mckenzie group

A Bureau Veritas Group Company

BUILDING CODE OF AUSTRALIA REPORT

Revision: B SEPTEMBER 2019

Project Maui
GenesisCare Cancer Centre
49A Frenchs Forest Road, Frenchs Forest

Prepared for: Forest Central Business Park Pty Ltd

Document Disclaimer

This document has been prepared solely for the use of our client in accordance with our current professional standards and as per our agreement for providing compliance consulting services. Although all due care has been taken in the preparation of this document, no warranty is given, nor liability accepted (except that required by law) in relation to the information contained within this document.

This document represents the opinions of McKenzie Group Consulting based on the facts and matters known at the time of preparation of this document. Opinions, judgments and recommendations detailed in this document, which are based on our understanding and interpretation of current statutory and regulatory obligations and standards, should not be construed as legal opinions.

Table of Contents

Date	Rev No	No. of Pages	Issue or Description of Amendment	Assessed By	Approved By	Date Approved
27/08/19	A	37	Draft report issued for DA submission	Zoe Brown	Aaron Celarc	29/08/19
04/09/19	B	37	Report issued for DA submission	Zoe Brown	Aaron Celarc	29/08/19

Executive Summary

Development Overview

The proposed development is a new cancer care facility for GenesisCare. The proposed new building contains:

- 3 x basement car parking levels
- 4 x levels used for the purpose of Medical consulting suites, medical imagining, a radiation bunker, an oncology unit and associated uses.

Due to the different operations of each care unit, the building will contain Class 5 Medical consulting areas and Class 9a health care areas.

Compliance Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by Team 2 Architects (refer appendix A) for compliance with the Building Code of Australia 2019.

In this regard the following areas in particular require further review as the project develops:

No.	Items for review	Responsibility
1.	**Services** Please advise if there are any proposed alternative building solutions with regard to design of the building services for the project.	Services Consultants
2.	**BCA Spec C1.1 – Fire Resisting Construction** Please confirm the FRL achieved through-out the building	Architect / Structural Engineer
3.	**BCA Clause C1.9– Non-combustible elements** Fire Test reports to be provided for all external cladding and building attachments	Architect
4.	**BCA Clause C2.12 & C2.13 – Separation of equipment** Location of the equipment is to be identified and confirmation of FRL of 120/120/120 to be provided.	Fire Services Consultant / Architect
5.	**BCA Clause D1.6 Dimensions of exist and paths of travel to exits** The unobstructed with of each exit or path of travel to an exit must not be less than 1.0m. The roof level currently contains paths of travel less than 1.0m. Design amendments required to comply	Architect
6.	**BCA Clause D2.14 – Stair landings** Landings of stairs are to be increased to accommodate the movement of the stretcher.	Architect
7.	**BCA Clause D2.13 – D3.17 Stair, barrier and handrail construction** Stair details, including goings and risers, barrier details and handrail details to be provided for further assessment. Review of the number of midlands is to be reviewed in the northern stair to ensure compliance is met.	Architect
8.	**BCA Clause D3.2 – Access to buildings** Accessible pathway to the building be shown on the plans	Architect

9.	**BCA Clause E1.3 & E1.4 - Hydrants and Hose Reels** Hydrant and Hose Reel coverage plans are to be provided to enable further assessment	Fire Services Consultant
10	**BCA Clause E1.3 - Hydrants** Hydrant booster location and pump room to be provided to enable further assessment	Fire Services Consultant / Architect
11	**BCA Clause F2.3 Sanitary Facilities** Number and layout of sanitary facilities proposed to be indicated on the plans	Architect
12.	**BCA Clause F2.3 – Sanitary facilities** Additional facilities to be provided to the class 9a level including: - Kitchen; - Laundry facilities - Shower for every 8 patients - Plunge bath	Architect

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

No.	Alternative Solution Description	DTS Clause	Performance Requirement
Fire Safety Items			
1.	**Travel Distances** The following areas exceed the maximum allowable travel distance and are to be addressed by the Fire engineer as part of the performance solution: Level 1 (Class 9a): • 17m in lieu of 12m to a point of choice • 40m in lieu of 30m to an exit Roof: • 37m to an exit in lieu of 20m	D1.4	DP4 EP2.2
2.	**Distance between alternative exits** Exits must be located so that alternative paths of travel do not converge such that they become less than 6.0m apart The Level 1 corridors are 5.6m apart and therefore do not comply.	D1.5	DP4 EP2.2
3.	**Travel via Fire Isolated Stairs** The discharge of fire stair 1, and 2 require travel along the building to reach the road or open space. As such, treatment of the external wall which they pass within 6m of, require treatment. The rationalisation of that treatment may form part of the fire engineered solution.	D1.7, C3.4	DP4 EP2.2

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

The 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.

