Building Code of Australia 2019 Amdt 1 Compliance Report

3 Central Road, Avalon

Prepared by: Alison Brown
Prepared for: Cottee Parker Architects Pty Ltd
Date: 25 October 2021
Revision: E

Table of Contents

Date	Rev No	No. of Pages	Issue or Description of Amendment	Checked By	Approved By	Date Approved
18.11.19	A	24	Draft BCA report submitted for DA	Alison Domenici	-	18.11.19
5.12.19	B	25	Final BCA report submitted for DA submitssion	Alison Domenici	Aaron Celarc	5.12.19
12.12.19	C	24	Minor updates for DA submission	Alison Domenici	-	12.12.19
24.09.21	D	28	Updated BCA report for S4.55 submission	Alison Brown	-	24.09.21
25.10.21	E	27	Final BCA report for S4.55 submission	Alison Brown		25.10.21

1. Executive Summary

Development Overview

The proposed development is for the erection of a residential unit block, over three storeys with ancillary carparking.

The building is to be located at 3 Central Road, Avalon.

Compliance Summary

As Private Certifiers we have reviewed architectural design documents prepared by Cottee Parker Archtiects Pty Ltd (refer appendix A) for compliance with the current building assessment provisions, including (but not limited to) the following:

- Building Code of Australia 2019 Amendment 1; and
- The Disability Access to Premises (Buildings) Standard 2010;

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

Performance Solutions

The assessment of the design documentation has revealed that the following areas are required to be assessed against the relevant performance requirements of the BCA. The submission for Construction certificate will need to include verification from a suitably accredited fire engineer: -

No.	Alternative Solution Description	DTS Clause	Performance Requirement
Fire Safety Items			
1	**Skylights and glazed roof** The roof is required to have an FRL or its covering is required to be non-combustible and the glazed roof is located within 3m of a fire separated part. Where prescriptive compliance is not achieved by the design team a performance solution by a suitably qualified fire engineer may be achievable.	C1.1, Spec C1.1	CP1, CP2
2	**Protection of openings in external walls** The Western boundary is within 3 metres of openings in the external wall of the building. Openings in the Ground & Level 01 located within 3 metres of the side boundary are not to be protected in accordance with C3.4 Where prescriptive compliance can not be achieved a fire engineered solution may be achievable by a suitably qualified fire engineer.	C3.2	CP1, CP2
3	**Travel distances** The locations of the proposed exits indicate that the deemed to satisfy requirements in terms of travel distances would be satisfied, with the exception of the following:	D1.4, D1.5	DP4 & EP2.2

	• Lower ground level – basement carpark area has more than 20m to a point of choice (31m worse case to plant area) • Lower ground level – the alternative exits are located less than 9m apart (4.2m) • Ground level – Distances to an exit to apartment 3 is over 20m (22m) to single exit to floor noting that open space (exit) is not achieved until open to the sky above • Level 01 - Greater than 6m to a point of choice from apartment entry door (10m) Where prescriptive compliance can not be achieved a fire engineered solution may be achievable by a suitably qualified fire engineer.		
4	**Travel by non-fire-isolated stairs** The central stairs discharge more than 15m (21m) from the exit into open space due to the glazed entry portico.	D1.9	DP4 & EP2.2
Accessibility Items			
5	Subject to review and commentary from the Accredited Access Consultant.	Part D3	DP1
Miscellaneous Items			
7	**Weatherproofing of External Walls** As there are no deemed to satisfy provisions relating to the weatherproofing of external walls, a performance solution is to be provided by the façade engineer/registered architect demonstrating that the external walls comply with the requirements of Performance Requirement FP1.4.	-	FP1.4

The fire engineered solution relating to EP2.2 will be subject to consultation with the NSW Fire Brigade as part of the Construction Certificate process under Clause 144 of the Environmental Planning & Assessment Regulation 2000.

