DA Stage BCA Assessment Report

The Landmark St Leonards Village

Project:	The Landmark St Leonards Village
Reference No:	115389-BCA-r3
Date:	1 July 2022
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Document Control

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115389-BCA-r1	22 June 2022	DA Stage BCA Assessment Report	
115389-BCA-r2	1 July 2022	Updated DA Stage BCA Assessment Report	
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BCA Logic Acquired by Jensen Hughes

BCA Logic was acquired by Jensen Hughes, the largest specialist fire and safety engineering firm in the world, in September 2021.

A respected global leader in safety, security and risk-based engineering and consulting, Jensen Hughes employs more than 1,400 people across 100 countries. This acquisition marks the company's entry into the Australian market and speaks to BCA Logic's experience and expertise in building legislation and regulations, fire, accessibility, and energy consulting.

Partnering with Jensen Hughes allows BCA Logic to further advance our capabilities in all aspects of fire safety engineering and support our clients with an expanded range of complementary services. Both companies share a commitment to technical excellence and exceptional client service.

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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 (Livable Housing Design has been assessed under separate Access Assessment Report cover).

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.

Livable housing

Note: NSW have advised that the livable housing provisions **will not be adopted** at this time as a result of the impact of the pandemic, rising interest rates and stability of the current housing market. This could change at any time in the future.

Volumes One and Two contain new livable housing requirements for Class 1a buildings (houses and townhouses) and Class 2 sole-occupancy units (individual apartments). This puts in place features based on the Livable Housing Design Guidelines silver standard, with a voluntary gold standard also available for features over and above silver.

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 is 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.

Early childhood centres

There are new deemed-to-satisfy (DtS) Provisions for early childhood centres in Volume One. Most of these are extra requirements to address the difficulties associated with evacuating young occupants from the upper levels of multi-storey buildings; but some requirements apply for all early childhood centres.

Fire safety of external walls

Volume One contains a number of amendments to the fire safety of external walls. This clarifies interpretations 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

There are new DtS Provisions in Volume Two for waterproofing of wet areas, not previously covered by an acceptable construction practice or manual.

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**
C2.5	C3D6	Fire separation of **early childhood centres** and requirement for 2 fire compartments per storey.
D1.2	D2D3	**Number of Exits** • Ground floor can be provided with a single exit in lieu of 2 • 2 exits required from each storey and each fire compartment of an **early childhood centre**
D1.6	D2D7 – D2D11	**Dimensions of Exits** Clause split into multiple clauses
D1.11	D2D16	**Horizontal Exits** – New provisions relating to early childhood centres
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
-	G7	**Livable housing design**
H1.1	Part I1	**Class 9b Building**
H2.1	Part I2	**Public Transport Buildings**
H3.1	Part I3	**Farm Buildings and Farm Sheds**

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 The Landmark St Leonards Village, at Sites (Areas) 1, 2 & 4 located 4-8 Marshall Avenue, 1-5 Canberra Avenue and 2-8 Holdsworth Avenue St Leonards. The building incorporates five (5) storeys of basement carparking with residential sole-occupancy units located in the storeys above. Common resident's facilities are also proposed including lobby spaces, swimming pool(s) and gym, open rooftop terrace spaces and central park spaces between the three (3) residential towers. The residential towers form a single building via the common basement carparking below.

2.2. Purpose

The purpose of this report is to assess the current design proposal against the Deemed-to-Satisfy Provisions of BCA 2019, 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 Assessment (Performance Solution) 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 One – Building Code of Australia, 2019 Edition (BCA) Amendment 1, 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 services.

This report does not include, or imply compliance with:

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

(b) the Disability Discrimination Act 1992 including the Disability ((Access to Premises – Buildings) Standards 2010 – unless specifically referred to), (Note: The provision of access for people with a disability has been assessed against the Deemed-to-Satisfy Provisions of Part D3 and Clauses E3.6, F2.4 and F2.9 of BCA2019 under separate Access Assessment Report);

(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 building has a rise in storeys of nineteen (20) based on the section drawings provided.

3.2. Classification (Clause A6.0)

The building has been classified as follows.

Table 1. Building Classification

Class	Level	Description
Class 7a	Basement 4, 3, 2 & Part Basement 1 & Level 0	Carparking
Class 7b	Part Basement 1	Storage
Class 2	Part Level 0, Level 1 – Tower 1 Roof	Residential

3.3. Effective Height (Clause A1.0)

The building has an *effective height* of approximately 63.95m (T1 Roof RL125.7 – Basement 1 RL61.75), therefore more than 12m, more than 25m and more than 50m.

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

The building is required to be of Type A Construction.

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

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

Class 7b	Maximum Floor Area	5 000 m^2
	Maximum Volume	30 000 m^3
Class 7a	The carpark is to be provided with a sprinkler system complying with Specification E1.5 and as such there are no maximum floor area or volume limitations for this area.	
Class 2	The Class 2 portions of the building are not subject to floor area and volume limitations of C2.2 as Table 3 of Specifications C1.1 and Clause C3.11 of the BCA regulates the compartmentation and separation provisions applicable to buildings, or building portions, of Class 2 classifications.	

3.6. Fire Compartments

The following *fire compartments* have been assumed:

(a) The carpark (and storage) areas across the basement levels and level 0 form a single combined fire compartment via the interconnecting carpark ramps;

(b) Each residential storey forms a separate fire compartment, except R Tower 1 & L18, and L0, L1 & L2 in Tower 1 and L1, L2 & L3 in Tower 2 which are interconnected by open voids and open stairways.

3.7. Exits

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

(a) The doorways opening into the fire-isolated stairways at B4 – B1, L0, L1 & L2 in addition to the doorways leading to the road/open space, and throughout L2 – Roof.

(b) The doorways leading to the road/open space at L0, L1 & L2.

3.8. Climate Zone (Clause A1.0)

The building is located within Climate Zone 5.

3.9. Location of Fire-source features

The fire source features for the subject development are:

North: The far boundary of Marshall Ave (>6m).

South: The common allotment boundaries with Area 3 and Area 6 (>3m).

East: The far boundary of Canberra Ave (>6m) and the common allotment boundary with Area 3 (>3m).

West: The far boundary of Holdsworth Ave (>6m).

In accordance with Clause 2.1 of Specification C1.1, a part of a building element is exposed to a *fire-source feature* if any of the horizontal straight lines between that part and the fire-source feature, or vertical projection of the feature, is not obstructed by another part of the building that–

(a) has an FRL of not less than 30/–/–; and

(b) is neither transparent nor translucent.

