VIC LILLI
&PARTNERS CONSULTING

BUILDING CODE OF AUSTRALIA 2016
ASSESSMENT REPORT

PREPARED FOR
Mr Owen Walsh
Sydney Business Park
920 Richmond Road
MARSDEN PARK NSW 2765

FINAL REPORT

PREMISES

4 Darling Street
MARSDEN PARK NSW 2765

Reference: J180018

Date: 22 March 2018

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1.0- Introduction

1.1 Introduction

The following BCA compliance assessment report has been prepared at the request of Mr Owen Walsh from Sydney Business Park for the purpose of the proposed development on 4 Darling Street, Marsden Park. The purpose of this report is to assess the documentation as provided (and referenced) within this report against the 'deemed-to-satisfy' provisions of the Building Code of Australia 2016 (BCA) including any NSW variations and adopted standards.

The proposed development involves the construction of a warehouse and storage complex with an associated two (2) storey commercial building. A detached showroom/retail building will also be provided on the development.

This report will provide the consent authority with a BCA analysis to assist in the determination of the application.

Prepared by:

Roland Allam
VIC LILLI & PARTNERS **Date:** 22 March 2018

1.1 – Revision Control

Revision No.	Issue Date	Report Details	
R1.1	7.02.2018	Description:	Draft BCA Assessment
		Prepared by:	Roland Allam
R1.2	13.03.2018	Description:	Final BCA Assessment Report
		Prepared by:	Roland Allam
R1.3	22.03.2018	Description:	Final Amendment
		Prepared by:	Roland Allam

2.0 – Building Description

2.1 - Building Description

Use/Classification	Class 5 – Office Class 6 – Retail/Showroom Class 7b – Storage Class 8 – Warehouse
Type of Construction	Type C Construction
Floor Area/Volume limitations	The floor area and volume limitations for the building which comprises of warehouse, storage and office components exceed the limitations of Table C2.2 and is therefore considered a large isolated building in accordance with Clause C2.3 of the BCA. The floor area and volume limitations for the Class 6 showroom & retail building are within the prescribed limitations of Table C2.2.
Populations	By way of application of clause D1.13 of the BCA, it is considered that the following populations are likely to the building: Class 5 Office if populated by BCA Clause D1.13 will be 10m² per person Class 6 Showroom if populated by BCA Clause D1.13 will be 5m² per person Class 7b & 8 components if populated by BCA Clause D1.13 will be 30m² per person
Effective Height	The building will have an effective height less than 12m (measured approximately 3.8m)
Climate zone	For the purpose of Section J the climate zone is 6

2.2 – Drawings & Information

This report is prepared on the assessment of architectural drawings provided by:

Reid Campbell Architects

Job No.	Drawing No.	Issue	Date	Drawing
	118101_A001	C	07.03.18	Cover Sheet / Drawing List
	118101_A002	C	07.03.18	Site Analysis
	118101_A003	B	07.03.18	Signage Strategy Plan
	118101_A100	J	07.03.18	Site Plan
	118101_A200	E	07.03.18	Warehouse Floor Plan
	118101_A201	E	07.03.18	Office Floor Plans
	118101_A202	F	07.03.18	Showroom Floor Plan
	118101_A203	C	07.03.18	Roof Plan
	118101_A300	D	07.03.18	Warehouse Elevations
	118101_A301	C	07.03.18	Office Elevations
	118101_A302	C	07.03.18	Showroom Elevations
	118101_A400	B	07.03.18	Sections
	118101_A900	A	07.03.18	Office Perspectives
	118101_A901	A	07.03.18	Showroom Prespectives

3.0- Building Code of Australia Assessment

3.1 – Structure (Section B, BCA)

Clause	BCA Matter	Comment
B1.1 B1.2 B1.4 B1.5 B1.6	Structural Provisions The development is to be designed so the structure will re-sist loads determined: • AS 1170.0/1/2–2002, • AS 1170.3 – 2011, AS 1170.4 – 200 • AS 2159-2009 - Piling — Design and installation • AS 2870-1996, AS 2890-2011 - Residential slabs and footings — Construction • AS 3700-2011 - Masonry structures • AS 4100-1998 - Steel structures • AS/NZS 4600-2005 - Cold-formed steel structures.	Structural engineer's certification is to be provided confirming that their design meets all the relevant provisions of the BCA as well as all relevant structural standards. All such certification is to be relevant to the Importance Levels and Design Events specified under this section of the BCA 2016.

3.2 – Fire Resistance (Section C, BCA)

3.2.1 – Fire Resistance and Stability (Part C1, BCA)

Clause	Item	Comment
C1.1	Type of Construction	All building elements are required to be constructed in Type C construction
C1.2	Rise in Storeys	The main building has a rise in storeys of two (2). The retail/showroom building has a rise in storeys of one (1).
C1.3	Buildings of Multiple classifications	Noted.
C1.4	Mixed Type of Construction	The building is proposed to be of Type C Construction.
C1.5	Two Storey Class 2, 3 and 9c Buildings	Not applicable to this building
C1.6	Class 4 Parts of Buildings	Not applicable to this building
C1.7	Open spectator stands and indoor sports stadiums	Not applicable to this building
C1.8	Lightweight fire rated construction to walls and columns Walls are to be constructed in accordance with Spec C1.8 of BCA 2016 and the manufacturer's specifications. Columns are to be constructed in accordance with the manufacturer's specifications and the gap between the column and protective board filled to a height not less than 1.2m	Where proposing to use lightweight fire rated materials compliance with this part and also the specific manufacturers installation requirements are to be complied with C1.8 of the BCA 2016 The exact systems proposed are to be detailed on the plans, including cross sections and penetration requirements. Their installation is to be strictly in accordance with the manufactures specifications.

Clause	Item	Comment
C1.10	Fire Hazard Properties All floor, wall and ceiling linings are to have fire hazard properties in accordance with Specification C1.10 of the BCA 2016– these relate to minimum 'critical radiant flux' not the traditional indices. Floors not < 1.2 Sprinkler protected areas not <2.2 Fire Isolated exits not <2.2 Lift cars Floor materials in areas with no sprinkler protection are to also have a maximum smoke development rate of 750 percent-minutes Wall and ceiling lining materials are to have the following 'group number' as determined under AS ISO 9705 Location — Group No Fire isolated exits — 1 Public Corridors — 1, 2, 3 (walls with sprinklers); 1, 2, 3 (ceilings with sprinklers) Specific Areas — 1, 2, 3 (walls with sprinklers); 1, 2, 3 (ceilings with sprinklers) Other Areas — 1, 2, 3 (walls with sprinklers); 1, 2, 3 (ceilings with sprinklers) Lift cars — 1, 2 (walls and ceilings) Air handling duct work is to comply with AS4254.	Note that any material specified for Construction Certificate is to have been suitably tested for their 'critical radiant heat flux' and 'group numbers' as defined. Note that some exemptions are applicable subject to the Prescriptive Requirements within Clause C1.10 of BCA 2016.

