DESIGN CONFIDENCE

AEA Grand Hotel P/L
c/- X.PACE Design Group

BCA Design Assessment Report

The Robertson Hotel
1 Fountaindale Road
Robertson NSW 2577

ACCESSIBILITY | BUILDING REGULATIONS | FIRE ENGINEERING | MANAGEMENT SERVICES

Project:	The Robertson Hotel
Document Type:	BCA Design Assessment Report
Our Reference:	P218_204-2 (BCA) LB

The following report register documents the development and issue of this and each subsequent report(s) undertaken by Design Confidence (Sydney) Pty Ltd.

Revision History —

OUR REFERENCE	REMARKS	ISSUE DATE
P218_204-1 (BCA) LB	Report issued in DRAFT for review and comment	16 December 2019
P218_204-2 (BCA) LB	Report issued as final to accompany DA submission	7 February 2020

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EXECUTIVE SUMMARY

This BCA Design Assessment report has been prepared by Design Confidence at the request of X. PACE Design Group relates to the proposed redevelopment of The Robertson Hotel located at 1 Fountaindale Road, Robertson.

With respect to the assessment undertaken the following areas in particular need further review as the project develops —

ITEM	ITEMS FOR FURTHER CONSIDERATION	RESPONSIBILITY
1.	The proposed strategy of the issues identified within the Preliminary Fire & Life Safety Audit Summary report for the existing buildings, prepared by this office (refer Appendix 4 of this report) are to be considered in the development application. It is recommended that the proposed strategy to upgrade existing building elements are submitted to for review and endorsement by the consent authority pursuant to Clause 94 of the Environmental Planning & Assessment Regulation 2000.	Project Architect / Client
2.	The following building elements and their components must be non-combustible – i. External walls and common walls, including all components incorporated in them, including the façade covering, framing and insulation; ii. The flooring and floor framing of lift pits; iii. Non-loadbearing internal walls where they are required to be fire-resisting.	Project Architect
3.	Architectural drawings are to be updated to include the following essential fire safety measures – i. Location of the fire indicator panel; ii. Location of the sprinkler alarm valves; iii. Fire Hose reel enclosures / cabinets; iv. Hydrant locations; v. Fire extinguisher locations	Project Architect / Fire Services
4.	A test report from a Registered Testing Authority must be provided to certify that the façade / external walls achieve compliance with BCA FP1.4 and FV1.	All

In addition to undertaking a detailed assessment of the design against the perspective requirements of the BCA a preliminary performance-based assessment has also been undertaken. The purpose of the assessment was to look at the incorporation of a performance-based design may add value in-lieu of complying with the prescriptive (DtS) provisions.

Table 2 below lists scenarios where we believe the adoption of a performance design may add value to development –

NO.	DESIGN EFFICIENCIES	DTS CLAUSE	PERFORMANCE REQUIREMENT
FIRE SAFETY			
1.	Rationalise reduced FRL for intermediate floors within wet areas based on slab set downs. Rationalise reduced FRL for building elements wihtin the restaurant/ conference areas.	C1.1, Spec. C1.1	CP1, CP2 & EP2.2
2.	Public corridors in hotel portions exceed 40m in length and are not divided with smoke-proof construction.	C2.14	CP2, EP2.2
3.	Justify extended exit travel distances to a point of choice to alternative exits and nearest exits.	D1.4	DP4, EP2.2
4.	Justify extended exit travel distance between alternative exits.	D1.5	DP4, EP2.2
5.	Justify provision of discontinuous required non-fire isolated stairway/s	D1.9	DP4, EP2.2
6.	Justify connection of 4 consecutive storeys for the atriums within the main building.	G3	CP2
7.	Non-protection of openings in external walls between different fire compartments.	C3.3	CP2
8.	Justify omission of fire hose reels to class 7a and 9b parts	E1.4	EP1.1

Be advised that the adoption of performance solutions for fire safety matters may 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.

1.0 INTRODUCTION

1.1 General

This BCA Design Assessment Report has been prepared at the request of X.PACE Design on behalf of AEA Grand Hotel P/L and relates to the proposed redevelopment of The Robertson Hotel.

The proposed hotel development comprises of extensive additions and alterations to the existing hotel, comprising of a new hotel wing, swimming pool and spa, restaurants and function rooms, eco-cabins and extensive landscaping features across the site.

1.2 Purpose of Report

The purpose of this report is to identify the extent to which the architectural design documentation complies with the relevant prescriptive provisions of the Building Code of Australia (BCA) Volume 1 and Volume 2, edition 2019.

This report is based upon, and limited to, the information depicted in the documentation provided for assessment, and does not make any assumptions regarding 'design intention' or the like.

1.3 Documentation Provided for Assessment

This assessment is based upon the architectural documentation prepared by X.PACE Design Group and listed within **Appendix 1**.

1.4 Report Exclusions

It is conveyed that this report should not be construed to infer that an assessment for compliance with the following has been undertaken—

(i) Work Health & Safety Act and Regulations;

(ii) Work Cover Authority requirements;

(iii) Structural and Services Design Documentation;

(iv) The individual requirements of service authorities (i.e. Telecommunication Carriers, Sydney Water, Energy Australia);

(v) The Disability (Access to Premises - Buildings) Standards 2010;

(vi) The Disability Discrimination Act (DDA) 1992;

(vii) The relevant Accessibility and Energy Efficiency Provisions as contained within the BCA;

(viii) An assessment of the existing building parts. This has been undertaken previously by this office via a visual site audit – refer Appendix 4 for detailed commentary.

2.0 DEVELOPMENT DESCRIPTION

2.1 General

In accordance with the BCA, the assessment undertaken relates to the proposed redevelopment of The Robertson Hotel.

For the purpose of the BCA the subject development may be described as contained below.

2.2 Building Description

Table 2 – Building Characteristics

DESCRIPTION OR REQUIREMENT		
Building Classification	Community Leisure & Health Centre / Gym	9b
	Function Rooms	9b
	Artist in Residence	9b
	Museum	9b
	Carpark	7a
	Restaurant	6
	Office	5
	Managers residence	4
	Hotel	3
	Ecocabins / Villas	1b
Rise in Storeys	Main Building	Seven (7)
	Artist in Residence	One (1)
	Managers residence	Two (2)
Construction Type	Main building	Type A
	Artist in Residence	Type C
	Managers building	Type B
Effective Height	Main building	~26.48
	Artist in Residence	<12m
	Managers building	<12m
Area / Volume	Within limitations	
Climate Zone:	Climate Zone 6	

2.3 BCA Assessment – Interpretation Notes

To provide the reader with additional context the following information regarding assessment methodology used in this assessment is provided below—

(i) The main hotel building, restaurant, carpark, function rooms and health centre have been assessed as a single united building;

(ii) The Ecocabins and Villas have been assessed as class 1b buildings;

(iii) The managers residence is understood to be located above the reception, small venue and fire refuge, hence has been assessed as a class 4 use;

(iv) The effective height of the building has been determined based on the difference in RL of Level 2 – 760.200 and Level 7 – 786.68;

(v) Refer to the Preliminary Fire & Life Safety Audit Summary prepared by this office, dated 25 January 2019, relating to the existing building parts that are subject to alterations and additions – included in Appendix 4;

(vi) Refer the Access Design Assessment Report prepared by this office for review of the accessibility provisions of the BCA;

(vii) Exits have been assessed as coinciding within one being open to the sky where an overhang or balcony is located above an external door;

(viii) Travel to alternative exits from the point of choice have been treated as being ≥45° apart;

(ix) Each of the buildings assessed within this report are highlighted in the figure below.

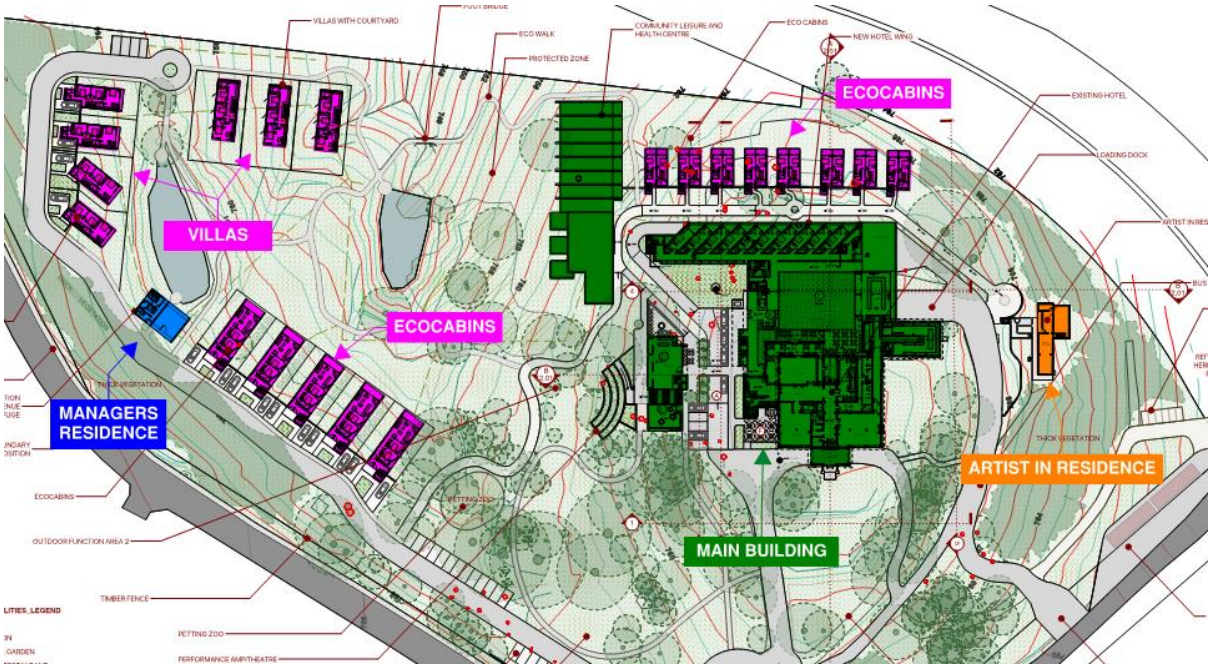


Figure 1 – Site plan highlighting buildings assessed

(x) The central exit stairway wihtin the carpark on levels 2 and 3, connecting the carpark levels to the class 3 part on level 4 of the main building has been treated as non-fire isolated.

3.0 BCA ACCESS DESIGN ASSESSMENT SUMMARY

3.1 General

The following tables summarises the compliance status of the architectural design in terms of each *applicable* prescriptive provision of the BCA and indicates a ***capability for compliance*** ('COMPLIES') with the provisions of the BCA.

A detailed analysis and commentary are provided in **Section 3.0** of this report in the instance that prescriptive non-compliance occurs ('DOES NOT COMPLY') or further 'DESIGN DETAIL' is required.

Such instances should not necessarily be considered BCA deficiencies, but rather matters which need to be considered by the design team, the certifying authority and all other relevant stakeholders as design progresses.

For those instances of either prescriptive non-compliance ('DOES NOT COMPLY') or further 'DESIGN DETAIL' is required, a detailed analysis and commentary is provided within **Section 4.0** of this report.

3.2 BCA Volume 1 – All buildings (excl. Ecocabins and Villas)

3.3 Section B – Structure

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
B1.1	resistance to actions			✓
B1.2	determination of individual actions			✓
B1.4	materials and form of construction			✓
B1.6	construction of buildings in floor hazard areas			✓

3.4 Section C – Fire Resistance

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
C1.1	fire resisting construction			✓
C1.8	structural tests for lightweight construction			✓
C1.9	non-combustible building elements			✓
C1.10	fire hazard properties			✓
C1.14	ancillary elements			✓
C2.2	general floor area and volume limitations	✓		
C2.6	vertical separation			✓
C2.7	separation by fire walls			✓
C2.8	separation of classifications in the same storey			✓
C2.9	separation of classifications in different storeys			✓
C2.10	separation of lift shafts			✓
C2.12	separation of equipment			✓
C2.13	electricity supply system			✓
C2.14	public corridors in Class 2 and 3 buildings		✓	

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
C3.2	protection of openings in external walls	✓		
C3.3	separation of external walls and associated openings in different fire compartments		✓	
C3.4	acceptable methods of protection			✓
C3.5	doorways in fire walls			✓
C3.8	openings in fire isolated exits			✓
C3.9	service penetrations in fire-isolated exits			✓
C3.10	openings in fire isolated lift shafts			✓
C3.11	bounding construciton: Class 2 and 3 buildings and Class 4 parts			✓
C3.12	openings in floors and ceilings for services			✓
C3.15	openings for services installations			✓
C3.16	construction joints			✓
C3.17	columns protected with lightweight construction to achieve an FRL			✓

3.5 Section D – Access and Egress

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
D1.2	number exits required		✓	
D1.4	exit travel distances		✓	
D1.5	distance between alternative exits		✓	
D1.6	dimensions of exits and paths of travel to exits			✓
D1.7	travel via fire-isolated stairway		✓	
D1.9	travel by non-fire-isolated stairways or ramps		✓	
D1.10	discharge from exits			✓
D1.17	access to lift pits			✓
D2.2	fire isolated stairways and ramps			✓
D2.3	non-fire-isolated stairways and ramps			✓
D2.4	separation of rising and descending stair flights			✓
D2.7	Installations in exits and paths of travel			✓
D2.8	enclosure of space under stairs and ramps			✓
D2.10	pedestrian ramps			✓
D2.12	roof as open space			✓
D2.13	goings and risers			✓
D2.14	landings			✓
D2.15	thresholds			✓
D2.16	balustrades			✓
D2.17	handrails			✓
D2.19	doorways and doors			✓
D2.20	swinging doors			✓
D2.21	operation of latch			✓

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
D2.22	re-entry from fire isolated exits			✓
D2.23	signs on doors			✓
D2.24	protection of openable windows			✓

3.6 Section E – Services and Equipment

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
E1.3	Fire Hydrants			✓
E1.4	Fire Hose Reels			✓
E1.5	Sprinklers			✓
E1.6	portable fire extinguishers			✓
E1.8	fire control centres			✓
E2.2	smoke hazard management			✓
E3.1	lift installations			✓
E3.2	stretcher facility in lifts			✓
E3.3	warning against use of lifts in fire			✓
E3.4	Emergency lifts			✓
E3.7	Fire service controls			✓
E3.9	Fire service recall control switch			✓
E3.10	Lift car fire service drive control switch			✓
E4.2	emergency lighting requirements			✓
E4.5	exit signs			✓
E4.6	direction signs			✓
E4.9	Emergency Warning and Intercom Systems			✓

3.7 Section F - Health and Amenity

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
F1.0	weatherproofing of external walls			✓
F1.1	stormwater drainage			✓
F1.4	external above ground membranes			✓
F1.5	roof coverings			✓
F1.6	sarking			✓
F1.7	waterproofing of wet areas in buildings			✓
F1.9	damp-proofing			✓
F1.10	damp-proofing of floors on the ground			✓
F1.11	provision of floor wastes			✓
F1.13	glazed assemblies			✓
F2.1	facilities in residential buildings			✓
F2.3	Facilities in class 3 to 9 buildings			✓
F2.5	construction of sanitary compartments			✓

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
F3.1	heights of rooms and other spaces			✓
F4.1	provision of natural light	✓		
F4.2	methods and extent of natural light			✓
F4.3	Natural light borrowed from adjoining room			✓
F4.4	artificial lighting			✓
F4.5	ventilation of rooms			✓
F4.6	Natural ventilation			✓
F4.8	restriction of position of water closets and urinals		✓	
F4.9	airlocks			✓
F4.11	carparks			✓
F5.4	sound insulation rating of floors			✓
F5.5	sound insulation rating of walls			✓
F5.6	sound insulation rating of internal services			✓
F5.7	sound isolation of pumps			✓
F6.2	Pliable building membrane			✓
F6.3	Flow rate and discharge of exhaust systems			✓
F6.4	Ventilation of roof spaces			✓

3.8 Section G – Ancillary Provisions

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
G1.1	Swimming pools and recirculation systems			✓
G1.101	provision for cleaning windows			✓
G3	atriums		✓	
G5.2	construction in bushfire prone areas			✓
G6.1	occupiable outdoor areas			✓

3.9 BCA Volume 2 – Ecocabins and Villas

3.10 Part 3.1 – Site Preparation

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
3.1.1.1	earthworks			✓
3.1.2.0	earth retaining structures			✓
3.1.3.0	Drainage			✓
3.1.4	Termite risk management			✓

3.11 Part 3.2 – Footings & Slabs

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
3.2.0	footings and slabs			✓

3.12 Part 3.3 – Masonry

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
3.3	Masonry			✓

3.13 Part 3.4 – Framing

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
3.4.2.0	Steel framing			✓
3.4.3.0	Timber framing			✓
3.4.4.0	structural steel members			✓

3.14 Part 3.5 – Roof & Wall Cladding

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
3.5.1.0	sheet roofing			✓
3.5.2.0	roof tiles and shingles			✓
3.5.3.0	gutters and downpipes			✓
3.5.4.0	timber and composite wall cladding			✓
3.5.4.5	Eaves and soffit linings			✓
3.5.4.6	Flashings to wall openings			✓
3.5.5.0	Metal wall cladding			✓

3.15 Part 3.6 – Glazing

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
3.6.0	glazing			✓

3.16 Part 3.7 – Fire Safety

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
3.7.1.2	Fire hazard properties			✓
3.7.3.2	Separating walls			✓

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
3.7.3.3	Services in separating walls			✓
3.7.5.2	requirements for smoke alarms			✓
3.7.5.4	location – Class 1b buildings			✓
3.7.5.6	lighting to assist evacuation – Class1b buildings			✓

3.17 Part 3.8 – Health & Amenity

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
3.8.1.2	wet areas			✓
3.8.2.2	ceiling heights			✓
3.8.3.2	required facilities			✓
3.8.3.3	construction of sanitary compartments			✓
3.8.4.2	natural lighting			✓
3.8.4.3	artificial lighting			✓
3.8.5.2	ventilation requirements			✓
3.8.5.3	location of sanitary compartments			✓
3.8.6.2	Sound insulation requirements			✓
3.8.6.5	Services			✓
3.8.7.2	Pliable building membrane			✓
3.8.7.3	Flow rate and discharge of exhaust systems			✓
3.8.7.4	Ventilation of roof spaces			✓

3.18 Part 3.9 – Safe Movement & Access

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
3.9.1.2	Stairway construction			✓
3.9.1.4	Slip-resistance			✓
3.9.1.6	thresholds			✓
3.9.2.2	Barriers to prevent falls			✓
3.9.2.3	construction of barriers to prevent falls			✓

3.19 Part 3.10 - Additional Construction Requirements

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	DESIGN DETAIL
3.10.3.0	flood hazard areas			✓
3.10.5.0	Construction in bushfire prone areas			✓

4.0 BCA DETAILED ASSESSMENT – CLASS 2-9 BUILDINGS (EXCL. ECONCABINS & VILLAS)

4.1 General

With reference to the BCA Design Assessment Summary contained in **Section 3.0** above, the following analysis and commentary is provided.