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

Fire Safety Services	
1.	Fire hydrant system throughout
2.	Fire hose reels to the carpark
3.	Portable fire extinguishers.
4.	Automatic smoke detection and alarm system to BCA Specification E2.2a.
5.	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

Further Assessment

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

No.	Further Information / Review Required	Report Reference
1	Details of the fire rating of elements to comply with C1.1 to be provided.	6.1, 6.4
2.	Details of external walls and attachments including proposed signage for non-combustibility compliance with C1.9 and C1.14 in Construction Certificate documentation. Clarification to be provided regarding the timber screens as attachments to Type A construction and compliance with C1.9 and C1.4 of the BCA	6.3
3.	Where a fire wall is proposed to separate the classifications at lower ground, a compartment plan indicating proposed fire wall, should be provided. Details of protection of openings in accordance with C3.2, C3.3 and C3.4 of the BCA as applicable to be provided.	6.2
4.	Residential bounding construction, and openings onto the corridor should be protected in accordance with Spec C1.1 and C3.11.	6.1
5.	Fire hazard indices of linings to ceilings, floors and walls to be provided to indicate compliance with C1.10, and Spec C1.10 in Construction Certificate documentation.	6.3
6.	Details of handrails, balustrades, openable window devices, slip resistance requirements to be provided in Construction Certificate documentation	7.5, 7.6, 7.7
7.	The following areas to be clarified as to how compliance will be achieved by the access consultant. • Accessible entry to the building and through the entry to Patterson Lane is not provided in accordance with the requirements. This is due to the access to the front entry of the building being more than 50m away and access having to travel back out to the public road. Furthermore the length of approach internally in the entry would not have adequate length to the latch side of the door due to the restriction of the stair overhead affecting access. Access to the entry to the lower units at Patterson Lane entry to be rectified for compliance. • Full details of the suspended entry ramp compliance with AS1428.1. Landing dimensions at Central Road and the entry gate restricting access, to be clarified as how they comply. • An accessible carpark space has not been indicated.	Part 11
8.	Please provide fire services drawings showing fire services throughout the building, including hydrants, hose reels, emergency lighting, exit signage. Any variations to compliance with the standards required by the BCA to be identified for inclusion with any fire engineered solution. Concurrence with the FRNSW may be required.	Part 8

9.	Full details of the lifts to be provided as design develops.	8.5
10.	Clarification to be provided on the provision of adequate natural light and natural ventilation in accordance with Part F to the residential components of the united building which is required to all habitable rooms.	9.3
11.	Details of the separating construction ability to achieve the sound insulation requirements of Part F to be provided.	9.4

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

Assessed by

Alison Brown
Senior Building Surveyor
McKenzie Group Consulting (NSW) Pty Ltd

2. Introduction

The proposed development comprises of a residential unit block, over three storeys with ancillary carparking.

The site is located at 3 Central Road, Avalon.

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

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.

This process will come into effect on 1 July 2021.

5. Preliminaries

5.1. Building Assessment Data

Summary of Construction Determination:

Part of Project	3 Central Road
Classification	2, 7a, 7b
Number of Storeys	3
Rise In Storeys	3
Type of Construction	A
Effective Height (m)	<25m

Note: The effective height of the project includes all stories included in the rise in stories of the project, noting that basement storeys and the top plant level are not included.

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
Lower ground	2, 7a, 7b	601m^2	TBC	4
Ground	2	387m^2	TBC	14
Level 01	2	256m^2	TBC	8
Total		**1241m^2**		**26**

Notes:

- The above populations have been based on floor areas and calculations in accordance with Table D1.13 of the BCA.
- The floor areas have been adjusted without ancillary areas such as sanitary facilities, corridors, shelving.
- The Car park areas have been considered ancillary to the use for the purposes of population numbers
- The architect to confirm volumes to floor levels.

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'*

Occupiable outdoor areas have been identified to Level 01 Communal Roof Garden. Applicable BCA provisions have been detailed in the report below.

5.2. **Structural Provisions (BCA B1):**

New structural works are to comply with the applicable requirements of BCA Part B1, including AS/NZS 1170.0-2002, AS/NZS 1170-1-2002, AS/NZS 1170.2-2011 and AS 1170.4-2007.

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

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

Glazing is to comply with AS1288-2006, and AS2047-2014.

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

6. Fire Protection

6.1. **Fire Compartmentation (BCA C1.1)**

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

Based upon the rise in storeys and use of the building, it is required to be constructed in accordance with the requirements of Type A Construction, in accordance with Table 3 & 3.9 of Specification C1.1 of the Building Code of Australia 2019.