Clause	Item	Comment
C1.11	<u>Performance of external walls in fire</u> Concrete external walls that could collapse as complete panels (e.g. tilt-up and pre-cast concrete), in a building having a rise in storeys of not more than 2, must comply with Specification C1.11. Concrete external walls that could collapse as complete panels (e.g. tilt-up and precast concrete) which— a) consist of either single or multiple panels attached by steel connections to lateral supporting members; and b) depend on those connections to resist outward movement of the panels relative to the supporting members; and c) have height to thickness ratio not greater than 50.	Based on my assessment of the architectural plans, the specified construction of the external wall will comprise of the following materials: ▪ Precast Concrete Dado Panel with Metal Sheeting fixed to Structural Steel It is expected that the performance of the external walls in the event of a fire will be designed and constructed to achieve compliance with the prescriptive requirements of BCA Clause C1.11 and Specification C1.11. Construction details are to confirm compliance at CC stage.
C1.12	<u>Non-combustible materials</u>	Based on my assessment of the architectural plans, the specified materials adopted on the external wall are: ▪ Aluminium Composite Panel ▪ Metal Profiled Wall Sheeting Further clarification is to be provided regarding the particular composite/aluminum panel product to be adopted on the external façade at Construction Certificate Stage. It is also the expectation of this office, that any attachments to the external façade of the building will comply with the deemed to satisfy provisions of the BCA Specification C1.1 Part 2.4.
C1.13	<u>Fire protected timber: Concession</u>	Not applicable to this building

3.2.2 – Fire Compartmentation and Separation (Part C2, BCA)

Clause	Item	Comment
C2.2	Floor Area and Volume Limitations	Floor area and volume limitations are exceeded in the building incorporating the Class 5, 7b and 8 components.
C2.3	Large Isolated Buildings	The building exceeds the specified floor area and volume limitations prescribed within Table C2.2 and is therefore to be treated as a large isolated building and achieve compliance with Clause C2.3(b). Specifically: a) The building will be protected throughout with a sprinkler system complying with Specification E1.5; and b) provided with a perimeter vehicular access complying with C2.4(b).
C2.4	Requirement for open spaces and vehicular access	The vehicular access required for the subject building – ✓ must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building ✓ must have a minimum unobstructed width of 6 m and in no part of the 6 m width be built upon or used for any purpose other than vehicular or pedestrian movement ✓ No part of its furthest boundary more than 18 m. The figure below illustrates a potential scenario where the vehicular pathway, marked in blue, will not achieve compliance with BCA Clause C2.4(b)(iii). For a particular period of time whilst the truck is maneuvering around the building, its furthest part will be located at a distance greater than 18m, approximately 20m. ✓ must provide reasonable pedestrian access from the vehicular access to the building; and ✓ Must have a load bearing capacity and unobstructed height to permit the operation and passage of fire brigade vehicles. ✓ must be wholly within the allotment except that a public road complying with (i), (ii)

Clause	Item	Comment
C2.5	Class 9a and 9c Buildings	Not applicable to this building
C2.6	Vertical separation of openings in external walls	Not applicable to this building
C2.7	Firewalls	Not applicable to this building.
C2.8	Separation of classifications in same storey	Construction details are to confirm compliance with C2.8(a).

Clause	Item	Comment
C2.9	Separation of classification in different stories	Not applicable to this building.
C2.10	Separation of lift shafts	Not applicable to this building.
C2.11	Stairways and lifts in one shaft	Not applicable to this building.
C2.12	Separation of equipment The following equipment is to be fire isolated from the building with construction having an FRL not less than 120/120/120, doors accessing the spaces are to be self-closing –/120/30 fire doors: • Lift motors and lift control panels • Emergency generators or central smoke control plant • Boilers • Batteries	Any such equipment must be separated from remainder of the building as per C2.12 of BCA 2016. Construction details are to confirm compliance
C2.13	Electricity supply system Substations, electrical conductors and main switchboards that are required to sustain power to essential equipment operating in emergency mode is to be fire isolated from the remainder of the building with construction having a minimum of FRL of 120/120/120.	In buildings of this type, the BCA requires that a main switchboard located within the building which sustains emergency equipment operating in the emergency mode must – 1. be separated from any other part of the of the building by construction having an FRL of not less than 120/120/120; and 2. have any doorway in that construction protected with a self-closing fire door having an FRL of not less than --/120/30. Electrical conductors located within the building that supply a main electrical switchboard that sustains emergency equipment operating in the emergency mode, are to have a classification in accordance with AS/NZS 3013-2005 of not less than: a) WS 53W (if capable of being damaged by vehicles; or b) WS 52W; or c) enclosed or protected by construction achieving an FRL of not less than 120/120/120. Switchboards that sustain electricity supply to the buildings emergency equipment (i.e. fire systems pumps if required) are to be constructed so that emergency equipment switchgear is separated from non-emergency equipment switchgear by metal partitions designed to minimise the spread of a fault from non-emergency equipment switchgear. Detail drawings are to ensure compliance is achieved in relation to the requirements of the clause.
C2.14	Public Corridors in Class 2 and 3 buildings	Not applicable to this building.

3.2.3 – Protection of Openings (Part C3, BCA)

Clause	Item	Comment
C3.1	Application of Part This part is applicable to all openings in the external walls of the building (e.g. doors, windows, etc) and includes openings formed in the vertical plane of the building between floors and columns. This part also applies to penetrations in fire rated elements of the building (e.g. bounding fire rated construction and floors) except for penetrations between floors of car park levels	Compliance is to be achieved
C3.2	Protection of openings in external walls Openings in the external walls of the building are required to be 'protected' per C3.4 below where they are located within 3.0m of the allotment boundary or 6.0m of the far boundary of a road adjoining the allotment. Openings requiring protection are not occupy greater than 1/3 of the area of the external wall of the storey concerned.	Compliance has been achieved in accordance with BCA Clause C3.2.
C3.3	Separation of external wall and opening in different fire compartments	Not applicable to this building.
C3.4	Acceptable methods of protection Doors – Internal or external wall wetting sprinklers to a self closing door or a –/60/30 self closing fire door. Windows – internal or external wall wetting sprinklers over fixed or automatic closing windows, fixed fire rated windows (FRL –/60/–) or fire shutters. Other openings – Internal or external wall wetting drenchers or construction with FRL –/60/–	Compliance is to be achieved where required

