MONDAN
CONSULTING

Regulatory Compliance Report

Showground

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Revision: D

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Date	Rev No	Issue or Description of Amendment	Assessed By
18.03.2021	A	Preliminary - For Stakeholders Comments	Vic Lilli
27.05.2021	B	Final	Vic Lilli
11.06.2021	C	Final to incorporate the Woolworths Fitout	Vic Lilli
30.06.2021	D	Final	Vic Lilli

1. Executive Summary

Development Overview

The proposed development is construction of a mixed-use buildings that consist of four (4) towers, commercial tenancy, six (6) basement levels and communal podium.

Compliance Summary

As BCA Consultants we have reviewed the architectural design documents prepared by Turner (Project No. 19068 dated 25.06.2021) for compliance with the current building assessment provisions, i.e. the Building Code of Australia 2019 Amendment 1 (BCA).

This report has been prepared to assess the project against the Building Code of Australia to enable issuance of construction approvals. Further assessment of the design will be undertaken as the design develops to ensure compliance is achieved prior to approval being issued

Deviations from the Deemed-to-Satisfy Provisions

The assessment of the 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			
1	**Fire Resistance Levels** ▪ The travelator connecting the Ground Level and the Basement Levels is proposed to be glazed	C1.1 Spec. C1.1 C2.7 C2.9	CP1 CP2
2	**Rationalisation of Fire-Resistant Level's (FRL) of Wet Areas within the Residential Apartments** ▪ The floor slabs of the wet areas throughout the residential levels will incorporate a 20mm set down in the wet areas resulting in a local reduction in the FRL as it reduces the slab thickness from 200mm to 180mm resulting in a local FRL of 60/60/90 (in lieu of the required 90/90/90 FRL)	C1.1 Spec. C1.1	CP1
3	**Non-Combustible Building Elements** ▪ The external façade is proposed to be provided with planter boxes having plants and tress form part of the external wall	C1.9	CP2
4	**Public corridors in Class 2 and 3 buildings** ▪ Public corridors are proposed to exceed 40m in length without smoke separation	C2.14	CP4, EP2.2
5	**Number of exits required** ▪ Lobby D and the adjacent commercial lobby are provided with a single exit in lieu of required 2 exits	D1.2	DP4
6	**Extended Travel Distance and Distances Between Alternative Exits** ▪ Basement 06: - Travel to a Point of Choice where 2 alternative exits are available is up to 28m in lieu of 20m - Total Travel distance where 2 alternative exits are available is up to 56m in lieu of 40m - The distance between alternative exits is up to 97m in lieu of 60m	D1.4 D1.5	DP4 EP2.2

No.	Description	DTS Clause	Performance Requirements
	Note: The Western plenum has extended distance to a POC that will require design amendment or clarification on the nature of access/egress in order to further review compliance. ▪ Basement 05 and 04: - Travel to a Point of Choice where 2 alternative exits are available is up to 31m in lieu of 20m - Total Travel distance where 2 alternative exits are available is up to 73m in lieu of 40m - The distance between alternative exits is up to 97m in lieu of 60m *Note: The Western plenum has extended distance to a POC that will require design amendment or clarification on the nature of access/egress in order to further review compliance.* ▪ Basement 03: - Travel to a Point of Choice where 2 alternative exits are available is up to 37m in lieu of 20m - Total Travel distance where 2 alternative exits are available is up to 73m in lieu of 40m - The distance between alternative exits is up to 92m in lieu of 60m *Note: The Western plenum has extended distance to a POC that will require design amendment or clarification on the nature of access/egress in order to further review compliance.* ▪ Basement 02: - Travel to a Point of Choice where 2 alternative exits are available is up to 34m in lieu of 20m - Total Travel distance where 2 alternative exits are available is up to 56m in lieu of 40m - The distance between alternative exits is up to 99m in lieu of 60m *Note: The Western plenum has extended distance to a POC that will require design amendment or clarification on the nature of access/egress in order to further review compliance.* ▪ Basement 01: - Travel to a Point of Choice where 2 alternative exits are available is up to 40m in lieu of 20m - Total Travel distance where 2 alternative exits are available is up to 67m in lieu of 40m - The distance between alternative exits is up to 101m in lieu of 60m *Note: The Western plenum has extended distance to a POC that will require design amendment or clarification on the nature of access/egress in order to further review compliance.* ▪ Ground Level Commercial: - Travel to a Point of Choice where 2 alternative exits are available is up to 30m in lieu of 20m - Total Travel distance where 2 alternative exits are available is up to 53m in lieu of 40m - The distance between alternative exits is up to 89m in lieu of 60m ▪ Level 2 Child Care: - Further Assessment will need to be undertaken upon the finalisation of the design to ascertain the travel distance requirements. - Based on the proposed layout, the child care tenancy is capable of complying with the travel distance requirements of the BCA		

