BCA Assessment Report

Barker College SSDA Projects

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Document Control

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<tr><th>Revision</th><th>Date</th><th colspan="2">Description</th></tr>
<tr><td>115344-BCA-r1</td><td>18 July 2022</td><td colspan="2">BCA Assessment Report – SSDA submission</td></tr>
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1 ADOPTION OF BCA 2022

1.1. Proposed Introduction

It is proposed to introduce the National Construction Code (NCC), Volume One, Building Code of Australia (BCA) 2022 on 1 September 2022. BCA2022 is proposing some major changes to Condensation Management, Energy Efficiency and the introduction of Livable Housing Design.

The introduction of the BCA is in stages and therefore it is not clear what the extent of changes will be as each and every state is still considering whether or not to adopt the proposed changes.

At present there is a draft available however the changes to condensation management and energy efficiency have not been released. The proposed timeline is summarised below:

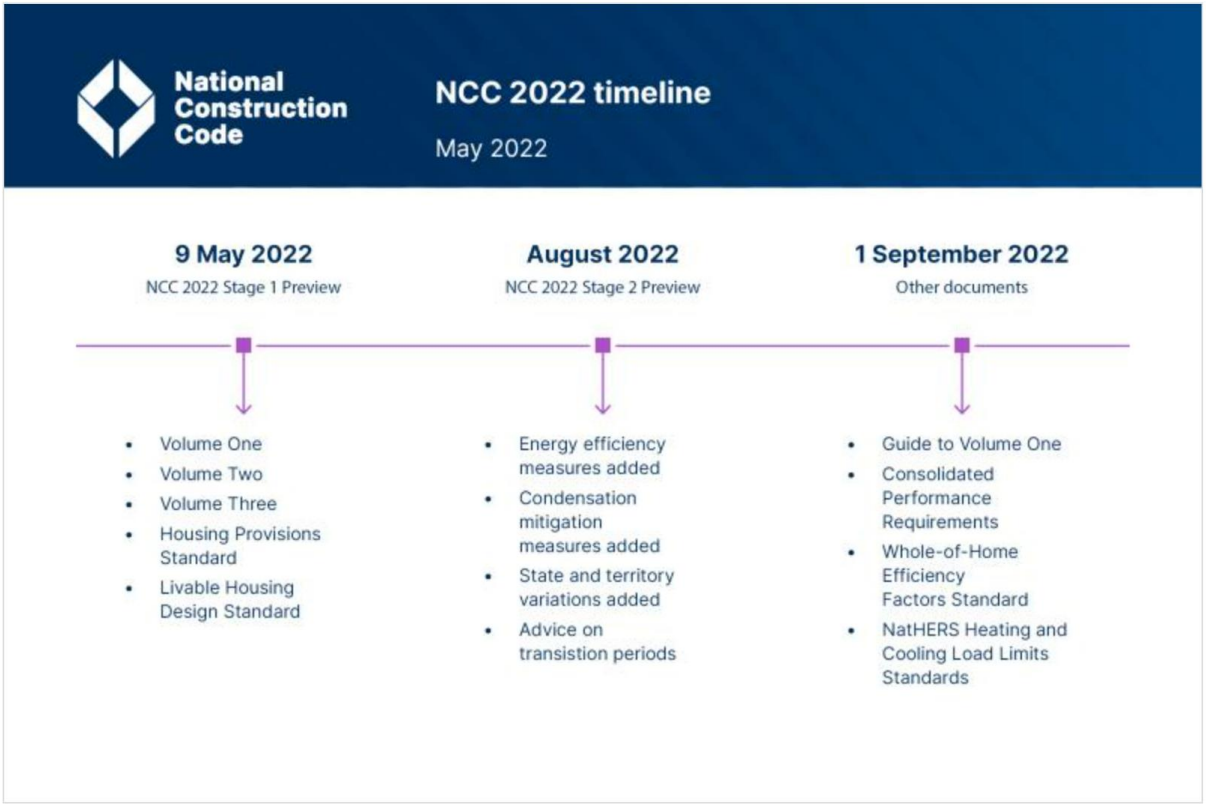

Figure 1- Source: www.abcb.gov.au

1.2. Major Changes known to date

Below is a summary of the proposed changes which were released in the May draft preview. We have also provided a table below for quick reference. Your project has been assessed against the proposed changes where applicable.

Consistent volume structure

BCA2022 uses a new structure and clause referencing system to create better consistency across all volumes. While the new Section-Part-Type-Clause system makes the NCC look different at first, it's intended to improve user experience and make it more web accessible.

The new structure results in a reorganisation of specifications and parts, some of which are contained in the table below.

Fire safety of external walls

Volume One contains a number of amendments to the fire safety of external walls. This clarifies interpretation of concessions from non-combustibility requirements. Also included is a new provision that prevents fixing of certain bonded laminated cladding panels by adhesive only.

Waterproofing

Waterproofing in Volume One is restructured into three parts to enhance readability and accommodate future changes.

Weatherproofing

Volume One contains additional DTS Provisions, providing new solutions for weatherproofing of external walls. These include references to weatherproofing provisions in Australian Standards for masonry, autoclaved aerated concrete and metal wall sheeting.

Falls for floor wastes

Volumes One and Two are amended to require bathrooms and laundries where a floor waste is installed, to have a fall of the floor in order to help drain the surface. This also applies to floor wastes included voluntarily.

Number of exits

Some minor amendments to the required number of exits are in Volume One. This includes a new concession allowing a single exit for a part of a storey in some circumstances, where previously at least two exits were required.

1.3. Summary of Major Changes

Summary of Major Changes		
Clause Reference		Description of proposed changes
BCA 2019	BCA2022	
C1.9	C2D10	**Non-combustible building elements** Further exemptions to the non-combustible requirements of external walls added. Larger list of materials that can be used where non-combustible materials are required.
-	C2D15	**Fixing of Bonded Laminated Cladding panels**
D1.2	D2D3	**Number of Exits** • Ground floor can be provided with a single exit in lieu of 2
D1.6	D2D7 – D2D11	**Dimensions of Exits** Clause split into multiple clauses
D2.16	D3D17 - D3D21	**Barrier** clause split into multiple clauses
E1.5	E1D4 - E1D13	**Sprinkler** requirements split into separate clauses for each building class.
E2.2	E2D3 – E2D21	General Requirements – **Smoke Hazard Management** Tables removed and replaced with clauses for each building class
F1.7	Part F2	**Wet Area and Overflow Prevention**
F1.11	F2D4	**Floor wastes –** floor must be graded with a minimum fall of 1:80
FP1.4	Part F3	**Roof and Wall Cladding** Introduces DTS provisions for walls and roofs in lieu of the previous BCA requiring performance solutions for all weatherproofing

H1.1	Part I1	**Class 9b Building**

1.4. August Changes

The August draft of BCA2022 is proposed to include significant changes to condensation management in external walls and changes to all parts of Section J Energy Efficiency.

At the present time, we do not have any information on these proposed changes and therefore cannot give any advice on the likely impact on the design proposal the subject of this report.

It is suggested that when the next draft is released in August 2022, the design be re-assessed against these new provisions, if it is likely that a construction certificate (including a staged CC) will be issued after 1 September 2022.

2 BASIS OF ASSESSMENT

2.1. Location and Description

The building development, the subject of this report, is located at 91 Pacific Highway, Hornsby and is known as Barker College where it is proposed to carry out a staged development. Stage 1 incorporates pedestrian infrastructure including raised walkways, stairways and lift access to C Block and various external domain works. Future stages of the development will include the construction of an Aquatics and Tennis Centre, Performing Arts + Exam Centre and Maintenance Facility.

