



A Bureau Veritas Group Company

# COCKLE BAY PARK REDEVELOPMENT

Appendix G – Building Code of Australia Compliance Report

**State Significant Development,  
Development Application (SSD DA)**

Prepared for DPT Operator Pty Ltd and DPPT Operator Pty Ltd

13<sup>th</sup> October 2021

Revision [D]



A Bureau Veritas Group Company

## Table of Contents

1.	Executive Summary .....	3
2.	Introduction .....	7
3.	The Site .....	8
4.	Compliance with the Building Code of Australia.....	9
5.	Documentation of Performance Solutions.....	9
6.	Preliminaries .....	10
7.	Structure .....	12
8.	Fire Protection .....	13
9.	Access and Egress.....	18
10.	Services and Equipment.....	22
11.	Health and Amenity .....	25
12.	Energy Efficiency.....	30
13.	Access for People with Disabilities.....	38
14.	Appendix A - Reference Documentation .....	41
15.	Appendix B - Draft Fire Safety Schedule.....	43
16.	Appendix C - Fire Resistance Levels .....	45

Date	Rev No	No. of Pages	Issue or Description of Amendment	Assessed By	Approved By	Date Approved
13.10.21	D	47	BCA Report for SSDA submission following further stakeholder review	Michael Krogh	Andrew Brohier	13.10.21

## Document Disclaimer – McKenzie Group Consulting

This document has been prepared solely for the use of our client in accordance with our current professional standards and as per our agreement for providing compliance consulting services. Although all due care has been taken in the preparation of this document, no warranty is given, nor liability accepted (except that required by law) in relation to the information contained within this document. This document represents the opinions of McKenzie Group Consulting based on the facts and matters known at the time of preparation of this document. Opinions, judgments and recommendations detailed in this document, which are based on our understanding and interpretation of current statutory and regulatory obligations and standards should not be construed as legal opinions.

## 1. Executive Summary

### Development Overview

The proposed development is the Cockle Bay Redevelopment located at 241-249 Wheat Road, Cockle Bay.

### Compliance Summary

As the BCA Consultant we have reviewed the architectural design documents prepared by Henning Larsen and Architectus (refer appendix A) for compliance with the current building assessment provisions, i.e. the Building Code of Australia 2019 Amendment 1 (BCA).

### Deviations from the Deemed-to-Satisfy Provisions

The assessment of the design documentation indicates that the following areas deviate from the deemed-to-satisfy provisions of the BCA. These items are to be addressed to ensure compliance is achieved, either through design amendment to achieve compliance with the deemed-to-satisfy provisions, or through a performance solution demonstrating compliance with the Performance Requirements of the BCA:

No.	Description	DTS Clause	Performance Requirements
<b>Fire Safety Items</b>			
1	<b>Reduction of FRLs</b> The below areas are proposed to have the FRL requirements addressed on a performance basis; <ul style="list-style-type: none"> <li>Retail portions proposed to have an FRL of 120/120/120.</li> <li>Pergola FRLs to be addressed on a performance basis.</li> </ul>	C2.8, C2.9, Spec C1.1	CP1, CP2
2	<b>Green Wall</b> The proposed green walls are proposed to be installed to the external walls and will not achieve the non-combustibility requirements of C1.9 when tested to AS1530.1-1994.	C1.9	CP2
3	<b>Fire Protected Timber</b> Cross Laminated Timber is proposed to be used in the building which is proposed to have an effective height of greater than 25m. It is anticipated that the penetrations through the timber will be addressed on a performance basis.	C1.13, Spec C1.13, C3.15, Spec C3.15	CP1, CP2
4	<b>Oversized Fire Compartments</b> Fire compartments proposed to exceed the maximum allowable compartment size for Type A Construction as a result of glazing and other openings.	C2.2, Spec C1.1	CP1, CP2
5	<b>Travel Distances</b> Proposed extended travel distances below; Level 00 <ul style="list-style-type: none"> <li>Travel distance to a point of choice is up to 25m in lieu of 20m.</li> <li>Travel distance between alternative exits is up to 96m in lieu of 60m.</li> </ul> Level 01	D1.4, D1.5	DP4, DP6, EP2.2

No.	Description	DTS Clause	Performance Requirements
	<ul style="list-style-type: none"> <li>▪ Travel distance to a point of choice is up to 22m in lieu of 20m.</li> <li>▪ Travel distance to the nearest exit is up to 49m in lieu of 40m.</li> <li>▪ Travel distance between alternative exits is up to 90m in lieu of 60m.</li> </ul> <p>Level 02</p> <ul style="list-style-type: none"> <li>▪ Travel distance to a point of choice is up to 30m in lieu of 20m.</li> <li>▪ Travel distance to the nearest exit is up to 48m in lieu of 40m.</li> </ul> <p>Level 03</p> <ul style="list-style-type: none"> <li>▪ Travel distance between alternative exits is up to 67m in lieu of 60m.</li> </ul> <p>Level 04</p> <ul style="list-style-type: none"> <li>▪ Travel distance to a point of choice is up to 23m in lieu of 20m.</li> <li>▪ Travel distance to the nearest exit is up to 43m in lieu of 40m.</li> <li>▪ Travel distance between alternative exits is up to 82m in lieu of 60m.</li> </ul> <p>Level 05-13</p> <ul style="list-style-type: none"> <li>▪ Travel distance to a point of choice is up to 30m in lieu of 20m.</li> <li>▪ Travel distance to the nearest exit is up to 55m in lieu of 40m.</li> <li>▪ Travel distance between alternative exits is up to 63m in lieu of 60m.</li> </ul> <p>Level 14-17</p> <ul style="list-style-type: none"> <li>▪ Travel distance to the nearest exit is up to 45m in lieu of 40m.</li> <li>▪ Travel distance between alternative exits is up to 63m in lieu of 60m.</li> </ul> <p>Level 18-23</p> <ul style="list-style-type: none"> <li>▪ Travel distance to a point of choice is up to 21m in lieu of 20m.</li> <li>▪ Travel distance to the nearest exit is up to 45m in lieu of 40m.</li> <li>▪ Travel distance between alternative exits is up to 63m in lieu of 60m.</li> </ul> <p>Level 24-31</p> <ul style="list-style-type: none"> <li>▪ Travel distance to the nearest exit is up to 45m in lieu of 40m.</li> <li>▪ Travel distance between alternative exits is up to 63m in lieu of 60m.</li> </ul> <p>Level 32-34</p> <ul style="list-style-type: none"> <li>▪ Travel distance to the nearest exit is up to 45m in lieu of 40m.</li> <li>▪ Travel distance between alternative exits is up to 63m in lieu of 60m.</li> </ul> <p>Level 35-39</p>		