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

- Bounding construction to the sole occupancy units of 90 minutes,
- Separation between the carpark levels and the residential portions of the building 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:

6.2. **Fire Resistance (BCA C1.1, C2.8, C2.9)**

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

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

- Lift Motor Rooms;
- Electricity Supply;
- Hydrant Pump Rooms;

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

Separation of classifications

Where a building has parts of different classifications located alongside one another in the same storey each building element in that storey must have the FRL prescribed in Specification C1.1 for that element for the classifications concerned or the parts must be separated in that storey by a fire wall complying with clause C2.7.

Different classifications occur at lower ground level with storage (Class 7b), carparking (Class 7a) and residential (Class 2). The storage is considered ancillary as it consists of less than 10% of the floor area of the storey. A fire wall to comply with C2.7 could be provided to reduce the FRL's in this floor or the building elements should achieve the higher FRL (120/120/120) prescribed in Spec C1.1 for elements in the classification concerned.

If parts of a different classification are situated one above the other in adjoining storeys they must be separated by a floor between the adjoining parts not less than that prescribed in Specification C1.1 for the classification for the **lower** storey in accordance with clause C2.9. This occurs between Lower Ground (Class 2, Class 7a,) and ground (Class 2).

Compartmentation drawings to be provided to show the different FRLs. Alternatively, the higher FRL's may be able to be rationalised through a fire engineered solution.

6.3. **Fire Hazard Properties (BCA C1.10 and BCA C1.9)**

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

Non-Sprinkler Protected Areas

a) Floor Coverings – Critical radiant Flux not less than 2.2 kW/m^2 a maximum smoke development rate of 750 percent-minutes;
b) Wall and Ceiling Linings –Material Group No 1 for the Wall and 1 Ceilings for the public corridor and for other areas Material Group No 1 for the Wall and 1, 2. 3 and Ceilings 1, 2, 3 of, and with a smoke growth rate index not more than 100, or an average specific extinction area less than 250m^2/kg;
c) Sarking-type material Flammability Index of 5;
d) Other Materials – Spread of Flame Index not exceeding 9 and Smoke Developed Index not exceeding 8 (if Spread of Flame if >5)

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

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

Occupiable outdoor areas:

Subject to the below a lining, material or assembly in a occupiable outdoor area must comply with C1.10 as for an internal element except for the fire hazard properties are not required to comply with C1.10 - the average specific extinction area, smoke-developed index, smoke development rate, and smoke growth rate index to a lining, material or assembly in a occupiable outdoor area

External Wall Cladding

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

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

Please provide product specifications and test reports to AS 1530.1-1994 for all materials to demonstrate compliance. For external materials clarification to be provided regarding the timber screens as attachments to Type A construction and compliance with C1.9 and C1.4 of the BCA

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) 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 laminated material as a whole does not exceed 0 and 3 respectively.

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

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

a) An ancillary element that is non-combustible.
b) A gutter, downpipe or other plumbing fixture or fitting.
c) A flashing.
d) A grate or grille not more than 2 m² in area associated with a building service.
e) An electrical switch, socket-outlet, cover plate or the like.

f) A light fitting.
g) A required sign.
h) A sign other than one provided under (a) or (g) that—
   i) achieves a group number of 1 or 2; and
   ii) does not extend beyond one storey; and
   iii) does not extend beyond one fire compartment; and
   iv) is separated vertically from other signs permitted under (h) by at least 2 storeys.

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

6.4. **Vertical Separation of openings in external walls (BCA C2.6)**

A building of Type A construction must be provided with spandrel separation between openings on different storeys unless the building is protected with a sprinkler system (other than a FPAA101D or FPAA101H system) throughout in accordance with Specification E1.5. Spandrels are required in accordance with BCA Clause 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 reveal protection will be required to be provided by either a spandrel or by the balconies. Further design detailing has been provided and will be developed to ensure that spandrel or horizontal slab protection is provided to prescriptive compliance.

Appropriate detailing will be provided for prescriptive compliance with C2.6 in Construction Certificate documentation.

6.5. **Stairways and lifts in one shaft and separation oflifts (BCA C2.10 and BCA C2.11)**

A stairway and lift must not be in the same shaft if either the stairway or the lift is required to be in a fire-resisting shaft.

