DA and proposed development

Approved DA Envelope Design Scheme

41.50% Overshadowing of Alexandria Park at 9:00 AM on 21 June

Proposed Scheme

29.94% Overshadowing of Alexandria Park at 9:00 AM on 21 June

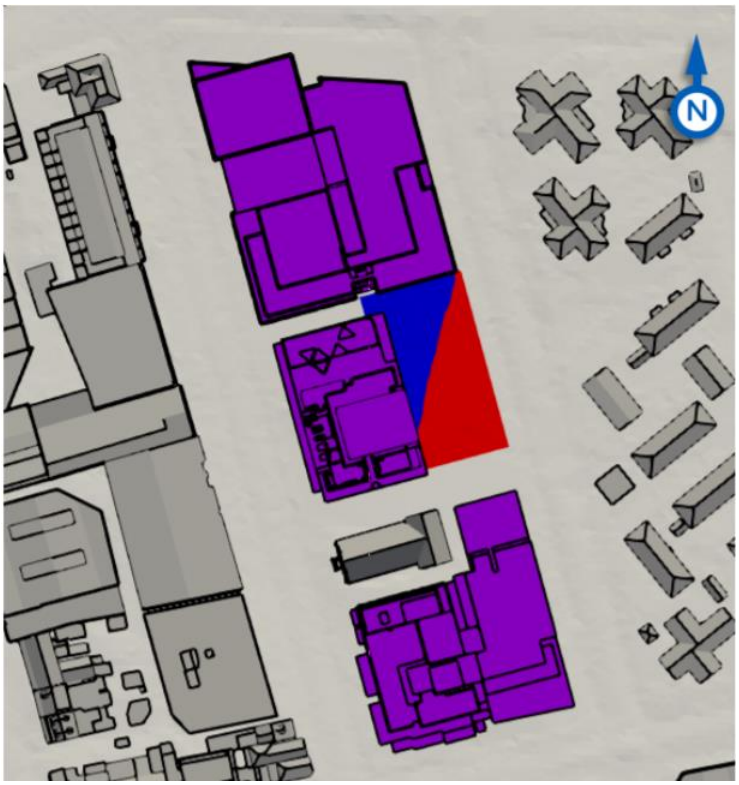
Source: RWDI Anemos Ltd

Cope Street Plaza

The simulations indicate that 57.3% of Cope Street Plaza can receive at least 2 hours of direct sunlight between 9am and 3pm on June 21, thereby complying with the requirement in the Waterloo Metro Quarter Design and Amenity Guidelines (see Figure 53).

Detailed point-in-time shadow plots are also provided in the report, with the percentage of area receiving sunlight at 15-minute increments to demonstrate the overall availability of sunlight at the winter solstice. The modelling show that sunlight is generally available in the morning hours between 9:15am and 11:15am, when the 50% criterion is achieved, with afternoon hours mostly in shadow.

Figure 53 Area in Cope Street Plaza where Direct Solar Access is Available Above 2 Hours (red)



Source: RWDI Anemos Ltd

Neighbouring Developments and Alexandria Heritage Conservation Area

The new development does not create any additional overshadowing onto a neighbouring dwelling on Wellington Street and Botany Road, where that dwelling currently receives less than 2 hours direct sunlight to habitable rooms and 50% of the private open space between 9am and 3pm on 21 June.

The simulations also indicate that no areas within the Heritage Conservation Area which currently receive 2 hours of direct sunlight experience a reduction to below 2 hours. The approved Concept DA envelope was predicted to create areas within the Heritage Conservation Area that see reductions below 2 hours. The proposed development reduces the total impacted area by approximately 1,330 m², or approximately 12%, which is a significant improvement (see Figure 54).

An annual assessment of potential sunlight hours on the ground was also conducted to provide an understanding of sunlight impacts during other times of year. The assessment compared the total hours of potential sunlight gained under the detailed SSD design against the concept DA scheme (refer to Figure 55). The study better illustrates the improvement of the proposal by including a wider range of possible solar positions compared to the uniformly low elevation sun angles in the 21 June analysis. Improvements in solar access were predicted up to 450m away, though the majority of improvement is confined to a radius of approximately 250m.

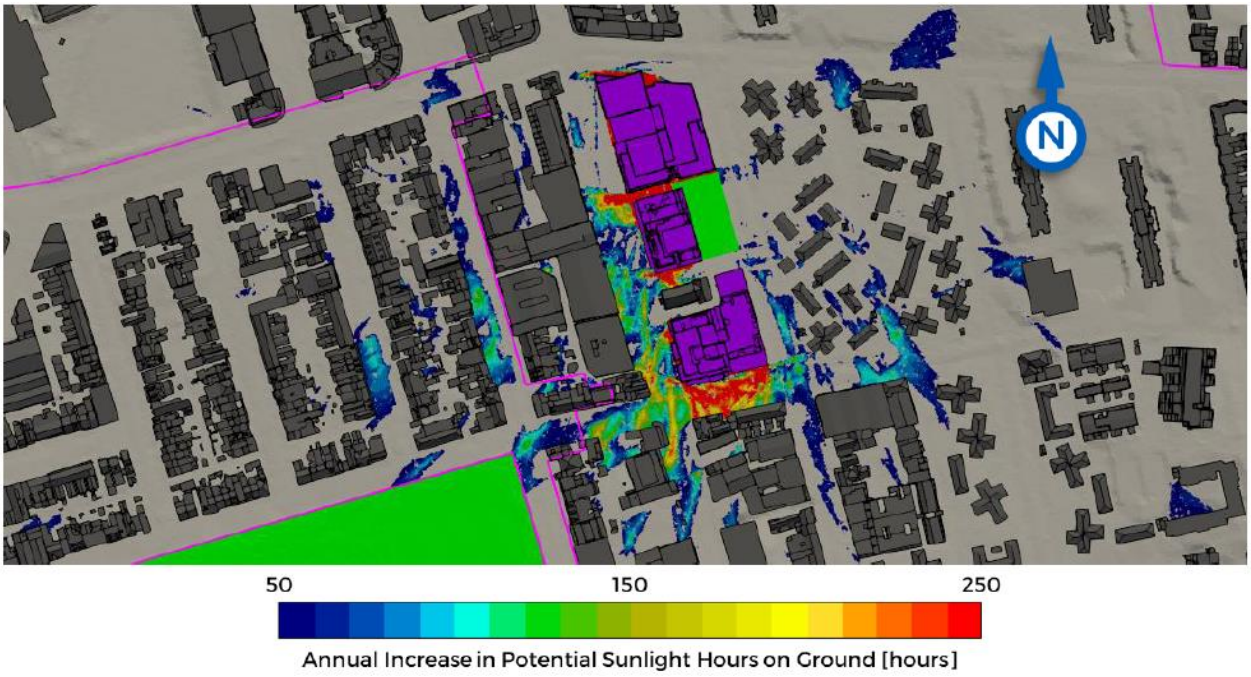
Along Botany Road the proposal increases potential solar access at grade between 50 and 200 hours per year. Along Wellington Street, solar access is increased up to 300 hours per year.

Overall, the proposed development will have a minimal impact on solar access to the residences in the Heritage Conservation Area. The impact on other neighbouring buildings is also reduced compared to the solar access impact of the Concept DA scheme.

Figure 54 Comparison of approved concept DA and proposed development of grade level areas where direct solar access is reduced to less than two hours on 21 June

Source: ***RWDI Anemos Ltd***

Figure 55 Annual increase in potential sunlight hours on ground - Proposed Scheme VS. Concept DA Envelope



Source: RWDI Anemos Ltd

Mitigation Measures

No mitigation measures are required.

Conclusion

The simulations predict that the proposal will not create new shadowing on Alexandria Park between 10:00 am and 3:00 pm on 21 June. Very slight new shadowing is predicted to Alexandria Park before 10:00 am. This shadowing is expected to be at a maximum at 9:00 am, amounting to 29.94% of the Park area and reducing rapidly. The design and associated solar access impacts achieve the solar access criteria for Alexandria Park.

The simulations predict that 57.3% of Cope Street Plaza can receive at least 2 hours of direct sunlight between 9 am and 3 pm on June 21, thereby complying with the requirement in the Waterloo Metro Quarter Design and Amenity Guidelines.

An assessment of the at grade level conditions in the surrounding neighbourhood and Alexandria Heritage Precinct indicated that the proposed development would have a minimal impact on solar access to the residences in the Heritage Precinct. The proposal will result in an improvement compared to Concept DA envelopes.

In conclusion, the overshadowing caused by the proposed development complies with the design criteria in the Waterloo Metro Quarter Design and Amenity Guidelines.

8.4.3. Natural Cross Ventilation

A Natural Cross Ventilation Assessment has been undertaken by RWDI Anemos Pty Ltd (Appendix PP) to ensure the proposed residential apartments (including affordable housing units) comply with the natural cross ventilation requirements found within the Waterloo Design and Amenity Guidelines and **ADG**.

An assessment has been undertaken by Stantec to determine the noise affected locations the Central building, which affect the ability for the apartments to achieve simultaneously both the natural ventilation requirements as well as the acoustic requirements. The Central Building is noted to be impacted by noise generated along Botany Road, which limits the ability for apartments to have windows open while satisfy noise limits. The Noise and Vibration Impact Assessment report has addressed the noise affected apartments in further detail and is discussed in Section 8.7. The ventilation assessment has also addressed these noise affected apartments and the design solution to achieve natural ventilation.

The assessment concluded that:

36 of the 48 west facing apartments (75%) on levels 3 to 8 are noise affected apartments. 30 of these apartments are also noted as having the design provisions (opposite or adjacent openings) to enable natural cross ventilation to be provided.

Given that 36 apartments are noise affected apartments, where natural ventilation could not be achieved, alternative measure have been incorporated to enable these noise apartments to achieve natural ventilation and the internal noise criteria.

The alternative means is the provision of acoustic ventilator to meet the internal noise limits and achieve natural ventilation. The details of the acoustic plenum are provided in the Noise and Vibration Report (attached at **Appendix K**) and discussed in Section 8.7.

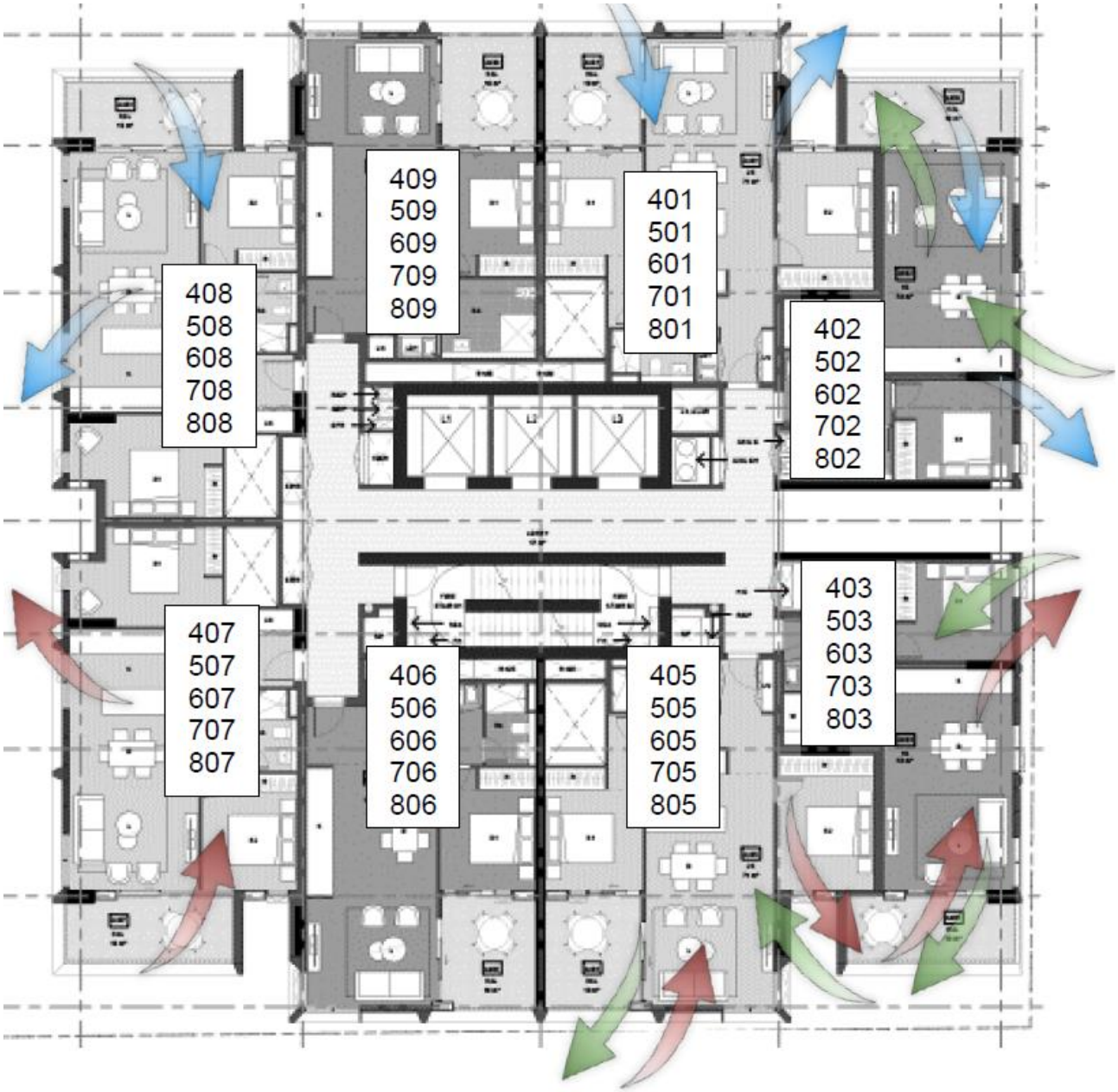
This alternative measure supported by the ADG, as section 4J of the ADG states that for apartments facing busy road and achieving the design criteria in the ADG may not be possible due to noise and pollution, alternatives may be considered for natural cross ventilation.

As a result of incorporating the plenum, 75% (36/48) of the residential apartments on levels 3 to 8 are considered to be naturally cross ventilated, achieving the requirement and the objective of the ADG control. This has been demonstrated in Figure 56, which note the flow direction for the north-easterly (blue) southerly (green) and westerly (red) wind direction based on pressure differential at the openings.

The Apartment Design Guide notes that apartments located on storey 10 and above can be considered to be naturally cross ventilated due to their elevated position providing sufficient exposure to wind pressures at opening locations. However, due to the Botany Road frontage 76 west facing apartments on levels 9 to 21 are also noise affected apartments. Therefore plenums are also provided for these apartments to achieve noise criteria and natural ventilation (refer to Figure 57).

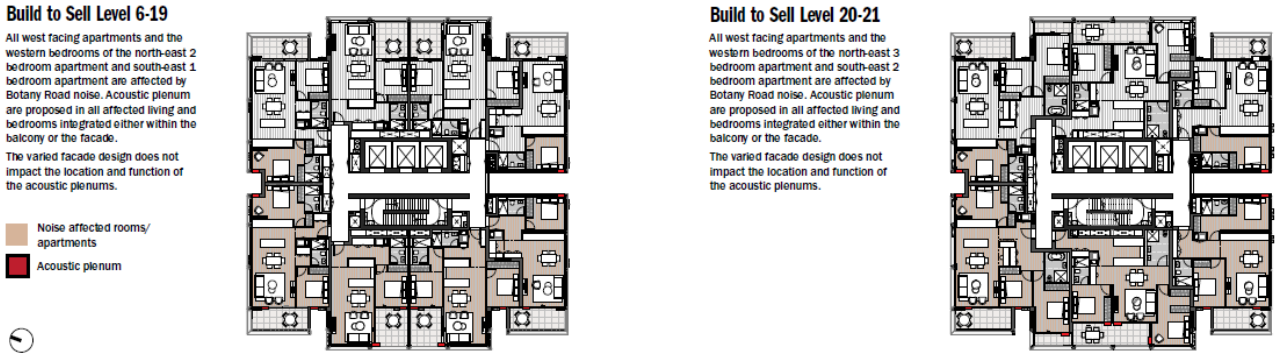
Figure 56 Natural Cross Ventilation Floor Plan (levels 3 to 8)


309
301
308
302
303
307
306
305



Source: RWDI Anemos Pty Ltd

Figure 57 Plenum on levels 6 to 21



Source: Hassell

Conclusion

Given the site is constrained by noise along Botany Road, an alternative mechanical ventilation solution is provided for noise affected apartments to achieve both natural ventilation and internal noise criteria. Overall,

the 75% of the residential apartments up to Level 8 (Storey 9) satisfy the objective of the Apartment Design Guide and are provided with alternative design solution to achieve natural cross ventilation.

In addition, due to the Botany Road frontage 76 of the west facing apartments on levels 9 to 21 are also provided with plenums to achieve noise criteria and natural ventilation objectives.

8.5. ENVIRONMENTAL PERFORMANCE/ESD

An Ecological Sustainable Design Report has been prepared by Cundall Johnston and Partners Pty Ltd and is included at **Appendix M.** The report demonstrates that the proposed development is committed to achieving the following ESD targets:

- 5 Star rating – Green Star Design and As-Built rating tool v1.3
- BASIX Energy score of ≥30
- BASIX Water score of >40

The WMQ will also obtain the following site-wide certifications:

- 6 star rating – Green Star Communities rating tool v1.1
- One Planet Community – recognition by BioRegional Australia

BASIX commitments are further outlined in Section 6.9 of this EIS, which demonstrates that the proposal exceeds the minimum compliance requirements defined in *State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004* and achieves a minimum BASIX 30 Energy rating and more than BASIX 40 Water rating in accordance with condition B19 of the Concept DA.

In accordance with the SEARs, an analysis of the proposal against the principles of ecologically sustainable development set out in the clause 7(4), Schedule 2 of the EP&A Regulation is provided within the ESD Report.

A modified version of the standard One Planet Living categories has been adopted as the Sustainability Framework for the project. The framework will inform design, construction and operational stages of the project. An integrated design approach will be adopted for the incorporation of sustainability measures, with input from the sustainability consultant from early planning through to construction phases. The sustainability framework also aligns with:

- Mirvac's This Changes Everything strategy;
- John Holland's Approach to Sustainability;
- UN Sustainable Development Goals Sustainable Sydney 2030 – Community Strategic Plan 2017-2021;
- SEARs dated 8 April 2020;
- Waterloo Metro Quarter Design and Amenity Guidelines – Section 3R sustainability;
- Sydney Metro City & Southwest Sustainability Strategy 2017-2024 (June 2019 update);
- Green Star Design and As-Built rating tool;
- Green Star Communities rating tool;
- WELL Building Standard;
- One Planet Community principles;
- NABERS Energy and Water;
- BASIX.

The table below identifies how sustainability initiatives are currently being considered throughout design development of the project.

Table 22 Sustainability Initiatives

Category	Objective	Goals/Target	Initiative
Zero Carbon Energy	Make buildings and infrastructure energy efficient, reduce use of fossil fuels and maximise renewable energy.	▪ BASIX Energy 30 ▪ Minimum use of on-site fossil fuels	▪ Minimise fossil fuels on-site: electric heat pumps used for space heating and domestic hot water instead of natural gas boilers. ▪ Passive design: façade designed to achieve an average NatHERS rating of [6.5 stars]. ▪ Energy efficient HVAC: Package units connected to central condenser water loop with central electric heat pumps (for heating hot water) and cooling towers (for heat rejection). ▪ Energy efficient HVAC: Day/night zoning to reduce energy consumption. ▪ Energy efficient lighting: LED lighting with zoned control, occupancy sensors and daylight dimming to suit the use of different spaces ▪ Energy efficient lifts: energy efficient motors and regenerative braking on main lifts ▪ Renewable energy: A minimum of [30 kW] of photovoltaic panels installed on the roof (subject to final review of permissible locations).
Sustainable Water	Use water efficiently, protecting local water resources and reducing flooding, drought and water pollution.	▪ BASIX Water 40+	▪ 4 star WELS rated taps and toilets. ▪ 3 star WELS rated showers in apartments. ▪ Landscaping design and plant selection to minimise irrigation demand. ▪ Rainwater collection for irrigation of the landscaping and vehicle wash down. ▪ Best practice cooling tower water treatment and management systems. ▪ Water sub-metering of major water uses.

Category	Objective	Goals/Target	Initiative
			▪ Water Sensitive Urban Design (**WSUD**) to reduce stormwater run-off and water pollution will be implemented in accordance with the City of Sydney Development Control Plans.
Waste Minimisation	Reduce consumption and re-use and recycle to work towards minimising waste to landfill.	▪ > 90% of construction & demolition waste diverted from landfill ▪ Facilities to enable > 50% of operational waste to be diverted from landfill	▪ Demolition and Construction Waste Minimisation Plan to Best Practice Green Star standards and achieve waste credit. ▪ Prefabrication of façade components and service risers to reduce on-site waste generation. ▪ General recycling facilities to the residential units including the use of a recycling chute. ▪ General recycling facilities for paper and cardboard and glass for the retail/childcare.
Materials and Supply Chain	Use materials from sustainable sources, apply life cycle principles, and prioritise products with transparent, ethical supply chains.	▪ Selection of materials and products that are certified, reused or contain recycled content (> 3% by cost). ▪ Life Cycle Assessment to achieve >50% of Green Star LCA credits and reduce embodied carbon by minimum 10%.	▪ Conduct life cycle assessment (**LCA**) to identify material selection / specification improvements during design development. ▪ Concrete mix to reduce embodied carbon – reduce Portland Cement content, include recycled or manufactured aggregates and source from energy efficient supplier. ▪ All timber is FSC certified or equivalent. ▪ Hazardous material risk assessment to reduce use of toxic materials. ▪ Low-off gassing materials to be selected – floor finishes, joinery and painting. ▪ Best practice PVC compliance for formworks, pipes, flooring, blinds & cables. ▪ Encourage key sub-contractors to become members of the Australian Supply Chain Sustainability School

Category	Objective	Goals/Target	Initiative
			(Mirvac and John Holland are both Partners with the school). ▪ Preference materials and suppliers with third party accreditation (social and/or environmental sustainability).
Land and Nature	Restore, preserve and protect land, biodiversity and natural capital for the benefit of people and wildlife.	▪ Maximise the extent of roof available as green roof. ▪ Tree canopy coverage to streets greater than [50%].	▪ Street tree planting. ▪ Deep Soil zone. ▪ Accessible roof garden / terrace for residents. ▪ Private roof terraces with planting. ▪ Planting to childcare centre terrace ▪ Native plant species selected for edible/usable properties and which may provide habitat or food sources for native birds, bees and insects. ▪ External lighting to minimise night sky pollution
Travel and Transport	Reduce the need to travel and encourage walking, cycling and low carbon transport.	▪ Encourage cycling by residents, workers and visitors. ▪ 9 Electric Vehicle chargers in the basement serving both the Central Precinct.	▪ Safe and quick access to the Sydney Metro station. ▪ Secure cycle storage, showers and lockers. ▪ 9 electric vehicle chargers are provided with capacity to increase over time to reflect the car fleets of the future. ▪ Design vehicle intersections to prioritise pedestrian and cyclist safety.
Sustainable Food	Promote sustainable humane farming and healthy diets high in local, seasonal organic food and vegetable protein.	▪ Encourage retailers to provide healthy food options. ▪ Urban food production Initiatives.	▪ Incorporate edible plants into the landscaping. ▪ Provide a rooftop garden terrace for residents to grow and harvest edible plants. ▪ Food & beverage to prioritise healthy, organic and affordable food outlets.

Category	Objective	Goals/Target	Initiative
			▪ Investigate partnership with a food rescue charity during operation. ▪ Community plan to include healthy eating and cooking classes.
Climate Risk and Adaptation	Apply practical actions to manage risks from climate impacts, protect communities and strengthen the resilience of the local economy.	▪ A Climate Adaptation Plan will inform the design of the project in accordance with international guidelines.	▪ Prepare and implement a Climate Adaptation Plan (plan to be prepared during design development) including agreeing on the climate change scenario to be adopted (2°C and/or 4°C). ▪ Reduce heat island effect – planting to roof terraces, street tree planting, PV panels, hard surfaces with high Solar Reflective Index (**SRI**). ▪ Passive design of facades to improve thermal performance and reduce impact of extreme weather days. ▪ Design cooling system capacity for higher design temperatures to allow for increasing peak temperatures. ▪ Stormwater systems designed for increased storm frequency and intensity.
Health and Wellbeing	Encourage active, social, meaningful lives and provide the buildings, infrastructure and spaces to support good health and wellbeing for all ages. Goals / Targets	▪ Fitness facilities accessible to residents and guests	▪ Cycle storage to encourage healthy transport options. ▪ Physical and mental health programs for workers during construction. ▪ Access to gym on site (in Southern Precinct). ▪ Accessible rooftop community garden for residents. ▪ [6.5 star] NatHERS average ratings to improve thermal comfort above the minimum BASIX requirements (which is equivalent to 5 star NatHERS average). ▪ Low-off gassing materials to be selected – floor finishes, joinery

Category	Objective	Goals/Target	Initiative
			and painting – to improve indoor air quality.
Ethics and Equity	Create safe, just and equitable places to live, work, learn & trade, and support local prosperity and fair trade	▪ Responsible procurement policies ▪ Targets for employment during construction	▪ Affordable housing provided to three levels. ▪ Implement a sustainable procurement policy addressing modern slavery, child labour and other social equity and ethics issues in the project supply chain. ▪ Set targets for employment of disadvantaged groups during construction. ▪ Support of local SMEs and disadvantaged local residents including Aboriginal enterprise and employment. ▪ Affordable retail and food strategies will be implemented. ▪ High speed internet to support working from home. ▪ Design for best practice accessibility.
Community and Culture	Nurture local identity and heritage, empower communities and promote a culture of sustainable living.	▪ Public Art program • Minimum 2,670m² of community facilities to be provided on whole precinct (shared between northern, central and southern precincts) ▪ Precinct Activation Fund and Committee to curate activation	▪ Community Hub Café in Central Precinct – curated with a not-for-profit organisation that will offer education in food to the underprivileged, providing social cohesion and connection in the precinct. It will also be used for the Precinct Leadership Group to meet, coordinate events and programs, and oversee activities in Cope Street Plaza. ▪ Public Plaza (Cope Street Place) as a focus for local activity, interim activation and events. Cope Street Place as a focus for local activity, interim activation and events. ▪ Childcare centre in Central Precinct with extended hours of operation. ▪ Public art program including Aboriginal curators, public art

Category	Objective	Goals/Target	Initiative
			competitions and co-evolved works with community. ▪ Creative hoardings program as part of public art strategy during construction. ▪ Place naming and wayfinding programs to engage with local community. ▪ Community Place Manager will be engaged.

Conclusion

Overall, the development will reflect leading industry practice for residential development.

