mckenzie group

A Bureau Veritas Group Company

BCA Regulatory Compliance Report

270 Pacific Highway BTR

270 Pacific Highway Crows Nest NSW 2064

Prepared for: **Silvernight**
Date: **19 May 2025**
Revision: **1**

Table of Contents

Date	Rev No	No. of Pages	Issue or Description of Amendment	Assessed By
02.04.25	0	46	Draft to Stakeholder Comments	Tse Min Chang
19.05.25	1	46	Final	Tse Min Chang

1. Executive Summary

Development Overview

The proposed development is construction of a 16 storey mixed use development at 270 Pacific Highway, Crows Nest. The proposed development comprises of 168 build to rent units and non-residential uses in the podium. Specifically, the SSDA seeks development consent for:

- demolition of two existing 5 storey commercial buildings
- construction of a maximum 16 storey building, including:
  - 2 basement parking levels (with 82 carparks, 8 motorbike spaces and 226 bicycle
  - spaces)
  - 3 podium levels comprising non-residential uses such as medical centre, retail,
  - and residential uses (build to rent units and residential amenity facilities such as
  - a gym and sauna, steam room, outdoor pool, class space, cinema room, co-working
  - space)
  - 13 storeys of residential uses in the tower, comprising build-to-rent units
  - communal open space
  - landscaping on ground, level 2 – level 15
  - rooftop solar panels
  - internal and external residential amenities space on roof top
- streetscape upgrades
- office and substation along the northwestern boundary

Compliance Summary

As Registered Certifiers we have reviewed the development application architectural design documents prepared by Fitzpatrick + Partners (refer appendix A) for compliance with the building assessment provisions currently outlined in BCA 2022, as current project timeframes indicate that BCA 2022 will be that which applies to the development.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 31 January 2025 and issued for the SSDA (SSD-79658964).

The design documentation reviewed nominates both a prescriptive and performance-based method of achieving compliance with the BCA. This report has been prepared to provide a high-level summary of the BCA provisions applicable to the project and will assist in the further development of design as the project progress through design phases.

The current design is generally considered to be capable of complying with BCA. Further assessment of the design will be required as the design develops to ensure compliance as part of the application for construction certificate/ complying development certificate.

Deviations from the Deemed-to-Satisfy Provisions

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

No.	Description	DTS Clause	Performance Requirements
Fire Safety Items			

No.	Description	DTS Clause	Performance Requirements
1	Rationalised fire resistance levels from 4 hours (due to storage usage) and 3 hours (due to retail usage)	C2D2, Spec 5	C1P1, C1P2, C1P8
2	Provision of non fire rated construction to residential amenities walls bounding public corridor	C2D2, C4D12, Spec 5	C1P1, C1P2, C1P8
3	Permit base of the garbage chute (shaft) to not be enclosed by fire rated construction	C2D2, S5C8	C1P2
4	There is lack of fire separation between different storey/ classification due to the proposed voids between Ground and Level 2.	C3C10	C1P2, C1P8
5	Omission of fire/ smoke rating at slab edge (eg. Open state cavity barrier, or non provision of fire/ smoke seal)	C2D2, C3D7, C3D10, S5C11	C1P2
6	Extended length smoke corridors within residential levels	C3D15, D2D5	C1P2, D1P4, E2P2
7	Unprotected opening within 3m from boundary	C4D3, C4D5	C1P2, C1P8
8	Level 2 roof light is located less than 3m from adjoining wall without the required fire resistance level	C2D2, S5C16	C1P1, C1P2, C1P4
9	Single exit in lieu of two exits within plant level	D2D3	D1P4, E2P2
10	Provision of ladder in lieu of stair serving plant room area exceeding 200m^2	D2D21	D1P2
11	Extended travel distance to point of choice of alternative exit and to an exit as per following: ▪ Basement 02 – 46m to exit in lieu of 40m ▪ Basement 01 – 50m to exit in lieu of 40m ▪ Ground (non SOU Class 2 part) – 25m to point of choice in lieu of 20m ▪ Ground – 34m to point of choice in lieu of 20m ▪ Level 2 (non SOU Class 2 part) – 25m to point of choice in lieu of 20m ▪ Level 2 (SOU) – 13m to point of choice in lieu of 6m ▪ Level 12 (non SOU Class 2 part) – 27m to point of choice in lieu of 20m ▪ Level 14 (non SOU Class 2 part) – 22m to point of choice in lieu of 20m ▪ Level 14 (roof) – 24m to single exit in lieu of 20m ▪ Level 16 (roof) – 27m to point of choice in lieu of 20m	D2D5	D1P4, E2P2
12	Extended/ reduced travel distance between exits as per following: ▪ Basement 02 & 01 – 72m to exit in lieu of 60m ▪ Level 16 – less than 9m between exits	D2D6	D1P4, E2P2
13	Medical centre tenancy that does not occupy the entire storey to be accessed directly from fire stair	D2D12(1)	D1P5, E2P2
14	▪ One of the fire stair discharge into covered area (next to loading dock) and is open for less than 2/3 of its perimeter (up to 49% open) ▪ Unprotected openings within 6m from fire stair discharge	D2D12(2)	D1P4, D1P5, E2P2

No.	Description	DTS Clause	Performance Requirements
	▪ Fire pump room is accessed directly from fire stair		
15	Fire control room alternative exit is not from public space or fire isolated passageway	E1D15, Spec 19	E1P6
16	▪ Booster assembly to be not within sight of main entry ▪ Booster assembly is not within the same façade as the building main entrance ▪ Hydrant coverage shortfall (TBC) ▪ Fire pump room not being accessed via airlock connected to fire stair	E1D2	E1P3
17	Variation to fire hose reel system (TBC)	E1D3	E1P1
18	▪ Omission of sprinklers (TBC) ▪ Fire main pipes will be located at alternate stairs at each level due to scissor stair arrangement (AS2118.6-2012 Cl 2.6.2)	E1D4 to E1D13, AS 2118.6-2012 Cl 2.6.2	E1P3, E1P4
19	The following concession (available for fully sprinklered building) will need to be addressed: ▪ C3D2 general floor area and volume limitations – fire compartment requirement is exempted within carpark ▪ C3D7 vertical separation of openings – provision of 1 hour fire rated spandrel is exempted ▪ Specification 7 fire hazard properties – reduced critical radiant flux requirements and additional material group permitted ▪ D2D4 fire isolated stairway - up to 3 storeys permitted with open/ non fire isolated stair (Class 2, 5, 6, 7 or 9) OR up to 2 storeys permitted with open/ non fire isolated stair (Class 3) ▪ E1D2 fire hydrants – protection of booster assembly is exempted	E1D13 interalia C3D2, C3D7, Spec 7, E1D2	E1P4, C1P1, C1P2, C1P4, E1P3
20	Omission of zone smoke control system within Class 5 (offices), Class 6 (retail tenancies) and Class 9b (public assembly part).	E2D3, E2D6	E2P2
21	Variation to stair pressurisations system (TBC)	E2D7	E2P2
Miscellaneous Items			
22	**Weatherproofing of External Walls** As the external walls are proposed to be constructed of a material not nominated in F3D5, a performance solution is to be provided by the façade engineer/registered architect demonstrating that the external walls comply with the requirements of Performance Requirement F3P1 (previously FP1.4).	F3D5	F3P1 (previously FP1.4).

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

Fire Safety Services

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

1.	Sprinklers system throughout
2.	Fire hydrant system throughout
3.	Fire hose reels throughout excluding the residential and office portions
4.	Zone smoke control system throughout
5.	Fire precautions during construction
6.	Air-pressurization throughout the fire isolated stairs throughout
7.	Automatic smoke detection and alarm system throughout
8.	Sound System and Intercom System for Emergency Purposes
9.	Carpark ventilation systems must comply with Clause 5.5 of AS/NZS1668.1-2015 except that fans with metal blades suitable for operation at normal temperature may be used and the electrical power and control cabling need not be fire rated

Refer to parts 9 and 10 of this report for further details regarding the required services.

Any fire engineered solution relating to fire safety system will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

Further Assessment

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

No.	Further Information / Review Required	Report Reference
1	Confirmation of proposed building population is required.	5.1
2	The medical centre parts are currently assessed as Class 5 (consulting suites). Where medical procedure is proposed, where the patients will undergo anaesthetic treatment, it may be considered as Class 9a (health care building). Further discussion is required as design develops.	5.1
3	Due to the proposed fire stair arrangements, fire hydrant coverage to the Ground level townhouses, as well as Ground floor retail tenancies and medical tenancy may be problematic as there is no direct access to the fire stair at this level. Further discussion is required as design develops.	9.1
4	The booster assembly location appears to be less than 10m (approx 9.9m, based on scaled measurement) from the substation. Update design to comply.	9.1
5	Detail of fire services equipments (such as fire hydrants, fire hose reel, fire extinguishers) are to be provided for review as design develops.	Part 9

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

The application for Construction Certificate shall be assessed under the relevant provisions of the Environmental Planning & Assessment Act 1979 (As Amended) and the Environmental Planning & Assessment (Development Certification and Fire Safety) Regulation 2021.