The lift connects more than two storeys and is therefore required to be fire-isolated under C2.10 of the BCA by walls having the relevant FRL prescribed by Specification C1.1.

The lift is not contained in a fire rated shaft nor is separated from the stair. The design team has advised of their intention to fully enclose the lift in fire rated protection so that the lift shaft if fire separated from the stair. Further detailing to be provided in design development/Construction Certificate documentation.

Where prescriptive compliance can not be achieved a fire engineered solution may be achievable by a suitably qualified fire engineer.

6.6. **Protection of Openings in External Walls (BCA C3.2 / C3.3 / C3.4)**

The prescriptive provisions of the BCA stipulate that any external opening within 3m of the boundary requires protection by -/60/- fire rated construction, or externally located wall wetting sprinklers.

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.

The Western boundary is within 3 metres of openings in the external wall of the building and should be protected in acordance with C3.4. Openings in the Ground & Level 01 exposed to this Western boundary within 3 metres are to be protected in accordance with C3.4.

Where protection can not be provided in accordance with the prescriptive clauses of the BCA, a fire engineered solution may be achieveable.

Separation of building into compartments

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

It is noted that the building may provide fire rated walls to separate the different classifications on the lower ground storey as discussed above. In this instance openings may be exposed. Compartmentation drawings to be provided during design development to determine openings to protected as required.

6.7. Protection of Openings fire rated building elements (BCA C3.12 and BCA C3.15)

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 of 90/90/90 in the residential Class 2 part and 120/120/120 where going through to the carpark level.

   Any penetration through a wall or room required to have an FRL (e.g. 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 of 90/90/90.

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.

7. Access and Egress

7.1. Provision for Escape (BCA D1)

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

- External perimeter doorways
- Required non-fire isolated stairways

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

- Door Hardware
- Exit Door Operation
- Stair Construction
- Handrail and Balustrade construction
- Details of the egress provisions to the Road.
- Door swings

7.2. **Exit Travel Distances (BCA 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 7a

- 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

- 6m from an exit or from a point of choice from the entrance doorway of a sole occupancy unit
- 20m from a single exit at the level of egress to a road or open space
- Alternate exits not more than 45m apart

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

- Lower ground level – basement carpark area has more than 20m to a point of choice (31m worse case to plant area)
- Lower ground level – the alternative exits are located less than 9m apart (4.2m)
- Ground level – Distances to an exit to apartment 3 is over 20m (22m) to single exit to floor noting that open space (exit) is not achieved until open to the sky above
- Level 01 - Greater than 6m to a point of choice from SOU (10m)

Where prescriptive compliance can not be achieved a fire engineered solution may be achievable by a suitably qualified fire engineer.

7.3. **Dimensions of Exits (BCA D1.6)**

Minimum dimensions of 1000mm and 2000mm height to be provided within exits, with the paths of travel should provide a minimum width of 1000mm.

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).

The required non-fire-isolated stair to the premises appears to be under 1m.

7.4. **Travel by non-fire-isolated exits (BCA D1.9)**

A non-fire-isolated stairway serving as a required exit must provide a continuous means of travel by its own flights and landing from every storey served to the level at which egress to a road or open space is provided.

In a Class 2 building the distance between the doorway of a room or sole-occupancy unit and the point of egress to a road or open space by way of a required non-fire-isolated stairway must not exceed 60m. Furthermore, it should not discharge at a point not more than –

(a) 15m from a doorway providing egress to a road or open space or from a fire-isolated passageway leading to a road/open space;
(b) 30m of one of two doorways is travel to each of them from the non-fire-isolated stairway is in opposite or approximately opposite directions.

The central stairs discharge more than 15m (23m) from the exit noting the exit should discharge into 'open space'. The exit at ground floor discharges under a glazed roof therefore open space is not achieved until open to the sky above.

Where prescriptive compliance can not be achieved a fire engineered solution may be achievable by a suitably qualified fire engineer.

Where an exit dicharges to open space that is at a different level than the public road to which it is connected the path of travel to the road must be by a ramp having a gradient not steeper than 1:14 (access is also required from the perimeter of the site to the main entry under access provisions below).

Full details of compliance with AS1428.1 required to be provided in accordance with access provisions noted below.