No.	Description	DTS Clause	Performance Requirements
	<ul style="list-style-type: none"> <li>Travel distance to the nearest exit is up to 45m in lieu of 40m.</li> <li>Travel distance between alternative exits is up to 63m in lieu of 60m.</li> </ul> <p>Level 40</p> <ul style="list-style-type: none"> <li>Travel distance to a point of choice is up to 36m in lieu of 20m.</li> </ul> <p>Level 41</p> <ul style="list-style-type: none"> <li>Travel distance to a point of choice is up to 30m in lieu of 20m.</li> <li>Travel distance to the nearest exit is up to 54m in lieu of 40m.</li> <li>Travel distance between alternative exits is up to 63m in lieu of 60m.</li> </ul> <p>Level 42</p> <ul style="list-style-type: none"> <li>Travel distance to a point of choice is up to 30m in lieu of 20m.</li> <li>Travel distance to the nearest exit is up to 48m in lieu of 40m.</li> </ul> <p>Point of choice in various areas are proposed to be within a retail tenancy on the podium levels.</p>		
6	<p><b>Fire isolated stairways</b></p> <p>The central fire stair (Tower egress A) discharges into a covered area which is not in accordance with D1.7.</p> <p>The discharge of the central fire stair (Tower egress A) is within 6m of unprotected openings which is not in accordance with D1.7.</p>	D1.7	DP4, DP6, EP2.2
7	<p><b>Escalators</b></p> <p>The proposed escalators between podium levels 2-5 are proposed to be open and not separated in accordance with Spec D1.12.</p>	D1.12, Spec D1.12	DP4, EP2.2
8	<p><b>Atrium Provisions</b></p> <p>The following components to be addressed as part of the performance solution:</p> <ul style="list-style-type: none"> <li>No bounding construction</li> <li>Performance-based smoke hazard management</li> <li>Omission of the 'EVACUATE' exit sign</li> </ul>	G3.2, G3.3, G3.4, G3.8 & Spec G3.8	CP1, CP2, EP1.4 & EP4.3
9	<p><b>Atrium</b></p> <p>Pressurisation will not be provided to the atrium as a result of the proposed smoke exhaust performance solution.</p>	G3, Spec. G3.8	CP2, EP2.2
10	<p><b>Fire Hydrant System coverage</b></p> <p>Fire Hydrant coverage on the tower levels are insufficient and require additional hydrant coverage from a DTS perspective, the current design is required to be addressed as a performance solution.</p>	E1.3	EP1.3
11	<b>Hydrant Booster</b>	E1.3	EP1.3, EP2.2

No.	Description	DTS Clause	Performance Requirements
	<p>As the proposal will have multiple entrances, the hydrant booster will not be located within sight of the main entrance and will be assessed through a performance solution.</p> <p>The radiant heat shield is required to be addressed on a performance basis as the fire hydrant pump room door is within the required 2m radius.</p>		
12	<p><b>Fire Control Room</b></p> <p>Please see the below items that is required to be addressed on a performance basis;</p> <ul style="list-style-type: none"> <li>The fire control room is not in sight on the main entrance as the building has many entrances</li> <li>The alternative exit proposed is not from a public space.</li> <li>The Internal walls of the Fire Control Room are less than the required 2.5m in width.</li> </ul>	E1.8, Spec E1.8	EP1.6
13	<p><b>Fire Hydrant &amp; Sprinkler Booster Vertical Ring Main</b></p> <p>The combined fire hydrant / system ring main does not meet the requirements of clause 2.6.2 of AS 2118.6-2012 which recommends that the vertical portions of the combined fire sprinkler / hydrant ring main shall be located within separate fire rated exits or fire rated riser shafts.</p>	Clause E1.3 and AS 2118.6-2012	EP1.3, EP1.4
14	<p><b>Sprinkler concession</b></p> <ul style="list-style-type: none"> <li>Specification E1.5 of the BCA states that a combined sprinkler and fire hydrant system is to comply with AS 2118.6-2012.</li> <li>AS 2118.6-2012 states that a combined sprinkler and fire hydrant system is to comply with AS 2419.1-2005 for the hydrant part and AS 2118.1-1999 for the sprinkler part.</li> <li>Appendix A of AS 2118.6-2012 states that AS 2118.1-1999 is to be complied with.</li> </ul>	E1.5 & Spec E1.5	EP1.5
15	<p><b>Sprinkler Concessions</b></p> <p>The DtS Provisions of the BCA contain concessions for buildings provided with a sprinklers system as follows, which can be addressed as a performance solution:</p> <ul style="list-style-type: none"> <li>Clause C2.6 regarding vertical separation of openings in external walls.</li> <li>Specification C1.1 Clause 3.5 regarding the roof not containing a FRL.</li> <li>Specification C1.10 regarding the fire hazard properties of floor coverings and wall and ceiling linings.</li> <li>Clause E1.3 regarding fire hydrant booster protection.</li> <li>Clause 6.4.2 of AS 2419.1-2005 regarding fire separation of internal pump rooms.</li> </ul>	E1.5 & Spec E1.5	EP1.5
16	<p><b>Smoke hazard management</b></p> <p>It is anticipated that the smoke hazard management system will be addressed on a performance basis.</p>	E2.2, Table E2.2a, Table E2.2b	EP2.2
17	<p><b>Emergency lift</b></p> <p>The emergency lifts do not stop at the mezzanine floor or plant levels of the building.</p>	E3.2	EP3.2

No.	Description	DTS Clause	Performance Requirements
18	<b>Exit signage</b> Directional exit signage in podium areas to be proposed to be greater than 2.7m from the finished floor level.	E4.5, E4.6	EP4.2
<b>Miscellaneous Items</b>			
19	<b>Weatherproofing of External Walls</b> 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.	-	FP1.4

The feasibility and any additional requirements that will apply as a result of the performance solution will need to be confirmed by the professional preparing the performance solution. Any performance solution will need to be prepared by a suitably qualified/accredited professional.

Any items which are the subject of Performance Solutions, will be developed as part of the detailed design stage of this project.

### Fire Safety Services

The following key fire safety services are required to meet the minimum DTS requirements unless altered by performance solutions.

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

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

Any fire engineered solution relating to EP1.3, EP1.4, EP1.6, EP2.2 & EP3.2 will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

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.

## 2. Introduction

This report has been prepared to accompany a detailed State Significant Development (SSD) Development Application (DA) (Stage 2) for a commercial mixed use development, Cockle Bay Park, which is submitted to the



Minister for Planning and Public Spaces pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The development is being conducted in stages comprising the following planning applications:

- Stage 1 – Concept Proposal setting the overall ‘vision’ for the redevelopment of the site including the building envelope and land uses, as well as development consent for the carrying out of early works including demolition of the existing buildings and structures. This stage was determined on 13 May 2019, and is proposed to be modified to align with the Stage 2 SSD DA.
- Stage 2 – detailed design, construction, and operation of Cockle Bay Park pursuant to the Concept Proposal.

### 3. The Site

The site is located at 241-249 Wheat Road, Sydney to the immediate south of Pyrmont Bridge, within the Sydney CBD, on the eastern side of the Darling Harbour precinct. The site encompasses the Cockle Bay Wharf development, parts of the Eastern Distributor and Wheat Road, Darling Park and Pyrmont Bridge.

The Darling Harbour Precinct is undergoing significant redevelopment as part of the Sydney International Convention, Exhibition and Entertainment Precinct (SICEEP) including Darling Square and the W Hotel projects. More broadly, the western edge of the Sydney CBD has been subject to significant change following the development of the Barangaroo precinct.



Figure 1 – Location Plan



The proposed development comprises of retail podium levels and high-rise commercial levels.