Clause	Item	Comment
C3.5	Doors in fire walls Doors in fire walls are required to occupy no more than ½ the total area of the wall and be protected with self or automatic fire doors or fire rated shutter of –/(FRL)/30 or 2 doors facing one another of –/(½ FRL)/30.	Not applicable to this building.
C3.6	Sliding fire doors	Not applicable to this building.
C3.7	Protection of doorways in horizontal exits	Not applicable to this building.
C3.8	Openings in fire isolated exits	Not applicable to this building.
C3.9	Service penetrations into fire isolated exits	Not applicable to this building.
C3.10	Openings in fire isolated lift shafts	Not applicable to this building.
C3.11	Bounding construction: Class 2, 3 and 4 buildings	Not applicable to this building.
C3.12	Openings in floors and ceilings for services	Not applicable to this building.
C3.13	Openings in shafts	Not applicable to this building.
C3.15	Openings for service installations	Not applicable to this building.
C3.16	Construction Joints	Not applicable to this building.
C3.17	Columns protected with lightweight construction to achieve an FRL	Not applicable to this building.

3.2.4 – Fire Resisting Construction (Spec C1.1, BCA)

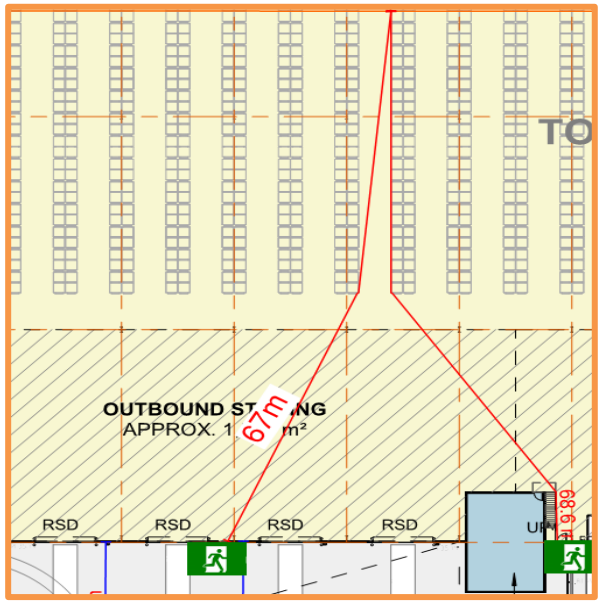
Clause	Item	Comment
Spec C1.1	Fire Resisting Construction Type A buildings are required to be of fire resisting compartmentalized construction. For the most part a building of concrete floor and column with masonry wall (internal and external) construction will generally comply. (Note Fire Source Features (FSF) in this instance are to the boundaries of the site and the far boundary of the adjacent public roadways) **REFER TO ANNEXURE 1 FOR APPLICABLE FRLs**	All designs are to ensure that the necessary FRLs are attained subject to the following notes. ▪ Any building elements that support another required to have an FRL is to have the same FRL. ▪ Non-combustible structures on the roof for the plant such as ventilation and air conditioning, window cleaning equipment, other non-combustible service units not containing combustible liquids or gases, etc are not required to be fire rated. **Note: It is highly recommended that a CodeMark Certificate is provided as well as Fire test reports confirming compliance with Relevant Australian Standards and BCA 2016 in relation to the use of external aluminum composite panels.**

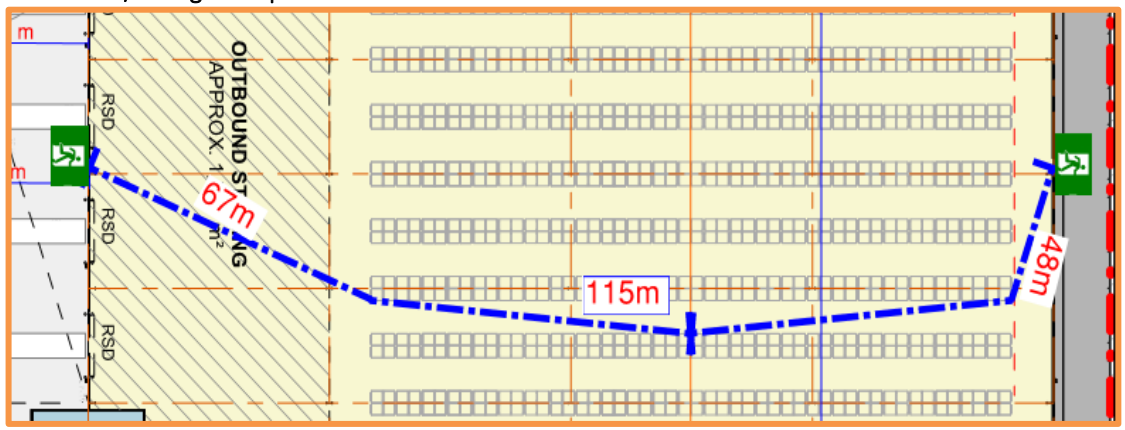
Spec C1.1: Fire Resisting Construction **(TYPE C Construction)**

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 therein) or other external building element, where the distance from any *fire-source feature* to which it is exposed is—				
Less than 1.5 m	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
1.5 to less than 3 m	–/–/–	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
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 1.5 m	90/–/–	90/–/–	90/–/–	90/–/–
1.5 to less than 3 m	–/–/–	60/–/–	60/–/–	60/–/–
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS—	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
INTERNAL WALLS-				
Bounding *public corridors*, public lobbies and the like—	60/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—	60/ 60/ 60	–/–/–	–/–/–	–/–/–
Bounding a stair if *required* to be rated—	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
ROOFS	–/–/–	–/–/–	–/–/–	–/–/–

3.3 – Access & Egress (Section D, BCA)

3.3.1 – Provision for escape (Part D1, BCA)

Clause	Item	Comment
D1.2	Number of exits required	Compliance has been achieved.
D1.3	Fire Isolation of Exits	Not applicable to this building.
D1.4	Exit travel Distances **Class 5, 6, 7, 8 or 9:** The maximum travel distance to an exit or point in choice in travel is not to exceed 20m and the total travel to one of those exits is not to exceed 40m	The exit travel distances within the building complies with Clause D1.4 of BCA 2016 except for the following areas: **Warehouse/Storage Component:** Based on my assessment, the maximum distance of travel to an exit is measured to be approximately 67m in lieu of 40m.  **Ground and First Floor Office:** Further clarification is required regarding the location of exits for our final assessment. This is a non-compliance which is subject to an alternative solution by a suitably qualified fire safety engineer