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

Generally

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

Where it is possible to fall more than 4m to the surface below, the balustrade shall not contain any horizontal or near horizontal members that facilitate climbing between 150 – 760mm above the floor.

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

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

7.6. **Openable Windows in Bedrooms (BCA D2.24)**

A non-fire-isolated stairway serving as a required exit must provide a continuous means of travel by its own flights and landing from every storey served to the level at which egress to a road or open space is provided.

In bedrooms of Class 2 and 3 buildings, andwhere 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. Details to be provided to show compliance.

7.7 Slip Resistance (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 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*

8. 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.

8.1. Fire Hydrants (BCA E1.3)

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

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

8.2. Fire Hose Reels (BCA E1.4)

A Fire Hose Reel System is required to BCA Clause E1.4 and AS2441-2005 to the carpark areas only (Class 2 residential areas are exempted).

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

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

No fire hose reels currently indicated. Details to be provided in Construction Certificate documentation.

8.3. **Fire Extinguishers (BCA E1.6)**

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

Table E1.6 details when portable fire extinguishers are required:

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

Details to be provided in Construction Certificate documentation.

8.4. **Smoke Hazard Management (BCA E2.2)**

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

- Automatic Shutdown of Mechanical Systems in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1;
- Automatic Smoke Detection and Alarm System in accordance with the requirements of BCA Spec E2.2a and AS 1670.1-2018;
- Carpark ventilation systems must comply with Clause 5.5 of AS/NZS1668.1-2015 Amendment 1 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

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

8.5. **Lift Services (BCA E3.4 and BCA E3.6)**

The passenger lifts to be installed are to be:-

- Fitted with warning signs, fire service controls in accordance with Clauses E3.3, Figure E3.3, of the BCA.
- 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

8.6. **Exit Signs and Emergency Lighting (BCA E4.2 and BCA E4.5)**

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

9. Health and Amenity

9.1. **Sanitary Facilities (BCA F2.2 and BCA F2.3)**

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.

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.

9.2. **Floor Wastes (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.

Details to be provided as design develops.

9.3. **Light and Ventilation (BCA 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.

9.4. **Sound Transmission and Insulation (BCA F5)**

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

Location	Notes	Sound Insulation Requirement
Walls separating habitable rooms		$R_w + C_{tr} \geq 50$
Walls separating habitable room and kitchen or bathroom	Wall must be of Discontinuous Construction	$R_w + C_{tr} \geq 50$
Floor separating habitable rooms	Impact isolation required	$R_w + C_{tr} \geq 50$ $L_{n,w} + C_l \leq 62$
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		$R_w \geq 30$

Details to be provided as design develops.

9.5. **Waterproofing (BCA FP1.4)**

Performance Requirement FP1.4 which relates to the prevention of the penetration of water through external walls, must be complied with. It is noted that there are no Deemed-to-Satisfy Provisions for this Performance Requirement in respect of external walls.

As such, a performance solution is to be prepared by a suitably qualified professional that demonstrates that the external walls of the proposed building complies with Performance Requirement FP1.4 which reads as follows:

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

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

External above Ground Membranes

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

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

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

Wet Areas

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

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

9.6. **Stormwater Drainage**

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

10. Energy Efficiency

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

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

The proposed development shall comply with Part J of the BCA. To achieve compliance, there are two options available:

1) The building can comply with the deemed-to-satisfy provisions of the BCA, relating to the following areas:
    - Building Fabric
    - Glazing
    - Building Sealing
    - Air Conditioning & Ventilation Systems
    - Artificial Lighting & Power
    - Hot Water Supply

2) The building can be verified against a reference building as per Verification Method JV3. This requires that the proposed building and its services be shown to have an annual energy consumption of equal or less than the reference building which has been modelled as per the requirements of Part J of the BCA.

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

Access for maintenance is to be provided to the building in accordance with the requirements of BCA Part J8.

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

11. Access for People with Disabilities

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

- The Building Code of Australia 2019 Amendment 1;
- The Access to Premises Standard;
- 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

11.1. General Building Access Requirements (BCA D3.1)

Access for people with disabilities shall be provided to and within the building in accordance with the requirements of Clause D3.2, D3.3 and D3.4 of the BCA 2019. 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.

The Access Consultant to provide advice on compliance with this part in their report.