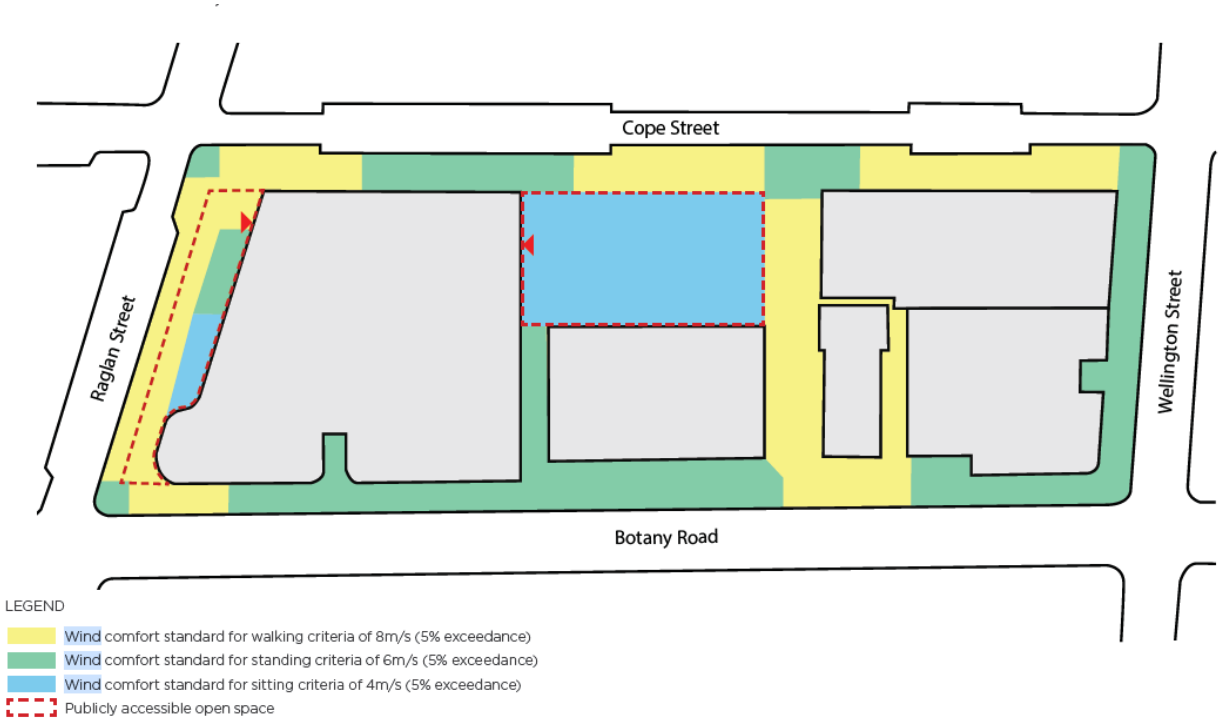
8.6. WIND IMPACTS

A Wind Impact Assessment has been prepared by RWDI Anemos and is included at **Appendix KK**. The assessment included wind tunnel testing to identify the impact of the proposal on surrounding wind conditions. The report considers the wind study criteria under the Concept DA and identifies specific measures to ameliorate wind impacts at podium level, street level and at the locations of existing and future public domain areas. The assessment also considers critical pedestrian areas, public sidewalks and elevated terrace areas.

Assessment

The pedestrian wind comfort and safety conditions were accessed based on the Lawson Criteria, consistent with the wind study criteria under the Concept DA and within the Design and Amenity Guideline. In general, the combined effect of mean and gust speeds on pedestrian comfort can be quantified by a Gust Equivalent Mean (**GEM**). The wind criteria are as follows:

Figure 58 Wind comfort and safety targets (ground level)



Source: Waterloo Design and Amenity Guideline

All initial wind tunnel testing has been carried out for the built form design only, without the inclusion of landscaping or wind mitigation elements such as awnings. This enables an initial understanding of the wind flow patterns and comfort conditions.

Testing of mitigation measures was then considered through the inclusion of building awnings as detailed on the architectural plan, and tree planting as outlined in the landscaping scheme. It should be noted that the trees have been modelled as young trees at the time of their planting (4m high with a 3m wide canopy). The trees are noted to be able to grow to a height of 10m-12 m with a 10m wide canopy at maturity (in 10 years) and hence will continue to increase their ability to reduce wind conditions over time.

The key findings from the wind testing are outlined as follows:

Central Precinct

Outdoor childcare play spaces are located on level 1 and 2 orientated towards the north. Early testing had indicated that this area could be exposed to the prevailing winds. As such the current design has included screening around the perimeter of the outdoor space as well as hit-and-miss rooftop canopy elements. This will help to ensure that conditions will satisfy the sitting and standing conditions throughout the year, being suitable for the intended childcare facility.

The rooftop terrace on Level 22 is generally suitable for walking conditions in the summer months. Majority of the area is also suitable for standing during the winter period. Landscaping in the form of hedges planting is proposed throughout this space, which will provide further mitigate wind impact for users.

Accordingly, no further mitigation measure is required for the Central Precinct.

The public domain areas around the Central Precinct have also been assessed and are summarised below:

Botany Road

Wind conditions along Botany Road will generally satisfy the standing comfort criteria, in line with the wind comfort targets. Localised uncomfortable conditions were observed at the corner of Botany Road and Raglan Street due to downwash and side-stream effects. The inclusion of the awnings for the Northern, Central and Southern Precincts along Botany Road, as well as the tree planting detailed in the landscape plan is able to mitigate wind impact and assist Botany Road to largely satisfy the standing and sitting criteria.

Accordingly, no further mitigation measure is required for Botany Road.

Waterloo Congregational Church and Church Square

Conditions at the entrance to Waterloo Congregational Church were found to satisfy the sitting criteria. Conditions for both Church Square and Church Yard are noted to generally satisfy the standing criteria throughout the year.

Accordingly, no further mitigation measure is required for Waterloo Congregational Church and Church Square.

Grit Lane

Grit Lane is exposed to the westerly winds, primarily during the winter months, which has been noted at the concept design phase. This is due to the funnelling of winds and pressure difference between the western and eastern aspects of the laneway.

During the summer months, the southerly winds are more influential. The inclusion of awnings on the Northern Building and the landscape treatment in Cope Street Plaza and along Botany Road is able to improve wind condition at the eastern end of the laneway in standing conditions.

During the winter months, conditions are noted to be marginally uncomfortable (satisfying walking conditions 94% of the time) The inclusion of the awnings at the Central Building Botany Road façade and street trees along Botany Road will minimise wind impact to enable walking conditions at the western end of the laneway, and reducing wind impact further in standing conditions to the eastern end of the laneway.

Accordingly, no further mitigation measure is required for Grit Lane.

Cope Street Plaza

- Without consideration of landscaping, Cope Street Plaza can generally satisfy the standing criteria. Some localised areas at the southern end of the Plaza can also satisfy the walking criteria in line with the wind comfort standards.
- Outdoor seating zone adjacent to Central Precinct will satisfy the sitting criteria throughout the year without any mitigation measures.
- Consideration has been made for the inclusion of young trees at the southern and northern end of the Plaza and along Cope Street to satisfy the sitting criteria.
- The majority of the Plaza was found to achieve sitting conditions for 90% or more of the time, with the northern portion of the Plaza found to be slightly more during the winter period, due to the shielding from the prevailing westerly winds.
- Locations adjacent to the southern east-west walkway between Cope Street and Botany Road are more exposed to the southerly and westerly winds and can achieve the sitting criteria between 80-85% of the year. The raised planter bed at the southern end of the Plaza will provide further wind protection to the bench seating area within the Plaza.
- Given the large open area of the Plaza will be exposed to direct sunlight, some wind flow, especially during the warmer months of the year will be beneficial and assist with overall thermal comfort, which is a more true account of human comfort.

Accordingly, no further mitigation measure is required for Cope Street Plaza.

Conclusion

The wind tunnel study found that the inclusion of the awnings detailed on the architectural drawings and tree planting outlined in the landscape design, enable the ground plane areas to satisfy the required wind comfort conditions for the Central Precinct and the surrounding public open space areas and laneway.

It should be noted that as the tree planting grows to full maturity, they will further enhance the plantings ability to mitigate localised wind conditions throughout the WMQ site.

Accordingly, no mitigation measures is required for the Central Building and the proposal will not result in unreasonable wind impact to surrounding streets public domain area.

8.7. NOISE AND VIBRATION

A Noise and Vibration Impact Assessment has been prepared by Stantec Pty Ltd and is included at **Appendix K.** The report addresses the impacts of construction noise, operational noise, mechanical noise and vibration and the intrusion of ambient noise such as traffic and future rail corridor noise, into and out of

the development. Consideration has also been given to the recommendations of the Concept Acoustic Assessment Report prepared by SLR Consulting dated 9 November 2019.

The proposed development has been assessed against the following regulations and guidelines:

- *NSW Government, Sydney Metro, Station Delivery Deed*
- *SEPP Infrastructure*
- *Development Near Rail Corridors and Busy Road - Interim Guideline for Noise Criteria*
- *NSW EPA Noise Policy for Industry (**NPI**) (2017)*
- *Sydney Development Control Plan 2012*

Short-term and long-term noise surveys were carried out on and around the site to characterise the noise generated by nearby traffic noise sources (Botany Rd, Raglan St, and Wellington St), and background and ambient noise at surrounding noise sensitive receivers. The site location of surrounding noise and vibration sensitive receivers are shown in Figure 54.

Short-term background and ambient noise measurements and short-term vehicle movements noise measurements were acquired from a combination of:

- noise monitoring conducted by Stantec Australia on 27th March 2020
- Previous noise monitoring conducted by SLR Consulting as part of the Concept DA in November 2018.

As these results were obtained prior to the COVID-19 pandemic and are a better representation of traffic noise and background levels under typical conditions.

While long-term (Unattended) noise surveys were conducted by Stantec from the 7th to the 13th of April 2020 to measure unattended background and ambient noise at locations L1 and L5 below (for the day, evening and night periods).

Figure 59 Surrounding noise-sensitive receivers

Source: Stantec

8.7.1. Operational Noise

Residential internal noise criteria

The table below outlines the project internal noise level targets for the apartment units. For closed windows, the ISEPP 2007 criteria have been adopted as per the Design and Amenity Guidelines. For open windows, the Sydney DCP 2012 criteria have been adopted as per the Design and Amenity Guidelines.

Table 23 Project Internal Noise Limits – Residential

Type of occupancy / activity	Metric	Standard	Noise Level Range dB(A)
Closed windows			
Residential - Bedrooms	LAeq,9h (10pm – 7am)	ISEPP 2007	< 35
Residential – Lounge Rooms	LAeq,15h (At any time)	ISEPP 2007	< 40
Child Care Centre – All Spaces	LAeq,T1	ISEPP 2007	< 40
Open windows and doors			
Residential - Bedrooms	LAeq,1h, noisiest (10pm – 7am)	Sydney DCP 2012	< 45

Type of occupancy / activity	Metric	Standard	Noise Level Range dB(A)
Residential – Lounge Rooms	LAeq,1h, noisiest (24 hours)	Sydney DCP 2012	< 55
Child Care Centre – All Spaces	LAeq,T1	ISEPP 2007	< 50
Project internal noise limits – closed windows & alternative means of ventilation operating			
Residential - Bedrooms	LAeq,9h (10pm – 7am)	ISEPP 2007	< 45
Residential – Other Habitable Rooms	LAeq,15h (At any time)	ISEPP 2007	< 50
Child Care Centre – All Spaces	LAeq, T1	ISEPP 2007	< 50

Source: Stantec Pty Ltd

Residential - Closed Windows Assessment

In order to provide acoustic amenity to occupants of the proposed development and comply with the project specific internal noise levels, the acoustic performance of the building facades was assessed.

3D acoustic modelling for external noise intrusion from the surrounding roads was conducted using the software SoundPlan (Version 8.1). Noise emissions and impacts from vehicle movements on the surrounding busy roads (Botany Road, Raglan Street and Wellington Street) were modelled in accordance with the CoRTN prediction techniques and calibrated to measurements and logger data from around the site.

In addition to this, noise emissions from the surrounding rooftop plantrooms were predicted and modelled within the 3D acoustic modelling.

Detailed results of the 3D modelling are provided in Appendix 2 of the Acoustic Report, showing the incident noise levels on the façade as a result of noise emissions from the external noise sources mentioned above.

The general limiting factor of the performance of a building façade in term of noise attenuation is the glazing. In this particular case, traffic noise on Botany Road, Raglan Street and Wellington Street place the most acoustic demand on the development facades.

Mitigation Measures

In order to achieve the project internal noise levels, set by ISEPP 2007, the glazing components of the façade of the proposed development must meet the acoustic demand ratings presented in Figure 57 below.

The double-glazed acoustic rating (Rw) is higher than the single-glazed acoustic rating is due to the reduction in acoustic performance double-glazed units (with 12-20mm cavities) experience at lower frequencies (63 Hz to 125 Hz), which are the peak frequencies typically characteristic of traffic noise emissions.

In addition to the required glazing systems, the solid/non-glazed elements of the façade shall have an acoustic performance of no less than Rw 55 to ensure the resulting internal noise levels within each space in the proposed development do not exceed the project internal noise limits.

The acoustic demand ratings proposed above has been provided as a high-level analysis only. The acoustic performance of the glazing facade may be reduced at certain locations within the development during the detailed design phase.

Figure 60 Recommended glazing façade systems and acoustic performance

Acoustic Demand Rating	Single-Glazed Acoustic Performance (Weighted Sound Reduction Index, Rw)	Double-Glazed Acoustic Performance (Weighted Sound Reduction Index, Rw)
1	32	34
2	34	36
3	36	38
4	40	42

Source: Stantec

Residential - Open Windows Assessment

An open windows assessment has been conducted in order to assess whether the habitable spaces can meet the internal noise level requirements stipulated within the *Sydney DCP 2012*, the *City of Sydney's Draft Alternative Natural Ventilation of Apartments in Noise Environments – Performance Pathway Guideline,* and *DP&E's Interim Guideline*, when windows are open for natural ventilation (open in accordance with the natural ventilation requirements of the NCC).

If there is an exceedance of the internal noise level criteria with the windows open, alternative means of ventilation is required in accordance with the requirements of the *National Construction Code 2016 Amendment 1 (i.e. an alternative ventilation system complying with AS 1668.2 and AS/NZS 3666.1).*

The assessment has been conducted using the typical estimation that when the windows are open to 5% of the floor area of the room being ventilated, that the windows achieves 10dB reduction in noise level. Room loss has also been considered. Where habitable spaces have the ability to open to wintergardens, this has also been taken into account.

The assessment concluded that 112 apartments are facing Botany Road and are noise-affected, which require an alternative means of ventilation to meet both the open windows noise requirements of the Sydney DCP 2012, and the ventilation requirements of the ADG.

Mitigation measure

The noise affected apartments are provided with acoustic ventilator. Details of the acoustic plenum and the critical components making up the acoustic plenum are provided in the Urban Design report attached at **Appendix E**.

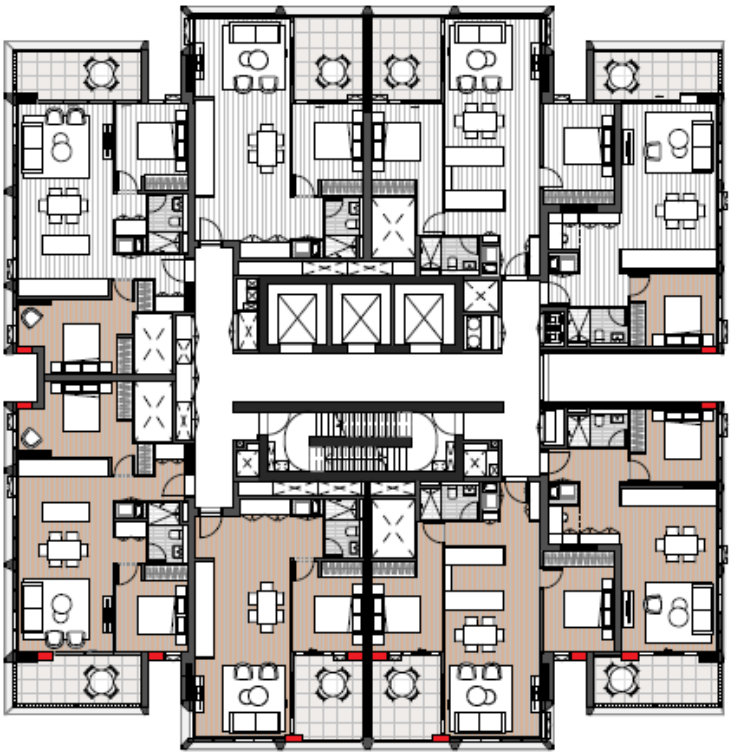
The location of all acoustic plenums in the façade to treat the habitable spaces is presented below:

Figure 61 Apartments that requires plenum treatments

Affordable Level 3-5

All west facing apartments and the north facing 1 bedroom apartment are affected by Botany Road noise. In addition, the western bedrooms of the north-east 2 bedroom apartment and south-east 1 bedroom apartment are also affected. Acoustic plenum are proposed in all affected living and bedrooms integrated either within the balcony or the facade.

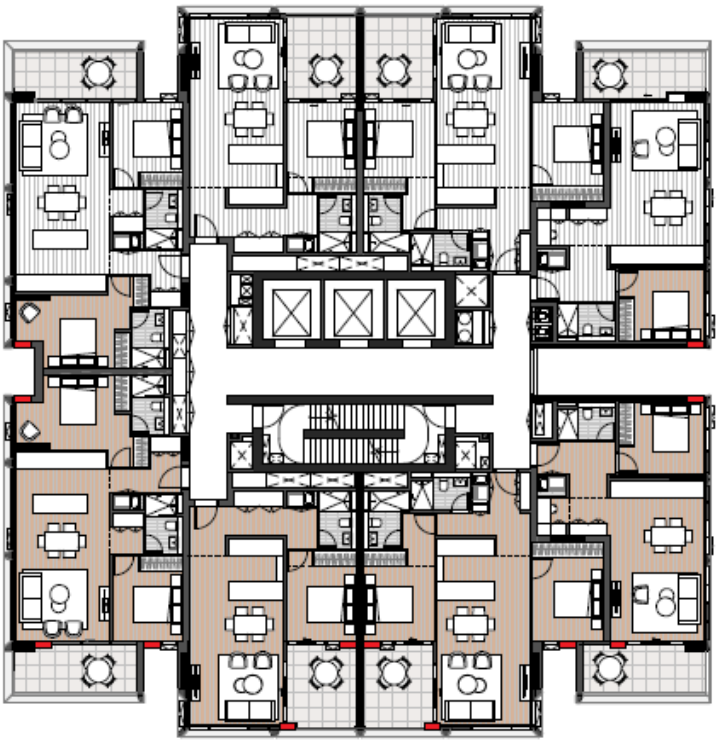
The varied facade design does not impact the location and function of the acoustic plenums.



Build to Sell Level 6-19

All west facing apartments and the western bedrooms of the north-east 2 bedroom apartment and south-east 1 bedroom apartment are affected by Botany Road noise. Acoustic plenum are proposed in all affected living and bedrooms integrated either within the balcony or the facade.

The varied facade design does not impact the location and function of the acoustic plenums.



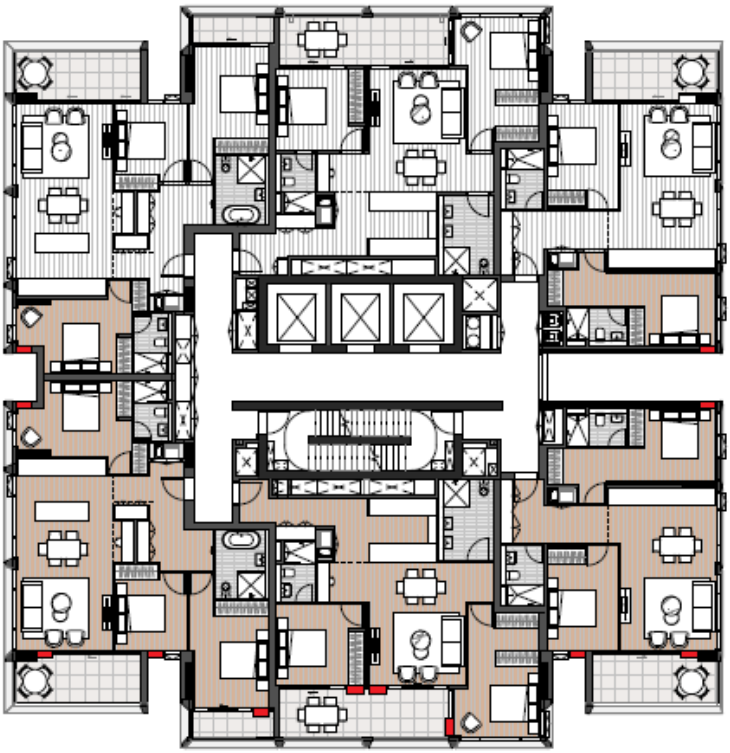
Noise affected rooms/ apartments

Acoustic plenum

Build to Sell Level 20-21

All west facing apartments and the western bedrooms of the north-east 3 bedroom apartment and south-east 2 bedroom apartment are affected by Botany Road noise. Acoustic plenum are proposed in all affected living and bedrooms integrated either within the balcony or the facade.

The varied facade design does not impact the location and function of the acoustic plenums.



Source: Hassel

The acoustic plenum must be designed to achieve a transmission loss values equal to or greater than the values presented below:

Figure 62 Minimum transmission loss requirements for each acoustic ventilator

Required Transmission Loss– Octave Band Centre Frequency						
63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
7	13	15	18	25	24	19

Source: Stantec

To achieve the internal noise level requirements outlined above, the acoustic plenum must achieve transmission loss values equal to or greater than those presented below:

Figure 63 Summary of internal noise level requirements for the acoustic plenum

Transmission Loss (dB)						
63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
13	14	16	18	25	24	19

Source: Stantec

Conclusion

The ventilation performance of the acoustic ventilators has been assessed and modelled to the requirements of the *Council's Draft Alternative Natural Ventilation of Apartments in Noise Environments – Performance Pathway Guideline.*

Stantec can confirm the design of the acoustic ventilator and all of the constituents of the acoustic ventilator satisfy the requirements of Council's Performance Pathway Guideline.

Project noise trigger

The following project noise trigger (**PNTL**) are used to assess plant and equipment, retail and childcare noise impacts to surrounding sensitive receivers. They are in accordance with the requirements of the NSW NPI and shall be assessed to the most affected point on or within the residential boundary.

Figure 64 Project noise trigger (PNTL)

Receiver	Period	Descriptor	PNTL dB(A)
NCA01	Commercial Receivers		
	When in use	$L_{Aeq,15min}$	63
NCA02	Residential Receivers		
	Day (7:00am to 6:00pm)	$L_{Aeq,15min}$	55
	Evening (6:00pm to 10:00pm)	$L_{Aeq,15min}$	48
	Night (10:00pm to 7:00am)	$L_{Aeq,15min}$	43
NCA03	Residential Receivers		
	Day (7:00am to 6:00pm)	$L_{Aeq,15min}$	55
	Evening (6:00pm to 10:00pm)	$L_{Aeq,15min}$	48
	Night (10:00pm to 7:00am)	$L_{Aeq,15min}$	43
Northern Precinct	Commercial Receivers		
	Day (7:00am to 6:00pm)	$L_{Aeq,15min}$	63
	Evening (6:00pm to 10:00pm)	$L_{Aeq,15min}$	63
	Night (10:00pm to 7:00am)	$L_{Aeq,15min}$	63
Southern Precinct	Residential Receivers		
Receiver	**Period**	**Descriptor**	**PNTL dB(A)**
	Day (7:00am to 6:00pm)	$L_{Aeq,15min}$	55
	Evening (6:00pm to 10:00pm)	$L_{Aeq,15min}$	48
	Night (10:00pm to 7:00am)	$L_{Aeq,15min}$	43
	Student Accommodation		
	Day (7:00am to 6:00pm)	$L_{Aeq,15min}$	60
	Evening (6:00pm to 10:00pm)	$L_{Aeq,15min}$	53
	Night (10:00pm to 7:00am)	$L_{Aeq,15min}$	48
Waterloo Congregational Church	Place of Worship		
	When in use – Day	$L_{Aeq,15min}$	60
	When in use – Evening	$L_{Aeq,15min}$	58
	When in use – Night	$L_{Aeq,15min}$	57

Source: Stantec

Mechanical Plant and Equipment Assessment

This assessment has considered the noise emissions from the mechanical plant serving the internal spaces of the development. The assessment has been conducted as per the City of Sydney Council requirements to achieve noise levels as per the NSW NPI.

In order to assess the worst-case scenario, it was assumed that the mechanical services associated with the development are running at any time throughout the daytime. While exact equipment has not been selected for the project, the sound power levels (**SWL**) have been assumed for the preliminary assessment, based on typical SWL's of equipment of the size shown.

The assessment assumed the below mechanical plant at each façade to assign the maximum sound power levels:

- Heat Pumps
- Condensers
- Cooling Towers
- AHU
- Car Park Exhaust – Discharge Outlet

The noise generated by the mechanical plant and equipment within the rooftop plantroom has been assessed to the noise-sensitive receivers surrounding the proposed development within the noise catchment areas. Figure 65 provides a summary of the results of the noise impact assessment of the mechanical plant and equipment.

The noise generated by the plant and equipment has been assessed with and without the noise mitigation measures. Based on the results of the assessment, the predicted noise levels at the surrounding noise-sensitive receivers are expected to comply with the project noise trigger levels established, and with the implementation of the mitigation measures the impact will be further mitigated.

Figure 65 Insertion losses required for mechanical plant and equipment

Receiver	Period	Predicted Noise Level LAeq,15min - dB(A) Without Mitigation	Predicted Noise Level LAeq,15min - dB(A) With Mitigation	PNTL LAeq,15min - dB(A)	Compliance (Yes/No)
NCA01	When in use	50	35	63	Yes, with and without mitigation
NCA02	Day	58	37	55	Yes, with mitigation
	Evening	52	31	48	Yes, with mitigation
	Night	47	26	43	Yes, with mitigation
NCA03	Day	59	38	39	Yes, with mitigation
	Evening	53	32	35	Yes, with mitigation
	Night	48	27	29	Yes, with mitigation
Northern Precinct	When in use	65	45	63	Yes, with mitigation
Southern Precinct (Residential)	Day	62	42	55	Yes, with mitigation
	Evening	56	36	48	Yes, with mitigation
	Night	51	31	43	Yes, with mitigation
	Day	64	54	60	Yes, with mitigation
Southern Precinct (Student Accommodation)	Evening	58	48	53	Yes, with mitigation
	Night	53	43	48	Yes, with mitigation
Waterloo Congregational Church	Day	43	37	47	Yes, with and without mitigation
	Evening	37	31	45	Yes, with and without mitigation
	Night	32	26	44	Yes, with and without mitigation

Source: Stantec

Mitigation measure

To meet the external noise emissions requirements for noise generated by the mechanical plant and equipment together, the following noise mitigation measures are required:

- Install type 1, type 2 and type 3 acoustic barriers to the Level 23 plantroom to the height shown in the architectural documentation. Acoustic barriers can be solid or can be an acoustic louvre, though the barrier must have a noise reduction of no less than the values shown in Table 56 of the Noise Report.
- Install type 2 and type 3 acoustic barriers to the Level 23 mezzanine plantroom to the height shown in the architectural documentation. Acoustic barriers can be solid or can be an acoustic louvre, though the barrier must have a noise reduction of no less than the values shown in Table 56 of the Noise Report.

Additional mitigation measures for the mechanical plant should be considered during the design development stage to comply with the noise criteria at the nearest sensitive receivers. These amelioration measures could include, but are not limited to, the following:

- Positioning mechanical plant away from nearby receivers
- Acoustic attenuators fitted to duct work
- Screening around mechanical plant
- Acoustic insulation within duct work
- Acoustic louvres

It should be noted that the noise reduction requirements will likely be refined and reduced once the mechanical plant and equipment selections and designs have been confirmed during the detailed design stage. The mitigation measures proposed at this stage of the development are conservative in nature.

Conclusion

Subject to the implementation of the mitigation measures outlined above, the mechanical services noise emissions from the operation of the development is expected to comply with the requirements of the NSW NPI and the project noise trigger levels.

Childcare

The proposed childcare centre is expected to have 146 children in the centre, aging from 6 weeks to 6 years old. The centre opening hours are subject to a separate DA and the childcare operators' requirements, however for the purpose of acoustic assessment it is assumed that the childcare will operate during the hours of 7:00am to 6:00pm.

Extended operation hour and Saturday opening hours are not included in this assessment will be further assessed subject to a fit-out DA.

