



WATERLOO METRO QUARTER OVER STATION DEVELOPMENT

Environmental Impact Statement Appendix R – BCA Assessment

SSD-10437 Southern Precinct

Detailed State Significant Development
Development Application

Prepared for **Waterloo Developer Pty Ltd**

30 September 2020

Reference	Description
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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 BCA Assessment has been prepared by McKenzie Group Consulting to accompany a detailed State significant development (SSD) development application (DA) for the Southern Precinct over station development (OSD) at the Waterloo Metro Quarter site.

As the Certifying Authority we have reviewed the architectural design documents prepared by BatesSmart (refer appendix 1) for compliance with the current building assessment provisions, i.e. the Building Code of Australia 2019 (BCA).

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

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 has been utilised as the version of the BCA applicable at the time of preparation this Report.

3. Introduction

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

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

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

- 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).

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 Southern Precinct (the site) of the Waterloo Metro Quarter site. The site has an area of approximately 4830sqm. The subject site comprises the following allotments and legal description at the date of this report.

- 130–134 Cope Street (Lot 12 DP 399757) (Part)
- 136–144 Cope Street (Lots A-E DP 108312) (Part)
- 93–101 Botany Road (Lot 1 DP 433969 and Lot 1 DP 738891) (Part)
- 156–160 Cope Street (Lot 31 DP 805384)
- 107–117A Botany Road (Lot 32 DP 805384 and Lot A DP 408116)
- 119 Botany Road (Lot 1 DP 205942 and Lot 1 DP 436831)

- 170–174 Cope Street (Lot 2 DP 205942).

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.

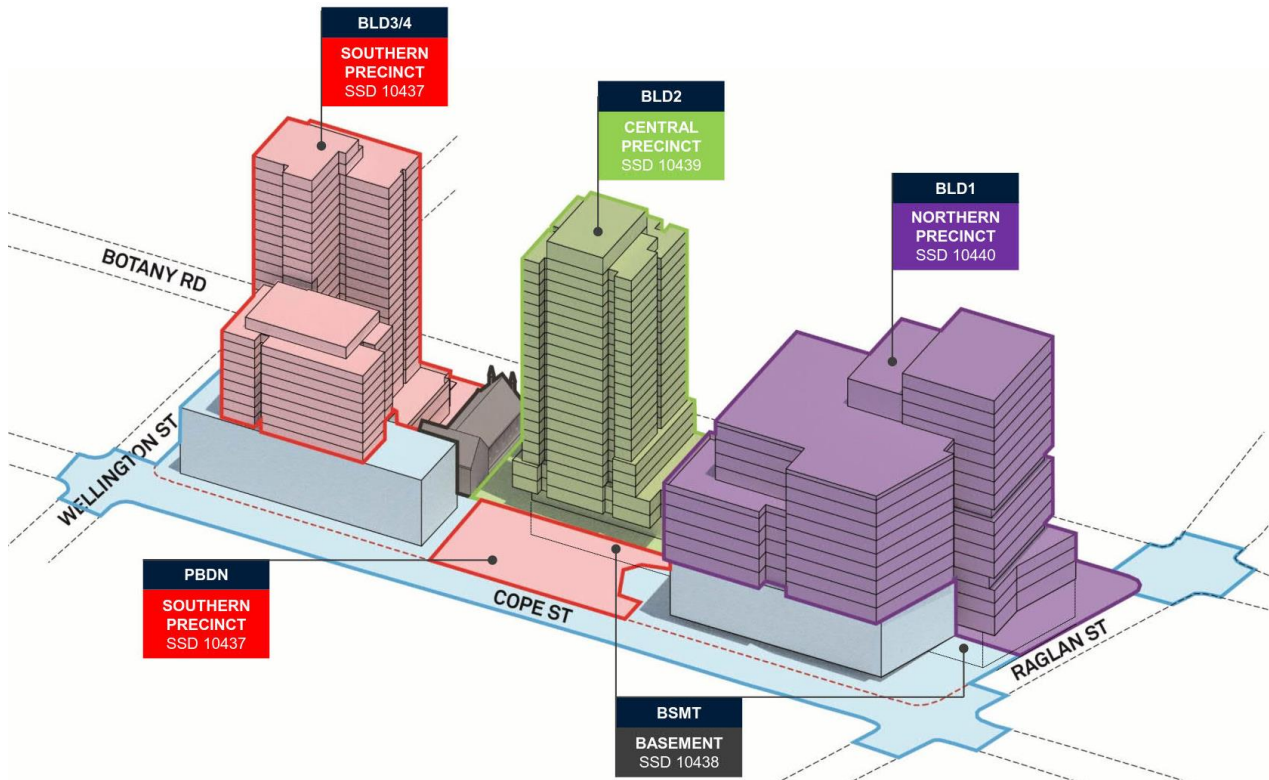


Figure 2 - Waterloo Metro Quarter site, with sub-precincts identified
Source: HASSELL

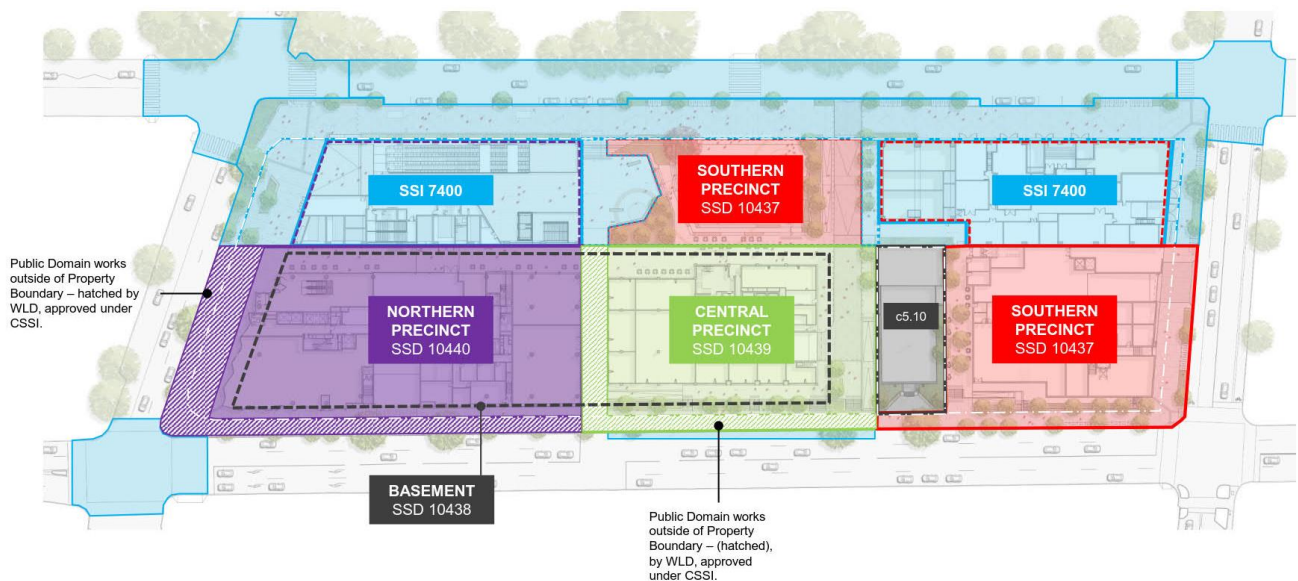


Figure 3 - Waterloo Metro Quarter site, with sub-precincts identified
Source: Waterloo Developer Pty Ltd

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 map illustrates the Sydney Metro network, including existing and planned lines, stations, and construction progress. The network is divided into three main sections: North West Metro (blue line), Sydney Metro City & Southwest (green line), and Sydney Metro West (dark green line). The North West Metro line runs from Tallawong in the north to Macarthur in the south, passing through stations like Schofields, Kellyville, Bella Vista, Norwest, Castle Hill, Cherrybrook, Epping, Macquarie University, Macquarie Park, North Ryde, Chatswood, Victoria Cross, Berangaroo, Sydney CBD, Martin Place, Pitt Street, Central, Waterloo, Sydneyham, Marrickville, Dulwich Park Hill, Canterbury, Campsie, Lakemba, Bankstown, Punchbowl, Willey Park, Belmore, and Liverpool. The Sydney Metro City & Southwest line runs from Westmead in the north to the city center, passing through stations like Paramatta, Sydney Olympic Park, North Strathfield, Five Dock, Burwood North, Sydneyham, Marrickville, Dulwich Park Hill, Canterbury, Campsie, Lakemba, Bankstown, Punchbowl, Willey Park, Belmore, and Liverpool. The Sydney Metro West line runs from Western Sydney International (Nancy Bird Walton) Airport in the north to Macarthur in the south, passing through stations like St Marys, Western Sydney Aerotropolis, and Macarthur. The map also shows the Sydney Trains suburban network (grey lines) and the Sydney Metro West optional station (blue dot). Construction progress is indicated by colored bars: blue for North West Metro, green for Sydney Metro City & Southwest, and dark green for Sydney Metro West. The map includes a key for the different line types and construction status, and a legend for the Sydney Metro West optional station and the Sydney Trains suburban network.

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.