2. Introduction

The proposed development comprises of construction of a 16 storey mixed use development at 270 Pacific Highway, Crows Nest. The proposed development comprises of 168 build to rent units and non-residential uses in the podium. Specifically, the SSDA seeks development consent for:

- demolition of two existing 5 storey commercial buildings
- construction of a maximum 16 storey building, including:
  - 2 basement parking levels (with 81 carparks, 8 motorbike spaces and 230 bicycle
  - spaces)
  - 3 podium levels comprising non-residential uses such as medical centre, retail,
  - and residential uses (build to rent units and residential amenity facilities such as
  - a gym and sauna, steam room, outdoor pool, class space, cinema room, co-working
  - space)
  - 13 storeys of residential uses in the tower, comprising build-to-rent units
  - communal open space
  - landscaping on ground, level 2 – level 15
  - rooftop solar panels
  - internal and external residential amenities space on roof top
- streetscape upgrades
- office and substation along the northwestern boundary

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

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

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

The version of the BCA applicable to the development, is version that in place at the time of the application to the Registered Certifier for the Construction Certificate. For the purposes of this Report, BCA 2022 has been utilised as it is anticipated that BCA 2022 will apply to the project based on project timeframes.

3. Compliance with the Building Code of Australia

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

Performance Requirements are satisfied by one of the following:

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

4. Documentation of Performance Solutions

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

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

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

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

a) Prepare a performance-based design brief in consultation with relevant stakeholders
b) Carry out analysis, using one or more of the assessment methods nominated above, as proposed by the performance-based design brief.
c) Evaluate results from (b) against the acceptance criteria in the performance-based design brief
d) Prepare a final report that includes:
    i. All Performance Requirements and/or Deemed-to-Satisfy Provisions identified as applicable
    ii. Identification of all assessment methods used
    iii. Details of required steps above
    iv. Confirmation that the Performance Requirement has been met; and
    v. Details of conditions or limitations, if an exist, regarding the Performance Solution.

5. Preliminaries

5.1. Building Assessment Data

Summary of Construction Determination:

Part of Project	Standalone Building	Main Tower
Classification	5	2, 5, 6, 7a, 7b
Number of Storeys	1	18
Rise In Storeys	1	16
Type of Construction	C	A
Effective Height (m)	N/A	50.6

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

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

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Approximate Volume (m^3)	Assumed Population
Basement 02	7a, 7b	1650	TBA	0*
Basement 01	7a, 7b	2938	TBA	0*
Ground	2 ,5, 6	2509	TBA	Medical Centre (56 persons) Retail (118 persons)

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Approximate Volume (m^3)	Assumed Population
				Office (6 persons) Apartment (2 person per bedroom)
Level 1	2, 5	1600	TBA	Medical Centre (160 persons) Apartment (2 person per bedroom)
Level 2	2, 5	1882	TBA	Medical Centre (96 persons) Apartment (2 person per bedroom)
Level 3 to 13	2	1294 to 1319 per storey	TBA	Apartment (2 person per bedroom) Residential Amenities (maximum 100 person per storey)
Level 14	2	435	TBA	Apartment (2 person per bedroom) Residential Amenities (maximum 100 person per storey)
Level 15	2	337	TBA	Apartment (2 person per bedroom)
Roof	2	379	TBA	0*

Notes:

- The above populations have been based on floor areas and calculations in accordance with Table D2D18 (prev. Table D1.13) of the BCA.
- The floor areas to retail portions have been adjusted without ancillary areas such as sanitary facilities, corridors, shelving and or racking layouts in storage areas.
- The carpark, BOH and plant areas have been considered ancillary to the use for the purposes of population numbers
- The storage usage within Basement levels exceed 10% of the total floor area for the storey

Occupiable Outdoor Areas

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

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

'a space on a roof, balcony or similar part of a building:
a) That is open to the sky; and
b) To which access is provided, other than access only for maintenance; and
c) That is not open space or directly connected with open space'

Confirmation of proposed building occupancy is required.

The medical centre parts are currently assessed as Class 5 (consulting suites). Where medical procedure is proposed, where the patients will undergo anaesthetic treatment, it may be considered as Class 9a (health care building). Further discussion is required as design develops.

6. Structure

6.1. Structural Provisions (BCA B1):

New structural works are to comply with the applicable requirements of BCA Part B1, including AS/NZS 1170.0-2002, AS/NZS 1170-1-2002, AS/NZS 1170.2-2021 and AS 1170.4-2007.

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

It is noted that BCA 2019 introduced a new Verification Method, B1V2 (previously BV2), which is a pathway available to verify compliance with BCA Performance Requirement B1P1 (1)(c) (previously BP1.1(a)(iii)).

Glazing is to comply with AS1288-2021, and AS2047-2014.

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

7. Fire Protection

7.1. Fire Compartmentation (BCA C2D2 (previously C1.1))

The BCA stipulates three levels of fire resistant construction, which is based upon the rise in storeys and classification of the building. Each of these types of construction has maximum floor area and volume limitations as per BCA Table C3D3 (previously C2.2).

Based upon the rise in storeys and use of the building, it is required to be constructed in accordance with the requirements of Type A Construction, in accordance with Tables S5C11a-g of Specification 5 (previously Table 3 & 3.9 of Specification C1.1) of the Building Code of Australia 2022.

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

- Bounding construction to the sole occupancy units of 90 minutes, 60 minutes if non-loadbearing,
- Separation between the carpark levels and the residential/ retail portions of 180 minutes,
- Fire compartmentation of the building at each floor level (except Ground to Level 3 is single fire compartment due to connecting voids)
- Separation between the medical centre and residential portions of 120 minutes.

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

Classification		Type of Construction		
		A	B	C
5, 9b or 9c aged care building	max floor area—	8 000 m^2	5 500 m^2	3 000 m^2

	max volume—	48 000 m^3	33 000 m^3	18 000 m^3
6, 7, 8 or 9a (except for patient care areas)	max floor area—	5 000 m^2	3 500 m^2	2 000 m^2
	max volume—	30 000 m^3	21 000 m^3	12 000 m^3

The largest fire compartment is between Ground and Level 3 and has not exceeded the maximum fire compartment size.

Where variation to the prescribed requirement is proposed, performance solution assessment by fire engineer is required, this includes:

- Rationalise fire resistance levels to the retail and storage parts (FRL 180 minutes and 240 minutes required).
- Provision of fire rated room in lieu of fire rated based to the garbage chute
- Roof light at Level 2 is within 3m from adjoining non fire rated parts that projects above the roof

7.2. Fire Resistance (BCA C2D2 (previously C1.1))

The building should be constructed generally in accordance with the relevant provisions of Specification 5 (previously Specification C1.1) of the BCA applicable to Type A Construction, Please refer to Appendix C which outlines the required fire rating to be achieved by the development.

Where a fire wall is proposed, it is noted that the wall is to achieve a structural rating regardless of whether it is loadbearing or not. Refer to Appendix C for required FRLs.

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

- Lift Motor Rooms;
- Electricity Supply;
- Hydrant Pump Rooms;
- Sprinkler Pump Rooms;
- Fire Control Room

The above areas are to be separated from the remainder of the building by construction achieving a minimum fire resistance level of 120 minutes.

Please note that with regards to fire separation, the provisions and required FRL's that apply to the building also apply to an occupiable outdoor space associated with the building.

Further details to be provided for review as design develops.

7.3. Atrium Provisions (BCA G3)

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

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

The maximum number of storeys connected by the void do not exceed 3m. As such, these voids are not considered as atrium.

7.4. Fire Hazard Properties (BCA C2D10 and C2D11 (previously C1.10 and BCA C1.9))

External Wall Cladding

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

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

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

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

Combustible Materials

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

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

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

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

The BCA 2022 has included additional items that are not required to comply with the above, including glazing, fixings, packers, paints, sealants to joints, adhesives and the like.

Furthermore, the BCA now considers the following items as non-combustible, therefore non-combustibility does not need to be demonstrated to achieve compliance. These items are concrete, steel, masonry, aluminium, autoclaved aerated concrete, iron, terracotta, porcelain, ceramic, natural stone, copper, zinc, lead, bronze, brass.

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

a) An ancillary element that is non-combustible.
b) A gutter, downpipe or other plumbing fixture or fitting.

c) A flashing.
d) A grate or grille not more than 2 m² in area associated with a building service.
e) An electrical switch, socket-outlet, cover plate or the like.
f) A light fitting.
g) A required sign.
h) A sign other than one provided under (a) or (g) that—
   i) achieves a group number of 1 or 2; and
   ii) does not extend beyond one storey; and
   iii) does not extend beyond one fire compartment; and
   iv) is separated vertically from other signs permitted under (h) by at least 2 storeys.
i) An awning, sunshade, canopy, blind or shading hood other than one provided under (a) that—
   i) meets the relevant requirements of Table S7C7 as for an internal element; and
   ii) serves a storey—
      A. at ground level; or
      B. immediately above a storey at ground level; and
   iii) does not serve an exit, where it would render the exit unusable in a fire.
j) A part of a security, intercom or announcement system.
k) Wiring.
l) Waterproofing material installed in accordance with AS 4654.2 and applied to an adjacent floor surface, including vertical upturn, or a roof surface.
m) Collars, sleeves and insulation associated with service installations.
n) Screens applied to vents, weepholes and gaps complying with AS 3959.
o) Wiper and brush seals associated with doors, windows or other openings.
p) A gasket, caulking, sealant or adhesive directly associated with (a) to (o)

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

Interior Linings

The fire hazard properties of fixed surface linings and mechanical ductwork will also need to be addressed within the detailed documentation phase pursuant to Specification 7 (previously Specification C1.10) of the Building Code of Australia. The following requirements apply:

Sprinkler Protected Areas

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

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

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

Further review required as design develops.