1.0 Introduction

The proposed development comprises of a new cancer care facility for GenesisCare. The proposed new building contains:

- 3 x basement car parking levels
- 4 x levels used for the purpose of Medical consulting suites, medical imagining, a radiation bunker, an oncology unit and associated uses.

The site is located within Forest Central Business Park and is identified as Building 9. It is accessed via a private road to the north-west corner of the site and the southern boundary adjoins Warringah Road.

Source : Six Maps

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.

1.1 Current Legislation

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

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

2.0 PRELIMINARIES

2.1 Building Assessment Data

Summary of Construction Determination: -

Part of Project	Genesis Care
Classification	5, 7a, 9a
Number of Storeys	7
Rise In Storeys	Ground – L3 4 storeys
Type of Construction	Type A
Effective Height (m)	13.2m RL 172 950 – RL 159 750

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

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Approximate Volume (m^3)	Assumed Population
Basement Level 3	7a	845	2,280	-
Basement Level 2	7a	845	2,280	-
Basement Level 1	7a	845	2,958	-
Ground	5	555	2,220	29 (incl. 15 Staff)
Level 1	9a	535	2,568	11 (incl. 5 Staff)
Level 2	5	535	1,872	32 (incl. 9 Staff)
Level 3	5	535	2,005	13 (incl. 3 Staff)
Roof	5	84	200	-
TOTAL	**5, 7a, 9a**	**4,695**	**16,383**	**85**

Notes:
1. The above populations have been provided by the client
2. The car park areas have been considered ancillary to the use for the purposes of population numbers

2.2 Structural Provisions (BCA B1)

Any new structural works are to comply with the applicable requirements of AS/NZS 1170.1.

Glazing is to comply with AS1288, and AS2047.

Prior to the issue of the Construction Certificate structural certification is required to be provided, including determination of the importance level of the development.

This is to include assessment against the provisions of BCA Clause B1.6 – Construction of Buildings in Flood Areas

2.3 Development Approval

A Development Approval will be required from the Local Authority for the development. A copy of the Development Permit conditions and approved drawings will be required prior to the issuing of the Building Approval for that component of works.

The proposed development must not be inconsistent with the endorsed drawings and all relevant conditions will need to be satisfied and accurately reflect the construction issue drawings.

Once the Development has been approved by Council, McKenzie Group will undertake a review and advise of which conditions of consent are to be satisfied prior to the issuance of the Construction Certificate

2.4 Copy of Certificate of Title:

A copy of the current Certificate of Title and Registered Plan / Plan of Subdivision is required. Where it is proposed to construct any part of the building work within an easement, the consent of the relevant authority and /or Council is required prior to the issue of the Construction Certificate.

3.0 FIRE PROTECTION

3.1 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, the building is required to be Type A Construction in accordance with Table 3 & 3.9 of Specification C1.1 of the Building Code of Australia 2019.

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

- Fire compartmentation of the building at each floor level,

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

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

The building is within the limitations of Table C2.2.

3.2 Class 9a Fire and Smoke Compartmentation Provisions (BCA C2.5)

In addition to the above general fire compartmentation requirements, the BCA also contains additional prescriptive fire and smoke compartmentation provisions for Class 9a patient care areas. The deemed to satisfy requirements are as follows:

Patient Care Areas (including wards and treatment areas):-

a) Are to have fire compartments no greater than 2000m2,, separated from the remainder of the building by construction achieving an FRL of 120/120/120.
b) Ward areas:-
   (i) fire compartments of 1000m^2 separated by construction achieving an FRL of 60/60/60, and
   (ii) smoke compartments no greater than 500m^2 are to be provided, smoke walls are to achieve compliance with Specification C2.5 of the BCA.
   (iii) where the floor area of a is not greater than 500m^2, the ward area is to be smoke separated from the remainder of the patient care area by smoke wall achieving compliance with Specification C2.5 of the BCA.
c) Treatment areas
   (i) fire compartments of 1000m^2 separated by construction achieving an FRL of 60/60/60, and
   (ii) where the floor area of a is not greater than 1000m^2, the treatment area is to be smoke separated from the remainder of the patient care area by smoke wall achieving compliance with Specification C2.5 of the BCA.