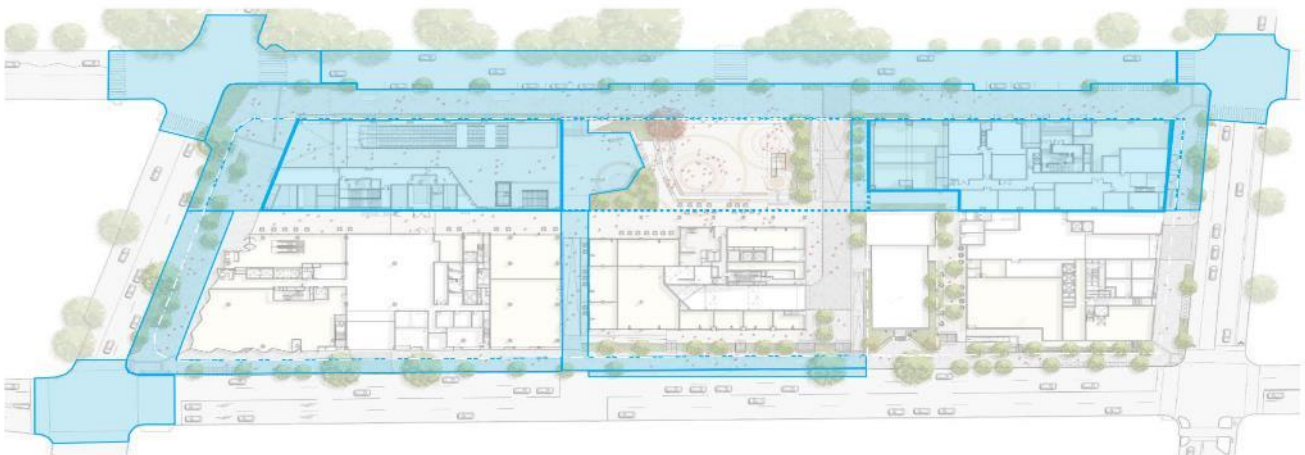


Figure 5 - CSSI Approval scope of works
Source: WL Developer Pty Ltd

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 Southern Precinct of the site, consistent with the parameters of this concept approval. Separate SSD DAs have been prepared and will be submitted for the Basement Car Park, Central Precinct, Northern Precinct and basement car park 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 Southern Precinct.

6.1.1 Southern Precinct [Subject DA]

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

The Basement Car Park comprises:

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

- Retail end of trip and bicycle storage facilities
- residential storage facilities
- shared plant and services.

6.1.3 Central Precinct

The Central Precinct comprises:

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

6.1.4 Northern Precinct

The Northern Precinct comprises:

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

7. Methodology

Compliance Summary

As the Certifying Authority we have reviewed the architectural design documents prepared by BatesSmart (refer appendix 1) for compliance with the current building assessment provisions, i.e. the Building Code of Australia 2019 (BCA).

The report is intended as an overview of the relevant provisions of the BCA for assistance only. Detailed drawings and associated review will be required as the final design is developed.

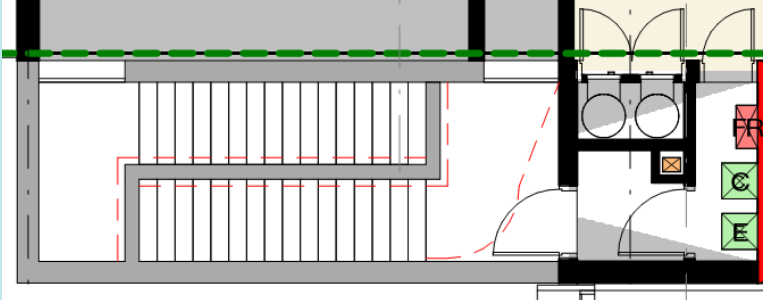
Performance Solutions

The assessment of the design documentation has revealed that the following areas are proposed to be assessed against the relevant performance requirements of the BCA, as they deviate from the deemed-to-satisfy provisions of the BCA.

Subject to review of the finalised Fire Engineering Report, the development is cable of meeting the Performance Requirements of the Building Code of Australia 2019. The Fire Engineering Assessment Report is to be prepared in consultation with Fire & Rescue NSW and submitted as part of the Construction Certificate application.

No.	Performance Solution Description	DTS Clause	Performance Requirements
Fire Safety Items			
1	Fire Resistance Levels (Retail) In accordance with Table 3 of Spec C1.1, class 6 areas are subject to an FRL of not less than 240 minutes The deemed-to satisfy provisions of Spec C1.1 are not met as the Fire Resistance Levels to the Class 6 parts (Retail) are proposed to be rationalised to 120 minutes in lieu of 180 minutes. A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.	C1.1 Spec C1.1	CP1 CP2
2	Fire Resistance Levels (Slabs) In accordance with Table 3 of Spec C1.1, class 2 floors are to have an FRL of not less than 90/90/90.	C1.1 Spec C1.1	CP1 CP2

No.	Performance Solution Description	DTS Clause	Performance Requirements
	<p>The deemed-to-satisfy provisions of Spec C1.1 are not met as the floor of the wet areas are proposed to be rationalised to 60 minutes in lieu of 90 minutes.</p> <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>		
3	<p>Fire Resistance Levels (Bike Storage)</p> <p>In accordance with Table 3 of Spec C1.1, class 7b separating walls and floors are to have an FRL of not less than 240/240/240.</p> <p>The deemed-to-satisfy provisions of Spec C1.1 are not met as the 7b areas (Bike Storage) are proposed to be rationalised to 120 minutes in lieu of 240 minutes</p> <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>	C1.1 Spec C1.1	CP1 CP2
4	<p>Protection of Openings</p> <p>In accordance with C3.2 openings within 6m from another building on the same allotment must be protected in accordance with C3.4.</p> <p>The deemed-to-satisfy provisions of C3.2 are not met as the proposed openings will not be protected.</p> <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>	C3.2 C3.4	CP2
5	<p>Service Penetrations in Fire-Isolated exits</p> <p>In accordance with D2.7 service shafts and services must not be accessed from the Fire Isolated exits, other than any services outlined in C3.9</p> <p>The deemed-to-satisfy provisions of D2.7 are not met as Building 4 Fire Isolated Stair between ground level and</p>	C3.9 D2.7	CP2 CP8 DP5

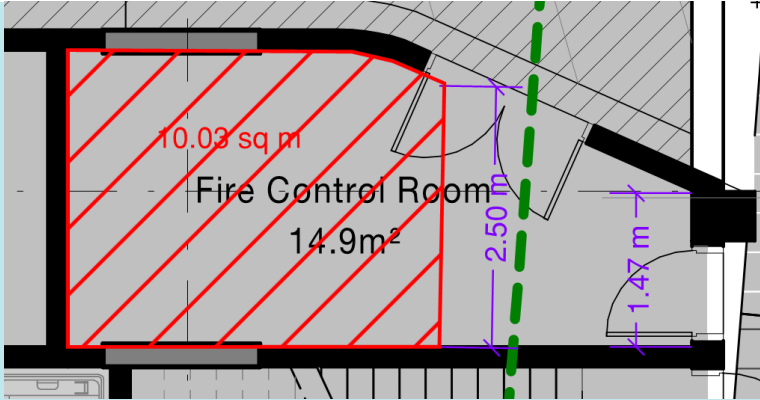
No.	Performance Solution Description	DTS Clause	Performance Requirements
	<p>level 1 contains openings to allow access to electrical services as shown below:</p>  <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>		
6	<p>Number of Exits Required</p> <p>In accordance with D1.2 the buildings are required to have at least 2 exits from each storey as they have an effective height greater than 25m.</p> <p>The deemed-to satisfy provisions of D1.2 are not met as the bike room located on Building 3 Mezzanine level only contains one exit in lieu of two.</p> <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>	D1.2	DP4 EP2.2
7	<p>Exit Travel Distances</p> <p>In accordance with D1.4, no point on a floor must be more than:</p> <p><u>Class 2 & 3:</u></p> <ul style="list-style-type: none"> From SOU doors, 6m to an exit, or point of choice to two exits From common areas, 20m to an exit, or point of choice to two exits. <p><u>Class 6 & 9b Areas (gym and commercial):</u></p> <ul style="list-style-type: none"> 40m to an exit, and 20m to a point of choice (where travel to 2 	D1.4	DP4 EP2.2

No.	Performance Solution Description	DTS Clause	Performance Requirements
	<p>different required exits is available)</p> <p>The deemed-to-satisfy provisions of D1.4 are not met as the following distances are achieved:</p> <p><u>Class 2 & 3 Areas:</u></p> <p>The entrance doorway of any Sole-occupancy unit must not be more than 6m from an exit or point of choice to an exit. In addition, the distance from a common area to an exit, or point of choice to an exit of not more than 20m</p> <ul style="list-style-type: none"> Building 3 contains a distance from a SOU entry door to an exit up to 11m in lieu 6m Building 4 contains distance from a SOU entry door to an exit of up to 13m in lieu of 6m (<i>design change required to reduce this distance – see notes under the further information / review required table</i>) Building 4 contains a point of choice to an exit from the Level 9 Communal Terrace of 28m in lieu of 20m <p><u>Class 6 & 9b Areas (gym and commercial):</u></p> <p>The distance to an exit or point of choice to 2 exits must not exceed 20m. The following areas contain extended distances:</p> <ul style="list-style-type: none"> Building 3 Gym contains a distance to an exit/point of choice of 24m in lieu of 20m Building 3 Bike Store contains a distance to an exit of 21m in lieu of 20m. <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>		
8	<p>Travel via Fire Isolated Exits – Openings into exits</p> <p>In accordance with D1.7, a doorway from a tenancy must not open directly into a fire isolated stair unless that tenancy occupies the entire storey.</p>	D1.7	DP4 EP2.2

No.	Performance Solution Description	DTS Clause	Performance Requirements
	<p>The deemed-to-satisfy provisions of D1.7 are not met as the gym and student communal areas open directly into the fire isolated stairs on levels 1 and 2.</p> <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>		
9	<p>Travel via Fire Isolated exits Discharge</p> <p>In accordance with D1.7, the point discharge of a fire isolated exit must not pass within 6m of any part of an external wall with an FRL of less than 60/60/60 and unprotected windows.</p> <p>The deemed-to-satisfy provisions of D1.4 are not met as the Building 4 stair discharges on ground floor and passes within 6m of the northern façade of building 3.</p> <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>	D1.7	DP4 EP2.2
10	<p>Re-entry From Fire-Isolated exits</p> <p>In accordance with D2.22 doors of a fire-isolated exit must not be locked from the inside as the buildings are over an effective height of 25m.</p> <p>Alternatively, the doors are to be fitted with a fail-safe device that automatically unlocks upon activation of the fire alarm, and at least one of the following options is to be implemented:</p> <ul style="list-style-type: none"> - Every fourth storey the doors must not be locked; or - an intercommunication system, or an audible or visual alarm system is to be provided <p>The deemed-to-satisfy provisions of D2.22 are not met as the fire-isolated stair doors are proposed to be locked from the stair side and will be provided with a manual break glass device at the stair side in lieu of the above Deemed-to-satisfy provisions.</p>	D2.22	DP4