No.	Description	DTS Clause	Performance Requirements
	▪ Residential Levels: - Distance to a single exit or Point of Choice is up to 12 m in lieu of 6m *Note: further assessment will be required upon the finalisation of the design*		
7	**Distances Between Alternative Exits** ▪ The proposed scissor stairs are less than 9m apart	D1.5	DP4 EP2.2
8	**Travel via fire-isolated exits** ▪ Discharge from the Fire Stairs FS_01 and FS_16 passes the shop front of Tenancy 10 and as such would require this opening to be protected in accordance with C3.4 of the BCA. Furthermore, the shop front will not achieve 60/60/60 ▪ Discharge from the Fire Stairs FS_03 passes the shop front of commercial Tenancy and as such would require this opening to be protected in accordance with C3.4 of the BCA. Furthermore, the shop front will not achieve 60/60/60 ▪ The Fire Stairs FS_13 and FS_19 converge into a single passageway and therefore do not provide independent egress via their own passage. ▪ The Fire Stairs FS_04, FS_05, FS_06, FS_07, FS_20 discharge into a covered area that is open for less than 1/3rd of its perimeter. Discharge also necessitates passing within 6m of unprotected openings ▪ The Fire Stairs FS_18 are proposed to have 3 doors opining into it without a smoke lobby or air pressurisation ▪ Discharge details of FS_15 to be provided.	D1.7	DP4 DP5 EP2.2
9	**Egress from early childhood centres** ▪ The childcare centre is proposed to be located on Level 02 and such will not have direct egress to a road or open space	D1.18	DP4 EP2.2
10	**Installations in exits and paths of travel** ▪ Access to Mech Supply Plant, and Remote Water Meters is provided via a fire isolated passageway	D2.7	DP5, EP2.2
11	**Roof as open space** ▪ the communal podium on level 2 is considered a roof as open space for the purpose of Clause D1.12, which is proposed to openings within 3 m of the path of travel to reach a road or open space	D2.12	DP4, EP2.2
12	**Swinging Doors** ▪ The doorway from FS_15 does not swing in the direction of egress	D2.20	DP4
13	**Fire hydrants** ▪ Vertical sections of the hydrant ring main will not be in their own fire isolated exit due to the nature of the scissor stairs ▪ The booster assembly will not be in sight of the main entrance as the building has multiple entrances.	E1.3	EP1.3

No.	Description	DTS Clause	Performance Requirements
	▪ The landscaping appears to obstruct the handstand area on De Clambe Drive required for FRNSW vehicles.		
14	**Sprinkler system** ▪ A combined Hydrant/Sprinkler system has been proposed which prescriptively nominates AS2118.1-1999 however, BCA 2019 Amdt 1 requires sprinklers to be installed to the AS2118.1-2017 standard. This technical departure will be addressed on a performance basis	E1.5	EP1.4
15	**Fire control Room** ▪ As the building has multiple entrances the Fire Control Room will not be at the main entrance.	E1.8	EP1.6 EP2.2
16	**Smoke Hazard Management** ▪ The stair pressuriation is proposed to be rationalised through a Performance Solution ▪ Rationalised Smoke Hazard Management and smoke exhaust to the commercial levels	E2.2	EP2.2
17	**Atrium** ▪ The atrium adjacent to the travelator will be assessed on a Performance basis	G3.2 G3.3 G3.4 G3.8 Spec. G3.8	CP1 CP2 DP6 EP1.4 EP2.2 EP4.2
Accessibility Items			
18	**Parts of Building to be Accessible (Access to Premises Standard 2010)** ▪ Accessibility review is required to be undertaken by a qualified access consultant to determine compliance with Part D3 of the BCA and the Disability (Access to Premises - Buildings) Standards 2010.	D3	DP1
Miscellaneous Items			
19	**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 feasibility and any additional requirements that will apply as a result of the performance solution will need to be confirmed by the professional preparing the performance solution. Any performance solution will need to be prepared by a suitably qualified/accredited professional.