The site is located on the 241-249 Wheat Road, Cockle Bay.

This report is based upon the review of the design documentation listed in Appendix A of this Report.

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 Registered Certifier for the Construction Certificate. For the purposes of this Report, BCA 2019 Amendment 1 has been utilised as the version of the BCA applicable at the time of preparation this Report.

#### 4. Compliance with the Building Code of Australia

The Building Code of Australia is a performance based document, whereby compliance is achieved by complying with the Governing Requirements and the Performance Requirements.

Performance Requirements are satisfied by one of the following:

- 1) A Performance Solution
- 2) A Deemed-to-Satisfy Solution
- 3) A combination of (1) and (2)

#### 5. Documentation of Performance Solutions

A Performance Solution must demonstrate compliance with all relevant Performance Requirements, or the solution must be at least equivalent to the Deemed-to-Satisfy provisions.

Compliance with the Performance Requirements is to be demonstrated through one or a combination of the following:

- a) Evidence of suitability in accordance with Part A5 of the BCA that shows the use of a material, product, plumbing and drainage product, form of construction or design meets the relevant Performance Requirements.
- b) A Verification Method including the following:
  - i. The Verification Methods provided in the NCC.
  - ii. Other Verification Methods, accepted by the appropriate authority that show compliance with the relevant Performance Requirements
- c) Expert Judgement
- d) Comparison with the Deemed-to-Satisfy Provisions

Where a Performance Solution is proposed as the method to achieve compliance, the following steps must be undertaken:

- a) Prepare a performance-based design brief in consultation with relevant stakeholders
- b) Carry out analysis, using one or more of the assessment methods nominated above, as proposed by the performance-based design brief.
- c) Evaluate results from (b) against the acceptance criteria in the performance-based design brief
- d) Prepare a final report that includes:
  - i. All Performance Requirements and/or Deemed-to-Satisfy Provisions identified as applicable
  - ii. Identification of all assessment methods used

- iii. Details of required steps above
- iv. Confirmation that the Performance Requirement has been met; and
- v. Details of conditions or limitations, if an exist, regarding the Performance Solution.

This process came into effect on 1 July 2021.

## 6. Preliminaries

### 6.1. Building Assessment Data

Summary of Construction Determination:

Part of Project	CBD
Classification	5, 6, 7b, 8 & 9b
Number of Storeys	42
Rise In Storeys	42
Type of Construction	A
Effective Height (m)	167.26m (RL 170.160-2.900) Effective height is measured to the floor of the last storey.

*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: -

Part of Project	BCA Classification	Approx. Occupiable Space (m <sup>2</sup> )	Assumed Population
Level 00 (GLAR+OLA)	6, 7b, 8	2406	1281
Level 01 (GLAR+CG GLAR+GLAR – Wellness + CG Wellness + OLA)	6, 9b	4403	2103
Level 01 Closed Mall Option (Additional GLAR)		465	177
Level 02 (GLAR + GLAR Wellness + CG GLAR- Wellness + OLA)	6	3647	1650
Level 03 (GLAR + GLAR – Wellness + OLA)	5, 6, 9b	1970	1239
Level 04 (GLAR + NLA Commercial (Co-working))	5, 6	2592	571
Level 05	5	2143	268*
Level 06	5	2216	277*
Level 07	5	2238	280*
Level 08	5	1929	242

Part of Project	BCA Classification	Approx. Occupiable Space (m <sup>2</sup> )	Assumed Population
Level 09	5	1874	235
Level 10	5	1681	211
Level 11	5	1820	228
Level 12	5	1820	228
Level 13	5	1766	221
Level 14	7b (Plant room – Not considered NLA)	0	0
Level 15	7b (Plant room – Not considered NLA)	0	0
Level 16	5	1780	223
Level 17	5	1798	225
Level 18	5	1843	234
Level 19	5	1980	248
Level 20	5	1980	248
Level 21	5	1980	248
Level 22	5	1980	248
Level 23	5	1982	248
Level 24	5	1890	237
Level 25	5	1891	237
Level 26	5	1831	229
Level 27	5	2036	255
Level 28	5	2036	255
Level 29	5	2036	255
Level 30	5	2036	255
Level 31	5	2036	255
Level 32	5	1944	243
Level 33	5	1915	240
Level 34	5	1821	228
Level 35	5	2028	254
Level 36	5	2028	254
Level 37	5	2028	254
Level 38	5	2028	254
Level 39	5	2025	254

Part of Project	BCA Classification	Approx. Occupiable Space (m <sup>2</sup> )	Assumed Population
Level 40	5, 7b (Plant room – Not considered NLA)	618	78
Level 41	7b (Plant room – Not considered NLA)	0	0
Level 42	7b (Plant room – Not considered NLA)	0	0
<b>Total (Retail and Commercial floors)</b>		80055m <sup>2</sup>	14993

Notes:

- The above populations have been based on ratios provided by TSA Management (Wellness – 1:3, Commercial floors – 1:8, Coworking floor – 1:6, Retail Internal Front of House (70%) - 1:2, Retail Back of House (30%) - 1:10, Retail outdoor terraces 1:1).
- The floor areas to retail portions have been adjusted without ancillary areas such as sanitary facilities, corridors, shelving and or racking layouts in storage areas.
- \*Over 260 threshold, however this is within a tolerance accepted by a fire engineer as a performance solution.

#### Occupiable Outdoor Areas

BCA 2019 introduced specific provisions regarding occupiable outdoor areas. These provisions outline requirements with regards to fire ratings, egress provisions and coverage from essential services and are contained in this report.

An occupiable outdoor area is defined in the BCA as follows:

*'a space on a roof, balcony or similar part of a building:*

- a) That is open to the sky; and*
- b) To which access is provided, other than access only for maintenance; and*
- c) That is not open space or directly connected with open space'*

## **6.2. 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.

## **7. Structure**

### **7.1. Structural Provisions (BCA B1):**

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 1170.4-2007. 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.

## 8. Fire Protection

### 8.1. Fire Compartmentation (BCA C1.1)

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

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

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

- Separation between the retail levels and the commercial levels of 120 minutes (based on the performance solution),
- Fire compartmentation of the building at each floor level,
- Fire compartmentation of the substation of 180 minutes (based on the performance solution)

The below areas are proposed to have the FRL requirements addressed on a performance basis;

- Retail portions proposed to have an FRL of 120/120/120.
- Pergola FRLs to be addressed on a performance basis

Fire compartments proposed to exceed the maximum allowable compartment size for Type A Construction as a result of glazing and other openings.

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
5, 9b or 9c aged care building	max floor area—	8 000 m <sup>2</sup>	5 500 m <sup>2</sup>	3 000 m <sup>2</sup>
	max volume—	48 000 m <sup>3</sup>	33 000 m <sup>3</sup>	18 000 m <sup>3</sup>
6, 7, 8 or 9a (except for patient care areas)	max floor area—	5 000 m <sup>2</sup>	3 500 m <sup>2</sup>	2 000 m <sup>2</sup>
	max volume—	30 000 m <sup>3</sup>	21 000 m <sup>3</sup>	12 000 m <sup>3</sup>

If the building exceeds the area / volume limitations of the BCA provisions, the building is then considered a large isolated building and the following provisions will apply:



- Automatic sprinkler protection to AS2118.1 and BCA Specification E1.5 throughout the development / smoke detection and alarm system in accordance with AS1670,
- Smoke exhaust required throughout the development if the building exceeds 18,000m<sup>2</sup> or 108,000m<sup>3</sup> in volume

## **8.2. 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 Generators;
- Electricity Supply;
- 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.