11.2. Provision for Access to Buildings

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

- Via the principle public 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 public.

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

The following is required to be altered to comply / clarification to be provided:

- Accessible entry to the building and through the entry to Patterson Lane is not provided in accordance with the requirements. This is due to the access to the front entry of the building being more than 50m away and access having to travel back out to the public road. Furthermore the length of approach internally in the entry would not have adequate length to the latch side of the door due to the restriction of the stair overhead affecting access. This design team has advised that access to the entry to lower units will be revised to comply with prescriptive approach.

- Full details of the suspended entry ramp compliance with AS1428.1. Landing dimensions at Central Road and the entry gate restricting access, to be clarified as how they comply.

The Access Consultant to provide advice on compliance with this part in their report.

11.3. Accessibility within Building (BCA D3.3)

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

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
- Any glazed 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 Access Consultant to provide advice on compliance with this part in their report.

11.4. Car Parking (BCA D3.5)

Accessible car parking spaces are required to comply with AS 2890.6-2009 at the rate of:

1. Class 5, 7, 8 - 1 space for every 100 carparking spaces or part thereof;

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

An accessible carpark space has not been indicated.

Access consultant to provide further comment on compliance of this part.

11.5. Tactile Indicators (BCA D3.8)

Tactile indicators are required to be provided to warn occupants of all 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.

The Access Consultant to provide advice on compliance with this part in their report.

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

Stairs shall be constructed as follows:

a) Where the intersection is at the property boundary, the stair shall be set back by a minimum of 900mm so that the handrail 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 in 300mm, 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 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.

The Access Consultant to provide advice on compliance with this part in their report.

11.7. Signage (BCA D3.6)

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

- Sanitary Facility Identification Signs (note that they are to comply with BCA Specification D3.6 and include the use of Braille, Tactile, etc and be placed on the wall on the latch side of the facility);
- Directional / Way Finding signs to the Lifts, etc;
- Identify each door required by BCA Clause E4.5 to be provided with an exit sign, stating ‘EXIT’ and ‘Level” number

The Access Consultant to provide advice on compliance with this part in their report.

11.8. Lifts (BCA E3.6)

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

The Access Consultant to provide advice on compliance with this part in their report.

Appendix A - Reference Documentation

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

Drawing No.	Title	Date	Issue
SD2007	Floor Plan – Lower Ground	14.09.21	D
SD2008	Floor Plan – Ground Floor	14.09.21	E
SD2009	Floor Plan – Level 01	14.09.21	E
SD2010	Floor Plan - Roof	14.09.21	D
SD3001	Street Elevations	14.09.21	E
SD3002	Street Elevations	14.09.21	E
SD3003	Elevations	14.09.21	C
SD3101	Sections 1	14.09.21	E
SD3102	Sections 2	14.09.21	C

Appendix B - Draft Fire Safety Schedule

	Essential Fire Safety Measures	Standard of Performance
1.	Access Panels, Doors and Hoppers	BCA Clause C3.13
2.	Automatic Fail Safe Devices	BCA Clause D2.19 & D2.21
3.	Automatic Smoke Detection and Alarm System	Clause 3 or 4 or 5 BCA Spec. E2.2a, AS 1670.1 – 2018, AS 3786-2014
4.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2018
5.	Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2018
6.	Exit Signs (non-illuminated)	BCA Clause E4.7
7.	Fire Blankets	BCA Clause E1.6, and AS 2444 – 2001
8.	Fire Dampers	BCA Clause C3.15, E2.2, , & AS 1668.1 – 2015
9.	Fire Doors	BCA Clause C3.2, C3.4, and AS 1905.1 – 2015
10.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005 Amdt 1
11.	Fire Hydrant System	Clause E1.3 & AS 2419.1 – 2005 Amdt 1
12.	Fire Seals	BCA Clause C3.15, C3.16, Spec C3.15, & AS 1530.4 – 2014
13.	Fire Shutters	BCA Spec. C3.4 & AS 1905.2 – 2005
14.	Fire Windows	BCA Spec. C3.4
15.	Lightweight Construction	BCA Clause C1.8, Spec C1.8
16.	Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012
17.	Paths of Travel	EP&A Reg 2000 Clause 186
18.	Portable Fire Extinguishers	BCA Clause E1.6, AS 2444 – 2001
19.	Required Exit Doors (power operated)	BCA Clause D2.19 (b)(iv)
20.	Smoke Alarms	AS 3786
21.	Wall-Wetting Sprinklers	BCA Clause C3.4
22.	Warning and Operational Signs	Section 183 of the EP & A Regulations 2000, AS 1905.1 – 2015~~,~~ BCA Clause, D2.23, E3.3

