



A Bureau Veritas Group Company

Regulatory Compliance Report

Chisolm Shopping Centre
Heritage Drive, Chisholm

Prepared for: **BN Group**
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Table of Contents

1.	Executive Summary.....	3
2.	Introduction.....	5
3.	Compliance with the Building Code of Australia.....	5
4.	Documentation of Performance Solutions.....	5
5.	Preliminaries.....	6
6.	Structure.....	8
7.	Fire Protection.....	8
8.	Access and Egress.....	12
9.	Services and Equipment.....	15
10.	Health and Amenity.....	17
11.	Ancillary Provisions.....	21
12.	Energy Efficiency.....	21
13.	Access for People with Disabilities.....	29
14.	Appendix A - Reference Documentation.....	36
15.	Appendix B - Fire Resistance Levels.....	38

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1. Executive Summary

Development Overview

The proposed development is mixed use shopping centre development and associated car park.

Compliance Summary

As Registered Certifiers we have reviewed the concept architectural design documents prepared by BN Group 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 schematic 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	Justification of travel distances exceeding 30m to an exit from the retail tenancies and medical centres on the ground floor.	D1.4	DP4, EP2.2
2	Justification of alternate exits to be located within 9m of one another to the childcare building.	D1.5	DP4
3	Justification of the reduced exit and travel to exit widths to the supermarket, mini major and childcare tenancies to allow for increased patron capacity.	D1.6	DP6
4	Justification as to the exit doors to swing inward against the direction of egress.	D2.20	DP2
5	Justification as to any fire hose reel omissions to ground floor retail tenancies, childcare/pool/gym building and carpark.	E1.4	EP1.1
6	Justification of the smoke exhaust system to be rationalised throughout the development.	E2.2	EP2.2
7	Justification of any exit signs proposed to be above 2.7m from the ground.	E4.2	EP4.2
8	Justification of the minimum unobstructed width of 6m to allow emergency vehicular access located within 18m around the entire building perimeter.	C2.4	CP9
Accessibility Items			
The current plans are not developed to a stage where a full DDA review for compliance could be undertaken and further matters may be seen as the design further develops.			
9	Justification of the distance of landing intervals to the 1:14 ramps of the eastern side of the building.	D3.2	DP2
Miscellaneous Items			

No.	Description	DTS Clause	Performance Requirements
10	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.	F1.1	FP1.4

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

Fire Safety Services

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

1.	Fire hydrant system throughout the buildings as per BCA E1.3 and AS2419.1-2005
2.	Fire hose reels throughout the buildings as per BCA E1.4 and AS2441-2005
3.	Automatic smoke detection and alarm system throughout as per BCA Specification E2.2a and AS1670.1-2018
4.	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 as per BCA E2.2 and AS168.1-2015

Refer to part 7 of this report for further details regarding the required services.

The fire engineered solution relating to insert relevant CP9 and EP2.2 items will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

Further Assessment

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

No.	Further Information / Review Required	Report Reference
1	Owners confirmation of occupant numbers. Numbers can be adjusted as required however it may affect egress and sanitary facility requirements.	5.1
3	A full detailed disabled access review will need to be undertaken once all surfaces, levels, thresholds, dimensions, and door widths and locations re shown on the plans.	8
7	A full detailed review of the early childcare facilities will need to be undertaken once further detail has been provided.	10.1 & 10.2
8	Verification around the kids splash/fountain water depth to determine whether a AS1926.1 & 2 will be required.	11.1

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

The proposed development comprises of the construction of a new mixed shopping centre building including retail, medical centre and childcare tenancies ground floor and a basement carpark including access to above ground pool and gym.

The site is located on the Heritage Drive, Chisholm.

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

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

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

The version of the BCA applicable to the development, is version that in place at the time of the application to the Registered Certifier for the Construction Certificate. For the purposes of this Report, BCA 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	Building 1 Main Building Structure	Building 2 Childcare/Pool/Gym
Classification	5, 6, 7a	9b, 10b
Number of Storeys	2	2
Rise In Storeys	2	2
Type of Construction	B	B
Effective Height (m)	3.25	5.25

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

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

Building 1: Main Building Structure

Part of Project	BCA Classification	Approx. Floor Area (m ²)	Assumed Population (D1.13)
WOW Supermarket (inc associated buildings)	6	4030	327
Medical Centre	5	412	28
Medical Centre	5	349	24
Tenancy 1	6	120	28
Tenancy 2	6	120	28
Tenancy 3	6	155	36
Tenancy 4	6	74	17
Tenancy 5	6	65	15
Tenancy 6	6	87	20
Tenancy 7	6	170	39

Part of Project	BCA Classification	Approx. Floor Area (m ²)	Assumed Population (D1.13)
Tenancy 8	6	65	15
Tenancy 9	6	93	21
Tenancy 10	6	75	17
Tenancy 11	6	257	59
Tenancy 12	6	145	33
Tenancy 13	6	143	33
Tenancy 14	6	416	97
Tavern	6	889	173
Mini Major	6	1500	133
Kiosk	6	194	17
Car Park	7a	3750	125
Car wash area	6	473	20
EOT facilities	6	113	20
Store	7b	218	7
Total		13719	1,332