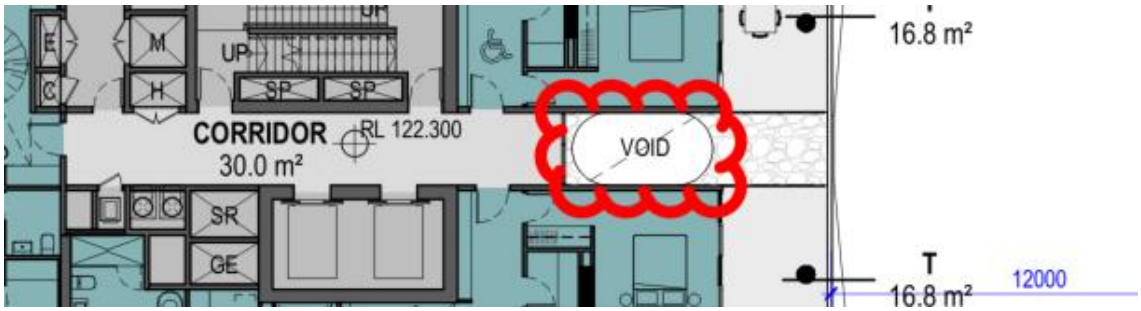
4 COMPLIANCE STATEMENT & MATTERS FOR FURTHER CONSIDERATION

4.1. General

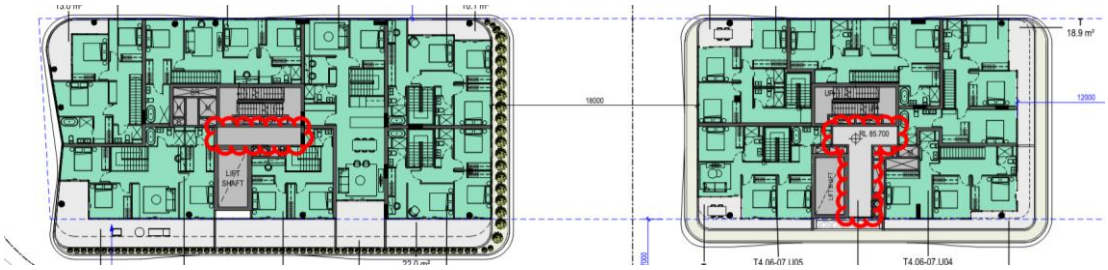
The architectural design documentation as referred to in this report has been assessed against the applicable provisions of the Building Code of Australia (BCA), and it is considered that such a design is capable of complying with the BCA, subject to those items identified in this report (particularly those items identified below) being satisfactorily addressed, and subject to the feasibility of those *Performance Solutions* listed in Part 4.3 of this report.

Note: It is also important that the Annexure E is read in conjunction with the items below, as some matters may not have had sufficient information provided to allow a detailed assessment to be undertaken.

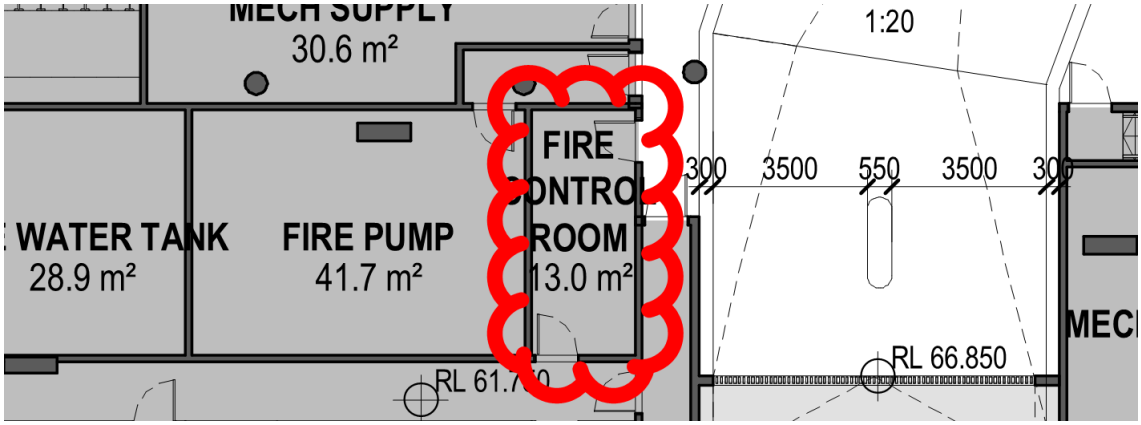
1. The parts of the building which project above the lightwell void openings shall have an FRL of 90/90/90 and all openings protected in accordance with BCA C3.4 where within 3m of, and 6m above, the lightwell void openings from the storey below in accordance with Clause 3.6 of BCA Spec C1.1, or otherwise be the subject of an additional fire engineered Performance Solution.



2. It is unclear how Tower 2 and Tower 4's Level 7 (presumably) services corridors are accessed and egressed from. All storeys must have access to at least two (2) exits pursuant to BCA D1.2.

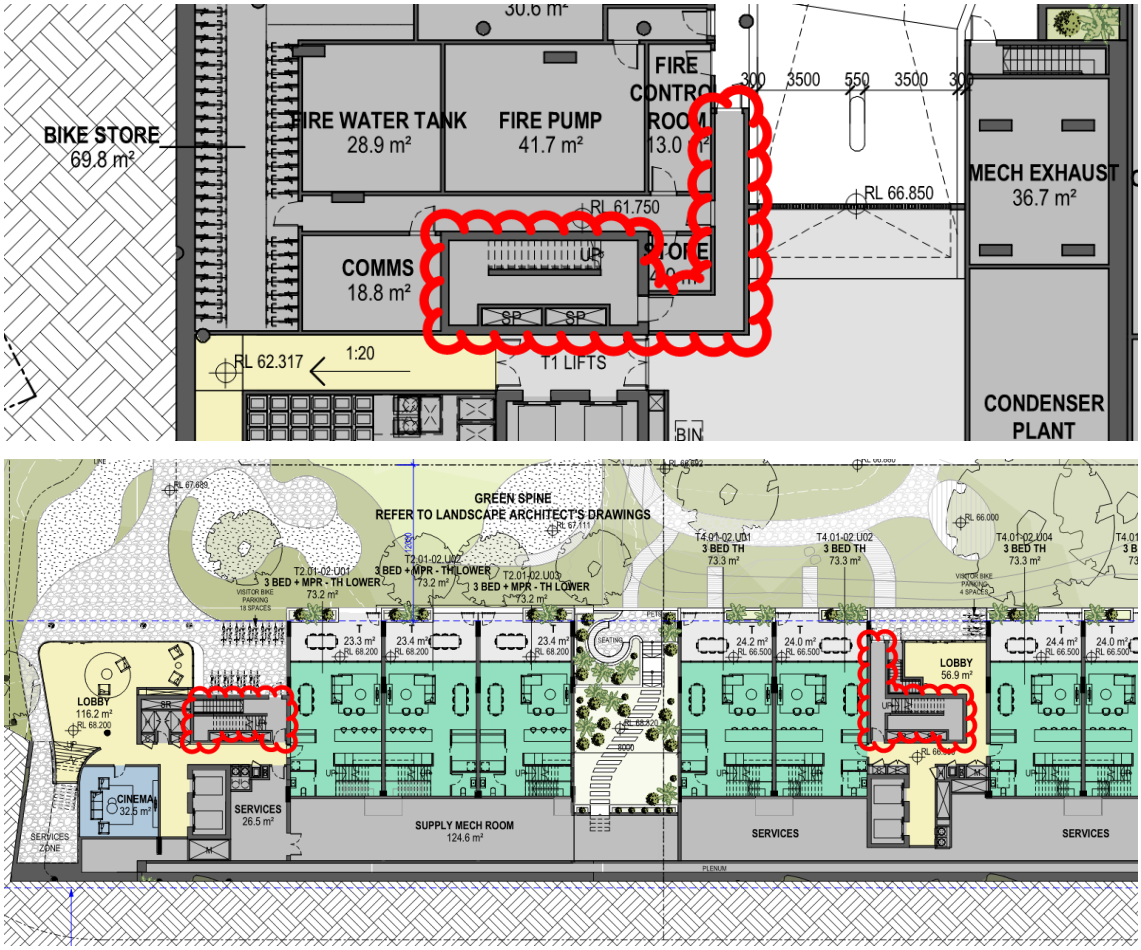


3. The fire control room must be accessible via two paths of travel, one from the front entrance of the building, and one from a public place or fire-isolated passageway which leads to a public place in accordance with BCA E1.8 and Specification E1.8. If not achieved, then an additional fire engineered Performance Solution will need to be investigated.