No.	Performance Solution Description	DTS Clause	Performance Requirements
	A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.		
11	<p>Hydrants</p> <p>In accordance with E1.5 and schedule 4 of the NCC, hydrants to be installed in accordance with AS 2419.1-2005.</p> <p>The deemed-to satisfy provisions of E1.3 are not met as hydrants are proposed to be installed in accordance with the 2017 edition of AS 2419.1 which is not adopted in NCC 2019 Amendment 1.</p> <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>	E1.3	EP1.3
12	<p>Sprinkler Protection</p> <p>In accordance with E1.5 sprinkler protection is required to be provided throughout the building in accordance with AS 2118.1-2017.</p> <p>The deemed-to satisfy provisions of E1.5 and Spec E1.5 are not met as Sprinkler protection is proposed to be omitted from the following parts of the building:</p> <ul style="list-style-type: none"> - The Top of the lift shafts - Refuse Chutes <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>	E1.5 & Spec E1.5	EP1.4
13	<p>Vertical Sections in Ring Mains</p> <p>In accordance with E1.5 sprinkler protection is required to be provided throughout the building in accordance with AS 2118.1-2017.</p>	E1.5 & Spec E1.5	EP1.3 & EP1.4

No.	Performance Solution Description	DTS Clause	Performance Requirements
	<p>Due to the scissor stair arrangement in the buildings, the vertical mains pass through the other stair at alternate levels rather than remain in a single fire-isolated stair shaft.</p> <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>		
14	<p>Zone Pressurisation</p> <p>In accordance with table E2.2a zone pressurisation is required to the class 6 (retail) and class 9b (gym) areas.</p> <p>The deemed-to satisfy provisions of E2.2 are not met as The system is proposed to be omitted to the class 6 (retail) and Class 9b (Gym) areas within Building 3.</p> <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>	E2.2	EP2.2
15	<p>Fire Control Room</p> <p>In accordance with E1.8, a Fire Control Room is to be provided for buildings with an effective height of greater than 50m. Specification E1.8 notes that the Fire Control Centre must be at least 10m² with an internal dimension not less than 2.5m at any point.</p> <p>Buildings 3 & 4 share a fire control room located on the ground floor of Building 3.</p> <p>The deemed-to satisfy provisions of Spec E1.8 are not met as the proposed room contains an area less than 2.5m wide internally as shown below</p>	E1.8 Spec E1.8	EP1.6

No.	Performance Solution Description	DTS Clause	Performance Requirements
	 <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>		
16	<p>Emergency Lift</p> <p>In accordance with E3.4, an emergency lift must be provided to serve all storeys that are served by a passenger lift.</p> <p>The deemed-to satisfy provisions of Spec E1.8 are not met as the gym is not provided with access to the emergency lift within the main lift core, and contains a dedicated passenger lift or the use of the gym only.</p> <p>A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>	E3.4	EP3.2
	Miscellaneous Items		
17	<p>Weatherproofing of External Walls</p> <p>As there are no deemed to satisfy provisions relating to the weatherproofing of external walls, a performance solution is to be provided by the façade engineer/registered architect demonstrating that the external walls comply with the requirements of Performance Requirement FP1.4.</p>	-	FP1.4
18	<p>Location of external Openings (Smoke Control System Discharge from Station)</p>	1668.1-2015	N/A

No.	Performance Solution Description	DTS Clause	Performance Requirements
	<p>AS 1668.1-2015 states that separation must be provided between smoke control discharge points, and outdoor air intake, makeup air and natural ventilation openings such that smoke contamination is minimised.</p> <p>The Metro Station building contains smoke control discharge openings within 12m of buildings 3 & 4 openings used for; Natural ventilation, makeup air, air intake and stair pressurisation relief system.</p> <p>As noted by WSP the location of discharge openings is a non-compliance with the provisions of AS 1668.1. The points from part 4 of AS 1668.1 as referenced by WSP are all directed at limiting the location of discharge openings, which in this case are being driven by the station development in lieu of the buildings subject to this development.</p> <p>Buildings 3 & 4 contain natural ventilation openings located within close proximity to station discharge that do not comply with AS 1668.1. This is not a fault with the proposed with the 1668.1 mechanical system for buildings 3 & 4, but instead a trade off from the Stations mechanical design. A performance solution has been proposed and is to form part of the Station Fire Engineering Report and Buildings 3 & 4 Fire Engineering Report as the issue relates to both developments.</p> <p>The locations of the stair pressurization relief and the makeup air openings are subject to compliance with BCA part E2.2 and AS 1668.1 for this development (buildings 3 & 4) which do not comply with the separation requirements in relation to the station discharge vents. A performance solution has been proposed by the design team and is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.</p>		
19	<p>Accessible SOU (Student Accommodation)</p> <p>A minimum of 4% (18 units) of the proposed student accommodation units are required to be accessible.</p> <p>The design team, including DDA consultant, have proposed a performance solution to reduce the number of accessible units for students with a mobility disability, whilst increasing the number of units to cater for students with vision, hearing and intellectual disabilities.</p>	-	Access to Premises Standard

No.	Performance Solution Description	DTS Clause	Performance Requirements
	Three different types of rooms have been proposed, and a Performance Solution is to be prepared by a suitably qualified access consultant in consultation with all stakeholders as part of the Construction Certificate process.		

Table 1 – Summary of Performance Solutions – Performance Requirements

Fire Safety Services

The following key fire safety services are required to meet the minimum DTS requirements.

1. Sprinklers system throughout the building
2. Fire hydrant system throughout the building
3. Fire hose reels throughout the building
4. Zone smoke control system
5. Fire precautions during construction
6. Air-pressurization throughout the fire isolated stairs
7. Automatic smoke detection and alarm system
8. Sound System and Intercom System for Emergency Purposes

Refer to part 7 of this report for further details regarding the required services.

The fire engineered solution relating to category 2 items will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

Further Assessment

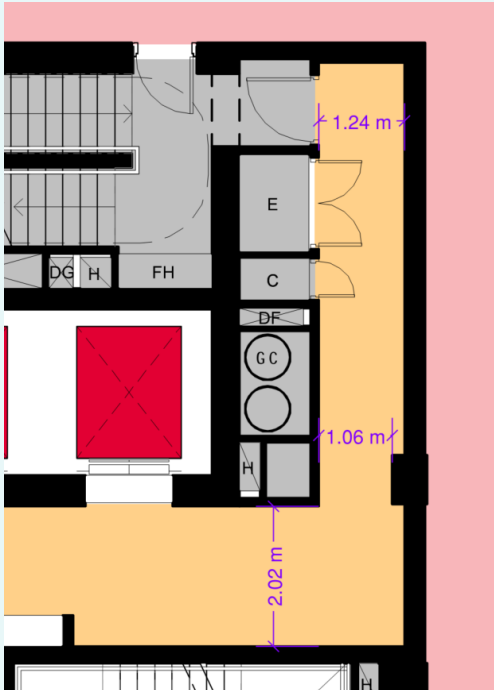
The assessment of the design documentation has also revealed that the following additional information is required in order to complete the assessment, and/or the following areas need to be further reviewed.

Subject to the following items being addressed, the development is capable of complying with the Deemed-to-satisfy provisions and/or Performance requirements of the Building code of Australia 2019.

No.	Further Information / Review Required	NCC Clause
1.	Fire Resisting Construction FRL Plans are to be provided to enable further assessment. This is to include methods of protection to openings.	C1.1 & Spec C1.1

No.	Further Information / Review Required	NCC Clause
2.	<p>Non-combustible Building elements</p> <p>External walls including all components incorporated in them are to be non-combustible.</p> <p>1530.1 Test Reports are to be provided for the following products to enable further review:</p> <ul style="list-style-type: none"> ▪ Insulation ▪ External Wall Cladding ▪ Soffit lining ▪ Sarking <p>This information is to be provided as part of the Construction Certificate Documentation, or as the design develops.</p>	C1.9
3.	<p>Fire Hazard Properties</p> <p>Low Profile rigid ductwork is proposed and must comply with the fire hazard properties in accordance with AS 4254.2-2012:</p> <ul style="list-style-type: none"> ▪ Smoke development index not greater than 3 ▪ Spread of flame index not greater than 0 when tested in accordance with AS 1530.3 <p>An AS 1530.3 test report has been reviewed for the Ducttech Spacesaver Low Profile Duct which meets the above requirements.</p> <p>Where an alternative product is proposed, AS 1530.3 test reports are to be provided for review.</p>	C1.10
4.	<p>Ancillary Elements / Attachments to the façade</p> <p>Ancillary elements attached to the façade are to be deemed non-combustible. Details of the below elements are to be provided to enable further assessment:</p> <ul style="list-style-type: none"> ▪ Aluminium vertical screen ▪ Metal Panel ▪ Building Signage ▪ Awnings 	C1.14
5.	<p>Exit Travel Distances</p> <p><u>Class 2 & 3 Areas:</u></p> <p>The entrance doorway of any Sole-occupancy unit must not be more than 6m from an exit or point of choice. The distance from a common area to an exit, or point of choice to an exit of not more than 20m</p>	D1.4

No.	Further Information / Review Required	NCC Clause
	<ul style="list-style-type: none"> Building 4 contains distance from a SOU entry door to an exit of up to 13m in lieu of 6m <p>A Design amendment is required to reduce the travel distance within the affected area as it cannot be supported at 13m. A distance of up to 12m maximum will be considered</p>	
6.	<p>Swinging Doors</p> <p>A swinging door in a required exit must swing in the direction of egress.</p> <p>The following doors swing in the opposite direction of egress and require a design amendment:</p> <ul style="list-style-type: none"> Ground floor Gym Entry door Ground floor student accommodation lobby Ground floor Community main entry Social Housing Lobby main entry 	D2.20
7.	<p>Access paths of Travel</p> <p>Accessways to be provided to all public/common areas and the entry door of each Sole-occupant units</p> <p>The following areas do not meet the requirements and are to be amended to meet compliance:</p> <p><u>Building 3:</u></p> <ul style="list-style-type: none"> Level 1; Wheelchair turning area to the Student Communal corridor that leads the fire-isolated exit as shown below: 	AS 1428.1

