



**PRIVATE
CERTIFIERS
AUSTRALIA**
Certainty through precision

Building Code of Australia

BCA Compliance Report

Class 7a, 7b, 5, 4

C3d for Gerd Grigull

34 Orlando Road CROMER

Revision History & Quality Management

DATE	REV.	STATUS	AUTHOR	SIGNATURE	PEER REVIEWED	SIGNATURE
18/04/2019	A	DRAFT for Peer Review	R. Evans		G.Harrington	
29/04	B	FINAL for Release	R. Evans		R.Evans	

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1 Introduction

1.1 Background / Proposal

Private Certifiers Australia Pty Ltd (PCA) have been commissioned by J Mangraviti – C3d Architects to provide a BCA Report. The proposal is in support of a Development Application for a new mixed use commercial building comprising a car park, warehouse, office and caretakers unit.

It is anticipated that this will be a single phase project.

1.2 Aim

The purpose of this report is to provide a BCA Compliance Report for the submission of the Development Application.

1.3 The Project Team

The following PCA team members have contributed to this report:

- ▶ Grant Harrington, Director, Grade A1 Unrestricted BPB 0170
- ▶ Richard Evans, Accredited Certifier, Grade A3, BPB 2333

1.4 Documentation

The following documentation has been reviewed, referenced and/or relied upon in the preparation of this report:

- ▶ BCA 2016
- ▶ Guide to the BCA 2016
- ▶ J Mangraviti – C3d Architects:

DRAWING TITLE	REVISION/ DATE
DRG 01 – Site and Roof Plan	2 – 20/10/2018
DRG 02 – Lower Gnd Level	2 – 20/10/2018
DRG 03 – Ground Level	2 – 20/10/2018
DRG 04– Level 1	2 – 20/10/2018
DRG 05 – Section A,B and C	2 – 20/10/2018
DRG 06 – North and South Elevations	2 – 20/10/2018
DRG 07 – East and West Elevations	2 – 20/10/2018
DRG 08 – East elevation Section	2 – 20/10/2018
DRG 09 – West Elevation Section	2 – 20/10/2018

1.5 Regulatory Framework

Pursuant to clause 145 of the Environmental Planning and Assessment (EPA) Regulation 2000 all new building work must comply with the current BCA however the existing features of an existing building need not comply with the BCA unless upgrade is required by other clauses of the legislation.

Clause 143(3) of the EPA Regulation 2000 prevents a certifying authority from issuing a construction certificate if the proposed new work will result in a reduction to the fire protection and structural capacity of the building.

1.6 Limitation & Exclusions

The limitations and exclusions of this report are as follows:

- ▶ The following assessment is based upon a review of the architectural documentation.
- ▶ No assessment has been undertaken with respect to the Disability Discrimination Action (DDA) 1992. The building owner should be satisfied that their obligations under the DDA have been addressed.

The report does not address matters in relation to the following:

1.6.1.1.1 Local Government Act and Regulations.

- a) NSW Public Health Act 1991 and Regulations
 - b) Occupation Health and Safety (OH&S) Act and Regulations
 - c) Work Cover Authority requirements.
 - d) Water, drainage, gas, telecommunications and electricity supply authority requirements.
- ▶ PCA do not guarantee acceptance of this report by Local Council, NSW Fire Brigades or other approval authorities.
 - ▶ Local planning policies and/or guidelines
 - ▶ No part of this document may be reproduced in any form or by any means without written permission from PCA. This report is based solely on client instructions, and therefore, should not be used by any third party without prior knowledge of such instructions.

Terminology:

Alternative Solution

A building solution which complies with the Performance Requirements other than by reason of satisfying the DtS Provisions.

Building Code of Australia (BCA)

Document published on behalf of the Australian Building Codes Board. The BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia and is adopted in NSW (NSW) under the provisions of the EPA Act and Regulation. Building regulatory legislation stipulates that compliance with the BCA Performance Requirements must be attained and hence this reveals BCA's performance based format.

Construction Certificate

Building Approval issued by the Certifying Authority pursuant to Part 4A of the EP&A Act 1979.