Smoke separation is proposed in lieu of fire separation at the slab edge, where fire compartments are located directly above one another.

Fire separation between fire compartments in the same storey will not be provided.

## **8.3. Atrium Provisions (BCA G3)**

---

Part G3 of the BCA contains additional fire and smoke management provisions for buildings containing atriums, but only applies where the atrium connects –

- i. More than 2 storeys, or
- ii. More than 3 storeys if each storey is protected with a sprinkler system and one of those storeys connected is situated at a level which has direct egress to a road or open space

The BCA deemed to satisfy provisions for atriums are outlined below:

### Dimensions of Atrium Well

The atrium well must have a width throughout that is able to contain a cylinder having a horizontal diameter of not less than 6m.

### Separation of Atrium by Bounding Construction

The atrium must be separated from the remainder of the building at each storey by bounding walls set back not more than 3.5m from the perimeter of the atrium void.

The boundary walls must be constructed to achieve a 60/60/60 FRL and have any door openings protected with self closing -/60/30 fire doors; or

Be constructed of fixed toughened safety or wired glass in non-combustible frames with wall wetting sprinklers.

If a bounding wall separating the atrium is set back from the perimeter of the atrium wall, the balustrade around the atrium wall should be constructed of non-combustible material and be imperforate.

### Separation at Roof

The roof of the atrium will require either a FRL as prescribed in Table 3 of Specification C1.1, or the roof structure and membrane must be protected by a sprinkler system.

The following fire services must be provided to the entire building in accordance with BCA Specification G3.8:

- Sprinkler system complying with AS2118.1-2017 and BCA Specification G3.8 Part 2;
- Specific smoke control requirements to any mechanical air handling systems serving the atrium, and dedicated smoke exhaust to the atrium itself complying with AS1668.1-2015 and BCA Specification G3.8 Part 3;
- Fire detection and alarm system complying with AS1670.1-2018 and BCA Specification G3.8 Part 4;
- Emergency Warning and Intercom system for emergency purposes complying with AS1670.4-2018 and BCA Specification G3.8 Part 5;
- Where a required path of travel to an exit is within an atrium, a standby power supply system must be provided to operate required fire safety systems in the building (including sprinkler and hydrant pumps, air handling systems, alarms occupant warning and communication systems, etc). The standby power system must comply with BCA Specification G3.8 Part 6.

The following components to be addressed as part of the performance solution:

- No bounding construction
- Performance-based smoke hazard management
- Omission of the 'EVACUATE' exit sign
- Pressurisation will not be provided to the atrium as a result of the proposed smoke exhaust performance solution.

### **8.4. 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:

#### Sprinkler Protected Areas

- a) Floor Coverings – Critical radiant Flux not less than 1.2 kW/m<sup>2</sup>
- b) Wall and Ceiling Linings – Material Group No. 1, 2
- c) Other Materials – Spread of Flame Index not exceeding 8 and Smoke Developed Index not exceeding 5

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

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

#### External Wall Cladding

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

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

- All loadbearing internal walls and loadbearing fire walls, including those that are part of loadbearing shafts.

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.

Any Aluminium Composite Panels must be labelled in accordance with SA TS 5344.

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 m<sup>2</sup> 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.

The proposed green walls are proposed to be installed to the external walls and will not achieve the non-combustibility requirements of C1.9 when tested to AS1530.1-1994.

#### **8.5. Fire-protected timber: Concession (C1.13)**

Fire-protected timber may be used wherever an element is required to be non-combustible, provided –

- a) The building is –
  - (i) a separate building; or
  - (ii) a part of a building –
    - (A) which only occupies part of a story, and is separated from the remaining part by a fire wall; or
    - (B) which is located above or below a part not containing fire protected timber and the floor between the adjoining parts is provided with an FRL not less than that prescribed for a fire wall for the lower storey; and
- b) the building has an effective height of not more than 25m; and
- c) the building has a sprinkler system (other than FPAA101D or FPAA101H system) throughout complying with specification E1.5; and
- d) any insulation installed in the cavity of the timber building element required to have an FRL is non-combustible; and
- e) Cavity barriers are provided in accordance with Specification C1.13.

Cross Laminated Timber is proposed to be used in the building which is proposed to have an effective height of greater than 25m. It is anticipated that the penetrations through the timber will be addressed on a performance basis.

#### 8.6. 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 120/-/- 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.

#### 8.7. 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

*Fire source feature is defined as;*

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

## **8.8. 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:

- a) Penetrations through fire rated floors to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a fire rated shaft achieving an FRL the same as the FRL of the floor it is passing through;
- b) 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 the same as the FRL of the floor it is passing through; (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.

## **9. Access and Egress**

### **9.1. 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

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 the egress provisions to the Road.
- Door swings

The tapered treads for the proposed spiral staircases are proposed to have more than 18 risers and the gradient of the stair is required to be addressed as a performance solution.

The proposed escalators between podium levels 2-5 are proposed to be open and not separated in accordance with Spec D1.12.



## 9.2. 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 central fire stair (Tower egress A) discharges into a covered area which is not in accordance with D1.7.

The discharge of the central fire stair (Tower egress A) is within 6m of unprotected openings which is not in accordance with D1.7.

## 9.3. 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.

Provide further information on this item for assessment.

## 9.4. Exit Travel Distances (BCA D1.4)

---

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

Proposed extended travel distances below;

#### Level 00

- Travel distance to a point of choice is up to 25m in lieu of 20m.
- Travel distance between alternative exits is up to 96m in lieu of 60m.

#### Level 01

- Travel distance to a point of choice is up to 22m in lieu of 20m.
- Travel distance to the nearest exit is up to 49m in lieu of 40m.
- Travel distance between alternative exits is up to 90m in lieu of 60m.

#### Level 02

- Travel distance to a point of choice is up to 30m in lieu of 20m.
- Travel distance to the nearest exit is up to 48m in lieu of 40m.

#### Level 03

- Travel distance between alternative exits is up to 67m in lieu of 60m.

#### Level 04

- Travel distance to a point of choice is up to 23m in lieu of 20m.
- Travel distance to the nearest exit is up to 43m in lieu of 40m.
- Travel distance between alternative exits is up to 82m in lieu of 60m.

#### Level 05-13

- Travel distance to a point of choice is up to 30m in lieu of 20m.
- Travel distance to the nearest exit is up to 55m in lieu of 40m.
- Travel distance between alternative exits is up to 63m in lieu of 60m.

#### Level 14-17

- Travel distance to the nearest exit is up to 45m in lieu of 40m.
- Travel distance between alternative exits is up to 63m in lieu of 60m.

#### Level 18-23

- Travel distance to a point of choice is up to 21m in lieu of 20m.
- Travel distance to the nearest exit is up to 45m in lieu of 40m.
- Travel distance between alternative exits is up to 63m in lieu of 60m.