Building 2: Childcare & Gym/Pool Building

Part of Project	BCA Classification	Approx. Floor Area (m ²)	Assumed Population (D1.3)
Childcare building	9b	1722	125
Gym/Pool/Change	9b	2083	150
Shade Sails	10	N/A	N/A
Total		3805	275

Notes:

- The above populations have been based on floor areas and calculations in accordance with Table D1.13 of the BCA, upon further detail of exit locations and widths the assumed population may be reduced (see D1.6).
- The floor areas to retail portions have been adjusted without ancillary areas such as sanitary facilities, corridors, shelving and or racking layouts in storage areas.
- The carpark areas have been considered ancillary to the use for the purposes of population numbers

6. Structure

6.1. Structural Provisions (BCA B1):

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

7. Fire Protection

7.1. 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 that the main structure building is to be constructed in accordance with the requirements of Type B Construction, the childcare and gym/pool building to be constructed in accordance with the requirements of Type B Construction and is to be constructed in accordance with Table 4 & 5 of Specification C1.1 of the Building Code of Australia 2019 Amendment 1.

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

- The main structure building will be fire separated being seen as separate fire compartments not exceeding the maximum floor and volume limitations.
- The childcare and gym/pool building being seen as each storey having a separate fire compartment.

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

Classification		Type of Construction		
		A	B	C
5, 9b or 9c aged care building	max floor area—	8 000 m ²	5 500 m ²	3 000 m ²
	max volume—	48 000 m ³	33 000 m ³	18 000 m ³
6, 7, 8 or 9a (except for patient care areas)	max floor area—	5 000 m ²	3 500 m ²	2 000 m ²
	max volume—	30 000 m ³	21 000 m ³	12 000 m ³

7.2. Fire Resistance (BCA C1.1)

The building should be constructed generally in accordance with the relevant provisions of Specification C1.1 of the BCA applicable to Type B Construction.

Please refer to Appendix B which outlines the required fire rating to be achieved by the development.

The registered project structural engineer will need to supply a signed consultant advice note confirming the above fire resistance levels are achieved to all loadbearing and non-loadbearing concrete and masonry elements.

Fire rated tested wall systems are to be chosen by the project architect for all non-loadbearing and lightweight partitions with references to AS1530.4 test reports or fire rated tested system reference numbers (i.e. CSR Redbook, Boral Selector, Knauf Blueprint).

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

7.3. 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:

Sprinkler Protected Areas

- a) Floor Coverings – Critical radiant Flux not less than 1.2 kW/m²
- b) Wall and Ceiling Linings – Material Group No. 1,2 & 3

Non-Sprinkler Protected Areas

- a) Floor Coverings – Critical radiant Flux not less than 2.2 kW/m² a maximum smoke development rate of 750 percent-minutes
- b) Wall and Ceiling Linings – Material Group No. 1 & 2 and with a smoke growth rate index not more than 100, or an average specific extinction area less than 250m²/kg
- c) 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.

External Wall Cladding

Since the main structure and childcare/pool/gym building is of Type B 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 since the building is a Class 9b building;
- 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:

7.4. 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) Lift motors and lift control panels; or
- b) Central smoke control plant; or

7.5. 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);

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

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

8. Access and Egress

8.1. Provision for Escape (BCA D1)

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

- External perimeter doorways
- External Doors

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

Every part of the class 9b childcare centre must be wholly within a storey which provides direct egress to a road or open space.

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

The following matters have been noted and require further detailing and advice:

a) Alternate exit within 9m Childcare Building

Alternate exits are not permitted to be located within 9m of one another under the deemed-to-satisfy provisions of the BCA.



8.2. Exit Travel Distances (BCA D1.4)

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
- in a class 5 & 6 building, the distance to a single exit serving a storey at the level of access to a road or open space may be increased to 30m

Once locations of all exits have been provided to the retail tenancies a further review can be carried out. The extended travel distances will need to be addressed to comply with the requirements of the deemed to satisfy provisions noted above, or be assessed as a performance based design solution using BCA Performance Requirements DP4 & EP2.2.

The extended travel distances will need to be 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

8.3. 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 (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).

If a tenancy is to accommodate more than 100 persons but not more than 200 persons, the aggregate unobstructed width, except for doorways must be not less than 1m plus 250mm for each 25 persons (or part) in excess of 100.

If a tenancy is to accommodate more than 200 persons, the aggregate unobstructed width except for doorways is to be 2m plus 500mm for every 75 persons (or part) in excess of 200.