Construction Type

The construction type is a measure of a buildings ability to resist a fire. The minimum type of fire resisting construction of a building must be that specified in Table C1.1 and Specification C1.1 except as follows for:

- 1.6.1.1.2 Certain Class 2, 3 or 9c buildings in C1.5; and
- 1.6.1.1.3 A Class 4 part of a building located on the top storey in C1.3 (b); and
- 1.6.1.1.4 Open spectator stands and indoor sports stadiums in C1.7.

Note: Type A construction is the most fire-resistant and Type C the least fire-resistant of the types of construction.

Climatic Zone

An area defined in BCA Figure A1.1 and in Table A1.1 for specific locations, having energy efficiency provision based on a range of similar climatic characteristics

Deemed to Satisfy Provisions (DtS)

Provisions which are deemed to satisfy the Performance Requirements.

Effective Height

The height to the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units) from the floor of the lowest storey providing direct egress to a road or open space.

Fire Resistance Level (FRL)

The grading periods in minutes for the following criteria:

- a) structural adequacy; and
- b) Integrity; and
- c) Insulation,

And expressed in that order.

Fire Source Feature (FSF)

The far boundary of a road which adjoins the allotment; or a side or rear boundary of the allotment; or an external wall of another building on the allotment which is not a Class 10 building.

National Construction Code Series (NCC)

The NCC was introduced 1 May 2011 by the Council of Australian Governments. The BCA Volume One (Class 2 to 9 Buildings) is now referenced as the National Construction Code Series Volume One – BCA.

Occupation Certificate

Building Occupation Approval issued by the Principal Certifying Authority pursuant⁵ to Part 4A of the EPA Act 1979.

Open Space

A space on the allotment, or a roof or other part of the building suitably protected from fire, open to the sky and connected directly with a public road.

Performance Requirements of the BCA

A Building Solution will comply with the BCA if it satisfies the Performance Requirements. A Performance Requirement states the level of performance that a Building Solution must meet.

Compliance with the Performance Requirements can only be achieved by:

- a) Complying with the DtS Provisions; or
- b) Formulating and Alternative Solution which –
 - (i) Complies with the Performance Requirements; or
 - (ii) Is shown to be at least equivalent to the DtS Provisions; or
- c) A combination of a) and b).

Sole Occupancy Unit (SOU)

A roof or other part of a building for occupation by one or joint owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant, or other occupier and includes a dwelling.

2 Building Characteristics

PCA can confirm they have undertaken a desktop review of the design at 34 Orlando Road CROMER NSW 2099 also known as Lot 1 DP407210.

2.1 Building Classification

The following table presents a summary of the relevant building classifications of the proposed building development:

Table 1 – Characteristics of Buildings

Building Classification	7a, 7b, 5, 4
Proposed Use	Primary use – Warehouse Secondary uses – Car park, Office, Caretakers Flat
Rise in Storeys	4
Type of Construction Required (BCA 2016 Vol 1 C1.1)	A

2.1 Fire Source Feature

The distances from the nearest Fire Source Features are:

New mixed use industrial and commercial building – Single stage 1

<i>Boundary</i>	<i>Distance to Fire Source Feature (Approx. metres)</i>
North	6.5 m (Boundary at Road)
West	<1m (Side Boundary)
East	<1m (Side Boundary)
South	<1m (Rear Boundary)

3 BCA Assessment

3.1 BCA Deemed to Satisfy Compliance Requirements

The following comments have been made in relation to the relevant BCA provisions relating to the compliance associated with the proposed new mixed use Industrial and Commercial building to include a class 4 part.

The general BCA requirements applicable to this project are listed and discussed below:

- *BCA C1.1 – The proposed buildings will be Class 7a, 7b, 5, 4, of TYPE A Construction, with a Rise in Storeys of four (4) – calculated under BCA 2016 Vol 1 C1.2.*

The mezzanine/office is enclosed and will therefore will count as a storey.

- *BCA Table C1.1 - The building elements are required to comply with Table 3 – FRL of Building Elements. Refer Appendix 1 for FRL requirements to external wall, internal wall bounding other classifications, floor between sole occupancy units, structural columns and roof.*

Note - the external wall including sarking and insulation must be non- combustible and FRL's achieved in both directions of building element. Action: Construction Certificate plans and Specifications to be updated to demonstrate compliance.