#### Level 24-31

- Travel distance to the nearest exit is up to 45m in lieu of 40m.
- Travel distance between alternative exits is up to 63m in lieu of 60m.

#### Level 32-34

- Travel distance to the nearest exit is up to 45m in lieu of 40m.
- Travel distance between alternative exits is up to 63m in lieu of 60m.

#### Level 35-39

- Travel distance to the nearest exit is up to 45m in lieu of 40m.
- Travel distance between alternative exits is up to 63m in lieu of 60m.

#### Level 40

- Travel distance to a point of choice is up to 36m in lieu of 20m.

#### Level 41

- Travel distance to a point of choice is up to 30m in lieu of 20m.
- Travel distance to the nearest exit is up to 54m in lieu of 40m.
- Travel distance between alternative exits is up to 63m in lieu of 60m.

#### Level 42

- Travel distance to a point of choice is up to 30m in lieu of 20m.
- Travel distance to the nearest exit is up to 48m in lieu of 40m.

Point of choice in various areas are proposed to be within a retail tenancy on the podium levels.

The extended travel distances and distance between the exit stairs will need to be addressed to comply with the requirements of the deemed to satisfy provisions noted above, or be assessed as performance solutions by the Fire Safety Engineer using BCA Performance Requirements DP4 & EP2.2

### 9.5. 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).

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).

## **9.6. 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.

In the event the above cannot be achieved, this will be addressed as a performance solution.

In addition to the above, handrails are required to both sides of all stairs with a width of 2m or more.

### 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

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

## **9.7. 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
------------------------------	----	----

## 10. Services and Equipment

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

### 10.1. Fire Hydrants (BCA E1.3)

A system of Fire Hydrants is required to be provided in accordance with BCA Clause E1.3 and AS2419.1-2005.

Pressure and flow information will be required to confirm the required pressures and flow to the system, depending on the type of hydrant to be utilized.

The fire services/hydraulic engineer is to confirm the required flow rates for the development.

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.

Please see below items required to be addressed through a performance solution;

- Fire Hydrant coverage on the tower levels are insufficient and require additional hydrant coverage from a DTS perspective, the current design is required to be addressed as a performance solution.
- As the proposal will have multiple entrances, the hydrant booster will not be located within sight of the main entrance and will be assessed through a performance solution.
- The radiant heat shield is required to be addressed on a performance basis as the fire hydrant pump room door is within the required 2m radius.
- The combined fire hydrant / system ring main does not meet the requirements of clause 2.6.2 of AS 2118.6-2012 which recommends that the vertical portions of the combined fire sprinkler / hydrant ring main shall be located within separate fire rated exits or fire rated riser shafts.

### 10.2. Fire Hose Reels

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

The system is required to provide coverage to the commercial and loading dock zones only.

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 a performance solution is developed under BCA Performance Requirement EP1.1

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

The hose reels currently not indicated on the drawings.

### 10.3. Fire Extinguishers (BCA E1.6)

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

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

Occupancy Class	Risk Class (as defined in AS 2444)
General provisions – Class 2 to 9 buildings (except within sole-occupancy units of a Class 9c building)	a) To cover Class AE or E fire risks associated with emergency services switchboards. (Note 1) b) To cover Class F fire risks involving cooking oils and fats in kitchens. c) To cover Class B fire risks in locations where flammable liquids in excess of 50 litres are stored or used (not excluding that held in fuel tanks of vehicles). d) To cover Class A fire risks in normally occupied fire compartments less than 500m <sup>2</sup> 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.

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 not indicated on the drawings.

#### 10.4. Automatic Sprinkler Protection (BCA E1.5)

Automatic sprinkler protection is required to Specification E1.5 and AS2118.1-2017 & AS2118.6-2012 to the following areas:

- Throughout the entire building where the effective height exceeds 25m;
- Throughout any fire compartment containing Class 6 areas that exceeds 3,500m<sup>2</sup> in floor area or 21,000m<sup>3</sup> in volume;
- Throughout any fire compartment that exceeds 2,000m<sup>2</sup> in floor area or 12,000m<sup>3</sup> in volume where occupancies of excessive hazard are proposed

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.

Please see below items required to be addressed through a performance solution;

- Specification E1.5 of the BCA states that a combined sprinkler and fire hydrant system is to comply with AS 2118.6-2012.
- AS 2118.6-2012 states that a combined sprinkler and fire hydrant system is to comply with AS 2419.1-2005 for the hydrant part and AS 2118.1-1999 for the sprinkler part.
- Clause C2.6 regarding vertical separation of openings in external walls.
- Specification C1.1 Clause 3.5 regarding the roof not containing a FRL.
- Specification C1.10 regarding the fire hazard properties of floor coverings and wall and ceiling linings.
- Clause E1.3 regarding fire hydrant booster protection.
- Clause 6.4.2 of AS 2419.1-2005 regarding fire separation of internal pump rooms.
- Appendix A of AS 2118.6-2012 states that AS 2118.1-1999 is to be complied with.

#### 10.5. 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 Shutdown of Mechanical Systems in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1;
- Automatic Smoke Exhaust System activated by Automatic Smoke Detection & Alarm System in accordance with the requirements of BCA Spec E2.2a and AS1670.1-2018
- Automatic Pressurisation to Fire Isolated Exits in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1

It is anticipated that the smoke hazard management system will be addressed on a performance basis.

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.

#### **10.6. 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 emergency lifts do not stop at the mezzanine floor and plant room levels of the building.

#### **10.7. 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.

Where exit signs are proposed to be above 2.7m to avoid potential damage by forklifts in the warehousing areas, this will need to be documented as a performance solution by an accredited fire safety engineer. This would need to be assessed to BCA Performance Requirement EP4.2.

Directional exit signage in podium areas to be proposed to be greater than 2.7m from the finished floor level.

#### **10.8. 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.

### 10.9. Fire Control Centre (BCA E1.8)

As the Class 6, 7, 8 or 9 building contains a floor area of greater than 18,000m<sup>2</sup>, a fire control centre is required in accordance with BCA Specification 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

The proposed Fire Control Room does not comply as follows:

- The fire control room is not in site on the main entrance as the building has many entrances
- The alternative exit proposed is not from a public space.
- The Internal walls of the Fire Control Room are less than the required 2.5m in width.

### 10.10. 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.

## 11. Health and Amenity

### 11.1. 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.

#### *Offices*

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

The following table summarises the sanitary facilities provided:

Level 00 – 1281 persons – 641 males and 641 females

Sanitary Facilities Provided			
	WC	Urinals	Basins
Male	9	12	4
Female	16	0	9
Accessible	1	0	1
Parents	1	0	1
The above facilities are adequate for 1000 males & 1450 females			

**Sanitary Facilities Provided**

Surplus of 359 males &amp; 809 females.

Level 01 – 2103 persons – 1052 males and 1052 females

**Sanitary Facilities Provided**

	WC	Urinals	Basins
<b>Male</b>	10	12	9
<b>Female</b>	17	0	9
<b>Accessible</b>	2	0	2

The above facilities are adequate for 1350 males &amp; 1550 females.

Surplus of 298 males &amp; 546 females.