7.5. Separation of equipment (C3D13 (previously C2.12))

Equipment listed below must be separated from the remainder of the building providing a FRL as required by Specification 5 (previously Spec C1.1) but not less than 120/120/120 with a self-closing fire door with an FRL or not less than -/120/30. When separating a lift shaft and life motor room, an FRL of not less than 12/-/- is required.

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

Further review required as design develops.

7.6. Vertical Separation of openings in external walls (BCA C3D7 (previously C2.6))

A building of Type A construction must be provided with spandrel separation between openings on different storeys unless the building is protected with a sprinkler system throughout in accordance with Specification 17 (previously Specification E1.5).

For the purposes of C3D7 (previously C2.6), window or other opening means that part of the external wall of a building that does not have an FRL of 60/60/60 or greater.

Spandrels are required in accordance with BCA Clause C3D7 (previously C2.6), which stipulates a 900mm high spandrel; with 600mm of this spandrel being above the finished floor level. Alternatively, an 1100mm horizontal slab may be utilized. The spandrel material is required to be non-combustible and to achieve an FRL of 60/60/60.

It is noted that any penetrations in the spandrel construction e.g. for drainage, overflow etc. are to be protected.

Detailed elevations will be required to enable a full check and assessment to be undertaken of the spandrels proposed.

Spandrel requirement does not apply to sprinkler protected building. However, if there is proposal for removal of sprinkler to parts of the building, this concession will not longer be applicable. Performance solution assessment by fire engineer is required.

7.7. Public Corridors: Class 2 and 3 Buildings (BCA C3D15 (previously C2.14))

Public corridors exceeding 40m in length to be divided into intervals of not more than 40m by smoke proof walls complying with Clause 2 of BCA Specification 11 (previously Specification C2.5)

The current design generally complies, with the exception of the following:

- Ground – exceeds 40m
- Level 2 – up to 42m

Update design to comply or alternative seek performance solution assessment by fire engineer.

7.8. Protection of Openings in External Walls (BCA C4D3, C4D4, C4D5 (previously C3.2 / C3.3 / C3.4))

The prescriptive provisions of the BCA stipulate that any external opening within 3m of the boundary, within 6m of the far boundary of a road, river, lake or the like that adjoins the allotment, or within 6m of another building on the allotment requires protection by -/60/- fire rated construction, or externally located wall wetting sprinklers.

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

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

There are openings along the west, east and south elevations that are within 3m from the adjoining boundary (measured perpendicularly) that will require protection. Refer attached mark up for location. Where it is proposed to omit protection, performance solution assessment by fire engineer is required.

Fire source feature is defined as;

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

7.9. Protection of Openings fire rated building elements (BCA C4D6, C4D11 (previously C3.5 and BCA C3.10))

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

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

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

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

8. Access and Egress

8.1. Provision for Escape (BCA D2 (previously D1))

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

- Fire isolated stairways
- Non Required Non Fire isolated Stairs

- External Doors

The egress provisions that apply to the building also apply to any occupiable outdoor areas.

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

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

The following design departures will require updated design or performance solution assessment:

- Provision of single exit in lieu of two at Level 14 (roof) and Level 16 (roof)
- Provision of ladder in lieu of stair serving plant room area exceeding 200m^2
- Further review is required to the roof/ plant areas (pending plant layout)

8.2. Required Fire Isolation of Exits (BCA Clause D2D5 (previously D1.3))

Class 2 or 3

Stairs are required to be fire isolated unless they connect, pass through or pass by not more than 3 storeys in a Class 2 building or 2 storeys in a Class 3 building.

An additional storey of any classification may be added if:

i) It is only for the accommodation of motor vehicles or for other ancillary purposes; or

ii) the building has a sprinkler system (other than a FPAA101D system) complying with Specification 17 installed throughout; or

iii) the required exit does not provide access to or egress for, and is separated from, the extra storey by construction having—

   A. an FRL of –/60/60, if non-loadbearing; and

   B. an FRL of 90/90/90, if loadbearing; and

   C. no opening that could permit the passage of fire or smoke.

Class 5 to 9

Stairs utilised as required exits must be fire isolated where they connect, pass through or pass by more than 2 consecutive storeys and, an extra storey may be added if the building has a sprinkler system (other than a FPAA101D system) installed throughout.

Alternatively, where the stair does not provide access to or egress from the third storey, and is separated from that storey by construction achieving and FRL of 60 minutes or, in a Type A building where the construction is loadbearing, 90 minutes, the exit is also not required to be fire isolated.

The proposed exits are required to be fire isolated and have been indicated on the drawings.

8.3. Travel via Fire Isolated Exits (BCA D2D12 (previously D1.7))

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

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

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

Majority of the fire stairs have openings within 6m from the fire stair discharge that will require fire protection. Refer mark up for location. Any variation from the prescribed requirement will require performance solution assessment by fire engineer.

8.4. Fire Stair Re-Entry (BCA D3D27 (previously D2.22))

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

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

a) On at least every fourth storey the doors are not able to be locked and a sign is fixed on such doors stating that re-entry is available; or
b) An intercommunication system, or an audible or visual alarm system operated from within the enclosure is provided, and a sign is fixed adjacent to such doors explaining its purpose and method of operation.

(b) above is not required in an early childhood centre where the door is fitted with a fail-safe device that automatically unlocks on activation of the fire alarm,

Further details to be provided for review as design develops. Any variation from the prescribed requirement will require performance solution assessment by fire engineer.

8.5. Exit Travel Distances (BCA D2D5, D2D6 (previously D1.4, D1.5))

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

The travel distances to exits should not exceed:

Class 5 to 9

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

Class 2 & 3

- 6m from an exit or from a point of choice from the entrance doorway of a sole occupancy unit
- 20m from a single exit at the level of egress to a road or open space

- Alternate exits not more than 45m apart

The above indicates that the deemed to satisfy requirements in terms of travel distances would be satisfied, with the exception of the following areas:

- Basement 02 – 46m to exit in lieu of 40m
- Basement 01 – 50m to exit in lieu of 40m
- Ground (non SOU Class 2 part) – 25m to point of choice in lieu of 20m
- Ground – 34m to point of choice in lieu of 20m
- Level 2 (non SOU Class 2 part) – 25m to point of choice in lieu of 20m
- Level 2 (SOU) – 13m to point of choice in lieu of 6m
- Level 12 (non SOU Class 2 part) – 27m to point of choice in lieu of 20m
- Level 14 (non SOU Class 2 part) – 22m to point of choice in lieu of 20m
- Level 14 (roof) – 24m to single exit in lieu of 20m
- Level 16 (roof) – 27m to point of choice in lieu of 20m

Distances between alternative exits do not comply in the following areas:

- Basement 02 & 01 – 72m to exit in lieu of 60m
- Level 16 – less than 9m between exits

The extended travel distances and distance between the exit stairs will need to addressed to comply with the requirements of the deemed to satisfy provisions noted above, or be assessed as performance solutions by the Fire Safety Engineer using BCA Performance Requirements D1P4 and E2P2 (previously DP4 & EP2.2)

8.6. Dimensions of Exits (BCA D2D7, D2D8, D2D9, D2D10, D2D11 (previously D1.6))

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

The following table summarises the exit widths required by BCA Clause D2D7, D2D8, D2D9, D2D10, D2D11
Doorways are permitted to contain a clear opening width of the required width of the exit minus 250mm, with a height of 1980mm as part of egress requirements. Access for persons with disabilities however requires a clear doorway opening width of 850mm (i.e. minimum 920 mm doors).

Further details to be provided for review as design develops.

8.7. Non-Required Non-Fire Isolated Stairs, Ramps and Escalators (BCA D2D17 (previously D1.12))

An escalator moving walkway, or non-fire isolated stairway or pedestrian ramp must not be used between storeys in a patient care area in a Class 9a health care building pr a resident use area in a Class 9c building.

An escalator moving walkway, or non-fire isolated stairway or pedestrian ramp may connect any number of storeys if it is In an open spectator stand or indoor sports stadium, in a carpark or atrium, external to a building, or in a Class 5 or 6 building that is sprinklered throughout where the escalator, walkway, stairway or ramp complies with Specification 14 (previously Spec D1.12).

Specification 14 requires that the escalator, walkway, stairway or ramp be contained within a shaft of:

i. construction with an FRL of not less than 120/120/120 if loadbearing or –/120/120 if non-loadbearing and if of lightweight construction must comply with Specification 6 (previously Spec C1.8); or

ii. glazed construction with an FRL of not less than –/60/30 protected by a wall wetting system in accordance with S31C2 to S31C6 (previously Spec G3.8 Clause 2.1-2.5).

