Waterloo Integrated
Station Development

A Joint Venture Project
JOHN HOLLAND
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WATERLOO METRO QUARTER OVER STATION DEVELOPMENT

Environmental Impact Statement
Appendix R – Building Code of Australia Report

SSD-10438 Basement Car Park

Detailed State Significant Development
Development Application

Prepared for **Waterloo Developer Pty Ltd**

30 September 2020

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Reference	Description
Applicable SSD Applications	SSD-10438 Basement Car Park
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Reviewed	Waterloo Developer Pty Ltd Perry Milledge
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1. Glossary and abbreviations

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

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

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

2. Executive summary

This planning report has been prepared by McKenzie Group to accompany a detailed State significant development (SSD) development application (DA) for the Basement Car Park over station development (OSD) at the Waterloo Metro Quarter site.

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

3. Introduction

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

Basement Car Park

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

The report is intended as an overview of the relevant provisions of the Building Code of Australia for Development Application Submission. Detailed drawings and associated review will still be required as the final design is developed.

4. The site

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

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

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

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

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

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

Basement Car Park DA

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

- 69–83 Botany Road (Lot 1, DP 1084919)
- 130–134 Cope Street (Lot 12 DP 399757) (Part)
- 136–144 Cope Street (Lots A-E DP 108312) (Part)
- 85 Botany Road (Lot 1 DP 27454)
- 87 Botany Road (Lot 2 DP 27454)
- 89–91 Botany Road (Lot 1 DP 996765)
- 93–101 Botany Road (Lot 1 DP 433969 and Lot 1 DP 738891) (Part).

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

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

Figure 1 - Aerial image of the site
Source: Urbis

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

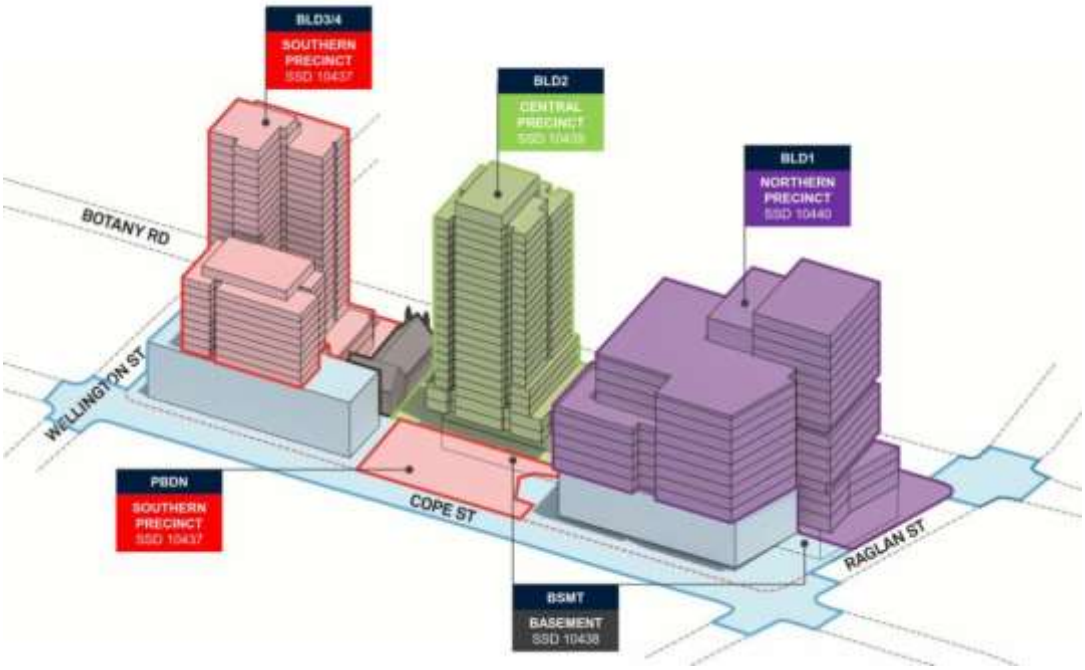

Figure 2 - Waterloo Metro Quarter site, with sub-precincts identified
Source: HASSELL

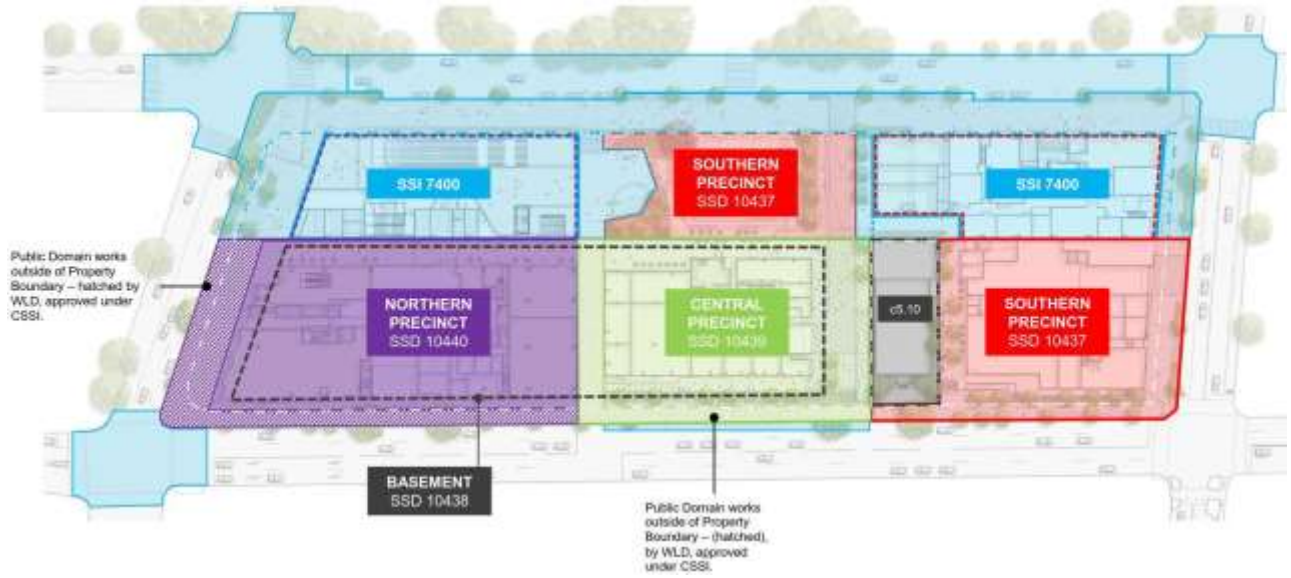

Figure 3 - Waterloo Metro Quarter site, with sub-precincts identified
Source: Waterloo Developer Pty Ltd

5. Background

5.1 About Sydney Metro

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

There are four core components:

5.1.1 Sydney Metro North West

This project is now complete and passenger services commenced in May 2019 between Rouse Hill and Chatswood, with a metro train every four minutes in the peak. The project was delivered on time and $1 billion under budget.