This commentary is formulated to enable the design documentation to be further progressed, for the purpose of evidencing the attainment of compliance with the relevant provisions of the BCA.

4.2 Section B - Structure

B1.1	The resistance of a building or structure shall be greater than the most critical action effect determined by B1.2 of the BCA, AS/NZS 1170.0-2002 and B1.4 of the BCA.
B1.2	The structural design of the building is required to be determined in accordance with the varying "actions" considerations contained within this clause (i.e. permanent actions, imposed actions, wind / snow / earthquake actions).
B1.4	The structural resistance of materials and forms of construction shall be determined in accordance with the following: (i) Masonry - AS3700-2018 (ii) Concrete construction - AS3600-2018 (iii) Footings and slabs – AS2870-2011 (iv) Steel construction - AS4100-1998 or AS/NZS 4600-2005 (v) Termite Risk Management - AS3660.1-2014 (vi) Piling - AS2159-2009 (vii) Glazed assemblies - AS2047-2014-amendments 1 & 2 (external), and/or AS1288-2006 (internal)
B1.6	A class 3 building in a flood hazard area must comply with the ABCB Standard for Construction of Buildings in Flood Hazard Areas.

4.3 Section C – Fire Resistance

C1.1	Testing certificates are to be provided confirming the proposed cladding material has been tested in accordance with AS1530.1 and AS1530.3. Notwithstanding the above, the building elements are required to achieve the nominated FRLs as nominated within BCA Spec C1.1 as applicable, these FRLs have been summarised within Table A2.1 as contained within Appendix 2. In addition to the FRLs contained within the Appendix A2 the following information details the construction methodology and concessions available to the subject building.

C1.1
Cont'd

General notes

Type A Construction - Main building

(i) Internal walls required to have an FRL must extend:

- To the underside the floor next above;
- To the underside of a roof covering if it is non-combustible and must not be crossed by timber or other combustible building elements, expect for roof battens with dimensions of 75mm x 50mm or less or sarking-type material; or
- A ceiling that is immediately below the roof and has a resistance to the incipient spread of fire to the roof space between the ceiling and the roof of not less than 60 minutes;

(ii) Any loadbearing internal wall and a loadbearing fire wall (including shafts) is required to be of concrete or masonry or fire-protected timber;

(iii) A non-loadbearing internal wall required to achieve an FRL is required to be of non-combustible construction;

(iv) A shaft which is not for the discharge of hot products of combustion and not load-bearing is required to be of non-combustible construction;

(v) The bottom of any shafts is required to be non-combustible and laid directly on the ground unless otherwise enclosed by construction having an FRL not less than that required for the walls; and

(vi) Building elements are required to achieve an FRL from both sides.

Type B Construction - Managers Residence Building

(i) Internal walls required to have an FRL with respect to integrity and insulation, except a wall that bounds a sole occupancy unit in the topmost storey and there is only one unit in that storey, must extend to -

- The underside the floor next above if that floor has an FRL of at least 30/30/30; or
- The underside of a ceiling having a resistance to the incipient spread of fire to the space above itself of not less than 60 minutes; or
- The underside of the roof covering if it is non-combustible and must not be crossed by timber or other combustible building elements, expect for roof battens with dimensions of 75mm x 50mm or less or sarking-type material; or
- 450mm above the roof covering if it combustible.

(ii) Any loadbearing internal wall and a loadbearing fire wall (including shafts) is required to be of concrete or masonry or fire-protected timber;

(iii) The bottom of any shafts is required to be non-combustible and laid directly on the ground unless otherwise enclosed by construction having an FRL not less than that required for the walls; and

(iv) Building elements are required to achieve an FRL from both sides.

C1.1 *Cont'd*

Type C Construction - Artist in Residence Building

(i) Building elements are required to achieve an FRL from the outside only.

Concessions

(i) A floor need not have an FRL if it is within a sole occupancy unit in a class 3 or 4 building;

(ii) A floor need not have an FRL if it is laid directly on the ground;

(iii) A roof of the main building need not achieve an FRL if its covering is non-combustible on the basis the building is provided with a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Spec. E1.5 installed throughout;

(iv) Where the carpark levels are protected by a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Spec. E1.5 and is separated from the class 3 part above in accordance with C2.9, the carpark levels may comply with Table A2.2 as contained within Appendix 2;

Method of attachment not to reduce the fire-resistance of building elements

The method of attaching or installing a finish, lining, ancillary element or service installation to a building element must not reduce the fire-resistance of that element to below that required.

C1.8

Any lightweight construction to internal walls required to achieve an FRL or protection to steel columns required achieve an FRL are required to be tested for resistance in accordance with this clause.

C1.9

It is requested that testing certificates be provided confirming the proposed cladding material has been tested in accordance with AS1530.1 and AS1530.3 and referenced within the next report update.

The following building elements and their components must be non-combustible–

(i) External walls and common walls, including all components in them including the facade covering, framing and insulation;

(ii) The flooring and floor framing of lift pits;

(iii) Non-loadbearing internal walls where they are required to be fire-resisting;

(iv) A shaft, being a lift, ventilating, pipe, garbage, or similar shaft that is not for the discharge of hot products of combustion, that is non-loadbearing;

(v) A loadbearing internal wall and a loadbearing fire wall, including those that are part of a loadbearing shaft.

C1.10	The fire hazard properties for materials proposed to be provided in each building part have been summarised within Table A3.1 as contained within Appendix 3.
C1.14	An ancillary element must not be fixed, installed or attached to the internal parts or external face of an external wall that is required to be non-combustible unless it is one of the elements permitted under this clause.
C2.6	Windows and other openings within external walls (including externals walls not having an FRL of 60/60/60) within buildings of Type A construction (i.e**. main building**), are required to contain vertical separation via either of the following means – (i) The provision of spandrels within the external walls not less than 900mm in height and extend not less than 600mm above the finished floor level. The spandrels are required to non-combustible and have an FRL being not less than 60/60/60; (ii) The provision of horizontal aprons/projections that project outwards from the external face of the wall not less than 1100mm and extends along the wall not less than 450mm beyond the openings concerned. The horizontal projections are required to be non-combustible and have an FRL being not less than 60/60/60); or (iii) Provision of a sprinkler system (other than a FPAA101H system) complying with Spec. E1.5 throughout the building.
C2.7	A fire wall must be constructed in accordance with the following – (i) The fire wall has the relevant FRL prescribed in Spec. C1.1 for each of the adjoining parts, and if these are different, the greater FRL, where Table 3.9, 4.2 and 5.2 of Spec. C1.1 permit a lower FRL on the carpark side; (ii) Any openings in a fire wall must not reduce the FRL required by Spec. C1.1 for the fire wall, except where permitted by Part C3; (iii) Building elements, other than roof battens with dimensions of 75mm x 50mm or less or sarking type material, must not pass through or cross the fire wall unless the required fire resisting performance of the fire wall is maintained. A part of a building separated from the remainder of the building by a fire wall may be treated as a separate fire compartment if it is constructed in accordance with the above and the fire wall extends to the underside of – (i) A floor having an FRL required for a fire wall; and (ii) The roof covering.

C2.8 The following areas highlighted in the figures below are noted as having different classification located alongside one another in the same storey and hence the following options are provided –

(i) **Option 1** – Introduce fire walls complying with C2.7, separating the different classifications. Location of fire wall locations are highlighted in the figures below; or

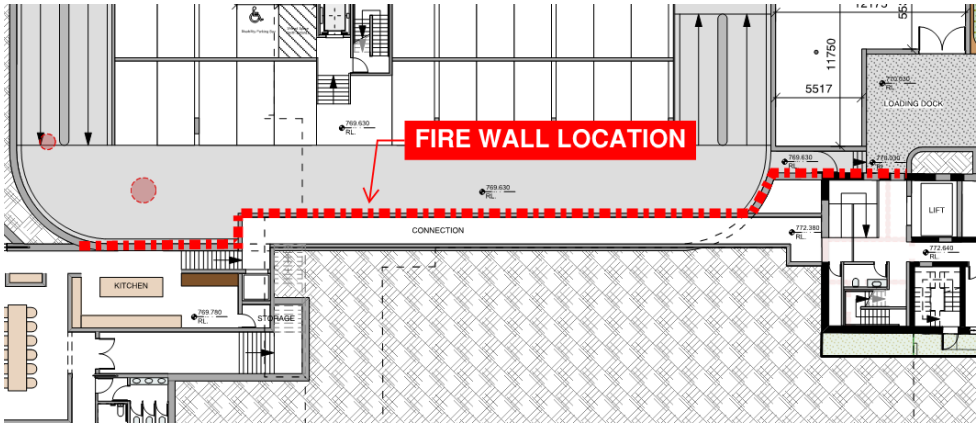


Figure C2.8a – Level 3/4

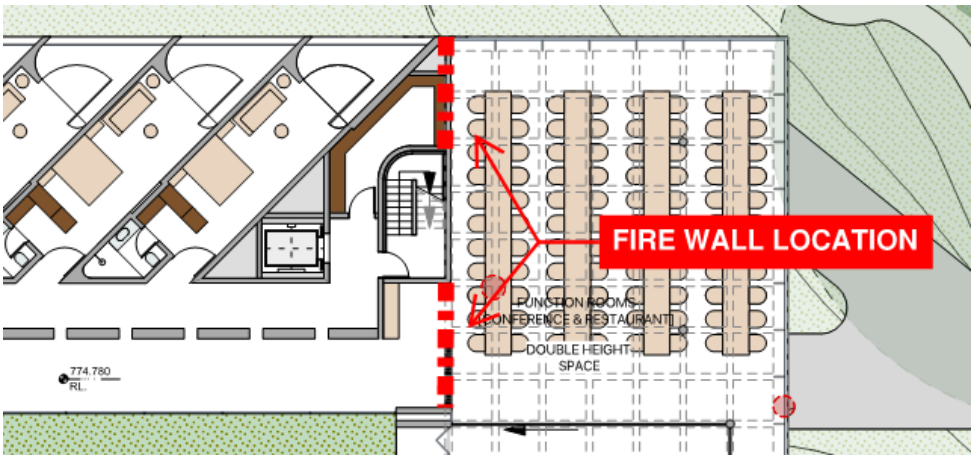


Figure C2.8b – Level 4 east (typical location of fire wall)

Figure C2.8c – Level 4 north

C2.8
Cont'd

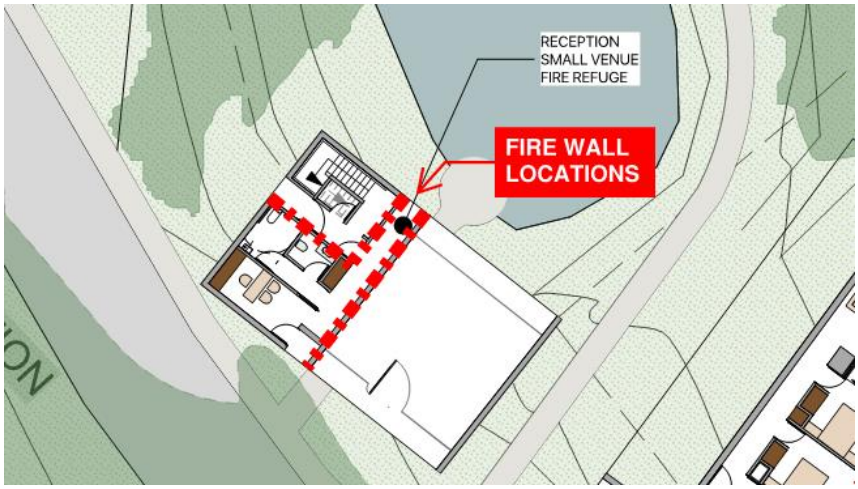


Figure C2.8d – Managers residence building

(ii) **Option 2** – In lieu of the provision of fire walls, all relevant building elements in the storeys having different classifications are to be constructed to achieve the higher FRL prescribed in Spec. C1.1. This includes the intervening floor separating the parts above.

C2.9

The intermediate floors separating different classifications must be separated as follows –

(i) **Type A construction (Main Building)** – the floor between the adjoining parts must have an FRL of not less than that prescribed in Spec. C1.1 for the classification of the lower storey – refer Appendix 2 for required FRL for floors, appropriate to the classification;

(ii) **Type B construction (Managers Residence & Artist in Residence)** – the floor separating the managers residence from the storey below must –

a. be a floor/ceiling incorporating a ceiling which has a resistance to the incipient spread of fire to the space above itself of not less than 60 minutes; or

b. have an FRL of at least 30/30/30; or

c. have a fire-protective covering on the underside of the floor, including beams incorporated in it, if the floor is combustible or of metal.

C2.10

The lift shall be separated from the remainder of the building by shaft walls achieving the required FRLs in accordance with the tables contained in Appendix 2 of this report, appropriate to the building classifcation.

Emergency lifts msut be contained within a fire resisting lift shaft having an FRL of not less than 120/120/120.

Note - where a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Spec. E1.5 is provided within the carpark, the lfit shaft walls need only acheive an FRL 60/60/60 - – refer Table A2.2 within Appendix 2 for further concessions.

C2.12

(i) Lift Installations

If the lift motor and lift control panel are not contained within the lift shaft, then the equipment is required to be separated with construction achieving an FRL of 120/120/120 or --/120/120 (if nonloadbearing) and any access doorway is required to protected with a self-closing fire door having an FRL of --/120/30.

(ii) Plant Equipment

In the event the plant equipment contains boilers then these boilers and associated equipment are required to be separated with construction achieving an FRL of 120/120/120 or --/120/120 (if nonloadbearing) and any access doorway is required to protected with a self-closing fire door having an FRL of --/120/30.

Note, boilers is a defined term within the BCA, hence it is recommended that the services engineer review the terminology to first determine whether any components of the air-handling system constitute as boilers.

C2.13

(i) An electricity substation within the building must be separated by construction having an FRL of not less than 120/120/120 and doorway to it must be protected with a fire door having a minimum FRL of --/120/30;

(ii) The main switch board within the building which sustains emergency equipment operating in the emergency mode must also be separated as per (i) above;

(iii) Electrical conductors within the building that supply a switch board covered under (b) above or a substation that supplies that switchboard must be protected with construction having an FRL of 120/120/120, and be classified in accordance with AS/NZS 3013 as WS53W or WS52W as applicable;

(iv) In switch boards that supply the emergency equipment mentioned above the emergency equipment switch gear must be separated by metal partitions designed to minimize the spread of a fault from the non-emergency equipment switch gear.