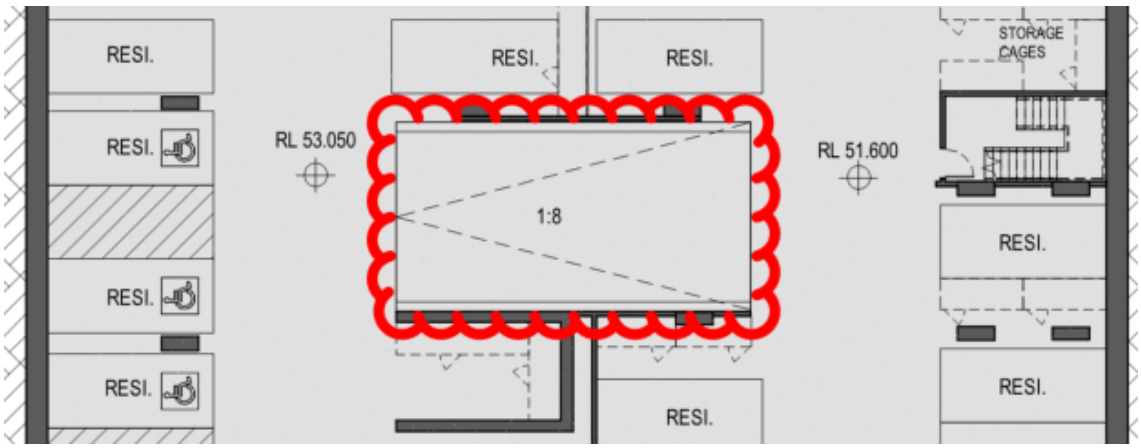


4. It is unclear how Tower 1, Tower 2 and Tower 4's fire-isolated scissor stairs are configured – their individual levels of discharge are unclear in the design, and it appears as though they either converge within a single fire-isolated passageway at Basement 1/Level 1 and/or one of the stairways discharges within the Level 0 and Level 2 lobbies.

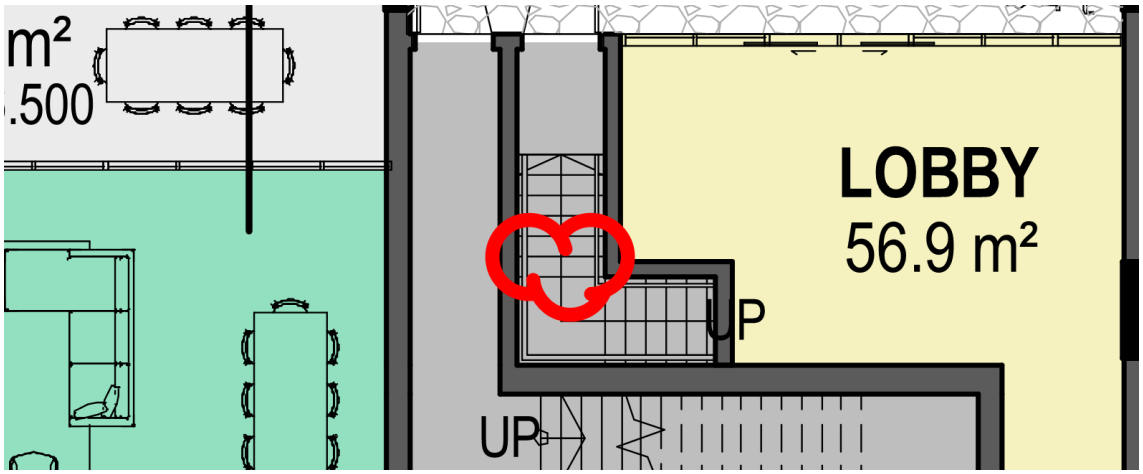
   This is to be confirmed for assessment and will also affect the stair press design. If any of the fire-isolated exits discharge within the lobbies, or if rising and descending stair flights converge without non-combustible smoke sealed separation as required by BCA D2.4, then an additional fire engineered Performance Solution will need to be investigated.



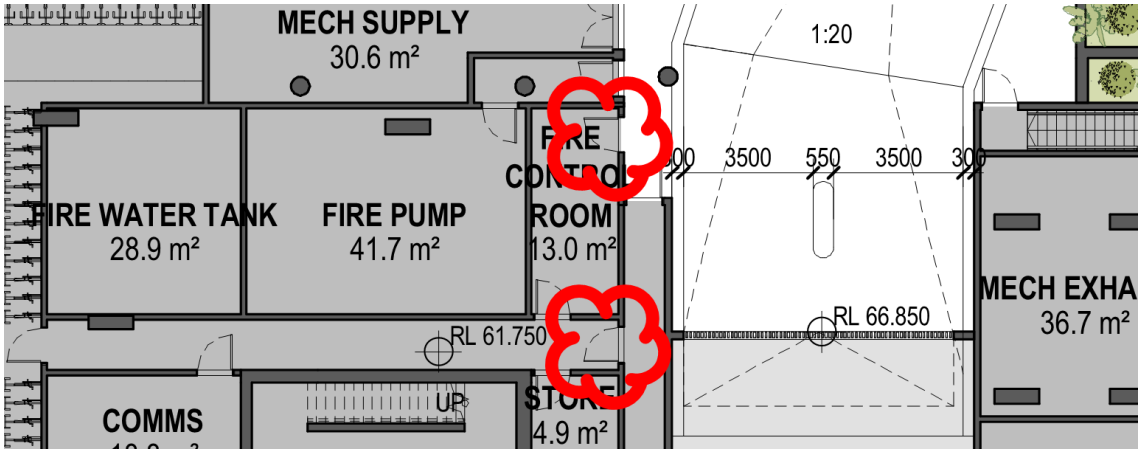
5. Where the vehicle ramps are relied upon as a path of egress (where steeper than 1:20 up to 1:8), they shall be provided with a single handrail for their full length in accordance with BCA D2.17.