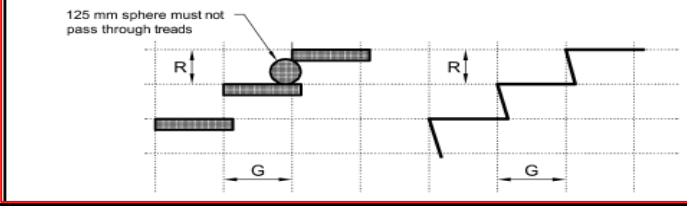
Clause	Item	Comment
D1.5	<u>Distance between alternate exits</u> Exits to the floors are to be distributed as uniformly as practicable, not < 9.0m apart, not >45m in Class 2 and 3 buildings, > 60m apart in Class 5,6, 7, and the paths of travel to exits are not to converge so that they become less than 6.0m apart.	Based on my assessment, the maximum distance of travel between exits through the point of choice is measured to be approximately 115m in lieu of 60m. **Warehouse/Storage Component:**  This is a non-compliance which is subject to an alternative solution by a suitably qualified fire safety engineer.
D1.6	<u>Dimensions of exits and paths of travel</u> All paths of travel and exit routes are to be: 1. 2.0m in clear height (noting ceiling height requirements under F3.1 below) 2. A minimum 1.0m in clear unobstructed width. In relation to the unobstructed width of stairs, it is to be the dimension between the handrail and the opposing wall/handrail. Doors may reduce egress widths to 1980mm in height and 750mm of clear unobstructed width. Note that where disabled access is required this is to be 850mm of clear width.	Exits and paths of travel to exits are considered capable of complying with D1.6 of BCA 2016 In buildings of this type, all exits and paths of travel to the buildings exits are to achieve a minimum unobstructed height of not less than 2.0 metres (except the height of a doorway may be reduced to not less than 1980 mm) with a minimum unobstructed width of not less than 1000 mm. Reductions in width are available at doorways. All detail drawings are to ensure compliance in this regard with this part.

Clause	Item	Comment
D1.7	Fire isolated exits	Not applicable to this building.
D1.8	External Stairs In lieu of Fire Isolated Stairs	Not applicable to this building.
D1.9	Travel by non-fire-isolated stairways or ramps Continuous means of travel and discharge to road or open space	Not applicable to this building
D1.10	Discharge from exits Bollards or other suitable barriers are to be provided to ensure that exits must are not blocked by parked vehicles. Be located as far apart as practical. Required exit widths must be maintained between the discharge point of the exits and the roadway and the path connecting the exit to the road must have stairs and/or ramps connecting it.	Discharge from all exits need to show compliance with D1.10 of BCA 2016 All detail drawings are to ensure compliance in this regard.
D1.11	Horizontal Exits	Not applicable to this building
D1.12	Non-Required, Ramps, Stairs and Escalators	Not applicable to this building
D1.13	Populations	See earlier comments in this report. Architect to confirm final areas so populations can be assessed.
D1.16	Plant rooms and lift machine rooms- concessions Ladders may be used for plant rooms less than 100m^2 in area or all but one access point for plant rooms up to 200m^2	Not applicable to this building
D1.17	Access to Lift Pits Where the pit depth is greater than 3.0m access to the pit must be provided in accordance with the provisions of clause D1.17 (b)	Not applicable to this building

3.3.2 – Construction of exits (Part D2, BCA)

Clause	Item	Comment
D2.2	Fire-isolated stairs and ramps	Not applicable to this building
D2.3	Non Fire-isolated stairs and ramps	Not applicable to this building
D2.4	Separation of rising and descending flights	Not applicable to this building
D2.5	Open Access Ramps and Balconies	Not applicable to this building
D2.6	Smoke Lobbies	Not applicable to this building
D2.7	Installations in exits and paths of travel Access to service shafts and services other than fire fighting equipment is not permitted from fire isolated exits. Gas or other fuel services must not be installed within 'required exits'. Where electricity meters, distribution boards or ducts, central telecommunication distribution boards or equipment or electrical or other motors serving the building are located in corridors, hallways or the like leading to an exit they are to be enclosed in non-combustible construction or a fire protective covering with doorways and openings suitably sealed against smoke spreading from the enclosure.	All detail drawings are to ensure compliance in this regard.
D2.8	Enclosures under stairs and ramps	Non fire-isolated stairways and ramps — The space below a required non fire-isolated stairway (including an external stairway) or non fire-isolated ramp must not be enclosed to form a cupboard or other enclosed space unless— (i) the enclosing walls and ceilings have an FRL of not less than 60/60/60; and (ii) any access doorway to the enclosed space is fitted with a self-closing –/60/30 fire door All detail drawings are to ensure compliance in this regard.

Clause	Item	Comment
D2.9	Width of stairs.	Not applicable to this building
D2.10	Pedestrian ramps A fire-isolated ramp may be substituted for a fire-isolated stairway if the construction enclosing the ramp and the width and ceiling height comply with the requirements for a fire-isolated stairway A ramp serving as a required exit must where the ramp is also serving as an accessible ramp under Part D3, be in accordance with AS 1428.1 or in any other case, have a gradient not steeper than 1:8. The floor surface of a ramp must have a non-slip finish.	Ramps serving an exit or path of travel to an exit throughout the building are required to comply with Clause D2.10 of the BCA. All detail drawings are to ensure compliance in this regard.
D2.11	Fire Isolated Passageways	Not applicable to this building
D2.12	Roof as Open Space	Not applicable to this building