5.1.2 Sydney Metro City & Southwest

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

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

5.1.3 Sydney Metro West

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

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

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

5.1.4 Sydney Metro Greater West

Metro rail will also service Greater Western Sydney and the new Western Sydney International (Nancy Bird Walton) Airport. The new railway line will become the transport spine for the Western Parkland City's growth for generations to come, connecting communities and travellers with the rest of Sydney's public transport system with a fast, safe and easy metro service.

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

The Sydney Metro project is illustrated below.

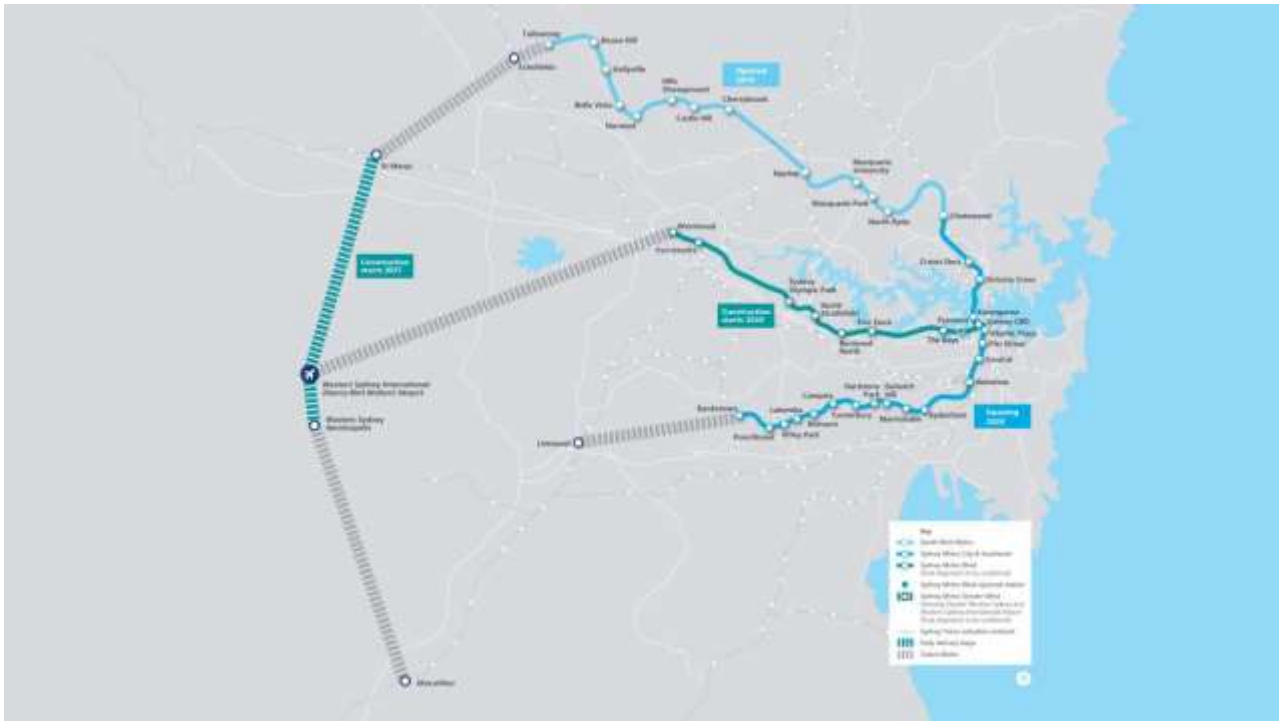

Figure 4 - Sydney Metro alignment map
Source: Sydney Metro

5.2 Sydney Metro CSSI Approval (SSI 7400)

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

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

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

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

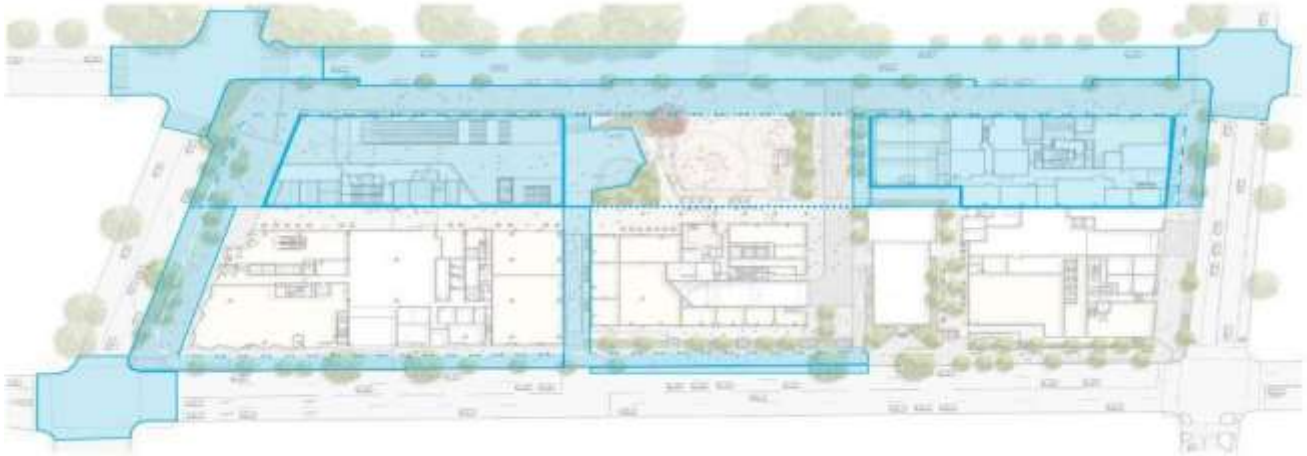

Figure 5 - CSSI Approval scope of works
Source: WL Developer Pty Ltd

5.3 Concept Approval (SSD 9393)

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

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

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

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

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

6. Proposed development

6.1 Waterloo Metro Quarter Development

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

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

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

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

6.1.1 Southern Precinct

The Southern Precinct comprises:

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

6.1.2 Basement Car Park SSD 10438 [Subject DA]

The Basement Car Park comprises:

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

- residential storage facilities
- shared plant and services
- in ground OSD tank for Building 2 located in Church Square.

6.1.3 Central Precinct

The Central Precinct comprises:

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

6.1.4 Northern Precinct

The Northern Precinct comprises:

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

7. Methodology

As Certifying Authority, McKenzie Group Consulting, have reviewed the architectural design documents prepared by Woods Bagot (refer appendix A) for compliance with the current building assessment provisions, i.e. the Building Code of Australia 2019 Amendment 1 (BCA).

The report is intended for DA submission. Detailed drawings and associated review will be required as the final design is developed.

8. Assessment and findings

The applicable legislation governing the design of buildings is the Environmental Planning and Assessment Act 1979. This Act requires that all new building works must be designed to comply with the BCA.