Level 02 – 1650 persons – 825 males and 825 females

**Sanitary Facilities Provided**

	WC	Urinals	Basins
<b>Male</b>	12	20	13
<b>Female</b>	21	0	12
<b>Accessible</b>	3	0	3

The above facilities are adequate for 2050 males &amp; 2050 females

Surplus of 1225 males &amp; 1225 females.

Level 03 – 1239 persons

**Sanitary Facilities Provided**

	WC	Urinals	Basins
<b>Male</b>	0	0	0
<b>Female</b>	0	0	0
<b>Accessible</b>	0	0	0

Adequate facilities are provided on levels 00, 01 and 02

Level 04 – 324 for coworking (This is based on a density of 1 in 6)

**Sanitary Facilities Provided**

	WC	Urinals	Basins
<b>Male</b>	8	5	6
<b>Female</b>	12	0	6
<b>Accessible</b>	1	0	1

Adequate facilities for Level 4 coworking

Level 04 – 337 for retail

Sanitary Facilities Provided			
	WC	Urinals	Basins
Male	0	0	0
Female	0	0	0
Accessible	0	0	0
The retail areas on Level 4 will be served by the surplus on levels 00, 01 and 02.			

## Level 05-08

Sanitary Facilities Provided			
	WC	Urinals	Basins
Male	5	4	5
Female	7	0	5
Accessible	3	0	3
The above facilities are adequate for 150 males & 150 females/ floor.			

## Level 09-13

Sanitary Facilities Provided			
	WC	Urinals	Basins
Male	5	4	5
Female	7	0	5
Accessible	1	0	1
The above facilities are adequate for 120 males & 120 females/ floor			

## Level 16-23

Sanitary Facilities Provided			
	WC	Urinals	Basins
Male	5	4	5
Female	7	0	5
Accessible	2	0	2
The above facilities are adequate for 140 males & 135 females/ floor			

## Level 24-26

Sanitary Facilities Provided			
	WC	Urinals	Basins
Male	5	4	4
Female	7	0	4
Accessible	1	0	1
The above facilities are adequate for 120 males & 120 females/ floor			

## Level 27-31

Sanitary Facilities Provided			
	WC	Urinals	Basins
Male	5	4	5
Female	7	0	5
Accessible	2	0	2
The above facilities are adequate for 140 males & 135 females/ floor			

## Level 32

Sanitary Facilities Provided			
	WC	Urinals	Basins
Male	5	4	4
Female	7	0	4
Accessible	2	0	2
The above facilities are adequate for 140 males & 135 females/ floor			

## Level 33-39

Sanitary Facilities Provided			
	WC	Urinals	Basins
Male	5	4	4
Female	7	0	4
Accessible	2	0	2
The above facilities are adequate for 140 males & 135 females/ floor			

## Level 40

Sanitary Facilities Provided			
	WC	Urinals	Basins
Male	2	2	2
Female	4	0	2
Accessible	2	0	2
The above facilities are adequate for 60 males & 90 females/			

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.

*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.



## **11.2. Floor 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.

## **11.3. Light and Ventilation (BCA Part F4)**

---

Class 5, 6 and 7

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.

## **11.4. Condensation management (BCA Part F6)**

---

Pliable building membranes installed to an external wall must:

- achieve compliance with AS 4200.1, and
- be installed in accordance with AS4200.2, and
- be a vapour permeable membrane (applicable as the development is in climate zone 7); and
- 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 a minimum flow rate of 25L/s for bathrooms and sanitary compartments must discharge directly or via a duct to outdoor air or to a roof space that is ventilated.

Kitchens and laundries to achieve a minimum flow rate 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. Openings 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.

## **11.5. 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

### 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.

### **11.6. Stormwater Drainage**

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

## **12. Energy Efficiency**

### **12.1. SECTION J (Transition Period)**

The commentary below is an assessment based on the provisions included in BCA 2019 Amendment 1.

### **12.2. 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 JVb 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 JVb 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, 10m<sup>3</sup>/hr.m<sup>2</sup> 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 m<sup>3</sup>/hr.m<sup>2</sup> 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 5m<sup>3</sup>/hr.m<sup>2</sup> at 50 Pa reference pressure.

- Part J3 and performance solution that uses on of the other NCC assessment Methods which verifies that compliance with JP1 (e) will be achieve can also be used as verification methods.

### 12.3. 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 zones 1, 2, 3, 4 and 5, R3.7 for a downward direction of heat flow; and
- (ii) in climate zone 6, R3.2 for a downward direction of heat floor; and
- (iii) in climate zone 7, R3.7 for an upward direction of heat flow; and
- (iv) in climate zone 8, R4.8 for an upward direction of heat flow;

In climate zones 1, 2, 3, 4, 5, 6 and 7, 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

#### 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 5, 6, 7, 8 or 9b building other than a ward area, U2.0; and
- (ii) for a Class 3 or 9c building or a Class 9a ward area –
  - (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.

## 12.4. 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 50m<sup>2</sup>; 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.

## 12.5. 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<sub>r</sub> and a heater of more than 1kW<sub>heating</sub> 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 1, 2, 3, 4, 5, 6 or 7	Climate zone 8
Within a conditioned space	1, 2	2.0
Where exposed to direct sunlight	3.0	3.0
All other locations	2.0	3.0

### 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<sub>r</sub> –

- (a) Where water cooled, have a minimum energy efficiency ratio of  $4.0 W_r / W_{\text{input power}}$  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; 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.

## **12.6. 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 or Class 4 part the lamp power density/illumination power density of artificial lighting must not exceed the allowance of 5 W/m<sup>2</sup> within a sole-occupancy unit and 4 W/m<sup>2</sup> 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 or a Class 4 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	4.5W/m <sup>2</sup>
Stairways, including fire-isolated stairways	2W/m <sup>2</sup>
Toilet, locker room, staff room, rest room or the like	3W/m <sup>2</sup>
Lift cars	3W/m <sup>2</sup>
Service area, cleaner's room and the like	3W/m <sup>2</sup>



Control room, switch room or the like	
(A) intermittent monitoring	3W/m <sup>2</sup>
(B) Constant monitoring	4.5W/m <sup>2</sup>
Plant room:	
(A) Where an average of 160 lx vertical illuminance is required on a vertical panel such as in switch rooms	4W/m <sup>2</sup>
(B) With a horizontal illuminance target of 80 lx	2W/m <sup>2</sup>
Library:	
(A) Stack & shelving area	2.5W/m <sup>2</sup>
(B) Reading room & general areas	4.5W/m <sup>2</sup>
Office:	
(A) Artificially lit to an ambient level of 200 lx or more	4.5W/m <sup>2</sup>
(B) Artificially lit to an ambient level of less than 200 lx	2.5W/m <sup>2</sup>
Museum & gallery	2.5W/m <sup>2</sup>
Retail:	14W/m <sup>2</sup>
Corridors:	5W/m <sup>2</sup>
Common rooms, spaces & corridors in a Class 2 building	4.5W/m <sup>2</sup>
Lounge area for communal use in a Class 3 or 9c building	4.5W/m <sup>2</sup>
Dormitory of Class 3 building:	
(A) Used for sleeping only	3W/m <sup>2</sup>
(B) Used for sleeping & study	4W/m <sup>2</sup>
Storage	1.5W/m <sup>2</sup>
School:	4.5W/m <sup>2</sup>
Health Care:	
(A) Infants & children's wards & ED	4W/m <sup>2</sup>
(B) Exam room	4.5W/m <sup>2</sup>
(C) Exam room in intensive care & high dependency ward	6W/m <sup>2</sup>
(D) All other patient care areas inc wards & corridors	2.5W/m <sup>2</sup>
Kitchen and food preparation area:	4W/m <sup>2</sup>
Car parks:	
(A) General	2W/m <sup>2</sup>
(B) Entry zone (first 15m of travel during the daytime)	11.5W/m <sup>2</sup>
(C) Entry zone (next 4m of travel) during the day	2.5W/m <sup>2</sup>
(D) Entry zone (first 20m of travel) during nighttime	2.5W/m <sup>2</sup>
Auditoriums, church and public hall :	8W/m <sup>2</sup>
Restaurant, café, bar:	14W/m <sup>2</sup>