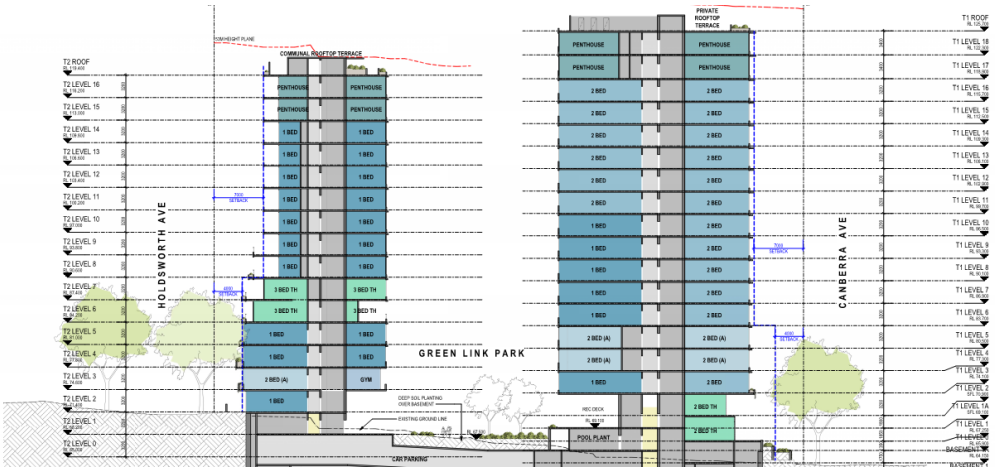
6. It shall be ensured that offset stair treads are provided to all stairways throughout the development to ensure that the handrail is able to comply with BCA D2.17 including Clause 12 of AS1428.1-2009.



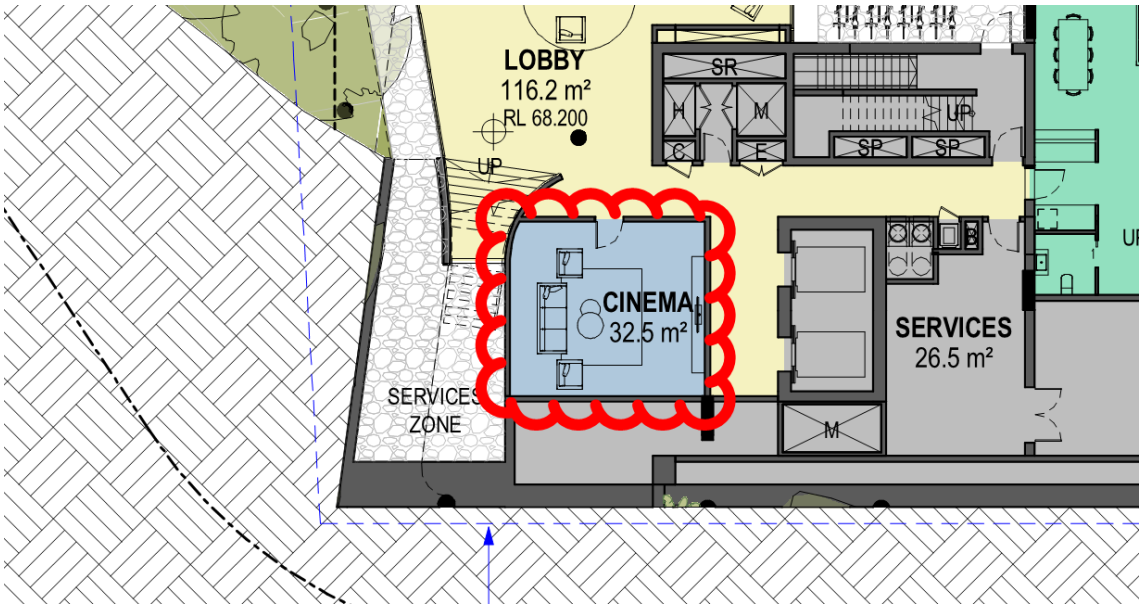
7. All doorways serving as required exits must swing in the direction of egress in accordance with BCA D2.20, unless it serves a part of the building with a floor area not more than 200m², is the only required exit from the part of the building and is fitted with a device for holding it in the open position (noting doorways into fire-isolated exits and from the Fire Control Room such as below cannot be fitted with a hold-open device as they are required to be self-closing fire doors).



8. The building has an effective height of greater than 50m and therefore a fire service relay pump is required in accordance with BCA E1.3 and AS2419.1-2005. There currently is no fire service relay level identified in the design and coordination with the fire service system designer is important to ensure that this is accommodated.



9. Natural light shall be provided to the Tower 2 Level 1 Cinema room as required by BCA Part F4.



4.2. Dimensions and Tolerances

The BCA contains the minimum standards for building construction and safety, and therefore generally stipulates minimum dimensions which must be met. BCA Logic's assessment of the plans and specifications has been undertaken to ensure the minimum dimensions have been met.

The designer and builder should ensure that the minimum dimensions are met onsite, and consideration needs to be given to construction tolerances for wall set outs, applied finishes and skirtings to corridors and bathrooms for example, tiling bed thicknesses and the like which can adversely impact on critical matters such as access for people with disabilities, stair and corridor widths and balustrade heights.

4.3. Performance-based Design – Performance Solutions

There are specific areas throughout the development where strict Deemed-to-Satisfy BCA Compliance may not be achieved by the proposed design and site constraints. These matters may need to be addressed in a detailed Performance Solution and/or Fire Engineering Report, to be prepared for this development under separate cover.

Where/if the below Performance Solutions are not feasible after important consultation with the engaged Fire Engineer has occurred, then design revision will be necessary.

Table 2. Performance Solutions

Item	Description of Performance Solution	DTS Provision
1.	To permit the 120/120/120 FRL's required of the Class 7a part to be applied across the Class 7b parts at Basement 1 which exceed 10% of the floor area of the storey and therefore require FRL 240/240/240.	C1.1
2.	To permit the garbage chute shafts to be open to the waste rooms at the base of the shaft.	2.7 of Spec C1.1
3.	To permit the carpark fire compartment, which contains Class 7b parts at Basement 1, to exceed the floor area and volume limitations.	C2.2
4.	To omit smoke-proof walls complying with Clause 2 of Specification C2.5 within Tower 2's residential lobbies which exceed 40m in length across Levels 4-5.	C2.14