Photograph courtesy of Six Maps

2.2. Purpose

The purpose of this report is to assess the current design proposal against the Deemed-to-Satisfy Provisions of BCA 2019, Amendment 1, and to clearly outline those areas (if any) where compliance is not achieved, where areas may warrant redesign to achieve strict BCA compliance or where areas may be able to be assessed against the relevant performance criteria of BCA 2019. Such assessment against relevant performance criteria will need to be addressed by means of a separate Performance Based Fire Safety Engineered Assessment Report to be prepared under separate cover.

2.3. Building Code of Australia

This report is based on the Deemed-to-Satisfy Provisions of the National Construction Code Series Volume 1 – Building Code of Australia, 2019, Amendment 1 (BCA) incorporating the State variations where applicable. Please note that the version of the BCA applicable to new building works is the version applicable at the time of the lodgement of the Construction Certificate application to the Accredited Certifying Authority. The BCA is updated generally on a three-yearly cycle, starting from the 1st of May 2016.

2.4. Limitations

This report does not include nor imply any detailed assessment for design, compliance or upgrading for:

(a) the structural adequacy or design of the building;

(b) the inherent derived fire-resistance ratings of any proposed structural elements of the building (unless specifically referred to); and

(c) the design basis and/or operating capabilities of any proposed electrical, mechanical or hydraulic fire protection services.

This report does not include, or imply compliance with:

(a) the National Construction Code – Plumbing Code of Australia Volume 3

(b) the Disability Discrimination Act 1992 including the Disability ((Access to Premises – Buildings) Standards 2010 – unless specifically referred to), (Note: The provision of disabled access to the subject development has been assessed against the deemed to satisfy provision of Part D3 and F2.4 of BCA2019 only);

(c) Demolition Standards not referred to by the BCA;

(d) Work Health and Safety Act 2011;

(e) Requirements of Australian Standards unless specifically referred to;

(f) Requirements of other Regulatory Authorities including, but not limited to, Telstra, Telecommunications Supply Authority, Water Supply Authority, Electricity Supply Authority, Work Cover, Roads and Maritime Services (RMS), Local Council, ARTC, Department of Planning and the like; and

(g) Conditions of Development Consent issued by the Local Consent Authority.

2.5. Design Documentation

This report has been based on the Design plans and Specifications listed in Annexure A of this Report.

3 BUILDING DESCRIPTION

For the purposes of the Building Code of Australia (BCA) the development may be described as follows.

3.1. Rise in Storeys (Clause C1.2)

The C Block building has a rise in storeys of four (4).

The Aquatic and Tennis Centre building has a rise in storeys of four (4).

The Co Curricular Performing Arts and Exam Centre building has a rise in storeys of two (2) (Subject to the underside of the basement ceiling not being more than 1m above the finished ground level).

3.2. Classification (Clause A6.0)

The building has been classified as follows.

Table 1. Building Classification

Class	Level	Description
C Block		
5	Level 1	Parts used for office and administration purposes.
9b	Levels 1, 2 & 3	Parts of building used for educational purposes.
7b	Field level	Storage area accessed from field.
Aquatic and Tennis Centre		
7a	Lower ground	Car parking area.
9b	Ground floor, First floor, Second floor	Parts of the building used for sporting and recreational purposes.
10b	Ground floor	Swimming pool structures.
Co Curricular Performing Arts and Exam Centre		
7a	Basement	Car parking area.
7b	Basement	Storage parts of the building.
8	Basement, Lower ground	Workshop and maintenance areas.
9b	Lower ground, Ground	Parts of building used for educational purposes.

3.3. Effective Height (Clause A1.0)

The C Block building has an *effective height* of 8.950 metres.

The Aquatic and Tennis Centre building has an *effective height* of 14.65 metres

The Co Curricular Performing Arts and Exam Centre building has an effective height of 6.700 metres.

3.4. Type of Construction Required (Table C1.1)

The C Block building is required to be of Type A Fire Resisting Construction.

The Aquatic and Tennis Centre building is required to be of Type A Fire Resisting Construction.

The Co Curricular Performing Arts and Exam Centre building is required to be of Type B Fire Resisting Construction.

3.5. Floor Area and Volume Limitations (Table C2.2)

The building is subject to maximum floor area and volume limits of:-

Type A Construction

Class 5, 9b	Maximum Floor Area	8 000m^2
	Maximum Volume	48 000m^3
Class 7, 8	Maximum Floor Area	5 000m^2
	Maximum Volume	30 000m^3

Type B Construction

Class 9b	Maximum Floor Area	5 500m^2
	Maximum Volume	33 000m^3
Class 7, 8	Maximum Floor Area	3 500m^2
	Maximum Volume	21 000m^3

3.6. Fire Compartments

To be further confirmed as designs develop.

3.7. Exits

The following points in the building have been considered as the exits:

(a) Doors providing access to the open space.

(b) Stairways and Ramps providing connection between storeys and the open space.

3.8. Climate Zone (Clause A1.0)

The building is located within Climate Zone 5.

4 BCA ASSESSMENT

4.1. Introduction

The assessment undertaken is in relation to the plans prepared for the development consent application. The technical details required for a development consent are far less than that required for a construction certificate and as such, this assessment is designed to address a higher-level assessment of the building against the provisions of the BCA.

The main purpose of this report is to address any major design changes required to the building, services required to be installed, and the fundamentals of design required by sections C, D, E, F, G and H (where applicable) of the BCA. This report does not address the design requirements for the structure of the building (Section B), or for the detailed design of services (Section E).

The summary below is to be read in conjunction with the BCA specification contained in Annexure F of the report.

4.2. C BLOCK

4.2.1. Section C - Fire Resistance and Stability

The proposed building elements are to be constructed to achieve the requirements for Type A fire resisting construction. It is expected that these will be achieved using concrete, structural steel and other non-combustible materials. The required fire resistance levels for the building elements are outlined in **Annexure C** of this report. Note that structural steel would need suitable intumescent paint treatments or the like to achieve the required FRLs, alternatively the need for fire resistance could be reviewed by a fire safety engineer.

It is noted that the works involve the design and construction of a new verandah awning attached to the external wall of the building. The materials used in the construction of this awning, including the covering material, are required to be deemed non-combustible when tested in accordance AS 1530.1-1994. If the awning is to be attached to the building's external walls, then the method of attachment must not reduce the fire resisting nature of those walls.

Overall fire compartmentation limitations are expected to be readily achieved. Where further separation is needed it is considered that this could be more closely determined at a later stage prior to the issue of the Construction Certificate.

The proposed walkway will provide sufficient width to form spandrel separation between the openings on Levels 1 & 2 and achieve a minimum fire rating of 60/60/60. Existing spandrel separation is to remain to Level 3.

The new and altered openings in the external walls, less than 6m from the separate buildings, would require protection in accordance with one of the methods outlined within Clause 3.4. It is considered that this could be readily achieved at construction where required.

4.2.2. Section D - Occupant Access and Egress

All parts of the storeys must maintain access to at least two exits which then provide connection to the open spaces areas and public roads. This will be suitably provided via the proposed stairway and walkways.

Exits are considered to be suitably distributed and available around the storeys and is considered that travel distances required by this section would be achieved. Should non-compliance be identified at a later stage it is considered that these could be readily subject to performance-based assessment.