Appendix C - Fire Resistance Levels

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

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS	**Class of building — FRL: (in minutes)** *Structural adequacy/Integrity/Insulation*			
	2, 3 or 4 part	**5, 7a or 9**	**6**	**7b or 8**
EXTERNAL WALL (including any column and other building element incorporated within it) or other external building element, where the distance from any fire-source feature to which it is exposed is -				
For *loadbearing* parts-				
less than 1.5 m	90/ 90/ 90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/ 60/ 60	120/ 90/ 90	180/180/120	240/240/180
3 m or more	90/ 60/ 30	120/ 60/ 30	180/120/ 90	240/180/ 90
For non-*loadbearing* parts -				
less than 1.5 m	–/ 90/ 90	–/120/120	–/180/180	–/240/240
1.5 to less than 3 m	–/ 60/ 60	–/ 90/ 90	–/180/120	–/240/180
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an *external wall*, where the distance from any *fire-source feature* to which it is exposed is -				
less than 3 m	90/–/–	120/–/–	180/–/–	240/–/–
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS	90/ 90/ 90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS				
Fire-resisting lift and stair *shafts*				
Loadbearing	90/ 90/ 90	120/120/120	180/120/120	240/120/120
Non-*loadbearing*	–/ 90/ 90	–/120/120	–/120/120	–/120/120
Bounding *public corridors*, public lobbies and the like				
Loadbearing	90/ 90/ 90	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*				
Loadbearing	90/ 90/ 90	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Ventilating, pipe, garbage, and like *shafts* not used for the discharge of hot products of combustion				
Loadbearing	90/ 90/ 90	120/ 90/ 90	180/120/120	240/120/120
Non-*loadbearing*	–/ 90/ 90	–/ 90/ 90	–/120/120	–/120/120
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS	90/–/–	120/–/–	180/–/–	240/–/–
FLOORS	90/ 90/ 90	120/120/120	180/180/180	240/240/240
ROOFS	90/ 60/ 30	120/ 60/ 30	180/ 60/ 30	240/ 90/ 60

Table 3.9 REQUIREMENTS FOR CARPARKS			**FRL (not less than) Structural adequacy/Integrity/Insulation** **ESA/M (not greater than)**
Wall			
(a)	*external wall*		
	(i)	less than 3 m from a *fire-source feature* to which it is exposed:	
		Loadbearing	60/60/60
		Non-*loadbearing*	–/60/60
	(ii)	3 m or more from a *fire-source feature* to which it is exposed	–/–/–
(b)	*internal wall*		
	(i)	*loadbearing*, other than one supporting only the roof (not used for carparking)	60/–/–
	(ii)	supporting only the roof (not used for carparking)	–/–/–
	(iii)	non-*loadbearing*	–/–/–
(c)	*fire wall*		
	(i)	from the direction used as a *carpark*	60/60/60
	(ii)	from the direction not used as a *carpark*	as *required* by Table 3
Column			
(a)	supporting only the roof (not used for carparking) and 3 m or more from a *fire-source feature* to which it is exposed		–/–/–
(b)	steel column, other than one covered by (a) and one that does not support a part of a building that is not used as a *carpark*		60/–/– or 26 m^2/tonne
(c)	any other column not covered by (a) or (b)		60/–/–
Beam			
(a)	steel floor beam in continuous contact with a concrete floor slab		60/–/– or 30 m^2/tonne
(b)	any other beam		60/–/–
Fire-resisting lift and stair shaft (within the *carpark* only)			60/60/60
Floor slab and vehicle ramp			60/60/60
Roof (not used for carparking)			–/–/–
Notes:	1.	ESA/M means the ratio of exposed surface area to mass per unit length.	
	2.	Refer to Specification E1.5 for special requirements for a sprinkler system in a *carpark* complying with Table 3.9 and located within a multi-classified building.	