Item	Description of Performance Solution	DTS Provision
5.	To permit internal glazing around internal rooms such as the Tower 2 Level 3 residential amenities, gym and lobby void space below, and the Level 1 residential corridor and void spaces to the lobbies above/below.	C3.11
6.	To permit the Basement 1 Bike Store, Mech Supply, Workshop, Comms, Store, Fire Water Tank, Fire control Room and Fire Pump rooms to have access to only a single exit.	D1.2
7.	To permit the egress travel distance to the nearest exit/point of choice between alternative exits at the Tower 2 communal rooftop terrace to be up to approximately 31m.	D1.4
8.	To permit the egress travel distance to the nearest exit/point of choice between alternative exits within Tower 2's residential lobbies to be up to approximately 14m from the SOU doorways (worst case Level 4 & 5).	D1.4
9.	To permit the egress travel distance to the nearest exit/point of choice between alternative exits within Tower 4's residential lobbies to be up to approximately 11m from the SOU doorways (worst case Level 4 & 5).	D1.4
10.	To permit an egress travel distance of up to 27.5m to reach the nearest exit from the Basement 1 Bike Store.	D1.4
11.	To permit an egress travel distance of up to approximately 42m to reach the nearest exit at Basement 4.	D1.4
12.	To permit the distance between the alternative doorways opening into the scissor stair fire-isolated exits throughout the building to be less than 9m apart.	D1.5
13.	To permit a distance between alternative exits of up to approximately 84m at Basement 4.	D1.5
14.	To permit a distance between alternative exits of up to approximately 72m at Basement 3, 2 & 1.	D1.5
15.	To permit the alternative exits within the scissor stair fire-isolated stairways to discharge adjacent to one another within the same covered space which is not as far apart as practical (exact levels of discharge to be confirmed as identified under Part 4.1).	D1.5 & D1.10
16.	To rationalise the protection of glazing and other openings within 6m of the path of travel to reach the road from the discharge of the fire-isolated stairways (most notably the lobby glazing adjacent to the discharge of Tower 2's fire-isolated stairways, the western wall of Tower 1 and walls facing the external stairway between Towers 2 & 4 which occupants egressing from Towers 2 & 4 are required to egress within 6m of).	D1.7
17.	To permit Tower 2's fire-isolated stairways to discharge within a covered area which is not sufficiently open for its perimeter (1/3 or 2/3).	D1.7
18.	To permit Tower 1, 2 and 4's fire-isolated stairways to discharge within the enclosed residential lobby spaces (exact levels of discharge to be confirmed as identified under Part 4.1).	D1.7
19.	To permit Tower 2's rising and descending stair flights to converge without non-combustible smoke sealed separation.	D2.4
20.	To rationalise any openings in the roof of the basement carpark which are within 3m of the path of travel of persons egressing over the basement carpark roof to reach the road.	D2.12
21.	To rationalise the egress of occupants via the carpark ramp, and through the associated carpark shutter, towards Canberra Ave at Basement 1.	D2.19 & D2.21

Item	Description of Performance Solution	DTS Provision
22.	To rationalise egress through the private garage roller shutters at Level 0.	D2.19 & D2.21
23.	To permit the hydrant booster assembly to not be in sight of all main entrances to the building where there are a number of entrances and lobbies proposed.	E1.3
24.	To permit the fire control room to be in a location which does not have a doorway from the front entrance of the building, and an additional doorway from a public place or fire-isolated passageway which leads to a public place.	E1.8
25.	To demonstrate that the construction of the external walls is such that they will prevent the penetration of water that could cause unhealthy or dangerous conditions or loss of amenity to occupants and undue dampness or deterioration of building elements.	F1.0 (No DtS Provisions – FP1.4 only)

4.4. Façade Construction – Non-combustible

As the building is required to be of Type A Construction, the external façade is required to be *non-combustible* and comply with Clause C1.9 of BCA2019 which states as follows:

(a) *In a building required to be of Type A or B construction, the following building elements and their components must be non-combustible:*
  (i) *External walls and common walls, including all components incorporated in them including the facade covering, framing and insulation.*
  (ii) *The flooring and floor framing of lift pits.*
  (iii) *Non-loadbearing internal walls where they are required to be fire-resisting.*

(b) *A shaft, being a lift, ventilating, pipe, garbage, or similar shaft that is not for the discharge of hot products of combustion, that is non-loadbearing, must be of non-combustible construction in—*
  (i) *a building required to be of Type A construction; and*
  (ii) *…*

(c) *A loadbearing internal wall and a loadbearing fire wall, including those that are part of a loadbearing shaft, must comply with Specification C1.1.*

(d) *The requirements of (a) and (b) do not apply to gaskets, caulking, sealants, termite management systems, Glass including laminated glass, thermal breaks associated with glazing systems and damp-proof courses.*

(e) *The following materials, may be used wherever a non-combustible material is required:*
  (i) *Plasterboard.*
  (ii) *Perforated gypsum lath with a normal paper finish*
  (iii) *Fibrous-plaster sheet.*
  (iv) *Fibre-reinforced cement sheeting.*
  (v) *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.*
  (vi) *Sarking-type materials that do not exceed 1 mm in thickness and have a Flammability Index not greater than 5.*
  (vii) *Bonded laminated materials where—*
    (A) *each lamina, including any core, is non-combustible; and*
    (B) *each adhesive layer does not exceed 1 mm in thickness and the total thickness of the adhesive layers does not exceed 2 mm; and*
    (C) *the Spread-of-Flame Index and the Smoke-Developed Index of the bonded laminated material as a whole do not exceed 0 and 3 respectively.*

It is also noted that this clause prohibits the use of in situ formwork containing combustible elements including PVC lined formwork products where the PVC lining remains in place for the life of the building where proposed to be used as an external wall element, common walls, the flooring and floor framing of lift pits, services riser shafts or non-*loadbearing* internal walls required to be fire resisting. It should be noted

that perimeter walls of basement (below ground) floor levels are also deemed to be external walls and the above provisions apply.

Note: Due to industry wide changes to Professional Indemnity Insurance which include exclusions to external combustible cladding, BCA Logic are not in a position to recommend, advocate for, or undertake performance-based solutions for any combustible wall elements including external claddings or the use of PVC lined formwork products and the like. A reference to the use of any of these products within this report is not to be taken as support for their use in the building. BCA Logic are not responsible for the selection of any materials and our report outlines compliance pathways and whether or not compliance is achieved only.

ANNEXURE A DESIGN DOCUMENTATION

Annexure A – Design Documentation

This report has been based on the following design documentation.

Table 3. Architectural Plans

Architectural Plans Prepared by rothelowman			
Drawing Number	**Revision**	**Date**	**Title**
TP00.00	A	29.06.22	Cover Page
TP00.01	A	29.06.22	Site Plan
TP00.02	A	29.06.22	Demolition Plan
TP01.00	A	29.06.22	Basement 4
TP01.01	A	29.06.22	Basement 3
TP01.02	A	29.06.22	Basement 2
TP01.03	A	29.06.22	Basement 1
TP01.04	A	29.06.22	Level 0
TP01.05	A	29.06.22	Level 1
TP01.11	A	29.06.22	Level 2
TP01.12	A	29.06.22	Level 3
TP01.13	A	29.06.22	Level 4
TP01.14	A	29.06.22	Level 5
TP01.15	A	29.06.22	Level 6
TP01.16	A	29.06.22	Level 7
TP01.17	A	29.06.22	Level 8
TP01.18	A	29.06.22	Level 9
TP01.19	A	29.06.22	Level 10
TP01.20	A	29.06.22	Level 11
TP01.21	A	29.06.22	Level 12
TP01.22	A	29.06.22	Level 13
TP01.23	A	29.06.22	Level 14
TP01.24	A	29.06.22	Level 15
TP01.25	A	29.06.22	Level 16
TP01.26	A	29.06.22	Level 17
TP01.27	A	29.06.22	Level 18
TP01.28	A	29.06.22	Level 19
TP01.29	A	29.06.22	Roof Plan
TP02.01	A	29.06.22	North Elevation
TP02.02	A	29.06.22	South Elevation – Building 4
TP02.03	A	29.06.22	South Elevation – Building 1 & 2
TP02.04	A	29.06.22	East Elevation – Building 1
TP02.05	A	29.06.22	East Elevation – Building 2 & 4
TP02.06	A	29.06.22	West Elevation – Building 2 & 4
TP02.07	A	29.06.22	West Elevation – Building 1
TP03.01	A	29.06.22	Section A1
TP03.02	A	29.06.22	Section A2
TP03.03	A	29.06.22	Section B
TP03.04	A	29.06.22	Section C

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, including any omissions or additions as a result of the fire engineering process.