In general, the proposed exits, stairways and ramp can readily meet the construction requirements of this part. The Breezeway stairway is required to be fire isolated from the remainder of the building, as it passes by more than two consecutive storeys in a non-sprinkler protected building. In lieu of fire isolation it is

considered that the arrangement could be suitably shielded from the effects of fire and be subject to performance-based assessment.

The works are required to be suitable for use by persons with a disability which is subject to a separate Access Assessment Report.

4.2.3. Section E - Services and equipment

The building is required to be provided with the services and equipment set out in **Annexure B** of this report. The annexure also outlines the standard of performance to be achieved by the services and equipment.

The proposed lifts will need to comply with the requirements of Specification E3.1, which is expected to be achieved. The proposed lifts are noted to vertically travel not more than 12m and therefore will not require fire service functions.

4.2.4. Section F – Health and amenity

New sanitary facilities for each sex are noted to be suitably proposed. It is considered that the proposed works do not necessarily increase the need for sanitary facilities, and it is expected that an appropriate number will remain available across the campus.

Suitable provision made within the floor levels to achieve the required minimum ceiling heights of this part, being 2.4m in the classrooms, 2.7m in the walkway areas and 2.1m to the sanitary facilities and lockers. Natural lighting will be maintained to the existing classrooms and increased in part.

The proposed walkways are not expected to affect the existing ventilation of the classroom's areas. Where necessary appropriate ventilation can be provided by natural or mechanical means to the new or altered parts. Artificial lighting can be readily provided throughout the building and required areas.

4.2.5. Section J – Energy efficiency

The building is required to meet the energy efficiency requirements of this Section and is expected to be readily achieved as necessary.

4.3. AQUATIC AND TENNIS CENTRE

4.3.1. Section C - Fire Resistance and Stability

The proposed building elements are to be constructed to achieve the requirements for Type A fire resisting construction. It is expected that these will be achieved using concrete, structural steel and other non-combustible materials. The required fire resistance levels for the building elements are outlined in **Annexure C** of this report and can be readily achieved.

Overall fire compartmentation limitations are expected to be readily achieved. Separation of the car park area will be necessary to satisfy smoke hazard management provisions. Where further separation is needed it is considered that this could be more closely determined at a later stage prior to the issue of the Construction Certificate.

The proposed skylight is not considered to cause any significant concerns relating to fire resistance and stability and can meet relevant requirements. The building will be subject to spandrel separation requirements between the external openings of the different and can be achieved.

The building provides sufficient separation from boundaries and other buildings ensuring that external wall openings do not require any fire protection.

4.3.2. Section D - Occupant Access and Egress

All parts of the storeys must maintain access to at least two exits which then provide connection to the open spaces areas and public roads. This will be suitably provided via the proposed stairway and walkways.

Exits are considered to be suitably distributed and available around the storeys and is considered that travel distances required by this section would be achieved. Should non-compliance be identified at a later stage it is considered that these could be readily subject to performance-based assessment.

The works are required to be suitable for use by persons with a disability which is subject to a separate Access Assessment Report.

4.3.3. Section E - Services and equipment

The building is required to be provided with the services and equipment set out in **Annexure B** of this report. The annexure also outlines the standard of performance to be achieved by the services and equipment. It will need to be ensured that not more than 1000 persons is accommodated by the indoor spectator seating

The proposed lifts will need to comply with the requirements of Specification E3.1, which is expected to be achieved. The proposed lift will travel and serve an effective height greater than 12m and will therefore need to accommodate fire service controls and the ability to accommodate a raised stretcher bed.

4.3.4. Section F – Health and amenity

It is noted that allowance has been made for sanitary facilities for employees and patrons. It will need to be ensured that separate male and female facilities are provided, which is expected to be able to be achieved. Additional facilities may be necessary, subject to final populations being determined; in which case it is expected that this could be further achieved by internal design arrangements.

Suitable provision made within the floor levels to achieve the required minimum ceiling heights of this part, being 2.4m in the classrooms, 2.7m in the walkway areas and 2.1m to the sanitary facilities and lockers.

Where necessary appropriate ventilation can be provided by natural or mechanical means. Artificial lighting can be readily provided throughout the building and required areas.

4.4. Section J – Energy efficiency

The building is required to meet the energy efficiency requirements of this Section and is expected to be readily achieved as necessary.

4.5. CO-CURRICULAR PERFORMING ARTS + EXAM CENTRE

4.5.1. Section C - Fire Resistance and Stability

The proposed building elements are to be constructed to achieve the requirements for Type B fire resisting construction. It is expected that these will be achieved using concrete, structural steel and other non-combustible materials. The required fire resistance levels for the building elements are outlined in **Annexure C** of this report and can be readily achieved.

Overall fire compartmentation limitations are expected to be readily achieved. Separation of the car park area and potentially other areas of the building will be necessary to satisfy smoke hazard management provisions. Where further separation is needed it is considered that this could be more closely determined at a later stage prior to the issue of the Construction Certificate.

The building provides sufficient separation from boundaries and other buildings ensuring that external wall openings do not require any fire protection.

4.5.2. Section D - Occupant Access and Egress

All parts of the storeys must maintain access to at least two exits which then provide connection to the open spaces areas and public roads. This will be suitably provided via the proposed stairway and walkways.

Exits are considered to be suitably distributed and available around the storeys and is considered that travel distances required by this section would be achieved. Should non-compliance be identified at a later stage it is considered that these could be readily subject to performance-based assessment.

The works are required to be suitable for use by persons with a disability which is subject to a separate Access Assessment Report.

4.5.3. Section E - Services and equipment

The building is required to be provided with the services and equipment set out in **Annexure B** of this report. The annexure also outlines the standard of performance to be achieved by the services and equipment.

Note that this building will need to be provided with an automatic sprinkler system throughout due to the number of vehicle spaces and void connection.

The proposed lifts will need to comply with the requirements of Specification E3.1, which is expected to be achieved. The proposed lift will not serve an effective height greater than 12m and will therefore not need to accommodate fire service controls or the ability to accommodate a raised stretcher bed.

4.5.4. Section F – Health and amenity

It is noted that allowance has been made for sanitary facilities for employees and patrons. It will need to be ensured that separate male and female facilities are provided, which is expected to be able to be achieved. Additional facilities may be necessary, subject to final populations being determined; in which case it is expected that this could be further achieved by internal design arrangements.

Suitable provision made within the floor levels to achieve the required minimum ceiling heights of this part, being 2.7m in the classrooms, 2.7m in the walkway areas and 2.1m to the sanitary facilities and lockers and car park.

Where necessary appropriate ventilation can be provided by natural or mechanical means. Artificial lighting can be readily provided throughout the building and required areas.

4.6. Section J – Energy efficiency

The building is required to meet the energy efficiency requirements of this Section and is expected to be readily achieved as necessary.

5 STATEMENT OF COMPLIANCE

The plans assessed were developed to a standard suitable for submission as a development application and do not contain all the details necessary to allow a CC to be issued. As such, this assessment was limited to the major items of the BCA with the view of identifying any items that may result in a modified development consent being required, or additional key items that need to be included in the design.

The architectural design documentation as referred to in report has been assessed against the applicable provisions of the Building Code of Australia, (BCA) and it is considered that such documentation complies or is capable of complying with that Code.

ANNEXURE A DESIGN DOCUMENTATION

Annexure A – Design Documentation

This report has been based on the following design documentation.