Increased dimensions of exits and paths of travel to exits is to be considered by the design team and further review is to be undertaken to determine patron numbers achieve the patron number desired

The following table summarises the exit widths required by BCA Clause D1.6:

Tenancy	Assumed number of people	Exit Width Required	Exit Width Provided
WOW Supermarket	327	3.5m	1m
Medical Centre	28	1m	TBD
Medical Centre	24	1m	1m
Tenancy 1	28	1m	TBD
Tenancy 2	28	1m	TBD
Tenancy 3	36	1m	TBD

Tenancy	Assumed number of people	Exit Width Required	Exit Width Provided
Tenancy 4	17	1m	TBD
Tenancy 5	15	1m	TBD
Tenancy 6	20	1m	TBD
Tenancy 7	39	1m	1m
Tenancy 8	15	1m	TBD
Tenancy 9	21	1m	TBD
Tenancy 10	17	1m	TBD
Tenancy 11	59	1m	TBD
Tenancy 12	33	1m	TBD
Tenancy 13	33	1m	TBD
Tenancy 14	97	1m	TBD
Tavern	173	2m	TBD
Mini Major	133	1.5m	TBD
Kiosk	17	1m	1m
Childcare	125	1.25m	5m
Gym/pool/change	150	1.5m	3m

8.4. Egress from Early Childhood Centres (BCA D1.18)

Every part of a 9b early childhood centre must be wholly with a storey that provides direct egress to a road or open space.

Should the early childhood centre not provide direct egress to a road or open space a performance solution is to be used to demonstrate compliance.

8.5. 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.

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

Intermediate rails located between 665mm and 750 mm should be provided within Class 9b Primary Schools.

Openable Windows in Bedrooms & Early Childhood Centres

In Class 9b early childhood centres, where the distance from the floor level to the level below exceeds 2m, window openings shall be provided with protection in accordance with BCA Clause D2.24.

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

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

The device or screen required must –

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

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

8.6. 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

Confirmation of the method of meeting slip resistance will be required to all stairways and ramps used by pedestrians using either tread / surface materials or via a slip resistant luminance contrast nosing.

9. Services and Equipment

The following section of this report describes the essential fire safety measures and the minimum performance requirements of those measures.

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

9.1. 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.

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.

9.2. Fire Hose Reels

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

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

9.3. 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 all buildings.

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.

Fire extinguishers are to be located in accordance with AS 2444 – 2001.

The fire extinguisher locations are to be shown within either the fire service drawings or the architectural drawings for further review and approval by McKenzie Group.

9.4. Automatic Sprinkler Protection (BCA E1.5)

Automatic sprinkler protection is required to Specification E1.5 and AS2118.1-2017 to the following areas:

- Throughout any fire compartment containing Class 6 areas that exceeds 3,500m² in floor area or 21,000m³ in volume;
- Throughout any fire compartment that exceeds 2,000m² in floor area or 12,000m³ in volume where occupancies of excessive hazard are proposed

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

9.5. Smoke Hazard Management (BCA E2.2)

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

- 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.

9.6. 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 600mm wide, 2000mm long and 1400mm high;
- 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

9.7. 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.

10. Health and Amenity

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

Retail

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

The following table summarises the sanitary facilities provided:

Sanitary Facilities Provided			
	WC	Urinals	Basins
Male	4	9	7
Female	10	NA	7
Accessible	1	NA	1

The above facilities are adequate for 12,000 patrons servicing the shopping centre and department stores

Early childhood centre

Facilities for use by children must have each sanitary compartment screened by a partition which, except the doorway, is opaque for a height of at least 900mm but not more than 1200mm above floor level.

The following table summarises the sanitary facilities provided:

Sanitary Facilities Provided			
	WC	Urinals	Basins
Children	9		9

The above facilities are adequate for 125 children servicing the childcare centre

Detailed designs will need to be developed as to the layout, dimensions, etc of the sanitary facilities.

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

Bathroom Construction

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

10.2. Childhood Centre Facilities (F2.3)

Early childhood centres are to be provided with the following facilities in accordance with F2.3 (h):

- A kitchen or food preparation area with a kitchen sink, separate hand washing facilities space for a refrigerator and space for cooking facilities, with facilities protected by a door or gate with child proof latches to prevent unsupervised access to the facilities by children younger than 5 years old and the ability to facilitate supervision of children from facilities if the early childhood centre accommodates children younger than 2 years old,
- One bath, shower or shower-bath,
- If the centre accommodates children younger than 3 years old:
 - A laundry facility comprising a washtub and space in the same room for a washing machine,
 - A bench type baby bath, which is within 1m of the nappy change bench,
 - A nappy changing bench which is:
 - Within 1m of separate adult hand washing facilities and bench type baby bath,
 - Must be not less than 0.9m in area and at a height of not less than 850mm, but not more than 900mm above the finished floor level,
 - Must have a space not less than 800mm high, 500mm wide and 800mm deep for the storage of steps,
 - Is positioned to permit a staff member changing a nappy to have visibility of the play area at all times.

10.3. Light and Ventilation (BCA Part F4)

9b early childhood centre natural light:

Natural light is required to be provided by windows (excluding roof lights) that have an aggregate light transmitting area measured exclusive of framing members, glazing bars or other obstructions of not less than 10% of the floor area of all playrooms or the like for the use of children.

The sills of 50% of windows in children's rooms must be located not more than 500 mm above the floor level.

Class 5, 6, 7, 8 & 9:

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

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

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

10.4. Room Heights (BCA F3)

The following room heights are applicable to the project and are to be documented in the reflective ceiling plans or similar:

Classification	Room Type	Room height
Office, Retail, Childcare, Pool & Gym (Class 5, 6 & 9b)	General area	2.4m
	Corridors, toilets	2.1m
	Commercial Kitchen	2.4m
Carpark (Class 7a)	General area	2.1m
	Path to accessible space	2.2m
	Above accessible space	2.5m

The architect is to advise if there is any area where the above head height clearances are not available so that options can be explored in relation to compliance or a performance based solution.