The version of the BCA applicable to the development, is version that in place at the time of the application to the Certifying authority for the Construction Certificate. For the purposes of this Report, BCA 2019 Amendment 1 has been utilised as the version of the BCA applicable at the time of preparation this Report.

Summary of Deemed-to-Satisfy Departures

The assessment of the design documentation has revealed the following Deemed to Satisfy departures.

No.	Deemed to satisfy departures	DTS Clause	Performance Requirements
Fire Safety Items			
1.	The following has been proposed to be rationalised as part of a performance-based solution: ▪ FRL for separation of the storage area and the EOT area on Level P1, between the same storey and the other storeys, from 240 minutes to 120 minutes ▪ FRL for separation of the Retail Portion on GF to the remainder of the building from 180 minutes to 120 minutes	Spec C1.1, C2.7, C2.8 & C2.9	CP1 & CP2
2.	**Separation between Building 1 and 2 at basement level – Smoke Hazard Management** Buildings 1 and Building 2 will not have any physical separation at basement level. The fire alarm and evacuation from this part of the development is proposed to be addressed through a performance-based solution.	C2.7, E2.2	CP2, EP2.2

No.	Deemed to satisfy departures	DTS Clause	Performance Requirements
	Fire services coverage to this part will also be a performance-based solution as it is anticipated a combination of services from buildings 1 and 2 will be utilised.		
3.	**Extended Travel Distances/Alternative Exits** Travel distance exceeds the deemed to satisfy requirements of the BCA. Refer to Section 6.4 of this report for details.	D1.4, D1.5	DP4, EP2.2
4.	**Location of Fire Services Infrastructure** Fire services infrastructure is proposed to be located in the basement where there is no physical separation between buildings. This is also to be assessed in the station building	E1.3, E1.5, E2.2	EP1.3, EP1.4, EP2.2
5.	**Adoption of the AS2419.1-2017 standard in lieu of 2005** The 2017 hydrant standard has been proposed which is not adopted by BCA 2019 Amdt 1.	E1.3	EP1.3
6.	**Fire Hydrant** It is proposed to install a combined hydrant and sprinkler system. Due to the nature of a scissor stairs, internal hydrants will not be located within a single fire compartment.	E1.3	EP1.3
7.	**Connectivity Between Station & Tower Buildings**	E1.8, E2.2	EP1.6, EP2.2

No.	Deemed to satisfy departures	DTS Clause	Performance Requirements
	Due to the connectivity between buildings, the smoke hazard management and alarm systems of all buildings will not be in accordance with the DTS provisions of the BCA.		
8.	**Sprinklers** The AS2118.1-2017 version of the sprinkler standard has been proposed which is a technical departure with the provisions of AS2118.6-2012 which requires AS2118.1-1999 to be used. As DTS departures with the sprinkler system have been identified, either a design amendment or fire engineered performance solution is required.	E1.5	EP1.4

Table 1 – Summary of Deemed- Satisfy Departures

In the event that fire engineered solutions are proposed for any category 2 items, consultation with the NSW Fire Brigade as part of the Construction Certificate process will be required.

9. Preliminaries

9.1 Building Assessment Data

Summary of Construction Determination:

Part of Project	Building 1 - Northern
Classification	5,6,7a,7b
Number of Storeys	17
Rise In Storeys	15
Type of Construction	A
Effective Height (m)	72.7m

Table 2 – Building Assessment Data

Note: The effective height has been determined based on RL89.4 – RL16.7

Summary of the floor areas and relevant populations where applicable: -

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Assumed Population
Basement P2	7a	4266m^2	66
Basement P1	7a	4266m^2	89
Total		8532m^2	155

Table 3 –Building Assessment Data

Notes:

- The above populations have been based on floor areas and calculated in accordance with the car parking spaces.

10. Structure

10.1 Structural Provisions (BCA B1):

Any new structural works are to comply with the applicable requirements of BCA Part B1, including AS/NZS 1170.0-2002, AS/NZS 1170-1-2002, AS/NZS 1170.2-2011 and AS 1170.4-2007.

The importance level of the building will be determined by the Structural Engineer in accordance with AS/NZS 1170.0-2002, the non-structural elements of the building, including partitions (and non-structural fire walls), ceilings, services and shelving may be required to comply with the seismic restraint requirements of AS 1170.4-2007.

Where this is required, certification accompanying the Construction Certificate application, will be required confirming that the design of the seismic restraints comply with AS 1170.4-2007. This may be provided by a specialist seismic consultant or by the architect and services design engineers.

Glazing is to comply with AS1288-2006, and AS2047-2014.

Prior to the issue of the Construction Certificate structural certification is required to be provided by a Professional Engineer registered on the National Engineering Register.

The Basement is proposed to be assessed as a separate building in lieu of a united building.

11. Fire Protection

12.1 Fire Compartmentation (BCA C1.1)

The BCA stipulates three levels of fire-resistant construction, which is based upon the rise in storeys and classification of the building. Each of these types of construction has maximum floor area and volume limitations as per BCA Table C2.2.

Based upon the rise in storeys and use of the building, it is required to be constructed in accordance with the requirements of Type A Construction, in accordance with Table 3 of Specification C1.1 of the Building Code of Australia 2019 Amendment 1.

The deemed-to-satisfy provision of the BCA require the below fire separation between BCA classifications:

- Carparking and commercial areas 120/120/120,
- Separation of different storeys between the basement carpark levels and the childcare/ retails portions on GF by an FRL not less than 120 minutes,
- Fire separation in the same storey between the storage area and the car parking in the basement is required to be 240 minutes
- Fire separation in the same storey between the EOT area and the car parking in the basement is required to be 240 minutes

It has been proposed to undertake the following performance-based solution:

- Rationalise the FRL for separation of the storage area and the EOT area on Level P1, between the same storey and the other storeys, from 240 minutes to 120 minutes
- Rationalise the FRL for separation of the Retail Portion on GF to the remainder of the building from 180 minutes to 120 minutes
- Building 1 and Building 2 will not have any physical separation at basement level. The fire alarm and evacuation from this part of the development is proposed to be addressed through a performance-based solution.
- Fire services coverage to this part will also be a performance-based solution as it is anticipated a combination of services from buildings 1 and 2 will be utilised.

The maximum floor area and volume limitations of a fire compartment as nominated in the deemed to satisfy provisions are as follows:

Classification		Type of Construction		
		A	B	C
7	max floor area—	5 000 m^2	3 500 m^2	2 000 m^2
	max volume—	30 000 m^3	21 000 m^3	12 000 m^3

Table 4 – Table C2.2
Source: BCA 2019 Amendment 1

11.2 Fire Resistance (BCA C1.1)

The building should be constructed generally in accordance with the relevant provisions of Specification C1.1 of the BCA applicable to Type A Construction, please refer to Appendix A which outlines the required fire rating to be achieved by the development.