Table 2. Architectural Plans

Architectural Plans Prepared by Neeson Murcutt + Neille			
Drawing Number	**Revision**	**Date**	**Title**
Stage 1: C Block Walkway			
DA1.01	SSDA	25/05/22	Cover Sheet + Site Plan
DA1.02	SSDA	25/05/22	Circulation Diagram
DA2.01	SSDA	25/05/22	Level 1 Demolition Plan
DA2.02	SSDA	25/05/22	Level 2 Demolition Plan
DA2.03	SSDA	25/05/22	Level 3 Demolition Plan
DA2.11	SSDA	25/05/22	Level 1 Plan
DA2.12	SSDA	25/05/22	Level 2 Plan
DA2.13	SSDA	25/05/22	Level 3 Plan
DA3.01	SSDA	25/05/22	Elevations + Sections
DA4.01	SSDA	25/05/22	Materials
DA5.01	SSDA	25/05/22	3D Views
Aquatics + Tennis Centre			
RD(AQ) 1.01	SSDA	25/05/22	Cover Sheet
RD(AQ) 2.01	SSDA	25/05/22	Demolition Plan
RD(AQ) 2.02	SSDA	25/05/22	Lower Ground Plan
RD(AQ) 2.03	SSDA	25/05/22	Ground Floor Plan
RD(AQ) 2.04	SSDA	25/05/22	First Floor Plan
RD(AQ) 2.05	SSDA	25/05/22	Second Floor Plan
RD(AQ) 2.06	SSDA	25/05/22	Roof Plan
RD(AQ) 3.01	SSDA	25/05/22	Elevations
RD(AQ) 3.02	SSDA	25/05/22	Elevations
RD(AQ) 4.01	SSDA	25/05/22	Sections
RD(AQ) 4.02	SSDA	25/05/22	Sections
Co-Curricular Performing Arts + Exam Centre			
RD(PA) 1.01	SSDA	25/05/22	Cover Sheet
RD(PA) 2.01	SSDA	25/05/22	Demolition Plan
RD(PA) 2.02	SSDA	25/05/22	Basement Plan

Architectural Plans Prepared by Neeson Murcutt + Neille			
RD(PA) 2.03	SSDA	25/05/22	Lower Ground Plan
RD(PA) 2.04	SSDA	25/05/22	Ground Floor Plan
RD(PA) 2.05	SSDA	25/05/22	Roof Plan
RD(PA) 3.01	SSDA	25/05/22	Elevations
RD(PA) 3.02	SSDA	25/05/22	Elevations
RD(PA) 4.01	SSDA	25/05/22	Sections
RD(PA) 4.02	SSDA	25/05/22	Sections

ANNEXURE B ESSENTIAL SERVICES

Annexure B - Essential Services

The following fire safety measures are required to be installed in the building. The following table may be required to be updated as the design develops and options for compliance are confirmed.

Table 3. Essential Fire Safety Measures

C BLOCK		
Item	**Essential Fire and Other Safety Measures**	**Standard of Performance**
Fire Resistance (Floors – Walls – Doors – Shafts)		
1.	Access Panels & doors/hoppers (fire rated)	**BCA2019 C3.13** (Openings in Shafts) **BCA2019 Spec C3.4** AS 1905.1:2015 (Fire Resistant Doorsets)
2.	Fire doors (Subject to Design)	**BCA2019 C3.2** (Protection of Openings) **BCA2019 C3.3** (Separation of external walls and associated openings in different fire compartments) **BCA2019 C3.4** (Acceptable methods of Protection) **BCA2019 C3.5** (Doors in Fire Walls) **BCA2019 C3.10** (Opening in Fire Isolated Lift Shafts) AS1735.11- 1986 Spec C3.4 AS1905.1: 2015
3.	Fire seals protecting openings in fire resisting components of the building	**BCA2019 C3.15** (Openings for service installations) **BCA2019 C3.16** (Construction joints) **BCA2019 Spec C3.15** AS1530.4:2014 & AS4072.1-2005
4.	Fire shutters (Subject to Design)	**BCA2019 C3.4** (Acceptable methods of protection) **BCA2019 Spec. C3.4** AS1905.2-2005
5.	Fire windows (Subject to Design)	**BCA2019 C3.2** (Protection of Openings) **BCA2019 C3.3** (Separation of external walls and associated openings in different fire compartments) **BCA2019 C3.4** (Acceptable Methods of Protection) **BCA2019 Spec. C3.4** identical to tested porotype

C BLOCK		
Item	**Essential Fire and Other Safety Measures**	**Standard of Performance**
6.	Lightweight construction	**BCA2019 C1.1, Spec. C1.1** **BCA2019 C1.8, Spec C1.8** AS1530.4:2014
General		
7.	Portable fire extinguishers	**BCA2019 E1.6** AS 2444–2001
8.	Warning & operational signs	**BCA2019 D2.23 (**Signs on Fire Doors) **BCA2019 D3.6** (Braille Exit Signs) (Note: E4.5 (Exit Signs)) **BCA2019 E3.3** (Lift Signs)
Electrical Services		
9.	Automatic fire detection & alarm	**BCA2019 E2.2**, NSW Table E2.2a, Table 2.2b, **Spec E2.2a** AS 1670.1:2018 (Fire)
10.	Emergency lighting	**BCA2019 E4.2, E4.4** AS/NZS 2293.1:2018
11.	Exit signs	**BCA2019 E4.5** (Exit Signs) **BCA2019 E4.6** (Direction Signs) **BCA2019 E4.8** (Design and Operation – Exits) AS/NZS 2293.1:2018
12.	Emergency warning and intercom systems for Emergency Purposes	**BCA2019 E4.9** AS 1670.4:2018 (EWIS)
Hydraulic Services		
13.	Fire hydrant systems	**BCA2019 E1.3** **BCA2019 C2.12 (Separation of Equipment)** AS 2419.1:2005 FRNSW Technical Sheet D15/45534.V9 issued 10.01.19, 'Compatible Hose Connections'
14.	Fire hose reel systems (Not required to Classrooms and associated corridors)	**BCA2019 E1.4** AS 2441:2005
15.	Wall-wetting sprinkler system	**BCA2019 C3.4**

C BLOCK		
Item	**Essential Fire and Other Safety Measures**	**Standard of Performance**
	(Subject to design)	
Mechanical Services		
16.	Fire dampers	**BCA2019 E2.2, Spec E2.2a, Spec E2.2b** **BCA2019 C3.15** AS 1668.1:2015 (Amdt 1) AS 1682.1:2015 & AS 1682.2:2015
17.	Mechanical air handling systems 2. Auto-shutdown of Air-handling System. > (Clause E2.2(b)) – Any system that recycles air from one fire compartment to another, or operates in a manner that may spread smoke and does not operate as a smoke control system as per AS 1668.1:2015; > (NSW Table E2.2b) – Any system in a Class 9b assembly building which does not form part of a smoke hazard management system, other than: ○ non-ducted individual room units with a capacity of not more than 1000 L/s; or ○ miscellaneous exhaust are systems installed as per Section 5 and 6 of AS 1668.1:2015.	**BCA2019 E2.2, Table E2.2a, Table E2.2b** **Spec E2.2a, Spec E2.2b** AS 1668.1:2015 (Amdt 1)
18.	**Performance Solution** Further fire safety measures may be required as a result of Fire Safety Engineering assessment carried out at a later stage.	