Clause	Item	Comment
D2.13	<u>Goings and Risers</u> The goings and risers of the stairs to: 1. Be within the dimensional limitations of Table D2.13 of the BCA. 2. Have not > 18 risers per flight 3. If open risers have not >125mm between treads. 4. Be of solid construction. 5. Have a non-slip finish or be provided with non-skid strips near the edge of the nosings.	All stairways are to comply as required. All stairways are to have a non-slip surface or a non-slip nosing strip in accordance with Table D2.14 of the BCA and AS 4586-2013. In addition, the external steps are to be designed in accordance with Clause 11 and Clause 12 of AS 1428.1-2009. All detail drawings are to ensure compliance in this regard. **Table D2.13 RISER AND GOING DIMENSIONS (mm)** Riser (R) / Going (G) [2] / Quantity (2R+G) Public stairways: Riser Max 190, Min 115; Going Max 355, Min 250; Quantity Max 700, Min 550 Private stairways[1]: Riser Max 190, Min 115; Going Max 355, Min 240; Quantity Max 700, Min 550 
D2.14	<u>Landings</u> The landings of stairs are to: 1. Have a cross fall not greater than 1 in 50 2. Be not less than 750mm long. 3. Have a non-slip finish or be provided with non-skid strips near the edge of the nosings.	All stairways are to comply as required. All landings are to have a non-slip surface or a non-slip nosing strip in accordance with Table D2.14 of the BCA and AS 4586-2013. All detail drawings are to ensure compliance in this regard.
D2.15	<u>Thresholds</u> Steps at doorways from internal spaces on the building to external areas are to be not greater than 190mm (step permitted only where the internal space is higher). Note that some doors require AS1428.1 compliant threshold ramps may be required where disabled access is required. No threshold step or ramp of any dimension is permitted to internal doorways at point from the doorway less than the width of the door leaf.	All stairways are to comply as required. All detail drawings are to ensure compliance in this regard.

Clause	Item	Comment
D2.16	<u>Balustrades</u> Balustrades are required where the height change between to levels is greater than 1000mm. Balustrades to the building are to be as follows: *Balconies, non-fire isolated stairs and other locations* 1. Be not less than 1000mm high above landings and 865mm above the nosings of stairs. 2. Have openings not > 125mm. 3. Where the change in level is >4.0m it must not contain horizontal elements between 150mm and 760mm above the floor level that can facilitate climbing. 4. Windows to floors where the change in level is >4.0m must not have openable portions less than 865mm above the floor level. All balustrades are to be designed to ensure compliance with AS1170.1 or AS/NZS 1170.1. Furthermore, we note that particular requirements are applicable under D2.16 (h) and Table D2.16 in relation to wire balustrades. Loading docks are exempted from needing to meet these requirements.	All balustrades and barriers are to comply as required. All detail drawings are to ensure compliance in this regard. **Notes:** 1. It is not permissible to have frameless glass balustrades under AS1288 – 2006.

Clause	Item	Comment
D2.17	Handrails Each flight of stairs are to be fitted with at least one (1) handrail for fire isolated stairs and at least two handrails for non-fire isolated exits.	All stairways are to comply as required. All stairways are to be provided with handrails on both sides of the stairway in accordance with Clause 11 and Clause 12 of AS 1428.1-2009. All detail drawings are to ensure compliance in this regard.
D2.18	Fixed platforms, walkways, stairways and ladders All platforms, walkways, stairways and ladders within the plant areas are to be designed in accordance with AS1657 or the stair, landing and balustrade requirements as above.	All detail drawings are to ensure compliance in this regard.
D2.19	Doorways and doors Doors serving as exits are to be swinging doors except that power sliding doors can be used where it opens directly to a road or open space, capable of being manually opened under a force not > 110N upon a power malfunction and will automatically open on power failure or activation of the fire services in the building.	Details generally indicate that the exits to be the building will be served by swinging doors. All detail drawings are to ensure compliance in this regard.
D2.20	Swinging doors All exit doors are required to swing in the direction of egress. Any swinging door must not encroach into the required width of an exit by more than 500mm and when fully open encroach by greater than 100mm.	The final exit doors swing in the direction of egress from the building as required. All detail drawings are to ensure compliance in this regard.

Clause	Item	Comment
D2.21	Operation of latch. All exit doors and doors in the path of travel to exits are to be provided with lever action door furniture or panic bars located 900mm to 1.1m above the floor level which do not require a key to operate them on the side that a person would be seeking egress from the building. Where security is required to the doors there may be locked provided that they are fitted with a 'fail safe' device (e.g. an electronic strike) which opens/releases on activation of the smoke detection or sprinkler systems installed throughout the building.	The BCA requires that all exit doors and doors in the path of travel to an exit are to be fitted with single handed action (downward) door hardware positioned at a height of between 900 mm – 1100 mm above finished floor level. In addition, door hardware levers are to: a) be such that the hand of a person who cannot grip will not slip from the handle during the operation of the latch; and b) have a clearance between the handle and the back of the plate or door face at the centre of the grip section of the handle of not less than 35 mm and not more than 45 mm. All detail drawings are to ensure compliance in this regard.
D2.22	Re-entry from fire isolated exits Doors of a fire isolated exit must not be locked from the inside in a Class 9a building, 9c aged care building or exit serving any storey above a effective height of 25m. Doors may be locked if the automatically unlock by a fail-safe device by activation of a fire alarm, however least every forth storey doors are not locked and signed that re-entry is available, or intercommunication system is provided with signage explaining its purpose and method of operation is provided.	All doors of a fire-isolated exit must not be locked from the inside which serve a storey above an effective height of 25m. All detail drawings are to ensure compliance in this regard.

Clause	Item	Comment
D2.23	Signs on doors Doors accessing fire isolated exits and in horizontal exits are to be provided with 20mm high lettering of a colour contrasting to it's background stating 'FIRE DOOR, DO NOT OBSTRUCT, DO NOT KEEP OPEN'. Doors discharging fire isolated stairs are to be provided with 20mm high lettering of a colour contrasting to it's background stating 'FIRE SAFETY DOOR, DO NOT OBSTRUCT'.	The building is to be provided with signage to the fire-isolated stairway/passageway doors as required by this clause of the BCA. A) For a self-closing door— "FIRE SAFETY DOOR-DO NOT OBSTRUCT-DO NOT KEEP OPEN" - 20 mm high capital letters. Note: Signs to be positioned on the approach side of the door. B) For an automatic door held open by an automatic hold-open device — "FIRE SAFETY DOOR-DO NOT OBSTRUCT" - 20 mm high capital letters. Note: Signs to be positioned on both sides of the door. C) Doors Discharging from Fire Isolated Stairway/Passageway "FIRE SAFETY DOOR-DO NOT OBSTRUCT" - 20 mm high capital letters. Note: Signs to be positioned on both sides of the door. D) Offences Signs - Offences signs are to be displayed adjacent to the entry doors that give access into the buildings fire-isolated stairway and passageway in accordance with Clause 183 of the Environmental Planning and Assessment Regulation 2000. All detail drawings or specifications are to ensure compliance in this regard.
D2.24	Protection of openable windows Window openings must be provided with protection, if the floor below the window is 2m or more above the surface beneath it, in a a bedroom in a Class 2 or 3 building or Class 4 part of a building; or a Class 9b early childhood centre.	Not applicable to this building

3.3.3 – Construction of Exits (Part D3, BCA)

Clause	Item	Comment
D3.1, D3.2 & D3.3	General access requirements & parts required to be accessible Buildings and parts of buildings must be accessible as required by Table D3.1 clause D3.1 of BCA 2016. Class 5 – To and within all areas normally used by the occupants. Class 6 – To and within all areas normally used by the occupants. Class 7b - To and within all areas normally used by the occupants. Class 8 – To and within all areas normally used by the occupants.	The development is subject to requirements contained within Part D3 of the BCA, AS 1428.1-2009 and the *Premises Standards*. All detail drawings or specifications are to ensure compliance in this regard. It is recommended that a suitably qualified access consultant is appointed to ensure the buildings comply with the applicable provisions at Construction Certificate stage.