New Commercial Building:

External load bearing walls to the South, East and West elevations are to achieve a minimum FRL240/240/240.

External load bearing walls to the Northern elevation that is 6.5m from the fire source feature are to achieve FRL240/180/90

External columns (loadbearing) regardless of distance from any fire source feature, must achieve an FRL of no less 240/-/-.

PCA have formed the view that compliance with the BCA via DtS or a performance solution is readily achievable for the construction of the external walls and achieving FRL at required points of the external wall. **A performance based solution for the rationalisation of any FRL's may be considered by the Certifying Authority given the nature of the development.**

- *BCA C1.9 – In a building required to be of Type A or B construction, the following building elements and their components must be non-combustible (tested to AS1530.1-2009 OR constructed wholly of material that are not deemed combustible);*
 - 1) External walls and common walls, including all components incorporated in them including the facade covering, framing and insulation. – Required
 - 2) The flooring and floor framing of lift pits – N/A
 - 3) Non-loadbearing internal walls where they are required to be fire-resisting – N/A

Non-combustible façade required – please provide further details at CC stage – test reports and material data sheets will be requested. Any plans and specifications remitted as part of an application for a Construction Certificate must clearly demonstrate compliance with BCA clause C1.9

- *BCA C1.10 – Fire Hazard Properties*

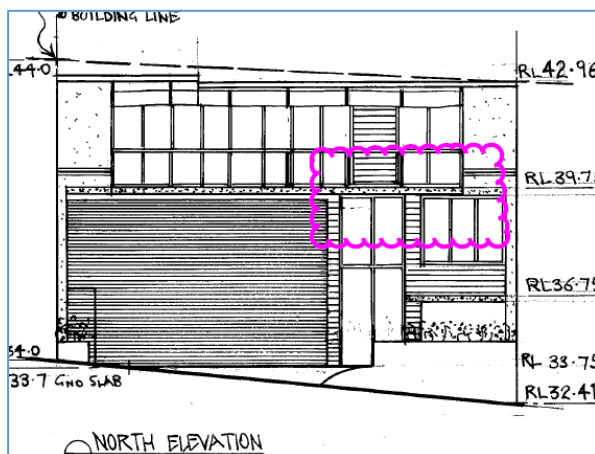
The fire hazard properties of the internal floor, wall, ceiling, lift car linings, and air handling ductwork within a Class 2 - 9 building must comply with Specification C1.10, as well as any attachments to the floors, ceiling, internal wall and the internal linings of the external wall.

Action: Construction Certificate specifications must be updated to demonstrate compliance

- *BCA C2.6 – Vertical separation of openings in external walls*

If in a building of type A construction, any part of a window or other opening in an external wall is above another opening in the storey next below and its vertical projection falls no further than 450mm outside the lower opening (measured horizontally) the openings must be separated but a spandrel that is not less than 900mm in height and extends not less than 600mm above the upper surface of the intervening floor and is of non-combustible material having an FRL of not less than 60/60/60

Clarification of windows requiring spandrel separation:



- *BCA C2.8 and C2.9 – Separation of classifications in different and same storeys*

If a building has different classifications situated in the same storey alongside each other, then each building element must have the higher FRL prescribed by Spec. C1.1,

For separation of classifications in different storeys, for Type A construction (applicable), the floor between the adjoining parts must be strictly in accordance with Specification C1.1 – Table 3.

Action: Plans and specifications must be updated particularly to demonstrate wall and floor types, to include materials and thicknesses and also to demonstrate FRL's achieved for each part.