AQUATIC AND TENNIS CENTRE		
Item	**Essential Fire and Other Safety Measures**	**Standard of Performance**
Fire Resistance (Floors – Walls – Doors – Shafts)		
1.	Access Panels & doors/hoppers (fire rated)	**BCA2019 C3.13** (Openings in Shafts) **BCA2019 Spec C3.4** AS 1905.1:2015 (Fire Resistant Doorsets)
2.	Fire doors	**BCA2019 C2.12** (Separation of Equipment) **BCA2019 C2.13** (Electricity Supply Systems) **BCA2019 C3.4** (Acceptable methods of Protection) **BCA2019 C3.5** (Doors in Fire Walls)

AQUATIC AND TENNIS CENTRE		
Item	**Essential Fire and Other Safety Measures**	**Standard of Performance**
		BCA2019 C3.10 (Opening in Fire Isolated Lift Shafts) AS1735.11- 1986 Spec C3.4 AS1905.1: 2015
3.	Fire seals protecting openings in fire resisting components of the building	**BCA2019 C3.15** (Openings for service installations) **BCA2019 C3.16** (Construction joints) **BCA2019 Spec C3.15** AS1530.4:2014 & AS4072.1-2005
4.	Lightweight construction	**BCA2019 C1.1, Spec. C1.1** **BCA2019 C1.8, Spec C1.8** AS1530.4:2014
General		
5.	Portable fire extinguishers	**BCA2019 E1.6** AS 2444–2001
6.	Warning & operational signs	**BCA2019 D2.23 (**Signs on Fire Doors) **BCA2019 D3.6** (Braille Exit Signs) (Note: E4.5 (Exit Signs)) **BCA2019 E3.3** (Lift Signs)
Electrical Services		
7.	Automatic fire detection & alarm	**BCA2019 E2.2**, NSW Table E2.2a, Table 2.2b, **Spec E2.2a** AS 1670.1:2018 (Fire)
8.	Emergency lighting	**BCA2019 E4.2, E4.4** AS/NZS 2293.1:2018
9.	Exit signs	**BCA2019 E4.5** (Exit Signs) **BCA2019 E4.6** (Direction Signs) **BCA2019 E4.8** (Design and Operation – Exits) AS/NZS 2293.1:2018
10.	Emergency warning and intercom systems for Emergency Purposes	**BCA2019 E4.9** AS 1670.4:2018 (EWIS)
Hydraulic Services		

AQUATIC AND TENNIS CENTRE		
Item	**Essential Fire and Other Safety Measures**	**Standard of Performance**
11.	Fire hydrant systems	**BCA2019 E1.3** **BCA2019 C2.12 (Separation of Equipment)** AS 2419.1:2005 FRNSW Technical Sheet D15/45534.V9 issued 10.01.19, 'Compatible Hose Connections'
12.	Fire hose reel systems	**BCA2019 E1.4** AS 2441:2005
Mechanical Services		
13.	Fire dampers	**BCA2019 E2.2, Spec E2.2a, Spec E2.2b** **BCA2019 C3.15** AS 1668.1:2015 (Amdt 1) AS 1682.1:2015 & AS 1682.2:2015
14.	Mechanical air handling systems 1. Mechanical ventilation to carpark. 2. Auto-shutdown of Air-handling System. > (Clause E2.2(b)) – Any system that recycles air from one fire compartment to another, or operates in a manner that may spread smoke and does not operate as a smoke control system as per AS 1668.1:2015; > (NSW Table E2.2b) – Any system in a Class 9b assembly building which does not form part of a smoke hazard management system, other than: o non-ducted individual room units with a capacity of not more than 1000 L/s; or o miscellaneous exhaust are systems installed as per Section 5 and 6 of AS 1668.1:2015.	**BCA2019 E2.2, Table E2.2a, Table E2.2b** **Spec E2.2a, Spec E2.2b** AS 1668.1:2015 (Amdt 1) **Note: 5.5.3 Override control** To enable manual control by attending emergency services personnel, fans that are not required to shut down on initiation of fire mode in the car park shall be provided with a control switch at the designated building entry point. **Note:** Signage should be located at the car park entry indicating the location of the control switches.
15.	**Performance Solution** Further fire safety measures may be required as a result of Fire Safety Engineering assessment carried out at a later stage.	

CO CURRICULAR PERFORMING ARTS AND EXAM CENTRE		
Item	**Essential Fire and Other Safety Measures**	**Standard of Performance**
Fire Resistance (Floors – Walls – Doors – Shafts)		
1.	Access Panels & doors/hoppers (fire rated)	**BCA2019 C3.13** (Openings in Shafts)

CO CURRICULAR PERFORMING ARTS AND EXAM CENTRE		
Item	**Essential Fire and Other Safety Measures**	**Standard of Performance**
		BCA2019 Spec C3.4 AS 1905.1:2015 (Fire Resistant Doorsets)
2.	Fire doors	**BCA2019 C2.12** (Separation of Equipment) **BCA2019 C2.13** (Electricity Supply Systems) **BCA2019 C3.4** (Acceptable methods of Protection) **BCA2019 C3.5** (Doors in Fire Walls) **BCA2019 C3.**7 and D1.11 (Horizontal Exits) **BCA2019 C3.10** (Opening in Fire Isolated Lift Shafts) AS1735.11- 1986 Spec C3.4 AS1905.1: 2015
3.	Fire seals protecting openings in fire resisting components of the building	**BCA2019 C3.15** (Openings for service installations) **BCA2019 C3.16** (Construction joints) **BCA2019 Spec C3.15** AS1530.4:2014 & AS4072.1-2005
4.	Lightweight construction	**BCA2019 C1.1, Spec. C1.1** **BCA2019 C1.8, Spec C1.8** AS1530.4:2014
General		
5.	Portable fire extinguishers	**BCA2019 E1.6** AS 2444–2001
6.	Warning & operational signs	**BCA2019 D2.23 (**Signs on Fire Doors) **BCA2019 D3.6** (Braille Exit Signs) (Note: E4.5 (Exit Signs)) **BCA2019 E3.3** (Lift Signs)
Electrical Services		
7.	Automatic fire detection & alarm	**BCA2019 E2.2**, NSW Table E2.2a, Table 2.2b, **Spec E2.2a** AS 1670.1:2018 (Fire)

CO CURRICULAR PERFORMING ARTS AND EXAM CENTRE		
Item	**Essential Fire and Other Safety Measures**	**Standard of Performance**
8.	Emergency lighting	**BCA2019 E4.2, E4.4** AS/NZS 2293.1:2018
9.	Exit signs	**BCA2019 E4.5** (Exit Signs) **BCA2019 E4.6** (Direction Signs) **BCA2019 E4.8** (Design and Operation - Exits) AS/NZS 2293.1:2018
10.	Emergency warning and intercom systems for Emergency Purposes	**BCA2019 E4.9** AS 1670.4:2018 (EWIS)
Hydraulic Services		
11.	Automatic fire suppression systems	**BCA2019 E1.5** AS 2118.1:2017 (Sprinklers) AS 2118.6:2012 (Combined Sprinklers/Hydrant)
12.	Fire hydrant systems	**BCA2019 E1.3** **BCA2019 C2.12 (Separation of Equipment)** AS 2419.1:2005
13.	Fire hose reel systems	**BCA2019 E1.4** AS 2441:2005
Mechanical Services		
14.	Fire dampers	**BCA2019 E2.2, Spec E2.2a, Spec E2.2b** **BCA2019 C3.15** AS 1668.1:2015 (Amdt 1) AS 1682.1:2015 & AS 1682.2:2015
15.	Mechanical air handling systems 1. Smoke Control System/Smoke Exhaust System 2. Mechanical ventilation to carpark. 3. Auto-shutdown of Air-handling System. > (Clause E2.2(b)) - Any system that recycles air from one fire compartment to another, or operates in a manner that may spread smoke and does not operate as a smoke control system as per AS 1668.1:2015; > (NSW Table E2.2b) - Any system in a Class 9b assembly building which does not form	**BCA2019 E2.2, Table E2.2a, Table E2.2b** **Spec E2.2a, Spec E2.2b** AS 1668.1:2015 (Amdt 1) **Note: 5.5.3 Override control** To enable manual control by attending emergency services personnel, fans that are not required to shut down on initiation of fire mode in the car park shall be provided with a control switch at the designated building entry point.