No.	Further Information / Review Required	NCC Clause
	 <ul style="list-style-type: none"> Latch-side clearance to various sole-occupancy units <p><u>Building 4:</u></p> <ul style="list-style-type: none"> Latch-side clearance to various sole-occupancy units 	
8.	<p>Fire Control Room Ventilation</p> <p>Confirmation of the proposed ventilation method to the Fire Control is to be provided to enable further assessment</p>	E1.8
9.	<p>Sanitary Facilities</p> <p>Sanitary facilities are to be provided for the staff and patrons of the gym. Details of the facilities are to be provided to enable further review. The fit-out of the gym, including sanitary facilities is subject to a future DA. For the purpose of Base Building CC and OC approvals, these facilities are to be provided to enable compliance with Part F2 of the BCA.</p>	F2.3
10.	<p>United Building</p> <p>The buildings have been assessed as a united building and must comply with all the requirements for a single building</p>	A7
11.	<p>Lot Boundaries & Protection of Openings</p>	C3.4

No.	Further Information / Review Required	NCC Clause
	<p>Stratum boundaries are shown to separate buildings 3 and buildings 4. Stratum boundaries are not considered fire source features and further information is to be provided should the proposed subdivision change.</p> <p>Although assessed as a united building, building 3 and building 4 upper levels are separate fire compartments. Therefore, building 3 openings within 4m of the station and building 4 are to be protected in accordance with C3.4.</p>	

Table 2 – Further Information – Review

Documentation to enable assessment and demonstrate compliance will be required to address the above items prior to approval.

The application for Construction Certificate shall be assessed under the relevant provisions of the Environmental Planning & Assessment Act 1979 (As Amended) and the Environmental Planning & Assessment Regulation 2000.

8. Preliminaries

8.1 Building Assessment Data

Summary of Construction Determination:

Part of Project	Building 3	Building 4
Classification	3, 6, 9b Student accommodation, Retail(Community) & Gym	2 Social housing
Number of Storeys	26	9
Rise In Storeys	25	9
Type of Construction	A	A
Effective Height (m)	70.97 m (RL 87.35 – RL 16.38)	44.28 m (RL 60.66 – RL 16.38)

Table 3 – Building Assessment Data

Note: The effective height of the project includes all stories included in the rise in stories of the project.

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

Building 3 – Student Accommodation

Part of Project	BCA Classification	Approx. Floor Area (m ²)	Approximate Volume (m ³)	Assumed Population
Ground Floor	3, 6, 7a, 9b	1,045	TBA	143
Community	6	302		101
Loading Dock	7a	200		2
Services, bin room etc	2, 3, 6, 9b	321		11
Student Accommodation Lobby	3	82		17
Gym Lobby	9b	65		7
Social Housing Lobby	2	75		5
Mezzanine	3, 6, 7b	215	TBA	9
Bike Room	7b	92		4
Services	3, 6, 7b	123		5
Level 1	3, 6, 9b	1,116	TBA	272
Gym	9b	469		156

Part of Project	BCA Classification	Approx. Floor Area (m ²)	Approximate Volume (m ³)	Assumed Population
Iglu Communal	3	545		109
Plant / Tanks	3, 6, 9b	91		4
Level 2	3, 9b	971	TBA	243
Gym	9b	537		179
Iglu Communal	3	320		64
Levels 3 - 5	3	683	TBA	42
Levels 6 - 15	3	683	TBA	42
Levels 16 - 22	3	709	TBA	44
Level 23	3	709	TBA	16
Level 24	-	376	TBA	13
Level 25 (Roof)	-	335	TBA	11
Total	3, 6, 7a, 7b, 9b	18,120	TBA	-

Table 4 – Building 3 Student Accommodation

Building 4 – Social Housing

Part of Project	BCA Classification	Approx. Floor Area (m ²)	Approximate Volume (m ³)	Assumed Population
Level 1	2	831	TBA	24
Level 2	2	832	TBA	30
Levels 3 - 7	2	832	TBA	30
Level 8	2	831	TBA	30
Level 9	2	719	TBA	8
Total	2	8,001	TBA	-

Table 5 – Building 4 Social Housing

Notes:

- The above populations have been based on floor areas and calculations in accordance with Table D1.13 of the BCA.

The ground floor loading dock and waste area contains openings which connect buildings 3 & 4. They also share services such as a fire control room.

The buildings have been assessed as a united building and must comply with all the requirements for a single building

8.2 Council Development Approval

A Development Approval will be required from the Local Authority for the development. A copy of the Development Approval conditions and approved drawings will be required prior to the issuing of the Building Approval for that component of works.

The proposed development must not be inconsistent with the endorsed drawings and all relevant conditions will need to be satisfied and accurately reflect the construction issue drawings.

8.3 Copy of Certificate of Title:

A copy of the Certificate of Title and associated plan of subdivision is required. Where it is proposed to construct any part of the building over, under or within an easement, the consent of the relevant authority and Council is required prior to the issue of the Construction Certificate.

9. Structure

9.1 Structural Provisions (BCA B1):

The importance level of the building is 3.

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.

Depending on the importance level of the building as determined by AS/NZS 1170.0-2002, the non structural elements of the building, including partitions (and non-structural fire walls), ceilings, services and racking/shelving may be required to comply with the seismic restraint requirements of AS 1170.4-2007. Where this is required, certification will be required confirming that the design of the seismic restraints comply with AS 1170.4-2002. This may be provided by a specialist seismic consultant or by the architect and services design engineers.

It is noted that BCA 2019 introduced a new Verification Method, BV2, which is a pathway available to verify compliance with BCA Performance Requirement BP1.1(a)(iii).

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.

10. Fire Protection

10.1 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 & 3.9 of Specification C1.1 of the Building Code of Australia 2019.

The building has been assessed on the basis of the following fire separation / compartmentation within the development:

- Bounding construction to the sole occupancy units of 90 minutes,
- Separation between the Loading Dock and the retails portions of 120 minutes
- Separation between the bike store and the remaining building of 240 minutes (Subject to performance solution)
- Fire compartmentation of the building at each floor level

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
9b (Gym)	max floor area—	8 000 m ²	5 500 m ²	3 000 m ²
	max volume—	48 000 m ³	33 000 m ³	18 000 m ³
6 (Retail)	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 6 – Table C2.2

Source: BCA 2019 Amendment 1

The proposed building does not exceed the area and volume limitations

10.2 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 C 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;
- Emergency Generators;
- Electricity Supply;
- Boilers or Batteries;
- Hydrant Pump Rooms;
- 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 minutes.

10.3 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:

- a) Floor Coverings – Critical radiant Flux not less than 1.2 kW/m²
- b) Wall and Ceiling Linings – Material Group No. 1, 2 or 3
- c) Other Materials – Spread of Flame Index not exceeding 9 and Smoke Developed Index not exceeding 8

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.

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 since the building is a Class 2 / Class 3 / Class 9a / Class 9b / Class 9c building;
- All non-loadbearing shafts connecting more than 2 storeys since the building is a Class 5 / Class 6 / Class 7a / Class 7b / Class 8 building.
- All loadbearing internal walls and loadbearing fire walls, including those that are part of loadbearing shafts.

Please provide product specifications and test reports to AS 1530.1-1994 for all materials to demonstrate compliance

For materials and assemblies that are required to be non-combustible, the material or system must be not deemed combustible when tested in accordance with AS 1530.1-1994.

Combustible Materials

The following materials, though combustible or containing combustible fibres, may be used wherever a non-combustible material is required:

- a) Plasterboard.
- b) Perforated gypsum lath with a normal paper finish.
- c) Fibrous-plaster sheet.
- d) Fibre-reinforced cement sheeting.
- e) Pre-finished metal sheeting having a combustible surface finish not exceeding 1 mm thickness and where the Spread-of-Flame Index of the product is not greater than 0.
- f) Sarking type materials that do not exceed 1mm in thickness and have a Flammability Index not greater than 5.
- g) Bonded laminated materials where -
 - (i) each laminate is non-combustible; and
 - (ii) each adhesive layer does not exceed 1 mm in thickness; and
 - (iii) the total thickness of the adhesive layers does not exceed 2 mm; and
 - (iv) the Spread-of-Flame Index and the Smoke-Developed Index of the bonded laminated material as a whole does not exceed 0 and 3 respectively.

It is recommended that once material selections are made, copies of the fire test certificates/reports be provided for review and approval.

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.

Please provide fire hazard properties reports for any proposed signs and confirm their extent i.e. not spanning more than one storey or fire compartment.

10.4 Separation of equipment (C2.12)

Equipment listed below must be separated from the remainder of the building providing a FRL as required by Spec C1.1 but not less than 120/120/120 with a self-closing fire door with an FRL or not less than -/120/30. When separating a lift shaft and life motor room, an FRL of not less than 12/-/- is required.

- 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.

10.5 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.

A Sprinkler system is proposed throughout and therefore spandrels are not required.

10.6 Public Corridors: Class 2 and 3 Buildings (BCA C2.14)

Public corridors exceeding 40m in length to be divided into intervals of not more than 40m by smoke proof walls complying with Clause 2 of BCA Specification C2.5

The corridors do not exceed 40m.

10.7 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 7 – Table C3.3
Source BCA 2019 Amendment 1

Although assessed as a united building, building 3 and building 4 upper levels are separate fire compartments. Therefore, building 3 openings within 4m of the station and building 4 are to be protected in accordance with C3.4.

Fire source feature is defined as;

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

10.8 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:

- 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 FRL in accordance with Spec C1.1
- Any penetration through a wall or room required to have an FRL (e.g. substation, boiler room, apartment separating wall etc) 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 in accordance with Spec C1.1 (or 120/120/120 where it is a room such as a substation);
- 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.