The Association of Australian Acoustical Consultants (**AAAC**) sets out criteria for noise emissions from Childcare Centres and forms bases of the assessment. The sound power has also been adjusted to take into consideration the number of children in proposed age group:

- 10 Children aged 0 to 2 years – 77 to 80 dB(A)
- 10 Children aged 2 to 3 years – 83 to 87 dB(A)
- 10 Children aged 3 to 6 years – 84 to 90 dB(A)

The assessment has been conducted considering 146 children playing outdoors continuously, split into groups of four, throughout a 15-minute period, distributed around the outdoor area for both Levels 1 and 2. The predicted noise level from the operation of the outdoor play area is shown below, which assessed at the future residential receivers within the proposed development as well as the nearest external noise-sensitive receiver.

Figure 66 Predicted noise levels at childcare centre

Receiver	Period	Predicted Noise Level $L_{Aeq,15minutes}$ dB(A)	Noise Criteria $L_{Aeq,15minutes}$ dB(A	Compliance (Yes/No)
Nearest Apartment in Central Precinct (Building 2)	7am – 6pm (up to 2 hours)	59	70	Yes
	7am – 6pm (more than 2 hours)		65	Yes
NCA01	7am – 7pm	39	65	Yes
NCA02	7am – 6pm (up to 2 hours)	37	57	Yes
	7am – 6pm (more than 2 hours)		52	Yes
NCA03	7am – 6pm (up to 2 hours)	36	60	Yes
	7am – 6pm (more than 2 hours)		55	Yes
Northern Precinct	7am – 7pm	57	65	Yes
Southern Precinct	7am – 6pm (up to 2 hours)	35	57	Yes
	7am – 6pm (more than 2 hours)		52	Yes
Waterloo Congregational Church	7am – 6pm	38	60	Yes

Source: Stantec

Based on the results of the assessment of the noise generated by children playing within the outdoor area of the childcare centre, the predicted noise levels at the surrounding noise sensitive receivers are expected to comply with the project noise trigger levels **without further mitigation**.

Noise impact within the childcare

As the childcare centre is located on the façade most affected by the noise emissions generated by Botany Road, similar to residential development, the internal spaces within the child care centre that are noise-affected require an alternative means of ventilation and will be provided with mechanical ventilation (in addition to openable windows) to meet the requirements of the National Construction Code 2019, AS 1668.2 and AS/NZS 3666.1, as well as to meet the project internal noise limits.

The design of the mechanical ventilation system required to serve the noise-affected spaces within the childcare centre will be addressed in the detailed design stages of the project.

Retail

Noise emissions from the retail tenancies located on the ground floor are based on many factors, such as the type of tenancy and number of occupants within the tenancy under normal or extended operation hour.

This information would typically be provided as part of a fit-out development application for the tenancy and hence, the noise emissions from the retail tenancies and outdoor licensed seating area will be assessed as part of future fit-out DAs.

8.7.2. Construction Noise

Assessment

Noise impacts from the construction works have been assessed based on the following hours (i.e. worst case scenario).

- Monday to Friday: 7am to 6pm
- Saturday: 7.30am to 3.30pm
- Sunday and public holidays: no work.

The assessment considers the noise impacts associated with the following construction works:

- Structure (ground level and rooftop);
- Façade;
- Fit out, finishes and services.

The noise sources likely to be associated with structure and façade works, including equipment such as crane, powered hand tools, concrete pump and truck movement.

A qualitative construction noise impact assessment has been conducted to identify the most-affected surrounding noise-sensitive receivers. The following receivers are considered the most-affected noise sensitive receivers:

- NCA01
- NCA02
- NCA03
- H1 – Church

The prediction modelling was conducted for each of the following construction scenarios:

- Scenario 1: Structure (Ground – L5)
- Scenario 2: Structure (L6 – L10) and Façade (Ground – L5)
- Scenario 3: Structure (L11 – L15) and Façade (L6 – L10)
- Scenario 4: Structure (L16 – 23) and Façade (L11 – L15

The assessment concluded that given the exceedance in the noise management level at any given time during the construction of the Central Precinct, construction noise level is predicted to be limited to approximately 3 dB(A) upon implementation of the mitigation measures outlined below, it is not expected there will be significant construction noise impacts on the surrounding noise-sensitive receivers.

Cumulative Construction Noise Assessment

A cumulative construction noise and vibration assessment has been undertaken, which also includes assessment of impact to the Waterloo Congregational Church.

The proposed overall cumulative construction works will comprise the following stages:

- Civil Works (Basement and Southern Precinct)
- Structure – All Precincts (Ground Level to Rooftop)
- Façade – All Precincts (Ground Level to Rooftop
- Fit out, Finishes and Services

Cumulative Construciton Noise

The assessment concluded that in the instance the excavation and piling for each of the precincts occurs simultaneously, the predicted noise level at nearest noise sensitive receiver (Waterloo Congregational Church) will exceed the noise management level by 21 dB(A).

This result is conservative in the sense that the majority of the noise is generated based on modelling of a rock breakers in close proximity to the receiver, where this may not be the case in reality given the predominant soil type (sand).

Upon implementation of the mitigation measures outlined above, it is not expected there will be significant construction noise impacts on the surrounding noise-sensitive receivers within the nearby noise catchment areas.

Mitigation measures

Mitigation measures are listed below:

- A solid acoustic barrier (made from plywood or similar) 2.4 metres above Ground Level is recommended to be erected around the perimeter of the site. The acoustic barrier could be either Class A or Class B type hoarding.
- Where it proves reasonable and feasible, heavy truck movements are recommended to travel along Botany Road to enter the construction site. This will not be possible for significant durations of construction on-site due to other site constraints that must be addressed by travelling along Cope Street and Raglan Street.
- In addition, noise monitoring is recommended to be conducted at the most-affected noise-sensitive receivers in accordance with the monitoring programme and the noise management measures flow chart attached in the Noise Report.

In addition to the above, the list of General Acoustic Recommendations for Construction is included in the Noise Report should also be applied to minimize the spread of noise and vibrations to the potential receivers.

Conclusion

Construction noise impacts are able to be mitigated by the implantation of the abovementioned mitigation measure to achieve satisfactorily acoustic levels.

8.7.3. Construction Vibration

Assessment

The vibration associated with construction is dependent on a number of variables including the types of machinery, the proximity to the nearby receivers as well as the ground type.

Generic safe working distances for vibration impacts associated with various types of machinery at given distances are presented within the TfNSW ‘Construction Noise Strategy’ document. This document presents the safe construction working limits for Cosmetic Damage to adjacent structures (in accordance with BS 7385) and Human Comfort (OH&E).

Concrete vibrators are expected be used in close proximity to the Waterloo Congregational Church when pouring the Level 01 slab. Mitigation measure is discussed below to ensure vibration generated on the structure of the Waterloo Congregational Church does not exceed the project vibration requirements.

Cumulative Construction Vibration Assessment

Similar to the vibration assessment of the Central Precinct, concrete vibrators are expected be used in close proximity to the Waterloo Congregational Church when pouring the Ground Level slab. In addition to this, piling and excavating with a hammer attachment may be conducted in close proximity to the Waterloo Congregational Church.

Mitigation measures should be implemented to ensure vibration generated on the structure of the Waterloo Congregational Church does not exceed the project vibration requirements. These mitigation measures are discussed below.

Mitigation measures

It recommended that when pouring the Level 01 slab, attended vibration measurements should be conducted on the structure of the Waterloo Congregational Church to ensure the vibration generated on the

structure does not exceed the values for cosmetic damage and structural damage outlined in BS 7385 and DIN 4150 (project construction vibration limits established in Section 9.6.4). The vibration will primarily be generated by the concrete vibrators used during the concrete pour.

Conclusion

Construction vibration impacts are able to be mitigated by the implantation of the abovementioned measure to acceptable acoustic levels.

8.7.4. Metro Impact Assessment

An assessment for the ground borne noise or regenerated noise, into the nearest affect residential and childcare space within the proposed development as a result of a train pass-by within the subterranean corridor has been conducted.

Based on the assessment and the structural concept design for the proposed development, the ground-borne noise generated within the childcare and residential spaces is predicted to comply with the requirements of the ISEPP for both the residential areas (bedroom and lounge areas) and the child care centre spaces.

It should also be noted that beyond the assessment conducted within this report, there is an obligation on the trackform designers to ensure the trackform is designed such that the requirements of the ISEPP are met without any additional mitigation provided to the structure of the building.

A vibration impact assessment to the Human Comfort and Structural Damage criteria has been undertaken to the nearest affected structure of the development as a result of a train pass-by within subterranean corridor.

The predicted values were implemented into the assessment to determine whether there will be any adverse effect on occupants of the development with regards to human comfort, or any potential structural damage to the building.

Based on the results of the vibration dose value predictions, the vibration impact on the occupants of the proposed development is predicted to comply with the Human Comfort requirements of the ISEPP.

Based on the predicted vibration levels at the nearest structure of the proposed development, it is not expected that there will be any exceedance of the criteria established with regards to structural damage.

In conclusion, the vibration impact on the structure of the proposed development is predicted to comply with the requirements of the ISEPP based on the structural design of the proposed development.

8.8. TRANSPORTATION AIR QUALITY

A Transportation-Related Air Quality Assessment report has been prepared RWDI Anemos Ltd and is attached at **Appendix W**.

The report assesses air quality impacts from emissions associated with transportation in the vicinity of the proposed development. Two potential sources of emissions were considered:

- exhaust associated with the Sydney Metro; and
- motor vehicle emissions from major roadways.

Emissions associated with the Metro exhaust have been considered, however as noted in Sydney Metro's Environmental Impact Statement (Chapter 22, Air Quality), the concentrations of particulates and other compounds are expected to be minor and that *"it is unlikely that the project would have air quality impacts on the surrounding environment, including sensitive receivers"*.

Therefore, the focus of this study is limited to emissions from roadway sources only, with focus on traffic on Botany Road, to determine the potential for adverse air quality effects at the proposed development.

The assessment was based on the nominal peak hour traffic volume of 2,200 along Botany Road, which provides a worst-case of existing and future 2036 traffic volumes.

The simulation results indicate that compliance is easily achieved at the kerb of Botany Road for carbon monoxide (CO), nitrogen dioxide (NO2), and inhalable particulate matter (PM10). The findings indicate that vehicle emissions on Botany Road will be compliant with NSW air quality criteria anywhere within the development site, for both existing and future 2036 scenarios.

Accordingly, no mitigation measures were recommended by RWDI Anemos Ltd and the site is considered suitable for residential developments.

8.9. AIRSPACE

Approval has been sought from Sydney Airport Corporation Limited (**SACL**) under the *Airports (Protection of Airspace) Regulations 1996 (the Regulations)* for the intrusion of multi-storey buildings at the WMQ site into the airspace, which under the Regulations is prescribed airspace for Sydney Airport.

Approval has been granted by the Department of Infrastructure, Regional Development and Cities as part of the Concept DA, for the controlled activity and intrusion into prescribed airspace for Sydney Airport to a maximum height of 116.9 metres AHD. The approved penetration of prescribed airspace is up to 55.9 metres (approved attached at **Appendix DD**).

The proposed development has a maximum height of RL 98.46 (81.88m) measured to the top of the roof plant and PV zone. At a maximum height of RL 98.46 AHD, the proposed development penetrates the Obstacle Limitation Surface by approximately 37.56m, which is below the approved maximum intrusion height.

The Central Building is below the approved airspace height and would not contribute any measurable adverse effect to the safety, regularity or efficiency of air traffic to and from Sydney Airport and or in the foreseeable future.

This SSDA will continue to conform to the Airspace Approval Conditions imposed by the Department of Infrastructure, Regional Development and Cities.

8.10. TRAFFIC, ACCESS AND CAR PARKING

ptc. has prepared a Traffic Impact Assessment (**TIA**) in accordance with SEARs Item 9 and the conditions of consent for the concept SSDA, which is included at **Appendix I**.

This report provides an assessment of the surrounding traffic and transport network following the introduction of the proposed development, provides a preliminary plan for managing service vehicles within the shared loading dock and assess proposed car parking and bicycle provisions.

A swept path analysis on both proposed driveways is appended to the TIA, and a Green Travel Plan (**GTP**) is also attached at **Appendix I**.

8.10.1. Mode Share

Census 2016 Journey to Work data has been used to assess the current commuter travel behaviour within the suburb of Waterloo.

In summary, when travelling to Waterloo as a place of work, approximately 59% of staff travel to work by car, 23% travel to work via public transport and 7% travel by an active mode of travel. When travelling to work from Waterloo, approximately 36% travelled by car, 41% travel to work via public transport and 12% travel by an active mode of transport.

An assessment of the potential future mode shares has been undertaken in consultation with TfNSW and City of Sydney and is based on existing data and the strategic opportunities associated with the WMQ development.

The future mode share targets agreed for the AM peak for all trip purposes are:

- Train – 40%
- Walk only – 25%
- Car – 20%
- Bus – 10%
- Cycle – 5%

The above targets are based on a number of factors, including:

- Proximity to Sydney Metro's Waterloo Station, which will provide access to high quality mass transit service;

- Densely located land uses and proximity to Sydney CBD and Green Square, enabling shorter trip lengths more conducive to walking and cycling;
- Existing low traffic generation rates due to high density apartments and limited parking;
- Enhancements to the bus network to strengthen east-west routes, enabled by Sydney Metro City & Southwest;
- Improved cycling connections; and
- Consideration of City of Sydney's maximum LEP parking requirements to represent best practice in the provision of transport facilities appropriate for the development.

A Green Travel Plan has also been prepared to encourage a modal shift away from car usage and encourage active transport. This is further discussed in Section 8.10.7.

8.10.2. Parking and Access

The proposed development is subject to the parking requirements stipulated in the following policies and Condition of Consent:

- Concept DA SSD 9393 Conditions of Consent B8 – B10
- Waterloo Metro Quarter Design and Amenity Guideline (consistent with rate provided under Conditions B8 to B10)
- Sydney LEP 2012 (consistent with rate provided under Conditions B8)
- RMS Guide to Traffic Generating Developments
- Sydney DCP 2012

It is important to note that in accordance with clause 11 of the SRD SEPP, the provisions of Sydney DCP 2012 do not apply to this development, unless specified by the Concept DA Conditions of Consent B9 and B10, which relates to bicycle parking, accessible car parking spaces and motorcycle parking spaces. Notwithstanding this, the Sydney DCP 2012 has been considered as a reference for childcare and service bay parking rate.

The permissible and proposed parking provisions for the Central Precinct are summarised in Table 23. Compliance with the parking rates prescribed under the above mentioned polies are also summarised.

The car parking provisions associated with the Central Precinct will be provided within the shared basement car park located below the North and Central Precincts, proposed under a separate SSDA (SSD – 10438).

Table 24 Car Parking Provision Summary (Central Precinct)

Use	**Units/GFA/Spaces**	**Maximum Parking Rate under SSD 9393**	**DCP Parking Rate (as reference)**	**Permissible Spaces**	**Proposed Parking Spaces**
One-bed unit	68 units	0.3 spaces per unit	N/A	21	
Two-bed unit	76 units	0.7 spaces per unit	N/A	53	
Three-bed unit	6 units	1 space per unit	N/A	6	
Residential Total	150 units			Maximum: 80 spaces	67
Accessible Parking – Residential	23 adaptable units	Minimum: 1 space per 1 adaptable unit	Minimum: 1 space per 1	Minimum: 23 spaces and 3 accessible	9 residential accessible parking

Use	Units/GFA/Spaces	Maximum Parking Rate under SSD 9393	DCP Parking Rate (as reference)	Permissible Spaces	Proposed Parking Spaces
		One space for every 20 car parking spaces or part thereof is to be allocated as accessible visitor parking	adaptable unit visitor parking One space for every 20 car parking spaces or part thereof is to be allocated as accessible visitor parking	visitor spaces	(included in the total residential car parking of 67) + 2 residential visitor accessible space. See justification below
Car Share – Residential	67 spaces	1 per 50 spaces	N/A	Maximum: 2 spaces	2
Car Wash Bay – Residential	150 units	N/A	N/A	N/A	1
Service Bays – Residential	150 units	N/A	Minimum: 1 space for 50 units and 0.5 spaces per 50 units+	Minimum: 2 spaces	2 SRV and 2 MRV loading bays are provided within the northern loading dock to be shared between the Northern and Central Building.
Retail	674m^2	1 space per 90m^2 GFA	N/A	Maximum: 2 spaces	0
Retail – car share	0 non-residential car parking provided	1 space per 30 non-residential car parking spaces.	N/A	0	0
Child Care	146 children	N/A	Minimum: 1 space per 8 children and limited in duration to no	Minimum Short term: 18 spaces	1 long term visitor parking.

Use	Units/GFA/Spaces	Maximum Parking Rate under SSD 9393	DCP Parking Rate (as reference)	Permissible Spaces	Proposed Parking Spaces
			more than 30 minutes. 1 long term visitor car parking space per centre.	Minimum Long term: 1 space	See justification below
Motorcycle – Residential	72 residential spaces	1 motorcycle space for every 12 car parking spaces.	1 motorcycle space for every 12 car parking spaces.	Maximum: 6 spaces	6

The proposal adopted a minimal car parking approach to encourage walkability and reduce car dependency in an accessible location. This is also to in lined with the objective of a transport oriented development.

As outlined above, the proposal comprises 67 residential parking spaces (including 9 accessible car parking spaces), 2 residential accessible visitor space 1 wash bay and 2 shared residential parking space. which is a total of 72 residential car parking and is below the maximum 80 permissible parking provision as prescribed under the Concept DA. Therefore, residential car parking satisfies the maximum Concept DA car parking conditions.

Accessible car parking:

A total of 23 adaptable units are proposed. A total of 11 accessible car parking spaces comprising 9 accessible car parking for residents and 2 residential accessible visitor space is proposed, which is below the DCP carparking rate.

The proposed number of accessible spaces is supported by access consultant Morris Goding and is justified in the Accessibility Statement attached at **Appendix S**.

The assessment concluded that the reduction of accessible car space is in line with the proposed ratio of overall car parking and apartments proposed for the overall Central Precinct. The reduction of accessible car space is a reasonable proposition given the immediate proximity of the Waterloo metro station, and precedence with regards to the reduction of accessible car space for other approved residential projects at Barangaroo and Darling Square. Therefore, the proposal is considered reasonable in this regard.

Motorcycle parking:

Condition B9 of the Concept DA also requires motorcycle parking to be consistent with Sydney DCP rate. Based on the total residential parking number of 72 for the Central Precinct, the DCP requires 6 motorcycle spaces. The proposed development provides 6 motorcycle spaces bays within the basement, therefore meeting the minimum requirement of the DCP and Condition B9.

Retail car parking:

No retail employment or visitor car parking spaces are proposed, as the site is located in an accessible location close to public transport options. The majority of the retail visitors are also anticipated to be from the proposed WMQ developments or the locality, therefore do not require additional visitor parking onsite.

Childcare parking:

No childcare visitor parking spaces are been proposed, and only 1 long term parking space is provided for the childcare centre within level P1 of the basement. This is inconsistent with Sydney DCP reference childcare parking visitor parking rate.

It is expected that the Child Care Centre will be used predominately by residential occupants of the development or staff within the commercial offices in the Northern Precinct. Therefore, trips would be

undertaken as part of a combined trip, utilising parking already provided within the development or by public transport. Additional parking for drop off or pick up is therefore not required.

Staff of the Child Care Centre would also be able to use public transport to access the centre and therefore a zero-parking provision is proposed for staff.

Given the above, one long-term visitor parking space is considered adequate to service the childcare centre. This childcare visitor bay is located close to the Central Building left core for ease of access and shall satisfy the following design requirements:

- Vehicle and pedestrian access points are to be appropriately marked and sign posted.
- Vehicles must be able to enter and leave the site in a forward direction.
- Areas used by vehicles must be separated from areas used by children with appropriate fencing and gates.
- Where parking spaces are within a mixed-use development, the space for the childcare centre are to be located and grouped together and conveniently located near the access point to the centre.

The proposed parking provision is able to satisfy maximum Concept DA car parking conditions, and to support the initiatives of the GTP and the encouragement of sustainable transport modes.

Where compliance cannot be met for accessible car parking, it is supported by an Accessibility Statement attached at **Appendix S** and is in line with the proposed ratio of general car bays and apartments given the immediate proximity of the railway station, therefore is considered to be reasonable. The DCP shortfall of childcare centre is justified given that the Child Care Centre is to be used by residential occupants of the development or staff within the commercial premises, therefore trips would be undertaken as part of a combined trips and utilising parking already provided within the development or by public transport. Overall, the development is able to provide minimal residential and retail car parking to encourage green travel and adequate parking for services.

8.10.3. Traffic Generation and Road Network Impact

Assessment

Existing development

The development is proposed on land which is currently vacant and therefore does not generate any traffic activity. However, construction works are being undertaken within the site and the traffic activity associated with construction would be captured within the traffic surveys for traffic assessment

To determine the current traffic volumes within the vicinity of the site, intersection surveys were conducted on Tuesday 12th March 2020, between 7.30am - 9.30am and 4.00pm – 7.00pm. Traffic surveys were undertaken prior to any restrictions placed on movement (on 22nd March 2020) due to the Covid-19 outbreak.

The peak hour for the below intersections was determined as follows:

- Henderson Road and Wyndham Street

  7.45am to 8.45 am - 2812 vehicles

  5.15pm to 6.15pm - 2995 vehicles
- Botany Road, Henderson Road and Raglan Street

  7.45am to 8.45am - 3162 vehicles

  5.45pm to 6.45pm - 3272 vehicles
- Raglan Street and Cope Street

  8.15am to 9.15am - 732 vehicles

  5.30pm to 6.30pm - 806 vehicles
- Cope Street and Wellington Street

  8.30am to 9.30am - 487 vehicles

5.15pm to 6.15pm - 510 vehicles

- Botany Road, Buckland Street and Wellington Street

  7.45am to 8.45am - 2376 vehicles

  5.15pm to 6.15pm - 2303 vehicles

Proposed Development

The proposed traffic assessment was undertaken using SIDRA modelling software to assess traffic impact to 2036. The total peak hour trip generation was concluded as follows:

- Market Residential – 8.04;
- Affordable housing– 0.96;
- Retail – Nil;
- Community space – Nil;
- Childcare – One space provided as a long-term visitor space. Therefore, traffic generation during the peak hour has been determined to be zero. Assumed residents or commercial staff use childcare centre and would travel to the site by public transport.

The proposed development is estimated to generate approximately 9 vehicle trips during the road network peak periods.

It is noted that the proposed detailed design scheme (for all precincts within the WMQ site) comprises a total of 220 residential apartments and 435 student accommodation rooms, which is lower than what is assumed by the traffic generation of the concept DA. The detailed design SSDAs will generate less traffic from the residential component than what is assessed under the Concept DA.

The traffic modelling undertaken shows that with the proposed development, including growth to 2036, the external road network will continue to operate at an acceptable levels of service and experiences no change in the level of service associated with the traffic generated by the development. The level of service at the surrounding intersections will operate in the rating of A, B, E or E. Therefore, the development is not anticipated to have any detrimental effect on the network operation.

Mitigation Measures

No specific mitigation measures proposed.

Conclusion

The traffic modelling undertaken demonstrated that the external road network should operate at acceptable levels of service or at a level of service less than the approved concept DA (SSD 9393) and therefore, the development should not have a detrimental effect on the network operation.

8.10.4. Loading and Servicing

Loading dock:

A shared loading dock is provided at the ground floor of the Northern Precinct and can be accessed off Botany Road as shown in Figure 65. The driveway allows an inbound vehicle to pass an outbound vehicle within the driveway.

The loading dock can accommodate 2 MRV bays and 2 SRV bays. It should be noted that the MRV spaces are sized to accommodate the City of Sydney 9.25m waste collection vehicle.

Access to the loading dock is off Botany Road via a 6.9 metre to 9.0 metre wide driveway and an internal 9.0 metre diameter turntable, which allows vehicles to enter and exit the dock in a forward direction.

The Northern loading dock has a headroom clearance of 4.3 metres. The proposed headroom clearance of 4.3m is adequate for a standard 9.25m City of Sydney refuse collection vehicle, which requires a minimum headroom of 4.0m per the City of Sydney Guidelines for Waste Management in New Developments.

However, it is noted that AS2890.2 stipulates a minimum headroom clearance requirement of 4.5m for standard MRVs. Notwithstanding this, the proposed 4.3m headroom would be able to accommodate service

vehicles up to 8.8m MRVs with a maximum body height of 4.0m (plus 300mm safety clearance to any overhead structures).

A roller shutter is located at the building frontage and another one is located at the entry to the loading dock. The outer roller shutter will be open during the peak hours of operation with the inner shutter controlled by the Building Manager.

Once in the loading dock, vehicles will proceed onto the turntable and the appropriately trained user will operate the turntable to rotate the vehicle to the allocated spot to access the allocated loading bay.

Access and egress onto Botany Road will be restricted to left in and left out.

Service/Courier Bays:

Within Level 1 of the basement car park (SSD-10438), five service/courier bays are provided, and these are located as shown in Figure 68. The five bays are suitable utes and car derived vans and are accessed from the Church Square Shared Zone, via the 5.8 metre wide basement access ramp.

A boom gate is located at the top of the access ramp, which will control access and egress to the basement car park, via an intercom back to the control room or dock manager.

Vehicular access will be off the Church Square shared zone and the driveway width allows an inbound vehicle to pass an outbound vehicle within the driveway.

Vehicles will enter the basement car park and turn right to access the service vehicles bays. Exit from the service bays will be via the basement access ram and back onto the Church Square shared zone.

The access and use of the loading dock and service bays will be coordinated through the implementation of a Freight and Servicing Management Plan, discussed further below.