CO CURRICULAR PERFORMING ARTS AND EXAM CENTRE		
Item	**Essential Fire and Other Safety Measures**	**Standard of Performance**
	part of a smoke hazard management system, other than: ○ non-ducted individual room units with a capacity of not more than 1000 L/s; or ○ miscellaneous exhaust are systems installed as per Section 5 and 6 of AS 1668.1:2015.	**Note:** Signage should be located at the car park entry indicating the location of the control switches.
16.	**Performance Solution** Further fire safety measures may be required as a result of Fire Safety Engineering assessment carried out at a later stage.	

ANNEXURE C FIRE RESISTANCE LEVELS

Annexure C - Fire Resistance Levels

The following fire resistance levels (FRL's) are required for the various building elements, with a fire source feature being the far boundary of a road adjoining the allotment, a side or rear boundary or an external wall of another building on the allotment except a Class 10 structure.

Type A Construction

Table 4. Type A Construction

Item	Class 5, 7a or 9b	Class 7b or 8
Loadbearing External Walls (including columns and other building elements incorporated therein)		
- Less than 1.5m to a *fire-source feature*	120/120/120	240/240/240
- 1.5 – less than 3m from a *fire-source feature*	120/90/90	240/240/180
- 3m or more from a *fire source feature*	120/60/30	240/180/90
Non-Loadbearing External Walls		
- Less than 1.5m to a *fire-source feature*	-/120/120	-/240/240
- 1.5 – less than 3m from a *fire-source feature*	-/90/90	-/240/180
- 3m or more from a *fire-source feature*	-/-/-	-/-/-
External Columns		
- Loadbearing	120/-/-	240/-/-
- Non-loadbearing	-/-/-	-/-/-
Common Walls & Fire Walls	120/120/120	240/240/240
Stair and Lift Shafts required to be fire-resisting		
- Loadbearing	120/120/120	240/120/120
- Non-loadbearing	-/120/120	-/120/120
Internal walls bounding sole occupancy units		
- Loadbearing	120/-/-	240/-/-
- Non-loadbearing	-/-/-	-/-/-
Internal walls bounding public corridors, public lobbies and the like:		
- Loadbearing	120/-/-	240/-/-
- Non-loadbearing	-/-/-	-/-/-

Item	Class 5, 7a or 9b	Class 7b or 8
Ventilating, pipe, garbage and like shafts: - Loadbearing - Non-loadbearing	120/90/90 -/90/90	240/120/120 -/120/120
Other loadbearing internal walls, beams trusses and columns	120/-/-	240/-/-
Floors	120/120/120	240/240/240
Roofs	120/60/30	240/90/60

Type B Construction

Table 5. Type B Construction

Item	Class 5, 7a or 9b	Class 7b or 8
Loadbearing External Walls		
- Less than 1.5m to a *fire-source feature*	120/120/120	240/240/240
- 1.5 – less 3m from *fire-source feature*	120/90/60	240/180/120
- 3 – less 9m from *a fire-source feature*	120/30/30	240/90/60
- 9 – less 18m from a *fire-source feature*	120/30/-	240/60/-
- 18m or more from a *fire-source feature*	-/-/-	-/-/-
Non-Loadbearing External Walls		
- Less than 1.5m to a *fire-source feature*	-/120/120	-/240/240
- 1.5 – less 3m from *fire-source feature*	-/90/60	-/180/120
- 3m or more from a *fire-source feature*	-/-/-	-/-/-
Loadbearing External Columns		
- Less than 18m	120/-/-	240/-/-
- 18m or more	-/-/-	-/-/-
Non-Loadbearing External Columns	-/-/-	-/-/-
Common Walls & Fire Walls	120/120/120	240/240/240
Stair and Lift Shafts required to be fire-resisting		
- Loadbearing Stair & Lift shaft	120/120/120	240/120/120
- Non-loadbearing Stair shaft only	-/120/120	-/120/120
Internal walls bounding sole occupancy units		
- Loadbearing	120/-/-	240/-/-
- Non-loadbearing	-/-/-	-/-/-
Internal walls bounding public corridors, public lobbies and the like:		
- Loadbearing	120/-/-	240/-/-
- Non-loadbearing	-/-/-	-/-/-

Item	Class 5, 7a or 9b	Class 7b or 8
Other loadbearing internal walls and columns	120/-/-	240/-/-
Roofs	-/-/-	-/-/-

In a Class 9b building, a floor separating storeys or above a space for the accommodation of motor vehicles or used for storage or any other ancillary purpose, must—

(a) be constructed so that it is at least of the standard achieved by a floor/ceiling system incorporating a ceiling which has a resistance to the incipient spread of fire to the space above itself of not less than 60 minutes; or

(b) have an *FRL* of at least 30/30/30; or

(c) have a fire-protective covering on the underside of the floor, including beams incorporated in it, if the floor is combustible or of metal.

ANNEXURE E DEFINITIONS

Annexure E - Definitions

Effective height

Effective height means the vertical distance between the floor of the lowest storey included in a determination of rise in storeys and the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units).

Envelope

Envelope, for the purposes of Section J in Volume One, means the parts of a building's fabric that separate a conditioned space or habitable room from—

(a) the exterior of the building; or

(b) a non-conditioned space including—

(i) the floor of a rooftop plant room, lift-machine room or the like; and

(ii) the floor above a carpark or warehouse; and

(iii) the common wall with a carpark, warehouse or the like.

Exit

Exit means –

(a) Any, or any combination of the following if they provide egress to a road or open space—

(i) An internal or external stairway.

(ii) A ramp.

(iii) A fire-isolated passageway.

(iv) A doorway opening to a road or open space.

(v) A horizontal exit or a fire-isolated passageway leading to a horizontal exit.

Fire compartment

Fire compartment means –

(a) the total space of a building; or

(b) when referred to in—

(i) the Performance Requirements — any part of a building separated from the remainder by barriers to fire such as walls and/or floors having an appropriate resistance to the spread of fire with any openings adequately protected; or

(ii) the Deemed-to-Satisfy Provisions — any part of a building separated from the remainder by walls and/or floors each having an FRL not less than that required for a fire wall for that type of construction and where all openings in the separating construction are protected in accordance with the Deemed-to Satisfy Provisions of the relevant Part.

Fire-resistance level (FRL)

Fire-resistance level (FRL) means the grading periods in minutes determined in accordance with Specification A2.3, for the following criteria—

(a) structural adequacy; and

(b) integrity; and

(c) insulation,

and expressed in that order.

Note: A dash means that there is no requirement for that criterion. For example, 90/–/– means there is no requirement for an FRL for integrity and insulation, and –/–/– means there is no requirement for an FRL.

Fire-source feature

(a) the far boundary of a road, river, lake or the like adjoining the allotment; or

(b) a side or rear boundary of the allotment; or

(c) an external wall of another building on the allotment which is not a Class 10 building

Fire wall

Fire wall means a wall with an appropriate resistance to the spread of fire that divides a storey or building into fire compartments.