11. Access and Egress

11.1 Provision for Escape (BCA D1)

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

- Fire isolated stairways
- External perimeter doorways
- Required non-fire isolated stairways (gym)
- External Doors
- Fire Isolated Stairs

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

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

A swinging door in a required exit must swing in the direction of egress.

The following doors swing in the opposite direction of egress and require a design amendment:

- Ground floor Gym Entry door
- Ground floor student accommodation lobby
- Ground floor Community main entry
- Social Housing Lobby main entry

11.2 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.

Additionally, where the path of travel from the point of discharge requires occupants to pass within 6m of any part of the external wall of the same building (measured horizontally), that external wall must have a 60/60/60 FRL and have any openings protected internally for a distance of 3m above or below the path of travel.

The Building 4 stair discharges on ground floor and passes within 6m of the northern façade of building 3.

A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.

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

The doors of a fire isolated exit must not be locked from the inside so as to allow provision for fire stair re-entry within fire isolated exits serving any storey above any effective height of 25m.

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.

11.4 Exit Travel Distances (BCA D1.4)

The locations of the proposed exits would appear to indicate that the deemed to satisfy requirements in terms of travel distances, distances between alternative exits and egress widths would be satisfied.

The travel distances to exits should not exceed:

Class 5 to 9

- 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

Class 2 & 3

- 6m from an exit or from a point of choice from the entrance doorway of a sole occupancy unit

- 20m from a single exit at the level of egress to a road or open space
- Alternate exits not more than 45m apart

The locations of the proposed exits indicate that the deemed to satisfy requirements in terms of travel distances would be satisfied, with the exception of the following:

- Building 3 contains a distance from an SOU entry door to an exit up to 11m in lieu 6m
- Building 3 Gym contains a distance to an exit/point of choice of 24m in lieu of 20m
- Building 3 Bike Store contains a distance to an exit of 21m in lieu of 20m.

A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.

In addition to the above, building 4 contains distance from an SOU entry door to an exit of up to 13m in lieu of 6m. A design amendment is required to reduce the travel distance within the affected area as it cannot be supported at 13m.

11.5 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 Required	Exit Width Provided
Ground Floor Iglu	17	1.0	1.0
Ground Floor Community	101	1.25	3.0
Ground Floor Gym	7	1.0	1.25
Level 1 iglu	109	1.25	2.0
Level 1 Gym	156	1.75	3.0
Level 2 iglu	64	1.0	2.0
Level 2 Gym	179	2.0	3.0
Building 3 Levels 3-24	44 max.	1.0	2.0
Building 4 Levels 1-9	30 max	1.0	2.0

Table 8 – Dimension 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).

11.6 Balustrades and Handrails (BCA D2.16 / BCA D2.17 / D2.24)

Generally

Balustrading to a minimum height of 1000mm with a maximum opening of 124mm in any direction should be provided adjacent to balconies, landings, 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

Openable Windows in Bedrooms

In bedrooms of Class 2 and 3 buildings, where the distance from the floor level to the level below exceeds 2m, window openings shall be provided with protection in accordance with BCA Clause D2.24.

Where the lowest part of the window opening is less than 1.7m above a floor, the window opening must be:

- a) Fitted with a device to restrict the opening; or
- b) Fitted with a screen with secure fittings

The device or screen required must –

- a) Not permit a 125mm sphere to pass through it; and
- b) Resist an outward horizontal action of 250N; and

- c) Have a child resistant release mechanism if the screen or device is able to be removed, unlocked or overridden

Further review will be undertaken to ensure compliance as the design develops.

11.7 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 9 – Table D2.14

12. 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 2.

12.1 Fire Hydrants (BCA E1.3)

A system of Fire Hydrants is required to be provided in accordance with BCA Clause E1.3 and AS2419.1-2017.

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 attached to the building at the main entry. If remote from the building, the booster is to be located at the main vehicle entry or with sight of the main entry of the building within 20m of a hardstand area.

A fire ring main is required.

12.2 Fire Hose Reels

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

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 such as water meters, etc., and doors to fire hose reel cupboards are not to impede the path of egress unless an alternative solution is developed under BCA Performance Requirement EP1.1

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

The hose reels coverage plans are to be provided to enable further assessment

12.3 Fire Extinguishers (BCA E1.6)

The provision of portable fire extinguishers is required to BCA Clause E1.6 and AS2444 - 2001 to provide coverage to all zones.

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)	<ul style="list-style-type: none"> 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 10 – Table E1.6

In addition, extinguishers are to be provided to the class 2/3 portions of the building in accordance with the below:

- an ABE type fire extinguisher is to be installed with a minimum size of 2.5 kg; and
- extinguishers are to be distributed outside a sole-occupancy unit:
 - a) to serve only the storey at which they are located; and
 - b) so that the travel distance from the entrance doorway of any sole-occupancy unit to the nearest fire extinguisher is not more than 10 m.

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

The fire extinguisher locations currently indicated are satisfactory.

12.4 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 where the effective height exceeds 25m;

A sprinkler system is required to be provided throughout the whole building. This system is to comply with Specification E1.5a and the relevant parts of Specification E1.5a.

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

Details of the proposed sprinkler system design will need to be reviewed as the design develops.

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

12.5 Smoke Hazard Management (BCA E2.2)

Smoke hazard management shall be provided throughout the building by means of the following systems:

- Zone Smoke Control in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1;
- Automatic Smoke Detection and Alarm System in accordance with the requirements of BCA Spec E2.2a and AS 1670.1-2018;
- Automatic Pressurisation to Fire Isolated Exits in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1
- Automatic smoke detection and alarm system complying with BCA Specification E2.2b and AS/NZS1668.1-2015 Amendment 1;

A fire indicator panel is required as part of the detection system. This panel is to be located within 4m of the main entry and should be incorporated within the fire control room. 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.

12.6 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 600mm 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

The gym is not provided with access to the main lift core and emergency lifts. Design amendment is to be undertaken to meet the Deemed to Satisfied requirements of clause E3.4.

12.7 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.

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

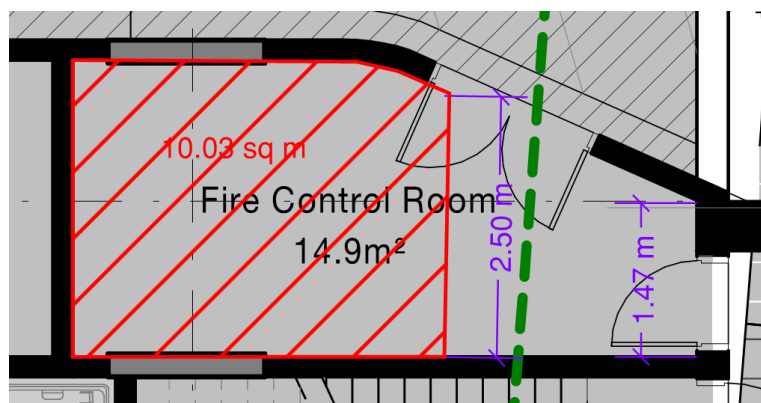
A Sound System and Intercom System is required in accordance with AS1670.4-2018 and BCA Clause E4.9

Details are to be provided for our review.

12.9 Fire Control Centre (BCA E1.8)

As the building has an effective height of greater than 25m, a fire control centre is required. Where the effective height of the building exceeds 50m, the fire control centre must be located within a dedicated room in accordance with the requirements of BCA Specification E1.8

Buildings 3 & 4 share a fire control centre and services provided within Building 3. The area of a fire control room must not be less than 10sqm and not less than 2.5m wide at any point internally. The proposed room contains an area less than 2.5m wide internally as shown below:



A performance solution has been proposed by the design team to justify this non-conformance with the Deemed-to-satisfy provisions. The Performance Solution is to be prepared by a suitably qualified fire engineer in consultation with Fire & Rescue NSW.

12.10 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.

13. Health and Amenity

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

Retail

Separate sanitary facilities are required to be provided for male & female employees. In relation to the public, sanitary facilities are required to be provided either where more than 600 persons can be accommodated (standard shops) or for café / restaurant where there are more than 20 seats.

Apartments

Each apartment is required to be provided with the following:

- A kitchen sink and facilities for the preparation and cooking of food; and
- A bath or shower; and
- A closet pan and wash basin; and
- Clothes washing facilities comprising at least one wash tub and space for a washing machine; and
- Clothes line of at least 7.5m, or space for one heat operated drying device within the same space as the clothes washing.

Gym:

Separate sanitary facilities are required to be provided for male & female employees at a rate at the following.

It is noted that the gym fit-out, including sanitary facilities, is subject to a future DA, however for the purposes of the CC and OC assessment of the base building, facilities are to be provided to comply with part F2 of the BCA. The following table summarises the sanitary facilities required:

Sanitary Facilities Required – Total 114 Occupants (including 14 staff)			
	WC	Urinals	Basins
Male Patrons (50)	5	5	5
Female Patrons (50)	5	-	5
Male Staff (7)	1	0	1
Female Staff (7)	1	-	1

Table 11 – Table F2.3

Detailed designs will need to be developed as to the layout, dimensions, etc of the sanitary facilities.

Note:

The Unisex facilities provided for people with disabilities may be counted once for each sex. These

facilities are to be provided in accordance with AS1428.1-2009.
Occupant Numbers have been provided by the Owner

Bathroom Construction

Where bathrooms or rooms containing water closets have the WC within 1200mm of the doorway, the door shall be either sliding, open outwards, or be provided with removable hinges.

13.2 Floor Wastes

Floor wastes to be provided within bathrooms and laundries where located above another sole occupancy unit. The floor shall be sloped towards these wastes.

Floor wastes are required to be provided where wall hung urinals are provided and the floor shall be sloped towards these wastes.

Floor wastes are not indicated.

13.3 Light and Ventilation (BCA Part F4)

Class 2 & 3:

Natural light and ventilation is to be provided to all habitable rooms at a rate of 10% and 5% of the floor area of the rooms respectively.

A required window that faces a boundary of an adjoining allotment or a wall of the same building or another building on the allotment must not be less than a horizontal distance from that boundary or wall that is the greater of:

- (i) generally — 1 m; and
- (ii) 50% of the square root of the exterior height of the wall in which the window is located, measured in metres from its sill.