Ancillary Areas:-

a) Are to be separated from the remainder of the building by construction achieving an FRL of 60/60/60. Ancillary areas include:-
   - Areas containing high potential fire hazard equipment and materials;
   - Kitchens greater than 30m^2;
   - Pressure chambers;
   - Medical records storage greater an 10m^2;
   - Laundry with gas dryer or other high potential fire hazard equipment

3.3 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 A Construction, Please refer to Appendix C which outlines the required fire rating to be achieved by the development. These fire ratings are summarised below:-

Building Element		5, 7a & 9a
External Walls > 3.0m from fire source	Loadbearing Non-Loadbearing	120/60/30 --/--/--
External Columns	Loadbearing Non-loadbearing	120/--/-- --/--/--
Fire Walls	Loadbearing	120/120/120
Fire Stair / Shaft Walls	Loadbearing Non-loadbearing	120/120/120 --/120/120
Service Shaft Walls	Loadbearing Non-loadbearing	120/90/90 --/90/90
Floors		120/120/120
Loadbearing internal Walls, Beams, trusses and columns		120/--/--
Roof		120/60/30

Other passive fire protection issues that will need to be addressed in detailed documentation phase include:
- Lift Motor Rooms,
- Emergency Power Supply,
- Emergency Generators,
- Electricity Supply,
- Hydrant Pump Rooms,
- Sprinkler Pump Rooms,

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

3.4 Fire Hazard Properties (BCA C1.10 and BCA C1.12)

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 Building Code of Australia. The following requirements apply:

Sprinkler Protected Areas

a) Floor Coverings – Critical radiant Flux not less than (insert) kW/m2
b) Wall and Ceiling Linings – Material Group No. (insert)
c) Other Materials – Spread of Flame Index not exceeding (insert) and Smoke Developed Index not exceeding (insert)

Non-Sprinkler Protected Areas

a) Floor Coverings – Critical radiant Flux not less than (insert) a maximum smoke development rate of 750 percent-minutes
b) Wall and Ceiling Linings – Material Group No. (insert) 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

As the building is of Type A construction the external walls, including any external and internal claddings & linings must be non-combustible as determined by AS1530.1. 1994.

The following materials may be used wherever a non-combustible material is required:

a) Plasterboard.
b) Perforated gypsum lath with a normal paper finish.
c) Fibrous-plaster sheet.
d) Fibre-reinforced cement sheeting.
e) Pre-finished metal sheeting having a combustible surface finish not exceeding 1 mm thickness and where the Spread-of-Flame Index of the product is not greater than 0.
f) Bonded laminated materials where—
    i. each lamina, including any core, is non-combustible; and
    ii. each adhesive layer does not exceed 1 mm in thickness and the total thickness of the adhesive layers does not exceed 2mm; and
    iii. 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.

The BCA does nominate that ancillary elements may 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.

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

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

A building of Type A construction must be provided with spandrel separation between opening on different storeys unless the building is sprinkler protected throughout.

The building is proposed to be sprinkler protected and therefore spandrels are not requried

3.6 Protection of Openings in External Walls (BCA C3.2)

The prescriptive provisions of the BCA stipulate that any external opening within 3m of the fire source feature 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.

3.7 Protection of Openings in 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 of --/120/60;

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 of --/120/60 (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.

4.0 EGRESS PROVISIONS

4.1 Provisions for Escape (BCA D1)

The egress provisions from the proposed building are provided by:

- Fire isolated stairways
- External perimeter doorways

Other detailing issues that will need to be addressed include:

- Door Hardware
- Exit door operation
- Stair construction
- Handrail and balustrade construction
- Details of Separation of rising & descending stairs
- Discharge from the Fire Isolated Exits
- Details of the egress provisions to the Road.

4.2 Travel via Fire Isolated Exits (BCA D1.7)

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.

Fire Stair Re-Entry

The doors of a fire isolated exit must not be locked from the inside so as to allow provision for fire stair re-entry in Class 9a buildings or parts.