C2.14 The eastern extension to the existing main building is proposed to accommodate 3 levels of sole occupancy units, with the public corridors exceeding 40m in length without provison of smoke proof walls (being up to ~65m), as highlighted in figure 1 below.

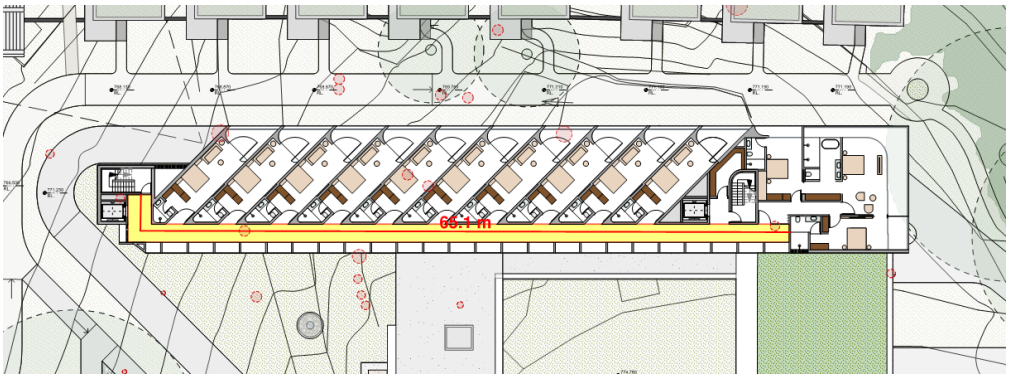


Figure C2.14 - Corridor length (Typical)

To address the compliance departure identified above, the following options are offered for resolution –

(i) Introduce a smoke poof wall complying with Clause 2 of Spec. C2.5 along the public corridors at a distance not exceeding 40m, from one end of the corridor; or

(ii) Justify the proposed configuration of the public corridors via a performance-based solution, demonstrating compliance with the performance requirement/s of the BCA.

Notwithstanding the above, public corridors in the class 3 parts exceeding 40m in length to be divided into intervals of not more than 40m by smoke proof walls complying with Clause 2 of BCA Specification C2.5.

C3.2 The setbacks and location of the class 3-9 buildings on the allotment are noted as being located min. 6m apart.

It is noted that the ecocabins and villas are located within 6m of each other and more than 6m away from other buildings on the allotment, however, have been determined as class 1b buildings and hence not subject to the requirements of this clause – refer section 5 for detailed assessment of the class 1b buildings.

C3.3 Subject to the determination of the proposed strategy to separate building parts of different classifications located alongside one another in the same storey, as detailed in C2.8 above, where the building parts are separated by a fire wall, the following methods of protection are applicable.

Parts of the external walls and openings within them in different fire compartments that are separated by fire walls are located within 6m apart and hence must have –

(i) Each wall must have an FRL of not less than 60/60/60; and

(ii) Any openings protected in accordance with C3.4.

The location of the subject areas requiring protection are highlighted in the figures below.

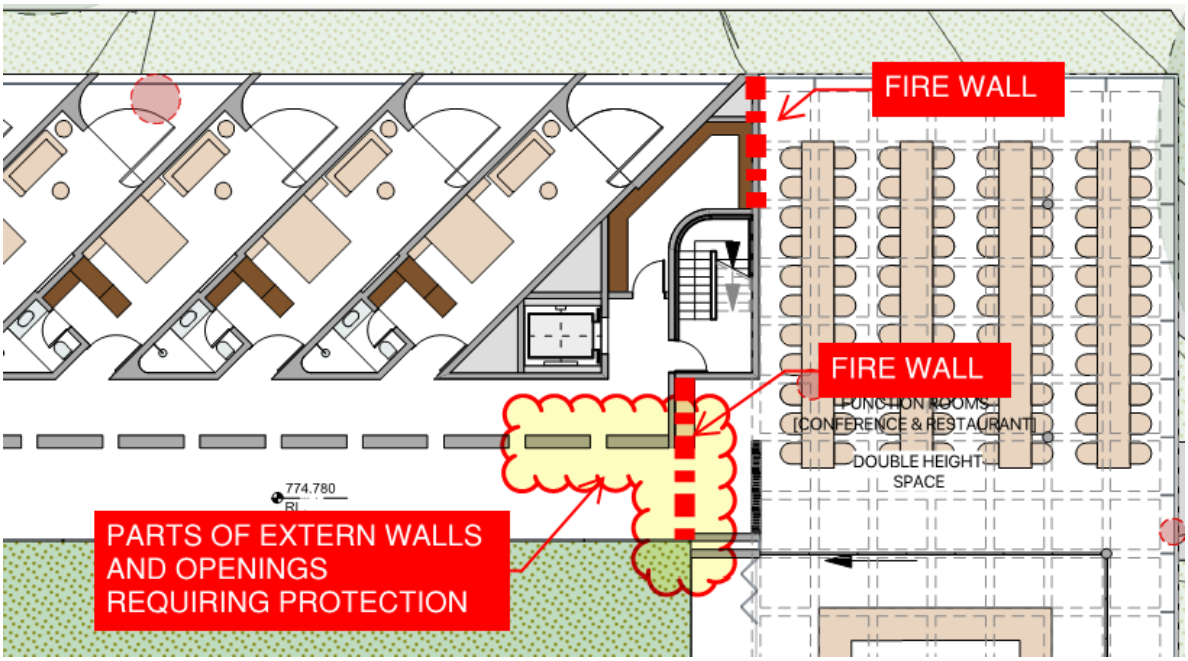


Figure C3.3a – Eastern extension (level 4 to level 6 typical)

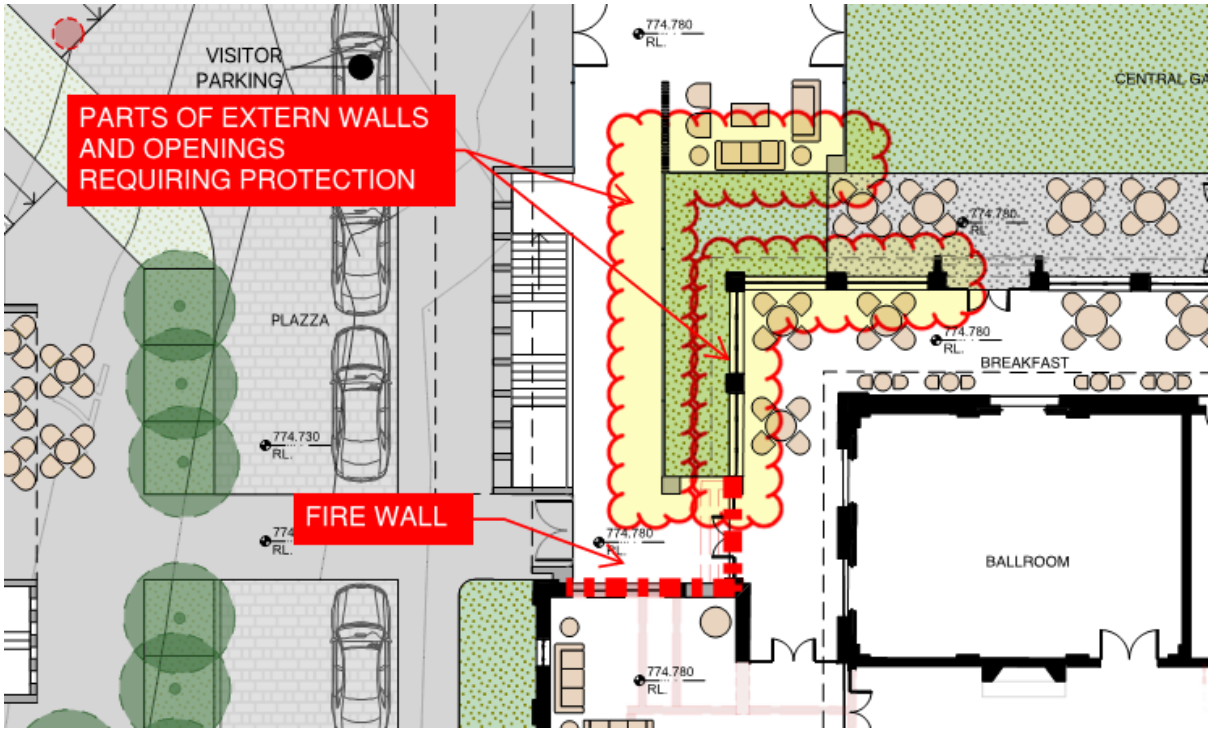


Figure C3.3b – Level 4 north

C3.4	Any openings requiring protection are required to comply with the provisions of this clause and Specification C3.4. Where protection is required, the DTS provisions requires that doorways, windows and other openings must be protected as follows: (i) Doorways: a. External wall-wetting sprinklers used with doors that are self-closing or automatic closing; or b. –/60/30 fire doors that are self-closing or automatic closing.

C3.4 *Cont'd*

(ii) Windows:

a. Wall-wetting sprinklers located externally if windows are automatic closing or permanently fixed in the closed position; or
b. --/60/-- fire windows that are automatically closing or permanently fixed in the closed position; or
c. --/60/-- automatic closing fire shutters.

(iii) Other openings:

a. Excluding voids – internal or external wall-wetting sprinklers, as appropriate;
b. Construction having an FRL not less than -/60/-.
c. Fire doors, fire windows and fire shutters must comply with Specification C3.4.

C3.5

Doorways within a fire wall must be protected by –

(i) 2 fire doors or fire shutters, one on each side of the doorway, each of which has an FRL of not less than ½ that required by Specification C1.1 for the fire wall except that each door or shutter must have an insulation level of at least 30; or

(ii) a fire door on one side and a fire shutter on the other side of the doorway, each of which complies with (i); or

(iii) a single fire door or fire shutter which has an FRL of not less than that required by Specification C1.1 for the fire wall except that each door or shutter must have an insulation level of at least 30.

A fire door or fire shutter must be self-closing, or automatic closing in accordance with the following –

(i) The automatic closing operation required by (b) must be initiated by the activation of a smoke detector, or any other detector deemed suitable in accordance with AS 1670.1 if smoke detectors are unsuitable in the atmosphere, installed in accordance with the relevant provisions of AS 1670.1 and located on each side of the fire wall not more than 1.5 m horizontal distance from the opening.

(ii) Where any other required suitable fire alarm system, including a sprinkler system (other than a FPAA101D system) complying with Specification E1.5, is installed in the building, activation of the system in either fire compartment separated by the fire wall must also initiate the automatic closing operation.

C3.8	(i) Doorways that open to fire-isolated stairways, fire-isolated passageways, and are not doorways opening to a road or open space, must be protected by –/60/30 fire doors that are self-closing, or automatic-closing in accordance with (i) and (ii); (ii) The automatic-closing operation required by (i) must be initiated by the activation of a smoke detector, or any other detector deemed suitable in accordance with AS 1670.1 if smoke detectors are unsuitable in the atmosphere, installed in accordance with the relevant provisions of AS 1670.1 and located not more than 1.5 m horizontal distance from the approach side of the doorway; (iii) Activation of the sprinkler system must also initiate the automatic-closing operation.
C3.9	Fire isolated exits must not be penetrated by any services other than – (i) electrical wiring permitted by D2.7(e) to be installed within the exit; or (ii) ducting associated with a pressurisation system if it – (iii) is constructed of material having an FRL of not less than –/120/60 where it passes through any other part of the building; and (iv) does not open into any other part of the building; or (iii) water supply pipes for fire services.
C3.10	The entrance doorway of the lift shaft must be protected by --/60/-- fire doors that comply with AS1735.11-1986 and are set to remain closed except when discharging or receiving passengers, goods or vehicles. A lift call panel, indicator panel or other panel in the wall of the lift shaft must be backed by construction having an FRL of not less than --/60/60 if it exceeds 35,000mm^2 in area.
C3.11	Doorways providing access from the sole occupancy units and any other rooms not within a sole occupancy unit (i.e. common room) to the public corridor wihtin the class 3 parts must be protected with self-closing -/60/30 fire doors.
C3.12	Where a service passes through a floor required to have an FRL or a ceiling required to have a resistance to the incipient spread of fire (refer to C1.1), that service is required to protected by either a shaft in accordance with C1.1 or in accordance with C3.15.

C3.13	Any opening in a wall providing access to a ventilating, pipe, garbage or other service shaft are required to be protected as follows: (i) Sanitary compartment – Non-combustible door or panel assembly or an FRL of --/30/30; (ii) --/60/30 fire door or hopper that is self-closing; (iii) Access panel with an FRL of --/60/30; or (iv) Garbage shaft – A door or hopper of non-combustible construction.
C3.15	Any openings for service installations (electrical, mechanical, plumbing, etc.) that penetrates a building element which is required to be of fire resisting construction is required to be protected (i.e. fire seals).
C3.16	Construction joints, spaces and the like in and between building elements required to be fire-resisting with respect to integrity and insulation are required to be protected in a manner identical with a prototype tested in accordance with AS1530.4-2014 to achieve the required FRL.
C3.17	Where a column is protected by lightweight construction to achieve the required FRL defined by C1.1 passes through a building element that is also required to have an FRL it is required to be installed using a method and materials identical with the prototype assembly of the construction which has achieved the required FRL.

4.4 Section D – Access and Egress

D1.2	The main building is noted as having an effective height exceeding 25m and hence must be provided with not less than 2 exits to each storey, which is generally provided throughout. However, the upper level community and leisure centre is noted as only having a single exit in lieu of 2. Compliance is readily achievable via the provision of an additional exit discharging from the gym to the external space or by justifying the current configuration via a performance-based solution.

D1.4 Travel distances within the development have been assessed as generally being compliant with the exception of the following areas, as detailed below in figures below -

(i) The travel distance to a point of choice to alternative exits within the swimming pool area exceeds 20m, being up ~34m. Additionally, the overall travel distance to the nearest exit exceeds 40m, being up to ~44m; and

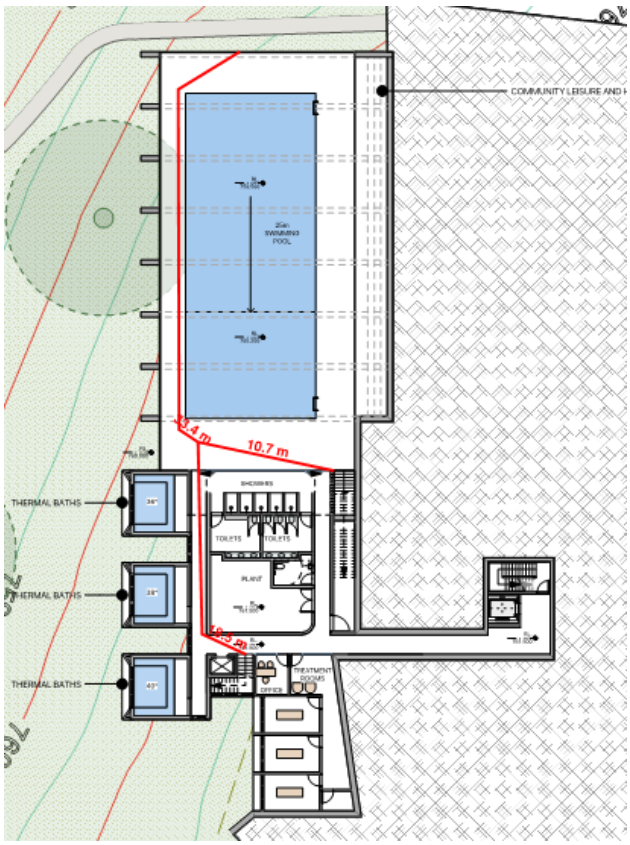


Figure D1.4a – Travel distance in pool area

(ii) The travel distance to the single exit from the upper level of the community leisure centre exceeds 20m, being up to 24m;

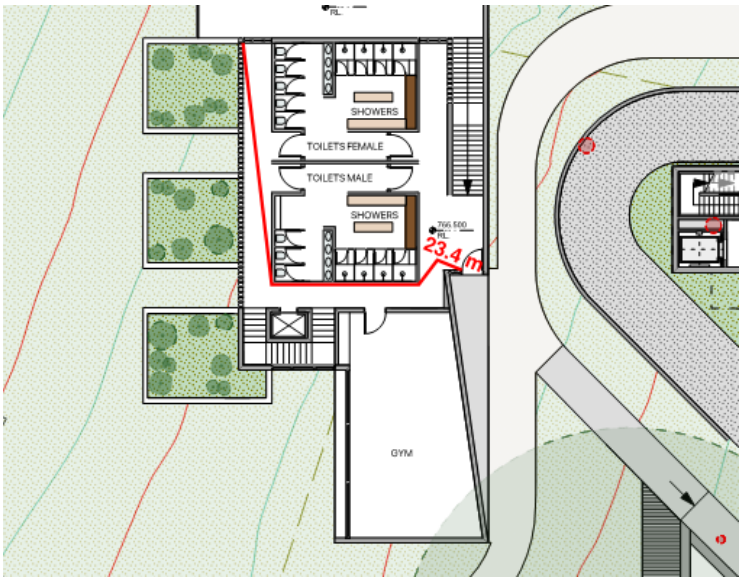


Figure D1.4b - Travel distance within community health and leisure centre

D1.4
Cont'd

(iii) The travel distance to a point of choice to alternative exits from the southern part of the level 3 carpark exceeds 20m, being up to 44m. Additionally, the overall distance to the nearest exit exceeds 40m, being up to 54m.