In all other cases, the escalator, walkway, stairway or ramp must not, either directly or indirectly, connect more than 2 storeys, or more than 3 storeys in a sprinklered building (Specification 17,(previously Spec E1.5) compliant), and those storeys must be consecutive.

There are two non-required non-fire isolated stairs nominated between Levels 4 and 13. These stairs are located external of the building, and thus permissible under D2D17(b)(iii). Details of the stair construction, in particular demonstrating compliance with Table D3D14 Note (3)(b) requirements to be provided for review as design develops.

8.8. Balustrades and Handrails (BCA D3D17, D3D18, D3D19, D3D20, D3D22, D3D29 (previously D2.16 / BCA D2.17 / D2.24))

Generally

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

Where it is possible to fall more than 4m to the surface below, the balustrade shall not contain any horizontal or near horizontal members that facilitate climbing between 150 – 760mm above the floor. It is noted that these provisions also apply to any building elements, including AC covers and the like, that are within 1m of the required balustrade.

Where a required barrier is fixed to the vertical face forming an edge of a landing, balcony, deck, stairway or the like, the opening formed between the barrier and the face must not exceed 40 mm.

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

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

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

Fire Isolated Stairways

Balustrades in the fire isolated stairways (excluding those serving a Class 9b early childhood centre) and Class 7b or 8 parts of buildings are permitted to contain a 3 rail system, with a bottom rail situated at not more than 150mm above the nosings. The distance between the rails shall not exceed 460mm.

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

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

Openable Windows in Bedrooms

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

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

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

The device or screen required must –

a) Not permit a 125mm sphere to pass through it; and
b) Resist an outward horizontal action of 250N; and
c) Have a child resistant release mechanism if the screen or device is able to be removed, unlocked or overridden

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

8.9. Slip Resistance (BCA D3D15 (previously D2.14))

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

Table D3D15 (prev. Table D2.14) SLIP-RESISTANCE CLASSIFICATION

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

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

9. Services and Equipment

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

It is noted that the provisions below also apply to occupiable outdoor areas.

9.1. Fire Hydrants (BCA E1D2 (previously E1.3))

A system of Fire Hydrants is required to be provided in accordance with BCA Clause E1D2 (prev. E1.3) and AS2419.1-2021.

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

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

The building is required to be provided with a booster assembly as part of the fire hydrant requirements. The booster is required to be located attached to the building at the main entry. If remote from the building, the booster is to be located at the main vehicle entry or with sight of the main entry of the building within 20m of a hardstand area.

The proposed booster location does not comply as:

- It is not within sight from the main building entrance
- It is not within the same façade as the main entrance or within 20m from the main entrance

A fire ring main is required.

The fire pump location is not satisfactory, as it is accessed directly from the fire stair in lieu of via airlock connected to

Due to the proposed fire stair arrangements, fire hydrant coverage to the Ground level townhouses, as well as Ground floor retail tenancies and medical tenancy may be problematic as there is no direct access to the fire stair at this level.

Any variation from the prescribed requirements will require performance solution assessment by fire engineer along wit concurrence with fire brigade as part of the design development process.

9.2. Fire Hose Reels (BCA E1D3 (previously E1.4))

A Fire Hose Reel System is required to BCA Clause E1D3 (previously E1.4) and AS2441-2005.

The system is required to provide coverage to the throughout, excluding the residential and commercial parts (ie. medical centre, offices).

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

Fire hose reel cupboards must not contain any other services such as water meters, etc., and doors to fire hose reel cupboards are not to impede the path of egress unless a performance solution is developed under BCA Performance Requirement E1P1 (previously EP1.1).

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

Further review required as design develops. Any variation from the prescribed requirements will require performance solution assessment by fire engineer along with concurrence with fire brigade as part of the design development process.

9.3. Fire Extinguishers (BCA E1D14 (previously E1.6))

The provision of portable fire extinguishers is required to BCA Clause E1D14 (previously E1.6) and AS2444 - 2001 to provide coverage to the residential and commercial zones.

Table below details when portable fire extinguishers are required:

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

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

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

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

Further detail to be provided for review as design develops. Any variation from the prescribed requirements will require performance solution assessment by fire engineer along with concurrence with fire brigade as part of the design development process.

9.4. Automatic Sprinkler Protection (BCA E1D4 – E1D13 (previously E1.5))

Automatic sprinkler protection is required to Specification 17 (previously Spec. E1.5) and AS2118.1-2017 to the following areas:

- Throughout the entire building where the effective height exceeds 25m;
- Throughout any fire compartment containing Class 6 areas that exceeds 3,500m^2 in floor area or 21,000m^3 in volume;
- Throughout any Class 7a car park (other than open deck car parks) containing accommodation for more than 40 vehicles;

A sprinkler system is required to be provided throughout the whole building in a Class 2 or 3 building. This system to the residential portions is to comply with Specification 17 (previously Spec E1.5) and the relevant parts of Specification 18 (previously Spec. E1.5a).

The sprinkler system shall be connected to and activate an occupant warning system complying with BCA Specification 20 (prev. Spec E2.2a).

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

An occupant warning system should be provided in accordance with BCA Specification 17 (previously Spec E1.5).

Further detail to be provided for review as design develops. Any variation from the prescribed requirements will require performance solution assessment by fire engineer along with concurrence with fire brigade as part of the design development process.

Please note that where it is proposed to omit provision of sprinklers, the other concessions available for sprinkler protected building will not be permissible unless addressed as performance solution assessment.

9.5. Smoke Hazard Management (BCA E2D3 – E2D20 (previously E2.2)

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

- Zone Pressurisation System/Smoke Control between vertically separated fire compartments in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1 ;
- Automatic Shutdown of Mechanical Systems in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1;
- Automatic Smoke Detection/Alarm System in accordance with the requirements of BCA Spec 20 Clause 3, 4 or a combination of Clause 3 and 4 (previously E2.2a) and AS 3786 and/or AS 1670.1-2018;

- Building Occupant Warning System activated by the smoke alarm/detection in accordance with BCA Specification 20 Clause 7 (previously Spec E2.2a) and Clause 3.22 of AS 1670.1-2018
- Automatic Pressurisation to Fire Isolated Exits in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1. It is noted that this is to be provided to the entire exit.
- Carpark ventilation systems must comply with Clause 5.5 of AS/NZS1668.1-2015 Amendment 1

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

Further detail to be provided for review as design develops. Any variation from the prescribed requirements will require performance solution assessment by fire engineer along with concurrence with fire brigade as part of the design development process.

9.6. Lift Services (BCA E3D3, E3D4, E3D5, E3D9, E3D10, E3D11E3.4 and BCA E3.6)

The passenger lifts to be installed are to be:-

- Fitted with warning signs, fire service controls in accordance with Clauses E3D4, Figure E3D4, E3D9, E3D11, andE3D12 (previously E3.3, Figure E3.3, E3.7, E3.9 and E3.10) of the BCA.
- Stretcher facilities are to be provided within the lifts with minimum dimensions of 600m wide, 2000mm long and 1400mm high;
- At least two emergency lifts with stretcher facilities in accordance with Clause E3D5 (previously Part E3.4) of the BCA. The two emergency lifts shall be located in separate shafts. These lifts are to serve all storeys that are served by passenger lifts.
- Be provided with the following in order to satisfy accessibility requirements:
  - A handrail in accordance with AS1735.12-1999,
  - Minimum internal floor dimensions of 1400 x 1600mm for lifts which travel more than 12m, or 1100 x 1400mm for lifts which travel not more than 12m,
  - Fitted with a series of door opening sensory devices which will detect a 75mm diameter or across the door opening between 50mm and 1550mm above floor level,
  - Have a set of buttons for operating the lift located at heights above level complying with AS1735.12 - 1999
  - For lifts serving more than 2 levels, automatic audible information within the lift car identifying the level each time the car stops, and audible and visual indication at each lift landing to indicate the arrival of a car

Further detail to be provided for review as design develops. Any variation from the prescribed requirements will require performance solution assessment by fire engineer along with concurrence with fire brigade as part of the design development process.

9.7. Exit Signs and Emergency Lighting (BCA E4D2, E4D4, E4D5, E4D6 and E4D8 (previously E4.2 E4.5, E4.6, E4.8))

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

Further detail to be provided for review as design develops. Any variation from the prescribed requirements will require performance solution assessment by fire engineer along with concurrence with fire brigade as part of the design development process.

9.8. Sound Systems and Intercom Systems for Emergency Purposes (BCA E4D9 (previously E4.9))

A Sound System and Intercom System is required in accordance with AS1670.4-2018 and BCA Clause E4D9 (previously E4.9).

Further detail to be provided for review as design develops. Any variation from the prescribed requirements will require performance solution assessment by fire engineer along with concurrence with fire brigade as part of the design development process.

9.9. Fire Control Room (BCA E1D15 (previously E1.8))

As the building is a Class 6, 7, 8 or 9 building that contains a floor area of greater than 18,000m^2, a fire control centre is required in accordance with BCA Specification 19 (previously Spec E1.8).