The requirement for doors to remain unlocked do not apply to a door fitted with a failsafe 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

The discharge of fire stair 1, and 2 require travel along the building to reach the road or open space. As such, treatment of the external wall which they pass within 6m of, require treatment. The rationalisation of that treatment may form part of the fire engineered solution.

4.3 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 & 7a
- 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 9a
- No point on the floor to be more than 12m from a point of choice
- Maximum distance of travel of 30m
- Alternative exits not more than 45m apart

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

Level 1 (Class 9a):
- 17m in lieu of 12m to a point of choice
- 40m in lieu of 30m to an exit

Roof:
- 37m to an exit in lieu of 20m

Separation of exits does not fully comply in the following areas:
- The Level 1 corridors are 5.6m apart and therefore do not comply.

4.4 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 in which case a 600mm clear width is required).

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

Storey	Number of People	Exit Width Required	Exit Width Provided	Number of people provided for with exit width
Basement Levels	-	-	2.1m	200
Ground Floor	29	1.0m	2.65m	260
Level 1	11	1.0m	2.2m	200
Level 2	32	1.0m	2.2m	200
Level 3	13	1.0m	2.2m	200

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).

4.5 Balustrading and Handrails (BCA D2.16 and BCA D2.17)

Generally

Balustrading to a height of 1000mm with a maximum opening of 125mm in any direction should be provided adjacent to balconies, landings, corridors etc where located adjacent to a change in level exceeding 1000mm.

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.

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

4.6 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 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*

5.0 ACCESS FOR PEOPLE WITH DISABILITIES

5.1 General Building Access Requirements (BCA D3.1)

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

- AS1428.1-2009 General Requirements for Access – New Building Work;
- AS1428.4-2009 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:-

- To and within all areas normally used by the occupants
- To and within any car parking level containing accessible car parking spaces.

5.2 Provision for Access to Buildings

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

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

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

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

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

5.3 Provisions for Access within Buildings (BCA D3.3)

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

Within the building the following are required;

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

The 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.

5.4 Car parking (BCA D3.5)

Accessible car parking spaces are required to comply with AS 2890.6-2009 at the rate of 1 space for every 50

The development is proposed to contain 58 car parking spaces which requires a minimum 2 accessible spaces.

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

5.5 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.

Exemptions apply in aged care facilities to include a down button to handrails in lieu of tactile indicators.

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

Stairs shall be constructed as follows:

a) Where the intersection is at the property boundary, the stair shall be set back by a minimum of 900mm so that the handrail TGSIs do not protrude into the transverse path of travel.
b) Where the intersection is at an internal corridor, the stair shall be set back in 300mm, so the handrails do not protrude into transverse path of travel.
c) Stairs shall have opaque risers.
d) Stair nosing shall not project beyond the face of the riser and the riser may be vertical or have a splay backwards up to a maximum 25mm.
e) Stair nosing profiles shall-
    - Have a sharp intersection;
    - Be rounded up to 5mm radius; or
    - Be chamfered up to 5mm x 5mm
f) All stairs, 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.

5.7 Provisions for 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 towels and as per following.

Building Type	Minimum accessible unisex sanitary compartments to be provided
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 AS1428.1-2009

5.8 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

5.9 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.

6.0 FIRE 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.

6.1 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, please provide pressure and flow calculations for review.

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;

- Feed hydrants (within 20m of hard stand for pumping appliance), 150 kPa
- Attack hydrant (within 50m of hard stand) 250 kPa
- Hydrants on a pump station, 700 kPa

Where a booster is required, it is 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 and within sight of the main entry of the building within 20m of a hardstand area.

A fire ring main is not required.

The fire pump location is to be indicated on the plans to enable further assessment

6.2 Fire Hose Reels (BCA E1.4)

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. Where required, additional fire hose reels shall be located internally as required to provide coverage.

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

6.3 Fire Extinguishers (BCA E1.6)

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

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).

Occupancy Class	Risk Class (as defined in AS 2444)
	(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.
Specific provisions (in addition to general provisions) – (a) Class 9a health care building (b)	To cover class A and E fire risks. (Note 2)

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

The fire extinguisher locations curare to be indicate on the plans for further assessment.