Any fire engineered solution relating to CP2, EP1.3, EP1.4, EP1.6, and EP2.2 will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

Fire Safety Services

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

1.	Sprinkler system throughout of the building
2.	Fire hydrant system throughout of the building
3.	Fire hose reels to the Class 6, 7a, 8, and 9b portions of the building
4.	Fire precautions during construction
5.	Air-pressurisation throughout the fire isolated stairs throughout the building
6.	Automatic smoke detection and alarm system throughout the building
7.	Automatic smoke exhaust to the Class 6 portions of the building that have a compartment size more than 2000 m^2
8.	Where the floor area of a Class 6 part of a fire compartment is more than 2000 m2, the fire compartment, including the enclosed common walkway or mall, must be provided with an automatic smoke exhaust system complying with Specification E2.2b
9.	Zone pressurisation between vertically separated fire compartments in accordance with AS 1668.1 (excluding class 2 and 7a portions)
10.	Sound System and Intercom System for Emergency Purposes
11.	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 is required in order to complete the assessment, and/or the following areas need to be further reviewed.

No.	Further Information / Review Required	Responsibility
1.	The following building elements and their components **must be non-combustible**: i. External walls and common walls, including all components incorporated in them including the facade covering, framing and insulation. ii. The flooring and floor framing of lift pits. iii. Non-loadbearing internal walls where they are required to be fire-resisting. iv. A shaft, being a lift, ventilating, pipe, garbage, or similar shaft that is not for the discharge of hot products of combustion, that is non-loadbearing A loadbearing internal wall and a loadbearing fire wall, including those that are part of a loadbearing shaft, must comply with Specification C1.1 The architect confirmed the proposed design will comply with the requirements of C1.9 & C1.14	Architect
2.	Please advise if there are any proposed alternative building solutions with regard to design of the building services for the project.	Services Consultants
3.	Fire compartment drawings detailing proposed FRL's of all walls, columns and floors to be submitted for review. It is understood that the compartmentation plans will be provided as the design develops	Architect
4.	Fire Service Engineer to confirm and provide design details of the following: ▪ Sprinklers will be provided to the lift shafts ▪ Sprinklers will be provided to the bin room ▪ Sprinklers will be provided to the plenum ▪ Sprinklers will be provided to the substation ▪ Fire Hose Reels coverage plans ▪ All other active fire safety measures	Fire Services Engineer
5.	The space below fire isolated stairs must not be enclosed to form a cupboard	Architect

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 Regulation 2000.

2. Introduction

This report is based upon the review of the design documentation provided by Turner dated 25.02.2021

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

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

The version of the BCA applicable to the development, is version that in place at the time of the application to the Registered Certifier for the Construction Certificate. For the purposes of this Report, BCA 2019 Amendment 1 has been utilised as the version of the BCA applicable at the time of preparation this Report.

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. Preliminaries

4.1. Building Assessment Data

Summary of Construction Determination:

Part of Project	Showground
Classification	2, 6, 7a, 8, 9b
Number of Storeys	29
Rise In Storeys	21
Type of Construction	A
Effective Height (m)	66.35 m (RL156.250 – RL89.90)

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

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'*

5. Structure

5.1. Structural Provisions (BCA B1):

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

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

6. Fire Protection

6.1. Fire Compartmentation and Fire Resistance (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 BCA 2019 Amendment 1.

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 level and the Ground Floor of 120 minutes,
- Fire compartmentation of the building at each floor level,
- Fire Separation of the substation of 240 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
9b	max floor area—	8 000 m^2
	max volume—	48 000 m^3
6, 7, 8	max floor area—	5 000 m^2
	max volume—	30 000 m^3

The following deviations from the BCA are proposed to be addressed on a Performance basis:

- The travelator connecting the Ground Level and the Basement Levels is proposed to be glazed
- The floor slabs of the wet areas throughout the residential levels will incorporate a 20mm set down in the wet areas resulting in a local reduction in the FRL as it reduces the slab thickness from 200mm to 180mm resulting in a local FRL of 60/60/90 (in lieu of the required 90/90/90 FRL)

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

- Emergency Power Supply;
- Emergency Generators;
- Electricity Supply;
- Hydrant Pump Rooms;
- Sprinkler Pump Rooms;
- Fire Control Room