Figure 67 Loading Dock at the Northern Precinct

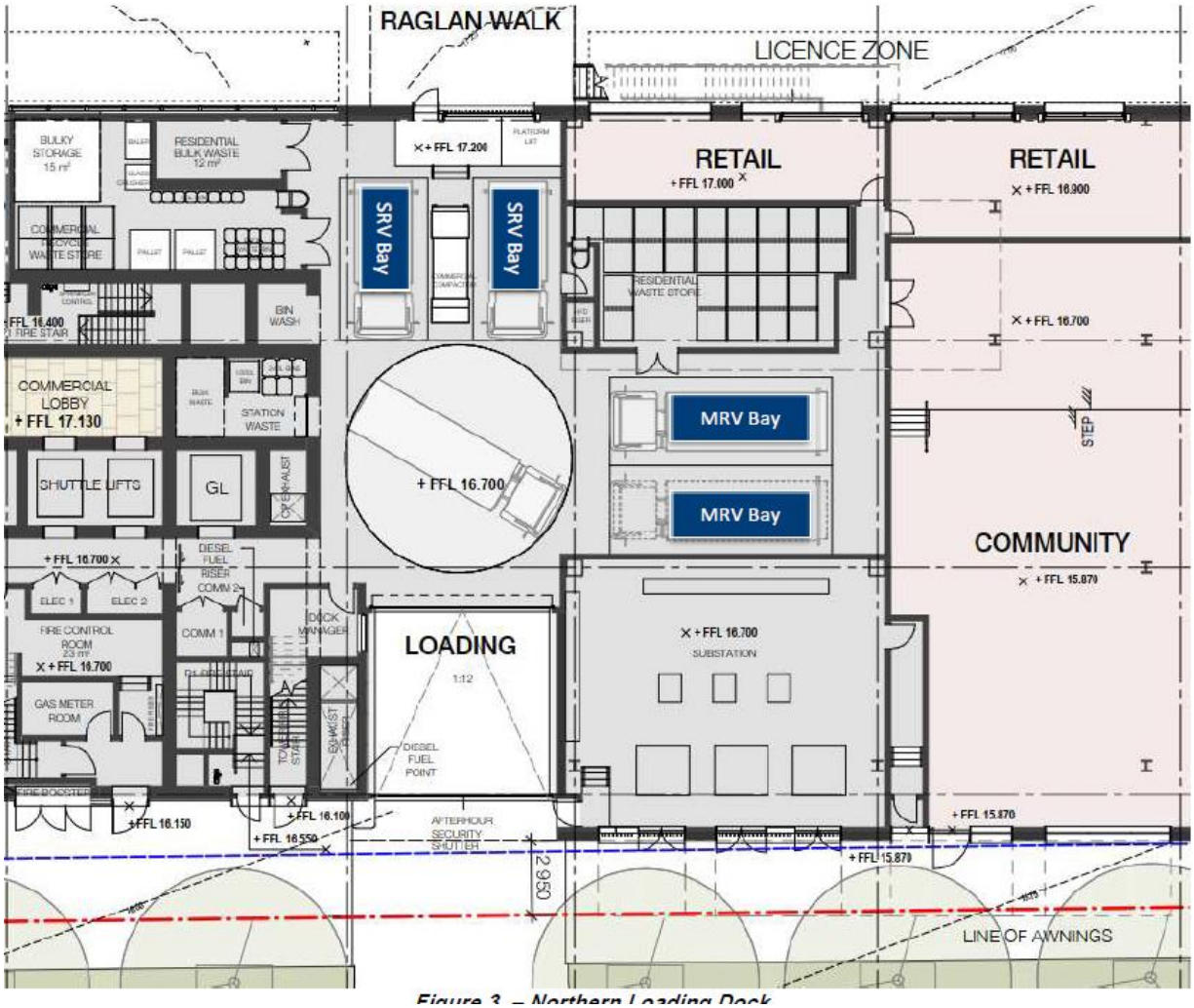
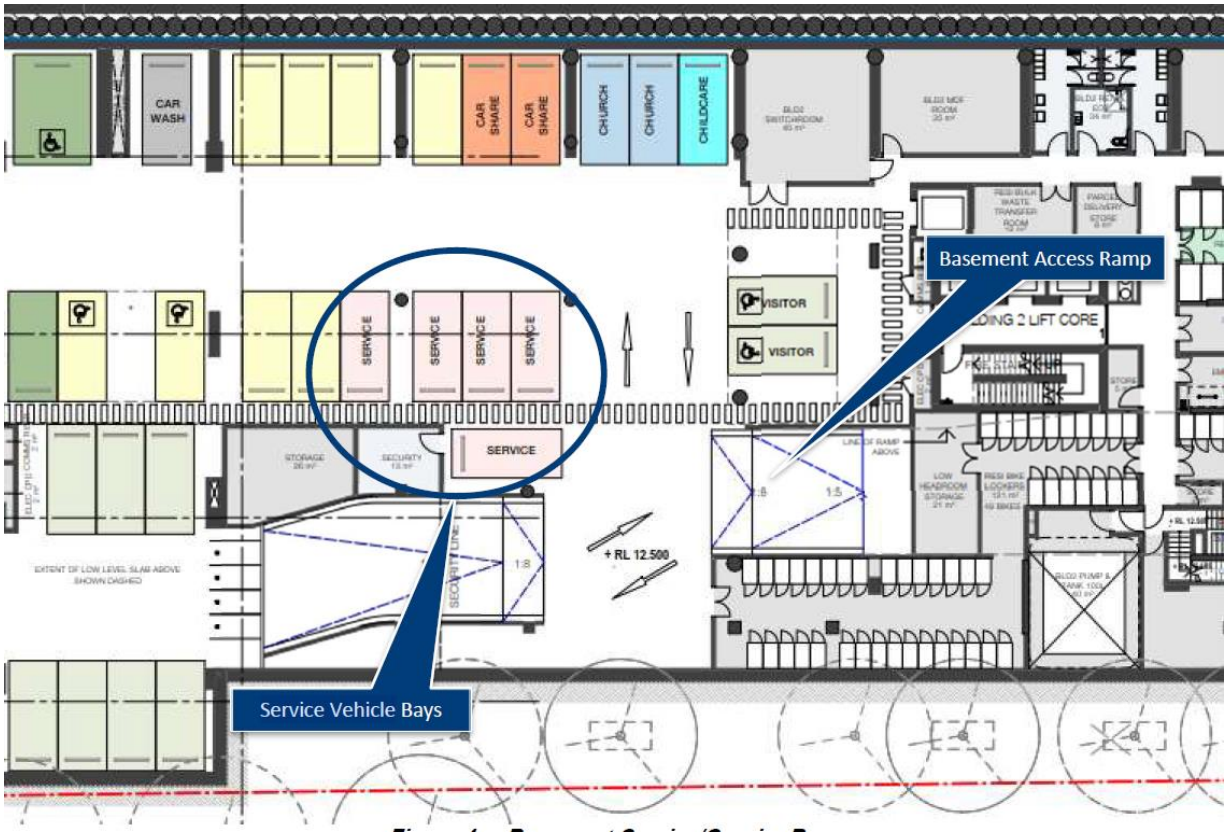


Figure 3 – Northern Loading Dock

Source: Woods Bagot

Figure 68 Service Bays in the basement



Source: Woods Bagot

Freight and Servicing Management Plan

A Freight and Servicing Management Plan has been prepared by ptc. and included at **Appendix I.** In accordance with the SEARs, the Freight and Servicing Management Plan details loading dock and servicing provision, adequacy and management with consideration of WQM site wide shared loading docks, including the Northern loading dock shared between the Central and Northern Precincts.

The Freight and Servicing Management Plan aims to:

- Increase safety around the Loading Dock between all user groups;
- Maintain a high level of access and efficiency of the Loading Dock and Service Bay facilities
- Minimise disruption to surrounding road network;
- Reduce conflicting occupancy within the Loading Dock and Service Bays; and
- Outline the rules associated with the use of the Loading Dock and Service Bays.

The loading dock will be utilised by Sydney Metro, commercial tenants and residents for the purposes of maintenance, deliveries, waste collection and removalists. Access to the dock would be generally restricted to Metro and waste collection vehicles between 10pm and 7am, to provide access for regular activities, with general access allowed between 7am and 10pm.

It is expected that all residential waste generated will be collected by Council with garbage being collected twice weekly and recycling once a week. Private waste contractors will collect waste from the retail and commercial facilities. Removalist activity would be restricted to weekends, with maintenance being undertaken on an ad hoc basis as required.

The loading dock will be available for use by appointment only. Similarly, the Service Bays will also be available for the use by the Owners and Occupiers entitled to use the bays, by appointment.

Access to the loading dock and service bays will be managed through an online booking system, which will allocate the times and durations vehicles will be allowed to access the site. This will ensure that bookings do not exceed the number of available bays for each time slot, thus managing vehicular access to the loading dock and service bays and minimise any potential queuing onto Botany Road.

For regular activities and deliveries, a regular time slot should be determined in coordination with the Building Manager. Bookings will be managed by an electronic 'app' based booking management system. This type of system allows the loading dock manager, tenants and vehicles using the dock to book in time slots and see in real time the availability of docks and bays for use. This would also allow tracking of vehicles on-route and allow for adjustments due to delays.

The management of the Loading Dock will be the responsibility of an appointed Building Manager. The Loading Dock management office is located within the Loading Dock area. A 24/7 security control room will be provided onsite and a guard will be positioned in the loading dock during peak operational times for the building. The site will be manned by 24/7 security who will assist with the management of the loading dock outside peak times.

The entry shutter will be equipped with visual strobe lighting to warn pedestrians when the loading dock shutter is opening to ensure pedestrian safety.

Bollards are located along the shared driveway (Church Square) to segregate pedestrian pathway and ensure pedestrian safety,

8.10.5. Pedestrian Access and Movements

Modelling of the pedestrian activity has been undertaken by WSP and this report can be found in Appendix 2 – Pedestrian Modelling Report of the TIA.

This report assesses the pedestrian demand for the overall WQM precinct consisting of the following four key components.

- Demand related to the proposed metro station
- Demand related to the proposed over station development
- Demand related to existing land uses in the wider area, referred to as background demand
- Demand related to the Botany Road bus stops

The assessment concluded that the overall WQM developments and the proposed public domain improvement, including Botany Road pedestrian way widening is able to accommodate for the incoming future pedestrian.

The separation of pedestrian entrances for the OSDs and metro station provides good space activity management and results in clearly visible, unobstructed and easily identifiable entrances from the street.

The proposed retail entrances on Botany Road and along Grit Lane has a clear pedestrian viewpoint from the street and natural access is provided by clearly defined footpaths leading up to the metro entrance.

Furthermore, the Church Square shared zone will be a Category 1 shared zone and is designed to specifically provide non-vehicular priority within the roadway. General design principles include:

- The road space will be devoid of delineation and kerbs to enhance the sense of pedestrian priority.
- The entrance to the zone (at the intersection with Cope Street) will provided I the form of a 'Continuous Footpath Treatment' in accordance with RMS TD 2013/05.
- Regulatory traffic signs, in accordance with TTD 2016/001 will be provided on both sides of the entry to the zone, to enhance the change in environment and priority.
- The pavement surface will clearly distinguishable in texture, colour and material, to highlight the difference in environment, in accordance with City of Sydney requirements.

As such, the Pedestrian Modelling Report concludes that the impact of the increase in pedestrian flows on the surrounding street network as a result of the OSD is considered acceptable.

8.10.6. Cycle Access and Parking

To promote active transport, Condition B10 of the Concept DA requires the development to provide bicycle parking and end-of-trip facilities in accordance with the rates specified within the Sydney DCP 2012. Accordingly, the following bicycle parking have been provided for the Central Precinct:

Figure 69 Bicycle Provision

Use Type	Units/GFA/ Staff	Bicycle Parking Requirement	Required Spaces	Provided Spaces	Class
Market Residential & Affordable Housing	150 units	1 space per unit	150	150	Class 1
Retail Staff	674m^2	1 space per 250m^2	3	3	Class 2
Child Care Staff	30 staff	1 space per 10 staff	3	3	Class 2
Market Residential & Affordable Housing - Visitors	150 units	0.1 spaces per unit	15	16	Class 3
Retail Visitors	674m^2	2 + 1 / 100m^2 over 100m^2	8	8	Class 3
Childcare Visitors		2 per centre	2	2	Class 3
TOTAL			**181**	**182**	

Source: ptc.

A total of 150 dedicated bicycle parking spaces are proposed within the basement car park to support the residential use of the Central Building, in addition to basement storage cages.

Residential bicycle parking is provided in the form Class 1 bike lockers. The residential bicycle parking is located on level P1 of the basement. Retail and childcare employee bicycle parking area provided in the form of Class 2 bike facilities, which are also located within level P1 of the basement (refer to Figure 33).

The end of trip facilities is also provided within the same basement level, which are to be shared between the employees of both Northern and Central Precinct (refer to Figure 33).

Visitor bicycle parking is provided in the form of Class 3 bike rails located within the public domain area.

Bicycle parking is proposed to be accessed via the Central Building lift core.

8.10.7. Green Travel Plan

The requirement for a Green Travel Plan (**GTP**) was requested in the SEARs for the proposed development. The GTP prepared by ptc. for the WMQ site including the Central Precinct and is included at the TIA. The GTP provides an assessment of the existing methods of public and active transport links to the site and outlines how the development intends to make travel to and from the site safer and more sustainable.

Based on Australian Bureau of Statics 2016 (ABS 2016) data, it is evident that active travel modes are not currently highly utilised. The objectives of the GTP are to promote and reduce the reliance of private car usage and encourage and support active transport, in order to achieve the target travel mode.

The GTP focuses on promoting four sustainable modes, including walking, cycling, public transport and carpooling.

Walking

The existing pedestrian connectivity is generally good in all directions. Opportunities to promote walking include:

- Employees and parents (associated with the childcare centre) living within 1km of the site could be targeted to walk to the site;

- Residents could be encouraged to utilise the numerous public transport options available through promotional material to raise awareness of these transport options;
- A working partnership could be established with City of Sydney to determine whether there are opportunities to improve the pedestrian connectivity to the site;
- Tenants could be encouraged to implement the '10,000 steps per day initiative', whereby, employees are provided with trackers that measure the step number they have walked. Staff members who have achieved the 10,000 steps goal over 80% days of a month could be awarded with free/ discounted gym membership; and
- Tenants could be encouraged to celebrate 'Walk to Work' day on an annual basis.

Public Transport

The site is highly accessible to high frequency public transport services including buses and trains. The Waterloo metro station beneath the site will significantly shorten the travel distance to public transport services for tenants and visitors. To increase the public transport usage, the following measures should be considered:

- Create a map identifying the location of bus stops and routes and make this available to all users;
- Improved wayfinding signage between the site and nearby public transport interchanges;
- Promote the use of apps for public transport connectivity.

Carpooling

Carpooling forum could be developed to encourage employees to travel in groups. This would provide a platform for employees travelling on the same route to the site to travel together. Existence of the platform could be provided through brochures, noticeboards and social media.

Conclusion

Section 12 of the GTP includes a list of strategies to encourage residents, visitors and employees to adopt alternative sustainable transport options. Given the GTP is a live document, the GTP should be monitored and reviewed to understand whether and how the travel plan is having an impact on the mode share. An annual review of the GTP is recommended to identify how mode share has changed over time.

8.11. CONSTRUCTION IMPACT ASSESSMENT

A Construction Environmental Management Plan (**CEMP**) has been prepared by John Holland (**Appendix Q**), which details the procedures and processes associated with the construction methodology for the proposed development.

In accordance with the SEARs, the CEMP provides 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.

The assessment also considers the potential cumulative impacts 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).

The timing for other external developments (e.g. renewal of the social housing estate) are not planned to be undertaken concurrently with the Central Precinct at this stage, therefore, specific impacts are not able to be assessed as part of this CEMP. The CEMP will be further developed prior to commencement of construction to address any further cumulative impacts from other construction activities in proximity to the Central Precinct.

Station Works Interface

WL Developer will ensure that effective communication channels are established and maintained through regular correspondence, engagement, meetings, reporting and evaluation on an ongoing basis. The elected interface manager will actively engage with interface parties to ensure that their requirements are proactively sought, managed and delivered by the project team.

With respect to the external interfaces, there are significant Interface Contractor works that run through the development that will create complex interfaces with the proposed 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 (the 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.

Site Establishment

A-Class and B-Class hoardings will be installed around the perimeter of the site following the handover of the Central Precinct work areas by the Station Contractor. These hoardings will be erected along Raglan Street, Cope Street, Wellington Street and Botany Road (refer to Figure 67).

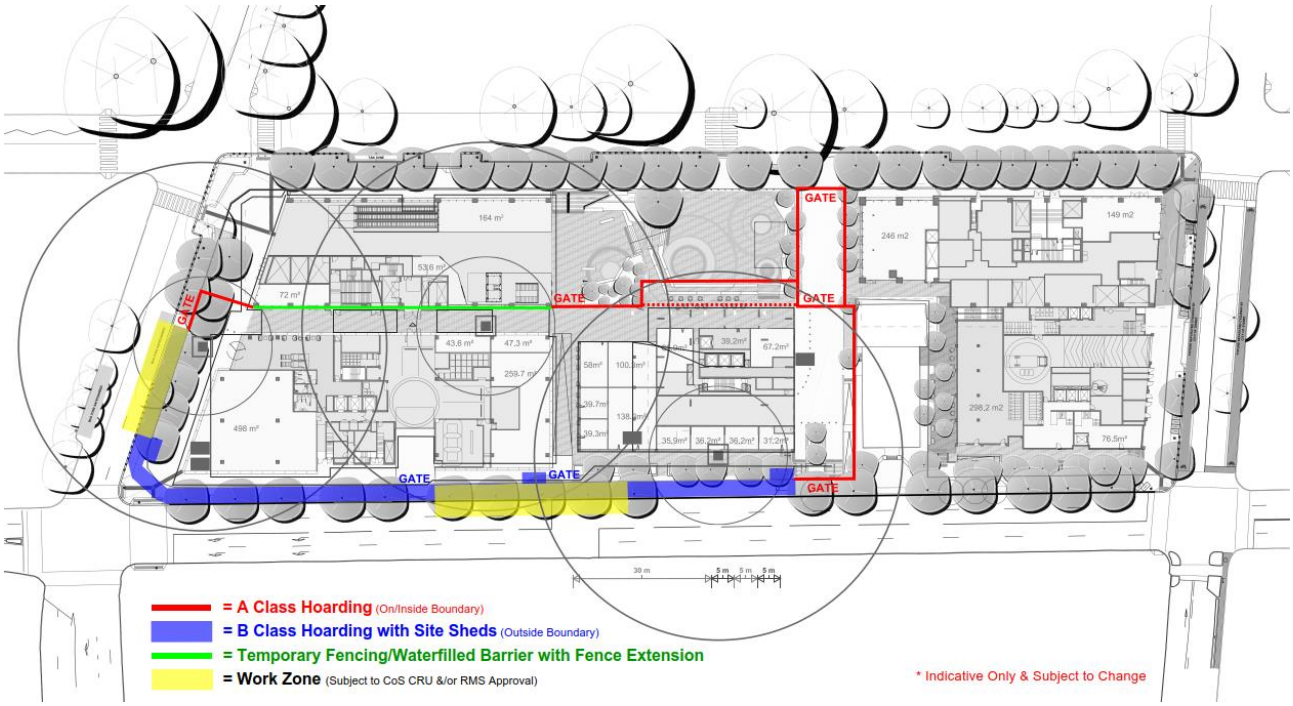
The site will be secured at all times with no unauthorised access permitted. Out of hours security patrols will be utilised strategically during the project. with a focus on shutdown periods such as Christmas and Easter when potential for theft and vandalism increases.

Access to the site will be controlled through a secured gate system. Individuals will require personalised identity swipe cards which will ensure a live record of the workers on-site at any given time. The proposed hoardings and/or fencing will also help delineate between the Station Contractors site and the Central Precinct site to ensure that Station Contractor and the Central Precinct workforce cannot access the opposing work areas.

The project office will be located within one block of the site and will include accommodation for project management staff. Accommodation and amenities such as lunch sheds, office sheds, first aid sheds, change rooms and 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 building.

Figure 70 Site Establishment Plan



Source: John Holland

8.11.1. Construction Pedestrian and Traffic Management Plan (Preliminary CPTMP)

The Preliminary Construction Pedestrian and Traffic Management Plan (**CPTMP**) prepared by ptc. is included at **Appendix J**. The CPTMP outlines the construction process associated with the Northern Precinct and preliminary construction traffic management measures to improve and regulate the safety of pedestrians, motorists and workers within the vicinity of the construction site.

As part of the SSDA exhibition process, TfNSW and City of Sydney will review and comment on the Preliminary Construction Pedestrian and Traffic Management Plan. Comments raised during exhibition will be discussed and incorporated into the final CPTMP for construction.

The following section has been structured in accordance with Condition B16 of the Concept consent (SSD 9393).

Impact on on-street parking and bus zone

The swept path assessment indicates that in order to facilitate access or egress manoeuvres (driveway locations and Works Zones), on-street parking would need to be temporarily removed and converted to 'No Stopping' zones to provide adequate manoeuvring area for construction vehicles. This also includes the temporary removal of bus zone on Botany Road.

Details of a temporary bus stop location will be provided in the final CPTMP for construction, subject to the consultation with TfNSW and the State Transit Authority (**STA**).

No other bus stops will be affected by the subject works.

Figure 71 Temporary loss of on-street parking and bus zone

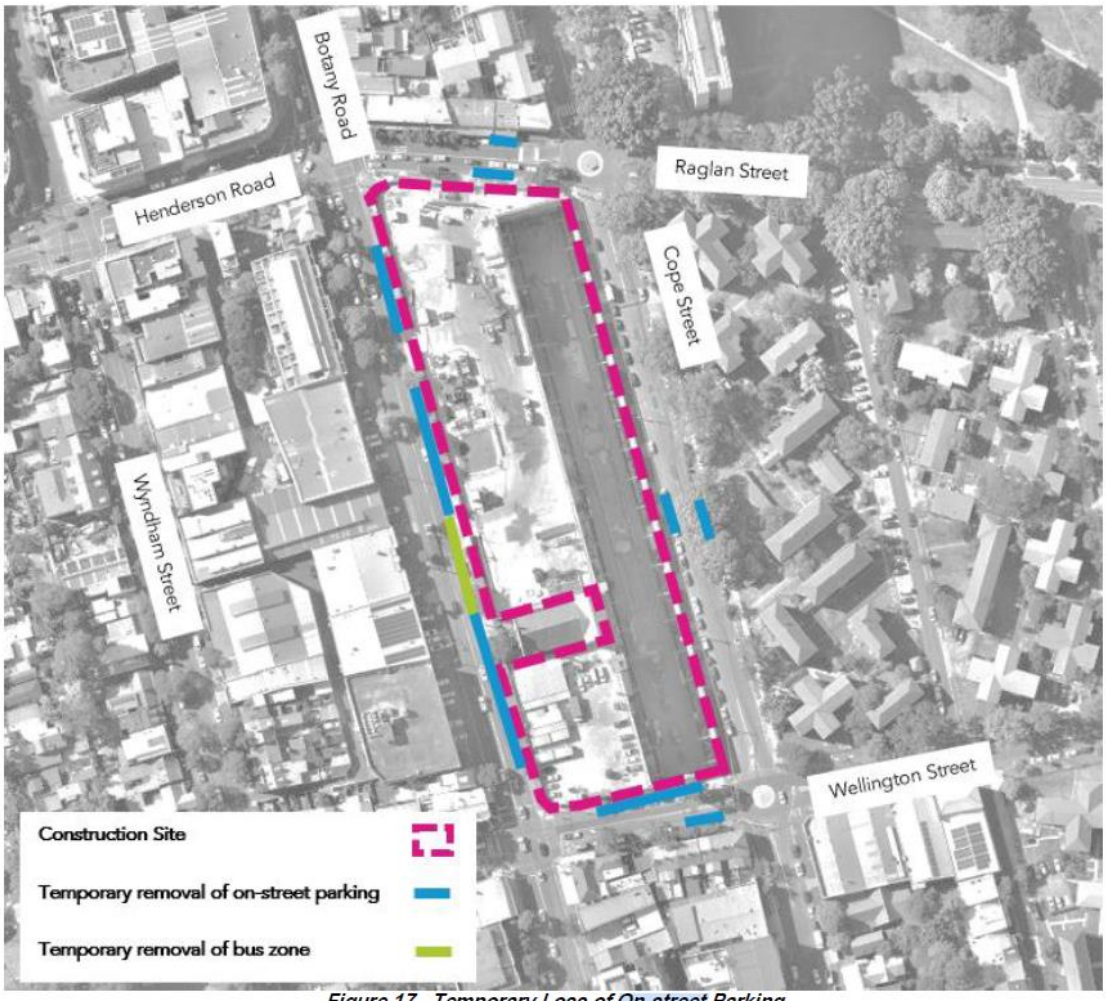


Figure 13 - Temporary Loss of On-street Parking

Source: ptc.

Construction Staff Car Parking Strategy

Due to site constraints, there will be limited parking available for staff. All site personnel are advised to not park on streets. To minimise parking demand, all construction workers and contractors are encouraged to carpool or utilise public transport. Construction works and contractors will be informed of the bus and train services readily available.

A Green Travel Plan will be implemented to encourage public transport for construction workers and details the measures to monitor and manage the uptake of sustainable travel options. It is envisaged that this Green Travel Plan will be reviewed and amended accordingly in the final CPTMP.

Staff can access the site via:

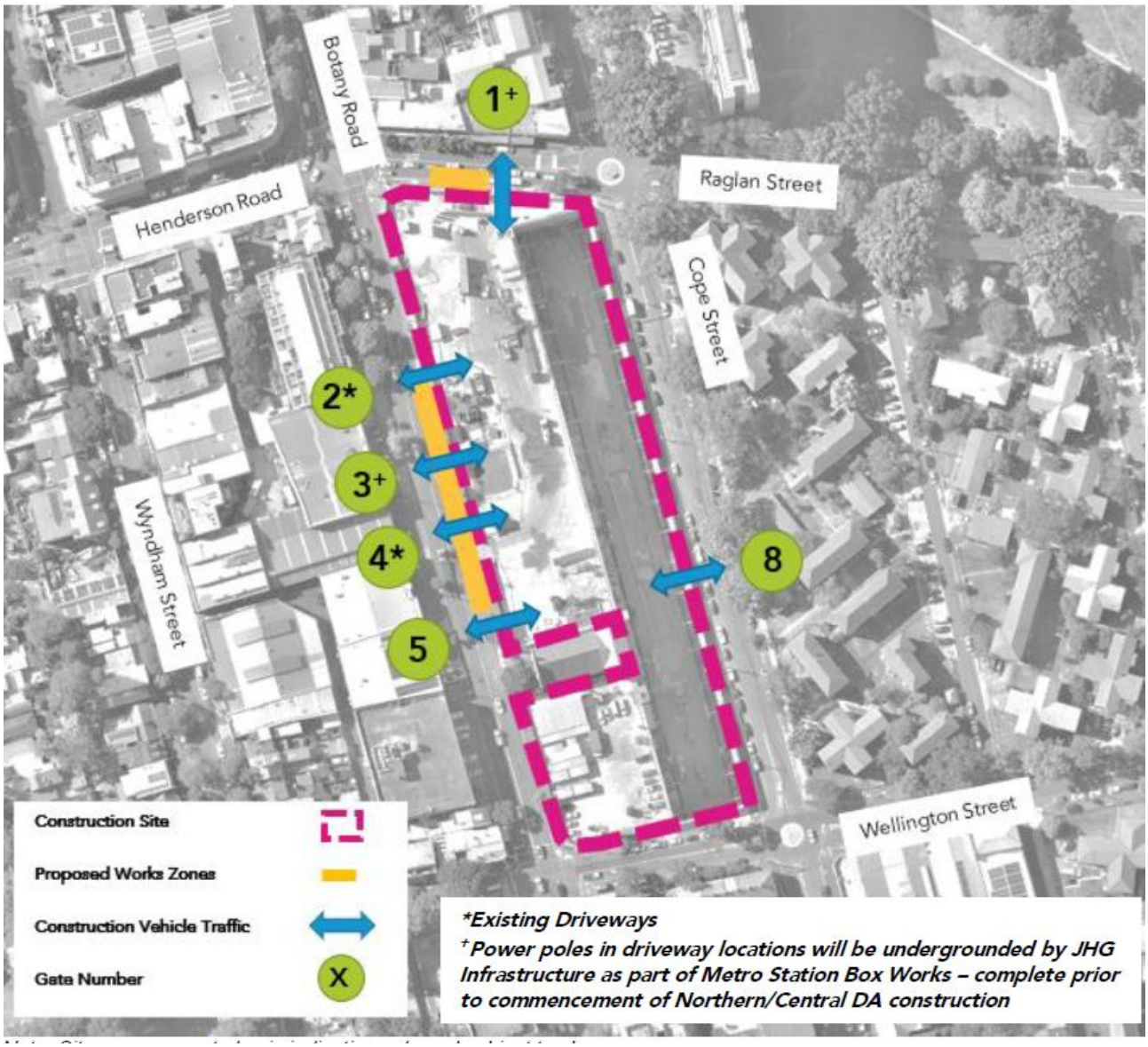
- Signalised pedestrian crossings on all approaches of the intersection of Botany Road / Raglan Street / Henderson Road;
- Signalised pedestrian crossings on all approaches of the intersection of Botany Road / Wellington Street / Buckland Street;
- Marked pedestrian crossing on the north approach of Cope Street / Raglan Street roundabout with refuge islands on all other approaches; and
- Refuge islands on all approaches of Cope Street / Wellington Street roundabout to allow staged pedestrian crossing movements.

Detailed Travel Management Strategy for Construction vehicles

Construction vehicles will access the site via gates situated within the frontages to Botany Road, Raglan Street and Cope Street as shown in Figure 70.

Ingress/egress driveways are provided on three frontages (Raglan Street, Botany Road and Cope Street). Works Zones are proposed on the Botany Road and Raglan Street frontages as indicated in Figure 70.