Class 6, & 9:

Natural Ventilation is required to be provided to rooms at a rate of 5% of the floor area in openings. Alternatively, mechanical ventilation is required in accordance with AS1668.2-2012

Artificial lighting complying with AS/NZS1680.0-2009 is to be incorporated with the final detailed design to be developed to confirm this.

13.4 Sound Transmission and Insulation (BCA F5)

Building elements within Class 2/3 buildings should provide the following sound insulation levels.

Location	Notes	Sound Insulation Requirement
Walls separating habitable rooms		$R_w + C_{tr} \geq 50$
Walls separating habitable room and kitchen or bathroom	Wall must be of Discontinuous Construction	$R_w + C_{tr} \geq 50$
Floor separating habitable rooms	Impact isolation required	$R_w + C_{tr} \geq 50$ $L_{n,w} + C_i \leq 62$
Duct, soil, waste or water supply pipe, including pipes that is located in a floor or wall cavity, serves or passes through more than one room	Adjacent habitable room or Adjacent non-habitable room	$R_w + C_{tr} \geq 40$ or $R_w + C_{tr} \geq 25$
Door to habitable room		$R_w \geq 30$

Table 12 – Sound Transmission and Insulation
Source BCA 2019 Amendment 1 F5 Specifications

Please provide a report from the acoustic engineer verifying design compliance with the provisions of part F5 of the BCA.

13.5 Condensation management (BCA Part F6)

Pliable building membranes installed to an external wall must achieve compliance with AS 4200.1, be installed in accordance with AS4200.2, be located on the exterior side of the primary insulation layer or the wall assembly and except for the single skin mason and single sin concrete be separated from water sensitive materials.

Exhaust systems must achieve 25L/s for bathrooms and sanitary compartment with discharge directly or via a duct to our door air or to a roof space that is ventilated. Kitchens and laundries to achieve 40L/s and discharge directly or via a shaft or duct to outdoor air.

Exhaust systems discharging directly or via a shaft or a duct to a roof space must be through evenly distributed systems. Opening for minimum flow requirements must have a total unobstructed area of 1/300 of the respective ceiling area if the roof pitch is greater than 22°. 30% of the total unobstructed area required for exhaust being discharged directly or via a shaft or duct to outdoor air must be located not more than 900 mm below the ridge or highest point of the roof space.

13.6 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.

For external balconies the waterproofing membrane must have a vertical upward termination height in accordance with the table below dependant on the wind class of the site. The wind class is determined by the structural engineer.

Wind Class Regions A & B	Wind Class Regions C & D	Ultimate Limit State Wind Speed	Termination Height (mm)
N1	-	34	40
N2	-	40	50
N3	C1	50	70
N4	C2	61	100
N5	C3	74	150
N6	C4	86	180

Table 13 – Wind Class Regions

Wet Areas

Internal wet areas throughout the development (e.g. bathrooms, laundries) shall be waterproofed in accordance with AS3740 - 2010 requirements.

Further review will be undertaken as the design develops with respect to the specification of waterproofing membrane, provision of water-stops at doorways etc.

13.7 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.

14. Energy Efficiency

The deemed-to-satisfy provisions of the BCA only apply to thermal insulation in a class 2 building where development consent or a Complying Development certificate specifies that the insulation is to be provided as part of the development.

The residential (Class 2) portions of the building are subject to BASIX, and a BASIX Certificate will be required prior to the issuance of the Construction Certificate for the works.

14.1 SECTION J (Transition Period)

A transition period applies to Section J requirements, from 1 May 2019 to 30 April 2020 Section J of NCC 2016 Amendment 1 may apply instead of Section J of NCC 2019. From 1 May 2020 Section J of NCC 2019 will apply.

The commentary below is an assessment based on the provisions included in BCA 2019.

14.2 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.

Verification Methods

The Verification Methods available to demonstrate compliance with the BCA on a performance basis are as follows:

JV1 NABERS Energy for Offices

- To achieve compliance with JP1 a class 5 building must achieve a minimum of 5.5 NABERS Energy for Offices Base Building Commitment Agreement and comply with ANSI/ASHRAI Standard 140.
- To achieve the energy model for (JP1 (i)) solar radiation the base buildings greenhouse gas emissions are not more than 67% of the 5.5 star level when excluding:
 - Tenant supplementary heating; and
 - Cooling systems; and
 - External lighting; and
 - Car park services.

- A thermal comfort level between predicted mean vote of -1 to +1 is achieved across not less than 95% of the floor area of all occupied zones for not less than 98% of annual hours of operation.
- The building also needs to comply with additional requirements of Spec JVa.

JV2 Green Star

- To achieve compliance with JP1 for Class 3,4,5,6, 7, 8, 9 and common area of Class 2 buildings Green Star can be used as a verification method when the calculation method complies with ANSI/ASHRAE Standard, Specification JVa and when:
 - The building complies with simulation requirements and is registered for a Green Star – Design & As-Built rating; and
 - The annual greenhouse gas emissions of the proposed building are less than 90% of the annual greenhouse gas emissions of the reference building; and
 - In the proposed building, a thermal comfort level of between predicted mean vote of -1 to +1 is achieved across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation of the building; and
 - The building complies with the additional requirements of Specification JVa.

JV3 Verification Using a Reference Building

- To achieve compliance with JP1 for Class 3,4,5,6, 7, 8, 9 and common area of Class 2 buildings verification using a reference building can be used when the calculation method complies with ANSI/ASHRAE Standard, Specification JVa and when:
 - It is determined that the annual greenhouse gas emissions of the proposed building are not more than the annual greenhouse gas emissions of a reference building when the proposed building is modeled with the proposed services and the proposed building is modeled with the same services as the reference building. The proposed building thermal comfort level is to be between predicted mean vote of -1 to +1 across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation; and
 - The building achieves the additional requirements in Specification JVa; and
 - The greenhouse gas emissions of the proposed building may be offset by renewable energy generated and used on site and another process such as reclaimed energy used on site.

JV4 Building Envelope Sealing

- Compliance with sealing of the building against air leakage is verified when the envelope is sealed at an air permeability rate tested in accordance with Method 1 of AS/NZS ISO 9972, of not more than –
 - For a class 2 building or a class 4 part of a building, 10m³/hr.m² at 50 Pa reference pressure; or
 - For a class 5, 6, 8, 9a or 9b building other than a ward area in climate zones 1, 7 and 8, 5 m³/hr.m² at 50 Pa reference pressure; or
 - For class 3 or 9c building, or a class 9a ward area in climate zones 1, 3, 4, 6, 7 and 8 5m³/hr.m² at 50 Pa reference pressure.
- Part J3 and performance solution that uses one of the other NCC assessment Methods which verifies that compliance with JP1 (e) will be achieved can also be used as verification methods.

14.3 Building Fabric (Part J1)

Roof and Ceiling Construction (Part J1.3)

For a deemed-to-satisfy solution roofs and or ceilings are to be constructed to provide a total R-Value greater than or equal to-

- (i) in climate zone 5, R3.7 for a downward direction of heat flow; and

In climate zone 5 the solar absorptance of the upper surface of a roof must be not more than 0.45.

Where the layer of insulation is penetrated by the percentages as tabled below, additional upgrading of the remainder of the insulation level is required.

To achieve compliance with J0.2 (c) a roof that has a metal sheet roofing fixed to metal purlins, metal rafters or metal battens and does not have a ceiling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens must have a thermal break. The thermal break to be consisting of a material with a R-Value of not less than R0.2, installed at all points of contact between the metal sheet roofing and its supporting metal purlins, metal rafters or metal battens.

Roof lights (Part J1.4)

Where roof lights are installed they must have :-

- (a) a total area of not more than 5% of the floor area of the room or space served; and
- (b) transparent and translucent elements, including any imperforate ceiling diffuser, with a combined performance of:-
 - (i) for Total system SHGC, in accordance with the below table; and
 - (ii) for Total system U-value, not more than U3.9;

Roof light shaft index (see Note 1)	Total area of roof lights up to 3.5% of the floor area of the room or space	Total area of roof lights more than 3.5% and up to 5% of the floor area of the room or space
Less than 1.0	Not more than 0.45	Not more than 0.29
1.0 to less than 2.5	Not more or equal to than 0.51	Not more than 0.33
Greater than 2.5	Not more than or equal to 0.76	Not more than 0.49

Table 14 – Roof Light Index

External Walls and Glazing (Part 1.5)

For walls and glazing construction the total system U-value must not be greater than-

- (i) for a Class 2 common area, a Class 6, 7, 8 or 9b building, U2.0; and
- (ii) for a Class 3–
 - (a) in climate zones 1, 3, 4, 6 or 7, U1.1; or

- (b) in climate zones 2 or 5, U2.0; or
- (c) in climate zones 8, U0.9;

The total system U-value of wall-glazing construction should be calculated in accordance with Specification J1.5a.

Wall components of the wall-glazing construction must achieve a minimum total R-Value of R1.0 where the wall is less 80% if the area and reflect the value specified in Table J1.5a where the wall is *0% or more of the area.

There are further design parameters for display glazing and solar admittances for wall-glazing construction, both of which should comply with the relevant provisions of J1.5.

To achieve compliance with J0.2 (c) a wall that does not have a wall lining or has a wall lining that is fixed directly to the same metal frame and has a lightweight external cladding such as weatherboards, fibre-cement or metal sheeting fixed to a metal frame must have a thermal break. The thermal break is to consist of a material with an R-Value of not less than R.02, installed at all points of contact between the external cladding and metal frame.

Floors (Part J1.6)

Floors are to achieve an R rating of 2.0.