- *BCA C2.10 – Separation of lift shafts*

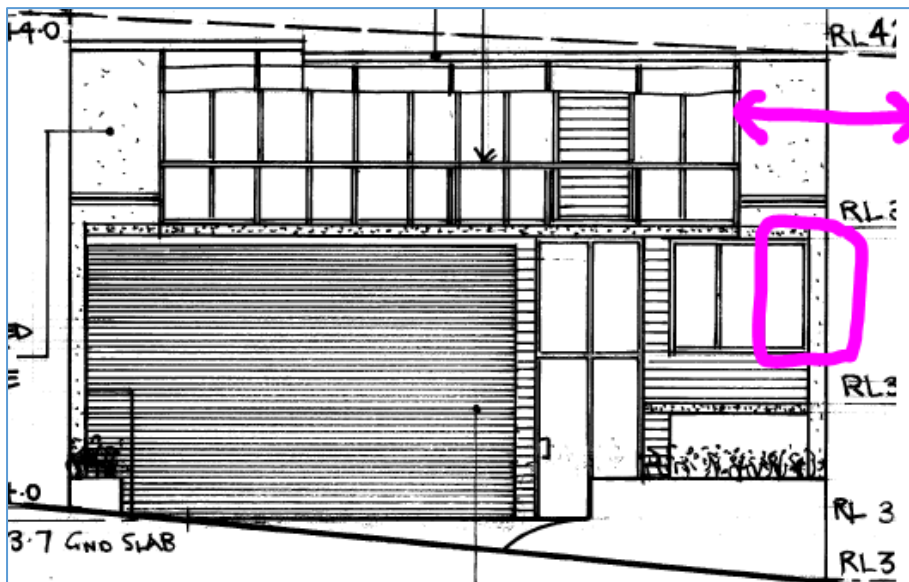
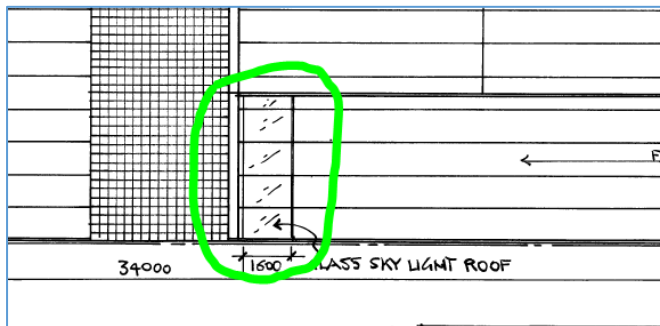
A lift is not required or proposed.

- *BCA C3.2 – Window and door openings in external walls required to have an FRL must be protected in accordance with BCA C3.4.*

Applicable to all openings on the northern elevation within 3 metres of a fire source feature and being a type A building, any opening on the roof within 3m of the boundary.

Noting – The window directly above the driveway to the basement car park. This is an opening directly above the fire compartment below (7a part). The window is to be protected in accordance with C3.4 – wall wetting sprinkler to window permanently fixed in the closed position.

Action: Construction Certificate plans and specifications must demonstrate compliance.



- BCA C3.4 – Protection must be in accordance with C3.4:

C3.4 Acceptable methods of protection

- (a) Where protection is *required*, doorways, *windows* and other openings must be protected as follows:
- (i) Doorways—
 - (A) internal or external wall-wetting sprinklers as appropriate used with doors that are *self-closing* or *automatic* closing; or
 - (B) –/60/30 fire doors that are *self-closing* or *automatic* closing.
 - (ii) *Windows*—
 - (A) internal or external wall-wetting sprinklers as appropriate used with *windows* that are *automatic* closing or permanently fixed in the closed position; or
 - (B) –/60/– fire *windows* that are *automatic* 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; or
 - (B) construction having an FRL not less than –/60/–.
- (b) Fire doors, fire *windows* and fire shutters must comply with **Specification C3.4**.

- BCA C3.12 – For Type A construction, where a service passes through a floor that is required to have an FRL or a ceiling that is required to have resistance to the incipient spread of fire, the service must be protected by a shaft that will not reduce the fire performance of the building element it penetrates OR be protected in accordance with BCA C3.15.

Action: Construction Certificate plans and specifications must demonstrate compliance. The requirement applies to any service penetration.