10.5. 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 22°. 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.

10.6. 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.

10.7. 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.

11. Ancillary Provisions

11.1. Swimming Pools (G1.1)

A swimming pool with a depth of water more than 300mm must have suitable barriers constructed is to be in accordance with AS1926 Parts 1 & 2.

Further review of the swimming pool will be undertaken when further design has been provided.

Further verification will be required as to the depth of the water to the kids water splash/fountain playground to verify whether suitable barriers are required.

11.2. Cool Rooms (G1.2)

Refrigerated or cooling chambers which is sufficient size for a person to enter is to be designed in accordance with G1.2.

11.3. Outdoor Play Spaces

Any outdoor play spaces in an early childhood centre must be enclosed on all sides with a barrier which complies with AS 1926.1 & 2.

12. Energy Efficiency

12.1. SECTION J (Transition Period)

The commentary below is an assessment based on the provisions included in BCA 2019 Amendment 1.

12.2. SECTION J (JP1 Energy Use)

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

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

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.

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

Verification Methods

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

JV1 NABERS Energy for Offices

- To achieve compliance with JP1 a class 5 building must achieve a minimum of 5.5 NABERS Energy for Offices Base Building Commitment Agreement and comply with ANSI/ASHRAI Standard 140.

- To achieve the energy model for (JP1 (i)) solar radiation the base buildings greenhouse gas emissions are not more than 67% of the 5.5 star level when excluding:
 - Tenant supplementary heating; and
 - Cooling systems; and
 - External lighting; and
 - Car park services.
 - A thermal comfort level between predicted mean vote of -1 to +1 is achieved across not less than 95% of the floor area of all occupied zones for not less than 98% of annual hours of operation.
- The building also needs to comply with additional requirements of Spec JV a.

JV2 Green Star

- To achieve compliance with JP1 for Class 3,4,5,6, 7, 8, 9 and common area of Class 2 buildings Green Star can be used as a verification method when the calculation method complies with ANSI/ASHRAE Standard, Specification JVb and when:
 - The building complies with simulation requirements and is registered for a Green Star – Design & As-Built rating; and
 - The annual greenhouse gas emissions of the proposed building are less than 90% of the annual greenhouse gas emissions of the reference building; and
 - In the proposed building, a thermal comfort level of between predicted mean vote of -1 to +1 is achieved across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation of the building; and
 - The building complies with the additional requirements of Specification JV a.

JV3 Verification Using a Reference Building

- To achieve compliance with JP1 for Class 3,4,5,6, 7, 8, 9 and common area of Class 2 buildings verification using a reference building can be used when the calculation method complies with ANSI/ASHRAE Standard, Specification JVb and when:
 - It is determined that the annual greenhouse gas emissions of the proposed building are not more than the annual greenhouse gas emissions of a reference building when the proposed building is modeled with the proposed services and the proposed building is modeled with the same services as the reference building. The proposed building thermal comfort level is to be between predicted mean vote of -1 to +1 across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation; and
 - The building achieves the additional requirements in Specification JV a; and
 - The greenhouse gas emissions of the proposed building may be offset by renewable energy generated and used on site and another process such as reclaimed energy used on site.

JV4 Building Envelope Sealing

- Compliance with sealing of the building against air leakage is verified when the envelope is sealed at an air permeability rate tested in accordance with Method 1 of AS/NZS ISO 9972, of not more than –
 - For a class 2 building or a class 4 part of a building, 10m³hr.m² at 50 Pa reference pressure; or
 - For a class 5, 6, 8, 9a or 9b building other than a ward area in climate zones 1, 7 and 8, 5 m³/hr.m² at 50 Pa reference pressure; or
 - For class 3 or 9c building, or a class 9a ward area in climate zones 1, 3, 4, 6, 7 and 8 5m³/hr.m² at 50 Pa reference pressure.
- Part J3 and performance solution that uses one of the other NCC assessment Methods which verifies that compliance with JP1 (e) will be achieved can also be used as verification methods.

12.3. Building Fabric (Part J1)

Roof and Ceiling Construction (Part J1.3)

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

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

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

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

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

Roof lights (Part J1.4)

Where roof lights are installed they must have :-

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

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

External Walls and Glazing (Part 1.5)

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

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

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

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

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

To achieve compliance with J0.2 (c) a wall that does not have a wall lining or has a wall lining that is fixed directly to the same metal frame and has a lightweight external cladding such as weatherboards, fibre-cement or metal sheeting fixed to a metal frame must have a thermal break. The thermal break is to consist of a material with an R-Value of not less than R.02, installed at all points of contact between the external cladding and metal frame.

Floors (Part J1.6)

Floors are to achieve an R rating of 2.