Other passive fire protection issues that will need to be addressed in detailed documentation phase include:

- Lift Motor Rooms;
- Emergency Power Supply;
- Electricity Supply;
- Combined Hydrant/Sprinkler Pump Rooms;
- Fire Control Room

The above areas are to be separated from the remainder of the building by construction achieving a minimum fire resistance level of 120/120/120 and doors to be self-closing -/120/30 fire doors.

The lifts which are partially within the atrium are not proposed to be in fire rated construction. The lift landing doors will not achieve the minimum -/60/- FRL as a result of the above.

11.3 Fire Hazard Properties (BCA C1.10 and BCA C1.9)

The fire hazard properties of fixed surface linings and mechanical ductwork will also need to be addressed within the detailed documentation phase pursuant to Specification C1.10 of the Building Code of Australia. The following requirements apply:

Rigid and flexible air handling ductwork must comply with AS4254 Parts 1 & 2 2012.

Floor linings and floor coverings used in lift cars must have a critical radiant flux not less than 2.2, and wall and ceiling linings must be a Material Group No. 1 or 2.

External Wall Cladding

Since the building is of Type A construction, the following components are required to be completely non-combustible:

- External walls, including façade coverings, framing, insulation;
- Flooring and framing of lift pits;
- Non-loadbearing internal walls required to have an FRL;
- All non-loadbearing shafts;
- All loadbearing internal walls and loadbearing fire walls, including those that are part of loadbearing shafts.

Details of product specifications and test reports to AS 1530.1-1994 and AS 1530.3-1999 will be required to be submitted with the application for a Construction Certificate to demonstrate compliance.

The BCA does nominate that ancillary elements may not be fixed to an external wall that is required to be non-combustible unless they comprise of the following:

a) An ancillary element that is non-combustible.
b) A gutter, downpipe or other plumbing fixture or fitting.
c) A flashing.
d) A grate or grille not more than 2 m² in area associated with a building service.
e) An electrical switch, socket-outlet, cover plate or the like.
f) A light fitting.
g) A required sign.
h) A sign other than one provided under (a) or (g) that—
    i) achieves a group number of 1 or 2; and
    ii) does not extend beyond one storey; and
    iii) does not extend beyond one fire compartment; and
    iv) is separated vertically from other signs permitted under (h) by at least 2 storeys.

It is anticipated that the smoke flashing will be used at the slab edge in lieu of fire rated construction and as such the horizontal FRL does not extend fully to the outer construction. Where this is the case a performance solution will need to be prepared by the fire engineer.

11.4 Separation of equipment (C2.12)

Equipment listed below must be separated from the remainder of the building providing a FRL as required by Specification C1.1 but not less than 120/120/120 with a self-closing fire door with an FRL or not less than -/120/30.

a) Lift motors and lift control panels; or
b) Emergency generators used to sustain emergency equipment operating in the emergency mode; or
c) Central smoke control plant; or
d) Boilers; or
e) A battery system installed in that building that has total voltage of 12 volts or more and a storage capacity of 200kWh or more.

11.5 Vertical Separation of openings in external walls (BCA C2.6)

A building of Type A construction must be provided with spandrel separation between openings on different storeys unless the building is protected with a sprinkler system throughout in accordance with Specification E1.5.

As DTS departures with the sprinkler system have been identified, either a design amendment or fire engineered performance solution is required.

11.6 Protection of Openings in External Walls (BCA C3.2 / C3.3 / C3.4)

The prescriptive provisions of the BCA stipulate that any external opening within 3m of the boundary, within 6m of the far boundary of a road, river, lake or the like that adjoins the allotment, or within 6m of

another building on the allotment requires protection by -/60/- fire rated construction, or externally located wall wetting sprinklers.

Where a building is separated into fire compartments, the distance between parts of external walls and openings within them must be not less than the table below unless those parts of each external wall has an FRL not less than 60/60/60 and openings are protected.

Angle Between Walls	Minimum Distance
0° (walls opposite)	6m
More than 0° to 45°	5m
More than 45° to 90°	4m
More than 90° to 135°	3m
More than 135° to 180°	2m
More than 180°	Nil

Table 5 – Table C3.3
Source: BCA 2019 Amendment 1

Fire source feature is defined as;

a) The far boundary of a road, river, lake or the like adjoining an allotment,
b) The side or rear boundary of the allotment,
c) The external wall of another building on the allotment which is not a class 10 building.

11.7 Protection of Openings fire rated building elements (BCA C3.5 and BCA C3.10)

The prescriptive provisions of the BCA stipulate that openings within building elements required to have an FRL shall be protected as follows:

a) Penetrations through fire rated floors to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a fire rated shaft achieving an as required by the building element.
b) Any penetration through a wall or room required to have an FRL (e.g. substation) is to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a shaft achieving an FRL of 120 minutes or higher is required by the building element;
c) Self-closing -/60/30 fire doors to the doors opening to the fire isolated stairs (note that this also includes the access doors to the condenser units on the plant platforms).

Note that where fire dampers, fire collars, etc are utilised, allowance needs to be made for access hatches to be provided within the walls / ceilings to ensure that maintenance access is provided.

As the design develops, details will need to be included in relation to sealing of penetrations / construction of fire rated shafts.

Openings are located within 3m of the fire source feature and required to be protected as per the requirements of C3.4 from a DTS perspective.

12. Access and Egress

12.1 Provision for Escape (BCA D1)

The egress provisions for the proposed building are provided by the following:

- Fire isolated stairways

Detailing issues that will need to be addressed as the design develops include:

- Door Hardware
- Exit Door Operation
- Stair Construction
- Handrail and Balustrade construction
- Discharge from Fire Isolated Exits
- Details of the egress provisions to the Road.
- Door swings

12.2 Travel via Fire Isolated Exits (BCA D1.7)

The proposed exits are required to be fire isolated.

The BCA requires each fire isolated stairway to provide independent egress from each storey served and discharge directly, or by way of its own fire isolated passageway to:

- A road or open space; or
- To a point in a storey within the confines of the building, that is used only for pedestrian movement, car parking or the like and is open for at least 2/3 of its perimeter, and an unimpeded path of travel not more than 20m to a road or open space; or
- A covered area that adjoins a road or open space, is open for at least 1/3 of its perimeter, has an unobstructed clear height throughout of not less than 3m, and provides an unimpeded path of travel to a road or open space of not less than 6m.

12.3 Fire Stair Re-Entry (BCA D2.22)

The re-entry requirements associated with the fire isolated exits serving storeys above any effective height of 25m are noted below:

The requirement for doors to remain unlocked do not apply to a door fitted with a fail-safe device that automatically unlocks the door upon activation of a fire alarm and –

a) On at least every fourth storey the doors are not able to be locked and a sign is fixed on such doors stating that re-entry is available; or

b) An intercommunication system, or an audible or visual alarm system operated from within the enclosure is provided, and a sign is fixed adjacent to such doors explaining its purpose and method of operation.

The fire engineer has proposed a performance solution to support the fire-isolated stairs being locked from the stair side in normal mode-operation and be provided with a manual break glass device on the stair side at every fourth level, in lieu of a door that is not able to be locked, or an intercom on every level.