6.4 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 Class 7a car park (other than open deck car parks) containing accommodation for more than 40 vehicles;
- In a Class 9a health care building having a rise in storeys or more than 2 and not more than 25m effective height is required to have:
  (i) a zone pressurisation system between vertifically separated fire compartments in accordance with AS 1668.1; or
  (ii) a sprinkler system complying with Specification E1.5 throughout with residential sprinkler heads in patient care areas.

It has been indicated that sprinklers are proposed in lieu of zone pressurisation.

Location of pumps, tanks, FIP, control valves and booster assemblies will be subject to review.

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

6.5 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 AS2293.1-2018

Details are required to be provided for review.

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

A Sound System and Intercom System is required in accordance with AS1670.4-2015 and BCA Clause E4.9

Details are to be provided for our review.

6.7 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;

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.

6.8 Lift Services (BCA E3.42 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, 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: -
    - A handrail in accordance with AS 1735.12;
    - Minimum internal floor dimensions as specified in Table E3.6b of the BCA i.e. 1,400mm x 1,600mm;
    - Minimum clear door opening complying with AS 1735.12;
    - Passenger protection system complying with AS 1735.12;
    - Have a set of buttons for operating the lift located at heights above level complying with AS 1735.12;
    - Lighting in accordance with AS 1735.12;
    - Automatic audible information within the lift car to identify the level each time the car stops; and
    - Audible and visual indication at each lift landing to indicate the arrival of the lift car.

6.9 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.

7.0 HEALTH AND AMENITY

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

The sanitary & other facilities within the development would generally consist of: -

Sanitary Facilities Required				
Level		**WC**	**Urinals**	**Basins**
Ground Level 15 staff	Male	1	0	1
	Female	1	-	1
	Accessible	1	-	1
Level 1 5 staff	Male		1 unisex facility	
	Female			
	Accessible	1	-	1
Level 1 6 patients	Male	1	-	1
	Female	1	-	1
Level 2 9 staff	Male		1 unisex facility	
	Female			
	Accessible	1	-	1
Level 3 3 staff	Male		1 unisex facility	
	Female			
	Accessible	1	-	1

Note:
1. 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.

7.2 Floor Wastes (BCA F1.11)

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

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

Floor wastes are not indicated.

7.3 Light and Ventilation (BCA Part F4)

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. The architect is to provide calculations to verify compliance is achieved.

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

(Class 9a) 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) in a patient care area or other room used for sleeping purposes in a Class 9a building — 3 m; and
iii) 50% of the square root of the exterior height of the wall in which the window is located, measured in metres from its sill.

7.4 Weatherproofing of External Walls (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.

8.0 ENERGY EFFICIENCY

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

1. The building can comply with the deemed-to-satisfy provisions of the BCA, relating to the following areas:

    - Building Fabric
    - Glazing
    - Building Sealing
    - Air Conditioning & Ventilation Systems
    - Artificial Lighting & Power
    - Hot Water Supply

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

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

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

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

Due to special nature of the building some energy provisions may not be appropriate.

8.1 Roof and Ceiling Construction

Roofs and or Ceilings are to be constructed to provide an R rating of 3.2.

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 be provided as follows:

Percentage of ceiling are uninsulated	**Minimum *R-Value* of ceiling insulation required to satisfy J1.3(a)**							
	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
	Adjusted minimum *R-Value* of ceiling insulation required to compensate for loss of ceiling area insulation							
0.5% to less than 1.0%	2.8	3.4	*4.0*	*4.7*	*5.4*	*6.2*	*6.9*	
1.0% to less than 1.5%	2.9	3.6	*4.4*	*5.2*	*6.1*	*7.0*		
1.5% to less than 2.0%	3.1	3.9	*4.8*	*5.8*	*6.8*			
2.0% to less than 2.5%	3.3	4.2	*5.3*	*6.5*				
2.5% to less than 3.0%	3.6	4.6	*5.9*			**Not permitted**		
3.0% to less than 4.0%	4.5	5.7						
4.0% to less than 5.0%	5.0							
5.0% or more								

Where roof lights are installed, we will require the size of roof lights and the depth of the shaft to work out the roof light shaft index and extent of glazing as per the table below which would dictate the glazing to be used.