As the building has an effective height of greater than 25m, a fire control centre is required. Where the effective height of the building exceeds 50m, the fire control centre must be located within a dedicated, fire rated room in accordance with the requirements of BCA Specification 19 (previously Spec E1.8)

The proposed Fire Control Room does not comply as follows:

- The alternative door to fire control room is not accessed from public place or fire isolated passageway 4

Update design to comply or alternatively performance solution assessment by fire engineer along with concurrence from fire brigade will be required.

9.10. Fire Precautions During Construction (BCA E1D16 (previously E1.9))

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

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

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

10. Health and Amenity

10.1. Stormwater Drainage (BCA Clause F1D3 (previously Clause F1.1)

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

10.2. Surface Water Management (BCA Part F1)

Exposed Joints

Exposed joints in the drainage surface on a roof, balcony, podium or similar horizontal surface part of a building must not be located beneath or run through a planter box, water feature or similar part of the building.

Joints are to be protected in accordance with Section 2.9 of AS 4654.2.

External Waterproofing Membranes

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

10.3. Floor Wastes (BCA Clause F2D4 (previously F1.11)

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

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

Further details to be provided for review as design develops.

10.4. Roof & Wall Cladding (BCA Part F3 (previously Part F1))

BCA 2022 has introduced some deemed to satisfy provisions that relate to the waterproofing of external walls. These provisions apply as follows:

- Masonry, including masonry veneer, unreinforced and reinforced masonry is to comply with AS 3700
- Autoclaved aerated concrete is to comply with AS 5146.3
- Metal wall cladding is to comply with AS 1562.1

Where the installation is not proposed to comply with the above, or a different material is proposed to be used, a performance solution can be utilised to demonstrate compliance.

Performance Requirement F3P1 (previously FP1.4) which relates to the prevention of the penetration of water through external walls, must be complied with. Where a performance solution is proposed, it is to be prepared by a suitably qualified professional (façade engineer with NER for structural engineering) that demonstrates that the external walls of the proposed building comply with Performance Requirement F3P1 (previously FP1.4) which reads as follows:

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

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

Further details to be provided for review as design develops.

10.5. Wet Areas & Overflow Protection (BCA Part F2 (previously Part F1)

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

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

10.6. Sanitary Facilities (BCA F4D2, F4D3, F4D4, F4D5, F4D6 (previously F2.2 and F2.3)

Retail

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

Apartments

Each apartment is required to be provided with the following:

- A kitchen sink and facilities for the preparation and cooking of food; and
- A bath or shower; and
- A closet pan and wash basin; and

- Clothes washing facilities comprising at least one wash tub and space for a washing machine; and
- Clothes line of at least 7.5m, or space for one heat operated drying device within the same space as the clothes washing.

The design submitted indicates that each apartment should satisfy the above requirements.

Offices

Separate sanitary facilities are required to be provided for male & female employees. Further assessment is required subject to confirmation of proposed building population.
Detailed designs will need to be developed as to the layout, dimensions, etc of the sanitary facilities.

Note: The Unisex facilities provided for people with disabilities may be counted once for each sex. These facilities are to be provided in accordance with AS1428.1-2009.

Bathroom Construction

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

10.7. Light and Ventilation (BCA Part F6 (previously Part F4)

Class 2, 3 & 4

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

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

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

Class 5, 6, 7, 8 & 9

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

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

These provisions also apply to areas considered as occupiable outdoor areas.

Further details to be provided for review as design develops.

10.8. Sound Transmission and Insulation (BCA Part F7 (previously Part F5))

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

Location	Notes	Sound Insulation Requirement
Walls separating habitable rooms		$R_w + C_{tr} \geq 50$

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

Please note for walls requiring impact resistance an air gap between leafs of the wall construction is required to be provided.

Please provide a report from the acoustic engineer verifying design compliance with the provisions of Part F7 (previously Part F5) of the BCA.

Further details to be provided for review as design develops.

10.9. Condensation management (BCA Part F8 (previously Part F6)

External Wall Construction

Pliable building membranes installed to an external wall must:

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

Where a pliable building membrane, sarking-type material or insulation layer is installed on the exterior sode of he primary insulation layer, it must have a vapour permeance of not less than: 0.143µg/N.s in climate zones 4 and 5, and not less than 1.14µg/N.s in climate zones 6,7 and 8.

Exhaust Systems

Exhaust systems must achieve a minimum flow rate of 25L/s for bathrooms and sanitary compartments and 40L/s for kitchens and laundries. These exhaust systems must all discharge directly or via a shaft/duct to outdoor air.

An exhaust system that is not run continuously and is serving a bathroom or sanitary compartment that is not ventilated in accordance with F6D7 is to be:

- Interlocked with the rooms light switch; and
- Include a run on timer so that the exhaust system continues to operate for 10 minutes after the light switch is turned off.

Ventilation of Roof Spaces

A roof in climate zones 6, 7 and 8 must have a roof space that:

a) Is located
   i. Immediately above the primary insulation layer; or
   ii. Immediately above sarking with a vapour permeance of not less than 1.14µg/N.s, which is immediately above the primary insulation layer; or
   iii. Immediately above ceiling insulation which meets the requirements of J3D7 (3) and (4)

h) Has a height of not less than 20mm; and
i) Is either
   i. Ventilated to outdoor air through evenly distributed openings in accordance with Table F8D5; or
   ii. Located immediately underneath roof tiles of an unsarked tiled roof

11. Energy Efficiency

The residential (Class 2) portions of the building are subject to BASIX, and a BASIX Certificate will be required prior to the issuance of the Construction Certificate for the works. It is noted that some provisions outlined in the BCA still apply in addition to BASIX.

11.1. SECTION J (JP1 Energy Efficiency)

Efficient energy use must be achieved appropriate to the function and use of the building, level of human comfort, solar radiation, energy source of the services and sealing of the building envelope. To achieve this JV1, JV2, JV3, JV4 and JV5 verification methods have been introduced as options available to achieve compliance.

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

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

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

Verification Methods

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

J1V1 (previously JV1) NABERS Energy for Offices

- To achieve compliance with J1P1 (previously JP1) a class 5 building must achieve a minimum of 5.5 NABERS Energy for Offices Base Building Commitment Agreement.
- The energy model demonstrates the base buildings greenhouse gas emissions are not more than 67% of the 5.5 star level when excluding:
  - Tenant supplementary heating and cooling systems
  - External lighting; and
  - Car park services.
  - A thermal comfort level between predicted mean vote of -1 to +1 is achieve across not less than 95% of the floor area of all occupied zones for not less than 98% of annual hours of operation.
- The building also need to comply with additional requirements of Spec 33 (previously JVa).

The calculation method must comply with ANSI/ASHRAE Standard 140

J1V2 (previously JV3) Green Star

To achieve compliance with J1P1 (previously JP1) for Class 3,4,5,6, 7, 8, 9 and common area of Class 2 buildings Green Star can be used as a verification method when the calculation method complies with ANSI/ASHRAE Standard 140, Specification 34 (previously Spec JVb) and when:

- The building complies with simulation requirements and is registered for a Green Star – Design & As-Built rating; and
- The annual greenhouse gas emissions of the proposed building are less than 90% of the annual greenhouse gas emissions of the reference building; and

- In the proposed building, a thermal comfort level of between predicted mean vote of -1 to +1 is achieve across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation of the building; and

J1V3 (previously JV3) Verification Using a Reference Building

To achieve compliance with JP1 for Class 3,4,5,6, 7, 8, 9 and common area of Class 2 buildings verification using a reference building can be used when the calculation method complies with ANSI/ASHRAE Standard, Specification 34 (previously Spec JVb) and when:

- It is determined that the annual greenhouse gas emissions of the proposed building are not more than the annual greenhouse gas emissions of a reference building when
  - the proposed building is modelled with the proposed services; and
  - the proposed building is modelled with the same services as the reference building.
  - The proposed building thermal comfort level is to be between predicted mean vote of -1 to +1 across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation; and
  - The building achieves the additional requirements in Specification 33 (previously Spec JVa); and
  - The greenhouse gas emissions of the proposed building may be offset by renewable energy generated and use on site and another process such as reclaimed energy used on site.

J1V4 (previously JV4) Building Envelope Sealing

Compliance with J1P1(e) (previously JP1) and J1P2 (previously JP2) is verified for building envelope sealing when the envelope is sealed at an air

- permeability rate, tested in accordance with Method 1 of AS/NZS ISO 9972, of not more than—For a class 2 building or a class 4 part of a building, 10m³hr.m² at 50 Pa reference pressure; or
- For a class 5, 6, 8, 9a or 9b building other than a ward area in climate zones 1, 7 and 8, 5 m³/hr.m² at 50 Pa reference pressure; or
- For class 3 or 9c building, or a class 9a ward area in climate zones 1, 3, 4, 6, 7 and 8 5m³/hr.m² at 50 Pa reference pressure.