12.4. Building sealing (Part J3)

Windows and Doors (Part J3.4)

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

Exhaust fans (Part J3.5)

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

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

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

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

- (i) The envelope; or
- (ii) In climate zones 4, 5, 6, 7 or 8

Construction required by above must be –

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

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

Evaporative coolers (Part J3.7)

An evaporative cooler must be fitted with a self-closing damper or the like –

- (a) When serving a heated space; or
- (b) In climate zones 4,5,6,7 or 8.

12.5. Air Conditioning and Ventilation systems (Part J5.0)

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

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

Table J5.5

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

Mechanical:

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

Heaters

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

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

- (i) if rated to consume 500 MJ/hour of gas or less, achieve a minimum gross thermal efficiency of 86% ; or
- (ii) If rated to consume more than 500 MJ/hour of gas, achieve a minimum gross thermal efficiency of 90%

Refrigerant chillers

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

Unitary air-conditioning equipment

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

- (a) Where water cooled, have a minimum energy efficiency ratio of $4.0 W_r / W_{input\ power}$ for cooling when tested in accordance with AS/NZS 3823.1.2 at test condition T1, where input power includes both compressor and fan input power; or
- (b) Where air cooled, have a minimum energy efficiency ratio of $2.9 W_r / W_{input\ power}$ for cooling when tested in accordance with AS/NZS 3823.1.2 at test condition T1, where input power includes both compressor and fan input power.

12.6. Artificial Lighting and Power (Part J6)

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

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

The maximum illumination power density;

Common rooms, spaces and corridors in a Class 2 building	4.5W/m ²
Stairways, including fire-isolated stairways	2W/m ²
Toilet, locker room, staff room, rest room or the like	3W/m ²
Lift cars	3W/m ²
Service area, cleaner's room and the like	3W/m ²
Control room, switch room or the like	
(A) intermittent monitoring	3W/m ²
(B) Constant monitoring	4.5W/m ²

Plant room:	
(A) Where an average of 160 lx vertical illuminance is required on a vertical panel such as in switch rooms	4W/m ²
(B) With a horizontal illuminance target of 80 lx	2W/m ²
Library:	
(A) Stack & shelving area	2.5W/m ²
(B) Reading room & general areas	4.5W/m ²
Office:	
(A) Artificially lit to an ambient level of 200 lx or more	4.5W/m ²
(B) Artificially lit to an ambient level of less than 200 lx	2.5W/m ²
Museum & gallery	2.5W/m ²
Retail:	14W/m ²
Corridors:	5W/m ²
Common rooms, spaces & corridors in a Class 2 building	4.5W/m ²
Lounge area for communal use in a Class 3 or 9c building	4.5W/m ²
Dormitory of Class 3 building:	
(A) Used for sleeping only	3W/m ²
(B) Used for sleeping & study	4W/m ²
Storage	1.5W/m ²
School:	4.5W/m ²
Health Care:	
(A) Infants & children's wards & ED	4W/m ²
(B) Exam room	4.5W/m ²
(C) Exam room in intensive care & high dependency ward	6W/m ²
(D) All other patient care areas inc wards & corridors	2.5W/m ²
Kitchen and food preparation area:	4W/m ²
Car parks:	
(A) General	2W/m ²
(B) Entry zone (first 15m of travel during the daytime)	11.5W/m ²
(C) Entry zone (next 4m of travel) during the day	2.5W/m ²
(D) Entry zone (first 20m of travel) during nighttime	2.5W/m ²
Auditoriums, church and public hall :	8W/m ²
Restaurant, café, bar:	14W/m ²

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

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

- 250m² if in a Class 6 building or Class 8 laboratory
- Not operate lighting for an area more than -
 - a) 250m² for a space of not more than 2000m²;
 - b) 1000m² for a space of more than 2000m²
 if in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building;
- 1000m² for a space of more than 2000m²

Interior decorative and display lighting

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

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

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

Exterior artificial lighting

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

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

Lifts (Part 6.7)

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

Escalators and moving walks (Part J6.8)

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

12.7. Heated Water Supply and Swimming Pool and Spa Pool Plant (Part 7)

Heated water supply (Part J7.2)

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

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

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

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

13. 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.

13.1. 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:

Office/shops (Class 5/Class 6 buildings)

To and within all areas normally used by the occupants

Car parks (Class 7a buildings)

To and within any level containing accessible car parking spaces.

Early childhood centres

To and within all areas normally used by the occupants.

Where a ramp or a lift complying with AS1428.1 is provided, to and within all areas of the level served by the lift or ramp.

Where a group of sole occupant units or individual units are provided, the following ratio is required.

1 to 10 single occupancy units	To and within 1 accessible sole occupancy units
11 to 40	To and within 2 accessible sole occupancy units
41 to 60	To and within 3 accessible sole occupancy units

61 to 80	To and within 4 sole occupancy units
81 to 100	To and within 5 sole occupancy units
101 to 200	To and within 5 sole occupancy units and 1 for every 25 sole occupancy units over 100 or part thereof in excess of 100.
201 to 500 single occupancy units	To and within 9 accessible sole occupancy units, plus 1 for every 30 units in excess of 200 units or part thereof in excess of 200.
More than 500	To and within 19 accessible sole occupancy units plus 1 for every 50 units in excess of 500 units

Where more than 2 single occupancy units are required to be accessible they must be indicative of the range of units/rooms available.