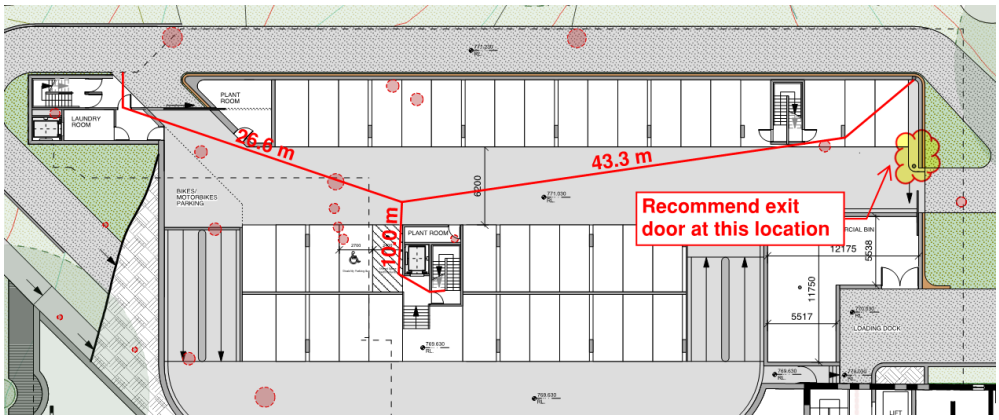


Figure D1.4c – Travel distance within level 3 carpark

To address the extended exit travel distances identified, the following options are offered for resolution –

(i) The current layouts are to be re-configured so that –
a. the distance to a point of choice to alternative exits does not exceed 20m;
b. the distance to the nearest exit does not exceed 40m.

(ii) Justify the extended exit travel distances identified via a performance-based solution, demonstrating compliance with the relevant performance requirement/s of the BCA.

Notwithstanding the above, the travel distances to exits should not exceed the following -

<u>Class 5-9 (carpark, function rooms, restaurants, health centre)</u>

(i) No point on a floor must be more than 20 m from an exit, or a point from which travel in different directions to 2 exits is available, in which case the maximum distance to one of those exits must not exceed 40 m.

<u>Class 3 (hotel)</u>

(i) 6 m from an exit or from a point from which travel in different directions to 2 exits is available;

(ii) 20m from a single exit at the level of egress to a road or open space;

(iii) no point on the floor of a room which is not in a *sole-occupancy unit* must be more than 20 m from an *exit* or from a point at which travel in different directions to 2 *exits* is available.

D1.5

The distance between alternative exits within the class 3 public corridor of the eastern extension of the main building exceeds 45m, being up to ~59m.

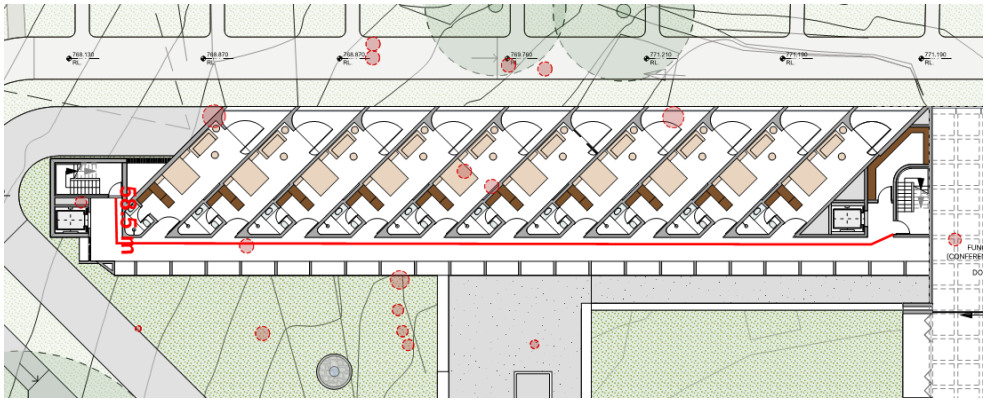


Figure D1.5 – Extended travel distance between exit in class 3 part

To address the extended exit travel distances identified, the following options are offered for resolution –

(i) The current layouts are to be re-configured so that the exits are not more than 45m apart in the class 3 parts.

(ii) Justify the extended exit travel distances identified via a performance-based solution, demonstrating compliance with the relevant performance requirement/s of the BCA.

Notwithstanding the above, the exits that are required as alternative exits must be-

(i) Not less than 9m apart; and

(ii) Not more than 45m apart in the class 3 parts;

(iii) Not more than 60m apart in all other cases;

(iv) Located so that the alternative paths of travel do not converge such that they become less than 6m apart.

D1.6

The path of travel to an exit and any required exit is to have an unobstructed height throughout of not less than 2m (except a doorway, which can be 1980mm) and an unobstructed width not less than 1m (except a doorway, which can be 750mm in an area not required to be accessible and 850mm in an area required to accessible).

D1.7

The fire isolated stairway within the main building are highlighted **red** in the figure below, with the following items noted.

Figure D1.7 – Location of fire isolated stairways in main building

(i) The northern fire isolated stairway is noted as discharging to a covered area and the path of travel from the point of discharge requires occupants to pass by wihtin 6m of the external wall and openings within the external wall of the building before reaching the open space;

(ii) The southern fire isolated stairway discharges internally wihtin the building in lieu of directly external to the building or to a covered area, or within the confines of the building, as permitted by D1.7 of the BCA.

To address the above, ensure that the fire isolated stairways, discharge directly to –

(a) a road or *open space*; or
(b) a point—
- in a *storey* or space, 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
- from which an unimpeded path of travel, not further than 20 m, is available to a road or *open space*; or

(c) into a covered area that—
- adjoins a road or *open space*; and
- is open for at least 1/3 of its perimeter; and
- has an unobstructed clear height throughout, including the perimeter openings, of not less than 3 m; and
- provides an unimpeded path of travel from the point of discharge to the road or *open space* of not more than 6 m; or

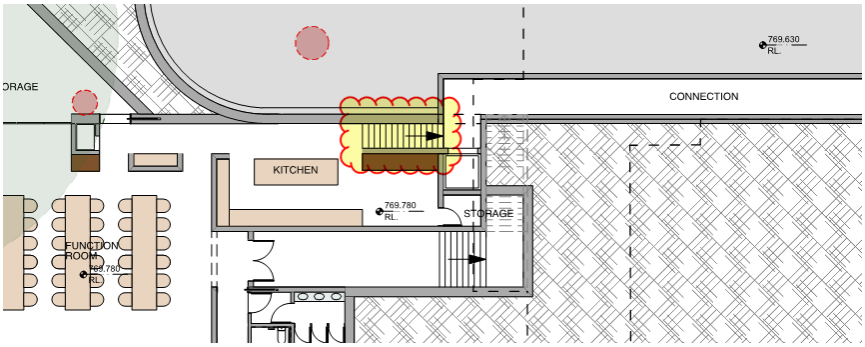
Where a path of travel from the point of discharge of a fire-isolated exit necessitates passing within 6 m of any part of an external wall of the same building, measured horizontally at right angles to the path of travel, that part of the wall must have—

(i) an FRL of not less than 60/60/60; and
(ii) any openings protected internally in accordance with C3.4,

for a distance of 3 m above or below, as appropriate, the level of the path of travel, or for the height of the wall, whichever is the lesser.

D1.9

The non-fire isolated stairway connecting the kitchens within the main building on level 3 is provided as discontinuous;



To address the above the following options are offered for resolution –

(i) Re-configure the subject layout so that the non-fire isolated stairway is continuous by its own flights and landings from every storey served to the level at which egress to a road or open space is provided; or

(ii) Justify the current stairway configuration via a performance based solution, demonstrating compliance with the relevant performance requirements of the BCA.

D1.10

The discharge points of the exits are required to have an unobstructed width of 1m (including gates) and be via a stairway, ramp or other incline having a gradient of no steeper than 1:8 or complying with AS1428.1-2009- amendment 2 (where required to be accessible for people with a disability).

As the design further develops, landscape plans are to be submitted for review and assessment to confirm compliance with the above provisions.

D1.17

Access to list pits must –

(a) Where the pit depth is not more than 3m, be through the lowest landing doors; or

(b) Where the pit depth is more than 3m, be provided through an access doorway complying with the following –

(i) In lieu of D1.6, the doorway must be level with the pit floor and not be less than 600 mm wide by 1980 mm high clear opening, which may be reduced to 1500 mm where it is necessary to comply with (i).

(ii) No part of the lift car or platform must encroach on the pit doorway entrance when the car is on a fully compressed buffer.

(iii) Access to the doorway must be by a stairway complying with AS 1657.

(iv) In lieu of D2.21, doors fitted to the doorway must be—

A. of the horizontal sliding or outwards opening hinged type; and
B. self-closing and self-locking from the outside; and
C. marked on the landing side with the letters not less than 35 mm high:

"DANGER LIFTWELL – ENTRY OF UNAUTHORIZED PERSONS PROHIBITED – KEEP CLEAR AT ALL TIMES"

D2.2

A stairway or ramp (including any landings) that is required to be within a fire-resisting shaft must be constructed –

(i) of non-combustible materials; and

(ii) so that if there is local failure it will not cause structural damage to, or impair the fire-resistance of, the shaft.

D2.3

The required non-fire isolated stairway (including landings and any supporting building elements) must be constructed in accordance with D2.2, or only of –

(i) Reinforced or prestressed concrete; or

(ii) Steel in no part less than 6mm thick; or

(iii) Timber that –

- Has a finished thickness of not less than 44mm;
- Has an average density of not less than 800 kg/m3 at a moisture content of 12%; and
- Has not been joined by means of glue unless it has been laminated and glued with resorcinol formaldehyde or resorcinol phenol formaldehyde glue.

D2.4

The fire-isolated stairways connecting the community leisure and health centre, carpark levels and hotel part above appear to have direct connection between rising and descending stair flights.

Figure D2.4– Typical location of fire isolated stairways having direct connection of rising and descending stair flights

There must be no connection between a flight rising from a storey below the lowest level of access to a road or open space, and the flight descending from a storey above that level.

Any construction that separates or is common to the rising and descending flights must be: non-combustible and smoke proof in accordance with Clause 2 of Specification C2.5.

D2.7 Gas or other fuel services shall not be installed within the required exits; and

Any services or equipment (being electrical meters, distribution boards or the like) installed within the hallway are required to be enclosed by non-combustible construction or a fire-protective covering (i.e. 1 layer of 13mm fire-protective grade plasterboard) with doorway(s) or opening(s) suitably sealed against smoke spreading from the enclosure.

D2.8 The space below a required non-fire isolated stairway (including an external stairway) 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.

D2.10 The pedestrian ramp serving the kitchen area within the main building on level 4 is noted as having a gradient of 1:10.

The floor surface of the ramp must have a slip resistance classification of not less than P4 (dry) and P5 (wet) when tested in accordance with AS4586.

D2.12 The roof of the level 3 carpark and function room is used as an open space form the discharge of exits on level 4, and hence must have an FRL of not less than 120/120/120.

D2.13 The going, riser and steepness dimension of the stairways are required to be designed within the following range:

STAIRWAY LOCATION	RISER (R)	GOING (G)	QUANTITY (2R + G)
Public	Max: 190mm Min:115mm	Max:355mm Min: 250mm	Max: 700mm Min:550mm
Private	Max:190mm Min: 115mm	Max: 355mm Min: 240mm	Max: 700mm Min: 550mm

(i) The risers and goings are required to be constant throughout the flight except variations of no greater than 5mm are permitted between adjacent risers or goings and no greater than 10mm are permitted between the smallest and largest goings or risers in a flight; and

(ii) The stair treads are required to have a surface or nosing strip achieving a slip-resistance classification of P3 or R10 in dry or P4 or R11 in wet tested in accordance with AS4586-2013 (amendment 1).

D2.14 Stair landings are required to be a minimum of 750mm long with a gradient not steeper than 1:50 and have a slip-resistance surface or strip.

The surface or strip is required to achieve a slip-resistance classification of P3 or R10 in dry or P4 or R11 in wet tested in accordance with AS4586-2013 (amend 1).

D2.15 The threshold of a doorway is not permitted to incorporate a step or ramp at any point closer to the doorway than the width of the door leaf.

That is unless the doorway opens to a road or open space and:

(i) In a building required to be accessible, is provided with a threshold or step ramp in accordance with AS1428.1-2009; or

(ii) In all other cases, the door sill is not more than 190mm above the finished surface of the ground.

D2.16 Balustrades are required to be constructed as follows:

(i) To a height not less than 865mm above the nosings of the stair treads or the floor of a ramp;

(ii) 1000mm above the floor of any access path, balcony, landing or the like;

(iii) Any opening does not permit a 125mm sphere to pass through it and for stairs, the space is measured above the nosings;

(iv) For floors more than 4m above the surface beneath, any horizontal or near horizontal elements between 150mm and 760mm must not facilitate climbing; and

(v) For balustrades in fire-isolated stairways used primarily for emergency purposes openings between balustrades can be up to 300mm or where rails are used, the bottom rail must be a maximum of 150mm above the stair nosings line or from the landing or floor and the opening between rails must not be more than 460mm.

D2.17 Handrails are required along one (1) side of each stairway flight and ramp, unless required to assist people with a disability as required by D3.3 of the BCA – refer Access Design Assessment Report prepared by this office for detailed requirements.

The handrails are required to fixed at a height of not less than 865mm measured above the nosings of the stair treads or ramp and be continuous such that no obstruction on or above them will tend to break a hand hold.

D2.19

A doorway serving as a required exit or forming part of a required exit –

(i) Must not be fitted with a revolving door;

(ii) Must not be fitted with a sliding door unless –

- ❑ It leads directly to a road or open space; and
- ❑ The door is able to be opened manually under a force of not more than 110N; and

(iii) If fitted with a door which is power-operated –

- ❑ It must be able to be opened manually under a force of not more than 110N if there is a malfunction or failure of the power source; and
- ❑ If it leads directly to a road or open space it must open automatically if there is a power failure to the door or on the activation of a fire or smoke alarm anywhere in the fire compartment served by the door.

D2.21

Any door in a required exit, forming part of a required exit or in the path of travel to a required exit are required to be readily operable without a key from the side that faces a person seeking egress and:

(i) By a single hand pushing or downward action on a single device located between 900mm and 1100mm from the floor;

- ❑ Be such that the hand of a person who cannot grip will not slip from the handle during the operation of the latch; and
- ❑ Have a clearance between the handle and the back plate or door face at the centre grip section of the handle of not less than 35mm nor more than 45mm; or
- ❑ A single hand pushing action on a single device which is located between 900mm and 1.2m above the floor.

(ii) Where the latch operation device referred to above is not located on the door leaf itself –

- ❑ Manual controls to power-operated doors must be at least 25mm wide, proud of the surrounding surface and located-
- ❑ Not less than 500mm from an internal corner; and
- ❑ For a hinged door, between 1m and 2m from the door leaf in any position; and
- ❑ For a sliding door, within 2m of the doorway and clear of a surface mounted door in the open position
- ❑ Braille and tactile signage complying with Clause 2 and 6 of Specification D3.6 must identify the latch operation.

(iii) Fitted with a fail-safe device which automatically unlocks the door upon the activation of any sprinkler system or detection system deemed suitable in accordance with AS1670.1-2018 installed throughout the building.

D2.22 The doors of the fire isolated exits serving the class 3 parts must not be locked from the inside, serving any storey above an effective height of 25m, throughout the exit.

The above requirements do not apply to a door fitted with a fail-safe device that automatically unlocks the door upon the activation of a fire alarm and –

(i) 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

(ii) an intercommunication system, or an audible or visual alarm system, operated from within the enclosure is provided near the doors and a sign is fixed adjacent to such doors explaining its purpose and method of operation.