Figure 72 Site Access Arrangement



Source: ptc.

All vehicles must enter and exit the construction site in a forward direction (unless specific approval for a one-off occasion is obtained from the City's Construction Regulation Unit) as per City of Sydney's standard CTMP requirements.

Due to the driveway width restriction of a maximum 10m width, gates 3 and 5 must operate as unidirectional flow at any one time, but able to be utilised for both access and egress.

A swept path assessment has been undertaken for numerous construction vehicles to identify the largest feasible vehicle that can access each gate and is attached at 14,1 of the CMP. The largest permissible vehicle able to access each gate is detailed in the CTMP.

Construction traffic and deliveries will need to be appropriately managed on-site to ensure that vehicles enter and exit using the correct gate. Deliveries are to be scheduled to ensure construction vehicles are not marshalled on a public road.

Haulage Movement Numbers and Routes

The proposed construction vehicle routes have regard for the surrounding local road network within the vicinity of the construction site. No queuing or marshalling of trucks is permitted on any public road. The construction vehicle access and egress routes are illustrated below.

Northbound ingress

Work Zone access on the frontages of Raglan Street and Botany Road are limited to northbound ingress along Botany Road, via right-turn from Botany Road to Wellington Street and left-turn onto Cope Street then left-turn onto Raglan Street, for vehicles up to the size of a 12.5m HRV only. It is noted that traffic controllers are required for left-turn vehicles from Wellington Street onto Cope Street.

Driveway access into the site on Botany Road permit vehicles up to the size of a 19m AV (right-turn ingress), which is the only possible access route for 19m AVs to enter the site.

Driveway access into the site on Raglan Street permit vehicles up to the size of a 12.5m HRV (left-turn ingress via Wellington Street and Cope Street), however it should be noted that this requires the direction of traffic controllers for the left turns at Wellington Street/Cope Street and Cope Street/Raglan Street for northbound ingress movements.

Southbound ingress

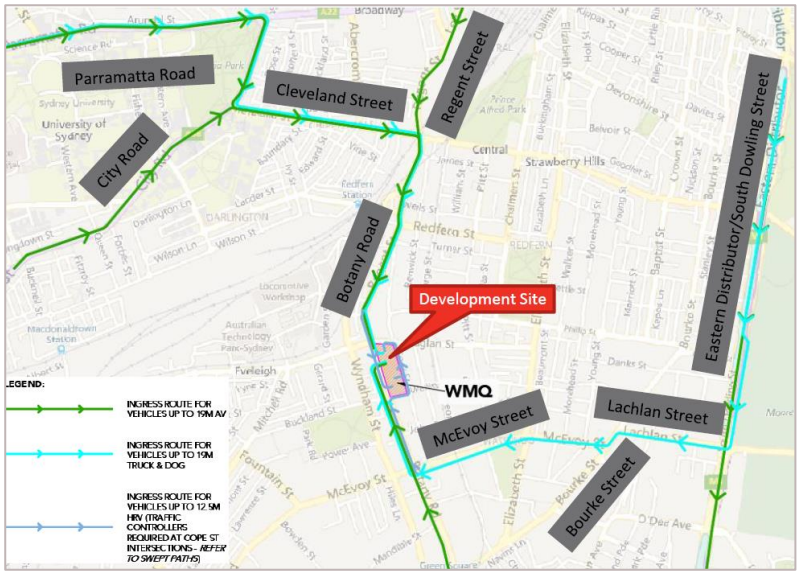
Works Zone access on the Botany Road frontage are limited to southbound ingress along Botany Road only, permitting vehicles up to the size of a 19m AV.

Driveway access into the site on Botany Road permit vehicles up to the size of a 19m Truck and Dog vehicle (left-turn ingress), assuming that the driveway widths of the existing gates (2 and 4) are retained.

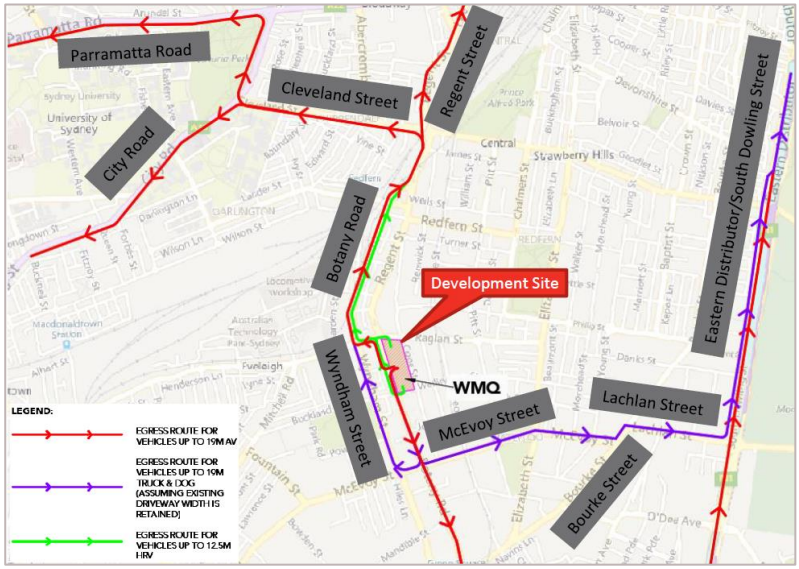
Driveway access into the site on Raglan Street permit vehicles up to the size of a 19m Truck and Dog vehicle (right-turn ingress) via left-turn from Botany Road onto Raglan Street.

Driveway access into the site on Cope Street permit vehicles up to the size of a 19m truck and Dog vehicle. To permit right-turn ingress via Raglan Street only, as left-turn at Wellington Street is not achievable.

Figure 73 Vehicle access and egress routes



Vehicle Access



Vehicle Egress Route
Source: ptc.

Contingency Routes

In the event that primary access routes outlined in the previous section become unavailable, contingency routes have been provided for alternative access to and from the site. The contingency (secondary) routes for construction vehicles originating from the north, south, east and west are summarised below:

Origin	Ingress Route		Egress Route	
	Primary	Secondary	Primary	Secondary
North	Via Regent St, Botany Rd	Via South Dowling St, Cleveland St, Botany Rd	Via Botany Rd, Henderson Rd, Gibbons St, Regent St	*Via Botany Rd, Wentworth Ave, Southern Cross Dr, ED
South	Via City Rd, Cleveland St, Regent St, Botany Rd	*Via ED, Southern Cross Dr, Wentworth Ave, Botany Rd	Via Botany Rd	Via Botany Rd, McEvoy St, Lachlan St, South Dowling St
East	Via ED, Lachlan St, Bourke St, McEvoy St, Botany Rd	*Via ED, Southern Cross Dr, Wentworth Ave, Botany Rd	Via Botany Rd, McEvoy St, Lachlan St, South Dowling St, ED	*Via Botany Rd, Wentworth Ave, Southern Cross Dr, ED
West	Via Parramatta Rd, City Rd, Cleveland St, Regent St, Botany Rd	Via Anzac Bridge/Western Distributor/A4, Cross City Tunnel, M1, ED, Lachlan St, McEvoy St, Botany Rd	Via Botany Rd, Henderson Rd, Gibbons St, Cleveland St, City Rd, Parramatta Rd	Via Botany Rd, Henderson Rd, Gibbons St, Cleveland St, South Dowling St, ED, Cross City Tunnel, Anzac Bridge

Source: ptc.

It should be noted that some limitations (i.e. largest truck size permissible on each route) are present for some of the routes.

Construction traffic

The delivery of materials to and from the site will result in some generated traffic activity. The following truck volume are expected for the construction of the Central Precinct. The final expected truck volumes are to be confirmed and updated in the construction stage.

SSD	Construction Stage	Longest Vehicle Types	Average no. of Trucks per day	Peak no. of Trucks per day
Central Precinct	Excavation & Civil Works	N/A	N/A	N/A
	Construction	Up to 19m Articulated Vehicle (AV)	33	66
	Services & Finishes	Up to 12.5m Heavy Rigid Vehicles (HRV)	20	40
Total			53	106

The cumulative truck volumes in conjunction with other OSDs have also been taken into consideration and summarised below:

Construction Stage	SSD	Average no. of Trucks per day	Peak no. of Trucks per day
Excavation & Civil Works	Northern Precinct	N/A	N/A
	Central Precinct	N/A	N/A
	Basement Car Park	15	20
	Southern Precinct	N/A	N/A
Subtotal		**15**	**20**
Construction	Northern Precinct	33	66
	Central Precinct	33	66
	Basement Car Park	33	66
	Southern Precinct	33	66
Subtotal		**132**	**264**
Services & Finishes	Northern Precinct	20	40
	Central Precinct	20	40
	Basement Car Park	20	30
	Southern Precinct	20	40
Subtotal		**80**	**150**

It is noted that construction for each OSD will occur at different time periods, and the worst-case scenario will be the concurrent timeline for the Northern Precinct, Southern Precinct and Central (subject SSDA) Precinct construction works.

The Waterloo Integrated Station Development works do not coincide with the Central Precinct SSDA construction works and therefore are not anticipated result in accumulative traffic impact.

In light of this, the worst-case scenario for the accumulated traffic generation from the OSD construction works would result in the peak daily truck volumes estimate to be 198 trips. This results in 18 truck movements per hour (or 1 truck every 3-4 minutes). Assuming the typical hours of work for weekdays being 11 hours, which do not necessarily arrive via the same route as trucks will be arriving via the north, south, east or west directions. As such, it is not anticipated that the daily accumulated truck volumes will have any adverse impacts on the road network.

Maintaining Property Access

Any proposed road closures will require approval from Council and will need to retain access for emergency vehicles. Appropriate traffic management measures (such as traffic controllers) will be implemented to ensure access is maintained to closed roads in the event of an emergency.

Access to all adjoining properties will be maintained throughout the works. The adjacent landowners will be notified of works via letter box distribution and road signage to advise of anticipated truck movements.

Maintaining bus operations including routes and bus stops

The temporary adjustment to Bus Stop will require the approval from the STA and TfNSW respectively prior to commencement of works.

Maintaining pedestrian and cyclist links / routes

Pedestrian Management

Works Zones are required on Botany Road and Raglan Street to facilitate loading and unloading of materials for construction vehicles. Partial closures of the footpath and/or diversion of pedestrians will be required.

Traffic control plans will be prepared as part of the detailed CPTMP detailing mitigation measures and signage to support pedestrian access arrangements. A summary of the proposed works zones and impacts on pedestrians is provided below.

Table 25 Impact of proposed Works Zones on pedestrians

Impact	Mitigation measure
Botany Road	
Due to the required Works Zones and multiple vehicular access and egress gates, it is proposed to close the footpath between Raglan Street and the Waterloo Congregational Church to eliminate the interaction between heavy vehicles and pedestrians. This will require partial closure of the footpath along the western frontage of the site between Raglan Street and the Waterloo Congregational Church.	Appropriate pedestrian diversion measures will be implemented to safely guide pedestrians across Botany Road to maintain pedestrian safety. Pedestrians will require guidance (via appropriate signage) to the nearest pedestrian crossings. Pedestrians are able to be safely redirected to the footpath on the western side of Botany Road by using the signalised pedestrian crossings. Pedestrians can also utilise the pedestrian facilities on Cope Street. Pedestrian access to the Church and the bus stop will be maintained. The footpath between the Church and Wellington Street will remain open or locally diverted. As such, no Works Zone will occupy the Botany Road frontage directly outside the Church.
Raglan Street	
Due to the required Works Zones occupying the footpath and vehicle access/egress gate on the southern side of Raglan Street, it is proposed to close the footpath between Cope Street and Botany Road to eliminate the interaction between vehicle movements and pedestrians.	Pedestrians will require guidance (via appropriate signage) to the nearest pedestrian crossings. Pedestrians are able to be safely redirected to the footpath on the northern side of Raglan Street by using the signalised pedestrian crossings.
Wellington Street	
No Works Zones are required on Wellington Street as part of this Central SSDA.	However, it is recommended for pedestrian diversion measures to be implemented to separate potential pedestrian and heavy vehicle interactions. Pedestrians will require guidance (via appropriate signage) to the nearest pedestrian crossings. The nearest pedestrian crossing facilities are located at the signalised intersection of Botany Road/Wellington Street and the priority intersection of Wellington Street/Cope Street. As such, pedestrians are able to be safely redirected to the footpath on the southern side of Wellington Street.
Cope Street	

Impact	Mitigation measure
No Works Zones are required on Cope Street as part of this Northern SSDA.	However, it is recommended for pedestrian diversion measures to be implemented to separate potential pedestrian and heavy vehicle interactions. Pedestrians will be diverted to the eastern side of Cope Street via the pedestrian crossings provided at the intersections of Raglan Street/Cope Street and Wellington Street/Cope Street.

Cyclist links

The existing cycling infrastructure in the development site vicinity is predominantly in the form of on-road environments (shared with other users) with a partial cycle lane commencing on then southern side of Wellington Street connecting to Buckland Street.

No work zone is proposed on Wellington Street as part of the construction for Central Precinct. As such, there are no closures of any existing cyclist links for the proposed OSD construction works. Should this subject to change, temporary replacement/diversion facilities are to be provided to provide comparable level of safety and convenience.

For mitigate possible impact, all staff and subcontractors engaged on site are required to undergo a site induction, which will include the need to exercise due care with regard for pedestrian and cyclist safety in the site vicinity during site access/egress manoeuvres.

Independent road safety audits

Independent road safety audits will be conducted by a suitably qualified consultant in due course when required in further design development involving road operations and traffic issues, cognisant of all road users.

Cumulative activities and work zones

Cumulative construction activities or work zones operating simultaneously between all individual WMQ precincts have been considered. Construction for the Central Precinct, the other precincts and the Waterloo Integrated Station Development (**ISD**) will occur simultaneously at one point (i.e. November 2022) despite differing commencement times.

Coordination will be undertaken between the two concurrent OSD developments (Central Precinct and Northern) to ensure that high construction traffic volume activities (e.g. concrete pours) are undertaken on separate days to reduce the impact on the external road network.

There are no other major developments within 250m of the development site.

Conclusion

The preliminary CPTMP has been prepared to outline the construction process and provide construction traffic management and mitigation measures to improve and regulate the safety of pedestrians, cyclists, motorists and workers within the vicinity of the construction site.

This preliminary report addresses the relevant Conditions of Consent (B16 and B21) of the concept DA, and the relevant SEARs requirements.

Cumulative truck movements of concurrent stages have also been taken into consideration and concluded that it is not anticipated that the daily accumulated truck volumes will have any adverse impacts on the road network.

It is envisaged that the CMPT will be continually reviewed and amended if required, in the event of changes to design, the surrounding road network, or additional requirements of City of Sydney Council, TfNSW or any other authority.

8.11.2. Construction Waste

The Contractor will ensure that the project supply chain is responsible and accountable for maintaining a clean, clear and safe working environment. A detailed Construction Waste Management Plan (**CQMP**) will be prepared by a separate party appointed by the developer and submitted prior to Construction Certificate.

Mitigation Measures

The following waste management initiatives are proposed for this development:

- The head contractor 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 to service the top floors where structure trades will be working, and large wheelie bins/or similar will service the lower levels where fit-out and service 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 CWMP 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.

8.11.3. Noise and Vibration

Noise and vibration generated from construction activities 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 slower levels of the building.

All noise generating activities are proposed to occur during the approved Standard Construction Hours site operating hours. Primary source of noise generated will be associated with vehicle movements, generators, heavy machinery, hand-held machinery and tools.

Mitigation Measures

To manage construction noise and vibration the following mitigation measures are proposed:

- 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 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

- Acoustic and Vibration Impact Assessment (prepared by Stantec (Australia) Pty Ltd) and the conditions contained therein will be adhered to for the duration of the project.

8.11.4. Air Quality and Odour Management

Sources of air emissions from the proposed construction works are deemed to be minimal as no bulk excavation is proposed. Potential air and odour impacts are primarily associated with traffic movements as a result of deliveries to the site.

Air quality impacts from construction vehicles shall be minimised or avoided by incorporation of appropriate dust suppression (e.g. sprinklers and misting) and implementing 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.

8.11.5. Soil and Water Quality Management

Stormwater runoff

Water courses within the 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 a range of principles detailed in the CEMP.

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

Groundwater Seepage

Groundwater seepage is not expected to occur as the Central Precinct, as it is constructed above the Basement (SSDA 10438) and therefore above the groundwater table.

Soil

Potential impacts to soil will be limited to areas of landscaping within the site. 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 Central Precinct in accordance with the CSSI approval.

8.11.6. Stakeholder Management

A stakeholder management plan will be developed prior to project commencement. 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.

8.12. OPERATIONAL WASTE MANAGEMENT

The storage, management and disposal of waste generated by the operation of the retail, childcare and residential use of the building have been appropriately considered in the Waste Management Plan (**WMP**) prepared by Elephants Foot Recycling Solutions at **Appendix L**.

The WMP was prepared in accordance with *City of Sydney Councils Guidelines for Waste Management in New Developments 2018* and Waterloo Metro Quarter Design and Amenity Guideline.

The following table shows the estimated volume (L) of waste and recycling generated by the residential component of the Central Precinct.

Figure 74 Residential Waste Estimate

# Units		Waste Generation Rate	Generated Waste	Recycling Generation Rate	Generated Recycling
		(L/unit/week)	(L/week)	(L/unit/week)	(L/week)
150		120	18000	120	18000
TOTAL	**150**		**18000**		**18000**
MGBs & Collections		Waste Bin Size (L)	1100	Recycling Bin Size (L)	1100
		Waste Bins per Week	17	Recycling Bins per Week	17
		Waste Collections per Week	2	Recycling Collections per Week	1
		Total Waste Bins Required	**9**	Total Recycling Bins Required	**17**
		Number of Waste Bins Per Day	3	Number of Recycling Bins Per Day	3

Source: Elephants Foot Recycling Solutions

The following table shows the estimated volume (L) of general waste, food waste and recycling generated by the retail and childcare component of the Central Precinct. A seven-day operating week has been assumed for the retail tenancies and a five-day operating week has been assumed for the childcare.

Figure 75 Retail (assumed mix) and Childcare Waste Estimate

Type	GFA (m^2)	Food Waste Generation Rate	Generated Food Waste	Garbage Generation Rate (L/100m^2/day)	Generated Garbage (L/week)	Recycling Generation Rate (L/100m^2/day)	Generated Recycling (L/week)
Health Bar	18	100	126	100	126	500	630
Newsagency	28	5	10	25	49	200	392
Travel	21	5	7	20	30	50	74
Bank	123	5	43	20	172	50	430
Florist	60	5	21	25	105	200	840
F & B	42	100	294	100	294	500	1470
F & B	40	100	280	100	280	500	1400
F & B	77	100	539	100	539	500	2695
F & B	71	100	497	100	497	500	2485
F & B	25	100	175	100	175	500	875
Social Enterprise	60	5	21	20	84	50	210
TOTAL	**565**		**2013**		**2351**		**11501**

Type	GFA (m^2)	Food Waste Generation Rate	Generated Food Waste	Garbage Generation Rate (L/100m^2/day)	Generated Garbage (L/week)	Recycling Generation Rate (L/100m^2/day)	Generated Recycling (L/week)
Childcare	1010	15	1060	50	3535	50	3535
TOTAL	**1010**		**1060**		**3535**		**3535**

**Note: Only the indoor childcare areas will generate waste and recycling and have been included in the table above.*

Source: Elephants Foot Recycling Solutions

Based on the estimated general waste, food waste and recycling waste generation outlined in the tables above, waste storage room required for each use component is summarised below:

Figure 76 Waste Room Ares

Level	Waste Room Type	MGBs & Equipment	Minimum Area Required (m^2)
Basement Car Park Waste Areas			
B2	Residential Chute Discharge Room	Waste: 5 x 1100L MGBs 2-Bin Linear Tracks 1 x Service Bin Recycling: 5 x 1100L MGBs 2-Bin Linear Tracks 1 x Service Bin	35
B1	Residential Bulky Waste Transfer Room	NA	12
Northern & Central Precinct Shared Waste Areas			
G	Central Residential Waste Room	Waste: 9 x 1100L MGBs Recycling: 17 x 1100L MGBs	70
G	Residential Bulky Waste Storage Room		14
G	Retail/Commercial Waste Room (*Shared with the commercial and retail component of the Northern Precinct*)	• 1 x vertical cardboard baler and 2 x pallets to store cardboard bales; • 6 x 1100L mixed recycling MGBs; • 1 x glass crusher and 8 x 60L MGBs; • 15 x 120L food waste MGBs.	70
G	Retail/Commercial Bulky Waste Storage Room (*Shared with the commercial and retail component of the Northern Precinct*)	NA	15
Other Precinct Waste Areas within the Loading Dock			
Station Waste and Recycling Room & Bulky Waste Area		1 x 1100L waste bins, 5 x 240L recycling bins & $4m^2$ for bulky waste storage	12
Cope Street Plaza Waste & Recycling Bins		4 x 240L MGBs temporarily stored in the loading dock at the rear of the MRV loading bays	NA

Source: Elephants Foot Recycling Solutions

Residential

Dual chutes (1 x waste chute and 1 x recycling chute) have been provided within each residential level.

Waste and recycling discharge into 1100L bins located in the residential chute discharge room in the shared basement (refer to Figure 78). Overall, one days' worth of waste and recycling will be stored in the residential chute room and 2-bin linear track systems will be provided for both waste and recycling.

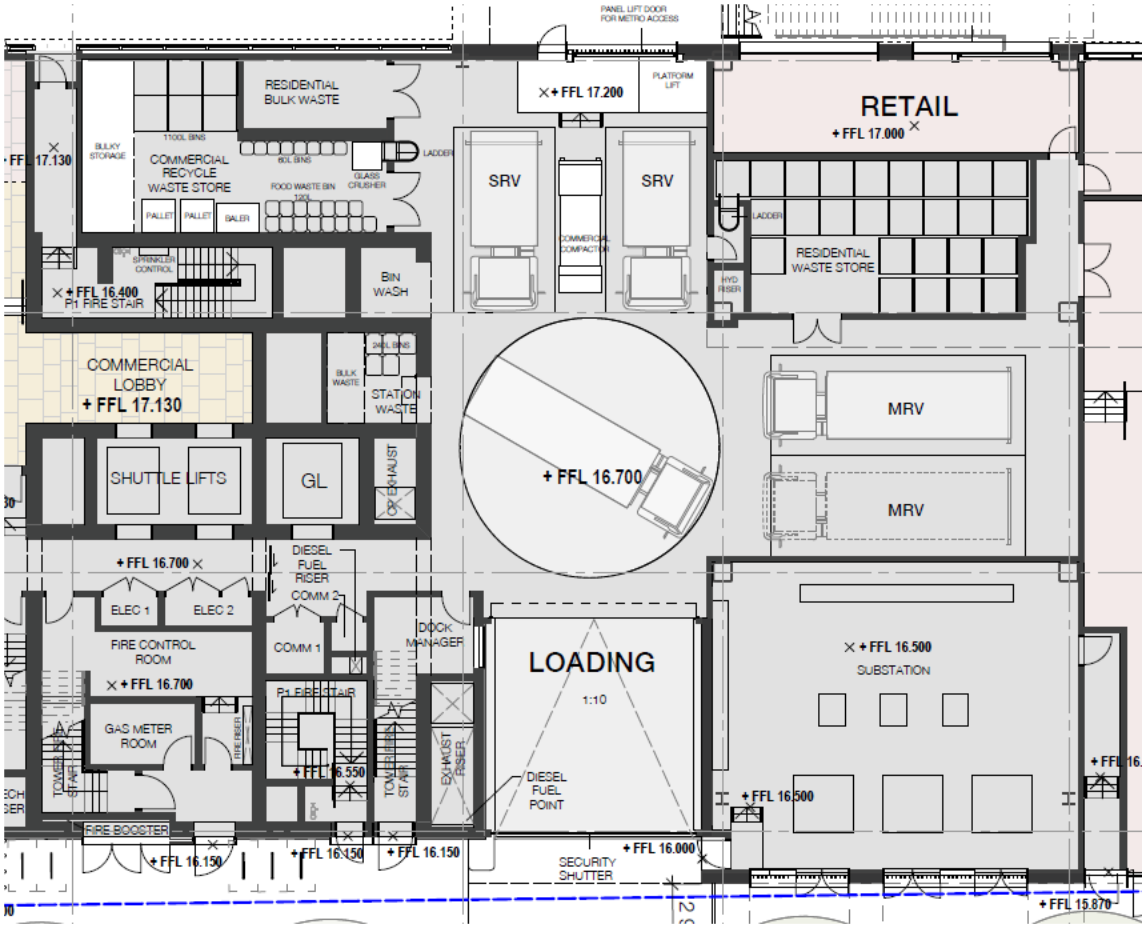
The building caretaker will be responsible for monitoring the capacity of bins and replacing full bins with empty bins on the track systems when required.

On collection days, the building caretaker will transfer full waste and recycling bins from the chute discharge room to the central residential waste room on the ground level (refer to Figure 77), via the service lift.

In the rare occurrence of a chute blockage,1 x 240L waste bin and 1 x 240L recycling bin has been provided in a locked compartment on each residential level as "back-up bins". In the event of a chute blockage, the building caretaker will barricade off the chute doors and unlock these compartments for residential use.

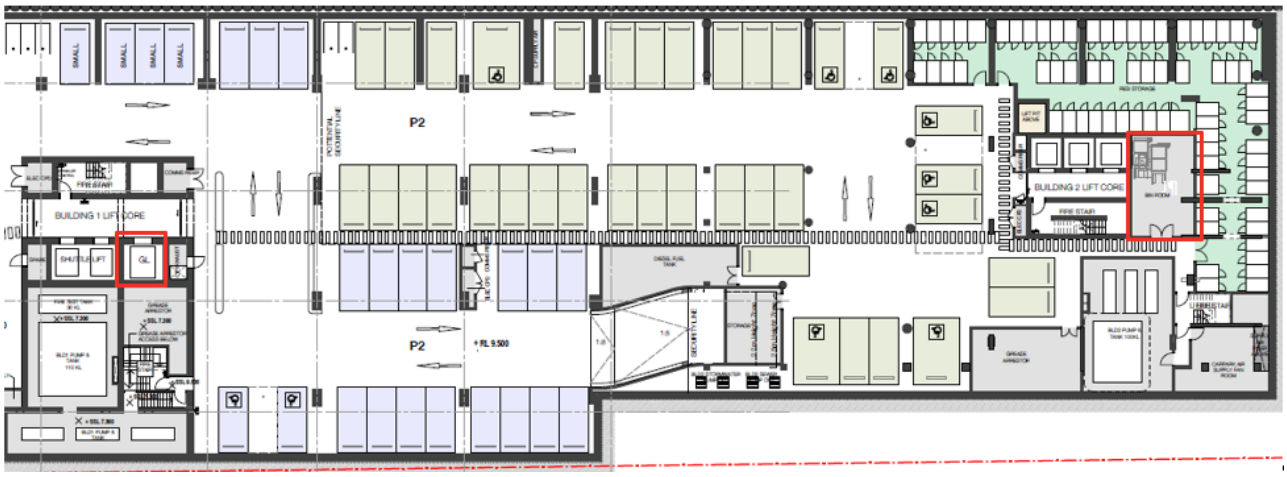
Council will service residential waste twice a week and recycling will be collected on a weekly basis. The Council collection vehicle will pull onto the vehicle turntable/loading area via Botany Road and service all bins directly from the residential waste room.

Figure 77 Ground Level Waste Rooms and Collection Area



Source: Elephants Foot Recycling Solutions

Figure 78 Basement Level 2 Displaying Residential Chute Discharge Rooms



Source: Elephants Foot Recycling Solutions

Retail

1 x 12m^3 or 14m^3 portable compactor (5:1 compaction ratio) for general waste will be supplied in the loading dock (refer to Figure 77). The Central Precinct will share its waste facilities and loading dock with the Northern Precinct. Therefore, the waste compactor and retail/commercial waste and recycling room located in the shared basement have been designed to accommodate for the waste generated for the Central Precinct and Northern Precinct.