Open space

Open space means a space on the allotment, or a roof or similar part of a building adequately protected from fire, open to the sky and connected directly with a public road.

Performance Requirement

Performance Requirement means a requirement which states the level of performance which a Performance Solution or Deemed-to-Satisfy Solution must meet.

Performance Solution

Performance Solution means a method of complying with the Performance Requirements other than by a Deemed-to-Satisfy Solution.

ANNEXURE F BCA COMPLIANCE SPECIFICATION

Annexure F – BCA Compliance Specification

The following BCA matters are to be addressed by specific BCA Design Certificate to be issued by the relevant architectural, services and engineering consultants at the Construction Certificate Stage. This schedule should be forwarded to all consultants to obtain verification that these items have and will be included in the design documentation / specifications:

Architectural Design Certification

1. The FRL's of building elements for the proposed works have been designed in accordance with Table 3 of Specification C1.1 of BCA2019 for a building of Type A Construction and Table 4 of Specification C1.1 of BCA2019 for a building of Type B Construction.
2. Lightweight construction used to achieve required fire resistance levels will comply with Specification C1.8 of BCA2019.
3. Building elements, including external walls and their components, must be non-combustible in accordance with C1.9 of BCA2019.
4. Materials, floor and wall linings/coverings, surface finishes and air-handling ductwork used in the works will comply with the fire hazard properties of Clause C1.10 and Specification C1.10 of BCA2019.
5. Any ancillary elements fixed, installed or attached to the internal parts or external face of an external wall that is required to be non-combustible will comply with Clause C1.14 of BCA2019.
6. Vertical separation will be provided to the new openings in the external walls in accordance with Clause C2.6 of BCA2019. It is noted that no spandrel separation is required in the stairway or to a void.
7. The external walls and openings of separate fire compartments will be protected in accordance with Clause C3.3.
8. The parts of different classifications located alongside one another in the same storey will be separated in accordance with Clause C2.8 and Specification C1.1 of BCA2019.
9. Floors separating storeys of different classifications will comply with BCA Clause C2.9 of BCA2019.
10. Equipment will be separated in accordance with Clause C2.12 of BCA2019.
11. An electricity substation and any main switch room sustaining emergency equipment required to operate in emergency mode, will be separated from the remaining building with construction having an FRL 120/120/120 and provided with self-closing -/120/130 fire doors in accordance with Clause C2.13 of BCA2019.
12. Openings in the external walls that are required to have an FRL will be in located in accordance with Clause C3.2 and C3.3 of BCA2019 or protected in accordance with Clause C3.4 of BCA2019.
13. Doorways in any fire walls separating fire compartments will be protected in accordance with Clause C3.5 of BCA2019.
14. Doorways in horizontal exits will be protected in accordance with Clause C3.7 of BCA2019.
15. Services penetrating elements required to possess an FRL including the floor slabs, walls, shafts, etc. will be protected in accordance with Clause C3.12, C3.13 and C3.15 and Specification C3.15 of BCA2019.
16. Construction joints, spaces and the like in and between building elements required to be fire-resisting with respect to integrity and insulation will be protected in accordance with BCA Clause C3.16.
17. The lift doors will be --/60/- fire doors complying with AS 1735.11:1986 in accordance Clause C3.10 of BCA2019.

18. Columns protected by light weight construction will achieve an FRL not less than the FRL for the element it is penetrating, in accordance with Clause C3.17 of BCA2019.
19. A lintel will have the FRL required for the part of the building in which it is situated, unless it does not contribute to the support of a fire door, fire window or fire shutter, and it spans an opening in masonry which is not more than 150 mm thick and is not more than 3m wide if the masonry is non-loadbearing; or not more than 1.8m wide if the masonry is loadbearing and part of a solid wall or one of the leaves of a cavity wall, in accordance with Specification C1.1 Clause 2.3 BCA2019.
20. The top and bottom of the riser shafts will achieve an FRL not less than the FRL required for the walls of the shaft in accordance with Clause 2.7 of Specification C1.1 of BCA2019.
21. Fire doors will comply with AS 1905.1:2015 and Specification C3.4 of BCA2019.
22. The number of exits provided to the building will be in accordance with Clause D1.2 of BCA2019.
23. Travel distances to exits will be in accordance with Clause D1.4 of BCA2019.
24. The alternative exits will be distributed uniformly around the storey and will not be less than 9m apart, and not more that 45m apart in the residential portion or patient care areas in the health-care building or 60m, in accordance with Clause D1.5 of BCA2019.
25. The dimensions of exits and paths of travel to exits will be provided in accordance with Clause D1.6 of BCA2019.
26. Discharge from exits will be in accordance with Clause D1.10 of BCA2019.
27. Horizontal exits will be in accordance with Clause D1.11 of BCA2019.
28. The ladder from the plant, lift machine rooms, and electricity network substation in lieu of a stairway will be in accordance with Clause D1.16 of BCA2019.
29. Access to the lift pit will be in accordance with Clause D1.17 of BCA2019.
30. The stairway or ramp within the fire-isolated shaft is to be non-combustible, and if there is a local failure not cause structural damage or impair the fire resistance of the shaft, in accordance with Clause D2.2 of BCA2019.
31. The non-fire isolated stairs will be constructed in accordance with Clause D2.3 of BCA2019.
32. The smoke lobby to the fire-isolated exit will be constructed in accordance with Clause D2.6 of BCA2019.
33. The construction of EDB's and telecommunications distribution boards will be in accordance with Clause D2.7 of BCA2019 with the enclosure bounded by non-combustible construction or fire protective covering and smoke seals provided around the perimeter of the non-combustible doors and any openings sealed with non-combustible mastic to prevent smoke spreading from the enclosure.
34. The enclosing walls and ceiling under the non-fire-isolated stairway will achieve an FRL of 60/60/60, and have a self-closing -/60/30 fire door, in accordance with Clause D2.8 of BCA2019.
35. New pedestrian ramps will comply with AS 1428.1:2009, Clause D2.10 and Part D3 of BCA2019. The floor surface of a ramp must have a slip-resistance classification complying with Table D2.14 when tested in accordance with AS 4586:2013.
36. The roof of the building where the exit discharges will have an FRL of 120/120/120, and will not have roof lights or openings within 3m of the path of travel in accordance with Clause D2.12 of BCA2019.
37. Stair geometry to the new stairways will be in accordance with Clause D2.13 of BCA2019. Stair treads are to have a surface with a slip-resistance classification complying with Table D2.14 when tested in accordance with AS 4586:2013.