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

In a sole-occupancy unit of a Class 2 building or a Class 4 part of a building, where an air permeability rate of not more than 5 m3/hr.m2 at 50 Pa reference pressure is achieved—

a) a mechanical ventilation system must be provided that—
   i. can be manually overridden; and
   ii. provides outdoor air, either—
      A. continuously; or
      B. intermittently, where the system has controls that enable operation for not less than 25 per cent of each 4 hour segment; and
   iii. provides a flow rate not less than that achieved with the following formula:
   Q = (0.05 x A + 3.5 x (N + 1)) / p (refer J1V4 for full articulation of equation.
b) any space with a solid-fuel burning combustion appliance must be ventilated with permanent openings directly to outside with a free area of not less than half of the cross-sectional area of the appliance's flue; and
c) any space with a gas-fueled combustion appliance must be ventilated in accordance with—
   i. clause 6.4 of AS/NZS 5601.1; and
   ii. clause 6.4.5 of AS/NZS 5601.1.

   The volume of the space is considered to be 1 m3 for determining ventilation requirements.

11.2. Building Fabric (Part J4 (previously Part J1))

Roof and Ceiling Construction (Part J4D4 (previously J1.3))

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

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

In climate zones 1, 2, 3, 4, 5, 6 and 7, the solar absorptance of the upper surface of a roof must be not more than 0.45.

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

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

Roof lights (Part J4D5 (previously J1.4))

Where roof lights are installed they must have :-

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

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

External Walls and Glazing (Part J4D6 (previously J1.5))

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

(i) for a Class 2 common area, a Class 5, 6, 7, 8 or 9b building other than a ward area, U2.0; and
(ii) for a Class 3 or 9c building or a Class 9a ward area –
    (a) in climate zones 1, 3, 4, 6 or 7, U1.1; or
    (b) in climate zones 2 or 5, U2.0; or
    (c) in climate zones 8, U0.9;

The total system U-value of wall-glazing construction should be calculated in accordance with Specification 37 (previously J1.5a).

Wall components of the wall-glazing construction must achieve a minimum total R-Value of R1.0 where the wall is less 80% if the area and reflect the value specified in Table J4D6a (previously J1.5a) where the wall is *0% or more of the area.

There are further design parameters for display glazing and solar admittances for wall-glazing construction, both of which should comply with the relevant provisions of J4D6 (previously J1.5).

Floors (Part J4D7 (previously J1.6))

Floors are to achieve an R rating of 2.0.

11.3. Building sealing (Part J5 (previously J3))

Windows and Doors (Part J5D5 (previously J3.4))

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

Exhaust fans (Part J5D6 (previously J3.5))

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

Construction of ceilings, walls and floors (Part J5D7 (previously J3.6))

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

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

(i) The envelope; or

(ii) In climate zones 4, 5, 6, 7 or 8

Construction required by above must be –

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

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

11.4. Air Conditioning and Ventilation systems (Part J6 (previously J5))

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

- Be capable of being deactivated when the building or part of a building being served by that system is not occupied;
- Where motorised dampers are in place, they should close when the system is deactivated
- Where serving a sole-occupancy unit in a Class 3 building, must not operate when any external door of the sole-occupancy unit that opens to a balcony or the like, is open for more than one minute;
- Time switches should be provided to control an air-conditioning system of more than 2kWr and a heater of more than 1kW $_{\text{heating}}$ used for air-conditioning, and be capable of switching electric power on and off at variable pre-programmed times on variable pre-programmed days.
- Ductwork and fittings in an air-conditioning system should have insulation complying with AS/NZS 4859.1 and have an insulation R-Value greater than or equal to:-
  - for flexible ductwork R1.0; or
  - for cushion boxes, that of the connecting ductwork; or
  - That specified in Table J6D6 (previously J5.5)

Table J6D6 (previously Table J5.5)

Location of ductwork and fittings	Climate zone 1, 2, 3, 4, 5, 6 or 7	Climate zone 8
Within a conditioned space	1, 2	2.0
Where exposed to direct sunlight	3.0	3.0
All other locations	2.0	3.0

Mechanical:

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

Heaters

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

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

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

(ii) If rated to consume more than 500 MJ/hour of gas, achieve a minimum gross thermal efficiency of 90%

Refrigerant chillers

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

Unitary air-conditioning equipment

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

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

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

11.5. Artificial Lighting and Power (Part J6)

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

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

In a building other than a sole-occupancy unit of a Class 2 building or a Class 4 building for artificial lighting, the aggregate design illumination power load must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum illumination power density below:-

The maximum illumination power density;

Common rooms, spaces and corridors in a Class 2 building	4.5W/m^2
Stairways, including fire-isolated stairways	2W/m^2
Toilet, locker room, staff room, rest room or the like	3W/m^2
Lift cars	3W/m^2
Service area, cleaner's room and the like	3W/m^2
Control room, switch room or the like	
(A) intermittent monitoring	3W/m^2
(B) Constant monitoring	4.5W/m^2
Plant room:	
(A) Where an average of 160 lx vertical illuminance is required on a vertical panel such as in switch rooms	4W/m^2
(B) With a horizontal illuminance target of 80 lx	2W/m^2
Library:	
(A) Stack & shelving area	2.5W/m^2
(B) Reading room & general areas	4.5W/m^2
Office:	
(A) Artificially lit to an ambient level of 200 lx or more	4.5W/m^2
(B) Artificially lit to an ambient level of less than 200 lx	2.5W/m^2

Museum & gallery	2.5W/m^2
Retail:	14W/m^2
Corridors:	5W/m^2
Common rooms, spaces & corridors in a Class 2 building	4.5W/m^2
Lounge area for communal use in a Class 3 or 9c building	4.5W/m^2
Dormitory of Class 3 building:	
(A) Used for sleeping only	3W/m^2
(B) Used for sleeping & study	4W/m^2
Storage	1.5W/m^2
School:	4.5W/m^2
Health Care:	
(A) Infants & children's wards & ED	4W/m^2
(B) Exam room	4.5W/m^2
(C) Exam room in intensive care & high dependency ward	6W/m^2
(D) All other patient care areas inc wards & corridors	2.5W/m^2
Kitchen and food preparation area:	4W/m^2
Car parks:	
(A) General	2W/m^2
(B) Entry zone (first 15m of travel during the daytime	11.5W/m^2
(C) Entry zone (next 4m of travel) during the day	2.5W/m^2
(D) Entry zone (first 20m of travel) during nighttime	2.5W/m^2
Auditoriums, church and public hall :	8W/m^2
Restaurant, café, bar:	14W/m^2

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

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

- 250m^2 if in a Class 6 building or Class 8 laboratory
- Not operate lighting for an area more than -
  a) 250m^2 for a space of not more than 2000m^2;
  b) 1000m^2 for a space of more than 2000m^2
  if in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building;
- 1000m^2 for a space of more than 2000m^2

<u>Interior decorative and display lighting</u>

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

- Separately from other artificial lighting; and
- By a manual switch for each area other than when operating times of the displays are the same in a number of areas (e.g. where in a museum) in which case they may be combined; and
- By a time switch in accordance with Specification 40 (previously J6) where the display lighting exceeds 1 kW

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

Exterior artificial lighting

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

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

Lifts (Part J7D8 (previously J6.7))

Lifts must be configured to ensure artificial lighting and ventilation in the car are turned off when it is unused for 15 minutes and achieve the idle and standby energy performance level required, and the energy efficiency class under J7D8 (previously J6.7) of the BCA.

Escalators and moving walks (Part J7D9 (previously J6.8))

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

11.6. Heated Water Supply and Swimming Pool and Spa Pool Plant (Part J8 (previously J7))

Heated water supply (Part J8D2 (previously J7.2))

A heated water supply system for food preparation and sanitary purposes must be designed and installed in accordance with Part B2 of NCC Volume Three — Plumbing Code of Australia.

Swimming Pool & Spa Pool Heating and Pumping (J8D3 & J8D4 (previously J7.3 & J7.4))

J8D3(2) (previously J7.3(b)) Where some or all of the heating required by (a) is by a gas heater or a heat pump, the swimming pool must have a cover with a minimum R-Value of 0.50 and in time switch to control the operation of the heater.

J8D4(2) (previously J7.4(b)) Where some or all of the heating required by (a) is by a gas heater or heat pump, the spa pool must have a cover with a minimum R- Value of 0.50 and a push button and a time switch to control the operation of the heater.

11.7. Energy Monitoring and On-Site Distributed Energy Resources (Part J9 (previously Part J8))

Facilities for Energy Monitoring (J9D3 (previously J8.3))

A building or sole-occupancy unit with a floor area of more than 500 m^2 must have energy meters configured to record the time-of-use consumption of gas and electricity.

A building with a floor area of more than 2 500 m^2 must have energy meters configured to enable individual time-of-use energy data recording, in accordance with the below, of—

a) artificial lighting; and
b) appliance power; and
c) central hot water supply; and
d) internal transport devices including lifts, escalators and moving walkways where there is more than one serving the building; and
e) on-site renewable energy equipment; and
f) on-site electric vehicle charging equipment; and
g) on-site battery systems; and
h) other ancillary plant.

Energy meters required by the above must be interlinked by a communication system that collates the time-of-use energy data to a single interface monitoring system where it can be stored, analysed and reviewed.