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;

- 250m<sup>2</sup> if in a Class 6 building or Class 8 laboratory
- Not operate lighting for an area more than -
  - a) 250m<sup>2</sup> for a space of not more than 2000m<sup>2</sup>;

b) 1000m<sup>2</sup> for a space of more than 2000m<sup>2</sup>  
if in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building;

- 1000m<sup>2</sup> for a space of more than 2000m<sup>2</sup>

#### 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.

#### **Escalators and moving walks (Part J6.8)**

Escalators and moving walkways must have the ability to slow to between 0.2 m/s and 0.05 m/s when unused for more than 15 minutes.

### 13. Access for People with Disabilities

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

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

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

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

#### 13.1. 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 Amdt 1 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;
- 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:

##### Office/retail (Class 5/Class 6 buildings)

To and within all areas normally used by the occupants

#### 13.2. Provision for Access to Buildings

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

- Via the principle pedestrian entry and at least 50% of all other entrances from the allotment boundary
- From designated car parking spaces for the use of occupants with a disability.
- From another accessible building connected by a pedestrian link.
- All areas used by the occupants.

In buildings over 500m<sup>2</sup> 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.

### **13.3. Accessibility within Building (BCA D3.3)**

---

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

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

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

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.

### **13.4. Tactile Indicators (BCA D3.8)**

---

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

### **13.5. Stairs (BCA D3.3 inter Alia AS1428.1)**

---

Stairs shall be constructed as follows:

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

background. Where the luminous contrasting strip is affixed to the surface of the tread, any change in level shall not exceed a difference of 5mm.

### **13.6. 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
Office, industrial, assembly building, schools, health care except for within a ward area of a Class 9a health-care building	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.

#### *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

### **13.7. 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.

### **13.8. 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 or any ticket office or teller's booth or reception where the public is screened from the service provider.

### **13.9. 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.

## 14. Appendix A - Reference Documentation

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

Drawing No.	Title
A-DA1000U	General Arrangement Plan Podium Overall – Level 00 Below Ground
A-DA1000	General Arrangement Plan Podium Overall – Level 00
A-DA1000M	General Arrangement Plan Podium Overall – Level 00 Mezzanine
A-DA1010	General Arrangement Plan Podium Overall – Level 01
A-DA1010C	General Arrangement Plan Podium Overall – CG Level 01
A-DA1020	General Arrangement Plan Podium Overall – Level 02
A-DA1020C	General Arrangement Plan Podium Overall – CG Level 02
A-DA1030	General Arrangement Plan Podium Overall – Level 03
A-DA1040	General Arrangement Plan Podium Overall – Level 04
A-DA1052	General Arrangement Plan Tower Low Rise Zone 2 – Level 05
A-DA1062	General Arrangement Plan Tower Low Rise Zone 2 – Level 06
A-DA1072	General Arrangement Plan Tower Low Rise Zone 2 – Level 07
A-DA1082	General Arrangement Plan Tower Low Rise Zone 2 – Level 08
A-DA1093	General Arrangement Plan Tower Low Rise Zone 2 – Level 09
A-DA1102	General Arrangement Plan Tower Low Rise Zone 2 – Level 10
A-DA1112	General Arrangement Plan Tower Low Rise Zone 2 – Level 11
A-DA1122	General Arrangement Plan Tower Low Rise Zone 2 – Level 12
A-DA1132	General Arrangement Plan Tower Low Rise Zone 2 – Level 13
A-DA1142	General Arrangement Plan Tower Low Rise Zone 2 – Level 14
A-DA1152	General Arrangement Plan Tower Low Rise Zone 2 – Level 15
A-DA1162	General Arrangement Plan Tower Mid Rise Zone 2 – Level 16
A-DA1172	General Arrangement Plan Tower Mid Rise Zone 2 – Level 17
A-DA1182	General Arrangement Plan Tower Mid Rise Zone 2 – Level 18
A-DA1192	General Arrangement Plan Tower Mid Rise Zone 2 – Level 19
A-DA1202	General Arrangement Plan Tower Mid Rise Zone 2 – Level 20
A-DA1212	General Arrangement Plan Tower Mid Rise Zone 2 – Level 21
A-DA1222	General Arrangement Plan Tower Mid Rise Zone 2 – Level 22
A-DA1232	General Arrangement Plan Tower Mid Rise Zone 2 – Level 23
A-DA1242	General Arrangement Plan Tower Mid Rise Zone 2 – Level 24
A-DA1252	General Arrangement Plan Tower High Rise Zone 2 – Level 25

Drawing No.	Title
A-DA1262	General Arrangement Plan Tower High Rise Zone 2 – Level 26
A-DA1272	General Arrangement Plan Tower High Rise Zone 2 – Level 27
A-DA1282	General Arrangement Plan Tower High Rise Zone 2 – Level 28
A-DA1292	General Arrangement Plan Tower High Rise Zone 2 – Level 29
A-DA1302	General Arrangement Plan Tower High Rise Zone 2 – Level 30
A-DA1312	General Arrangement Plan Tower High Rise Zone 2 – Level 31
A-DA1322	General Arrangement Plan Tower High Rise Zone 2 – Level 32
A-DA1332	General Arrangement Plan Tower Sky Rise Zone 2 – Level 33
A-DA1342	General Arrangement Plan Tower Sky Rise Zone 2 – Level 34
A-DA1352	General Arrangement Plan Tower Sky Rise Zone 2 – Level 35
A-DA1362	General Arrangement Plan Tower Sky Rise Zone 2 – Level 36
A-DA1372	General Arrangement Plan Tower Sky Rise Zone 2 – Level 37
A-DA1382	General Arrangement Plan Tower Sky Rise Zone 2 – Level 38
A-DA1392	General Arrangement Plan Tower Sky Rise Zone 2 – Level 39
A-DA1402	General Arrangement Plan Tower Sky Rise Zone 2 – Level 40
A-DA1412	General Arrangement Plan Tower Sky Rise Zone 2 – Level 41
A-DA1422	General Arrangement Plan Tower Sky Rise Zone 2 – Level 42
A-DA1432	General Arrangement Plan Roof Plan Rise Zone 2 – Level 43
DA2000	East Elevation – Overall
DA2010	South Elevation – Overall
DA2020	West Elevation – Overall
DA2030	North Elevation – Overall
A-DA-2500	Section A + B East – West
A-DA-2501	Section D East – West
A-DA-2502	Section E – F East – West
A-DA-2503	Section G + H East – West
A-DA-2550	Section K East – West
A-DA-2551	Section L East – West
A-DA-2552	Section M North – South
A-DA-2553	Section N North – South