Roof light shaft index (see Note 1)	Constant	Total area of roof lights serving the room or space as a percentage of the floor area of the room or space			
		Up to 2%	More than 2% and up to 3%	More than 3% and up to 4%	More than 4% and up to 5%
Less than 0.5	SHGC	Not more than 0.83	Not more than 0.57	Not more than 0.43	Not more than 0.34
	Total U-Value	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4
0.5 to less than 1.0	SHGC	Not more than 0.83	Not more than 0.72	Not more than 0.54	Not more than 0.43
	Total U-Value	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4
1.0 to less than 2.5	SHGC	Not more than 0.83	Not more than 0.83	Not more than 0.69	Not more than 0.55
	Total U-Value	Not more than8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4
2.5 or more	SHGC	Not more than 0.83	Not more than 0.83	Not more than 0.83	Not more than 0.83
	Total U-Value	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4

8.2 External Walls

External Walls are to be constructed to provide the following:

(a) (i) Achieve a minimum Total R-Value of 1.4
(ii) The minimum total R-Value in (i) is reduced
(A) For a wall with a surface density of not less than 220 kg/m^2, by 0.5; and
(B) For a wall that is –
(aa) Facing the south orientation by 0.5; or
(bb) Shaded with a projection shade angle in accordance of
(AA) 30 degrees to not more than 60 degrees, by 0.5; or
(BB) More than 60 degrees, by 1.0

(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like –
(i) Achieve a minimum Total R-Value of 1.4; and
(ii) Satisfy glazing energy index increase in glazing performance

8.3 Floors

Floors are to achieve an R rating of 2.0.

8.4 Glazing

This section relates to the conductance and solar heat gain of the windows, taking into consideration of the type of window frame, orientation and whether there are overhangs / shadings.

A glazing calculator will be required to be undertaken and results provided for assessment.

8.5 Building Sealing

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.

Miscellaneous exhaust fans must be fitted with a sealing device such as a self-closing damper.

An evaporative cooler must be fitted with a self-closing damper.

8.6 Air Conditioning

- Be capable of being inactivated in each Sole Occupancy Unit.
- Where motorised dampers, be close when system is inactivated
- Have any supply and return ductwork installed
  - Heating or Cooling only R1.0
  - Heating and Cooling R1.5
  - Where ductwork is conveying cold air, a vapour barrier must be installed on the outside of the insulation.

When an air conditioning system provides mechanical ventilation as well and the capacity exceeds 35 kwr (in climate zone 4-8), the system must be equipped with an outdoor air economy cycle.

Air Flow Rate:

When the air flow rate exceeds 1000L/s, it must be designed so the total motor shaft powers of the fans do not exceed the following;

Air-conditioning sensible heat load (W/m^2 of the floor area of the conditioned space)	Maximum fan power (W/m^2 of the floor area of the conditioned space)	
	For an air-conditioning system serving not more than $500m^2$	For an air-conditioning system serving more than $500m^2$
Up to 100	4.1	6.4
101 to 150	7.3	10.4
151 to 200	10.5	14.1
201 to 300	17.1	21.5
-301 to 400	23.6	28.4

Requirements do not apply to packaged Air Conditioned Units, exhaust systems, high efficiency air filters, or energy reclaim systems.

Mechanical:

- Be capable of being inactivated.
- When serving a conditioned space, not provide ventilation in excess of 20% of the rate of required (as determined) other than to;
  (i) Balance the required ventilation, due to exhaust ventilation
  (ii) Part of an exhaust system in a health care building
  (iii) As free cooling, with air conditioner switched off i.e. when external temperature is less than indoor temperature.

Air Flow Rate in Excess of 1000 L/S

- Comply with the fan to motor shaft power to air flow ratio.
  (i) an energy reclaim system that preconditions outside air or L/s without filters;
  (ii) the ability to modulate the system in pursuant to the number of occupants in lieu of the maximum or 0.75 L/s where filters are installed.

Car Park Ventilation

- when serving more than 40 cars in a car park;
  (i) be controlled by an atmospheric containment maintaining system or;
  (ii) maintain an average air change rate of 0.5 air changes per hour, other than when car park is not occupied for more than 2.0 hours.