These provisions do not apply to energy meters serving—

a) a Class 2 building where the total floor area of the common areas is less than 500 m^2; or
b) individual sole-occupancy units with a floor area of less than 2 500 m

Facilities for Electric Vehicle Charging Equipment (Clause J9D4)

A carpark associated with a Class 2, 3, 5, 6, 7b, 8 or 9 building must be provided with electrical distribution boards dedicated to electric vehicle charging in accordance with Table J9D4 in each storey of the carpark, and labelled to indicate use for electric vehicle charging equipment.

Electrical distribution boards dedicated to serving electric vehicle charging in a carpark must—

a) be fitted with a charging control system with the ability to manage and schedule charging of electric vehicles in response to total building demand; and
b) when associated with a Class 2 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 12 kWh from 11:00 pm to 7:00 am daily; and
c) when associated with a Class 5 to 9 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 12 kWh from 9:00 am to 5:00 pm daily; and
d) when associated with a Class 3 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 48 kWh from 11:00 pm to 7:00 am daily; and
e) be sized to support the future installation of a 7 kW (32 A) type 2 electric vehicle charger in—
    i. 100% of the car parking spaces associated with a Class 2 building; or
    ii. 10% of car parking spaces associated with a Class 5 or 6 building; or
    iii. 20% of car parking spaces associated with a Class 3, 7b, 8 or 9 building; and
f) contain space of at least 36 mm width of DIN rail per outgoing circuit for individual sub-circuit electricity metering to record electricity use of electric vehicle charging equipment; and
g) be labelled to indicate the use of the space required by (f) is for the future installation of metering equipment.

These provisions do not apply to a stand-alone Class 7a building.

Facilities for Solar Photovoltaic and Battery Systems

The main electrical switchboard of a building must—
a) contain at least two empty three-phase circuit breaker slots and four DIN rail spaces labelled to indicate the use of each space for—
    i. a solar photovoltaic system; and
    ii. a battery system; and
b) be sized to accommodate the installation of solar photovoltaic panels producing their maximum electrical output on at least 20% of the building roof area.

At least 20% of the roof area of a building must be left clear for the installation of solar photovoltaic panels, except for buildings—

a) with installed solar photovoltaic panels on—
    i. at least 20% of the roof area; or
    ii. an equivalent generation capacity elsewhere on-site; or
b) where 100% of the roof area is shaded for more than 70% of daylight hours; or
c) with a roof area of not more than 55 m2; or
d) where more than 50% of the roof area is used as a terrace, carpark, roof garden, roof light or the like.

The requirements do not apply to a building with solar photovoltaic panels installed on at least 20% of the roof area or to a building with battery systems installed.

12. Access for People with Disabilities

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

- The Building Code of Australia 2022;
- Disability (Access to Premises – Buildings) Standards 2010;
- AS1428.1-2009 General Requirements for Access – New Building Work;
- AS1428.4.1 -2009 Tactile Ground Surface Indicators
- AS2890.6-2009 Car Parking for People with Disabilities

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

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

12.1. General Building Access Requirements (BCA D4D2 (previously D3.1))

Access for people with disabilities shall be provided to and within the building in accordance with the requirements of Clause D4D3, D4D4 and D4D5 (previously D3.2, D3.3 and D3.4) of the BCA 2022 and AS 1428.1. Parts of the building required to be accessible shall comply with the requirements of:-

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

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

Apartment (Class 2 Buildings)

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

Office/shops (Class 5/Class 6 buildings)

To and within all areas normally used by the occupants

Car parks (Class 7a buildings)

To and within any level containing accessible car parking spaces.

Swimming Pools (Class 10b)

To and into swimming pools with a total perimeter greater than 40 m, associated with a Class 1b, 2, 3, 5, 6, 7, 8 or 9 building that is required to be accessible.

12.2. Provision for Access to Buildings (BCA Clause D4D3 (previously D3.2)

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

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

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

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

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

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

12.3. Accessibility within Building (BCA Clause D4D4 (previously D3.3))

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

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

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

Within the building the following are required;

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

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

12.4. Car Parking (BCA Clause D4D6 (previously D3.5))

Accessible car parking spaces are required to comply with AS 2890.6-2009 at the rate of 1 accessible space for every 100 carparking spaces for commercial usage and 1 accessible space for every 50 carparking spaces for retail usage.

The development is proposed to contain 82 car parking spaces which requires a minimum of 2 accessible spaces.

A ‘shared zone’ of minimum 5400mm x 2400mm is required adjacent to accessible car parking spaces, protected with a bollard.

12.5. Tactile Indicators (BCA Clause D4D9 (previously D3.8))

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

12.6. Swimming Pools (BCA Clause D4D11 (previously D3.10))

Where pools exceed 40m in total perimeter, at least 1 means of accessible entry in the form of the following is required.

a) Fixed or movable ramps (and an aquatic wheelchair) or
b) Zero depth entry at a maximum gradient of 1:14 (and an aquatic wheel chair)
c) Platform swimming pool lift (and an aquatic wheelchair) or
d) A sling style swimming pool lift

Where the perimeter exceeds 70m in total, sling style lifts are not permitted.

12.7. Stairs (BCA Clause D4D4 (previously clause D3.3 inter Alia AS1428.1))

Stairs shall be constructed as follows:

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

12.8. Accessible Sanitary Facilities (BCA Clause F4D5, F4D6, F4D7 (previously F2.4))

Unisex Accessible Sanitary Facilities

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

Building Type	Minimum accessible unisex sanitary compartments to be provided
Residential apartments	Where sanitary compartments are provided in common areas, not less than 1.
Office, industrial, assembly building, schools, health care except for within a ward area of a Class 9a health-care building	a) 1 on every storey containing sanitary compartments; and b) Where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments, at not less than 50% of those banks.

Ambulant Facilities

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

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

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

Accessible unisex showers

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

Building	Minimum accessible unisex showers to be provided
Residential apartments	Where showers are provided in common areas, not less than 1

12.9. Signage (BCA Clause D4D7 (previously D3.6))

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

- Sanitary Facility Identification Signs (note that they are to comply with BCA Specification 15 (previously Spe. D3.6) and include the use of Braille, Tactile, etc and be placed on the wall on the latch side of the facility);
- Directional / Way Finding signs to the Lifts, Sanitary Facilities, etc;
- Hearing Augmentation System;
- Identify each door required by BCA Clause E4D5 (previously E4.5) to be provided with an exit sign, stating ‘EXIT’ and ‘Level” number
- Braille and tactile signs must be illuminated to ensure *luminance contrast* requirements are met at all times during which the sign is required to be read.

12.10. Hearing Augmentation (BCA Clause D4D8 (previously D3.7))

A hearing augmentation system shall be installed throughout the building in accordance with the requirements of Clause D4D8 (previously D3.7) of the BCA, where ever in a 9b building, auditorium conference room, meeting room etc. contain a PA system not used for emergency purposed or any ticket office or teller’s booth or reception where the public is screened from the service provider.

12.11. Lifts (BCA Clause E3D7, E3D8 (previously E3.6))

Lifts compliant to BCA E3D7, E3D8, and E3D9 (previously E3.6, E3.7) must be provided, where required to be provided, with a minimum size of 1400 x 1600mm or 1100mm x 1400mm (whichever is appropriate) in size – with appropriate handrails and auditory commands.

13. Appendix A - Reference Documentation

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

Drawing No.	Title	Revision	Date	Prepared By
DA-10001	BASEMENT 02	03	14.04.25	Fitzpatrick + Partners
DA-10002	BASEMENT 01	03	14.04.25	Fitzpatrick + Partners
DA-10003	GROUND FLOOR	03	14.04.25	Fitzpatrick + Partners
DA-10004	LEVEL 01 – NON-RESIDENTIAL	03	14.04.25	Fitzpatrick + Partners
DA-10005	LEVEL 02 – RESIDENTIAL AMENITIES	03	14.04.25	Fitzpatrick + Partners
DA-10006	LEVEL 3 TERRACE	03	14.04.25	Fitzpatrick + Partners
DA-10007	LEVEL 4	03	14.04.25	Fitzpatrick + Partners
DA-10008	L5,L7,L9,L11 TYP. RESI FLOOR - WITHOUT TERRACE	03	14.04.25	Fitzpatrick + Partners
DA-10009	L6,L8,L10 TYP. RESI FLOOR - WITH TERRACE	03	14.04.25	Fitzpatrick + Partners
DA-10010	L12 TOWER 1 ROOF TERRACE	03	14.04.25	Fitzpatrick + Partners
DA-10011	L13	03	14.04.25	Fitzpatrick + Partners
DA-10012	L14 TOWER 2 ROOF TERRACE/ ROOF PLANT	03	14.04.25	Fitzpatrick + Partners
DA-10013	L15	03	14.04.25	Fitzpatrick + Partners
DA-10014	L12 TOWER 1 ROOF TERRACE	03	14.04.25	Fitzpatrick + Partners
DA-11001	ELEVATION – EAST	03	14.04.25	Fitzpatrick + Partners
DA-11002	ELEVATION – WEST	03	14.04.25	Fitzpatrick + Partners
DA-11003	ELEVATION - NORTH	03	14.04.25	Fitzpatrick + Partners
DA-11004	ELEVATION - SOUTH	03	14.04.25	Fitzpatrick + Partners
DA-12001	SECTION - NS	03	14.04.25	Fitzpatrick + Partners
DA-12002	SECTION – EW – NORTH TOWER	03	14.04.25	Fitzpatrick + Partners
DA-12003	SECTION – EW – SOUTH TOWER	03	14.04.25	Fitzpatrick + Partners