Clause	Item	Comment
D3.5	Accessible Carparking Class 5, 7a: 1 space for every 100 carparking spaces or part thereof. Class 9b (a) Up to 1000 carparking spaces - 1 space for every 50 carparking spaces or part thereof. (b) For each additional 100 carparking spaces or part thereof in excess of 1000 carparking spaces -1 space.	All detail drawings are to ensure compliance with D3.5 of the BCA and AS/NZS 2890.6.
D3.6	Signage Accessible signage is required in the building as per Clause D3.6, Specification D3.6 and AS/NZS 1428.1	All detail drawings are to ensure compliance with D3.6 of BCA 2016.
D3.7	Hearing augmentation	Required to be provided in the Class 9b if areas are provided with an inbuilt amplification system, other than one used only for emergency warning.
D3.8	Tactile indicators AS1428.4 tactile ground surface indicators are to be provide to all public accessible stairs, ramps and where overhead obstructions reduce below 2000mm in height.	Tactile indicators are required to all internal stairs, stairs used for emergency egress only will not require tactile indicators All detail drawings are to ensure compliance with D3.8 of BCA 2016.
D3.9	Wheelchair seating in Class 9b assembly parts	All detail drawings are to ensure compliance with D3.9 of BCA 2016.
D3.10	Swimming pools	Not applicable to this building
D3.11	Ramps On an accessway, a series of connected ramps must not have a combined vertical rise of more than 3.6m and a landing for a step ramp must not overlap a landing for another step ramp or ramp.	All detail drawings or specifications are to ensure compliance in this regard.
D3.12	Glazing on an accessway	All detail drawings or specifications are to ensure compliance in this regard.

3.4 – Services and Equipment (Section E, BCA)

3.4.1 – Fire Fighting Equipment (Part E1, BCA)

Clause	Item	Comment
E1.3	Fire Hydrants A hydrant system is required to protect the development in accordance with Clause E1.3 of the BCA & AS 2419.1 - 2005.	Buildings of this type are required to be served by a fire hydrant system in accordance with Clause E1.3 of the BCA and AS 2419.1–2005. A Fire Brigade Relay Pump shall be installed in accordance with the prescriptive requirements of Part 7.7 of AS2419.1-2005 and AS 2941-2013. The fire hydrant system is to be designed and certified by a practising *professional* Hydraulic Engineer. The proposed location of the hydrant/sprinkler booster is expected to comply with the prescriptive requirements of AS 2419.1-2005.
E1.4	Fire Hose Reels A fire hose reel system is required to protect the development in accordance with Clause E1.4 of the BCA & AS 2441 - 2005.	Fire hose reels are required to be provided to serve the whole building where one or more internal fire hydrants are installed. Fire hose reel coverage to all parts of the building, including carpark portion are required to be reviewed to ensure compliance. Compliant designs are to be provided from the relevant services consultant. All designs are to be certified as being in accordance with Clause E1.4 of the BCA and AS2441-2005.

Clause	Item	Comment
E1.5	Sprinklers Sprinklers are required to be installed throughout the building in accordance with Clause E1.5 of the BCA 2016 & AS 2118 - 1999.	Sprinklers are required to be installed throughout the building. Compliant designs are to be provided from the relevant services consultant. All designs are to be certified as being in accordance with BCA Clause E1.5 of BCA 2016 and AS 2118 - 1999.
E1.6	Portable Fire Extinguishers Portable fire extinguishers are required to protect the development in accordance with Clause E1.6 of BCA 2016 and AS 2444 - 2001.	Compliant locations are to be provided from the relevant services. All locations are to be certified as being in accordance with AS 2444 – 2001.
E1.8 Spec E1.8	Fire control centres A fire control facility must be provided for a building with an effectively height of more than 25m. A fire control centre in a building more than 50 m in effective height must be in a separate room **Fire control room** This Specification E1.8 describes the construction and content of required fire control centres and rooms. A fire control room is a fire control centre in a dedicated room with additional specific requirements. Clauses 2 to 5 apply to fire control centres (including fire control rooms). Clauses 6 to 12 apply additional requirements to fire control rooms.	The location of the Fire control room is to be verified at CC stage. The fire control room is required to be accessible via two paths of travel. Access to the fire control room is required from the main entrance of the building and is required to comply with Clause E1.8 and Specification E1.8 of BCA 2016
E1.9	Precautions during construction	Not Applicable to this building

3.4.2 – Smoke Hazard Management (Part E2, BCA)

Clause	Item	Comment
E2.2	Smoke Hazard Management Buildings **more than** 50m in effective height: A smoke hazard management system is required comprising of: ▪ An automatic smoke exhaust system in accordance with Specification E2.2b	Compliant designs are to be provided from the relevant services. All designs are to be certified as being in accordance with Clause E2.2, Specification E2.2b and E2.2a of BCA 2016, AS1670.1-2015, and AS/NZS1668.1-2015

3.4.3 – Lift Installations (Part E3, BCA)

Clause	Item	Comment
E3.2	Stretcher facility in lifts	Not Applicable to this building
E3.3	Warning against the use of the lift Adjacent to the call buttons of all passenger and goods lifts signage 10mm high stating 'DO NOT USE LIFTS IF THERE IS A FIRE' is to be provided.	All detail drawings or specifications are to ensure compliance with E3.3 of BCA 2016.
E3.4	Emergency lift	Not Applicable to this building
E3.5	Landings Access and egress to and from lift well landings must comply with the Deemed-to-Satisfy Provisions of Section D.	All detail drawings or specifications are to ensure compliance with E3.5 of BCA 2016.
E3.6	Facilities for people with disabilities Every passenger lift is to be provided with handrails, minimum internal floor dimensions, clear door opening dimensions and car control buttons in accordance with AS1735.12 and be fitted with a series of sensory devices per clause E3.6 of the BCA.	Compliant designs are to be provided from the relevant services consultant. All designs are to be certified as being in accordance with E3.6, E3.7 of BCA 2016 and AS 1735.1/2/3 or 16
E3.7	Fire Service Controls	Not Applicable to this building
E3.8	Aged care buildings	Not Applicable to this building
E3.9	Fire service recall operation switch Each group of lifts must be provided with one fire service recall control switch required by E3.7 that activates the fire service recall operation	Compliant designs are to be provided from the relevant services consultant.
E3.10	Lift car fire service drive control switch	Compliant designs are to be provided from the relevant services consultant.