Table 4. Essential Fire Safety Measures

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) AS 1905.2:2005 (Fire Resistant roller shutters)
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 C3.8** (Openings in Fire Isolated Exits) **BCA2019 C3.10** (Opening in Fire Isolated Lift Shafts) AS1735.11- 1986 **BCA2019 C3.11** (Bounding Construction) **BCA2019 C3.13** (Opening in Shafts) Spec E1.8 (Fire Control Centres) Spec C3.4 AS1905.1: 2015
3.	Fire seals protecting openings in fire resisting components of the building	**BCA2019 C1.1, Spec C1.1** **BCA2019 C3.15** (Openings for service installations) **BCA2019 C3.16** (Construction joints) **BCA2019 Spec C3.15** AS1530.4:2014 & AS4072.1-2005
4.	Fire windows > Fixed Internal wall-wetting sprinklers > Fixed External wall-wetting sprinklers > -/60/- Fire Windows automatic closing	**BCA2019 C3.4** (Acceptable Methods of Protection) **BCA2019 C3.8** (Openings in Fire Isolated Exits) **BCA2019 C3.11** (Bounding Walls)

Item	Essential Fire and Other Safety Measures	Standard of Performance
	> -/60/- Fire Windows fixed closed > -/60/- automatic closing Fire Shutters	**BCA2019 D1.7** (Travel Via Fire Isolated Exits) **BCA2019 Spec. C3.4** identical to tested porotype AS1905.2-2005 (Fire Resistant Roller Shutters)
5.	Lightweight construction	**BCA2019 C1.1, Spec. C1.1** **BCA2019 C1.8, Spec C1.8** AS1530.4:2014
6.	Smoke Walls	**BCA2019 C2.14** (Public Corridors Class 2/3) **BCA2019 D2.4** (Separation of Rising and Descending Stair Flights)
7.	Smoke Doors	**BCA2019 C2.14** (Public Corridors Class 2/3) Clause 2 of Spec C2.5 **BCA2019 D2.4** (Separation of Rising and Descending Stair Flights) **BCA2019 Spec C3.4** AS1670.1:2018
General		
8.	Fire control room	**BCA2019 E1.8, Spec E1.8** (Fire Control Centres)
9.	Portable fire extinguishers	**BCA2019 E1.6** AS 2444–2001
10.	Fire blankets	AS 2444–2001
General Egress		
11.	Automatic fail safe devices	**BCA2019 D2.21** (Operation of Latches) **BCA2019 D2.22** (Re-entry from fire-isolated stairs) AS 1670.1:2018 (Fire)
12.	Operation of Door latches	**D2.21** (Operation of Latch) AS 1670.1:2018
13.	Required Automatic Doors	**D2.19** (Doorways and Doors)
14.	Swing of Exit Doors	**D2.20** (Swinging Doors)
15.	Warning & operational signs	**BCA2019 D2.23 (**Signs on Fire Doors)

Item	Essential Fire and Other Safety Measures	Standard of Performance
		BCA2019 D3.6 (Braille Exit Signs) (Note: E4.5 (Exit Signs)) **BCA2019 E3.3** (Lift Signs) **BCA2019 Spec E1.8** (Fire Control Room) **BCA2019 Spec E1.8** (Fire Control Centres)
Lifts		
16.	Access to Lift Pits	**BCA2019 D1.17** (Access to Lift Pits)
17.	Emergency lifts	**BCA2019 E3.4** AS 1735.1:2003 (Appendix A) or AS 1735.2:2001
18.	Stretcher Lifts including	**BCA2019 E3.2** **BCA2019 E3.7** (Fire Service Controls) **BCA2019 E3.9** (Fire Service Recall Operation Switch) **BCA2019 E3.10** (Lift Car Fire Service drive control switch) **BCA2019 Spec E3.1** AS 1735.11:1986 (Fire rated landing doors)
Electrical Services		
19.	Automatic fail safe devices	**BCA2019 D2.21** (Operation of Latches) **BCA2019 D2.22** (Re-entry from fire-isolated stairs) AS1670.1:2018 (Fire)
20.	Automatic fire detection & alarm system	**BCA2019 E2.2**, NSW Table E2.2a, Table 2.2b **Spec E2.2a** AS 3786:2014 (Amdt 1-4) AS 1670.1:2018 (Fire) – Section 4 and 5 (Detectors) AS 1670.3:2018 (Fire Alarm Monitoring) AS 1670.4:2018 (EWIS)
21.	Emergency lighting	**BCA2019 E4.2, E4.4** AS/NZS 2293.1:2018
22.	Exit signs	**BCA2019 E4.5** (Exit Signs) **BCA2019 E4.6** (Direction Signs)

Item	Essential Fire and Other Safety Measures	Standard of Performance
		BCA2019 E4.8 (Design and Operation - Exits) AS/NZS 2293.1:2018
23.	Emergency warning and intercom system (EWIS)	**BCA2019 E4.9** AS 1670.4:2018 (EWIS)
24.	System Monitoring	**BCA2019 E2.2, Table E2.2a, Spec E2.2a** AS 1670.3:2018
Hydraulic Services		
25.	Automatic fire suppression systems	**BCA2019 E1.5** AS 2118.1:2017 (Sprinklers) AS 2118.6:2012 (Combined Sprinklers/Hydrant)
26.	Fire hydrant systems > NSW Storz Couplings > Ring Main required (LIB, >25m) > Fire Brigade Relay Pump (>50m) > On-site water storage (>25m)	**BCA2019 E1.3** AS 2419.1:2005 FRNSW Technical Sheet D15/45534.V9 issued 10.01.19, 'Compatible Hose Connections'
27.	Hose reel systems	**BCA2019 E1.4** AS 2441:2005
28.	Wall-wetting sprinkler / drenchers	**BCA2019 C3.4** AS 2118.2: Wall-wetting sprinkler / drenchers
Mechanical Services		
29.	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
30.	1. Mechanical air handling systems. 2. Mechanical ventilation to carpark. 3. Fire Isolated Exit Pressurisation System.	**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

Item	Essential Fire and Other Safety Measures	Standard of Performance
		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.
31.	Smoke dampers	**BCA2019 C2.5 and Spec C2.5** **BCA2019 E2.2, Spec E2.2a** AS 1668.1:2015 (Amdt 1), AS 1682.1:2015 & AS 1682.2:2015

Notes:

(An air-handling system which does not form part of a smoke hazard management system in accordance with Table E2.2a or Table E2.2b and which recycles air from one *fire compartment* to another *fire compartment* or operates in a manner that may unduly contribute to the spread of smoke from one *fire compartment* to another *fire compartment* must—

(i) ((be designed and installed to operate as a smoke control system in accordance with AS 1668.1:2015; or

(ii)

(A) incorporate smoke dampers where the air-handling ducts penetrate any elements separating the fire compartments served; and

(B) be arranged such that the air-handling system is shut down and the smoke dampers are activated to close automatically by smoke detectors complying with clause 7.5 of AS 1670.1:2018; and

for the purposes of this provision, each *sole-occupancy unit* in a Class 2 or 3 building is treated as a separate *fire compartment*.