14. Appendix B - Draft Fire Safety Schedule

	Essential Fire Safety Measures	Standard of Performance
1.	Access Panels, Doors and Hoppers	BCA 2022 Clause C4D14
2.	Automatic Fail Safe Devices	BCA 2022 Clause D3D24 & D3D26
3.	Automatic Smoke Detection and Alarm System	BCA 2022 Clause E2D3, E2D5, E2D7, E2D8, E2D9, E2D10, E2D11, E2D13, E2D14, E2D15, E2D16, E2D17, E2D19, E2D20, Spec 20 Clause S20C3/S20C4/S20C5, AS 1670.1 – 2018, AS/NZS 1668.1 – 2015, AS 3786-2014
4.	Automatic Fire Suppression System	BCA 2022 Clause C3D4, E1D5, E1D6, E1D7, E1D8, E1D9, E1D10, E1D11, E1D13, E2D8, E2D9, E2D10, E2D11, E2D13, E2D14, E2D15, E2D16, E2D17, E2D19, E2D20, G3D8, Spec 17, Spec 31 & AS 2118.1 – 2017 Amdt 1 & 2, AS 2118.6 – 2012 (Combined sprinkler & hydrant)
5.	Building Occupant Warning System activated by the Sprinkler System	BCA 2022 Spec 17 & Spec 20 Clause S20C7 & AS 1670.1 – 2015 – Clause 3.22
6.	Emergency Lifts	BCA 2022 Clause E3D5 & AS 1735.2 - 2001
7.	Emergency Lighting	BCA 2022 Clause E4D2, E4D4 & AS/NZS 2293.1 – 2018
8.	EWIS	BCA 2022 Clause E4D9 & AS 1670.4 - 2018
9.	Emergency Evacuation Plan	Fire Engineering Report XXXX Revision XX prepared by XXXX dated XXXX and AS 3745 – 2002
10.	Exit Signs	BCA 2022 Clauses E4D5, E4D6 & E4D8 and AS/NZS 2293.1 – 2018
11.	Fire Control Centres and Rooms	BCA 2022 Spec. 19
12.	Fire Blankets	BCA 2022 Clause E1D14, I3D11 and AS 2444 – 2001
13.	Fire Dampers	BCA 2022 Clause C3D13, C4D15, Spec 11, D2D12, E2D3, E2.3, F4.12, Spec E2.2, E2D21, Spec 21, Spec 31 & AS 1668.1 – 2015
14.	Fire Doors	BCA 2022 Clause C4D3, C4D5, C4D6, C4D7, C4D8 & C4D9 and AS 1905.1 – 2015
15.	Fire Hose Reels	BCA 2022 Clause E1D3 & AS 2441 – 2005 Amdt 1
16.	Fire Hydrant System	BCA 2022 Clause C3D13, E1D2, Spec 18, I3D9 & AS 2419.1 – 2021
17.	Fire Seals	BCA 2022 Clause C4D15, C4D16, Spec 13, Spec 14, & AS 1530.4 –2014
18.	Lightweight Construction	BCA 2022 Clause C2D9, Spec 6
19.	Mechanical Air Handling System	BCA 2022 Clause E2D3, E2D4, E2D6, E2D7, E2D8, E2D9, E2D10, E2D11, E2D12, E2D13, E2D14, E2D15, E2D16, E2D17, E2D18, E2D19, E2D20, G3D8, Spec 21, AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012
20.	Portable Fire Extinguishers	BCA 2022 Clause E1D14 & I3D11, AS 2444 – 2001
21.	Pressurising Systems	BCA 2022 Clause E2D3, E2D4, E2D6, E2D7, E2D9, E2D11, E2D12 & AS/NZS 1668.1 – 2015

	Essential Fire Safety Measures	Standard of Performance
22.	Required Exit Doors (power operated)	BCA 2022 Clause E3D24 (3)
23.	Self-Closing Fire Hoppers	BCA 2022 Clause C4D14 & AS 1530.4 – 2014
24.	Smoke Alarms	BCA 2022 Spec 20 & AS 3786 - 2014
25.	Smoke Hazard Management System	BCA 2022 Clause E2D3, E2D4, E2D6, E2D7, E2D8, E2D9, E2D10, E2D11, E2D12, E2D13, E2D14, E2D15, E2D16, E2D17, E2D18, E2D19, E2D20, G3D8, Spec 21, AS/NZS 1668.1 – 2015
26.	Smoke Doors	BCA 2022 Spec 11
27.	Wall-Wetting Sprinklers	BCA 2022 Clause C4D5, G3D8, Spec 31
28.	Warning and Operational Signs	BCA 2022 Clause C4D7, D3D28, E3D4, AS 1905.1 –2015

15. Appendix C - Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2022:

Type A Construction

Table S5C11a: Type A Construction: FRL of loadbearing parts of external walls

Distance from a fire source feature	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Less than 1.5m	90/90/90	120/120/120	180/180/180	240/240/240
1.5 to less than 3m	90/60/30	120/90/90	180/180/120	240/240/180
3m or more	90/60/30	120/60/30	180/120/90	240/180/90

Table S5C11b: Type A Construction: FRL of non-loadbearing parts of external walls

Distance from a fire source feature	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Less than 1.5m	-/90/90	-/120/120	-/180/180	-/240/240
1.5 to less than 3m	-/60/60	-/90/90	-/180/120	-/240/180
3m or more	-/-/-	-/-/-	-/-/-	-/-/-

Table S5C11c: Type A Construction: FRL of external columns non incorporated in an external wall

Column tyle	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Loadbearing	90/-/-	120/-/-	180/-/-	240/-/-
Non-loadbearing	-/-/-	-/-/-	-/-/-	-/-/-

Table S5C11d: Type A Construction: FRL of common walls and fire walls

Wall type	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Loadbearing or non-loadbearing	90/90/90	120/120/120	180/180/180	240/240/240

Table S5C11e: Type A Construction: FRL of loadbearing internal walls

Location	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Fire-resisting lift and stair shafts	90/90/90	120/120/120	180/120/120	240/120/120

Bounding public corridors, public lobbies and the like	90/90/90	120/-/-	180/-/-	240/-/-
Between or bounding sole-occupancy units	90/90/90	120/-/-	180/-/-	240/-/-
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion	90/90/90	120/90/90	180/120/120	240/120/120

Table S5C11f: Type A Construction: FRL of non-loadbearing internal walls

Location	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Fire-resisting lift and stair shafts	-/90/90	-/120/120	-/120/120	-/120/120
Bounding public corridors, public lobbies and the like	-/60/60	-/-/-	-/-/-	-/-/-
Between or bounding sole-occupancy units	-/60/60	-/-/-	-/-/-	-/-/-
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion	-/90/90	-/90/90	-/120/120	-/120/120

Table S5C11g: Type A Construction: FRL of other building elements not covered by Tables S5C11a to S5C11f

Location	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Other loadbearing internal walls, internal beams, trusses and columns	90/-/-	120/-/-	180/-/-	240/-/-
Floors	90/90/90	120/120/120	180/180/180	240/240/240
Roofs	90/60/30	120/60/30	180/60/30	240/90/60

(3) Carparks

For building elements in a carpark as described in (1) and (2), the following minimum FRLs are applicable:

a) External wall:
   i. Less than 3 m from a fire-source feature to which it is exposed:
      A. Loadbearing: 60/60/60.
      B. Non-loadbearing: –/60/60.
   ii. 3 m or more from a fire-source feature to which it is exposed: –/–/–.

b) Internal wall:
   i. Loadbearing, other than one supporting only the roof (not used for carparking): 60/–/–.
   ii. Supporting only the roof (not used for carparking): –/–/–.
   iii. Non-loadbearing: –/–/–.

c) Fire wall:
   i. From the direction used as a carpark: 60/60/60.
   ii. From the direction not used as a carpark: as required by Tables S5C11a to S5C11g.

d) Columns:
   i. Supporting only the roof (not used for carparking) and 3 m or more from a fire-source feature to which it is exposed: –/–/–.
   ii. Steel column, other than one covered by (i) and one that does not support a part of a building that is not used as a carpark—
      A. 60/–/–; or
      B. an ESA/M of not greater than 26m2/tonne.
   iii. Any other column not covered by (i) or (ii): 60/–/–.

e) Beams:
   i. Steel floor beam in continuous contact with a concrete floor slab
      A. 60/–/–; or
      B. an ESA/M of not greater than 30m2/tonne.
   ii. Any other beam: 60/–/–.

f) Fire-resisting lift and stair shaft (within the carpark only): 60/60/60.

g) Floor slab and vehicle ramp: 60/60/60.

h) Roof (not used for carparking): –/–/–.

(4) For the purposes of subclause (3):

   a) ESA/M means the ratio of exposed surface area to mass per unit length.
   b) Refer to Specification 17 for special requirements for a sprinkler system in a carpark complying with (3) and (b) located within a multi-classified building.