Each tenant will be responsible for their own storage of general waste, food waste and recycling waste during daily operations. On completion of each trading day or as required, nominated retail staff or cleaners will transport their general waste, food waste and recycling to the portable general waste compactor and retail/commercial waste and recycling room located at the loading dock.

Private waste contractors will be engaged to service all retail and commercial waste and recycling for the site. The waste collection vehicles will enter the site via Botany Road and pull up onto the vehicle turntable/loading area. Contractors will service all bins and bales directly from the commercial/retail waste room. A hook lift vehicle will remove the general waste portable compactor from site to service and return it upon completion.

Childcare:

Most of the waste typically generated by a childcare facility include soiled nappies, wipes, and food waste. Dedicated bins should be allocated for general waste and disposable nappies.

20L waste and recycling receptacles should be conveniently located within each indoor playroom, the kitchen and the staff room. A waste storage compartment should be provided on the first level of the childcare to store soiled nappies. The provision for additional 10L food waste receptacles must also be provided within the kitchen areas.

It is recommended that a compost facility be investigated for the outdoor play area as a disposal point for the food waste being generated onsite. Compostable material can then be utilised on the surrounding garden area. If this cannot be achieved, food waste must be transferred to the central food waste bins located in the retail/commercial waste and recycling room in the loading dock.

At the end of each trading day or as required, allocated staff or contracted cleaners will transport the sorted waste (bagged), food waste and recyclables to the central retail & commercial portable compactor and waste and recycling room.

Detailed waste management measures will be further reviewed and assessed subject to a future fit out DA.

Waste Collection Area

The collection areas have been reviewed by the traffic consultant to confirm the swept paths, load requirements and clearances for waste collections. This is to ensure that that the collection vehicle (and other trucks if required) can enter and exit the building in a forward direction.

A head height clearance of no less than 4m has been provided for vehicle access on the property.

Unimpeded access will be provided for collection from the waste and recycling storage locations at all times.

Prior to operation, Council's Waste Services unit must be contacted for information on installation of a compatible key system to allow for the City's staff to collect residential waste and recycling receptacles and bulky waste directly from the nominated waste holding areas. Commercial tenancies will have a commercial waste contract in place prior to commencement of business trading.

Additional waste management measures include waste servicing, waste avoidance, re-use and recycling, communication strategies, signage, monitoring and reporting are discussed in the WMP and should be implemented in the operational phase of the development.

Conclusion

In conclusion, the proposed waste and recycling management facilities are in line with this Waste Management Plan, SEAR requirements, *Waterloo Metro Quarter Design and Amenity Guidelines* and City of Sydney Council's *Guidelines for Waste Management in New Developments 2018* for the following reason:

- Residential waste and recycling facilities are stored separately to retail waste and recycling facilities;
- Waste and recycling rooms are sized sufficiently to store the required bins and bulky waste items;
- Separate waste and recycling streams have been identified and have been managed effectively to reduce the proportion of general waste being diverted to landfill optimise recycling;
- Suitable waste and recycling management equipment has been proposed, chutes as dual chutes and volume handling equipment;
- Loading areas are suitable to accommodate Council collection vehicles and private waste contractors.

8.13. UTILITIES

A Utilities and Infrastructure Servicing Report was prepared for the Concept DA which identifies the existing capacity of the site to service the Metro Quarter OSD and any augmentation requirements for utilities.

The detailed SSDA design further develops the Concept design to establish the capacity and augmentation requirements of the utility provisions for the development.

Generally, to support the development, the approach has included measures to avoid, protect, augment or relocate/remove utilities within the surrounding area. Connections into the Central Precinct include electrical, communications, fire, gas, potable water and sewer services, utilising existing connections where possible.

The Services and Infrastructure Report prepared by Waterloo Developer Pty Ltd is provided at **Appendix T**. The assessment of the existing infrastructure capabilities and identification of new connections required to be provided as part of the development are summarised in Table 8.

All indicative location of connection are contained in Appendix 1 of the Services and Infrastructure Report.

Table 26 Utilities services augmentation required

Utilities	**Augmentation required**
Water Services (Potable Cold Water and Fire)	The Central Precinct expected water demand has been anticipated at 86kL/day. The Central Precinct expected water use demand for the fire protection system has been sized to cater for the highest hazard within the development plus allowance for the fire hydrants and a number of operational drenchers. New connections for potable water and fire services are required. ▪ 150CICL network on Botany Road, connection is proposed approximately ~118m along Botany Road to the south of Raglan Street. ▪ A new DN150mm diameter connection will be made to the building water supply from within the water meter room. The fire supply will incorporate a double check detector assembly, Fire & Rescue NSW booster assembly and serve the new combined sprinkler and hydrant system. Sydney Water has provided preliminary advice via Sydney Water Feasibility letter, indicating that the connection to the 150CICL authority main is appropriate for the development. This connection route has been designed to comply with Sydney Water requirements and achieves sufficient clearance to other existing utilities. The project Water Services Coordinator (**WSC**) will provide a detailed connection design after receiving Sydney Water response to the Section 73 Notice of Requirements (**NoR**) during detail design (**DD**) phase. Requirements for amplifications and/or diversions will be confirmed as part of the Section 73 NoR from Sydney Water.
Wastewater Services	The Central Precinct expected sewer demand has been anticipated at 52kL /day. A new 225VC sewer network connection is proposed approximately 126m along Botany Road to the south of Raglan Street. Currently this connection route is designed to comply with Sydney Water requirement and achieved sufficient clearance to existing utilities. The

Utilities	Augmentation required
	WSC will provide a detailed connection design after receiving Sydney Water response to NoR during DD phase. Sydney Water has provided preliminary advice via a Sydney Water Feasibility letter, indicating that the connection to the 225VC authority main is appropriate for the development. Requirements for amplifications and/or diversions will be confirmed as part of the Section 73 NoR from Sydney Water.
Natural Gas Services	The Central Precinct expected gas demand has been anticipated at 12 off connections = 6000mj/hr. The proposal seeks to provide a new site gas connection to the existing gas main on Botany Road: 7kPa network on Botany Road, connection is proposed approximately 108m along Botany Road to the south of Raglan Street. Jemena has provided preliminary advice via the Connection email dated 18 June 2020, which indicated that the connection to the existing 110mm NY 210kPa authority main on Botany Road can accommodate the proposed 7kPa connection for the Central Precinct. The natural gas meter room shall be located at ground level on an external boundary wall with direct access to open space and shall be in strict accordance with Jemena's requirements for gas meter rooms. The gas meter room shall be a shared room and will house the main volume meter/gas regulator for the site and the main authority meters for the tenants. Requirements for amplifications and/or diversions will be confirmed as part of the formal application for connection to Jemena.
High Voltage Electrical	The Central Precinct expected electrical use demand is anticipated at maximum of 1,460kVA. The existing Ausgrid network comprises of low voltage and high voltage assets that utilises a combination of overhead and underground method of reticulation. The current arrangement includes overhead LV cabling along south side of Raglan street, the east side of Botany Road and the south side of Wellington Street, along with LV auxiliary cabling and HV Cabling within conduits back around the perimeter of the site. A Proposed Design Scope (**PDS**) has been submitted to Ausgrid for the development following the initial Application for Connection (**AFC**) being submitted to Ausgrid and the assignment of a Contestable Project Coordinator by Ausgrid. The PDS proposes the establishment of a 3x 1,500kVA transformer surface chamber substation within the Northern precinct, to support the Northern, Central Precincts, and Basement loads.

Utilities	Augmentation required
	It is noted that the application for connection AN21264 is currently under determination with Ausgrid, in accordance with the Contestable works process. Amplifications and/or Diversions Requirements for amplifications and/or diversions will be confirmed as part of the AN21264 Ausgrid response.
Communication and Data	The proposal is to be connected to the NBN network to provide telephone and data services. The proposed design is currently requiring two separate connections lead-ins for Central Precinct development on Botany Street: 2 x 100mm conduits, Communications provider TBC, approximately ~80m along Botany Road to the south of Raglan Street (Shared Trench with Northern Precinct commercial building 1) The requirements for communication connection is still under design development, the relevant service provider will be engaged to review the design during the detail design phase. Requirements for amplifications and/or diversions will be confirmed as part of the engagement with NBN Co., Carriers and other communication and data providers.

The report also includes plans, which indicate the proposed locations of services connections to the building from the authority mains in the street. It is noted that these locations have been coordinated with building services design but may be subject to change subject to service authority approval.

8.14. FLOODING AND STORMWATER

8.14.1. Stormwater

WSP have prepared a Stormwater Management Plan and Flood Impact Assessment and is attached at **Appendix O**, which considers the flood risks and sets out the stormwater management works associated with the detailed design of the Central Precinct.

The site falls under Sydney Water and City of Sydney stormwater requirements. The following guidelines are being considered for the stormwater design:

- *City of Sydney Design Specification A4 Drainage Design*
- *RMS Specification R11.*
- *Concrete Pipe Association's "Concrete Pipe Selection and Installation" Guide*
- *AR&R Vol 1 - Australian Rainfall and Runoff "A Guide to Flood Estimation" Volume 1, 1987*
- *AR&R Vol 2 - Australian Rainfall and Runoff "A Guide to Flood Estimation" Volume 2, 1987*
- *AR&R – Project 10 Australian Rainfall and Runoff – Revision Projects "Appropriate Safety Criteria for People"*
- *AR&R – Project 11 Australian Rainfall and Runoff – Revision projects "Blockage of Hydraulic Structures"*
- *AS 3500.3: Plumbing and Drainage Code – Stormwater Drainage (2003)*
- *AS 3725: Design for Installing of Buried Concrete Pipes*
- *Botany Bay & Catchment Water Quality Improvement Plan. Sydney Metropolitan CMA, 2011*

- *New South Wales Floodplain Development Manual*
- *Waterloo Design and Amenity Guidelines (March 2020)*

The overall WMQ site (including the Central Precinct) drains to four frontages: Botany Road, Cope Street, Wellington and Raglan Street. Botany Road frontage is serviced by a 900mm diameter pipe that is undersized and poorly maintained inlet pits.

The WMQ site then drains to Sheas Creek via Sydney Water trunk drainage and ultimately to Alexandria Canal and Botany Bay.

Assessment

The Sydney Water requirements for the overall WMQ site were confirmed as part of the Concept DA and were referenced in the *AECOM Water Quality, Flooding and Stormwater Report (dated October 2018).* The Permissible Site Discharge (**PSD**) requirements were undertaken based on the overall WMQ site area of 13,500sqm and are as follows:

- On Site Detention (**OSD**): 208 cubic meters
- Permissible Site Discharge: 503 L/s

The Concept DA AECOM report also recommends that the WMQ site provides a combined OSD tank volume of 480m^3. However, the AECOM report does not clarify why the OSD tank volume has increased from the Sydney Water requirement of 208m^3 to 480m^3. It should be noted that the DRAINS model results were not included in the report to verify this number.

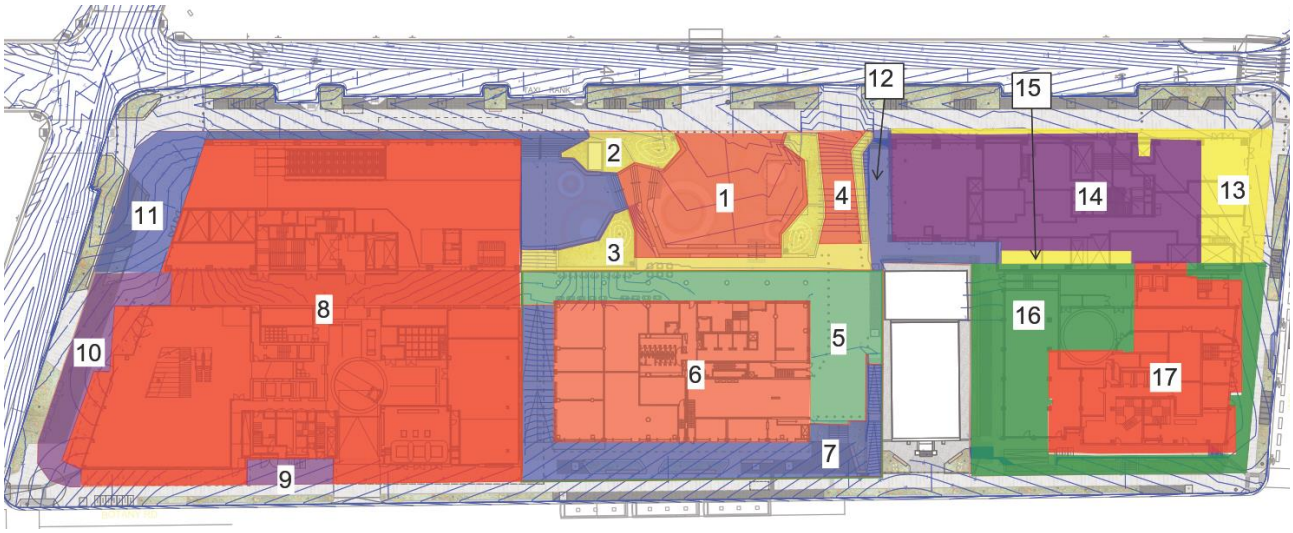
The AECOM report (Section 6.2) also notes the following statement, which have been taken into consideration at this detailed design stage:

> *"The total required On-Site Detention volume is approximately 480m3 split through a number of different catchment zones. Hydraulic calculations at the detailed design development stage will determine the final detention storage volumes, outlets and interfaces."*

As part of the detailed OSD SSDA development, the overall WMQ site area has been reduced to 12,733sqm, with a total captured area of 8,472sqm. The Central Precinct accounts for a total site area of 2,400sqm and captured area of 1,794sqm.

In addition, two portions of the proposed Cope Street Plaza (part of SSD-10437 Southern Precinct) identified as areas 2 and 3 shown on Figure 75, are proposed to be directed to the OSD and treatment tanks in the Central Precinct, which accounts for an additional 496sqm of captured area.

Figure 79 Overall WMQ Site Catchment Areas



Source: WSP

The hydrology and hydraulic analysis for the site was established using a DRAINS (computer program for hydrological and hydraulic assessment) model. The DRAINS model was used to ensure that each individual

Precincts meets the required overall PSD rate and OSD volume confirmed by Sydney Water. the PSD and OSD requirements for the Central Precinct are 94L/S and 48cu.m as outlined per Figure 76 below:

Figure 80 On Site Detention and Permissible Site Discharge for each Precinct

	Permissible Site Discharge (L/S)	On Site Detention Volume (CU.M)	Bypass Flow Discharge (L/S)	Captured Flow Discharge (L/S)
Building 1	186	74	26	152
Building 2 (Central Precinct)	94	78*	41	30
Public Plaza	49	*	51	0
Station	32	*	56	0
Building 3&4	139	56	113	29
Total	**500**	**208**	**287**	**211**

Source: WSP

208m^3 of On-Site Detention have been provided in the stormwater management plan to reduce the peak stormwater runoff from the site and meet the Sydney Water Permissible Site Discharge rates. The DRAINS modelling undertaken at this stage demonstrates that the Sydney Water required OSD volume of 208m^3 is sufficient to reduce the overall Permissible Site Discharge to less than the required 503L/s.

Therefore, the stormwater management plan provided at this stage meets the intention of the Sydney Water discharge requirements and the OSD requirement recommended by the AECOM report have been considered but have not been adopted.

The stormwater drainage point of discharge for the Central Precinct is proposed to be located to the west of the Central Precinct, connecting to the existing 900 mm diameter pipe on Botany Road. Details of the connection location is included in Appendix 1 of the Stormwater Report. The service report confirmed that it is not currently anticipated that amplifications will be required to the existing Botany Road DN900 Pipe.

The following key pollutant reduction targets (as per Sydney Water and City of Sydney Council requirements and Metro Quarter Design Amenity Guidelines) have been adopted to provide the highest level of water quality treatment:

- Reduction of Mean Annual Load of Gross Pollutants – 90% (greater than 5mm)
- Reduction of Mean Annual Load of Total Suspended Solids – 85%
- Reduction of Mean Annual Load of Total Phosphorous –60%
- Reduction of Mean Annual Load of Total Nitrogen – 45%

The proposed stormwater quality strategy for the Central Precinct is described in detail below.

Mitigation Measures

The water quality model for the site was created using MUSIC software (Version 6.3.0). The main method of treatment within the Central Precinct is by providing 6 Stormfilter cartridges.

As discussed above, the treatment tank for Central Precinct is also treating a catchment area from the Cope Street Plaza which is directed to the Central Precinct outfall. Therefore, Cope Street Plaza and the Central Precinct are considered as one for the purpose of stormwater quality improvements proposed below:

- A 10kL rainwater tank is to be installed within Central Precinct.

EnviroPod filters (or similar approved equivalent products) are to be installed within every stormwater inlet pit on the site. These are easy to maintain and provide effective removal of Total Suspended Solids and gross pollutants.

Conclusion

As concluded in the Stormwater Management Plan and Flood Impact Assessment **Appendix O**, the proposed drainage system and on-site detention tank indicate stormwater collected and discharged from the OSD can be managed in accordance with relevant requirements, including the design criteria recommended by Sydney Water as referenced in the Concept DA Stormwater report.

8.14.2. Flooding

The WMQ lies within the Alexandria Canal catchment. The Alexandria Canal catchment covers approximately 12 km of Sydney City Council LGA. Flooding within the catchments is mainly a combination of overland flow and mainstream flooding. Mainstream flooding issues tend to occur around Alexandria Canal and the open channels.

WSP engaged with City of Sydney Council on 15th of April 2020 to obtain the latest hydraulic model to describe the flood conditions (i.e. water level, water depth, water velocity and flood hazard) within the site. For this flood study, WSP obtained the City of Sydney Council adopted hydraulic model to define flood conditions at the site and surrounding area. The hydraulic modelling methodology was also discussed with the City of Sydney flood engineer during a project meeting in April 2020.

Assessment

The proposed development flood impact to the adjacent land have been assessed for the 20, 100 year and PMF design storm events. Flood impact has been assessed by comparing the baseline and proposed scenario model results for water level, velocity and flood hazard.

City of Sydney Council was consulted in April 2020 to discuss the minimum project requirement in terms of flood impact from the overall OSD developments within the WMQ site. Council confirmed that the proposed OSD developments flood impact has to demonstrate no increase in water depth to the adjacent land. Council considered 10mm as acceptable tolerance for the flood impact (i.e. no increase in water level more than 10 mm).

The summary below presents the changes in flood conditions along Botany Road generated by all the proposed OSD developments within the WMQ site (post development flood impact):

- **100 year average recurrence interval (ARI) flood event:** No increase in flood hazard to private properties (outside the street). Hazard changes are present only in limited areas where flood hazard is reduced from transitional to low hazard and increased from low to transitional; there are no increases in water depth in this area.
- **20 year ARI flood event**: No changes in flood hazard.
- **Probable Maximum Flood (PMF) flood event:** No increase in flood hazard to private properties. Limited increase in flood hazard to the East side of Botany Road (next to the Norther Precinct).

The permissible minimum building floor levels are outlined below, which applies to the residential and retail uses within the Central Precinct as prescribed within the Metro Quarter Design Amenity Guidelines (March 2020):

- Residential habitable rooms: 100 year ARI flood level + 0.5m of the PMF (whichever is the higher).
- Residential non-habitable rooms: 100 year ARI flood level.
- Retail floor levels: 100 year ARI flood level with stepped up zone inside property for shelter in place evacuation for emergency response.

Figure 77 below identifies ground floor subareas that requires to be assessed against the flood planning levels outlined above:

Figure 81 Central Precinct Ground Floor - Flood Planning Levels Identification Diagram

Source: WSP

An assessment has been undertaken to compare the proposed ground floor levels with the maximum water levels and minimum project requirements. Upper floors of the development are not discussed in the flood study as flood risk is not relevant due to the floor elevation higher than the PMF and 100 year ARI + 500 mm flood level.

The assessment concluded that all the identified area is able to comply with the required minimum flood planning levels (**FPLs**), expect for Area 11.

Retail Area 11 as indicated above has floor levels below the minimum FPLs required. It was not possible to achieve the minimum FPLs required for the following reasons:

- The tenancies are of minimal size: 21sqm, 28sqm and 18sqm respectively. Consequently the occupants for each shop will be limited.
- It is not possible to provide a raised area within these small tenancies as it would occupy a significant portion of the shop making the space unsuitable for retail.
- Provision of an escape corridor was considered; however, such a corridor would reduce the retail tenancies size to be commercially unviable.
- The DEEP has recommended the retail shop fronts to remain at footpath level and not be elevated to ensure an appropriate urban design outcome for the Precinct.
- Flood gates are not proposed as they prevent evacuation of the affected tenancies, and they a are not supported by the City of Sydney.

The following mitigation measures are proposed:

Mitigation Measures

Emergency Planning

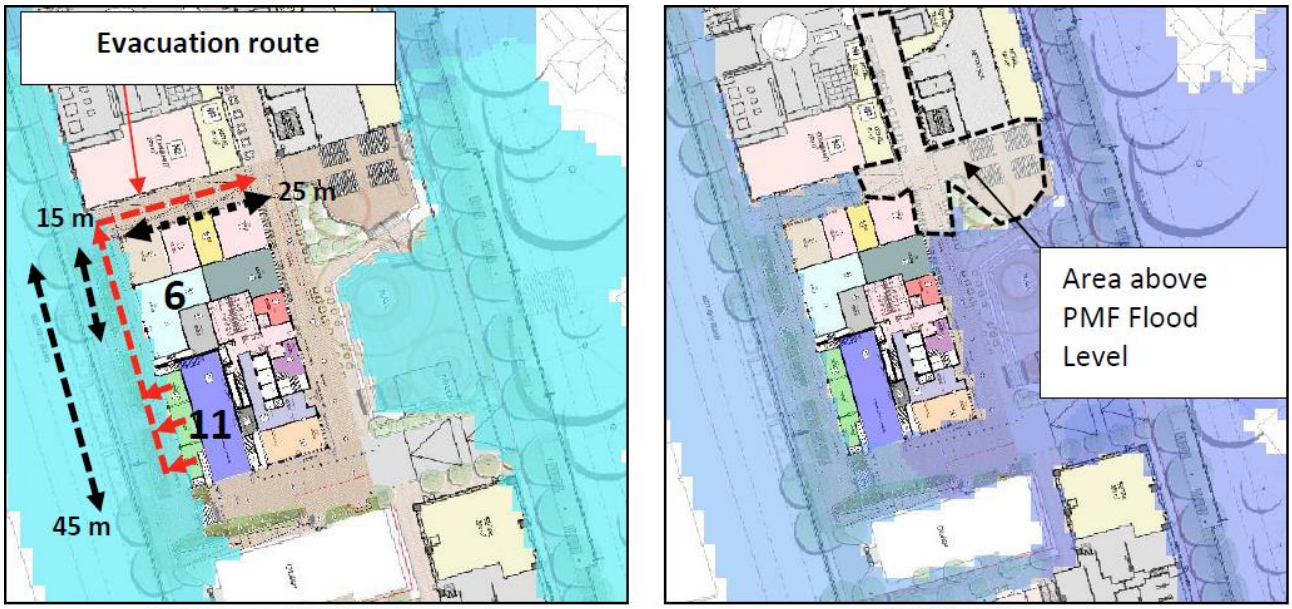
A flood warning and evacuation plan will be produced to inform the residents and managers of the building on the procedures to adopt to in case of an emergency associated to flood risk.

Emergency response measures have been identified in adopting appropriate FPLs that ensure that the occupants of the development can remain safe within the building in case of flood emergency.

Safe Refuge / Emergency Response

Emergency response for Area 11 can be provided by evacuating these areas towards a safe refuge located at higher ground levels (i.e. above the PMF and 100 year + 500 mm flood event). Figure 82 below shows a possible evacuation route to move the occupants of Area 11 to safe refuge.

Figure 82 Evacuation Route /Safe Refugee – Area 6 and 11



100 year ARI flood event *PMF flood event*

Source: WSP

Area 11 is approximately 70 meters from the safe refuge, as shown above. The time required for the water level to reach the retail floor level during the 100 year ARI flood event is approximately 18 minutes. In 18 minutes occupants of retail Area 11 should cover 70 meters to reach the safe refuge before water starts flowing into the retail areas during a 100 year ARI flood event.

The ability of occupants to reach the safe refuge during a flood event is dependent on the establishment of a suitable flood warning procedure for these areas and occupants receiving appropriate instructions following the flood warning on how to access the safe refuge. These details will be provided in a specific evacuation plan for the development. Maximum water depth in front of the retail areas is approximately 40cm with flood hazard classified as low.

Flooding at retail Area 11 might occur during lower return period events. As such evacuation to higher ground might be required for more frequent flood events. This has been considered and accepted as the small tenancies means population for each shop will be very low.

Details on evacuation and emergency procedures (e.g. emergency flood alarms, sign to evacuate the retail areas, etc.) for the Central Precinct will be discussed in the Evacuation Plan.

Refuge for other retail tenancies have also been considered and described in detail in the Stormwater and Flood Report.

Residual Risk

The residual risk related to surface water flooding around the area is mitigated by adopting floor levels above the 100 year ARI where possible. For retail tenancies in Area 11 where it was not possible to meet the design requirements, the residual risk is mitigated by preparing emergency evacuation plan to be implemented in case of flood emergency. During a flood emergency, occupant of Area 11 can reach safe refuge within the site area as discussed above.

Conclusion

The flood impact assessment concluded that:

- There is negligible afflux for the 20 and 100 year ARI events along Botany Road, Raglan Street and Wellington Street.

- In the PMF flood event afflux along Botany Road is below 50 mm; this is deemed to be acceptable for the PMF event. No increase in flood hazard is present in areas affected by PMF afflux;
- The proposed building footprints occupy a reduced area in respect to the existing buildings and do not exceed the existing building boundaries. As such the proposed buildings are not expected to negatively affect the existing flood conditions; and,
- There is no increase in flood hazard to private properties. There are limited changes in flood hazard within street areas where increases in flood hazard (from low to transitional hazard) alternate to reduction in flood hazard (from transitional to low hazard).
- While all areas are above the FPL except Area 11, the speed which flooding will occur provides sufficient time to allow occupants of these tenancies to reach safe refuge with the implementation of an emergency evacuation plan.

According to the considerations presented above the Central Precinct is not expected to generate negative flood impact to the adjacent land.

Building floor level have been designed to be above minimum flood planning level requirements except for retail areas 11 were it was not possible to achieve the minimum FPLs required. In order to reduce and mitigate the consequences of flood risk for occupants of retail areas 11, emergency response is provided by evacuating these areas towards a safe refuge within the site (higher ground levels which is above the PMF and 100 year + 500 mm flood event).

8.15. REFLECTIVITY

RWDI Anemos Ltd have prepared a Solar Reflectivity Report (**Appendix GG**) to assess the potential for hazardous glare from the façade of the proposed OSD developments affecting motorists, pedestrians and occupants of neighbouring buildings. The report assesses the reflectivity of glazing from Southern, Central and Northern Precincts collectively.