Swimming Pools (Class 10b)

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

13.2. 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.

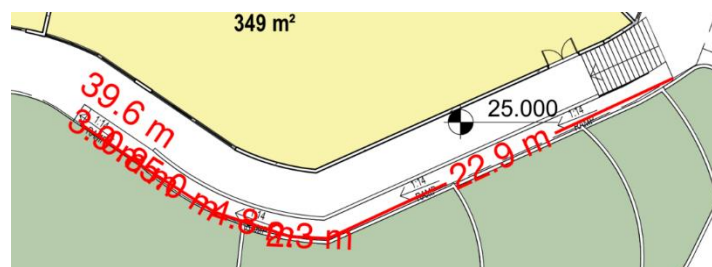
In buildings over 500m² in floor area, a non-accessible entrance must not be located more than 50m from an accessible entrance.

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.

Ramps with gradients of 1:14 are to be provided with landing intervals not greater than 9m.



13.3. 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 200m².

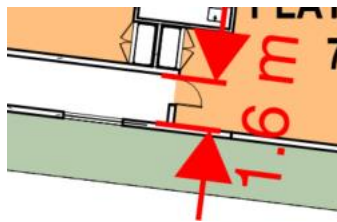
Within the building the following are required;

- 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 following has been noted and requires review:

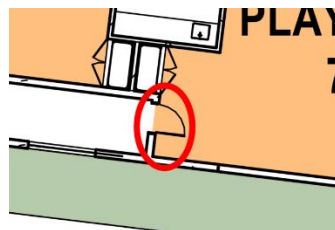
a) Childcare building turning space

Verification as to how the 180° turning space has been achieved to the ground floor corridor



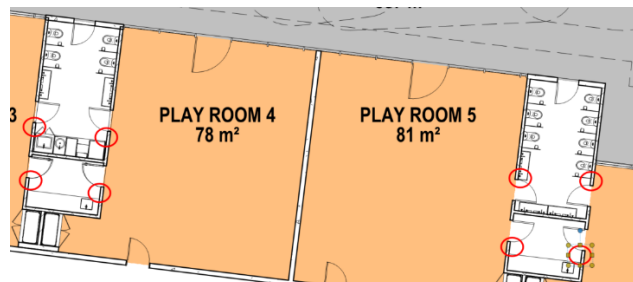
b) Childcare building doorway circulation

Verification as to how door circulation spaces have been achieved to the ground floor corridor doorway



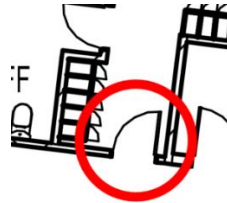
c) Childcare building facilities doorways circulation

Verification as to how door circulation spaces have been achieved to the ground floor staffroom doorway



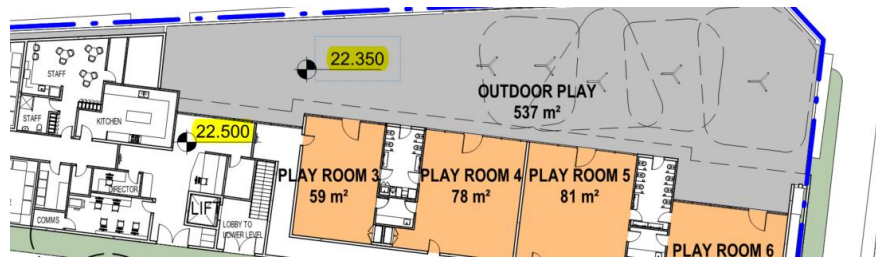
d) Childcare building doorway circulation

Verification as to how door circulation spaces have been achieved to the ground floor staffroom doorway



e) Childcare outdoor play access

Verification as to how the outdoor play area achieves accessible access from the main building with the change of floor level



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.

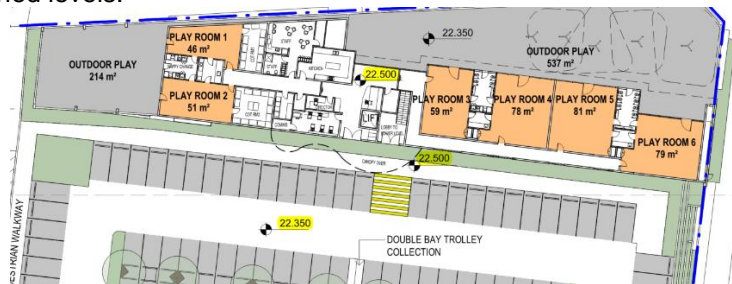
13.4. Car Parking (BCA D3.5)

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

- a) 1 per 50 (or part thereof) for retail spaces; and
- b) 1 per 100 (or part thereof) for office spaces, childcare/gym/pool

The development is proposed to contain 536 car parking spaces on the ground floor and 129 car spaces to the above ground basement.

Consideration will need to be taken in providing the childcare building access from accessible car parking spaces due to the change of finished levels.