3.4.4 – Emergency Lighting, Exit Signs and Warning Systems (Part E4, BCA)

Clause	Item	Comment
E4.2, E4.3 & E4.4	Emergency Lighting An AS 2293.1 – 2005 compliant system of emergency lighting is to be provided through the building.	Compliant designs are to be provided from the relevant services. All designs are to be certified as being in accordance with BCA 2016 clauses E4.2, E4.3 & E4.4 and AS 2293.1-2005.
E4.5, E4.6 & E4.8	Exit Signage An AS 2293.1 – 2005 compliant system of illuminated exit signage is to be provided through the building.	Compliant designs are to be provided from the relevant services. All designs are to be certified as being in accordance with BCA 2016 clauses E4.5, E4.6 & E4.8 and AS 2293.1 – 2005.
E4.9	Sound systems and intercom systems for emergency purposes A system for occupant evacuation and co-ordination is required for buildings exceeding 25m in effective height compliant with AS 1670.4-2015.	Compliant designs are to be provided from the relevant services consultant. All designs are to be certified as being in accordance with BCA 2016 Clauses E4.9 and AS 1670.4 -2015.

3.5 – Health and Amenity (Section F, BCA)

3.5.1 – Damp and Weatherproofing (Part F1, BCA)

Clause	Item	Comment
F1.1	Stormwater All storm water will be disposed of in accordance with AS3500.3	Compliant designs are to be provided from the relevant services consultant. All designs are to be certified as being in accordance with AS3500.3 – 2015.
F1.4	External above ground membranes Waterproofing membranes for external above ground use must comply with AS 4654 Parts 1 and 2.	All detail drawings or specifications are to ensure compliance in this regard.
F1.5	Roof Coverings All metal roofing is to comply with AS1562.1	All detail drawings or specifications are to ensure compliance in this regard.
F1.6	Sarking Any sarking is to comply with AS/NZS 4200 Parts 1 & 2 – 1994	All detail drawings and specifications are to ensure compliance in this regard.
F1.7	Waterproofing of wet areas in buildings. All bathroom and sanitary compartments are to be water resistant and waterproof in accordance with AS3740 as though they were in a residential building.	Design specifications are to include the need for water proofing to be carried out in accordance with AS3740 – 2010
F1.9	Damproofing The building is to be provided with damp proofing in accordance with AS2904, etc.	All designs are to be certified as being provided with a system of damp proofing in accordance with AS 2904 – 1995
F1.10	Damp-proofing of floors on the ground	All detail drawings and specifications are to ensure compliance in this regard
F1.11	Provision of floor wastes	All detail drawings and specifications are to ensure compliance in this regard
F1.13	Glazed Assemblies All glass to the building is to comply with AS2047 and AS1288.	Design specifications are to include the need for all glazing systems to be constructed, glazed and fitted in accordance with AS1288 – 2006 and AS2047 – 2014.

3.5.2 – Sanitary Facilities (Part F2, BCA)

Clause	Item	Comment
F2.1	Facilities in residential buildings	Not Applicable to this building
F2.2	Calculation of occupants The number of occupants used for the determination of the number of sanitary facilities required to the building has been determined in accordance with Table D1.13 of the BCA.	Note population numbers nominated earlier in the report. Final areas to be provided by the architect so occupant numbers can be assessed. All detail drawings or specifications are to ensure compliance in this regard.
F2.3	Facilities in class 3 to 9 buildings This clause offers the required ratios of sanitary facilities required to a building depending upon the respective populations	Fit out details are required to confirm that the facilities are compliant. Toilets required for staff to the retail tenancies, which are to be disabled accessible, unless the separate accessible facility within the common area is sufficient. All detail drawings and specifications are to ensure compliance with F2.3 of BCA 2016.
F2.4	Facilities for People Disabilities The BCA requires 1 disabled facility for up to 100 WCs and urinals (added together).	Fit out details are required to confirm that facilities are compliant.
F2.5	Construction of sanitary compartments Any fully enclosed sanitary facility, where an inward swinging door is less than 1.2m from the WC pan, the door leaf is to be provided with lift off hinges that facilitate the removal of the door from outside the enclosure.	All detail drawings and specifications are to ensure compliance with F2.5 of BCA 2016.
F2.6	Interpretation: Urinals and washbasins	Noted

Clause	Item	Comment
F2.7	Microbial (legionella) control Hot water, warm water and cooling water systems in a building other than a system serving only a single sole-occupancy unit in a Class 2 or 3 building or Class 4 part of a building must be installed in accordance with AS/NZS 3666.1.	All detail drawings or specifications are to ensure compliance in this regard.
F2.8	Waste Management	Not applicable to this building.

3.5.3 – Room Sizes (Part F3, BCA)

Clause	Item	Comment
F3.1	Heights of rooms and other spaces All areas of the building are required to have a minimum ceiling height of 2.4m including corridors except for the sanitary facilities which are permitted to be 2.1m in height.	All detail drawings and specifications are to ensure compliance with F3.1 of BCA 2016.

3.5.4 – Light and Ventilation (Part F4, BCA)

Clause	Item	Comment
F4.1	Provision of natural light Natural lighting must be provided in: • Class 2 and Class 4 parts of buildings to all habitable rooms. • Class 3 buildings to all bedrooms and dormitories. • Class 9a & 9c buildings to all rooms used for sleeping purposes. Class 9b buildings to all general-purpose classrooms in primary and secondary schools and playrooms or the like in early childhood centres.	Not Applicable to this building
F4.2	Methods and extent of natural lighting Natural lighting must be provided by windows with an aggregate light transmitting area of not less than 10% of the floor area of the room and are open to the sky or open verandah etc. For Class 2,3 9 (excluding 9c) of Class 4 parts: If facing the boundary of an adjoining allotment or another building on the allotment windows are to be a horizontal distance of not less than 1m away or 50% of the square root of the exterior height of the wall (which contains the window) measured in metres from the sill whichever is the greater.	Not Applicable to this building
F4.3	Natural light borrowed from adjoining room Natural lighting to a room in a Class 2 or 4 part of a building or in a sole-occupancy unit of a Class 3 building may come through a glazed panel or opening from an adjoining room	Not Applicable to this building