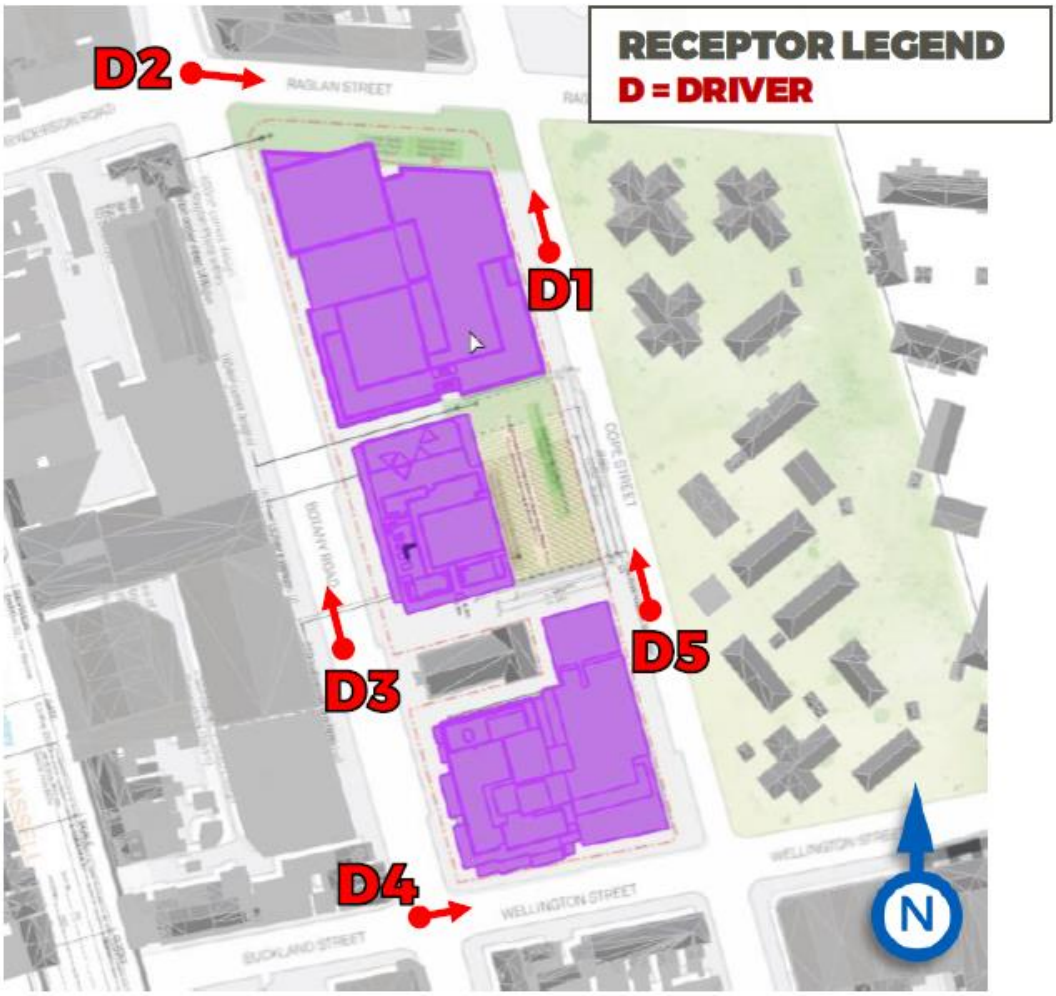
A reflectivity analysis demonstrates that the external treatments, materials and finishes of the development do not cause adverse or excessive glare was undertaken. To do this analysis, the Stiles-Holladay glare equation was used to determine the risk of glare due to light reflections from the proposed buildings.

The following reflection criteria have been adopted:

- Veiling luminance (**LVL**) of 500 candelas per square metre (Cd/m2) has been adopted as the maximum visual glare criteria - typical Australian criteria.
- A maximum external specular reflectance of 20% (for all angles of incidence) was considered for the assessment.

It should be noted that the external reflectivity assessment identified Cope Street, Raglan Street, Botany Road and Willington Street as the key roads of concern of visual glare assessment.

Figure 83 Receptor Locations



Source: RWDI Anemos Ltd

A summary of the results from the analysis is included in Table 24.

Table 27 Summary of reflectance by proposed OSD developments collectively

Receptor Description	Impact
D1 Northbound drivers on Cope Street at Raglan Street	Reflections fall intermittently during the winter months between 7:00 am AEST and 10:00 am AEST. Reflections are also possible between 11:00 am and noon from September through early April. None of the reflections were predicted to result in a veiling luminance above 500 cd/m.
D2 Eastbound drivers on Raglan Street at Botany Road	Reflections mainly fall between 9:00 am AEST and noon between March and mid-October. None of the reflections were predicted to result in a veiling luminance above 500 cd/m.
D3 Northbound drivers on Botany Road	Reflections fall infrequently with short duration throughout the year. These reflections are very sporadic and infrequent.

Receptor Description	Impact
	None of the reflections were predicted to result in a veiling luminance above 500 cd/m.
D4 Eastbound drivers on Wellington Street at Botany Road	Intermittent reflections were predicted throughout majority of the year between 2:00 pm and 5:00 pm AEST. During summer mornings reflections are also possible between 6:00 am and 8:00 am AEST. None of the reflections were predicted to have a veiling luminance that exceeded 500 cd/m².
D5 Northbound drivers on Cope Street near crosswalk	Intermittent reflections occur between 7:00 am and 11:00 am AEST between February and early-November. None of the reflections were predicted to have a veiling luminance that exceeded 500 cd/m².

Conclusion

In summary, the glare and shadows testing of the Southern, Central and Northern Precincts collectively confirms that the buildings have low potential for glare.

Assuming that drivers are maintaining forward eye contact, the predicted veiling luminance at all five identified roads is also below the 500 cd/m² limit. Collectively, visible reflectivity of the glazing remains at 20% or lower as a result of the proposed Southern, Central and Northern Precincts.

Accordingly, no mitigation measures are required, and the Central Precinct can comply with the overall reflectivity criteria set for the WMQ site. The proposed external treatments, materials and finishes of the development do not cause adverse or excessive glare.

8.16. BUILDING CODE OF AUSTRALIA (BCA)

McKenzie Group has undertaken an assessment of the proposed OSD against the Deemed-to-Satisfy (DTS) provisions of the relevant sections of the *Building Code of Australia* (**BCA**) and applicable Building Regulations (**Appendix R**).

The assessment identifies a number of matters which are considered “Deemed to Satisfy departures” with a recommendation of what is required to achieve compliance. The alternative solutions, including fire engineering solutions will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process, pursuant to the requirements of Clause 144 of the EP&A Regulations.

The assessment of the design documentation has also revealed a number of issues to be reviewed prior to the issue of a construction certificate. Documentation to enable assessment and demonstrate compliance will be required to address the items prior to the issue of the construciton certificate.

Overall the OSD detailed design is capable of complying with the relevant requirements of the EP&A Act, the Regulation and the BCA, through a combination of deemed-to-satisfy provisions and performance-based solutions.

Compliance is subject to resolution with the recommendations provided by McKenzie Group and further detailed regulatory reviews, which will be undertaken throughout the design development stage. These matters do not preclude issuing of Construction Certificate as they will be resolved prior to construction.

8.16.1. Accessibility

Morris-Goding Accessibility Consulting has assessed the proposed OSD with regards to accessibility objectives under the BCA, *Disability (Access to Premises – Buildings) Standards 2010 (Premises*

Standards), and the relevant Australian Standards as they relate to access to premises and the intent of the *Disability Discrimination Act 1992* (C*th) (**DDA**)* (Refer to **Appendix S**).

The assessment provides advice and strategies to maximise reasonable provisions of access for people with disabilities to ensure the development achieves DDA compliance as part of the detailed design phase.

In many instances, the report provides recommendations, indicating the current design is readily available to provide compliance with the relevant DDA requirements subject to ongoing refinement through the design development stages.

The accessibility report notes that a total 15% of the units (23 units) are proposed as 'adaptable', which complies with SDCP 2012 controls. The report also confirms that the proposed adaptable unit layouts are able to achieve all adaptable unit design requirements at preadaptation stage.

Given no parking spaces is provided for the retail premises, accessible parking for retail is not applicable in this instance. Under Part D3.5 of the BCA, the following number of parking spaces is required for residential accessible car parking:

> *Class 2 residential. Provide an adaptable unit car bay for each adaptable unit. These car bays can have 3.8 metre width or 2.4 m with 2.4 metre shared zone*

A total of 11 adaptable/accessible car parking is proposed, which is a reduction of adaptable unit car bays. This reduction is in line with the proposed ratio of general car parking and number of apartments for the overall Central Precinct.

The reduction of adaptable unit car bays is a reasonable proposition given the immediate proximity of the Metro station, and precedence of reduction of adaptable unit car bays for other approved residential projects at Barangaroo and Darling Square.

In conclusion, the proposed OSD will be capable of complying with the applicable accessibility requirements of the DDA Access to Premises Standards 2010, relevant Australian Standards and requirements of the BCA pertaining to external site linkages, building access, common area access and sanitary facilities.

It is recommended that Morris-Goding Accessibility Consulting will continue to work with the project team as the scheme progresses to ensure appropriate outcomes are achieved in building design and external domain design.

8.16.2. Fire safety

OMNII (NSW) Pty Ltd have undertaken fire engineering assessment to address the relevant *Performance Requirements of the National Construction Code 2019 Volume One,* (**NCC**), where a Performance Solution is proposed (**Appendix EE).**

The Fire Engineering Review outlines an extensive list of fire safety measures for the Central Building to achieve compliance with the relevant performance requirements. Utilising the NCC, an acceptable Compliance Solution is to be achieved by a combination of compliance with the NCC Deemed-to-Satisfy (**DTS**) provisions and formulating an acceptable Performance Solution.

The requirements of the fire safety measures will be further reviewed and developed following the completion of a detailed fire safety engineering assessment and further consultation with NSW Fire Brigade to determine whether additional measures are required.

Where relevant deemed-to-satisfy provisions of the NCC are not suitable, and compliance cannot be satisfied, alternative performance solutions have been developed to demonstrate an acceptable level of fire safety can be achieved.

As concluded within the Fire Engineering Review, it is possible to develop performance solutions for the issues identified to demonstrate compliance with the relevant performance requirements of the NCC without significant changes to the proposed OSD design. This approach is intended to allow the development of an effective performance-based building design, whilst maintaining an acceptable level of Fire and Occupant Life Safety.

8.17. SOCIAL AND ECONOMIC IMPACTS

A Social and Economic Impact Assessment (SEIA) has been prepared by Urbis Pty Ltd and is attached at **Appendix AA**. The SEIA assess the social and economic impact from the overall WMQ development,

including the Central Precinct. Key assessment findings in relation to the social needs assessment and economic benefit assessment is summarised below.

8.17.1. Social Needs Assessment

The report addresses community needs for five key types of social infrastructure proposed for the overall WMQ development: childcare, community and cultural facilities, open space and recreation, education facilities and health facilities. For the purpose of the Central Precinct assessment, the findings from childcare, retail and residential is discussed below.

Childcare:

The overall WMQ development will generate demand for childcare places from onsite residents and workers. The majority of demand for childcare is for facilities close to where people live (rather than where they work) as this is generally more convenient for drop offs and pick-ups rather than having to commute to and from work with children. Based on industry benchmarks, the overall onsite residents and workers are anticipated to drive demand for around 40 places in 2024.

A childcare centre on the site will also support demand from residents and workers in the surrounding area as the Metro Station will attract visitation. The social impact assessment found that there are currently vacancies in the local catchment of around 16%, indicating that the market is oversupplied. Population growth in the surrounding area will drive demand for additional childcare places in the catchment. However, with 546 places in the future pipeline there is anticipated to be an ongoing oversupply of around 312 places in 2024 if all this supply is developed.

Despite the potential oversupply, the WL Developer has advised that they are in discussions with an established childcare operator with multiple existing facilities in Sydney. The operator has expressed a need for a 150 place facility to make the childcare centre development viable. The operator is proposing to offer affordable childcare places which they believe will be attractive in the market with demand also supported by the strategic location above the new station. This highlights there is interest in the proposed facility.

Residential:

The proposed development comprises a diversity of residential types including market apartments and affordable housing. The proposed development is well positioned to attract demand from buyers and tenants as it will be a vibrant mixed-use precinct that has direct access to the new metro rail station facilitating access to employment nodes, educational facilities and other amenity.

The proposed 126 market apartments are supported as they will help contribute to the housing targets in the Sydney LGA of 10,792 private market dwellings from 2022-2026. Urbis modelling forecasts there will be a shortfall of around 1,940 dwellings by 2030 based on the current pipeline, supporting the need for the proposed apartments.

Housing affordability is a key challenge in the Sydney housing market with the proposed affordable housing assisting key workers in living close to their place of work. An assessment of housing stress in the Study Area indicates that around 53% of rental households are in housing stress. The proposed affordable housing is supported as it will help address a shortage in Inner Sydney and contribute to the City of Sydney's target of 2,714 affordable dwellings between 2022-2026.

Retail (based on the overall WMQ development):

Waterloo is currently undergoing urban renewal with a number of large sites earmarked for large scale residential and mixed use developments. This is forecast to result in steady population and worker growth over the next decade which will drive demand for additional retail facilities. There are currently three small independent supermarkets within the trade area, however there will be 958 residents in the trade area and 3,591 workers on the WMQ site by 2024 which will require further facilities to meet their needs. These onsite residents and workers are projected to generate $27.8 million of retail expenditure in 2024 (in constant $2020 dollars).

The WMQ retail development (which spans across the whole of the WMQ site) is relatively modest in scale and well-positioned to provide convenience-based shopping and food and beverage options for local residents and workers. It aims to combine retail, gym, medical and community uses to contribute to a vibrant, walkable and attractive precinct integrated with the new metro station.

The proposed WMQ retail development is forecast to achieve sales of $14.9 million (in constant $2020) in its first year of trading (2024). Onsite workers and residents are estimated to generate demand for 2,342 sqm of

convenience retail space (comprising food retail, food catering, leisure/general and retail services). This compares to 1,875 sqm of retail floorspace proposed in the overall WMQ site across these sectors. This indicates that the onsite workers and residents by themselves can more than support the proposed floorspace.

In its first full year of trading (2024), the proposed WMQ retail development is forecast to draw $12.2 million from key existing centres, and $2.8 million from the expanded South Eveleigh precinct. The important factor to note however, is that despite this, the WMQ development is still unlikely to undermine the commercial viability of any of the surrounding centres.

Due to growth in population and spending, as well as the modest scale of the WMQ development, no retail centre is forecast to experience an impact greater than -3% (from their 2024 trading level), which is considered to be a manageable level of impact. The analysis confirms that there is sufficient growth within the market to accommodate the proposed WMQ development without adversely impacting the viability of existing and expanded retail centres.

Conclusion

Overall, the proposed WMQ development is supported as it is anticipated to create a vibrant mixed-use precinct on the fringe of the Sydney CBD. The mix of commercial uses from office, housing (diverse mix of market, affordable, social and student housing), retail, food & beverage and gym are supported with the market assessment identifying demand for these uses.

The analysis confirms that there is sufficient growth within the retail market to accommodate the proposed WMQ development without adversely impacting the viability of existing and expanded retail centres.

The assessment identifies that the incoming residential and worker population is unlikely to drive sufficient demand to justify the size of the proposed childcare component. As such, the facility will need to attract demand from residents and workers in the surrounding area.

Being located above the metro station means the facility will offer good accessibility for families and demand is likely to be boosted by the affordable nature of the proposed childcare facility. While vacancies in the surrounding childcare centres indicate demand is currently limited, the development of the wider Waterloo precinct is likely to boost demand for childcare in the area over the next 15-20 years.

This is reflected by the WL Developer reportedly being in discussions with an operator for a 150 place centre. It is also understood that the podium where childcare is proposed has been designed so that if demand for childcare is not sufficient to make this facility viable in the future, it could accommodate another community use.

If the proposed childcare facility is not viable, we recommend a study be undertaken to understand the best use for this space to meet community need and align with planning for the Waterloo Estate.

8.17.2. Employment Generation and Economic benefit

The proposed WMQ development is anticipated to be a vibrant precinct with a significant on-site resident and employee population. The service based components such as retail, childcare and gym will support the onsite residents and workers as well as residents/workers in the local area.

Direct economic benefits during the development phase are identified in the form of employment and value add benefits. These direct benefits, in turn, generate flow on (multiplier or indirect) benefits which also benefit the regional and state economies.

Total expenditure estimates for the proposed WMQ development had been provided by the applicant and estimated to generate approximately $405 million of direct expenditure (Economic Output) to the local region and Greater Sydney, over an assumed 4.5-year planning and development period.

New jobs will be supported during the two-year development phase by the direct expenditure on the proposed development. The direct and indirect construciton employment benefits is estimated total of **466 construction jobs** over an assumed 4.5-year development period.

Value added benefits (Gross State Product) will be generated from the direct expenditure incurred on the OSDs. The direct and indirect value added benefits are estimated at $261.3 million.

The WMQ development includes several employment generating uses such as office, retail, gym, childcare and student accommodation. Based on industry benchmarks, it is estimated that the development would

support **3,591 jobs once fully operational**. There may also be a few jobs created as a result of the residential component though these have been excluded due to the small number.

The ongoing operation of the WMQ development will also indirectly support new jobs in the local region and state. The net increase in direct and indirect employment likely to result from the WMQ development is 5,996 jobs.

The NSW Government has a vision for Greater Sydney to become a '30 minute city' where people across the city can access their nearest city centre in 30 minutes by public transport. The opening of the Sydney Metro Rail Line will improve transport connectivity within Sydney with local residents (within the OSD and in the surrounding area) being able to reach more centres by public transport including from Bankstown in the south-west to Macquarie Park in the north. Conversely, people living in these areas will also be able to reach Waterloo within 30 minutes by public transport to work in the onsite businesses.

In summary, the development will contribute to the ongoing economic activity of the NSW workforce and support employment generation in the local area consistent with the objectives of the Sydney Region Plan and the Eastern District Plan.

8.18. CRIME AND SAFETY

A Crime Prevention Through Environmental Design (**CPTED**) Report has been prepared by Connley Walker Pty Ltd (**Appendix N**) to address the potential for anti-social and criminal behaviour within the public domain footprint and throughout the Central Precinct detailed OSD design.

Further, the reports mitigation focus and strategy includes assessing and mitigating crime risks by applying CPTED principles.

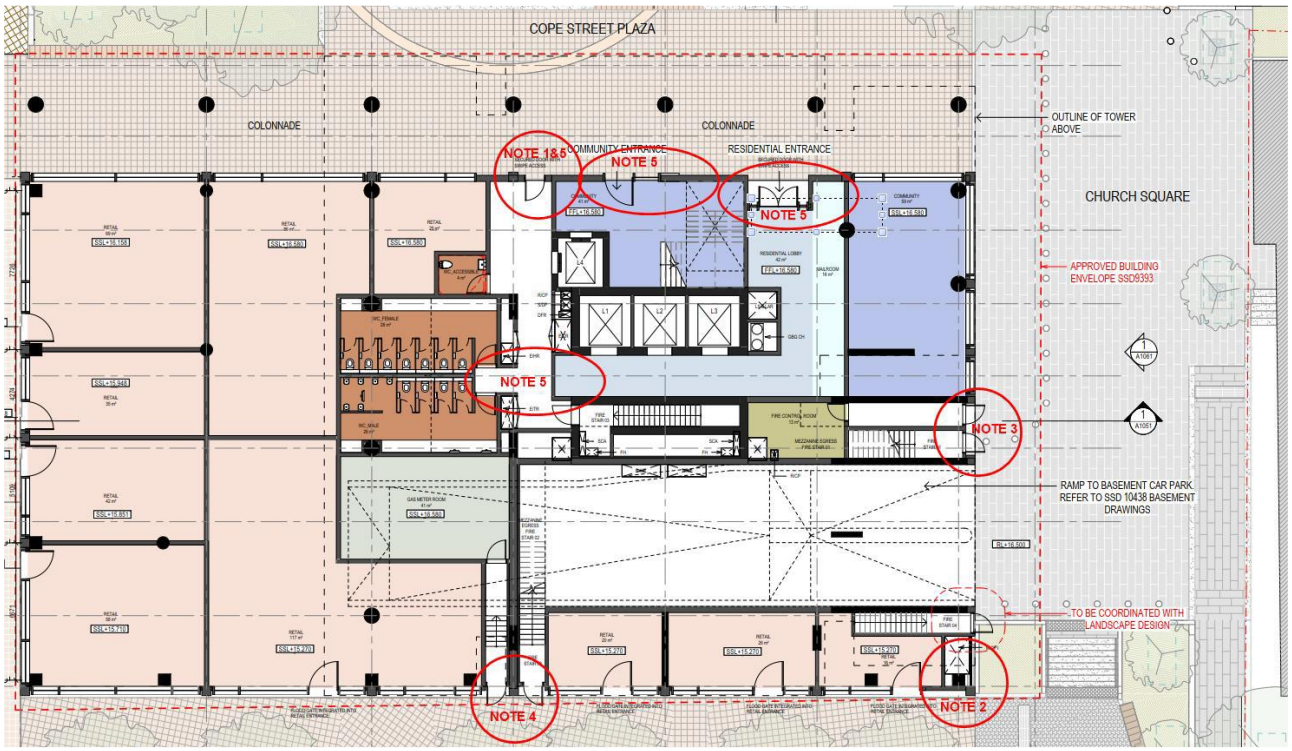
Table 28 CPTED Assessment and Mitigation Measures

CPTED Principle	Assessment / Mitigation Measures
Surveillance	Active spaces within the building have been located to maximise casual surveillance from outside the buildings via transparent glazing. Toilets are located and designed to maximise casual surveillance to facility entries. Blind-corners, recesses and other external areas that have the potential for concealment or entrapment have been minimised. Foyers enable surveillance from the public domain to the inside of the building at night. The residential accommodation entry has a clearly defined transitional space between public and private areas. Appropriate lighting levels are achieved. Natural surveillance of the Community / Child Care Entrance is available from Cope Street Plaza. Natural surveillance of the residential entrance and retail spaces is provided from Botany Road, Church Square, Raglan Walk, Cope Street Plaza and Grit Lane. Grit Lane and Church Square both provide a busy retail and pedestrian environment. These offer good natural surveillance of streets and laneways.
Access control	Entries are clearly visible, unobstructed and easily identifiable from the street. Signage that clearly defines the purpose of areas.

CPTED Principle	Assessment / Mitigation Measures
	It is expected that an electronic access control system and a suitable keying system will be installed throughout the building to ensure that no person has access to an area that they are not authorised, including after hour. Access to the external stairs are to be designed so that illegitimate access is not facilitated. The apartments have three levels of security (i.e. lobby entrance door, lift access and apartment entry door), and unauthorised access to an apartment would need to be facilitated via tailgating a resident or theft of an access card or key.
Territorial reinforcement	The only areas where territorial reinforcement may be an issue is Church Square. These are areas where people may loiter.
Maintenance	Maintenance requirement is to be addressed as part of the day to day operational management of the site. This will include removal of graffiti and repairs to building damage. Maintenance may also be assisted through the use of anti-graffiti coatings applied to the lower levels of the building exterior.

In response to the above assessment against the CPTED Principles, the following recommendations are proposed for the development:

Figure 84 CPTED Measures



Source: Connley Walker Pty Ltd

Note 1 Access Control:

Consider sliding door to prevent member of the public having access to precinct amenities.

Notes 2, 3 &4 Territorial Enforcement:

It is recommended that the concrete be sloped on the street side of the exit. This will mitigate the risks of:

- Rough sleeping.
- Urinating in the area.
- People blocking the exit with milk crate seats used by smokers out of the rain.

Note 5 Surveillance:

It is recommended that CCTV surveillance of the Community Entrance, Residential Lobby and entrance and corridor to the toilets be provided.

General Note

- External lighting in pedestrian areas to AS1158.3.1:2005.
- CCTV coverage of all entrances, goods lift, and public areas.
- Electronic access control or secure key for external entrances and goods lift.

The assessment has identified some risk areas in relation surveillance. Recommendations have been made to reduce the identified CPTED risk areas. With the implementation of the recommendations provided, the proposal is able to satisfactorily reduce crime risk.

8.19. SECURITY RISK ASSESSMENT

A Security Risk Assessment Report has been prepared by Connley Walker Pty Ltd and is attached at Appendix FF. The Security Risk Assessment has been prepared to address the relevant guidelines and controls prescribed within the *Australian Standard for Risk Management AS/NZS ISO 31000.*

The general methodology used to prepare the Security Risk Assessment was to establish the context, identify the risks, analyse the risks, evaluate the risk and recommend appropriate protective security measures. Consultation with South Sydney Police was conducted to gain an understanding of the operational context and specific security threats.

The recommendations of the assessment are provided to mitigate against potential security risks and to ensure an appropriate level of security is applied, through sound security principles and standards, for the operation of the OSD.

The Security Risk Assessment found that while no ‘very high’ security risks are present for the proposed development the following area is considered to have ‘high’ security risks:

- Childcare area with the risk of abduction
- All public spaces with the risk of assault
- Building management systems with the risk of cyber attack
- All areas with the risk of accidental or intentional fire
- All areas with the risk of Hoax Bomb
- All areas with the risk of attempted self-harm
- All areas with the risk of terrorism

To mitigate these risks CPTED measures (as discussed in the section above), access control and CCTV surveillance are recommended to be adopted. In addition to the CPTED measures, the following security risk mitigation measures are recommended to mitigate the high security risks:

- Consultation with Cyber consultant for cyber security
- Procedural controls for hoax bomb.
- CCTV surveillance of:
  - All public spaces.
  - All building entries.
  - Lift lobbies.

  - Carpark.
  - Bicycle storage.
  - Within all lifts.
  - Concierge points.
  - Roof access points.
  - Plant room entries.
- Electronic access control located at:
  - Residential lobby entries.
  - Lifts.
  - Entries to building management areas.
  - Non-public entries.

Each of these recommendations are readily able to be adopted within the proposed development without substantive change to the proposed architectural design and as such can be implemented as part of the detailed design phase.

The implementation of the security risk mitigation measures outlined will result the proposed development to be appropriate and acceptable.

Further, a separate Blast Vulnerability Assessment **(BVA)** has been prepared to support the proposed development. The BVA considers that the WMQ site is a higher risk category (relative to other similar commercial developments) due to its interface with adjacent Metro station.

The BVA demonstrates the Central Precinct development adopts a balanced risk mitigation strategy, combining strategic operational and physical security treatments. In addition, reducing the consequences of potential hazard through addressing the structural response and predicting the hazardous fragmentation exposure, in order to aid improving post event evacuation, and emergency services response.

8.20. SUITABILITY OF THE SITE

Suitability of the site for the development of a mixed use development was primarily established as part of the concept SSDA. Overall, the detailed SSDA proposal is considered suitable for the site for the following reasons:

- The project is consistent with the NSW Government and City of Sydney Council policies for the site and surrounding area including the Greater Sydney Region Plan, the East District Plan and local development controls for the height of buildings and density (FSR controls).
- The proposal comprises a prime opportunity to take advantage of the approved Sydney Metro project, with the airspace created as part of the Waterloo Quarter site proposed to be developed for the purposes of OSD.
- The proposal is permissible in the B4 Mixed Use zone pursuant to the SLEP 2012 and delivers a new mixed use building to maximise the use of future Metro infrastructure.
- The separation of the site from other buildings within the precinct provides sufficient separation distance to support a high level of residential amenity to be achieved for solar access and privacy.
- The proposal does not create additional overshadowing to Cope Street Plaza, Alexandria Park and the Alexandria Heritage Conservation, and does not adversely impact the visual amenity and views from the public domain.
- The proposed façade and exterior colour scheme have been designed to be sympathetic to the surrounding context, including the Waterloo Congregational Church and Alexandria Park Heritage Conservation Area, which feature significant brickwork and masonry elements.
- The proposed OSD can be successfully integrated with the Waterloo Station to allow optimal use of the public domain, increased pedestrian capacity and not impeding future station uses.

The proposal is considered suitable for the site as it delivers a world-class integrated public transport and residential development, which aligns with relevant strategic and statutory planning policies and significant NSW Government investment in public infrastructure.