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

6.2. Fire Hazard Properties (BCA C1.10 and BCA C1.9)

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

Sprinkler Protected Areas

a) Floor Coverings – Critical radiant Flux not less than 2.2 kW/m^2
b) Wall and Ceiling Linings – Material Group No. 1, 2, 3 (Group 1 for fire isolated stairs)

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

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

External Wall Cladding

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

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

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

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

Combustible Materials

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

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

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

Any Aluminium Composite Panels must be labelled in accordance with SA TS 5344.
The BCA does nominate that ancillary elements may not be fixed to an external wall that is required to be non-combustible unless they comprise of the following:

a) An ancillary element that is non-combustible.
b) A gutter, downpipe or other plumbing fixture or fitting.
c) A flashing.
d) A grate or grille not more than 2 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:

The following deviation from the BCA are proposed to be addressed on a Performance basis:

- The external façade is proposed to be provided with planter boxes having plants and tress form part of the external wall

6.3. Separation of equipment (C2.12)

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

a) Emergency generators used to sustain emergency equipment operating in the emergency mode; or
b) A battery system installed in that building that has total voltage of 12 volts or more & a storage capacity of 200kWh or more.

6.4. Public Corridors: Class 2 and 3 Buildings (BCA 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 C2.5. Alternatively, a Performance Solution to be provided to address the deviation form BCA Clause C2.14

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

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

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

Angle Between Walls	Minimum Distance
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

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.

6.6. Protection of Openings fire rated building elements (BCA C3.5 and BCA C3.10)

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

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

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

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

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
- Fire Isolated Stairs

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
- Discharge from Fire Isolated Exits
- Details of the egress provisions to the Road.
- Door swings

It is noted that the communal podium on level 2 is considered a roof as open space for the purpose of Clause D1.12, which is proposed to have openings within 3 m of the path of travel to reach a road or open space. As such, a Performance Solution will be required to address this departure

7.2. Travel via Fire Isolated Exits (BCA D1.7, D2.7)

The proposed exits are required to be fire isolated.

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

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

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

The following deviation from the BCA are proposed to be addressed on a Performance basis:

- Discharge from the Fire Stairs FS_01 and FS_16 passes the shop front of Tenancy 10 and as such would require this opening to be protected in accordance with C3.4 of the BCA. Furthermore, the shop front will not achieve 60/60/60
- Discharge from the Fire Stairs FS_03 passes the shop front of commercial Tenancy and as such would require this opening to be protected in accordance with C3.4 of the BCA. Furthermore, the shop front will not achieve 60/60/60
- The Fire Stairs FS_13 and FS_19 converge into a single passageway and therefore do not provide independent egress via their own passage.
- The Fire Stairs FS_04, FS_05, FS_06, FS_07, FS_20 discharge into a covered area that is open for less than 1/3rd of its perimeter. Discharge also necessitates passing within 6m of unprotected openings
- The Fire Stairs FS_18 is proposed to have 3 doors opining into it without a smoke lobby or air pressurisation
- Access to Mech Supply Plant, and Remote Water Meters is provided via a fire isolated passageway

7.3. Fire Stair Re-Entry (BCA D2.22)

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

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

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

7.4. 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 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 extended travel distances and distance between the exit stairs identified in the executive summary 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 DP4 & EP2.2

7.5. Dimensions of Exits (BCA D1.6)

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

Doorways are permitted to contain a clear opening width of the required width of the exit minus 250mm, with a height of 1980mm as part of egress requirements. Access for persons with disabilities however requires a clear doorway opening width of 850mm (i.e. minimum 920 mm doors).

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

Generally

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

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

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

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

In 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 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 & Early Childhood Centres

In bedrooms of Class 2 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.

7.7. Slip Resistance

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

Table D2.14 SLIP-RESISTANCE CLASSIFICATION

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

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.

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

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;

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.

A fire ring main is required.

The fire pump location is satisfactory

Fire Hydrant Coverage Plans are required for review

The following deviation from the BCA are proposed to be addressed on a Performance basis:

- Vertical sections of the hydrant ring main will not be in their own fire isolated exit due to the nature of the scissor stairs
- The booster assembly will not be in sight of the main entrance as the building has multiple entrances.
- The landscaping appears to obstruct the handstand area on De Clambe Drive required for FRNSW vehicles

8.2. Fire Hose Reels

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

The system is required to provide coverage to the Class 6, 7a, 8, and 9b zones only.