Clause	Item	Comment
F4.4	Artificial Lighting The building is required to be provided with artificial lighting in accordance with AS1680.0 - 2009	Compliant designs are to be provided from the relevant services consultant. All designs are to be certified as being compliant with AS1680.0-1998.
F4.5	Ventilation of rooms The building is required to be provided in mechanical ventilation is accordance with AS1668.2 or natural ventilation complying with Part F4.6.	Compliant designs are to be provided from the relevant services consultant. All designs are to be certified as being compliant with AS1668.2 and AS3666.1
F4.6	Natural ventilation Ventilation to be by permanent openings, windows, doors or other openable devices with an aggregate opening size of minimum 5% of the floor area of the room to be ventilated.	All detail drawings and specifications are to ensure compliance in this regard. If not otherwise providing mechanical ventilation as per F4.5 of BCA 2016.
F4.8 & F4.9	Restriction on position of water closets and urinals Airlocks A room containing a WC or urinal must not open directly into a workplace occupied by more than one person without the provision of an airlock or mechanical exhaust and a wall screening the door accessing the space.	All detail drawings and specifications are to ensure compliance in this regard
F4.11	Car parks Car parks are to be provided with a system of ventilation complying with AS1668.2.	Compliant designs are to be provided from the relevant services consultant. All designs are to be certified as being compliant with AS1668.2 - 2015.

3.5.5 – Sound Transmission and Insulation (Part F5, BCA)

The Deemed-to-Satisfy Provisions of this part are not applicable to this building

3.6 – Ancillary Provisions (Section G, BCA)

Clause	Item	Comment
Part G1 G1.1	Swimming pools All swimming pools with a depth of water 300mm or more, must comply with the *Swimming Pools Act 1992 ad the Swimming Pools Regulations 2008*, AS 1926.1 and 2 2007 and Part G1.1 of the BCA 2013.	Not applicable
G1.2	Refrogerated Chambers, Strong-Rooms and Vaults A refrigerated or cooling chamber, strongroom or vault which is of sufficient size for a person to enter must have a door which is capable of being opened by hand from inside without a key; and internal lighting controlled only by a switch which is located adjacent to the entrance doorway inside the chamber, strongroom or vault.	Not Applicable
G1.3	Outdoor Play Spaces	Not applicable
Part G2 G2.2	Installation of Appliances	Installation of appliances must comply with clause G2.2 of BCA 2016
G2.3	Open Fireplaces	Not Applicable
G2.4	Incinerator rooms	Not Applicable
Part G3	Atrium Construction	All detail drawings and specifications are to ensure compliance with this part
Part G4	Construction in alpine areas	Not applicable
Part G5	Construction in bushfire prone area	Not applicable

NSW G1.101	Provision for the cleaning of windows A building must be provided with a system of cleaning windows located 3 or more storeys above ground level by a system provided in accordance with the Work Health and Safety Act 2000 or by having the design facilitate the cleaning of the windows from wholly within the building.	Not applicable

3.7 – Special Use Buildings (Section H, BCA)

Clause	Item	Comment
H1.1	Application of Part	This part is applicable to class 8 and 9b building No stages are proposed in this building at present in Class 9b areas.
H1.2	Separation A theatre or public hall must have a sprinkler system or have the stage and backstage area separated	Not applicable
H1.3	Proscenium wall construction Must comply with Specification H1.3	Not applicable
H1.4	Seating area	Not Applicable
H1.5	Exits from theatre stages Exits must pass through the proscenium wall and exit from backstage areas must be independent to exist from the audience	Not applicable
H1.6	Access to platforms and lofts Stairway provides access to a service platform or rigging loft must comply with AS1657	Not applicable
H1.7	Aisle lighting in theatres If general lighting is dimmed or extinguished during public occupation and the floor is stepped or inclined at a slope of more than 1 in 12 aisles lights must be provided.	Not applicable

3.8 – Maintenance (Section I, BCA)

These provisions are not applicable to the subject building, the obligation to maintain safety measures is imposed under the Environmental Planning and Assessment Regulations 2000.

3.9 – Energy Efficiency (Section J, BCA)

The class 2 sole occupancy units are to comply with the following provisions in addition to BASIX requirements.

Part	Item	Comment
J1	Building fabric This part set out the requirements for the thermal efficiency of the envelope of the building.	The external envelope of the building is capable of achieving compliance with part J1. The residential parts are to comply with clause J1.2 for installation requirements. All detail drawings and specifications are to ensure compliance with this part
J2	External glazing This part sets out the requirements for glazing forming part of the envelope of a building	Glazing that forms part of the envelope of the building is to achieve compliance with Part J2 of the BCA 2016. All detail drawings and specifications are to ensure compliance with this part
J3	Building sealing This part sets out the provisions for sealing of a building to prevent the leakage of conditioned space	The method of construction of the envelope is to incorporate sealing of gaps etc. to prevent loss of conditioned air. All detail drawings and specifications are to ensure compliance with this part
J5	Air-conditioning and ventilation systems This part sets out the limitations of A/C and mechanical ventilations systems to impose minimum efficiencies within HVAC systems	Systems are to have maximum power inputs and control units if intending to be provided to comply with Part J5. Compliance to be certified by the relevant mechanical consultant as to compliance
J6	Artificial Lighting and power This part sets out maximum illumination power densities and control arrangements for efficiency within lighting configurations and power control for water boiling/chilling units	Internal lighting is required to achieve compliance with Part J6 of the BCA. Certification from the relevant consultant to be provided to confirm compliance

Part	Item	Comment
J7	Hot water supply and swimming pool and spa plant This part sets out the requirements for insulation of water supply lines to hot water units to reduce heat loss and heating/pumping of pools and spas.	Not applicable
J8	Access for maintenance and facilities for monitoring This part sets out the requirements for access to maintain systems and energy monitoring requirements.	Plans are to include access and energy monitoring details where applicable. Compliant designs and signoff are to be provided from the relevant services consultant.

4.0 - Conclusion

It is the opinion of this office that, on satisfaction of the above recommendations, the proposed building is capable of achieving compliance with the requirements of the Building Code of Australia (BCA) 2016 and relevant adopted standards without undue modification to the design or appearance of the building.

Whilst the above recommendations have been made as a means of achieving compliance with the various provisions of BCA Performance Requirements their acceptability has not been verified at this time. It will be necessary for the design to be reviewed by an appropriately qualified person prior to the issue of a Construction Certificate for the works.