Miscellaneous air-handling systems covered by Sections 5 and 6 of AS 1668.1:2015 serving more than one *fire compartment* (other than a carpark ventilation system) and not forming part of a smoke hazard management system must comply with that Section of the Standard.

A smoke detection system must be installed in accordance with Clause 5 of Specification E2.2a to operate AS 1668.1:2015 systems that are provided for zone smoke control and automatic air pressurisation for fire-isolated exits.

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 5. Type A Construction

Item	Class 2 part	Class 7a part	Class 7b part
Loadbearing External Walls (including columns and other building elements incorporated therein) - Less than 1.5m to a *fire- source feature* - 1.5 – less than 3m from a *fire-source feature* - 3m or more from a *fire source feature*	 90/90/90 90/60/60 90/60/30	 120/120/120 120/90/90 120/60/30	 240/240/240 240/240/180 240/180/90
Non-Loadbearing External Walls - Less than 1.5m to a *fire-source feature* - 1.5 – less than 3m from a *fire-source feature* - 3m or more from a *fire-source feature*	 -/90/90 -/60/60 -/-/-	 -/120/120 -/90/90 -/-/-	 -/240/240 -/240/180 -/-/-
External Columns - Loadbearing - Non-loadbearing	 90/-/- -/-/-	 120/-/- -/-/-	 240/-/- -/-/-
Common Walls & Fire Walls	90/90/90	120/120/120	240/240/240
Stair and Lift Shafts required to be fire-resisting - Loadbearing - Non-loadbearing	 90/90/90 -/90/90	 120/120/120 -/120/120	 240/120/120 -/120/120
Internal walls bounding sole occupancy units - Loadbearing - Non-loadbearing	 90/90/90 -/60/60	 120/-/- -/-/-	 240/-/- -/-/-
Internal walls bounding public corridors, public lobbies and the like: - Loadbearing - Non-loadbearing	 90/90/90 -/60/60	 120/-/- -/-/-	 240/-/- -/-/-
Ventilating, pipe, garbage and like shafts: - Loadbearing - Non-loadbearing	 90/90/90 -/90/90	 120/90/90 -/90/90	 240/120/120 -/120/120
Other loadbearing internal walls, beams trusses and columns	90/-/-	120/-/-	240/-/-
Floors	90/90/90	120/120/120	240/240/240
Roofs	90/60/30	120/60/30	240/90/60

ANNEXURE D DEFINITIONS

Annexure D - 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).

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.

Loadbearing

Intended to resist vertical forces additional to those due to its own weight.

Non-combustible

Non-combustible means—

(a) applied to a material — not deemed combustible as determined by AS 1530.1:1994 — Combustibility Tests for Materials; and

(b) applied to construction or part of a building — constructed wholly of materials that are not deemed combustible

Occupiable outdoor area

Occupiable outdoor area means 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.

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.

Sole-occupancy unit

Sole-occupancy unit means a room or other part of a building for occupation by one or joint owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant, or other occupier and includes—

(a) a dwelling; or

(b) a room or suite of rooms in a Class 3 building which includes sleeping facilities; or

(c) a room or suite of associated rooms in a Class 5, 6, 7, 8 or 9 building; or

(d) a room or suite of associated rooms in a Class 9c building, which includes sleeping facilities and any area for the exclusive use of a resident.

ANNEXURE E BCA COMPLIANCE SPECIFICATION

Annexure E – BCA Compliance Specification

The following BCA matters (except as varied by any subsequent Performance Solution and including any applicable NSW variations) 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 and to satisfy their obligations under the Design and Building Practitioners Act 2020 within their individual design compliance declarations.

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.
2. Lightweight construction used to achieve required fire resistance levels will comply with Specification C1.8 of BCA2019.
3. Building elements 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. The fire walls proposed to separate buildings and/or fire compartments will comply with Clause C2.7 of BCA2019.
7. 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.
8. Floors separating storeys of different classifications will comply with BCA Clause C2.9 of BCA2019.
9. Equipment will be separated in accordance with Clause C2.12 of BCA2019.
10. The electricity substation, 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.
11. The public corridors will be divided into intervals of not more than 40m in length with smoke proof walls in accordance with Clause C2.14, and Clause 2 of Specification C2.5 of BCA2019.
12. Doorways in any fire walls separating fire compartments will be protected in accordance with Clause C3.5 of BCA2019.
13. Doors in a fire-isolated exit will be self-closing or automatic closing fire doors with an FRL of not less than -/60/30 in accordance with Clause C3.8 of BCA2019.
14. Fire-isolated stairways will not be penetrated by services other than those permitted by Clause C3.9 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. Doorways and other openings in internal walls required to have an FRL will be protected in accordance with Clause C3.11 of BCA2019.
19. 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.
20. Fire doors will comply with AS 1905.1:2015 and Specification C3.4 of BCA2019.
21. Smoke doors will be constructed so smoke will not pass from one side of the doorway to the other in accordance with Specification C3.4 of BCA2019.
22. Fire shutters and fire windows will be in accordance with Specification C3.4 of BCA2019.
23. The number of exits provided to the building will be in accordance with Clause D1.2 of BCA2019.
24. The required exits will be fire-isolated in accordance with Clause D1.3 of BCA2019.
25. Travel distances to exits will be in accordance with Clause D1.4 of BCA2019.
26. 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 60m in other arwas, in accordance with Clause D1.5 of BCA2019.
27. The dimensions of exits and paths of travel to exits will be provided in accordance with Clause D1.6 of BCA2019.
28. The fire-isolated exits will be in accordance with Clause D1.7 of BCA2019.
29. Discharge from exits will be in accordance with Clause D1.10 of BCA2019.
30. 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.
31. Access to the lift pit will be in accordance with Clause D1.17 of BCA2019.
32. The stairway or ramp within the fire-isolated shaft is to be non-combustible, and if there is a local failure will not cause structural damage or impair the fire resistance of the shaft, in accordance with Clause D2.2 of BCA2019.
33. The non-fire isolated stairs will be constructed in accordance with Clause D2.3 of BCA2019.
34. The construction separating rising and descending stairs in the fire-isolated exit stairway will be non-combustible and smoke proof, in accordance with Clause D2.4 of BCA2019.
35. The ramp or balcony provided for smoke hazard management requirements will be in accordance with Clause D2.5 of BCA2019.
36. 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.
37. 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.
38. The fire-isolated passageway will be in accordance with Clause D2.11 of BCA2019.
39. 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.