12.4 Exit Travel Distances (BCA D1.4, D1.5)

The travel distances to exits should not exceed:

Class 7a

- no point on the floor must be more than 20m to a single exit or point of choice and where two exits are provided, a maximum of 40m to one of those exits; and
- exits shall be located to not be more than 60m apart and not closer than 9m

In the below instances travel distance exceeds the abovementioned criteria:

Basement P2
- Travel distance up to 42m to an exit where two exits are available

Basement P1
- Travel distance up to 47m to an exit where two exits are available

The abovementioned travel distances do not include fit-out.

Distances between alternative exits exceed the requirements of clause D1.5 of the BCA in the following area:

- Alternative exits are up to 79m apart in lieu of 60m in the basement.

12.5 Dimensions of Exits (BCA D1.6)

Minimum dimensions of 1000mm and 2000mm height to be provided within exits, with the paths of travel should provide a minimum width of 1000mm (note that all maintenance access, cat walks, etc may comply with AS1657-2018 in which case a 600mm clear width is required).

The following table summarises the exit widths required by BCA Clause D1.6:

Storey	Number of people	Exit Width Provided	Exit Width Required
Basement P2	66	4m	1m
Basement P1	89	4m	1m

Table 6 – Dimensions of exits

Doorways are permitted to contain a clear opening width of the required width of the exit minus 250mm, with a height of 1980mm as part of egress requirements. Access for persons with disabilities however requires a clear doorway opening width of 850mm (i.e. minimum 920 mm doors).

12.6 Balustrades and Handrails (BCA D2.16 / BCA D2.17)

Generally

Balustrading to a minimum height of 1000mm with a maximum opening of 124mm in any direction should be provided adjacent to balconies, landings, atrium, corridors etc where located adjacent to a change in level exceeding 1000mm, or where it is possible to fall through an openable window located more than 4m above the surface beneath.

Where it is possible to fall more than 4m to the surface below, the balustrade shall not contain any horizontal or near horizontal members that facilitate climbing between 150 – 760mm above the floor.

Handrails should generally be provided at a minimum height of 865mm alongside of all ramps and stairs.

The public stairs and ramps located along an accessible path of travel should be designed in accordance with the requirements of AS1428.1 for persons with disabilities. This requires a handrail on each side of the stair and ramp and for the handrail to extend approximately 550mm – 600mm past the last tread / end of ramp.

Fire Isolated Stairways

Balustrades in the fire isolated stairways are permitted to contain a 3 rail system, with a bottom rail situated at not more than 150mm above the nosings. The distance between the rails shall not exceed 460mm.

Handrails are required on both sides of all stairways except for fire isolated stairways used only for emergency egress purposes.

Note: in a required exit serving an area required to be accessible, handrails must be designed and constructed to comply with Clause 12 of AS1428.1-2009

12.7 Slip Resistance

The adoption of BCA 2014 introduced a requirement for slip resistance of stairway treads and ramp surfaces. The requirements are as follows:

Table D2.14 SLIP-RESISTANCE CLASSIFICATION

Application	Surface conditions	
	Dry	Wet
Ramp steeper than 1:14	P4 or R11	P5 or R12
Ramp steeper than 1:20 but not steeper than 1:14	P3 or R10	P4 or R11
Tread or landing surface	P3 or R10	P4 or R11
Nosing or landing edge strip	P3	P4

Table 7 – Table D2.14

13. Services and Equipment

The following section of this report describes the essential fire safety measures and the minimum performance requirements of those measures. A draft essential fire safety schedule can be found in Appendix B.

13.1 Fire Hydrants (BCA E1.3)

A system of Fire Hydrants is required to be provided in accordance with BCA Clause E1.3 and AS2419.1-2005 however the fire service engineer has proposed to utilise AS2419.1-2017. The use of this system is subject to endorsement from FRNSW through the 144 process.

The building is required to be provided with a booster assembly as part of the fire hydrant requirements. The booster is required to be located within sight of the main entry to achieve compliance with the deemed-to-satisfy provisions. The current design documentation includes the location of the booster assembly in a location that is not in sight of the main entrance of the building. The location of the booster assembly is to be reviewed by the Fire Engineer, in consultation with FRNSW.

Fire services infrastructure is proposed to be located in the basement where there is no physical separation between building.

It is proposed to install a combined hydrant and sprinkler system and due to the nature of a scissor stairs, internal hydrants will not be located within a single fire compartment.

13.2 Fire Hose Reels

A Fire Hose Reel System is required to BCA Clause E1.4 and AS2441-2005 for the basement areas.

Fire hose reels are to be located within 4m of exits and provide coverage within the building based on a 36m hose length and 4m of water spray. Where required, additional fire hose reels shall be located internally as required to provide coverage. These hose reels are to be located adjacent to internal hydrants.

Fire hose reel cupboards must not contain any other services and also not have any storage within the cupboards, and doors to fire hose reel cupboards are not to impede the path of egress.

Fire Hose reel are not to extend through Fire and Smoke Walls.

13.3 Fire Extinguishers (BCA E1.6)

The provision of portable fire extinguishers is required to BCA Clause E1.6 and AS2444 – 2001.

Table E.6 details when portable fire extinguishers are required:

Occupancy Class	Risk Class (as defined in AS 2444)
General provisions – Class 2 to 9 buildings (except within sole-occupancy units of a Class 9c building)	a) To cover Class AE or E fire risks associated with emergency services switchboards. (Note 1) b) To cover Class F fire risks involving cooking oils and fats in kitchens. c) To cover Class B fire risks in locations where flammable liquids in excess of 50 litres are stored or used (not excluding that held in fuel tanks of vehicles). d) To cover Class A fire risks in normally occupied fire compartments less than 500m2 not provided with fire hose reels (excluding open deck carparks). e) To cover Class A fire risks in classrooms and associated schools not provided with fire hose reels. f) To cover Class A fire risks associated with Class 2 or 3 building or class 4 part of building.

Table 8 – Table E1.6

Fire extinguishers are to be located in accordance with AS 2444 - 2001, often collocated with fire hydrants and/or fire hose reels.

13.4 Automatic Sprinkler Protection (BCA E1.5)

Automatic sprinkler protection is required to Specification E1.5 and AS2118.1-2017 to the following areas:

- Throughout the entire building as it has an effective height which exceeds 25m;

The sprinkler system shall be connected to and activate an occupant warning system complying with BCA Specification E2.2a.

An occupant warning system should be provided in accordance with BCA Specification E1.5.

The AS2118.1-2017 version of the sprinkler standard has been proposed which is a technical departure with the provisions of AS2118.6-2012 which requires AS2118.1-1999 to be used.