Air Conditioned Packaged Units

- Must have an energy efficiency ratio of (Watts);
  - 65 kWr to 95 kWr 2.7
  - 95 kWr to more 2.8

Heating and Cooling systems

Systems that provide heating or cooling for mechanical or air conditioning systems must –

(i) Have any *piping*, vessels, heat exchangers or tanks containing heated or chilled fluid, other than those with insulation levels covered by Minimum Energy Performance Standards (MEPS) must be insulated in accordance with Specification J5.4
(ii) Where water is circulated by pumping at greater than 2 L/s

Be designed in accordance to the following table:

Maximum Pump Power

Cooling or heating load (W/m^2 of the *floor area* of the *conditioned space*)	**Maximum *pump power* (W/m^2 of the floor area of the *conditioned space*)**		
	Chilled water	**Condenser water**	**Heating water**
Up to 100	1.3	0.9	1.0
101 to 150	1.9	1.2	1.3
151 to 200	2.2	2.2	1.7
201 to 300	4.3	3.0	2.5
301 to 400	5.0	3.6	3.2
More than 400	5.6	5.6	3.6

- have the pump capable of varying its speed in response to varying load when it is rated at more than 3kW of pump power, except where the pump is needed to run at full speed for safe or efficient operation; and
- if the system contains more than one water heater used for heating a building, chiller or coil, be capable of stopping the flow of water to those not operating.

Heaters

Boilers used to heat space via water must be:-

a) In accordance with the following table and
b) Where reticulated gas is available at the allotment boundary

Minimum Thermal Efficiency of a water heater

Fuel Type	Rated capacity ($kW_{heating}$)	Minimum gross thermal efficiency (%)
Gas	Not more than 750	80
	More than 750	83
Oil	All capacities	80

For heating a space other than via water, must be –

- A solar heater; or
- A gas heater; or
- An oil heater if reticulated gas is not available at the allotment boundary; or
- A heat pump heater; or
- A solid-fuel burning heater; or
- A heater using reclaimed heat from another process such as reject heat from refrigeration plant; or
- A combination of 2 or more of the above.

Where a fixed space heating appliance is installed outdoors (such as wall mount heaters), it must be controlled to automatically turn off when not needed by an outdoor air temperature sensor, timer, motion detector, or the like.

Refrigerant chillers

A refrigerant chiller up to 350 kWr capacity that is part of an air-conditioning system, must have an energy efficiency ratio as per:

Equipment	Minimum energy efficiency ratio ($W_r/W_{input\ power}$)	
	For full load operation	For integrated part load
Water cooled chiller	4.2	5.2
Air cooled or evaporative cooled chiller	2.5	3.4

Air Condensers

The fan motor of an air cooled condenser that is part of an air-conditioning system, other than one that is part of package air-conditioning equipment in or part of a Liquid Chilling Package, must not use more than 42 W of fan power, for each kW of heat rejected from the refrigerant.

Cooling Towers

The fan of a cooling tower that is part of an air-conditioning system must not use more than-

- If a propeller or axial fan, 310 W of fan power for each L/s of cooling water circulated.
- If a centrifugal fan, 590 W of fan power for each L/s of cooling water circulated.

Closed Circuit coolers

The fan of a closed circuit cooler that is part of an air-conditioning system must not sue more than-
i) If a propeller or axial fan, 500 W of fan power for each L/s of cooled fluid circulated; and
ii) If a centrifugal fan, 670 W of *fan power* for each L/s of cooled fluid circulated.

Evaporative condenser

The fan of an evaporative condenser that is part of an air-conditioning system must not use more than-

- If a propeller or axial fan, 18 W of fan power for each kW of heat rejected; and
- If a centrifugal fan, 22 W of fan power for each kW of heat rejected.

Water pumps

The spray water pump of a closed circuit cooler or evaporative condenser that is part of an air-conditioning system must not use more than 150 W of pump power for each L/s of spray water circulated.

Time Switch

Time switch must be provided to control each of the following;
(i) Air Conditioning system of more than 10 Kw
(ii) Ventilation system with an air flow rate of 1000 L/S
(iii) Heating system of more than 10 Kw heating.

8.7 Interior Artificial Lighting

The maximum design illumination load is not to exceed;

Consulting	9W/m2	Retail	22W/m2	Lobbies	W/m2
Patient care	13W/m2	Car parks	6W/m2	Auditoriums	10W/m2

Artificial Lighting must be controlled by a time switch, occupant sensor or a security swipe pass system.