40. Stair geometry 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.
41. Landings and door thresholds throughout the development will be provided in accordance with Clause D2.14 and D2.15 of BCA2019. Landings will 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.
42. The handrails and balustrades to all stairs and throughout the building will be in accordance with Clause D2.16, and D2.17 of BCA2019.
43. 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 1657:2018 or Part D2 of BCA2019.
44. The doorways and doors will be in accordance with Clause D2.19 and D2.20 of BCA2019.
45. Door latching mechanisms will be in accordance with Clause D2.21 of BCA2019
46. Re-entry doors from the fire-isolated exits will be in accordance with Clause D2.22 of BCA2019.
47. Signage will be provided on fire and smoke doors in accordance with Clause D2.23 of BCA2019.
48. The openable portion of a window in a 9b early childhood centre or a bedroom of a Class 2, 3, 4 building will be protected with a restricting device or secure screen that does not allow a 125mm sphere to pass through the opening or screen and resist an outward horizontal action of 250N in accordance with Clause D2.24 of BCA2019. In addition to window protection, and for other openable windows 4 meters or more above the ground below, a barrier with a height not less than 865mm above the floor will be installed to the openable window.
49. The fire control room will be in accordance with Specification E1.8 of BCA2019.
50. Fire precautions whilst the building is under construction will be in accordance with Clause E1.9 of BCA2019.
51. External above ground waterproofing membranes will comply with Clause F1.4 of BCA2019 and AS 4654 Parts 1 & 2:2012.
52. The new roof covering will be in accordance with Clause F1.5 of BCA2019.
53. Any sarking proposed will be installed in accordance with Clause F1.6 of BCA2019.
54. Waterproofing of all wet areas to the building will be carried out in accordance with Clause F1.7 of BCA2019 and AS 3740:2010.
55. Damp proofing of the proposed structure will be carried out in accordance with Clause F1.9 and F1.10 of BCA2019.
56. Floor wastes will be installed to bathrooms and laundries above sole-occupancy units or public space in accordance with Clause F1.11 of BCA2019.
57. All new glazing will be in accordance with Clause F1.13 of BCA2019 and AS 1288:2006 / AS 2047:2014.
58. 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.
59. The construction of the sanitary facilities will be in accordance with Clause F2.5 of BCA2019.
60. Ceiling heights will be in accordance with Clause F3.1 of BCA2019.
61. Natural light will be provided in accordance with Clause F4.1, F4.2, and F4.3 of BCA2019.

62. Natural ventilation will be provided in accordance with Clause F4.5, F4.6 and F4.7 of BCA2019.
63. Water closets and urinals will be located in accordance with Clause F4.8 of BCA2019.
64. The sanitary compartments will either be provided with mechanical exhaust ventilation or an airlock in accordance with Clause F4.9 of BCA2019.
65. Pliable building membranes installed in external walls will comply with Clause F6.2 of BCA2019 and where a pliable building membrane is not installed in an external wall, the primary water control layer will be separated from water sensitive materials by a drained cavity.
66. 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.
67. 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.
68. The swimming pool associated with the new building will comply with Clause G1.1 of the BCA2019 and AS 1926 parts 1 and 2 (Note: Excludes NSW. See NSW G1.1 Variation).
69. The stoves, heaters or similar appliances installed in the building will be in accordance with AS/NZS 2918:2018 and Clause G2.2 of BCA2019.
70. Boilers and pressure vessels shall be installed in accordance with Specification G2.2 of BCA2019.
71. Open fireplaces or fuel-burning appliances with an open fuel-burning compartment will be in accordance with Clause G2.3 of BCA2019.
72. The construction of the residential portions of the development will be undertaken in accordance with the relevant BASIX commitments that form part of the Development Consent approval.
73. Essential fire or other safety measures will be maintained and certified on an ongoing basis, in accordance with the provisions of the Environmental Planning and Assessment Regulation, 2000.
74. The building will comply with Section J of BCA2019.

Electrical Services Design Certification:

75. A smoke detection and alarm system will be installed throughout the building in accordance with Table E2.2a, and Specification E2.2a of BCA2019.
76. Emergency lighting will be installed throughout the development in accordance with Clause E4.2, E4.4 of BCA2019 and AS/NZS 2293.1:2018.
77. Exit signage will be installed in accordance with Clause E4.5, E4.7, and E4.8 of BCA2019 and AS/NZS 2293.1:2018.
78. An emergency warning and intercom system (EWIS) will be provided to the building in accordance with Clause E4.9 of BCA2019.
79. Artificial lighting will be installed throughout the development in accordance Clause F4.4 of BCA2019 and AS/NZS 1680.0:2009.
80. The building will comply with Section J of BCA2019.
81. 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:

82. Storm water drainage will be provided in accordance with Clause F1.1 of BCA2019 and AS/NZS 3500.3:2018

83. Fire hydrant system will be installed in accordance with Clause E1.3 of BCA2019 and AS 2419.1:2005 as required.
84. Fire hose reels will be installed in accordance with Clause E1.4 of BCA2019 and AS 2441:2005.
85. A sprinkler system will be installed in accordance with Clause E1.5 of BCA2019, Specification E1.5 and appropriate part(s) of AS 2118.
86. Portable fire extinguishers will be installed in accordance with Clause E1.6 of BCA2019 and AS 2444:2001.
87. The building will comply with Section J of BCA2019.

Mechanical Services Design Certification:

88. 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.
89. Stair pressurisation will be installed in the building in accordance with Table E2.2a of BCA2019 and AS 1668.1:2015.
90. Where not naturally ventilated the building will be mechanically ventilated in accordance with Clause F4.5 of BCA2019 and AS 1668.2:2012.
91. 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.
92. Exhaust systems installed in a kitchen, bathroom, sanitary compartment or laundry of a Class 2 or 4 *sole-occupancy unit* will have a minimum flow rate and discharge location in accordance with Clause F6.3 of BCA2019.
93. Where exhaust discharges directly or via shaft into a roof space of a Class 2 or 4 *sole-occupancy unit*, ventilation of the roof space will comply with Clause F6.4 of BCA2019.
94. The building will comply with Section J of BCA2019.
95. Rigid and flexible ductwork will comply with the fire hazard properties set out in AS 4254 Parts 1 and 2.

Structural Engineers Design Certification:

96. 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. ABCB Standard for Construction of Buildings in Flood Hazard Areas.
97. 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.
98. The lift shaft will have an FRL in accordance with Clause C2.10 and Specification C1.1 of BCA2019.

99. Lightweight construction used to achieve required fire resistance levels will comply with Specification C1.8 of BCA2019.
100. The construction joints to the structure will be in accordance with Clause C3.16 of BCA2019 to reinstate the FRL of the element concerned.
101. Upon completion of the works, a structural engineer will be able to certify that local failure will be in accordance with Clause D2.2 of BCA2019 for the fire isolated stairs.

Lift Services Design Certification:

102. 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.
103. Warning signage in accordance with Clause E3.3 of BCA2019 will be provided to advise not to use the lifts in a fire.
104. Emergency lifts will be provided in the building in accordance with Clause E3.4 of BCA2019.
105. 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.
106. A lift car fire service drive control switch is to be installed within the lift car in accordance with Clause E3.10.
107. 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.
108. The lifts will comply with AS 1735.12:1999 in accordance with Clause E3.6 of BCA2019.
109. All electric passenger lifts and electrohydraulic passenger lifts shall comply with Specification E3.1 of BCA2019.

Acoustic Services Design Certification:

110. The sound transmission and insulation of the residential portions of the development will comply with Part F5 of BCA2019.