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

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

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

Fire Hose Reel Coverage Plans are required for review

8.3. Fire Extinguishers (BCA E1.6)

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

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

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

8.4. Automatic Sprinkler Protection (BCA E1.5)

Automatic sprinkler protection is required to Specification E1.5 and AS2118.1-2017 throughout the entire building;

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

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

A combined Hydrant/Sprinkler system has been proposed which prescriptively nominates AS2118.1-1999 however, BCA 2019 Amdt 1 requires sprinklers to be installed to the AS2118.1-2017 standard. This technical departure will be addressed on a performance basis

The following performance solutions are required to be addressed by the Fire Safety Engineer using BCA Performance Requirements CP2 & EP1.4:

- Omission of sprinklers from residential balconies
- Omission of sprinklers from the lift shafts
- Omission of sprinklers from the bin chute, except for top of the shaft and bin room

An occupant warning system should be provided in accordance with BCA Specification E1.5.

8.5. 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 Exhaust System activated by Automatic Smoke Detection & Alarm System in accordance with the requirements of BCA Spec E2.2a and AS1670.1-2018
- Automatic Smoke Detection and Alarm System in accordance with the requirements of BCA Spec E2.2a and AS 1670.1-2018;
- Automatic Pressurisation to Fire Isolated Exits in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1
- Zone pressurisation between vertically separated fire compartments in accordance with AS 1668.1 (excluding class 2 and 7a portions)
- Where the floor area of a Class 6 part of a fire compartment is more than 2000 m2, the fire compartment, including the enclosed common walkway or mall, must be provided with an automatic smoke exhaust system complying with Specification E2.2b
- 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 and should be incorporated within the fire control room. Any variation to the prescriptive provisions will require the consent of the fire brigade and should form part of the fire safety engineering report to verify the performance requirements of the BCA.

It is noted that:
- The stair pressuriation is proposed to be rationalised through a Performance Solution
- Rationalised Smoke Hazard Management and smoke exhaust to the commercial levels

8.6. Lift Services (BCA E3.4 and BCA E3.6)

The passenger lifts to be installed are to be:-

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

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

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

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

Details are required to be provided for review.

8.8. Sound Systems and Intercom Systems for Emergency Purposes (BCA E4.9)

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

Details are to be provided for our review.

8.9. Fire Control Centre (BCA E1.8)

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

The following deviation from the BCA are proposed to be addressed on a Performance basis:

- As the building has multiple entrances the Fire Control Room will not be at the main entrance.

8.10. Fire Precautions During Construction (BCA E1.9)

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

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

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

9. Health and Amenity

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

Class 6

Separate sanitary facilities are required to be provided for male & female employees.

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.

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.

9.2. Floor Wastes

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.

9.3. Light and Ventilation (BCA Part F4)

Class 2

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 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	$R_w + C_{tr} \geq 50$ $L_{n,w} + C_I \leq 62$
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 F5 of the BCA.

9.5. Condensation management (BCA Part F6)

Pliable building membranes installed to an external wall must:

- achieve compliance with AS 4200.1, and
- be installed in accordance with AS4200.2, and
- be a vapour permeable membrane (applicable as the development is in climate zone 7); and
- be located on the exterior side of the primary insulation layer or the wall assembly and except for the single skin mason and single sin concrete be separated from water sensitive materials.

Exhaust systems must achieve a minimum flow rate of 25L/s for bathrooms and sanitary compartments must discharge directly or via a duct to outdoor air or to a roof space that is ventilated.

Kitchens and laundries to achieve a minimum flow rate 40L/s and discharge directly or via a shaft or duct to outdoor air.

Exhaust systems discharging directly or via a shaft or a duct to a roof space must be through evenly distributed systems. Openings for minimum flow requirements must have a total unobstructed area of 1/300 of the respective ceiling area if the roof pitch is greater than 22º. 30% of the total unobstructed area required for exhaust being discharged directly or via a shaft or duct to outdoor air must be located not more than 900 mm below the ridge or highest point of the roof space.

9.6. Weatherproofing (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.

9.7. Stormwater Drainage

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

The use of a syphonic stormwater drainage system is not covered by Australian Standards and any design incorporating one would need an appropriate performance solution will need to be documented by the hydraulic consultant addressing the system compliance against BCA Performance Requirements FP1.2 & FP1.3.

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 Class 6, 7, 8, 9 and common areas of the class 2 of the 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 / computation outlining how compliance is achieved.

Facilities for Energy Monitoring is to be provided to the building in accordance with the requirements of BCA Part J8.