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

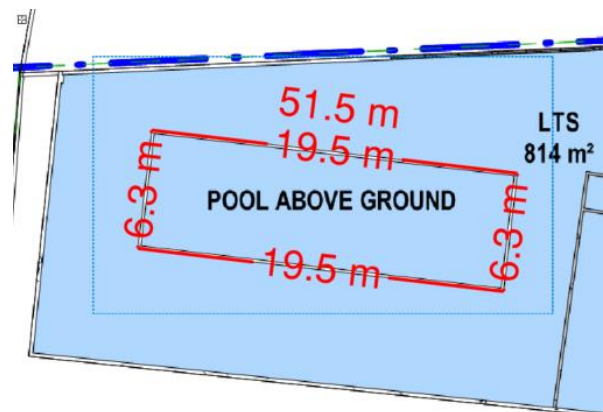
13.5. Tactile Indicators (BCA D3.8)

Tactile indicators are required to be provided to warn occupants of all stairs, escalators/travelators (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.

13.6. Swimming Pools (BCA D3.10)

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

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



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

Stairs shall be constructed as follows:

- 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.
- 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.
- Stairs shall have opaque risers.
- 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.
- Stair nosing profiles shall;
 - Have a sharp intersection;
 - Be rounded up to 5mm radius; or
 - Be chamfered up to 5mm x 5mm
- 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.

Consistent height of handrails at landings (staggered treads):

To ensure a continuous internal handrail is supplied at a consistent height it generally requires a staggered tread as per AS1428.1-2009. Further detailed review of the stairs is required to verify if compliance is achieved.

13.8. 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
Office, industrial, assembly building, schools, health care except for within a ward area of a Class 9a health-care building	a) 1 on every storey containing sanitary compartments; and b) Where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments, at not less than 50% of those banks.

Ambulant Facilities

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

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

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

Accessible unisex showers

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

Building	Minimum accessible unisex showers to be provided
Bed & Breakfast, holiday house, hostel, Boarding house	a) Not less than 1; and b) Where private accessible unisex showers are provided for every accessible bedroom, common accessible unisex showers need not be provided.
Residential apartments	Where showers are provided in common areas, not less than 1
Hotels and Class 9c aged care building	a) In every accessible sole – occupancy unit provided with showers within the accessible sole-occupancy unit, not less than 1; and b) 1 for every 10 showers or part thereof provided in common areas
Theatres, sporting venues or gyms	1 for every 10 showers or part thereof provided

13.9. Accessible adult change facility (F2.9)

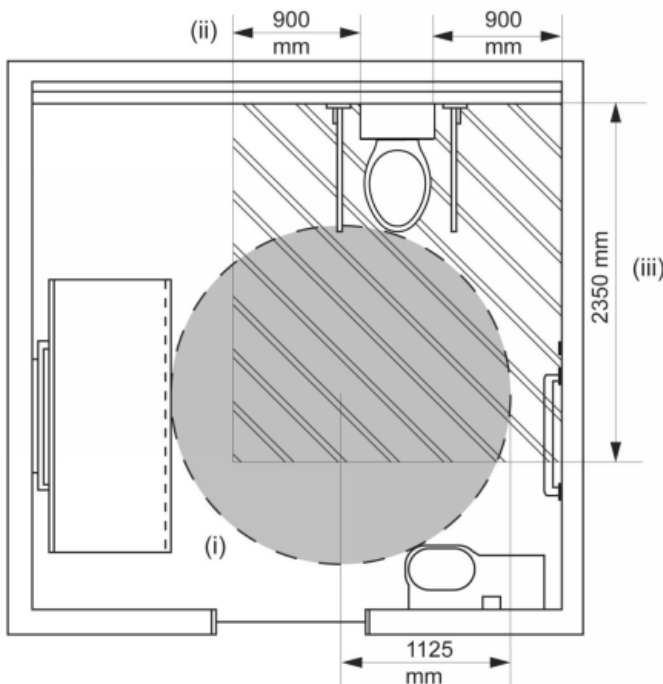
Accessible adult change facilities are required where:

- a) a class 6 building that is a shopping centre having an design occupancy of not less than 3,500 persons allowed and contains a minimum of 2 SOU's; or

- b) Class 9b sporting venue with a design occupancy of not less than 35,000 spectators or contains a swimming pool with a perimeter not less than 70m
- c) Museum, art gallery, theatre with a design occupancy of not less than 1,500 patrons
- d) A domestic or international airport terminal.

General requirements for the accessible adult change facility include:

- a) All required equipment and fixtures to be contained within the same room
- b) If it is to be a unisex facility, it must be located so that it can be entered without crossing an area reserved for one sex only.
- c) Room height of 2.4m minimum
- d) A hoist
- e) Toilet pan, seat, backrest, grab rails
- f) Washbasins and tap
- g) Fixture and fittings
- h) Change table
- i) Changing rails
- j) Automated entrance door
- k) Signage
- l) Operating instructions for hoist and change table
- m) Circulation spaces



13.10. 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.

13.11. Hearing Augmentation (BCA D3.7)

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

13.12. 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.