13.5 Smoke Hazard Management (BCA E2.2)

The Deemed to Satisfy provisions of the BCA require the following Smoke hazard management:

- Zone Smoke Control in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1;
- Automatic shutdown of mechanical systems in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1;
- Automatic smoke exhaust system activated by Automatic Smoke Detection & Alarm System in accordance with the requirements of BCA Spec E2.2a and AS1670.1-2018

- Automatic smoke detection and alarm system in accordance with the requirements of BCA Spec E2.2a and AS 1670.1-2018;
- Automatic air pressurisation for fire isolated exits in accordance with AS/NZS1668.1-2015 Amendment 1;
- Automatic smoke detection and alarm system complying with BCA Specification E2.2a AS/NZS1668.1-2015 Amendment 1;
- Carpark ventilation systems must comply with Clause 5.5 of AS/NZS1668.1-2015 Amendment 1 except that fans with metal blades suitable for operation at normal temperature may be used and the electrical power and control cabling need not be fire rated

Due to the connectivity between buildings, the smoke hazard management and alarm systems of all buildings will not be in accordance with the DTS provisions of the BCA.

Building 1 and Building 2 will not have any physical separation at basement level. The alarm cascading strategy will not be DTS.

A fire indicator panel is required as part of the detection system. This panel is to be located within the fire control room as noted in Specification E1.8. Any variation to the prescriptive provisions will require the consent of the fire brigade and should form part of the fire safety engineering report to verify the performance requirements of the BCA.

13.6 Lift Services (BCA E3.4 and BCA E3.6)

The passenger lifts to be installed are to be:-

- Fitted with warning signs, fire service controls in accordance with Clauses E3.3, Figure E3.3, E3.7, E3.9 and E3.10 of the BCA.
- Stretcher facilities are to be provided within the lifts with minimum dimensions of 600m wide, 2000mm long and 1400mm high;
- At least two emergency lifts with stretcher facilities in accordance with Part E3.4 of the BCA. The two emergency lifts shall be located in separate shafts. These lifts are to serve all storeys that are served by passenger lifts.
- Be provided with the following in order to satisfy accessibility requirements:
  - A handrail in accordance with AS1735.12-1999,
  - Minimum internal floor dimensions of 1400 x 1600mm for lifts which travel more than 12m, or 1100 x 1400mm for lifts which travel not more than 12m,
  - Fitted with a series of door opening sensory devices which will detect a 75mm diameter or across the door opening between 50mm and 1550mm above floor level,
  - Have a set of buttons for operating the lift located at heights above level complying with AS1735.12 - 1999
  - For lifts serving more than 2 levels, automatic audible information within the lift car identifying the level each time the car stops, and audible and visual indication at each lift landing to indicate the arrival of a car

13.7 Exit Signs and Emergency Lighting (BCA E4.2 and BCA E4.5)

Emergency Lighting and Exit Signs indicating exit location paths of travel to exits to be provided in accordance with BCA Part E4 and AS/NZS 2293.1-2018, including the potential use of photo luminescent exit signs.

The red EVACUATE signs will be omitted as part of the fire engineering report for the project.

13.8 Sound Systems and Intercom Systems for Emergency Purposes (BCA E4.9)

A Sound System and Intercom System is required in accordance with AS1670.4-2018 and BCA Clause E4.9

13.9 Fire Control Room (BCA E1.8)

As the building has an effective height of greater than 50m the fire control centre must be located within a dedicated room in accordance with the requirements of BCA Specification E1.8.

The following elements of the fire control room (FCR) will need to form part of the fire engineering strategy for the building:

- The building has multiple entrances and as a result the FCR will not be located at the main entrance,
- Alternative path to the FCR is not from a public place as a result of the double doors between the commercial entry and the shuttle lift lobby,
- Access to the FCR from the street exceeds 300mm,
- The current design includes internal walls which are less than 2.5m which do not meet the requirements of Spec E1.8,
- Path from outside of the building is via an airlock and in lieu of being from a fire stair or directly outside of the building.

5.10 Fire Precautions During Construction (BCA E1.9)

After the building has reached an effective height of 12m, the following fire services are required to be operational:

- Required fire hydrants and fire hose reels on every storey covered by the roof/floor structure (except the 2 uppermost storeys); and
- Booster connections installed.

Due to the height of the building this will need to be considered and implemented during construction.

14. Health and Amenity

14.1 Sanitary Facilities (BCA F2.2 and BCA F2.3)

The sanitary facilities for the building are provided within the building for the car park population and has been considered in the overall sanitary facilities.

14.2 Waterproofing (BCA FP1.4)

Performance Requirement FP1.4 which relates to the prevention of the penetration of water through external walls, must be complied with. It is noted that there are no Deemed-to-Satisfy Provisions for this Performance Requirement in respect of external walls.

As such, a performance solution is to be prepared by a suitably qualified professional that demonstrates that the external walls of the proposed building complies with Performance Requirement FP1.4 which reads as follows:

A roof and external wall (including openings around windows and doors) must prevent the penetration of water that could cause—

a) unhealthy or dangerous conditions, or loss of amenity for occupants; and
b) undue dampness or deterioration of building elements.

External above Ground Membranes

All external above ground areas (roof slabs, balconies etc.) shall be protected by a waterproofing system in accordance with AS4654 Parts 1 and 2 – 2012.

14.3 Stormwater Drainage

Stormwater drainage systems serving the building are to comply with AS3500.3 - 2018.

The use of a syphonic stormwater drainage system is not covered by Australian Standards and an appropriate performance solution will need to be documented by the hydraulic consultant addressing the system compliance against BCA Performance Requirements FP1.2 & FP1.3.

15. Energy Efficiency

15.1 SECTION J (JP1 Energy Use)

Efficient energy use must be achieved appropriate to the function and use of the building, level of human comfort, solar radiation, energy source of the services and sealing of the building envelope. To achieve this JV1, JV2, JV3 and JV4 verification methods have been introduced as options available to achieve compliance.

It is noted that a deemed to satisfy pathway is still available.

Access for maintenance is to be provided to the building in accordance with the requirements of BCA Part J8.

The proposed site will be located in a climate zone 5.

Certification from an appropriately qualified engineer should be provided for either option with a report / computations outlining how compliance is achieved.

16. Access for People with Disabilities

The development is required to comply with the accessibility provisions contained within:

- The Building Code of Australia 2019 Amendment 1;
- Disability (Access to Premises – Buildings) Standards 2010;
- AS1428.1-2009 General Requirements for Access – New Building Work;
- AS1428.4.1 -2009 Tactile Ground Surface Indicators
- AS2890.6-2009 Car Parking for People with Disabilities

Note: With the introduction of the Commonwealth *Disability Discrimination Act (DDA)* in 1992 (enacted in 1993), all organisations have a responsibility to provide equitable and dignified access to goods, services and premises used by occupants. Organisations and individuals since its introduction, are required to work to the objects of the Act which are to eliminate, as far as possible, discrimination against persons on the ground of disability in the **areas of work, accommodation, education, access to premises, clubs and sports, and the provision of goods, facilities, services and land, existing laws and the administration of Commonwealth laws and programs.**

This report assesses against the requirements contained with the Building Code of Australia (and documents referred to therein) and is not considered to be a full assessment against the Disability Discrimination Act.