14.4 Building sealing (Part J3)

Windows and Doors (Part J3.4)

- a) A door, openable window or the alike must be sealed –
 - (i) When forming part of the envelope; or
 - (ii) In climate zones 4,5,6,7 or 8
- b) The requirements of (a) do not apply to –
 - (i) A window complying with AS2047; or
 - (ii) A fire door or smoke door; or
 - (iii) A roller shutter door, roller shutter grille or other security door or device installed only for out of house security
- c) A seal to restrict air infiltration –
 - (i) For the bottom edge of a door, must be draft protection device; and
 - (ii) For the other edged of a door or the edges of an openable window or other such opening, may be a foam or rubber compression strip, fibrous seal or the like.
- d) An entrance to a building, if leading to a conditioned space must have an airlock, self-closing door, rapid roller door, revolving door or the like, other than –
 - (i) When the conditioned space has a floor area of not more than 50m²; or
 - (ii) Where a café, restaurant, open front shop or the like has –
 - (A) A 3m deep un-conditioned zone between the main entrance, including an open front, and the conditioned space; and
 - (B) At all other entrances to the café, restaurant, open front shop or the like, self-closing doors.
 - (iii) A loading dock entrance, if leading to a conditioned space, must be fitted with a rapid roller door or the like

Exhaust fans (Part J3.5)

An exhaust fan must be fitted with a sealing device such as a self-closing damper or the like when serving a conditioned space or a habitable room in climate zones 4, 5, 6, 7, or 8.

Construction of ceilings, walls and floors (Part J3.6)

A seal to restrict air infiltration must be fitted to each edge of the external doors and openable windows. The seals may be foam or compressible strip, fibrous seal or the like. The main entry doors must have either an airlock, or self-closing doors, or a revolving door.

Ceilings, walls, floors and any openings such as a window frame, door frame, roof light frame or the like must be constructed to minimise air leakage in accordance with the below when forming part of –

- (i) The envelope; or
- (ii) In climate zones 4, 5, 6, 7 or 8

Construction required by above must be –

- (iii) Enclosed by internal lining systems that are close fittings at ceiling, wall and floor junctions; or
- (iv) Sealed at junctions and penetrations with –
 - (A) Close fitting architrave, skirting or cornice; or
 - (B) Expanding foam, rubber compressible strip, caulking or the like

The above does not apply to openings, grilles or the like required for smoke hazard management.

Evaporative coolers (Part J3.7)

An evaporative cooler must be fitted with a self-closing damper or the like –

- (a) When serving a heated space; or
- (b) In climate zones 4,5,6,7 or 8.

14.5 Air Conditioning and Ventilation systems (Part J5.0)

Air conditioning and ventilation systems must be designed to comply with the following provisions:

- Be capable of being deactivated when the building or part of a building being served by that system is not occupied;
- Where motorised dampers are in place, they should close when the system is deactivated
- Where serving a sole-occupancy unit in a Class 3 building, must not operate when any external door of the sole-occupancy unit that opens to a balcony or the like, is open for more than one minute;
- Time switches should be provided to control an air-conditioning system of more than 2kW_r and a heater of more than 1kW_{heating} used for air-conditioning, and be capable of switching electric power on and off at variable pre-programmed times on variable pre-programmed days.

- Ductwork and fittings in an air-conditioning system should have insulation complying with AS/NZS 4859.1 and have an insulation R-Value greater than or equal to:-
 - for flexible ductwork R1.0; or
 - for cushion boxes, that of the connecting ductwork; or
 - That specified in Table J5.5

Table J5.5

Location of ductwork and fittings	Climate zone 5
Within a conditioned space	1, 2
Where exposed to direct sunlight	3.0
All other locations	2.0

Table 15 – Location of Ductworks and Fittings

Mechanical:

- Be capable of being deactivated where the building or part of the building served by that system is not occupied
- Time switches must be provided to a mechanical ventilation system with an air flow rate of more than 1000 L/s, capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days;

Heaters

A heater used for air-conditioning or as part of an air-conditioning system must be either a solar heater, gas heater, heat pump heaters, a heater using reclaimed heat or an electric heater.

A gas water heater, that is used as part of an air-conditioning system must:-

- (i) if rated to consume 500 MJ/hour of gas or less, achieve a minimum gross thermal efficiency of 86% ; or
- (ii) If rated to consume more than 500 MJ/hour of gas, achieve a minimum gross thermal efficiency of 90%

Refrigerant chillers

An air-conditioning system refrigerant chiller must comply with MEPS and the full load operation energy efficiency ratio and integrated part load energy efficiency ratio laid out under clause J5.10 of the BCA when determined in accordance with AHRI 551/591

Unitary air-conditioning equipment

Unitary air-conditioning equipment including packaged air-conditioners, split systems, and variable refrigerant flow systems must comply with MEPS and for a capacity greater than or equal to 65 kW_r –

- (a) Where water cooled, have a minimum energy efficiency ratio of 4.0 W_r/ W_{input power} for cooling when tested in accordance with AS/NZS 3823.1.2 at test condition T1, where input power includes both compressor and fan input power; or

- (b) Where air cooled, have a minimum energy efficiency ratio of $2.9 W_r / W_{\text{input power}}$ for cooling when tested in accordance with AS/NZS 3823.1.2 at test condition T1, where input power includes both compressor and fan input power.

14.6 Artificial Lighting and Power (Part J6)

Interior Artificial Lighting and Power Control (Part J6.2 & 6.3)

In a sole-occupancy unit of a Class 2 building the lamp power density/illumination power density of artificial lighting must not exceed the allowance of 5 W/m^2 within a sole-occupancy unit and 4 W/m^2 on a verandah, balcony or the like attached to a sole-occupancy unit.

In a building other than a sole-occupancy unit of a Class 2 building for artificial lighting, the aggregate design illumination power load must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum illumination power density below:-

The maximum illumination power density;

Common rooms, spaces and corridors in a Class 2 building	4.5 W/m^2
Stairways, including fire-isolated stairways	2 W/m^2
Toilet, locker room, staff room, rest room or the like	3 W/m^2
Lift cars	3 W/m^2
Service area, cleaner's room and the like	3 W/m^2
Control room, switch room or the like	
(A) intermittent monitoring	3 W/m^2
(B) Constant monitoring	4.5 W/m^2
Plant room:	
(A) Where an average of 160 lx vertical illuminance is required on a vertical panel such as in switch rooms	4 W/m^2
(B) With a horizontal illuminance target of 80 lx	2 W/m^2
Retail:	14 W/m^2
Corridors:	5 W/m^2
Common rooms, spaces & corridors in a Class 2 building	4.5 W/m^2
Lounge area for communal use in a Class 3 or 9c building	4.5 W/m^2
Dormitory of Class 3 building:	
(A) Used for sleeping only	3 W/m^2
(B) Used for sleeping & study	4 W/m^2
Storage	1.5 W/m^2
Restaurant, café, bar:	14 W/m^2

Artificial Lighting must be controlled by a time switch, other control device or a combination of both.

Each light control in a building must not operate lights within an area of more than;

- 250m² if in a Class 6 building
- Not operate lighting for an area more than -
 - a) 250m² for a space of not more than 2000m²;
 - b) 1000m² for a space of more than 2000m²
- if in a Class 3, 6, & 9 building;
- 1000m² for a space of more than 2000m²

Interior decorative and display lighting

Interior decorative and display lighting, such as for a foyer mural or art display, must be controlled -

- Separately from other artificial lighting; and
- By a manual switch for each area other than when operating times of the displays are the same in a number of areas (e.g. where in a museum) in which case they may be combined; and
- By a time switch in accordance with Specification J6 where the display lighting exceeds 1 kW

Window display must be controlled separately from other display lighting exceeds 1kW.

Exterior artificial lighting

Artificial lighting attached to or directed at the façade of the building if it exceeds a total of 100W must;

- Use LED luminaires for 90% of the total lighting load; or
- Be controlled by a motion detector in accordance with Specification J6 of the BCA;
- When used for decorative purposes, such as façade lighting or signage lighting, have a separate switch in accordance with Specification J6.

Lifts (Part 6.7)

Lifts must be configured to ensure artificial lighting and ventilation in the car are turned off when it is unused for 15 minutes and achieve the idle and standby energy performance level required, and the energy efficiency class under J6.7 of the BCA.

15. Access for People with Disabilities

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

- The Building Code of Australia 2019;
- 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.

15.1 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:

Apartment (Class 2 Buildings)

- From the pedestrian entrance to at least 1 floor containing Sole Occupancy Units and to the entrance door of all Sole Occupancy Units on that floor, and to at least one type of each common facility, such as gyms, shops, laundries (shared), gaming rooms etc.
- Where an AS1428.1 compliant lift or ramp is provided in addition to the above and access is required to and within all spaces, and to the entrance of doors to single occupancy units on the levels, served by the lift or ramp.

Apartment (Class 3 buildings)

- From the pedestrian entrance to at least 1 floor containing Sole Occupancy Units and to the entrance door of all Sole Occupancy Units on that floor, and to at least one type of each common facility, such as gyms, shops, laundries (shared), gaming rooms etc.

- Where an AS1428.1 compliant lift or ramp is provided in addition to the above and access is required to and within all spaces, and to the entrance of doors to single occupancy units on the levels, served by the lift or ramp.

Where individual Class 3 single occupancy units are provided:

1 to 10 single occupancy units	To and within 1 accessible sole occupancy units
11 to 40	To and within 2 accessible sole occupancy units
41 to 60	To and within 3 accessible sole occupancy units
61 to 80	To and within 4 sole occupancy units
81 to 100	To and within 5 sole occupancy units
101 to 200	To and within 5 sole occupancy units and 1 for every 25 sole occupancy units over 100
201 to 500 single occupancy units	To and within 9 accessible sole occupancy units, plus 1 for every 30 units in excess of 200 units
More than 500	To and within 19 accessible sole occupancy units, plus 1 for every 50 units in excess of 500 units

Table 16 – Occupancy Units

- * Not more than 2 required accessible units may be located adjacent to each other; and
- * Where more than 2 sole occupancy units are required to be accessible, they must be indicative of the range of units/rooms available.

Office/shops (Class 5/Class 6 buildings)

To and within all areas normally used by the occupants

15.2 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 500m² 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.

15.3 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 200m².

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, hand rail 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.

15.4 Car Parking (BCA D3.5)

The development does not contain any car parking

15.5 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.

15.6 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.