14. Appendix A - Reference Documentation

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

Title	Issue	Date
A00.01 - Title sheet, Location Plan & Drawing List	D	21.09.2021
A00.05 – Site Analysis	B	14.09.2021
A00.20 – Glar & Carparking Analysis	C	21.09.2021
A00.80 – Solar Study	C	21.09.2021
A02.01 – Proposed Site Plan	C	21.09.2021
A06.01 – Proposed Basement Floor Plan And Mezzanine Floor Plan	G	08.11.2021
A06.02 – Proposed Ground Floor Plan	G	08.11.2021
A06.03 – Proposed Roof Plan	C	21.09.2021
A06.04 – Proposed Childcare Plan	B	21.09.2021
A10.01 – North Elevation	C	21.09.2021
A10.02 – South Elevation	C	21.09.2021
A10.03 – East Elevation	C	21.09.2021
A10.04 – West Elevation	C	21.09.2021
A10.05 – Tigerhawk Drive Street View	C	21.09.2021
A10.09 – Elevation Childcare	B	21.09.2021
A11.01 – Section 1	B	21.09.2021
A11.02 – Section 2	C	21.09.2021
A11.03 – Section 3	B	14.09.2021

Title	Issue	Date
A11.04 – Sections Childcare	B	14.09.2021
A80.01 – 3D Visualization	C	21.09.2021
A80.02 – Perspective Sheet 1	C	21.09.2021
A80.03 – Perspective Sheet 2	C	21.09.2021

15. Appendix B - Fire Resistance Levels

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

Table 4 TYPE B CONSTRUCTION: FRL OF BUILDING ELEMENTS	Class of building—FRL: (in minutes)			
	<i>Structural adequacy/Integrity/Insulation</i>			
	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 <i>loadbearing</i> 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/ 30	120/ 90/ 60	180/120/ 90	240/180/120
3 to less than 9 m	90/ 30/ 30	120/ 30/ 30	180/ 90/ 60	240/ 90/ 60
9 to less than 18 m	90/ 30/–	120/ 30/–	180/ 60/–	240/ 60/–
18 m or more	–/–/–	–/–/–	–/–/–	–/–/–
For non- <i>loadbearing</i> parts—				
less than 1.5 m	–/ 90/ 90	–/120/120	–/180/180	–/240/240
1.5 to less than 3 m	–/ 60/ 30	–/ 90/ 60	–/120/ 90	–/180/120
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an <i>external wall</i> , where the distance from any <i>fire-source feature</i> 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—				
<i>Fire-resisting lift and stair shafts—</i>				
<i>Loadbearing</i>	90/ 90/ 90	120/120/120	180/120/120	240/120/120
<i>Fire-resisting stair shafts</i>				
<i>Non-loadbearing</i>	–/ 90/ 90	–/120/120	–/120/120	–/120/120
Bounding <i>public corridors</i> , public lobbies and the like—				
<i>Loadbearing</i>	60/ 60/ 60	120/–/–	180/–/–	240/–/–
<i>Non-loadbearing</i>	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding <i>sole-occupancy units—</i>				
<i>Loadbearing</i>	60/ 60/ 60	120/–/–	180/–/–	240/–/–
<i>Non-loadbearing</i>	–/ 60/ 60	–/–/–	–/–/–	–/–/–
OTHER LOADBEARING INTERNAL WALLS and COLUMNS—	60/–/–	120/–/–	180/–/–	240/–/–

ROOFS

-/-/-

-/-/-

-/-/-

-/-/-

Table 4.2
REQUIREMENTS FOR CARPARKS

 FRL (not less than) *Structural adequacy/Integrity/ Insulation*

ESA/M (not greater than)

Wall

(a)	<i>external wall</i>		
	(i)	less than 3 m from a <i>fire-source feature</i> to which it is exposed:	
		<i>Loadbearing</i>	60/60/60
		<i>Non-loadbearing</i>	-/60/60
	(ii)	3 m or more from a <i>fire-source feature</i> to which it is exposed	-/-/-
(b)	<i>internal wall</i>		
	(i)	<i>loadbearing</i> , other than one supporting only the roof (not used for carparking)	60/-/-
	(ii)	supporting only the roof (not used for carparking)	-/-/-
	(iii)	<i>non-loadbearing</i>	-/-/-
(c)	<i>fire wall</i>		
	(i)	from the direction used as a <i>carpark</i>	60/60/60
	(ii)	from the direction not used as a <i>carpark</i>	as required by Table 4

Column

(a)	supporting only the roof (not used for carparking) and 3 m or more from a <i>fire-source feature</i> to which it is exposed	-/-/-
(b)	steel column, other than one covered by (a)	60/-/- or 26 m ² /tonne
(c)	any other column not covered by (a) or (b)	60/-/-

Beam

(a)	less than 3 m from a <i>fire-source feature</i> :		
	(i)	steel floor beam in continuous contact with a concrete floor slab	60/-/- or 30 m ² /tonne
	(ii)	any other beam	60/-/-
(b)	3 m or more from a <i>fire-source feature</i>	-/-/-	

Lift shaft
Fire-resisting stair shaft (within the *carpark* only) 60/60/60
Roof, floor slab and vehicle ramp

-/-/-

Note: ESA/M means the ratio of exposed surface area to mass per unit length.