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

- 250m2 for a space of not more than 2000m2
- 1000m2 for a space of more than 2000m2

Artificial lighting around the lighting. If it exceeds a total of 100W must;

- Be controlled by a day light sensor or time switch and
- Be controlled by motion detection or have an average light source efficiency of not less than 60 Watts / Lumens.

8.8 Access for Maintenance

Access if to be provided to all plant, equipment and components associated with the provision of the above energy requirements i.e.

- Adjustable or monitored shading devices
- Time switches and motion detectors
- Room temperature thermostats
- Plant thermostats such as boilers or refrigeration units
- Motorised air dampers and central valves
- Reflectors, Lenses and Diffusers of light fittings
- Heat transfer equipment

Appendix A - Design Documentation

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

Drawing No.	Title	Date	Rev
DA-000	COVER SHEET	23.08.19	1
DA-010	SITE PLAN – EXISTING	23.08.19	1
DA-011	SITE PLAN – PROPOSED	23.08.19	1
DA-015	SURVEY PLAN	23.08.19	1
DA-050	ROOF PLAN	23.08.19	1
DA-100	FLOOR PLAN – BASEMENT 3	23.08.19	1
DA-101	FLOOR PLAN – BASEMENT 2	23.08.19	1
DA-102	FLOOR PLAN – BASEMENT 1	23.08.19	1
DA-103	FLOOR PLAN – GROUND	23.08.19	1
DA-104	FLOOR PLAN – LEVEL 1	23.08.19	1
DA-105	FLOOR PLAN –LEVEL 2	23.08.19	1
DA-106	FLOOR PLAN –LEVEL 3	23.08.19	1
DA-200	ELEVATIONS - SHEET 1	23.08.19	1
DA-201	ELEVATIONS – SHEET 2	23.08.19	1

Appendix B - Draft Fire Safety Schedule

No.	Measure	Particulars of Measure *(including where the requirement for the measure is set out or described i.e. in building plans or in a performance solution report)*
1.	Automatic Fail Safe Devices	BCA 2019 Clause D2.19 & D2.21
2.	Automatic Fire Detection and Alarm System	BCA 2019 Spec. E2.2a & AS 1670.1 – 2015, AS/NZS 1668.1 - 2015
3.	Automatic Fire Suppression System (sprinklers)	BCA 2019 Spec. E1.5 & AS 2118.1 – 2017,
4.	Emergency Lifts	BCA 2019 Clause E3.4 & AS 1735.2 – 2001
5.	Emergency Lighting	BCA 2019 Clause E4.2, E4.4 & AS/NZS 2293.1 – 2018
6.	EWIS (Sound Systems and Intercom Systems for Emergency Purpose)	BCA 2019 Clause E4.9 & AS 1670.4 - 2018 & AS 4428.4-2004
7.	Exit Signs	BCA 2019 Clauses E4.5, NSW E4.6 & E4.8 and AS/NZS 2293.1 – 2018 Amdt 1 & 2
8.	Fire Doors	BCA 2019 Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8, Spec C3.4 and AS 1905.1 – 2015
9.	Fire Hose Reel Systems	BCA 2019 Clause E1.4 & AS 2441 – 2005 Amdt 1
10.	Fire Hydrant Systems	BCA 2019 Clause E1.3 & AS 2419.1 – 2005 Amdt 1
11.	Fire Seals protecting fire resisting components of the building	BCA 2019 Clause C3.12, C3.15, C3.16 & AS 1530.4 – 2014
12.	Mechanical Air Handling System Automatic Shut-down system	BCA 2019 Clause E2.2, AS/NZS 1668.1 – 2015
13.	Portable Fire Extinguishers	BCA 2019 Clause E1.6 & AS 2444 – 2001
14.	Warning and Operational Signs	EP&A Reg 2000 Clause 183, BCA Clause C3.6, D2.23, E3.3 & H101.8
15.	Emergency Evacuation Plan	AS 3745 – 2002 Fire Engineering Report
16.	Fire Collars protecting fire resisting components of the building	BCA 2019 Clause C3.12, C3.15, C3.16 & AS 1530.4 – 2014
17.	Paths of Travel	EP&A Reg 2000 Clause 183, 184, 184 & 186 Fire Engineering Report

Appendix C- Fire Resistance Levels

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

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	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

Building element	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.