D2.23 Signage complying with this clause to alert persons that the operation of certain doors is required to be installed on or adjacent to –

(i) a required fire door providing direct access to a fire isolated exit, except a door providing direct egress from a SOU,

on the side of the door that faces a person seeking egress and if the door is fitted with a device for holding it in the open position, on either the wall adjacent to the doorway or both sides of the door; and

(ii) both sides of a door leading from a fire isolated to a road or open space.

Signage referred to above must be in capital letters not less than 20mm high in a colour contrasting with the background and state –

(i) for an automatic door held open by an automatic hold-open device
"FIRE SAFETY DOOR-DO NOT OBSTRUCT"

(i) for a self-closing door –
"FIRE SAFETY DOOR
DO NOT OBSTRUCT
DO NOT KEEP OPEN"

(ii) for a door discharging from a fire isolated exit –
"FIRE SAFETY DOOR-DO NOT OBSTRUCT"

D2.24 Window openings to bedrooms require protection, if the floor below the window is 2m above the surface beneath.

Protection need not be provided where the lowest level of the window is 1.7m or more above the finished floor level.

(i) Protection can be in the form of the following:

a. The openable portion of the window must be protected with a device to restrict the window opening or a screen with secure fittings;
b. The device or screen must not permit a sphere greater than 125mm is permitted to pass through;
c. Resist the outward horizontal action of 250N against the window or screen;
d. Have a child resistant release mechanism if the screen or device can be removed, unlocked or over ridden; and

D2.24 *Cont'd*

(ii) Protection can be in the form of the following:

a. The openable portion of the window must be protected with a device to restrict the window opening or a screen with secure fittings;
b. The device or screen must not permit a sphere greater than 125mm is permitted to pass through;
c. Resist the outward horizontal action of 250N against the window or screen;
d. Have a child resistant release mechanism if the screen or device can be removed, unlocked or over ridden; and

(iii) A barrier with a height of not less than 865mm above the floor is required to an openable window:

a. In addition, to window protection as per (i) above;
b. Where the floor below the window is 4m or more above the floor or if the window is not covered above; and
c. Any horizontal or near horizontal elements between 150mm and 760mm must not facilitate climbing and have no gaps greater than 125mm.

4.5 Section E – Services and Equipment

E1.3

A fire hydrant system complying with AS2419.1-2005 is required to serve the building, including -

(i) All points on a floor are required to be within reach of a 10 m hose stream issuing from a nozzle at the end of a –

a. 30 m length of hose laid on floor, connected to an internal attack fire hydrant outlet
b. 60m length of a hose laid on the floor, connected to an external fire hydrant outlet.

(ii) Additional hydrants can be installed in appropriate locations, where additional coverage is required;

(iii) Where a sprinkler system is installed throughout the building in accordance with AS2118.1, AS2118.4, AS2118.6, FPAA101H or FPAA101D, the fire hydrant booster protection requirements of Clause 7.3(c)(ii) and 7.3(d)(iii) of AS2419.1-2005 do not apply;

(iv) If the fire brigade booster assembly is within, or affixed to, the external wall of the building, the booster shall be within sight of the main entrance to the building;

(v) If the fire brigade booster assembly is remote from the building, it is required to be at the boundary of the site, be within sight of the main entrance of the building and adjacent to the principal vehicular access to the site.

E1.4

A hose reel system complying with AS2441-2005 is required to serve the class 7a and class 9 parts within the subject development.

A fire hose reel system must be provided in accordance with the following -

(i) Hose reels are required to be located within 4m of an exit; and

(ii) All points on a floor are required to be in reach of a 4m hose stream at the end of a 36m hose length laid on the floor;

(iii) Additional hose reels can be installed along the path of travel where additional coverage is required.

Note - Hose reel coverage does not apply to the class 3 parts.

E1.5

An automatic fire sprinkler system is required to be installed throughout the whole of the main building as the effective height exceeds 25m. Sprinklers are not required throughout the ecocabins, villas, managers residence building and artist in residence.

The required sprinkler system shall be in accordance with Specification E1.5 of the BCA, as applicable.

E1.6

Portable extinguishers must be provided in accordance with Table E1.6 to cover risk classes throughout the whole building.

Portable fire extinguishers complying with AS2444-2001 are required as follows:

(i) To cover Class A fire risks associated with the Class 3, 4 or 5 parts;

(ii) To cover Class B (if more than 50L excluding vehicle fuel tanks is stored); and

(iii) To cover Class AE or E fire risks associated with emergency service switchboards; and

(iv) To cover Class F fire risks involving cooking oils and fats in kitchens.

Within the class 3 & 4 parts, portable fire extinguishers are to be located within 10m of the entrance doorway of each sole occupancy unit.

E1.8

A fire control centre facility in accordance with Spec. E1.8 must be provided for the main building on the basis it has an effective height of more than 25m.

E2.2 The building requires all the following smoke hazard management systems –

Main building

(i) A smoke detection system complying with Clause 4 of Spec. E2.2a of the BCA & AS1670.1-2018; and

(ii) The smoke detection system is required to activate the emergency warning and intercommunication system complying with Clause E4.9 and AS1670.4-2018; and

(iii) The smoke detection system must be connected to a fire alarm monitoring system connected to a fire station or fire station dispatch centre in accordance with AS1670.3-2018; and

(iv) For the class 9b parts, an automatic shutdown of any air handling system (other than non-ducted individual room units with a capacity not more than 1000L/s and miscellaneous exhaust air systems installed in accordance with Sections 5 and 6 of AS1668.1) which does not form part of the smoke hazard management system, on the activation of –

a. Smoke detectors installed complying with Clasue 6 of Spec. E2.2a
b. Any other installed fire detection and alarm system, including a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Spec. E1.5.

(v) For the class 7a carpark levels, where a mechanical ventilation system is provided in accordance with AS1668.2 it must comply with Clause 5.5 of AS1668.1, except that –

a. Fans with metal blades suitable for operation at normal temperature may be used;
b. The electrical power and control cabling need not be fire rated.

Managers residence building

(i) A smoke alarm system complying with Clause 3 of Spec. E2.2a and AS3786 to the class 4 part; and

(ii) For the class 9b part, an automatic shutdown of any air handling system (other than non-ducted individual room units with a capacity not more than 1000L/s and miscellaneous exhaust air systems installed in accordance with Sections 5 and 6 of AS1668.1) which does not form part of the smoke hazard management system, on the activation of –

a. Smoke detectors installed complying with Clause 6 of Spec. E2.2a
b. Any other installed fire detection and alarm system, including a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Spec. E1.5.

E2.2
Cont'd

Artist in Residence building

An automatic shutdown of any air handling system (other than non-ducted individual room units with a capacity not more than 1000L/s and miscellaneous exhaust air systems installed in accordance with Sections 5 and 6 of AS1668.1) which does not form part of the smoke hazard management system, on the activation of –

a. Smoke detectors installed complying with Clause 6 of Spec. E2.2a
b. Any other installed fire detection and alarm system, including a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Spec. E1.5.

General

In addition to the above, the following applies to any air-handling system provided within the building which does not form part of a smoke hazard management system and which recycles air from one fire compartment to another fire compartment or operates in a manner that may unduly contribute to the spread of smoke from one fire compartment to another fire compartment must -

(i) be designed and installed to operate as a smoke control system in accordance with AS/NZS 1668.1-2012 (amendment 2); or

(ii) incorporate smoke dampers where the air-handling ducts penetrate any elements separating the fire compartments served and be arranged such that the air-handling system is shut down and the smoke dampers are activated to close automatically by smoke detectors complying with clause 7.5 of AS 1670.1-2018.

E3.1

An electric passenger lift installation and an electrohydraulic passenger lift installation must comply with Specification E3.1.

E3.2

A stretcher facility must be provided –

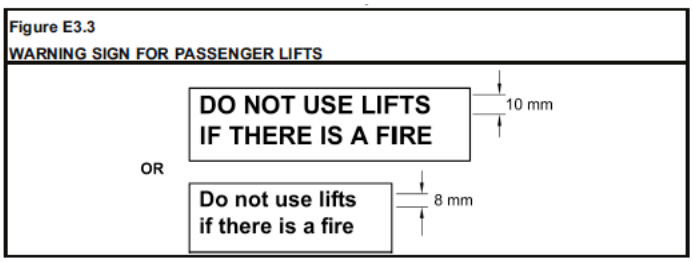
(i) In at least one emergency lift required by E3.4; or

(ii) Where an emergency lift is not required, if passenger lifts are installed to serve any storey above an effective height of 12m, in at least one of those lifts to serve each floor serve by the lift.

A stretcher facility must accommodate a raised stretcher with a patient lying on it horizontally by providing a clear space not less than 600mm wide x 2000mm long x 1400mm high above the floor level.

E3.3

A warning sign must be displayed where it can be readily seen near every call button for a passenger lift and comply with the details and dimensions of Figure E3.3 of the BCA.



E3.4

(i) At least one emergency lift must be installed in the main building on the basis it has an effective height of more than 25m.

(ii) An emergency lift may be combined with a passenger lift and must serve those storeys served by the passenger lift so that all storeys of the building served by passenger lifts are served by at least one emergency lift.

(iii) Where two or more passenger lifts are installed and serve the same storeys –

a. At least two emergency lifts must be provided to serve those storeys; and

b. If located within different shafts, at least one emergency lift must be provided in each shaft.

(iv) An emergency lift must be contained within a fire resisting shaft in accordance with C2.10, having an FRL of not less than 120/120/120.

E3.7

Where lifts serve any storey above an effective height of 12m, the following must be provided –

(i) A fire service recall control switch complying with E3.9 for

a. A group of lifts; or

b. A single lift no in a group that serves the storey

(ii) A lift car fire service drive control switch complying with E3.10 for every lift.

E3.9

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.

The switch must be provided in accordance with the requirements of this clause.

E3.10

The lift car fire service drive control switch required by E3.7 must be activated from within the lift car. The switch must be provided in accordance with the requirements of this clause.

E4.2

Emergency lighting complying with AS/NZS 2293.1-2018 is required to be installed throughout.

E4.5	Exit signage complying with AS/NZS 2293.1-2018 are required installed above or adjacent to any doorways serving as required exits from the building and final doors from stairways.
E4.6	If an exit is not readily apparent to persons occupying or visiting either the building, then exit signs complying with AS/NZS 2293.1-2018 are required to be installed in appropriate positions in corridors, hallways, lobbies and the like, indicating the direction to a required exit.
E4.9	An emergency and warning intercom system for emergency purposes complying with AS1670.4-2018 is required to serve the main building on the basis the effective height exceeds 25m and the class 3 building has a rise in storeys of more than 2.

4.6 Section F – Health and Amenity

F1.0	Weatherproofing of external wall(s) are required to comply with Verification Method FV1 (i.e. certificate of conformity). There are no Deemed-to-Satisfy Provisions for this Performance Requirement in respect of external walls.
F1.1	Stormwater drainage must comply with AS/NZS3500.3-2018.
F1.4	Waterproofing membranes for external above ground use (i.e. balconies and roof) are required to comply with AS4654-2012.
F1.5	A roof must be covered with — (i) Concrete roofing tiles complying with AS 2049 and fixed, except in cyclonic areas, in accordance with AS 2050, as appropriate; or (ii) terracotta roofing tiles complying with AS 2049 and fixed, except in cyclonic areas, in accordance with AS 2050; (iii) cellulose cement corrugated sheeting complying with AS/NZS 2908.1 and installed in accordance with AS/NZS 1562.2; or (iv) metal sheet roofing complying with AS 1562.1; or (v) plastic sheet roofing designed and installed in accordance with AS/NZS 4256.1, AS/NZS 4256.2, AS/NZS 4256.3, AS/NZS 4256.5 and AS/NZS 1562.3; or (vi) Terracotta, fibre-cement and timber slates and shingles designed and installed in accordance with AS 4597, except in cyclonic areas.
F1.6	Any sarking-type materials used for weatherproofing of roofs and walls are required to comply with AS/NZS4200.1-2017 and AS4200.2- 2017 incorporating amendment 1.

F1.7	Building elements in wet areas must be water-resistant or waterproof in accordance with Table F1.7 and comply AS 3740-2010.
F1.9	Where a damp-proof course is provided, it must consist of a material that complies with AS/NZS2904 or impervious sheet material in accordance with AS3660.1.
F1.10	A floor laid directly onto ground or fill must be provided with a vapour barrier complying with AS2870-2011.
F1.11	A bathroom or laundry located at any level above a class 3 or 4 sole-occupancy unit or public space must have a floor waste and the floor graded to the floor waste to permit drainage of water.
F1.13	The glazed assemblies in an external wall must comply with AS2047-2014 (amendments 1 and 2) for resistance to water penetration.
F2.1	For facilities in the class 3 parts, the following must be provided for each 10 residents for whom private facilities are not provided – (i) A bath or shower; and (ii) A closet pan; and (iii) A washbasin. For the sole occupancy unit of the managers residence, the following must be provided – (i) A kitchen sink and facilities for the preparation and cooking of food; and (ii) A bath or shower; and (iii) A closet pan; and (iv) A washbasin; and (v) Clothes washing facilities, comprising a washtub and space in the same room for a washing machine. Note that a kitchen sink or washbasin must not be counted as a laundry washtub; and (vi) A clothes line or hoist, or space for a heat operated drying cabinet or similar appliance for the exclusive use of the occupants.
F2.3	Facilities for occupants in the class 3 and 9b parts must be provided in accordance with Table F2.3 of the BCA.

F2.5

The door to a full enclosed sanitary compartment is required to:

- Open outwards;
- Slide; or
- Be readily removable from the outside of the sanitary compartment (i.e. lift-off hinges).

Unless there is a clear space of at least 1.2m between the closest pan within the sanitary compartment and the hinge side edge of the doorway.

F3.1

The required unobstructed ceiling heights throughout the buildings must not be less than -

Class 3 and Class 4 parts

(i) A corridor, passageway or the like – 2.1m;
(ii) A bathroom, sanitary compartment, store room, car parking area or the like – 2.1m;
(iii) A residential kitchen, laundry or the like – 2.1m;
(iv) A habitable room in a residential SOU excluding a kitchen – 2.4m;
(v) Above a stairway, ramp, landing or the like – 2m.

Class 5 and 7a parts

(i) A corridor, passageway or the like – 2.1m;
(ii) A bathroom, sanitary compartment, store room, car parking area or the like – 2.1m;
(iii) Above a stairway, ramp, landing or the like – 2m.
(iv) All other areas – 2.4m.

Class 9b parts

(i) A corridor that serves a part that accommodates not more than 100 persons – 2.4m;
(ii) A corridor that serves a part that accommodates more than 100 persons - 2.7m;
(iii) A bathroom, sanitary compartment, store room, car parking area or the like – 2.1m;
(iv) A commercial kitchen – 2.4m;
(v) Above a stairway, ramp, landing or the like – 2m.

F4.1

Natural light must be provided to all habitable rooms within the class 4 part (managers residence) and all bedrooms and dormitories in the class 3 parts.

Methods of providing natural right is to be in accordance with Clause F4.2.

F4.2 All habitable rooms are required to have natural lighting provided by either –

(i) Window(s) having a light transmitting area of not less than 10% of the floor area of the room, which are open to the sky or face a court or other space open to the sky or an open veranda, carport or the like; or

(ii) Roof light(s) having a light transmitting area of not less than 3% of the floor area of the room and open to the sky; or

(iii) A proportional combination of windows and roof lights required by (i) and (ii).

F4.3 Natural light to a room in the class 4 part or in an SOU of the class 3 parts, may come through one or more glazed panels or openings from an adjoining room (including an enclosed verandah) if –

(i) both rooms are within the same sole-occupancy unit or the enclosed verandah is on common property; and

(ii) the glazed panels or openings have an aggregate light transmitting area of not less than 10% of the floor area of the room to which it provides light; and

(iii) the adjoining room has—

(A) windows, excluding roof lights, that have an aggregate light transmitting area of not less than 10% of the combined floor areas of both rooms and are open to the sky or face a court or other space open to the sky or an open verandah, carport or the like; or

(B) roof lights, that have an aggregate light transmitting area of not less than 3% of the combined floor areas of both rooms; and are open to the sky; or

(C) a proportional combination of windows and roof lights required by (A) and (B).

F4.4 Artificial lighting in accordance with AS/NZS1680.0 must be provided —

(i) In required stairways, passageways and ramps; and

(ii) If natural lighting equivalent to the requirements of F4.2 is not available, to —

a. Class 4 part - to sanitary compartments, bathrooms, shower rooms, airlocks and laundries; and

b. Class 3, 5 & 9b parts - to all rooms frequently occupied, all spaces required to be accessible; corridors, lobbies and similar circulation spaces and paths of egress.