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;
- 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.

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 Amdt 1 and AS 1428.1. Parts of the building required to be accessible shall comply with the requirements of:-

- AS1428.1-2009 General Requirements for Access – 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.

Shops (Class 6 buildings)

To and within any level containing accessible car parking spaces.

Car parks (Class 7a buildings)

To and within any level containing accessible car parking spaces.

Club (Class 9b buildings)

To and within any level containing accessible car parking spaces.

11.2. Provision for Access to Buildings

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

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

In buildings over 500m^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.

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).

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.

11.4. Car Parking (BCA D3.5)

Accessible car parking spaces are required to comply with AS 2890.6-2009

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

11.5. Tactile Indicators (BCA D3.8)

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

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 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.

11.7. Accessible Sanitary Facilities (BCA F2.4)

Unisex Accessible Sanitary Facilities

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

Building Type	Minimum accessible unisex sanitary compartments to be provided
Commercial and assembly 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

11.8. Signage (BCA D3.6)

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

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

11.9. Lifts (BCA E3.6)

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

12. Appendix A - Draft Fire Safety Schedule

	Essential Fire Safety Measures	Standard of Performance
1.	Access Panels, Doors and Hoppers	BCA 2019 AMDT 1 Clause C3.13
2.	Automatic Fail-Safe Devices	BCA 2019 AMDT 1 Clause D2.19 & D2.21
3.	Automatic Smoke Detection and Alarm System	Clause 3 or 4 or 5 BCA 2019 AMDT 1 Spec. E2.2a, AS 1670.1 – 2018, AS/NZS 1668.1 – 2015, AS 3786-2014
4.	Automatic Fire Suppression System	BCA 2019 AMDT 1 Spec. E1.5 & AS 2118.1 – 2017 Amdt 1, AS 2118.6 – 2012 (Combined sprinkler & hydrant)
5.	Building Occupant Warning System activated by the Sprinkler System	BCA 2019 AMDT 1 Spec. E1.5 & Specification E2.2a Clause 7
6.	Emergency Lifts	BCA 2019 AMDT 1 Clause E3.4
7.	Emergency Lighting	BCA 2019 AMDT 1 Clause E4.2, E4.4 & AS/NZS 2293.1 – 2018
8.	EWIS	BCA 2019 AMDT 1 Clause E4.9 & AS 1670.4 - 2018
9.	Emergency Evacuation Plan	AS 3745 – 2002
10.	Exit Signs	BCA 2019 AMDT 1 Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2018
11.	Fire Control Centres and Rooms	BCA 2019 AMDT 1 Spec. E1.8
12.	Fire Dampers	BCA 2019 AMDT 1 Clause C2.12, C3.15, Spec C2.5, D1.7, E2.2, E2.3, F4.12, Spec E2.2, E2.3, Spec E2.2b, Spec G3.8 & AS 1668.1 – 2015
13.	Fire Doors	BCA 2019 AMDT 1 Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8 and AS 1905.1 – 2015
14.	Fire Hose Reels	BCA 2019 AMDT 1 Clause E1.4 & AS 2441 – 2005 Amdt 1
15.	Fire Hydrant System	Clause C2.12, E1.3, Spec E1.5a, H3.9 & AS 2419.1 – 2005 Amdt 1
16.	Fire Seals	BCA 2019 AMDT 1 Clause C3.15, C3.16, Spec C3.15, Spec D1.12, & AS 1530.4 –2014
17.	Mechanical Air Handling System	BCA 2019 AMDT 1 Clause E2.2, AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012
18.	Paths of Travel	EP&A Reg 2000 Clause 186
19.	Portable Fire Extinguishers	BCA 2019 AMDT 1 Clause E1.6 & H3.11, AS 2444 – 2001
20.	Pressurising Systems	BCA 2019 AMDT 1 Clause E2.2 & AS/NZS 1668.1 – 2015
21.	Required Exit Doors (power operated)	BCA 2019 AMDT 1 Clause D2.19 (b)(iv)
22.	Smoke Hazard Management System	BCA 2019 AMDT 1 Part E2 & AS/NZS 1668.1 – 2015
23.	Warning and Operational Signs	AS 1905.1 –2015~~,~~ BCA 2019 AMDT 1 Clause C3.6, D2.23, E3.3
24.	Fire Engineered Performance Solution	To meet the relevant performance requirements of the BCA

13. Appendix B - Fire Resistance Levels

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

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.			