## 15. Appendix B - Draft Fire Safety Schedule

No.	Measure	Particulars of Measure <i>(including where the requirement for the measure is set out or described i.e. in building plans or in a performance solution report)</i>	Proposed (Yes/No)
<b>STATUTORY FIRE SAFETY MEASURES</b>			
1.	Access Panels, Doors and Hoppers	BCA 2019 Amdt 1 Clause C3.13	Yes
2.	Automatic Fail Safe Devices	BCA 2019 Amdt 1 Clause D2.19 & D2.21	Yes
3.	Automatic Fire Detection and Alarm System	BCA 2019 Amdt 1 Spec. E2.2a & AS 1670.1 – 2018, AS/NZS 1668.1 - 2015	Yes
4.	Automatic Fire Suppression System (sprinklers)	BCA 2019 Amdt 1 Spec. E1.5 & AS 2118.1 – 2017, AS 2118.6 – 2017 (Combined sprinkler & hydrant)	Yes
5.	Emergency Lifts	BCA 2019 Amdt 1 Clause E3.4 & AS 1735.1-2016	Yes
6.	Emergency Lighting	BCA 2019 Amdt 1 Clause E4.2, E4.4 & AS/NZS 2293.1 – 2018	Yes
7.	EWIS (Sound Systems and Intercom Systems for Emergency Purpose)	BCA 2019 Amdt 1 Clause E4.9 & AS 1670.4 - 2018 & AS 4428.4-2004	Yes
8.	Exit Signs	BCA 2019 Amdt 1 Clauses E4.5, NSW E4.6 & E4.8 and AS/NZS 2293.1 – 2018	Yes
9.	Fire Control Room	BCA 2019 Amdt 1 Spec. E1.8	Yes
10.	Fire Dampers	BCA 2019 Amdt 1 Clause C3.15, AS/NZS 1668.1 – 2015 & AS 1682.1&2 - 1990	Yes
11.	Fire Doors	BCA 2019 Amdt 1 Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8, Spec C3.4 and AS 1905.1 – 2015	Yes
12.	Fire Hose Reel Systems	BCA 2019 Amdt 1 Clause E1.4 & AS 2441 – 2005 Amdt 1	Yes
13.	Fire Hydrant Systems	BCA 2019 Amdt 1 Clause E1.3 & AS 2419.1 – 2005 Amdt 1	Yes
14.	Fire Seals protecting fire resisting components of the building	BCA 2019 Amdt 1 Clause C3.12, C3.15, C3.16 & AS 1530.4 – 2014	Yes
15.	Lightweight Construction	BCA 2019 Amdt 1 Clause C1.8, C3.17 & AS 1530.3 – 1999	Yes
16.	Mechanical Air Handling System (nominate installed systems here e.g. zone smoke, smoke exhaust, pressurisation)	BCA 2019 Amdt 1 Clause E2.2, AS/NZS 1668.1 – 2015	Yes
17.	Portable Fire Extinguishers	BCA 2019 Amdt 1 Clause E1.6 & AS 2444 – 2001	Yes
18.	Smoke Dampers	AS/NZS 1668.1 – 2015	Yes
19.	Smoke Detectors and Heat Detectors	BCA 2019 Amdt 1 Spec E2.2a & AS 1670.1-2018, AS/NZS 1668.1-2015	Yes
20.	Smoke Doors	BCA 2019 Amdt 1 Spec. C3.4	Yes
21.	Wall-Wetting Sprinkler and Drencher Systems	BCA 2019 Amdt 1 Clause C3.4 & AS 2118.2 – 2010	Yes
22.	Warning and Operational Signs	EP&A Reg 2000 Clause 183, BCA 2019 Amdt 1 Clause D2.23, E3.3	Yes

23.	Emergency Evacuation Plan	Fire Engineering Report XXXX Revision XX prepared by XXXX dated XXXX and AS 3745 – 2010	Yes
24.	Fire Collars protecting fire resisting components of the building	BCA 2019 Amdt 1 Clause C3.12, C3.15, C3.16 & AS 1530.4 – 2014	Yes
25.	Paths of Travel	EP&A Reg 2000 Clause 183, 184, 184 & 186	Yes
26.	Required Exit Doors (power operated)	BCA 2019 Amdt 1 Clause D2.19	Yes

## 16. Appendix C - Fire Resistance Levels

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

<b>Table 3</b> <b>TYPE A CONSTRUCTION: FRL</b> <b>OF BUILDING ELEMENTS</b>	<b>Class of building — FRL: (in minutes)</b>			
	<b>Structural adequacy/Integrity/Insulation</b>			
	<b>2, 3 or 4 part</b>	<b>5, 7a or 9</b>	<b>6</b>	<b>7b or 8</b>
<b>EXTERNAL WALL</b> (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 <i>loadbearing</i> 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- <i>loadbearing</i> 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	-/-/-	-/-/-	-/-/-	-/-/-
<b>EXTERNAL COLUMN</b> not incorporated in an <i>external wall</i> , where the distance from any <i>fire-source feature</i> to which it is exposed is -				
less than 3 m	90/-/-	120/-/-	180/-/-	240/-/-
3 m or more	-/-/-	-/-/-	-/-/-	-/-/-
<b>COMMON WALLS and FIRE WALLS</b>	90/ 90/ 90	120/120/120	180/180/180	240/240/240
<b>INTERNAL WALLS</b>				
<i>Fire-resisting lift and stair shafts</i>				
<i>Loadbearing</i>	90/ 90/ 90	120/120/120	180/120/120	240/120/120
<i>Non-loadbearing</i>	-/ 90/ 90	-/120/120	-/120/120	-/120/120
Bounding <i>public corridors</i> , public lobbies and the like				
<i>Loadbearing</i>	90/ 90/ 90	120/-/-	180/-/-	240/-/-
<i>Non-loadbearing</i>	-/ 60/ 60	-/-/-	-/-/-	-/-/-
Between or bounding <i>sole-occupancy units</i>				
<i>Loadbearing</i>	90/ 90/ 90	120/-/-	180/-/-	240/-/-
<i>Non-loadbearing</i>	-/ 60/ 60	-/-/-	-/-/-	-/-/-
Ventilating, pipe, garbage, and like <i>shafts</i> not used for the discharge of hot products of combustion				
<i>Loadbearing</i>	90/ 90/ 90	120/ 90/ 90	180/120/120	240/120/120
<i>Non-loadbearing</i>	-/ 90/ 90	-/ 90/ 90	-/120/120	-/120/120
<b>OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS</b>				
	90/-/-	120/-/-	180/-/-	240/-/-
<b>FLOORS</b>	90/ 90/ 90	120/120/120	180/180/180	240/240/240
<b>ROOFS</b>	90/ 60/ 30	120/ 60/ 30	180/ 60/ 30	240/ 90/ 60