The system may provide a lesser level of illumination to the museum, gallery or the like, where sensitive displays require low lighting levels.

F4.5 Any habitable room, sanitary compartment, bathroom, laundry and any other room occupied by a person for any purpose must have either -

(i) Natural ventilation (i.e. opening(s) having an openable area of 5% of the room being served) complying with F4.6; or

(ii) Mechanical ventilation complying with AS1668.2-2012 (amendment 2).

F4.6	Natural ventilation must consist of openings, windows, doors or other devices which can be opened with a ventilating area not less than 5% of the floor area of the room required to be ventilated. Natural ventilation may be provided by borrowing ventilation from an adjoining room in accordance with the requirements of Clause F4.7.
F4.8	Numerous bathrooms / sanitary compartments within the class 3 sole occupancy units are noted as opening directly into the kitchen and hence must be protected in accordance with F4.9.
F4.9	A sanitary compartment opening directly into a kitchen within a sole occupancy unit in a class 3 or 4 part must – (i) Have access provided by an airlock, hallway or other room; or (ii) Be provided with mechanical exhaust ventilation.
F4.11	The carpark levels must have - (i) A system of mechanical ventilation complying with AS1668.2; or (ii) A system of natural ventilation complying with Section 4 of AS1668.4.
F4.12	A commercial kitchen must be provided with a kitchen exhaust hood complying with AS1668.1 and AS1668.2 where – (i) Any cooking apparatus has a. A total maximum electrical power input exceeding 8kW; or b. A total gas power input exceeding 29 MJ/h; or (ii) The total maximum power input to more than one apparatus exceeds – a. 0.5kW electrical power; b. 1.8 MJ/hour gas, per m^2 of floor area of the room or enclosure.
F5.4	A floor in the class 3 building must have an Rw + Ctr (airborne) of not less than 50 and an Ln,w+C1 (impact) not more than 62 where it separates: (i) sole-occupancy units; or (ii) a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification.

F5.5 Internal walls in the class 3 parts are required to be constructed as follows:

(i) The walls that separate sole-occupancy units must have an $R_w + C_{tr}$ (airborne) of not less than 50;

(ii) The walls that separate sole-occupancy units from public corridors, internal exit stairways, lifts, other rooms or the like and different classifications require an R_w (airborne) of not less than 50;

(iii) Be of discontinuous construction if the wall separates a bathroom, sanitary compartment, laundry or kitchen in a sole-occupancy unit from a habitable room (other than a kitchen in an adjoining unit) or lift shaft;

(iv) Doorways providing access to sole-occupancy units from public corridors must have an R_w of not less than 30; and

(v) A wall required to have a sound insulation must be constructed such that the wall continues to the underside of:
- The floor above;
- A ceiling having the same sound insulation required for the wall; and
- The underside of the roof above.

(vi) Services must not be chased into concrete or masonry elements.

F5.6 Any duct, soil, stormwater, waste or water supply pipe (including a duct or pipe that is located in a wall or floor cavity) serves or passes through more than one (1) sole-occupancy unit, the duct or pipe must be separated from the rooms of any sole-occupancy unit by construction with an $R_w + C_{tr}$ (airborne) not less than:

(i) 40 if the adjacent room is a habitable room (other than a kitchen); or

(ii) 25 if the adjacent room is a kitchen or non-habitable room.

F5.7 A flexible coupling must be used at the point of connection between the service pipes in a building and any circulating or other pump.

F6.2 Where a pliable building membrane is installed in an external wall of the class 4 managers residence, it must –

(i) comply with AS/NZS 4200.1; and

(ii) be installed in accordance with AS 4200.2; and

(iii) be a vapour permeable membrane for climate zones 6, 7 and 8; and

(iv) be located on the exterior side of the primary insulation layer of wall assemblies that form the external envelope of a building.

Except for single skin masonry and single skin concrete, where a pliable building membrane is not installed in an external wall, the primary water control layer must be separated from water sensitive materials by a drained cavity.

F6.3	For the class 4 managers residence – (i) An exhaust system installed in a kitchen, bathroom, sanitary compartment or laundry must have a minimum flow rate of— a. 25 L/s for a bathroom or sanitary compartment; and b. 40 L/s for a kitchen or laundry. (ii) Exhaust from a kitchen must be discharged directly or via a shaft or duct to outdoor air; (iii) Exhaust from a bathroom, sanitary compartment, or laundry must be discharged— a. directly or via a shaft or duct to outdoor air; or b. to a roof space that is ventilated in accordance with F6.4.

F6.4	(i) Where an exhaust system covered by F6.3 discharges directly or via a shaft or duct into a roof space, the roof space must be ventilated to outdoor air through evenly distributed openings. (ii) Openings required by (a) must have a total unobstructed area of 1/300 of the respective ceiling area if the roof pitch is greater than 22°, or 1/150 of the respective ceiling area if the roof pitch is less than or equal to 22°. (iii) 30% of the total unobstructed area required by (b) must be located not more than 900 mm below the ridge or highest point of the roof space, measured vertically, with the remaining required area provided by eave vents.

4.7 Section G – Ancillary Provisions

GP1.1	The swimming pool must be provided with a barrier compliant with AS1926 parts 1 and 2. The Swimming Pools Act 1992 and the Swimming Pools Regulation 2019, applicable to swimming pools with a depth of water of more than 300mm, regulate the circumstances in which a barrier is required and prevail in the case of any inconsistency.

G1.101	The windows located three (3) or more storeys above the street level shall be able to be cleaned from wholly within the building or by a method complying with Work Health and Safety Act 2011 and Regulations made under the Act.

G3	The light wells within the main building have been assessed as atriums and noted as connecting more than 3 consecutive storeys, being 4. It is recommended that the connection of storeys be justified via a performance based solution, demonstrating compliance with the relevant performance requirements of the BCA.

G5.2	If the building is located in a designated bushfire prone area, the building must comply with the following – (i) AS 3959 except— a. as amended by Planning for Bush Fire Protection; and b. for Section 9 Construction for Bushfire Attack Level FZ (BAL-FZ). Buildings subject to BAL-FZ must comply with specific conditions of development consent for construction at this level; or (ii) the requirements of (a) above as modified by the development consent following consultation with the NSW Rural Fire Service under section 4.14 of the Environmental Planning and Assessment Act 1979 if required; or (iii) the requirements of (a) above as modified by development consent with a bushfire safety authority issued under section 100B of the Rural Fires Act 1997 for the purposes of integrated development.
G6.1	The following areas within the building have been assessed as occupiable outdoor areas and hence must comply with the requirements of this clause. ▪ Ground floor communal open space ▪ Balconies of units (provisions of G6.2 relating to fire hazard properties only applicable).

5.0 BCA DETAILED ASSESSMENT – ECOCABINS & VILLAS

5.1 General

With reference to the BCA Design Assessment Summary contained in **Section 3.0** above, the following analysis and commentary is provided.

This commentary is formulated to enable the design documentation to be further progressed, for the purpose of evidencing.

5.2 Part 3.1 - Site Preparation

Part 3.1.1.1, 3.1.1.2, 3.1.1.3 & 3.1.1.4	Compliance with acceptable construction practice for earthworks associated with the construciton of a building or structure is satisfied, provided – (i) The site is classified as A, S, M, H or E in accordance with Part 3.2.4 and the work is undertaken in normal site conditions; and (ii) Un-retained bulk earthworks are undertaken in accordance with 3.1.1.1 and 3.1.1.2.
Part 3.1.2.0	Earth retaining structure/s associated with the construciton of a building or structure if it is designed and constructed in accordance with AS4678-2002.
Part 3.1.3.0	Drainage satisfies the requirements of this Part of the BCA when designed and constructed in accordance with AS/NZS3500.3-2018.
Part 3.1.4.0	Termite protection satisfies the requirements of this Part of the BCA when designed and constructed in accordance with AS3660.1-2014 and a durable notice is installed in a prominent location, such as a meter box or the like, indicating: (i) The termite management system used; (ii) The date of installation of the system; (iii) Where a chemical barrier is used, its life expectancy as listed on the appropriate authority's register label; and (iv) The installer's or manufacturer's recommendations for the scope and frequency of future inspections for termite activity.

5.3 Part 3.2 - Footings & Slabs

Part 3.2.0	The footings and/or slabs are to be designed in accordance with AS2870-2011 and AS2159-2009 (in the case of piling).

5.4 Part 3.3 - Masonry

Part 3.3.1.0, 3.3.2.0, 3.3.3.0, 3.3.4.0 & 3.3.5.0	Masonry satisfies the requirements of this Part of the BCA when designed and constructed in accordance with: (i) AS3700-2018; or (ii) AS4773.1-2015 and AS4773.2-2015.

5.5 Part 3.4 - Framing

Part 3.4.2.0	Steel framing satisfies the requirements of this Part of the BCA when designed and construciton in accordance with – (i) Residential and low-rise steel framing: ▪ Design: NASH Standard 'Residential and Low-Rise Steel Framing' Part 1. ▪ Design solutions: NASH Standard 'Residential and Low-Rise Steel Framing' Part 2. (ii) Steel structures: AS 4100-1998. (iii) Cold-formed steel structures: AS/NZS 4600-2018.
Part 3.4.3.0	Timber framing satisfies the requirements of this Part of the BCA when designed and constructed in accordance with the following, as appropriate- (i) Design of timber structures: AS 1720.1-2010. (ii) Design of nailplated timber roof trusses: AS 1720.5-2015. (iii) Residential timber-framed construction – non-cyclonic areas: AS 1684.2-2010. (iv) Residential timber-framed construction – cyclonic areas: AS 1684.3-2010. (v) Residential timber-framed construction – non-cyclonic areas (simplified): AS 1684.4-2010. (vi) Installation of particleboard flooring: AS 1860.2-2006.
Part 3.4.4.0	The use of structural steel members satisfies the requirements of this Part of the BCA when designed and constructed in accordance with: (i) AS4100-1998; or (ii) AS/NZS 4600-2005.

5.5 Part 3.5 - Roof & Wall Cladding

Part 3.5.1.0

Sheet roof satisfies the requirements of this Part of the BCA , if it complies one or a combination of the following –

(i) Metal roofing:
- AS 1562.1-2018; and
- In wind regions C and D in accordance with Figure 3.0.1 (cyclonic area), metal roof assemblies, their connections and immediate supporting members must be capable of remaining in position notwithstanding any permanent distortion, fracture or damage that might occur in the sheet or fastenings under the pressure sequences A to G defined in Table 3.5.1.0.

(ii) Plastic sheet roofing: AS/NZS 1562.3-1996.

Part 3.5.2.0

Roof cladding satisfies the requirements of this Part of the BCA if it complies with one or a combination of the following –

(i) Roof tiling – AS2050-2018;

(ii) Terracotta, fibre-cement and timber slates and shingles – AS 4597-1999.

Part 3.5.3.0

Gutters and downpipes satisfy the requirements of this Part of the BCA when designed and constructed in accordance with AS/NZS3500.3-2018.

Part 3.5.4.0

Timber and composite wall cladding satisfies the requirements of this Part of the BCA when designed and constructed in accordance with AS5146.1-2015.

Part 3.5.4.5

External fibre-cement sheets and linings used as eaves and soffit linings must:

(i) Comply with AS/NZS 2908.2-2000 or ISO 8336-1993E; and

(ii) Be fixed in accordance with Table 3.5.3.3 and Figure 3.5.3.3 using:

a. 2.8×30 mm Fibre-cement nails;

b. No. 8 Wafer head screws (for 4.5 mm and 6 mm sheets only); or

c. No. 8 Self embedding head screws (for 6 mm sheets only).

Part 3.5.4.6

Openings in external wall cladding exposed to weather must:

(i) Be flashed using materials that comply with AS/NZS2904-1995; and

(ii) Be securely fixed at least 25mm under the cladding and extend over the ends and edges of the framing of the opening.

Part 3.5.5.0	Metal wall cladding satisfies the requirements of this Part of the BCA when designed and constructed in accordance with AS1562.1-2018.

5.6 Part 3.6 - Glazing

Part 3.6.0	Glazing and windows satisfy the requirements of this part of the BCA where designed and installed in accordance with: (i) AS2047-2014 (i.e. glazed assemblies in external wall); and (ii) AS1288-2006 (glazed assemblies not in an external wall such as shower screens).

5.7 Part 3.7 - Fire Safety

Part 3.7.1.2	(i) Sarking-type materials used in the roof must have a flammability index not greater than 5. (ii) Flexible ductwork used for the transfer of products initiating from a heat source that contains a flame must comply with the fire hazard properties set out in AS 4254.1.
Part 3.7.5.2 & 3.7.5.4	The units are to be provided with smoke alarm(s) complying with AS3786-2014 and be connected to the consumer mains power where consumer power is supplied to the building. The smoke alarms are to be interconnected.
Part 3.7.2.5	A system of lighting must be installed to assist evacuation of occupants in the event of a fire and – (i) Be activated by the smoke alarms; and (ii) Consist of a light incorporated within the smoke alarm or the lighting located in the corridor, hallway or area served by the smoke alarm.
Part 3.7.3.2	The separating wall between the dwellings of the staff cabin buildings must – (i) Have either an FRL of not less than 60/60/60 or be of masonry construction not less than 90mm thick; (ii) Commence at the footings or ground floor slab; (iii) Extend – a. If the building has a non-combustible roof covering, to the underside of the roof covering; or b. If the building has a combustible roof covering, to not less than 450mm above the roof covering;

Part 3.7.3.2 *Cont'd*	(ii) If provided of lightweight construction, must be tested in accordance with Spec C1.8 of the BCA Volume One; (iii) Not be crossed by timber or other combustible building elements except for roof battens with dimensions of 75 x 50mm or less or roof sarking; (iv) Must have any gap between the top of the wall and the underside of the roof covering packed with mineral fibre or other suitable fire resisting material.
Part 3.7.3.3	Except as otherwise permitted under this part, any service opening, in a separating wall must have construction with an FRL of not less than --/60/60.

5.8 Part 3.8 - Health & Amenity

Part 3.8.1.2	Wet areas satisfy the requirements of this Part of the BCA when designed and constructed in accordance with Table 3.8.1.1 of the BCA and AS3740-2010.
Part 3.8.2.2	Heights of rooms and other spaces must be not less than - (i) In a habitable room excluding kitchen – 2.4m; and (ii) In a kitchen – 2.1m; and (iii) In a corridor, passageway or the like – 2.1m; and (iv) In a bathroom, shower room, laundry, sanitary compartment, pantry, storeroom, garage or the like – 2.0m.
Part 3.8.3.2	The class 1b buildings must be provided with – (i) a kitchen sink and facilities for the preparation and cooking of food; and (ii) a bath or shower; and (iii) clothes washing facilities, comprising at least one washtub and space in the same room for a washing machine; and (iv) a closet pan; and (v) a washbasin.

Part 3.8.3.3	The door to a fully enclosed sanitary compartment must: (i) Open outwards; (ii) Slide; or (iii) Be readily removable from the outside of the compartment (i.e. lift-off hinges), Unless there is a clear space of 1.2m measured between the closet pan within the sanitary compartment and the hinge side of the doorway.
Part 3.8.4.2	Natural lighting is required to habitable rooms and can be provided by the following: (i) Windows having a light transmitting area exclusive of framing members of 10% of the floor area of the room; (ii) Roof lights having a light transmitting area exclusive of framing members of 3% of the floor area of the room; or (iii) Combination of (i) and (ii).
Part 3.8.4.3	Sanitary compartments not provided with adequate natural lighting are required to have artificial lighting complying with one (1) of the following: (i) At a rate of one (1) light fitting per 16m^2 of floor area; or (ii) In accordance with AS/NZS1680.0-2009.
Part 3.8.5.2	Ventilation must be provided to a habitable room, sanitary compartment, bathroom, shower room, laundry and any other room occupied by a person for any purpose by any of the following means – (i) Openings, windows, doors or other devices which can be opened – a. with a ventilating area not less than 5% of the floor area of the room required to be ventilated; and b. open to— ▪ a suitably sized court, or space open to the sky; or ▪ an open verandah, carport, or the like; or ▪ an adjoining room in accordance with (ii).