38. Landings and door thresholds throughout the development will be provided in accordance with Clause D2.14 and D2.15 of BCA2019. Landings to have either a surface with a slip-resistance classification complying with Table D2.14 when tested in accordance with AS 4586:2013 or a strip at the edge of the landing with a slip-resistance classification complying with Table D2.14 when tested in accordance with AS 4586:2013 where the edge ledge to a flight below.
39. The handrails and balustrades to all stairs and throughout the building will be in accordance with Clause D2.16, and D2.17 of BCA2019.
40. The fixed platform, walkway, stairway and ladder and any associated going and riser, landing handrail, balustrade, located within the machinery room, boiler house, lift-machine room, plant-room, or non-habitable attic/storeroom within the sole occupancy unit will comply with AS 1657:2013 or Part D2 of BCA2019.
41. The doorways and doors will be in accordance with Clause D2.19 and D2.20 of BCA2019.
42. Door latching mechanisms will be in accordance with Clause D2.21 of BCA2019
43. Signage will be provided on fire and smoke doors in accordance with Clause D2.23 of BCA2019.
44. On an accessway, where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights and any glazing capable of being mistaken for a doorway or opening, will be clearly marked in accordance with AS 1428.1:2009 and Clause D3.12 of BCA2019.
45. Fire precautions whilst the building is under construction fire precautions will be in accordance with Clause E1.9 of BCA2019.
46. External above ground waterproofing membranes will comply with Clause F1.4 of BCA2019 and AS 4654 Parts 1 & 2:2012.
47. The new roof covering will be in accordance with Clause F1.5 of BCA2019.
48. Any sarking proposed will be installed in accordance with Clause F1.6 of BCA2019.
49. Waterproofing of all wet areas to the building will be carried out in accordance with Clause F1.7 of BCA2019 and AS 3740:2010.
50. Damp proofing of the proposed structure will be carried out in accordance with Clause F1.9 and F1.10 of BCA2019.
51. All new glazing to be installed throughout the development will be in accordance with Clause F1.13 of BCA2019 and AS 1288:2006 / AS 2047:2014.
52. Sanitary facilities will be provided in the building in accordance with Clause F2.1, Table F2.1, Clause F2.3 and Table F2.3 of BCA2019.
53. The construction of the sanitary facilities will be in accordance with Clause F2.5 of BCA2019.
54. Ceiling heights to the new areas will be in accordance with Clause F3.1 of BCA2019.
55. Natural light will be provided in accordance with Clause F4.1, F4.2, and F4.3 of BCA2019.
56. Water closets and urinals will be located in accordance with Clause F4.8 of BCA2019.
57. The sanitary compartments will be either be provided with mechanical exhaust ventilation or an airlock in accordance with Clause F4.9 of BCA2019.
58. Every storey of the carpark will be provided with an adequate system of permanent natural or mechanical ventilation in accordance with Clause F4.11 of BCA2019.
59. A safe manner for cleaning of windows located 3 or more storeys above ground level will be provided in accordance with the Work Health & Safety Act 2011 and regulations made under that Act in accordance with NSW G1.101 of BCA2019.

60. Essential fire or other safety measures must be maintained and certified on an ongoing basis, in accordance with the provisions of the Environmental Planning and Assessment Regulation, 2000.
61. Building Fabric and Thermal Construction will be in accordance with Part J1 of BCA2019.
62. Glazing will be in accordance with Part J1 of BCA2019.
63. Building sealing will be in accordance with Part J3 of BCA2019.
64. Facilities for Energy Monitoring will be provided in accordance with Clause J8.3 of BCA2019.

Electrical Services Design Certification:

65. A smoke detection and alarm system will be installed throughout the building in accordance with Table E2.2a, and Specification E2.2a of BCA2019.
66. Emergency lighting will be installed throughout the development in accordance with Clause E4.2, E4.4 of BCA2019 and AS/NZS 2293.1:2018.
67. Exit signage will be installed in accordance with Clause E4.5, E4.7, and E4.8 of BCA2019 and AS/NZS 2293.1:2018.
68. An emergency warning and intercom system (EWIS) will be provided to the building in accordance with Clause E4.9 of BCA2019.
69. Artificial lighting will be installed throughout the development in accordance Clause F4.4 of BCA2019 and AS/NZS 1680.0:2009.
70. Lighting power and controls will be installed in accordance with Part J6 of BCA2019.
71. Electrical conductors located within the building that supply a main switchboard that sustains emergency equipment will comply with Clause C2.13 of BCA2019.

Hydraulic Services Design Certification:

72. Storm water drainage will be provided in accordance with Clause F1.1 of BCA2019 and AS/NZS 3500.3:2018
73. Fire hydrant system will be installed in accordance with Clause E1.3 of BCA2019 and AS 2419.1:2005 as required.
74. Fire hose reels will be installed in accordance with Clause E1.4 of BCA2019 and AS 2441:2005.
75. A sprinkler system will be installed in accordance with Clause E1.5 of BCA2019, Specification E1.5 and appropriate part(s) of AS 2118.
76. Portable fire extinguishers will be installed in accordance with Clause E1.6 of BCA2019 and AS 2444:2001.
77. The heated water supply systems will be designed and installed to NCC Volume 3 – Plumbing code and Clause J7.2 of BCA2019.

Mechanical Services Design Certification:

78. An air-handling system which does not form part of a smoke hazard management system will be installed in accordance with Clause E2.2 of BCA2019, and AS 1668.1:2015.
79. A smoke exhaust system will be installed in the building in accordance with Table E2.2b, and Specification E2.2c of BCA2019.
80. Where not naturally ventilated the building will be mechanically ventilated in accordance with Clause F4.5 of BCA2019 and AS 1668.2:2012.

81. Every storey of the car park will be ventilated in accordance with Clause F4.11 of BCA2019 and where not naturally ventilated it will be mechanically ventilated in accordance with AS 1668.2:2012 as applicable.
82. The air-conditioning and ventilations systems will be designed and installed in accordance with Part J5 of BCA2019
83. Rigid and flexible ductwork will comply with the fire hazard properties set out in AS 4254 Parts 1 and 2.

Structural Engineers Design Certification:

84. The material and forms of construction for the proposed works will be in accordance with Clause B1.2, B1.4 and B1.6 of BCA2019 as follows:
    a. Dead and Live Loads – AS/NZS 1170.1:2002
    b. Wind Loads – AS/NZS 1170.2:2011
    c. Earthquake actions – AS 1170.4:2007
    d. Masonry – AS 3700:2018
    e. Concrete Construction – AS 3600:2018
    f. Steel Construction AS 4100:1998
    g. Aluminium Construction – AS/NZS 1664.1 or 2:1997
    h. Timber Construction – AS 1720.1:2010
85. The FRL's of the structural elements for the proposed works have been designed in accordance with Specification C1.1 of BCA2019, including Table 3 for a building of Type A Construction, including Table 4, for a building of Type B Construction, including Table 5.
86. The lift shaft will have an FRL in accordance with Clause C2.10 and Specification C1.1 of BCA2019.
87. Lightweight construction used to achieve required fire resistance levels will comply with Specification C1.8 of BCA2019.
88. The construction joints to the structure will be in accordance with Clause C3.16 of BCA2019 to reinstate the FRL of the element concerned.

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89. The lifts throughout the development will be provided with stretcher facilities in accordance with Clause E3.2 of BCA2019 and will be capable of accommodating a stretcher with a patient lying horizontally by providing a clear space not less than 600mm wide x 2000mm long x 1400mm high above the floor level.
90. Warning signage in accordance with Clause E3.3 of BCA2019 will be provided to the lifts to advise not to use the lifts in a fire.
91. A fire service recall control switch is to be installed on a landing at a location nominated by the appropriate authority in accordance with Clause E3.9.
92. A lift car fire service drive control switch is to be installed within the lift car in accordance with Clause E3.10.
93. Access and egress to the lift well landings will comply with the Deemed-to-Satisfy Provisions of D3 of the BCA2019 and will be suitable to accommodate disabled persons.
94. The type of lifts will also be suitable to accommodate persons with a disability in accordance with Clause E3.6, Table E3.6a, and will have accessible features in accordance with Table E3.6b of BCA2019.

95. The lifts will comply with AS 1735.12:1999 in accordance with Clause E3.6 of BCA2019.

96. All electric passenger lifts and electrohydraulic passenger lifts shall comply with Specification E3.1 of BCA2019.