16.1 General Building Access Requirements (BCA D3.1)

Access for people with disabilities shall be provided to and within the building in accordance with the requirements of Clause D3.2, D3.3 and D3.4 of the BCA 2019 and AS 1428.1. Parts of the building required to be accessible shall comply with the requirements of:-

- AS1428.1-2009 General Requirements for Access – New Building Work;
- AS1428.4.1 -2009 Tactile Ground Surface Indicators
- AS2890.6-2009 Car Parking for People with Disabilities

Access for persons with a disability is to be provided as follows:

Car parks (Class 7a buildings)

To and within any level containing accessible car parking spaces.

16.2 Provision for Access to Buildings

The BCA prescribes access to be provided to and within the building as follows:

- Via the principle pedestrian entry and at least 50% of all other entrances from the allotment boundary
- From designated car parking spaces for the use of occupants with a disability.

- From another accessible building connected by a pedestrian link.
- All areas used by the occupants.

In buildings over 500m^2 in floor area, a non-accessible entrance must not be located more than 50m from an accessible entrance.

Where a pedestrian entry contains multiple doors, the following is required;

- Entrance containing not more than 3 doors, at least one of the doorways must be accessible.
- Where an entrance contains more than 3 doors, not less than 50% of the doorways must be accessible.

A door is considered to be accessible if it is automatic (open and closing) or is more than 850mm in clear opening width and contains the required door circulation space.

16.3 Accessibility within Building (BCA D3.3)

A building required to be accessible is required to be equipped with either a AS 1428.1 compliant lift or AS 1428.1 compliant ramp, (but the maximum vertical rise of a ramp must not exceed 3.6m).

An exemption to not provide either a lift or ramp exists for class 5, 6, 7b, or 8 buildings, where a building contains;

a) Less than 3 storeys; and
b) Floor area of each storey (excluding the entrance level) is not more than 200m^2.

Within the building the following are required;

- Door circulation space as per AS1428.1 Clause 13.3
- Doorways must have a clear opening of 850mm;
- Passing spaces (1.8m wide passages) must be provided at maximum of 20m intervals
- Within 2.0m of end access ways/corridors, turning areas spaces are required to be provided.
- Carpet pile height of not more than 11mm to an adjacent surface and backing <4mm
- Any glazing capable of being mistaken for a doorway or opening must be clearly marked (or contain chair rail, handrail or transom as per AS 1288 requirements)

The design would generally comply with the prescriptive provisions of the BCA with additional ongoing review being undertaken as to door widths, circulation, etc. Further details are to be provided or access to these areas is to be assessed by an access consultant.

16.4 Tactile Indicators (BCA D3.8)

Tactile indicators are required to be provided to warn occupants of all stairs (except Fire Isolated stairs) and ramps regardless of public nature or private environment and where an overhead obstruction occurs less than 2.0m above the finished floor level.

16.5 Stairs (BCA D3.3 inter Alia AS1428.1)

Stairs shall be constructed as follows:

a) Where the intersection is at the property boundary, the stair shall be set back by a minimum of 900mm so that the handrail and TGSIs do not protrude into the transverse path of travel.
b) Where the intersection is at an internal corridor, the stair shall be set back one tread width plus 300mm (nominally 700mm as per AS 1428.1-2009 Fig 26(b)), so the handrails do not protrude into transverse path of travel.
c) Stairs shall have opaque risers.
d) Stair nosing shall not project beyond the face of the riser and the riser may be vertical or have a splay backwards up to a maximum 25mm.
e) Stair nosing profiles shall;
   - Have a sharp intersection;
   - Be rounded up to 5mm radius; or
   - Be chamfered up to 5mm x 5mm
f) All stairs, including fire isolated stairs shall, at the nosing of each tread have a strip not less than 50mm and not more than 75mm deep across the full width of the path of travel. The strip may be set back a maximum of 15mm from the front of the nosing. The strip shall have a minimum luminance contrast of 30% to the background. Where the luminous contrasting strip is affixed to the surface of the tread, any change in level shall not exceed a difference of 5mm.

16.6 Signage (BCA D3.6)

As part of the detailed design package, specifications will need to be developed indicating:

- Sanitary Facility Identification Signs (note that they are to comply with BCA Specification D3.6 and include the use of Braille, Tactile, etc and be placed on the wall on the latch side of the facility);
- Directional / Way Finding signs to the Lifts, Sanitary Facilities, etc;
- Hearing Augmentation System;
- Identify each door required by BCA Clause E4.5 to be provided with an exit sign, stating ‘EXIT’ and ‘Level” number
- Braille and tactile signs must be illuminated to ensure *luminance contrast* requirements are met at all times during which the sign is required to be read.

16.7 Lifts (BCA E3.6)

Lifts compliant to BCA E3.6 and BCA E3.7 must be provided, where required to be provided, with a minimum size of 1400 x 1600mm or 1100mm x 1400mm (whichever is appropriate) in size – with appropriate handrails and auditory commands.

17. Appendices

17.1 Appendix A – Reference Documentation

The following documentation was used in the assessment and preparation of this report:

Drawing No.	Title	Date	Revision
DA0001	COVER SHEET	31/07/20	B
DA0090	BASEMENT – FLOOR PLAN LEVEL 00	31/07/20	B
DA0091	BASEMENT – FLOOR PLAN LEVEL P1	31/07/20	B
DA0092	BASEMENT – FLOOR PLAN LEVEL P2	31/07/20	B
DA0101	BASEMENT – LONGITUDINAL SECTION 01	31/07/20	B
DA0102	BASEMENT – CROSS SECTION 01	31/07/20	B
DA0103	BASEMENT – CROSS SECTION 02	31/07/20	B
DA0121	BASEMENT – DEEP PLANTER SECTION 01	31/07/20	B
DA0122	BASEMENT – DEEP PLANTER SECTION 02	31/07/20	B
DA0190	BASEMENT – AREA PLAN 01	31/07/20	B