Part 3.8.5.2 *Cont'd*	(ii) Natural ventilation to a room may come through a window, opening, door or other device from an adjoining room (including an enclosed verandah) if— a. the room to be ventilated or the adjoining room is not a sanitary compartment; and b. the window, opening, door or other device has a ventilating area of not less than 5% of the floor area of the room to be ventilated; and c. the adjoining room has a window, opening, door or other device with a ventilating area of not less than 5% of the combined floor areas of both rooms; and d. the ventilating areas specified may be reduced as appropriate if direct natural ventilation is provided from another source. (iii) An exhaust fan or other means of mechanical ventilation may be used to ventilate a *sanitary compartment*, laundry, kitchen or bathroom, or where mechanical ventilation is provided in accordance
Part 3.8.6.2	The separating walls between the sole occupancy units of the staff cabin buildings must – (i) Have a Rw + Ctr (airborne) not less than 50; and (ii) Be of discontinuous construciton if it separates a bathroom, sanitary compartment, laundry or kitchen in one dwelling from a habitable room (other than a kitchen) in an adjoining dwelling. A wall required to have sound insulation must continue to – (i) The underside of the roof above; or (ii) A ceiling that provides the sound insulation required for the wall.
Part 3.8.6.5	(i) Services must not be chased into concrete or masonry separating walls between dwellings of the staff cabin buildings; (ii) If a duct, soil, waste, water supply or storm water pipe is located in a separating wall— a. a door or panel providing access to a duct or pipe required to be separated must— (A) not open into any habitable room, other than a kitchen; and (B) in any other part must be firmly fixed so as to overlap the frame or rebate of the frame by not less than 10 mm and be constructed of— ▪ wood, plasterboard or blockboard not less than 33 mm thick; or ▪ compressed fibre reinforced cement sheeting not less than 9 mm thick; or ▪ other suitable material with a mass per unit area not less than 24.4 kg/m^2; and b. in the case of a water supply pipe, it must— (A) only be installed in discontinuous construction; and (B) in the case of a water supply pipe that serves one dwelling, not be fixed to the wall leaf on the side of any other dwelling and have a clearance not less than 10 mm to the other wall leaf.

Part 3.8.6.5 *Cont'd*	(iii) Electrical outlets must be offset from each other— a. in masonry walling, not less than 100 mm; and b. in timber or steel-framed walling, not less than 300 mm
Part 3.8.7.2	(i) Where a pliable building membrane is installed in an external wall, it must— a. comply with AS/NZS 4200.1; and b. be installed in accordance with AS 4200.2; and c. be a vapour permeable membrane for climate zones 6, 7 and 8; and d. be located on the exterior side of the primary insulation layer of wall assemblies that form the external envelope of a building. (ii) Except for single skin masonry or single skin concrete, where a pliable building membrane is not installed in an external wall, the primary water control layer must be separated from water sensitive materials by a drained cavity.
Part 3.8.7.3	(i) An exhaust system installed in a kitchen, bathroom, sanitary compartment or laundry must have a minimum flow rate of— a. 25 L/s for a bathroom or sanitary compartment; and b. 40 L/s for a kitchen or laundry. (ii) Exhaust from a bathroom, sanitary compartment, or laundry must be discharged— a. directly or via a shaft or duct to outdoor air; or b. to a roof space that is ventilated in accordance with 3.8.7.4.
Part 3.8.7.4	(i) Where an exhaust system covered by 3.8.7.3 discharges into a roof space, the roof space must be ventilated to outdoor air through evenly distributed openings. (ii) Openings required by (a) must have a total unobstructed area of 1/300 of the respective ceiling area if the roof pitch is more than 22°, or 1/150 of the respective ceiling area if the roof pitch is not more than 22°. (iii) 30% of the total unobstructed area required by (b) must be located not more than 900 mm below the ridge or highest point of the roof space, measured vertically, with the remaining required area provided by eave vents.

5.9 Part 3.9 - Safe Movement & Access

Part 3.9.1.2

(i) A stairway must be designed to take loading forces in accordance with AS/NZS 1170.1 and must have- ground and risers and a slope relationship quantity (2R + G) in accordance with Table 3.9.1.1; and

Table 3.9.1.1 Riser and going dimensions (mm)

Stair type	Riser (R) (see Figure 3.9.1.4 below)		Going (G) (see Figure 3.9.1.4 below)		Slope relationship (2R+G)	
	Max	Min	Max	Min	Max	Min
Stairs (other than spiral)	190	115	355	240	700	550
Spiral	220	140	370	210	680	590

Note to Table 3.9.1.1: *Riser* and *going* dimensions must be measured in accordance with Figure 3.9.1.4.

(ii) constant goings and risers throughout each flight, except as permitted by (c) and (d), and the dimensions of goings (G) and risers (R) in accordance with (a), (b) and (c) are considered constant if the variation between—

a. adjacent risers, or between adjacent goings, is no greater than 5 mm; and

b. the largest and smallest riser within a flight, or the largest and smallest going within a flight, does not exceed 10 mm; and

(iii) risers which do not have any openings that would allow a 125 mm sphere to pass through between the treads.

Part 3.9.1.4

Treads and landings must have—

(i) a surface with a slip-resistance classification not less than that listed in Table 3.9.1.3 when tested in accordance with AS 4586; or

(ii) a nosing strip with a slip-resistance classification not less than that listed in Table 3.9.1.3 when tested in accordance with AS 4586.

Table 3.9.1.3 – Slip-resistance classification

Application	**Dry surface conditions**	**Wet surface conditions**
Tread surface	P3 or R10	P4 or R11
Nosing or landing edge strip	P3	P4

Part 3.9.1.5

Where a threshold of a doorway is more than 230mm above the adjoining surface, it must incorporate steps having riser and going heights in accordance with Part 3.9.1.2.

Part 3.9.2.2

A continuous barrier must be provided along the side of a trafficable surface, such as—

(i) a stairway, ramp or the like; and

(ii) a floor, corridor, hallway, balcony, deck, verandah, mezzanine, access bridge or the like; and

(iii) a roof top space or the like to which general access is provided; and

(iv) any delineated path of access to a building,

where it is possible to fall 1 m or more measured from the level of the trafficable surface to the surface beneath.

Part 3.9.2.3	A barrier required by 3.9.2.2 must comply with the following – (i) The height must be not less than 1m above the floor of the deck; (ii) Openings in barriers must be constructed so that they do not permit a 125mm sphere to pass through it; (iii) Must be designed to take loading forces in accordance with AS/NZS 1170.1.

5.10 Part 3.10 - Additional Construction Requirements

Part 3.10.3.0	If the subject site is located within a flood hazard area, the building is to be designed and constructed in accordance with the ABCB Standard for Construciton of Buildings in Flood Hazard Areas.

Part 3.10.5.0	The class 1 buildings located in a designated bushfire prone area must be constructed in accordance with – (i) AS 3959 except— ▪ as amended by Planning for Bush Fire Protection; and ▪ for Section 9 for Bushfire Attack Level FZ (BAL-FZ). (ii) NASH Standard – Steel Framed Construction in Bushfire Areas except— ▪ as amended by Planning for Bush Fire Protection; and ▪ for buildings subject to Bushfire Attack Level FZ (BAL-FZ). (iii) the requirements of (c), or (d) above as modified by the development consent following consultation with the NSW Rural Fire Service under section 4.14 of the Environmental Planning and Assessment Act 1979 if required; or (iv) the requirements of (c), or (d) above as modified by development consent with a bushfire safety authority issued under section 100B of the Rural Fires Act 1997 for the purposes of integrated development.

5.0 CONCLUSION

5.1 General

Based upon our detailed review of the proposed architectural drawings, it is the opinion of this office that the subject development is capable of complying with the performance provisions of the BCA.

Compliance would be achieved via a mixture of adopting a performance-based approach as well as complying with the relevant deemed-to-satisfy requirements as outlined within the BCA, compliance via the performance-based approach could occur without significant changes to the proposed design.

The details of the proposed performance solutions are subject to the outcome of the fire engineering brief and analysis which will be carried out in accordance with the International Fire Engineering Guidelines.

The performance solutions for the building will be developed as part of the ongoing design and consultation with the design team.

Report By

Lindsay Beard
Associate | Building Regulations
For Design Confidence (Sydney) Pty Ltd

Verified By

Nicolas Hurtado
Senior Associate
For Design Confidence (Sydney) Pty Ltd

APPENDIX 1 – DOCUMENTATION PROVIDED FOR ASSESSMENT

This assessment was based upon the architectural documentation prepared by X.PACE Design Group, namely—

DRAWING	REV	TITLE	DATE
1.01	-	MASTER PLAN EXISTING	-
01	-	MASTERPLAN	-
02	-	Southern Section _ Level 1	-
03	-	Southern Section _ Level 2	-
04	-	Southern Section _ Level 3	-
05	-	Southern Section _ Level 4	-
06	-	Southern Section _ Level 5	-
07	-	Southern Section _ Level 6	-
08	-	Southern Section _ Level 7	-
1.10	-	NORTHERN SECTION LEVEL 1	-
1.11	-	NORTHERN SECTION LEVEL 2	-
1.12	-	HOTEL _ LEVEL 1 EXISTING + PROPOSED	-
1.13	-	HOTEL _ LEVEL 2 EXISTING + PROPOSED	-
1.14	-	HOTEL _ LEVEL 3 EXISTING + PROPOSED	-
1.15	-	HOTEL _ LEVEL 4 EXISTING + PROPOSED	-
1.16	-	HOTEL _ LEVEL 5 EXISTING + PROPOSED	-
2.01	-	SITE SECTIONS PROPOSED	-
2.02	-	SITE ELEVATIONS PROPOSED	-
2.03	-	SITE ELEVATIONS PROPOSED	-
2.04	-	SITE ELEVATIONS PROPOSED	-
2.05	-	SITE ELEVATIONS PROPOSED	-

APPENDIX 2 – FIRE RESISTANCE LEVELS

The Table below represents the Fire Resistance Levels (FRLs) required in accordance with BCA 2019:

Table A2.1 – 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 therein) 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 A2.2 REQUIREMENTS FOR CARPARKS

BUILDING ELEMENT			FRL (NOT LESS THAN) / 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.

Table A2 TYPE B 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 therein) 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/ 30	120/ 90/ 60	180/120/ 90	240/180/120
3 to less than 9 m	90/ 30/ 30	120/ 30/ 30	180/ 90/ 60	240/ 90/ 60
9 to less than 18 m	90/ 30/–	120/ 30/–	180/ 60/–	240/ 60/–
18 m or more	–/–/–	–/–/–	–/–/–	–/–/–
For non-*loadbearing* parts—				
less than 1.5 m	–/ 90/ 90	–/120/120	–/180/180	–/240/240
1.5 to less than 3 m	–/ 60/ 30	–/ 90/ 60	–/120/ 90	–/180/120
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an *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
Fire-resisting stair *shafts*				
Non-*loadbearing*	–/ 90/ 90	–/120/120	–/120/120	–/120/120
Bounding *public corridors*, public lobbies and the like—				
Loadbearing	60/ 60/ 60	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—				
Loadbearing	60/ 60/ 60	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
OTHER LOADBEARING INTERNAL WALLS and COLUMNS—	60/–/–	120/–/–	180/–/–	240/–/–
ROOFS	–/–/–	–/–/–	–/–/–	–/–/–

Table A3 TYPE C 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 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	–/–/–	–/–/–	–/–/–	–/–/–

APPENDIX 3 – FIRE HAZARD PROPERTIES

The table below represents the required fire hazard properties for building materials applicable to this development in accordance with BCA 2019.

Table A3.1 – Fire hazard properties

FLOOR LININGS AND FLOOR COVERINGS CRITICAL RADIANT FLUX (CRF IN KW/M2	
Non-Sprinkler Protected Areas	2.2
Sprinkler Protected Areas	1.2
Fire-Isolated Exits & Fire Control Rooms	1.2
Lift Cars	2.2
WALL LININGS AND CEILING LININGS TESTED TO AS5637.1	
Fire-Isolated Exits & Fire Control Rooms	Group 1
Public Corridors – Walls	Group 1 or 2
Public Corridors – Ceilings	Group 1 or 2
Specific Areas – Walls	Group 1, 2 or 3
Specific Areas – Ceilings	Group 1, 2 or 3
Other Areas – Walls	Group 1, 2 or 3
Other Areas – Ceilings	Group 1, 2 or 3
Lift Cars	Group 1 or 2
NOTE	In addition to achieving the group number above they too must comply with the following – a smoke growth rate index not more than 100; or an average specific extinction area less than 250m^2/kg
OTHER MATERIALS OR ASSEMBLIES	
Fire-Isolated Exits & Fire Control Rooms	Spread-of Flame Index 0 Smoke-Developed Index 2
Non-fire-isolated stairs & escalators and auditorium fixed seating	Spread-of Flame Index 0 Smoke-Developed Index 5
Sarking-type material	Flammability Index 0 (fire control rooms) Flammability Index 5 (other areas)
Other materials	Spread-of Flame Index 9 Smoke-Developed Index 8 (if the Spread-of Flame Index is more than 5)

APPENDIX 4 – PRELIMINARY FIRE & LIFE SAFETY AUDIT SUMMARY

DESIGN CONFIDENCE
DUBAI & SYDNEY

25 January 2019

Our Ref: P218_204

X.PACE Design Group
Unit 201, 50 Marshall Street
SURRY HILLS NSW 2010

Attention: Goran Stojanovic

Dear Goran,

Re: Preliminary Fire & Life Safety Audit Summary
Premises: Robertson Hotel

1.0 INTRODUCTION

Reference is made to the engagement of this office to provide preliminary building regulatory advice based on a visual audit of the above-mentioned building.

2.0 ASSESSMENT BASIS

The content of this correspondence reflects and relies upon:

(i) Fire & Life Safety provisions (including NSW variations) as principally contained in Sections C, D & E of the Building Code of Australia, Volume 1, 2016 Edition (BCA) Amendment 1;

(ii) Architectural floor plans provided by X.PACE Design Group;

(iii) Visual inspection performed by Nicolas Hurtado of Design Confidence on 16th January 2019.

3.0 LIMITATIONS

The audit of the above-mentioned building was limited to visual inspection only, with the audit not extending to the following –

(i) Testing and operation of essential fire safety measures installed within the building;

(ii) Assessment and verification of structural building elements throughout the building;

(iii) Assessment and verification of fire resistance levels of the building elements throughout the building;

(iv) Other buildings on the allotment that are not are not specifically referenced within this audit summary.

4.0 BUILDING DESCRIPTION

Figure 1 below provides an aerial view of the building and site.

Figure 1 – Aerial image

Table 1 below summarises the fundamentals of the building.

BUILDING FUNDAMENTALS	
Building Classification	Class 3 & 9b
Storeys	Five (5)
Rise in Storeys	Five (5)
Construction Type	Type A
Effective Height	≤25m
Compartment Floor Area *	Within limitations
Compartment Volume *	Within limitations

Table 1 – Building fundamentals

* The building has been treated as a single fire compartment.

Table 2 below summaries of the primary building elements of the building.

BUILDING ELEMENT	DESCRIPTION
Floors	Timber
External walls	Masonry Brickwork (Rendered / Face)
Internal walls	Rendered brickwork (loadbearing) Plaster with studs (non-loadbearing)
Stairways	Timber
Ceilings	Fibrous plaster
Roof	Timber frame covered with metal roof sheeting and Terracotta / ceramic roof tiles

Table 2 – Building elements

5.0 ASSESSMENT

The philosophy of the strategy is to provide an adequate level of life safety for evacuating occupants and safeguard against the spread of fire, although not specifically in accordance with the DTS Provisions or Performance Requirements of the BCA. The aim is to improve the level of life safety to an acceptable level, whilst at the same time having regard to the heritage nature of the building.

It should be stressed that the aim is not necessarily to comply with the Deemed-to-Satisfy (DTS) provisions or Performance provisions contained within the BCA but to provide an adequate level of life safety to an appropriate level.

The strategy adopted herein has been developed via the methodology contained within the "Guidelines for Achieving Fire Safety when Recycling a Building" which as published by the Australian Uniform Building Regulations Co-ordinating Council (AUBRCC) August 1992 (The Guidelines).

The Guidelines were designed with the objective of assisting in the process of ensuring the level of fire safety within a recycled building is congruent with that of the overall level of fire protection afforded to occupants for a new building by the BCA.

The Guidelines states that:

It should not automatically be a cause for concern if a recycled building exhibits a level of fire safety somewhat lower or different from that which would arise from a full application of all BCA requirements.

The reference to 'BCA requirements' has been taken to mean the DTS provisions of the BCA.

Furthermore, the Guidelines noted that a building which is recycled by following the Guidelines should meet the objectives of the BCA.

In this regard, the table below summarises the noteworthy departures from the DTS provisions of the BCA and contains a summary of the proposed Fire and Life Safety Upgrade Strategy.

Where accept existing has been included in the third column, reliance has been placed on The Guidelines, proposed upgrade and/or literature.

Table 3 below summarises the noteworthy departures from the Deemed-to-Satisfy (DTS) provisions of the BCA and the proposed preliminary Fire and Life Upgrade Strategy.

BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
FIRE RESISTANCE		
C1.1	**FLOORS** The timber frame construction of the intermediate floors are taken as not achieving the required FRL. **EXTERNAL WALLS** The FRL of the external walls consisting of masonry and other material is unknown (typical). **INTERNAL WALLS** (i) The FRL of the internal walls consisting of masonry brickwork, timber frame and other material is unknown, lined with plasterboard (typical); (ii) The internal walls bounding the public corridor from the sole occupancy units is provided with a panel above the doorways that does not achieve the required FRL --/60/60; (iii) The construction and separating of the shaft, extending to the levels above the fire place/s on the ground floor is unknown. Further, the FRL of the bounding shaft passing areas on the upper levels is unknown; **ROOFS** The FRL of the roof is unknown (typical).	The following work is recommended - (i) Provide a sprinkler system complying with Clause E1.5 and Spec. E1.5 of the BCA throughout, this sprinkler system would address the lack of FRLs to both the floors between each level and the lack of bounding construction to the units / rooms; (ii) Replace the panels above the entrance doorways of SOU's with solid construction i.e. standard grade plasterboard (iii) Detailed investigations are to be undertaken to determine the construction method used to separate the shaft / chimney above the fire places on the ground floor. Further the shaft walls are to achieve an FRL of not less than 90/90/90 in the class 3 part and 120/90/90 in the class 9b part.

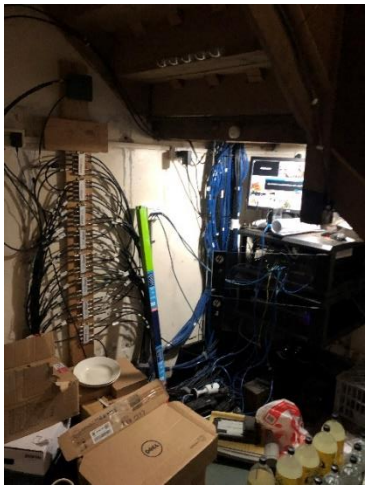
BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
FIRE RESISTANCE		
C1.10	The fire hazard properties of materials are unknown. This includes floor coverings, floor linings, wall linings, ceiling linings, ductwork et al.	Accept existing.
C2.6	The FRL of the spandrels in the external walls, that extend 600mm above the floors are unknown and not considered to achieve the required FRL. 	Accept existing on the basis the building will be sprinkler protected throughout.
C2.8	The FRL of the level 1 floor separating the class 3 from the class 9b part is unknown and not considered to achieve the required FRL.	Accept existing on the basis the building will be sprinkler protected throughout.
C2.14	The public corridors in the class 3 parts are not provided with smoke proof walls at intervals not more than 40m.	Accept existing on the basis the building will be sprinkler protected throughout.
C3.8	(i) The doors that open to the fire isolated exits are not provided with self-closing fire doors; and (ii) Windows of the external wall of the northern fire isolated stairways are located within 6m of other window openings in a wall of the same building and not protected in accordance with Clause C3.4 of the BCA.	The following work is recommended – (i) Accept existing on the basis the building is sprinkler protected throughout; and (ii) The doors that open to the fire isolated exits shall be replaced with self-closing fire doors with FRL --/60/30 and installed in accordance with AS1905.1-2005.

BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
FIRE RESISTANCE		
		
C3.11	(i) The doorways providing access from a sole occupancy unit and from a room that is not within a sole occupancy unit to the public corridor are not protected with self-closing --/60/30 fire doors; (ii) Openings above the doors providing access to sole occupancy units are provided with glazing panels that do not achieve an FRL. 	The following work is recommended – (i) Accept self-closing, tight fitting solid core doors that are not less than 35mm thick on the basis the building is sprinkler protected throughout; (ii) Replace the window opening with solid construction i.e. standard grade plasterboard.

BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
FIRE RESISTANCE		
C3.12	Openings for services passing through floors are not protected (typical).	Protect openings for services such that they are adequately protected from smoke, hence all services are to be caulked or the like.
C3.15	Openings for services passing through walls and floors are not protected (typical). 	The following work is recommended - Protect openings for services with shafts or fire seals so as to maintain the fire resistance of the floor (FRL 120/120/120) in accordance with Clause C3.12 and C3.15 of the BCA.

BCA CLAUSE		DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
ACCESS AND EGRESS			
D1.4	(i)	The travel distance from the entrance doorway of a sole occupancy unit on the class 3 levels, to a point of choice to alternative exits exceeds 6m.	Accept existing.
D1.6	(ii)	Doors serving as exits and in the path of travel to exits have an opening width of less than 750mm (typical);	Accept existing.
	(iii)	The unobstructed width of the paths of travel to exits are less than 1m (typical);	
	(iv)	The unobstructed height along paths of travel to exits on level 1 are less than 2m.	
D1.7	(i)	The western fire-isolated exit discharges within the confines of the building; and	Accept existing on the basis the building will be sprinkler protected throughout.
	(ii)	The openings in the external wall along within 6m of the path of travel from the point of discharge of the northern fire isolated exit is not protected in accordance with C3.4.  	

BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
ACCESS AND EGRESS		
D1.9	The non-fire isolated stairway serving the southern topmost level is discontinuous. 	Accept existing.
D2.2	Concern is raised with the materials used to construct the required fire isolated stairways, being not in accordance with D2.2 of the BCA.	Accept existing on the basis the building will be sprinkler protected throughout.
D2.3	Concern is raised with the materials used to construct the required non-fire isolated stairways, being not in accordance with D2.3 of the BCA.	Accept existing on the basis the building will be sprinkler protected throughout.

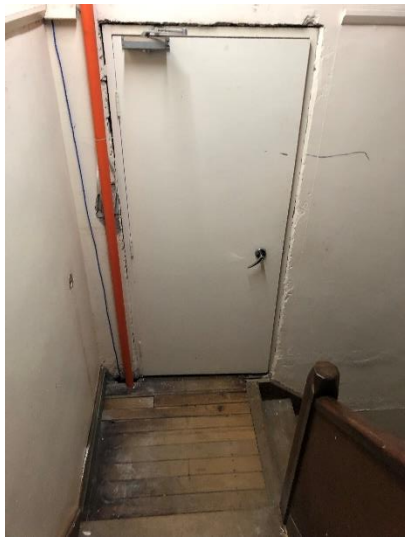
BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
ACCESS AND EGRESS		
D2.4	The ascending and descending stairway flights of the northern fire isolated exit that discharges to the open space at the mid landing between level 2 and level 1, are directly connected. 	The following work is recommended – (i) Accept existing on the basis the building will be sprinkler protected; and (ii) Provide signage within the northern fire isolated exit directing occupants to the location of the final exit door within the fire isolated shaft.
D2.7	The electrical services et al. are not protected against smoke spreading from the enclosure (typical). 	Protect the enclosures in accordance with D2.7 of the BCA.

BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
ACCESS AND EGRESS		
D2.8	Enclosures located under required stairways are not constructed with walls and access door having an FRL.	Accept existing on the basis the building will be sprinkler protected.
D2.13	(i) Numerous treads to the stairways do not contain a slip-resistant surface or nosing strip (typical); (ii) The stairways contain inconsistent risers and goings throughout the stair flight (typical); (iii) The riser openings to several stairways exceed 125mm; Additionally, concern is also raised with the structural adequacy of the riser and goings of the stairways (typical). 	The following work is recommended - (i) Accept existing stairway riser and going dimensions; and (ii) Install slip-resistant surface or nosing strip to each stairway landing achieving a slip resistance classification not less than P3 (dry) and P4 (wet) when tested in accordance with AS4586-2013; (iii) Modify the stairway risers so that the openings do not permit a 125mm sphere to pass through between treads; (iv) A detailed assessment is to be undertaken by a suitably qualified structural engineer to determine the structural adequacy of the stairways.

BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
ACCESS AND EGRESS		
D2.14	(i) Numerous landings to the stairways do not contain a slip-resistant surface or nosing strip (typical); (ii) The landings to several stairways are noted as being steeper than 1:50; Additionally, concern is also raised with the structural adequacy of the riser and goings of the stairways (typical). 	The following work is recommended - (i) Reconfigure the stairways so that the landings are not steeper than 1:50; (ii) Install slip-resistant surface or nosing strip to each stairway landing achieving a slip resistance classification not less than P3 (dry) and P4 (wet) when tested in accordance with AS4586-2013; (iii) A detailed assessment is to be undertaken by a suitably qualified structural engineer to determine the structural adequacy of the stairways.
D2.15	The doors contain a step at a point closer than the width of the door leaf (typical).	Provide signage to the side of the door that faces a person seeking egress stating 'CAUTION – WATCH YOUR STEP' or similar.

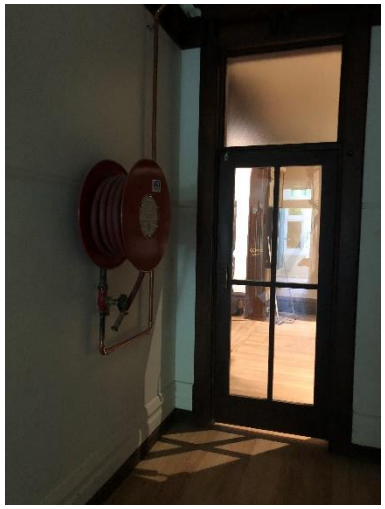
BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
ACCESS AND EGRESS		
D2.16	The following items were identified as deficient and/or item of concern - (i) Balustrades less than 1m in height above the floor or landing (typical); (ii) Balustrades have gaps greater than 125mm (typical); and (iii) Concern is raised with the loading capacity of the full height stained glass provided within the corridor of level 1 and level 2. 	Accept existing in part, subject to - (i) Rectify balustrades so as to be no less than 800mm above the floor or landing; (ii) Modify balustrades so that gaps / openings in balustrades do not permit a 125mm sphere to pass through; (iii) Undertake review and consultation with structural engineer to determine an acceptable level of protection to the full height glazing provided within the corridor of level 1 and level 2. It should be noted that stairways and balustrades forming significant heritage fabric are required to be considered at a later stage on a case by case basis, where the above is not acceptable from a heritage perspective.

BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
ACCESS AND EGRESS		
D2.17	Handrails: (i) Less than 865mm above the nosing line of treads or ramp (typical); (ii) Not continuous for full length of the flight (typical); (iii) Not installed along 1 side of stairways with a width of less than 2m (typical). 	The following work is recommended - (i) Accept existing; (ii) Rectify handrail so as to be no less than 750mm above the nosing line of treads; (iii) Install handrails along 1 side of stairways with a width of less than 2m.

BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
ACCESS AND EGRESS		
D2.20	The door opening to the western fire isolated exit on the first floor, encroaches into the required width of the exit stairway by more than 500mm. 	Accept existing.

BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
ACCESS AND EGRESS		
D2.21	(i) Doors serving as exits and in the path of travel to exits are not readily openable from the inside without a key by a single hand downward action on a single device (i.e. lever), with spherical door hardware provided (typical); (ii) The door hardware for doors serving as paths of travel to a required exit are located outside the permitted tolerance of 900-1100mm above the floor surface. 	The following work is recommended - (i) Accept existing; and (ii) Rectify door hardware to doors in path of travel to exits and required exit doors are readily openable from the inside without a key by a single hand downward action on a single device (i.e. lever type) at a height 900-1100mm or pushing action on a single device located at a height 900-1200mm above the floor surface.

BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
ACCESS AND EGRESS		
D2.23	Inadequate warning signage was provided to required to exit doors, on the side facing a person seeking egress. 	The following work is recommended – (i) A sign to alert persons that operation of certain doors must not be impaired must be installed where it can readily be seen or adjacent to a required fire door providing direct access to a fire isolated exit, on the side that faces a person seeking egress. (ii) The sign must be provided in accordance with Clause D2.23 of the BCA.
D2.24	The openable windows on the topmost level were found to be inadequately protected. 	A barrier with a height not less than 865mm above the floor is to be provided to an openable window. The barrier must not permit a 125mm sphere to pass through it and must not have any horizontal elements between 150-760mm above the floor that facilitates climbing.

BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
SERVICES AND EQUIPMENT		
E1.3	A fire hydrant system was not found to have been provided throughout the building.	Provide a fire hydrant system complying with E1.3 of the BCA and AS2419.1-2005.
E1.4	Fire hose reels to the class 9b part on the ground floor is located more than 4m from an exit. Additionally, concern is raised with a shortfall of compliant hose reel coverage to all class 9b parts on the ground floor. 	The following work is recommended - (i) The fire hose reel shall be relocated so that it is located less than 4m from an exit in accordance with E1.4 of the BCA and AS2441; and (ii) Confirmation from a professional engineer is to be obtained confirming compliant fire hose reel coverage is achieved to all Class 9b parts on the ground floor.

BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
SERVICES AND EQUIPMENT		
E2.2	An inadequate smoke detection and warning system was identified at the time of the inspection.	The following work is recommended - (i) The building shall be provided with a smoke detection system complying with Clause 4 of Spec. E2.2a and AS1670.1; (ii) The smoke detection system must activate a sound system and intercom system for emergency purposes complying with E4.9 of the BCA and AS1670.4; (iii) The smoke detection system shall be connected to a fire alarm monitoring system connected to a fire station or fire station dispatch centre in accordance with AS1670.3.
E4.2	Inadequate emergency lighting was found to be provided to throughout the building.	The following work is recommended - Install additional emergency lights to all parts of the building, specifically exits in accordance with Clause E4.2 of the BCA and AS2293.1-2005.

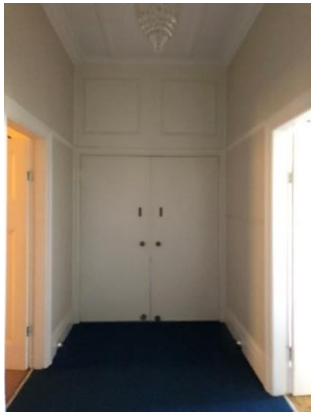
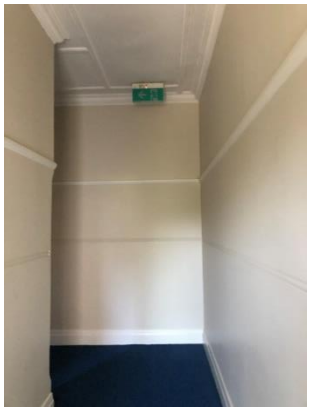
BCA CLAUSE	DESCRIPTION OF ISSUE	SUMMARY OF PROPOSED FIRE AND LIFE SAFETY UPGRADE STRATEGY
SERVICES AND EQUIPMENT		
E4.6	A lack of directional exit signage was identified throughout the building. 	The following work is recommended - Install additional directional exit signs in accordance with E4.6 of the BCA and AS2293.1-2005.
E4.8	Non-illuminated exit signage was found to be provided throughout the building. 	The following work is recommended - Install and/or replace existing exit signage with illuminated exit signage complying with E4.8 of the BCA and AS2293.1-2005.

Table 3 – Departures with proposed fire and life safety upgrade strategy

In terms of the items that the client would like addressed, the following advice is provided:

(i) The existing fire safety measures shall be verified for compliance / coverage by a relevant professional engineer associated with each fire safety measure;

(ii) Consideration of future upgrades in the building should be assessed on a case by case basis to ensure the future upgrades do not have a negative impact on the implement fire and life safety for the base building.

5.0 CONCLUSION

The information detailed in the above table indicates noteworthy fire and life safety problems with the building in the event the existing building was constructed today.

Based on any proposed work that will form part of a planning approval, it is recommended that a Fire & Life Safety Strategy be prepared and accompany the subject application.

The Fire & Life Safety Upgrade Strategy would directly highlight matters for consideration under Clause 94 of the Environmental Planning and Assessment Regulation 2000, which requires consent authorities to consider whether the measures contained in the building are adequate to:

(i) Protect persons using the building and to facilitate their egress from the building, in the event of a fire; or

(ii) To restrict the spread of fire from the building to other buildings nearby.

In terms of existing fire safety measures, Clause 182 of the Environmental Planning and Assessment Regulation 2000 requires the owner of a building to maintain fire safety measures to a standard no less than that to which the measure was originally designed and implemented.

Should you require any further information, please contact this office.

Report By

Nicolas Hurtado
Senior Associate
For Design Confidence (Sydney) Pty Ltd

Verified By

Luke Sheehy
Principal
For Design Confidence (Sydney) Pty Ltd

Design Confidence (Sydney) Pty Limited
Shop 2, 35 Buckingham Street, Surry Hills NSW 2010
ABN: 72 896 582 485

T: (02) 8399 3707
E: sydney@designconfidence.com
W: www.designconfidence.com