15.7 Accessible Sanitary Facilities (BCA F2.4)

Unisex Accessible Sanitary Facilities

An accessible unisex sanitary facility must be located so that it can be entered without crossing an area reserved for one sex only and provided in accordance with AS 1428.1-2009 and must contain a closet pan, washbasin, shelf or bench top and adequate means of disposal of sanitary products and as per following.

Building Type	Minimum accessible unisex sanitary compartments to be provided
Residential apartments	Where sanitary compartments are provided in common areas, not less than 1.
Assembly building	<ol style="list-style-type: none"> a) 1 on every storey containing sanitary compartments; and b) Where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments, at not less than 50% of those banks.

Table 17 – Accessible Sanitary Facilities

Source: BCA 2019 Amendment 1 F2.4

Ambulant Facilities

At each bank of toilets where there is one or more toilets in addition to an accessible unisex sanitary compartment, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS 1428.1-2009 must be provided for use by males and females.

Where male sanitary facilities are provided at a separate location to female sanitary facilities, accessible unisex sanitary facilities are only required at one of those locations.

An accessible unisex sanitary compartment or an accessible unisex shower need not be provided on a storey or level that is not provided with a passenger lift or ramp complying with AS 1428.1-2009

Accessible unisex showers

Accessible unisex showers must be provided in accordance with AS 1428.1 and at the following rates;

Building	Minimum accessible unisex showers to be provided
Gyms	1 for every 10 showers or part thereof provided

Table 18 – Showers

15.8 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.

15.9 Hearing Augmentation (BCA D3.7)

A hearing augmentation system shall be installed throughout the building in accordance with the requirements of Clause D3.7 of the BCA, where ever in a 9b building, auditorium conference room, meeting room etc. contain a PA system not used for emergency purposed.

15.10 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.

16. Cope Street Plaza

The public domain, identified as Cope Street Plaza, is located on the roof of the station at street level. It has been assessed as an *Occupiable Outdoor Area*.

16.1 Fire Hazard Properties

A lining, material or assembly must comply with C1.10 as for an internal lining as detailed in part 11.3 of this report.

Details of the proposed materials are to be provided as part of the Construction Certificate documentation to enable further assessment.

16.2 Fire Fighting Equipment

Fire Hydrant protection is to be provided to the Cope Street Plaza in accordance with AS 2419.1. The design team have advised that street hydrants are proposed to be utilised, subject to test results confirming the required pressures and flows are achieved.

Hose Reel coverage is to be provided to the Cope Street Plaza in accordance with AS 2441. Details and coverage plans are to be provided as part of the Construction Certificate documentation to enable further assessment.

16.3 Visibility in an emergency

Emergency lighting is to be provided to the Cope Street Plaza area in accordance with AS 2293.1. Details of the system design is to be provided as part of the Construction Certificate documentation to enable further assessment.

16.4 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.

Access is provided from Cope street through the public domain area allowing occupants to enter each building. All stairways and ramps within the public domain area are to comply with the Access to Premises Code and AS 1428.1.

The ramp indicated on the sketch plans is to be reviewed in consultation with DDA consultant as the path deviates from the main entry stair.

Ramp details are to be provided as part of the Construction Certificate Application to demonstrate compliance with AS 1428.1.

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

Stairs shall be constructed as follows:

- g) 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.
- h) 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.
- i) Stairs shall have opaque risers.
- j) 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.
- k) Stair nosing profiles shall;
 - Have a sharp intersection;
 - Be rounded up to 5mm radius; or
 - Be chamfered up to 5mm x 5mm
- l) All stairs, 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.

17. Conclusion

As the Certifying Authority we have reviewed the architectural design documents prepared by BatesSmart (refer appendix 1) for compliance with the current building assessment provisions, i.e. the Building Code of Australia 2019 (BCA).

The report is intended as an overview of the relevant provisions of the BCA for assistance only.

Subject to the items within this report being addressed, the development is capable of complying with the Deemed-to-satisfy provisions and/or Performance requirements of the Building code of Australia 2019.

18. Appendices

18.1 Appendix 1 – Reference Documentation

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

Drawing No.	Title	Issue	Date	Revision
Building 3				
DA100	Building 3 Ground Floor Plan	For Information	27/07/20	G
DA100M	Building 3 Mezzanine Plan	For Information	27/07/20	F
DA101	Building 3 Level 1 Plan	For Information	27/07/20	F
DA102	Building 3 Level 2 Plan	For Information	27/07/20	F
DA103	Building 3 Level 3 Plan	For Information	27/07/20	F
DA106	Building 3 Level 6 Plan	For Information	27/07/20	F
DA116	Building 3 Level 16 Plan	For Information	27/07/20	D
DA123	Building 3 Level 23 Plan	For Information	27/07/20	F
DA124	Building 3 Level 24 (Plant) Plan	For Information	27/07/20	F
DA140	Building 3 Elevation North	For Information	01/06/20	A
DA141	Building 3 Elevation West	For Information	01/06/20	A
DA142	Building 3 Elevation South	For Information	01/06/20	A
DA143	Building 3 Elevation East	For Information	01/06/20	A
DA150	Building 3 Section E - W	For Information	01/06/20	A
DA151	Building 3 Section N - S	For Information	01/06/20	A
Building 4				
DA101	Building 4 Level 1	For Information	27/07/20	1
DA102	Building 4 Level 2	For Information	27/07/20	D
DA103	Building 4 Levels 3-7	For Information	27/07/20	I
DA108	Building 4 Levels 8	For Information	27/07/20	H
DA109	Building 4 Levels 9	For Information	27/07/20	H
DA110	Building 4 Roof Plan	For Information	27/07/20	G
DA140	Building 4 Elevation North	For Information	01/06/20	B
DA141	Building 4 Elevation East	For Information	01/06/20	B
DA142	Building 4 Elevation South	For Information	01/06/20	B
DA143	Building 4 Elevation West	For Information	01/06/20	B
DA150	Building 4 Section A	For Information	01/06/20	F

Table 19 – Referenced Documentation

18.2 Appendix 2 – Draft Fire Safety Schedule

No.	Measure	Particulars of Measure (including where the requirement for the measure is set out or described i.e. in building plans or in a performance solution report)
STATUTORY FIRE SAFETY MEASURES		
1.	Access Panels, Doors and Hoppers	BCA 2019 Clause C3.13
2.	Automatic Fail Safe Devices	BCA 2019 Clause D2.19 & D2.21
3.	Automatic Fire Detection and Alarm System	BCA 2019 Spec. E2.2a & AS 1670.1 – 2015, AS/NZS 1668.1 - 2015
4.	Automatic Fire Suppression System (sprinklers)	BCA 2019 Spec. E1.5 & AS 2118.1 – 2017, Fire Engineering Report
5.	Emergency Lifts	BCA 2019 Clause E3.4 & AS 1735.2 – 2001
6.	Emergency Lighting	BCA 2019 Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005 Amdt 1 & 2
7.	EWIS (Sound Systems and Intercom Systems for Emergency Purpose)	BCA 2019 Clause E4.9 & AS 1670.4 - 2015 & AS 4428.4-2004
8.	Exit Signs	BCA 2019 Clauses E4.5, NSW E4.6 & E4.8 and AS/NZS 2293.1 – 2005 Amdt 1 & 2
9.	Fire Control Centre	BCA 2019 Spec. E1.8 Fire Engineering Report
10.	Fire Dampers	BCA 2019 Clause C3.15, AS/NZS 1668.1 – 2015 & AS 1682.1&2 - 1990
11.	Fire Doors	BCA 2019 Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8, Spec C3.4 and AS 1905.1 – 2015
12.	Fire Hose Reel Systems	BCA 2019 Clause E1.4 & AS 2441 – 2005 Amdt 1
13.	Fire Hydrant Systems	BCA 2019 Clause E1.3 & AS 2419.1 – 2017 Fire Engineered Solution
14.	Fire Seals protecting fire resisting components of the building	BCA 2019 Clause C3.12, C3.15, C3.16 & AS 1530.4 – 2014
15.	Lightweight Construction	BCA 2019 Clause C1.8, C3.17 & AS 1530.3 – 1999
16.	Mechanical Air Handling System (Stair pressurisation)	BCA 2019 Clause E2.2, AS/NZS 1668.1 – 2015
17.	Portable Fire Extinguishers	BCA 2019 Clause E1.6 & AS 2444 – 2001
18.	Smoke Dampers	AS/NZS 1668.1 – 2015
19.	Smoke Detectors and Heat Detectors	BCA 2019 Spec E2.2a & AS 1670.1-2015, AS/NZS 1668.1-2015

20.	Smoke Hazard Management System	BCA Part E2 & AS/NZS 1668.1 – 2015 Fire Engineering Report
21.	Wall-Wetting Sprinkler and Drencher Systems	BCA 2019 Clause C3.4 & AS 2118.2 – 2010
22.	Warning and Operational Signs	EP&A Reg 2000 Clause 183, BCA Clause C3.6, D2.23, E3.3 & H101.8
OTHER FIRE SAFETY MEASURES		
23.	Building Occupant Warning System	BCA 2019 Spec. E1.5, BCA Spec. E2.2a & AS 1670.1 – 2015 – Clause 3.22
24.	Emergency Evacuation Plan	Fire Engineering Report XXXX Revision XX prepared by XXXX dated XXXX and AS 3745 – 2002
25.	Fire Collars protecting fire resisting components of the building	BCA 2019 Clause C3.12, C3.15, C3.16 & AS 1530.4 – 2014
26.	Paths of Travel	EP&A Reg 2000 Clause 183, 184, 184 & 186 Fire Engineering Report
27.	Required Exit Doors (power operated)	BCA 2019 Clause D2.19
28.	Self-Closing Fire Hoppers	BCA 2019 Clause C3.13 & AS 1530.4 – 2015

Table 20 – Draft Fire Safety Schedule

18.3 Appendix 3 – Fire Resistance Levels

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

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				
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 21 – 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				
(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.	
		2.	Refer to Specification E1.5 for special requirements for a sprinkler system in a carpark complying with Table 3.9 and located within a multi-classified building.	

Table 22 – Fire Resistance Levels (Carpark)