Table 9 – Reference Documents

17.2 Appendix B – Draft Fire Safety Schedule

	Essential Fire Safety Measures	Standard of Performance
1.	Access Panels, Doors and Hoppers	BCA 2019 Amendment 1 Clause C3.13
2.	Automatic Fail-Safe Devices	BCA 2019 Amendment 1 Clause D2.19 & D2.21
3.	Automatic Smoke Detection and Alarm System	Clause 3 or 4 or 5 BCA 2019 Amendment 1 Spec. E2.2a, AS 1670.1 – 2018, AS/NZS 1668.1 – 2015
4.	Automatic Fire Suppression System	BCA 2019 Amendment 1 Spec. E1.5 & AS 2118.1 – 2017 Amdt 1, AS 2118.6 – 2012 (Combined sprinkler & hydrant)
5.	Emergency Lifts	BCA 2019 Amendment 1 Clause E3.4
6.	Emergency Lighting	BCA 2019 Amendment 1 Clause E4.2, E4.4 & AS/NZS 2293.1 – 2018
7.	EWIS	BCA 2019 Amendment 1 Clause E4.9 & AS 1670.4 - 2018
8.	Emergency Evacuation Plan	AS 3745 – 2010
9.	Exit Signs	BCA 2019 Amendment 1 Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2018
10.	Fire Control Room	BCA 2019 Amendment 1 Spec. E1.8
11.	Fire Dampers	BCA 2019 Amendment 1 Clause C2.12, C3.15, Spec C2.5, D1.7, E2.2, E2.3, F4.12, Spec E2.2, E2.3, Spec E2.2b, Spec G3.8 & AS 1668.1 – 2015
12.	Fire Doors	BCA 2019 Amendment 1 Clause C3.2, C3.4 & C3.8 and AS 1905.1 – 2015
13.	Fire Hose Reels	BCA 2019 Amendment 1 Clause E1.4 & AS 2441 – 2005 Amdt 1
14.	Fire Hydrant System	BCA 2019 Amendment 1 Clause C2.12, E1.3, Spec E1.5a & AS 2419.1 – 2005 Amdt 1
15.	Fire Seals	BCA 2019 Amendment 1 Clause C3.15, C3.16, Spec C3.15, Spec D1.12, & AS 1530.4 –2014

	Essential Fire Safety Measures	Standard of Performance
16.	Fire Shutters	BCA 2019 Amendment 1 Spec. C3.4 & AS 1905.2 – 2005
17.	Fire Windows	BCA 2019 Amendment 1 Spec. C3.4
18.	Lightweight Construction	BCA 2019 Amendment 1 Clause C1.8, Spec C1.8
19.	Mechanical Air Handling System	BCA 2019 Amendment 1 Clause E2.2, AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012
20.	Paths of Travel	EP&A Reg 2000 Clause 186
21.	Portable Fire Extinguishers	BCA 2019 Amendment 1 Clause E1.6 & H3.11, AS 2444 – 2001
22.	Pressurising Systems	BCA 2019 Amendment 1 Clause E2.2 & AS/NZS 1668.1 – 2015
23.	Required Exit Doors (power operated)	BCA 2019 Amendment 1 Clause D2.19 (b)(iv)
24.	Smoke Hazard Management System	BCA 2019 Amendment 1 Part E2 & AS/NZS 1668.1 – 2015
25.	Smoke Dampers	BCA 2019 Amendment 1 Clause Spec E2.2, E2.3, Spec E2.2b, Spec G3.8 & AS/NZS 1668.1 – 2015
26.	Smoke Doors	BCA 2019 Amendment 1 Spec. C3.4
27.	Wall-Wetting Sprinklers	BCA 2019 Amendment 1 Clause C3.4
28.	Warning and Operational Signs	AS 1905.1 –2015, BCA 2019 Amendment 1 Clause D2.23, E3.3

Table 10 – Draft Fire Safety Schedule

17.3 Appendix C – Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2019 Amendment 1:

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS	**Class of building — FRL: (in minutes)**			
	Structural adequacy/Integrity/Insulation			
	2, 3 or 4 part	**5, 7a or 9**	**6**	**7b or 8**
EXTERNAL WALL (including any column and other building element incorporated within it) or other external building element, where the distance from any fire-source feature to which it is exposed is -				
For *loadbearing* parts-				
less than 1.5 m	90/ 90/ 90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/ 60/ 60	120/ 90/ 90	180/180/120	240/240/180
3 m or more	90/ 60/ 30	120/ 60/ 30	180/120/ 90	240/180/ 90
For non-*loadbearing* parts -				
less than 1.5 m	–/ 90/ 90	–/120/120	–/180/180	–/240/240
1.5 to less than 3 m	–/ 60/ 60	–/ 90/ 90	–/180/120	–/240/180
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an *external wall*, where the distance from any *fire-source feature* to which it is exposed is -				
less than 3 m	90/–/–	120/–/–	180/–/–	240/–/–
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS	90/ 90/ 90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS				
Fire-resisting lift and stair *shafts*				
Loadbearing	90/ 90/ 90	120/120/120	180/120/120	240/120/120
Non-*loadbearing*	–/ 90/ 90	–/120/120	–/120/120	–/120/120
Bounding *public corridors*, public lobbies and the like				

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS	Class of building — FRL: (in minutes) *Structural adequacy/Integrity/Insulation*			
	2, 3 or 4 part	5, 7a or 9	6	7b or 8
Loadbearing	90/ 90/ 90	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*				
Loadbearing	90/ 90/ 90	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Ventilating, pipe, garbage, and like *shafts* not used for the discharge of hot products of combustion				
Loadbearing	90/ 90/ 90	120/ 90/ 90	180/120/120	240/120/120
Non-*loadbearing*	–/ 90/ 90	–/ 90/ 90	–/120/120	–/120/120
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES				
and COLUMNS	90/–/–	120/–/–	180/–/–	240/–/–
FLOORS	90/ 90/ 90	120/120/120	180/180/180	240/240/240
ROOFS	90/ 60/ 30	120/ 60/ 30	180/ 60/ 30	240/ 90/ 60

Table 11 – Fire Resistance Levels

Table 3.9 REQUIREMENTS FOR CARPARKS		FRL (not less than) Structural adequacy/Integrity/Insulation ESA/M (not greater than)
Wall		
(a)	External wall	
	(i) less than 3 m from a fire-source feature to which it is exposed:	
	Loadbearing	60/60/60
	Non-loadbearing	–/60/60
	(ii) 3 m or more from a fire-source feature to which it is exposed	–/–/–
(b)	internal wall	
	(i) loadbearing, other than one supporting only the roof (not used for carparking)	60/–/–
	(ii) supporting only the roof (not used for carparking)	–/–/–
	(iii) non-loadbearing	–/–/–
(c)	fire wall	
	(i) from the direction used as a carpark	60/60/60
	(ii) from the direction not used as a carpark	as required by Table 3
Column		
(a)	supporting only the roof (not used for carparking) and 3 m or more from a fire-source feature to which it is exposed	–/–/–
(b)	steel column, other than one covered by (a) and one that does not support a part of a building that is not used as a carpark	60/–/– or 26 m2/tonne
(c)	any other column not covered by (a) or (b)	60/–/–
Beam		

Table 3.9 REQUIREMENTS FOR CARPARKS		FRL (not less than) Structural adequacy/Integrity/Insulation ESA/M (not greater than)
(a)	steel floor beam in continuous contact with a concrete floor slab	60/–/– or 30 m2/tonne
(b)	any other beam	60/–/–
Fire-resisting lift and stair shaft (within the carpark only)		60/60/60
Floor slab and vehicle ramp		60/60/60
Roof (not used for carparking)		–/–/–
Notes:	1.	ESA/M means the ratio of exposed surface area to mass per unit length.

Table 12 – Fire Resistance Levels