8.21. PUBLIC INTEREST

The detailed SSDA proposal is considered to be in the public interest for the following reasons:

- The project supports the concept of the '30 minute' city envisioned within State and Regional strategic planning policy, by locating a mixed use development proximate to public transport infrastructure.
- The proposal contributes to the vibrancy of Waterloo by providing a landmark development which provides complementary land uses to support the local area.
- The proposal provides additional affordable housing and market residential apartments, which aids in the diversity of residential tenure available within Sydney to suit the diverse and evolving needs of the population.
- The proposal has been demonstrated as enabling high amenity and providing good quality future dwellings, which would provide an exceptional quality of life for future residents.
- The provision of community facilities, including a Community Childcare Centre will support the need of workers and residents within the WMQ site.
- The delivery of Church Square provides a meaningful amount of space for public appreciation and interaction with the Waterloo Congregational Church, which was never previously available.
- The detailed design provides an activated podium interface with the public domain areas in and around the Central Precinct which affords increased natural surveillance to ensure minimised anti-social and criminal behaviour within the locality.
- The proposal includes high sustainability initiatives, including the provision of minimal car parking spaces, and exceeding the mandatory requirements of residential sustainability prescribed by BASIX.
- The proposal would contribute to the delivery of 3,591 operational jobs across the overall WMQ site. Additional economic benefits would be provided by future residents using surrounding services following the completion of the development.

The proposal is in the public interest as it provides significant public benefits for the local and wider community by creating an exceptional experience for future site users and a landmark destination for public transport patrons.

8.22. HEALTH IMPACT ASSESSMENT

The following key environmental and health issues have been addressed in detail through this EIS:

- Built Form
- Heritage Impact
- View and Visual Impact
- Solar Access
- Overshadowing
- Natural Cross Ventilation
- Wind Impacts
- Noise and Vibration
- Transportation Air Quality
- Airspace
- Traffic, Access and Car Parking
- Construction Impact

- Utilities and infrastructure
- Flooding and Stormwater
- Reflectivity
- Accessibility
- Fire safety
- Social and Economic Impacts
- Crime and Safety

The following chapter undertakes risk assessment and provide a summary list of mitigation measures to further mitigate environmental impact and ensure that health risks of the proposal are at acceptable levels.

9. ENVIRONMENTAL RISK ASSESSMENT

9.1. RISK ASSESSMENT

The SEARs require an environmental risk analysis to identify potential environmental impacts associated with the proposal.

This analysis comprises a qualitative assessment consistent with the methodology used for the concept SSDA and the *Australian Standard AS4369:1999 Risk Management and Environmental Risk Tools*. The level of risk was assessed by considering the potential impacts of the proposed development prior to application of any mitigation or management measures.

The significance of the impact is assigned a value between 1 and 5 based on:

- The sensitivity of the environment receiving the impact
- The level of understanding of the type and extent of the impact
- The likely response to the environmental consequence of the project.

The manageability of the impact is assigned a value between 1 and 5 based on:

- The complexity of mitigation measures
- The known level of performance of the mitigation measures proposed
- The opportunity for adaptive management

The sum of the significance and manageability values provides an indicative ranking (between 1 and 10) of the potential residual impacts after the mitigation measures are implemented. The risk levels for likely and potential impacts were, therefore derived using the following risk matrix.

Table 29 Risk Matrix

		MANAGEABILITY OF IMPACT				
		A – COMPLEX	B – SUBSTANTIAL	C – ELEMENTARY	D – STANDARD	E – SIMPLE
SIGNIFICANCE	5	High	High	Medium	Low	Very Low
	4	High	High	Medium	Low	Very Low
	3	Medium	Medium	Medium	Low	Very Low
	2	Low	Low	Low	Low	Very Low
	1	Very Low	Very Low	Very Low	Very Low	Very Low

The results of the environmental risk assessment for the detailed SSDA are presented in Table 27.

Following the application of each of the mitigation measures, three residual risks are identified that have a risk profile of ‘medium’ or greater, including:

- Adverse noise conditions within the OSD from surrounding development and road network.
- Adverse wind environment to outdoor areas in the OSD, including to private balconies, communal areas and Public Domain. Potential for general and localised wind effects.
- Adverse impact on the pedestrian wind environment of surrounding streets.

Table 30 Risk Assessment

Aspect	Potential Impact	Significance	Manageability	Risk Level
Design Excellence	The development does not achieve design excellence	3	D	Low
Aboriginal Heritage	Potential impacts on Aboriginal places of significance (Construction).	3	D	Low
Non-Aboriginal Heritage	Impact on the significance of heritage items in the vicinity notably Waterloo Congregational Church.	2	D	Low
View and Visual Impact	Adverse view impacts to surrounding developments	2	D	Low
Solar Access	The residential apartments do not achieve adequate sunlight.	3	D	Low
	Potential impacts on adjoining residential dwellings and public open space.	2	D	Low
Privacy	Adverse impact on visual and acoustic privacy of surrounding residential properties	2	D	Low
Overshadowing	Increase in overshadowing to Alexandria Park	2	B	Low
Natural Ventilation	The residential apartments do not achieve adequate natural ventilation.	3	D	Low
Environmental Performance / ESD	Irreversible increase in energy usage.	2	C	Low
Wind Impact	Adverse wind environment to outdoor areas in the OSD, including to private balconies, communal areas and public domain area. Potential for general and localised wind effects.	3	C	Medium
Noise and Vibration	Adverse noise conditions within the OSD from Sydney Metro infrastructure and Botany Road.	2	D	Low
	Adverse noise conditions within the OSD from surrounding development and road network	3	C	Medium
	Adverse external noise conditions to surrounding development (Operation).	2	D	Low

Aspect	Potential Impact	Significance	Manageability	Risk Level
	Adverse external noise conditions to surrounding development (Construction).	3	D	Low
Airspace	Impact on prescribed and protected airspace	2	D	Low
Traffic and Transport	Increased traffic on local roads (Operational).	2	C	Low
	Increased traffic on local roads (Construction).	3	D	Low
	Additional demand for on-street car parking spaces (Operational and Construction)	3	D	Low
Pedestrian Management	Conflict with pedestrian and cycle/vehicle operations (Operational).	2	C	Low
	Conflict with pedestrian and cycle/vehicle operations (Construction).	3	D	Low
Pedestrian amenity	Adverse impact on the pedestrian wind environment of surrounding streets.	3	C	Medium
	Pedestrian volumes and footpath/public domain capacity.	2	C	Low
Waste	Waste production (Operation).	2	D	Low
	Waste production (Construction).	2	D	Low
Air Quality, Odour and Dust	Air quality, odour and dust emissions (construction)	2	C	Low
Construction	Impacts associated with public safety, visual amenity, noise, waste and traffic management in the locality during construction	3	D	Low
Soil and Water	Impact on water table	2	D	Low
Infrastructure provision	Adequate connection to infrastructure and utilities and adequate infrastructure capacity	2	D	Low
Structure	Structural interface with Metro Station and Infrastructure	3	C	Low
	Structural impact on Waterloo Congregational Church	3	D	Low
Flooding	Potential flooding of the OSD.	2	B	Low

Aspect	Potential Impact	Significance	Manageability	Risk Level
Stormwater	Adverse impact on the quality of stormwater runoff (Operation).	2	D	Low
	Adverse impact on the quality of stormwater runoff (Construction).	3	D	Low
Contamination	Exposure of contamination or hazardous materials during construction and operation.	2	D	Low
Reflectivity	Adverse impact on reflectivity of the proposed buildings on public domain, pedestrians and motorists.	2	D	Low
Building Standards	Adequate access for people with a disability.	2	C	Low
	Adherence to Building Code of Australia	2	D	Low
Safety and Security	Adverse impact on the safety and security of local community.	2	D	Low
Social Impact	General disruption to community associated with large scale construction.	3	D	Low
	Antisocial and criminal behaviour.	2	C	Low
Signage	Detracts from the architectural integrity of the building.	2	D	Low
	Adverse impact on public domain, pedestrians and motorists.	2	D	Low
Cumulative Impacts	Cumulative impacts (traffic, noise, dust, etc.) associated with concurrent construction of station and OSD, and other development in the area.	3	D	Low
	Cumulative impacts (traffic, noise emissions, etc.) during concurrent operation of station and OSD, and other development in the area.	3	D	Low

9.2. MITIGATION MEASURES

The measures identified to mitigate the potential environmental impacts of the proposed development are described in detail within Section 8 of the EIS and summarised in the table below.

Table 31 Mitigation Measures

Item	Potential Impact	Mitigation Measure
Design Excellence	The development does not achieve design excellence	Comply with the requirements of the Design Excellence Strategy. Maintain engagement with the 'design Architect' through the detailed design stage of the proposed development.
Aboriginal Heritage	Potential impacts on Aboriginal places of significance (Construction).	The recommendations and mitigation measures of the Artefact reports are to be adhered to during the construction phase of the SSD project.
Non-Aboriginal Heritage	Impact on the significance of heritage items in the vicinity notably Waterloo Congregational Church.	Adopt the recommendations of the Heritage Impact Statement with regard to maintaining the proposed building setbacks, materiality and finishes.
View and Visual Impact	Adverse view impacts to surrounding developments	Compliance with the Concept DA building envelope (as amended), and the assessment of the proposed façade features and embellishments to ensure no further adverse impacts. Prepare and implement an integrated public domain and landscape plan that includes deciduous tree planting that will reach mature heights (8m-15m) to provide tree canopies consistent with the existing local tree canopy.
Solar Access	The residential apartments do not achieve adequate sunlight.	Maintain proposed building orientation and floor layout.
	Potential impacts on adjoining residential dwellings and public open space.	Compliance with the proposed building envelope, including façade features and embellishments to ensure no further adverse impacts result.
Privacy	Adverse impact on visual and acoustic privacy of surrounding residential properties	Maintain proposed building orientation and floor layout, including privacy treatments and window locations.
Overshadowing	Increase in overshadowing to Alexandria Park	Maintain proposed building height and setbacks.
Natural Ventilation	The residential apartments do not achieve adequate natural ventilation.	Maintain approved floor plan layout. Utilisation of a ventilation plenum to all west facing apartments and southeast facing apartments. Acoustic plenum is to be installed in all noise affected living and bedrooms apartments (112 in total) integrated either within the balcony or the facade.

Item	Potential Impact	Mitigation Measure
Environmental Performance / ESD	Irreversible increase in energy usage.	Adhere to recommendations within the ESD Report.
Wind Impact	Adverse wind environment to outdoor areas in the OSD, including to private balconies, communal areas and public domain area. Potential for general and localised wind effects.	Maintain awnings detailed on the architectural drawings and tree planting outlined in the landscape design to enable the ground plane areas to satisfy the required wind comfort conditions for the Central Precinct and the surrounding public open space areas and laneway.
Noise and Vibration	Adverse noise conditions within the OSD from Sydney Metro infrastructure and Botany Road.	Maintain approved floor plan layout. Utilisation of a ventilation plenum to all west facing apartments and southeast facing apartments. Acoustic plenum is to be installed in all noise affected living and bedrooms apartments (112 in total) integrated either within the balcony or the facade. The design of the mechanical ventilation system is required to serve the noise-affected spaces within the childcare centre. The glazing components of the façade of the proposed development must meet the acoustic demand ratings presented for the double-glazed acoustic rating (Rw) in the Noise Report.
	Adverse external noise conditions to surrounding development (Operation).	To meet the external noise emissions requirements for noise generated by the mechanical plant and equipment together, the following noise mitigation measures are required: ▪ Install type 1, type 2 and type 3 acoustic barriers to the Level 23 plantroom where to the height shown in the architectural documentation. Acoustic barriers can be solid or can be an acoustic louvre, though the barrier must have a noise reduction of no less than the values shown in Table 56 of the Noise Report. ▪ Install type 2 and type 3 acoustic barriers to the Level 23 mezzanine plantroom to the height shown in the architectural documentation. Acoustic barriers can be solid or can be an acoustic louvre, though the barrier must have a noise reduction of

Item	Potential Impact	Mitigation Measure
		no less than the values shown in Table 56 of the Noise Report. Additional mitigation measures for the mechanical plant should be considered during the design development stage to comply with the noise criteria at the nearest sensitive receivers.
	Adverse external noise conditions to surrounding development (Construction).	▪ A solid acoustic barrier (made from plywood or similar) 2.4 metres above Ground Level is recommended to be erected around the perimeter of the site. The acoustic barrier could be either Class A or Class B type hoarding. ▪ Where it proves reasonable and feasible, heavy truck movements are recommended to travel along Botany Road to enter the construction site. This will not be possible for significant durations of construction on-site due to other site constraints that must be addressed by travelling along Cope Street and Raglan Street. ▪ In addition, noise monitoring is recommended to be conducted at the most affected noise-sensitive receivers in accordance with the monitoring programme and the noise management measures flow chart attached in the Noise Report. In addition to the above, the list of General Acoustic Recommendations for Construction included in the Noise Report should be applied to minimise the spread of noise and vibrations to the potential receivers.
Airspace	Impact on prescribed and protected airspace	Maintaining proposed maximum building height.
Traffic and Transport	Increased traffic on local roads (Operational).	The provision of proposed and compliant parking for the residential component and nil parking for retail. Implementation of a loading dock management plan to schedule services and deliveries to manage traffic movements from and to the site.
	Increased traffic on local roads (Construction).	The provision of zero parking spaces on site during construction for workers. Implementation of a Green Travel Plan.

Item	Potential Impact	Mitigation Measure
	Additional demand for on-street car parking spaces (Operational and Construction)	Implementation of a Green Travel Plan.
Pedestrian Management	Conflict with pedestrian and cycle/vehicle operations (Operational).	Implementation of a loading dock management plan to schedule services and deliveries to manage and mitigate traffic movements from and to the site.
	Conflict with pedestrian and cycle/vehicle operations (Construction).	Consistency with the Construction Traffic and Pedestrian Management Plan.
Pedestrian amenity	Adverse impact on the pedestrian wind environment of surrounding streets.	Maintain awnings detailed on the architectural drawings and tree planting outlined in the landscape design to enable the ground plane areas to satisfy the required wind comfort conditions for the Central Precinct and the surrounding public open space areas and laneway.
	Pedestrian volumes and footpath/public domain capacity.	Ensure public domain improvement, including Botany Road pedestrian way widening is achieved. The separation of pedestrian entrances for the OSDs and metro station is maintained. The following design principles should be maintained for Church Square: ▪ The road space will be devoid of delineation and kerbs to enhance the sense of pedestrian priority. ▪ The entrance to the zone (at the intersection with Cope Street) will provided a 'Continuous Footpath Treatment' in accordance with RMS TD 2013/05. ▪ Regulatory traffic signs, in accordance with TTD 2016/001 will be provided on both sides of the entry to the zone, to enhance the change in environment and priority. ▪ The pavement surface will be clearly distinguishable in texture, colour and material, to highlight the difference in environment, in accordance with City of Sydney requirements.
Waste	Waste production (Operation).	Implementation of the Operational Waste Management Plan.

Item	Potential Impact	Mitigation Measure
	Waste production (Construction).	Preparation and implementation of a detailed Construction Waste Management Plan.
Air Quality, Odour and Dust	Air quality, odour and dust emissions (construction)	Maintain compliance with AS1668.2.
Construction	Impacts associated with public safety, visual amenity, noise, waste and traffic management in the locality during construction	Finalisation and implementation of the draft Construction Environmental Management Plan.
Soil and Water	Impact on water table	Adhere to erosion and sediment control measures identified in the Construction Environmental Management Plan.
Infrastructure provision	Adequate connection to infrastructure and utilities and adequate infrastructure capacity	Adhere to mitigation measures identified in the Services and Utilities Infrastructure Report at Appendix T.
Structure	Structural impact on Waterloo Congregational Church	During construction it is recommended that when pouring the Level 01 slab, attended vibration measurements should be conducted on the structure of the Waterloo Congregational Church to ensure the vibration generated on the structure does not exceed the values for cosmetic damage and structural damage outlined in BS 7385 and DIN 4150 (project construction vibration limits established in Section 9.6.4).
Flooding	Potential flooding of the OSD.	▪ A flood warning and evacuation plan will be produced to inform the residents and managers of the building on the procedures to adopt to in case of an emergency associated to flood risk. ▪ Emergency response for Area 11 should be provided by evacuating these areas towards a safe refuge located at higher ground levels (i.e. above the PMF and 100 year + 500 mm flood event). ▪ Details on evacuation and emergency procedures (e.g. emergency flood alarms, sign to evacuate the retail areas, etc.) need to be include in the Evacuation Plan to be implemented at a flood event.
Stormwater	Adverse impact on the quality of stormwater runoff (Operation).	▪ Provide 6 Stormfilter cartridges.

Item	Potential Impact	Mitigation Measure
		▪ A 10kL rainwater tank is to be installed within Central Precinct. ▪ EnviroPod filters (or similar approved equivalent products) are to be installed within every stormwater inlet pit on the site.
	Adverse impact on the quality of stormwater runoff (Construction).	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 a range of principles detailed in the CEMP. An erosion and sediment control plan will be developed prior to the commencement of construction. This will be prepared in accordance with the NSW Blue Book requirements. All stormwater will be managed to prevent off site pollution.
Contamination	Exposure of contamination or hazardous materials during construction and operation.	Adopt the recommendations of the Contamination Strategy prepared by Douglas Partners.
Reflectivity	Adverse impact on reflectivity of the proposed buildings on public domain, pedestrians, and motorists.	All glazing and other reflective materials used on the façade shall have a maximum normal specular reflectivity of visible light of 20%.
Building Standards	Adequate access for people with a disability. Adherence to Building Code of Australia	Ensure detailed design adherence to BCA, accessibility objectives under the BCA, Disability (Access to Premises – Buildings) Standards 2010 (Premises Standards), and the relevant Australian Standards as they relate to access to premises and the intent of the Disability Discrimination Act 1992 (Cth) (DDA). Ensure detailed design adherence to Building Code of Australia.
Safety and Security	Adverse impact on the safety and security of local community.	Detailed design to include additional surveillance devices, mechanised access controls, and clear way-finding signage. Design consideration should be given to preventing hostile vehicle penetration. Implementation of camera surveillance, public domain furniture design, anti-graffiti façade protections.

Item	Potential Impact	Mitigation Measure
Social Impact	General disruption to community associated with large scale construction.	Consistency with the recommendations of the Construction Environmental Management Plan including notably ongoing engagement and consultation with the surrounding landowners and occupants during the construction period, including maintaining a complaints register.
	Antisocial and criminal behaviour.	Adoption of the recommendations of the CPTED assessment, including: ▪ Consider sliding door to prevent member of the public having access to precinct amenities. ▪ That the concrete be sloped on the street side of the exit. ▪ That CCTV surveillance of the Community Entrance, Residential Lobby and entrance and corridor to the toilets be provided. ▪ External lighting in pedestrian areas to AS1158.3.1:2005. ▪ CCTV coverage of all entrances, goods lift, and public areas. ▪ Electronic access control or secure key for external entrances and goods lift.
Signage	Detracts from the architectural integrity of the building.	Future signage to be located within the proposed signage zone. The detailed design and location of the sign within the signage zone are subject to future applications.
	Adverse impact on public domain, pedestrians and motorists.	Future signage to be located within the proposed signage zone. The detailed design and location of the sign within the signage zone are subject to future applications.
Cumulative Impacts	Cumulative impacts (traffic, noise, dust, etc.) associated with concurrent construction and operation of the station OSD, and other development in the area.	Implementation and finalisation of the Draft Construction Pedestrian and Traffic Management Plan and the Construction Environmental Management Plan. A detailed Construction Management Plan be prepared at CC stage, which should detail how screening, hoarding and construction zones should be coordinated to ensure public safety and amenity.

Item	Potential Impact	Mitigation Measure
	Cumulative impacts (traffic, noise emissions, etc.) during concurrent operation of station and OSD, and other development in the area.	Prepare and implementation of a Plan of Management for applicable uses. Implementation of a loading dock management plan to schedule services and deliveries to manage traffic movements from and to the site.

10. CONCLUSION AND JUSTIFICATION

This EIS has been prepared to accompany a Detailed SSDA for the construction and operation of a mixed use development located in the Central Precinct of the Waterloo Metro Quarter site – the Central Building.

This EIS has comprehensively addressed the general and key issues relating to the proposed development and has included the plan and document requirements identified in the SEARs and in Schedule 2 of the EP&A Regulation. This EIS is submitted to the NSW DPIE pursuant to Part 4 of the EP&A Act. The Minister for Planning and Public Spaces, or their delegate, is the consent authority for the Detailed SSDA.

The lodgement of the Detailed SSDA (SSD- 10439) follows the approval of a Concept SSDA (SSD 9393) granted by the Minister for Planning on 10 December 2019. An Amending DA has been lodged concurrently with this DA in accordance with Section 4.22 of the Environmental Planning and Assessment Act 1979 (**EP&A Act**). It seeks approval to amend the building envelope and description of development for the Northern Precinct and the podium design of the Central Building approved under SSD 9393. This detailed SSDA is consistent with the concept DA, as proposed to be modified.

The Detailed SSDA seeks approval for the detailed design, construction, and operation of affordable housing and private residential dwellings within the Central Building, with podium non-residential uses, including community facilities and retail uses on the ground floor.

The detailed design of the proposed Central Building has been the subject of design development and testing and ongoing review from various government and independent parties to ensure that it achieves the highest standard in architectural design, while ensuring a functional interface is delivered with the Sydney Metro.

Overall the proposed development sought within the Detailed SSDA is considered appropriate for the site and warrants approval from the Minister for Planning and Public Spaces for the following reasons:

- Aligns with the '30 minute' city envisioned within State and Regional strategic planning policy, by locating a mixed use development proximate to public transport infrastructure which will deliver a truly transport orientated development on the site.
- Will deliver a diverse range of community uses including a Community Childcare Centre, and community hub which can adapt and respond to the needs of the existing and future Waterloo community.
- Comprises a mix of land uses including retail/commercial land uses within the podium levels of the Central Building which will support activation of the precinct throughout the day and evening.
- Supports the delivery of active and vibrant new public domain spaces including Cope Street Plaza to the east, Church Square to the south and Grit Lane to the north which will all have different identities which together create a new network of public spaces for the existing and future Waterloo community.
- Will provide a mixed tenure residential development, comprising both affordable housing and market residential apartments which will benefit from the proximity to the Waterloo metro station transport network and new public domain spaces in and around the WMQ site.
- Delivers new housing which positively responds to the receiving environment of the site, including detailed consideration of acoustic impacts of Botany Road to deliver housing with high visual, acoustic, and solar amenity for future residents.
- Incorporates a high level of sustainability initiatives, including the provision of minimal car parking spaces, and exceeding the mandatory requirements of residential sustainability prescribed by BASIX.
- Delivers a landmark development within the WMQ which is commensurate to its importance as a new Sydney Metro Station site and will support the future revitalisation of the Waterloo area.
- Support 466 jobs during construction and 3,591 jobs during operation over the overall WMQ site, which will provide economic benefits to the existing and future Waterloo community.

In view of the above, we submit that the proposal is in the public interest and that the Detailed SSDA should be approved subject to appropriate conditions.

DISCLAIMER

This report is dated 26 October 2020 and incorporates information and events up to that date only and excludes any information arising, or event occurring, after that date which may affect the validity of Urbis Pty Ltd **(Urbis)** opinion in this report. Urbis prepared this report on the instructions, and for the benefit only, of WL DEVELOPER PTY LTD **(Instructing Party)** for the purpose of State Significant Development Application **(Purpose)** and not for any other purpose or use. To the extent permitted by applicable law, Urbis expressly disclaims all liability, whether direct or indirect, to the Instructing Party which relies or purports to rely on this report for any purpose other than the Purpose, and to any other person which relies or purports to rely on this report for any purpose whatsoever (including the Purpose).

In preparing this report, Urbis was required to make judgements which may be affected by unforeseen future events, the likelihood and effects of which are not capable of precise assessment.

All surveys, forecasts, projections and recommendations contained in or associated with this report are made in good faith and on the basis of information supplied to Urbis at the date of this report, and upon which Urbis relied. Achievement of the projections and budgets set out in this report will depend, among other things, on the actions of others over which Urbis has no control.

In preparing this report, Urbis may rely on or refer to documents in a language other than English, which Urbis may arrange to be translated. Urbis is not responsible for the accuracy or completeness of such translations and disclaims any liability for any statement or opinion made in this report being inaccurate or incomplete arising from such translations.

Whilst Urbis has made all reasonable inquiries it believes necessary in preparing this report, it is not responsible for determining the completeness or accuracy of information provided to it. Urbis (including its officers and personnel) is not liable for any errors or omissions, including in information provided by the Instructing Party or another person or upon which Urbis relies, provided that such errors or omissions are not made by Urbis recklessly or in bad faith.

This report has been prepared with due care and diligence by Urbis and the statements and opinions given by Urbis in this report are given in good faith and in the reasonable belief that they are correct and not misleading, subject to the limitations above.

APPENDIX A SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

APPENDIX B QUANTITY SURVEYOR'S REPORT

APPENDIX C SITE TITLE DIAGRAMS AND SURVEY PLANS

APPENDIX D ARCHITECTURAL DRAWINGS

APPENDIX E URBAN DESIGN REPORT

APPENDIX F ARCHITECTURAL DESIGN REPORT

APPENDIX G ENDORSED DESIGN EXCELLENCE STRATEGY

APPENDIX H HERITAGE IMPACT STATEMENT

APPENDIX I TRANSPORT, TRAFFIC AND PARKING IMPACT ASSESSMENT

APPENDIX J DRAFT CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT PLAN

APPENDIX K NOISE AND VIBRATION IMPACT ASSESSMENT (OPERATIONAL AND CONSTRUCTION) WASTE MANAGEMENT PLAN

APPENDIX L OPERATIONAL WASTE MANAGEMENT PLAN

APPENDIX M ECOLOGICALLY SUSTAINABLE DEVELOPMENT REPORT AND SUSTAINABILITY STRATEGY

APPENDIX N CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN ASSESSMENT

APPENDIX O STORMWATER MANAGEMENT STRATEGY AND FLOOD IMPACT ASSESSMENT

APPENDIX P STRUCTURAL REPORT

APPENDIX Q CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX R BCA ASSESSMENT

APPENDIX S DDA ASSESSMENT

APPENDIX T SERVICES AND UTILITIES INFRASTRUCTURE REPORT

APPENDIX U PRE-SUBMISSION CONSULTATION REPORT

APPENDIX V BIODIVERSITY DEVELOPMENT ASSESSMENT VIEWER

APPENDIX W TRANSPORTATION AIR QUALITY MANAGEMENT PLAN

APPENDIX X WATERLOO METRO DESIGN AND AMENITY GUIDELINES

APPENDIX Y DESIGN INTEGRITY REPORT

APPENDIX Z SUBDIVISION PLANS

APPENDIX AA SOCIAL AND ECONOMIC ANALYSIS

APPENDIX BB CIVIL ENGINEERING REPORT AND PLANS

APPENDIX CC HERITAGE INTERPRETATION STRATEGY

APPENDIX DD AIRSPACE APPROVAL

APPENDIX EE FIRE SAFETY STRATEGY REPORT

APPENDIX FF SECURITY RISK ASSESSMENT

APPENDIX GG REFLECTIVITY STATEMENT

APPENDIX HH VISUAL AND VIEW IMPACT ANALYSIS

APPENDIX II LANDSCAPE AND PUBLIC DOMAIN PLANS

APPENDIX JJ LANDSCAPE AND PUBLIC DOMAIN REPORT

APPENDIX KK WIND IMPACT ASSESSMENT

APPENDIX LL OVERSHADOWING ANALYSIS

APPENDIX MM PUBLIC ART STRATEGY

APPENDIX NN SOLAR ACCESS REPORT

APPENDIX 00 BASIX STATEMENT

APPENDIX PP NATURAL CROSS VENTILATION ASSESSMENT

APPENDIX QQ PRELIMINARY OPERATIONAL MANAGEMENT PLAN

APPENDIX RR CHILDCARE CENTRE PRELIMINARY COMPLIANCE REPORT

URBIS