- BCA 3.15 - Where an electrical, electronic, plumbing, mechanical ventilation, air-conditioning or other service penetrates a building element, (other than an external wall or roof) that is required to have an FRL with respect to integrity or insulation or a resistance to the incipient spread of fire, that installation must comply with any one of the following:

- (a) Tested System – in accordance with AS4072.1 and AS1530.4
- (b) Ventilation or Air Conditioning – must comply with AS1668.1
- (c) Compliance with BCA Specification C3.15

Action: Construction Certificate plans and specifications must demonstrate compliance. The requirement applies to any service penetration.

- BCA C3.17 - A column protected by lightweight construction to achieve an FRL which passes through a building element that is required to have an FRL or a resistance to the incipient spread of fire, must be installed using a method and materials identical with a prototype assembly of the construction which has achieved the required FRL or resistance to the incipient spread of fire.

Action: Architectural and Structural engineering drawings must be provided at Construction Certificate phase.

- *BCA D1.2 - Number of exits required*

DtS compliance achieved- one exit required at each level of the building. Additional exits may be required to address other non-compliances in relation to exit travel distances.

- *BCA D1.3 – Fire Isolated Exits*

Fire Isolated stairs are required. All stairs are to be fitted with self-closing fire doors minimum FRL -/60/30 Construction of fire isolated exits to be in accordance with the fire separation required by specification C1.1

- *BCA D1.4 - 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.*

Proposed design does NOT comply with this requirement – Basement and furthest point on level 1 (street level). The design must be amended to accommodate an additional exit or seek a Performance Based Solution from a Fire Engineer to address the non-compliance – extended travel distances.

Subject to acceptance by Certifying Authority

- (c) **Class 5, 6, 7, 8 or 9 buildings** — Subject to (d), (e) and (f)—
- (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; and
 - (ii) in a Class 5 or 6 building, the distance to a single *exit* serving a *storey* at the level of access to a road or *open space* may be increased to 30 m.

- *BCA D1.7 – Travel via Fire Isolated exits*

A doorway from a room (to include a Sole Occupancy Unit – in this case the Class 4 part) cannot open directly into a stairway that is required to be fire isolated if that SOU does not occupy all of that storey in which it is located.

The class 4 part does NOT comply. Either the storage room must be removed so that the SOU occupies all of that storey OR the exit system needs to be re-arranged so that the SOU does not discharge directly into the Fire Isolated Stair.

- *BCA D2.8 - Enclosure of space under stairs and ramps*

The space below a required non-fire-isolated stairway must not be enclosed to form a cupboard or other enclosed space unless—

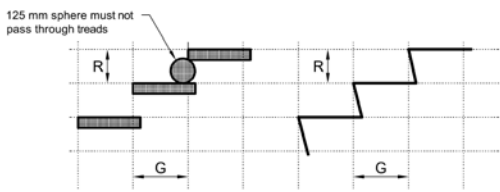
- 1) The enclosing walls and ceilings have an FRL of not less than 60/60/60; and
- 2) Any access doorway to the enclosed space is fitted with a self-closing -/60/30 fire door.

Plans assessed do not demonstrate enough detail. Spaces under stairs are evident but not designated. Any enclosures are to comply with this clause - 60/60/60 walls and ceiling with self-closing -/60/30 fire door.

- BCA D2.13 – Goings and Risers

Stair construction in a required stairway are to comply with this clause – (2R + G) to be within the following tolerances:

	Riser (R)		Going (G) ⁽²⁾		Quantity (2R+G)	
	Max	Min	Max	Min	Max	Min
Public stairways	190	115	355	250	700	550
Private stairways ⁽¹⁾	190	115	355	240	700	550



Notes:

- Private stairways are—
 - stairways in a *sole-occupancy unit* in a Class 2 building or Class 4 part of a building; and
 - in any building, stairways which are not part of a *required exit* and to which the public do not normally have access.
- The going in tapered treads (except winders in lieu of a quarter or half landing) in a curved or spiral stairway is measured—
 - 270 mm in from the outer side of the unobstructed width of the stairway if the stairway is less than 1 m wide (applicable to a non-*required* stairway only); and
 - 270 mm from each side of the unobstructed width of the stairway if the stairway is 1 m wide or more.

Any open risers not to permit a 125mm sphere to pass through the treads.

Treads to have a surface slip resistance classification not less than that listed in table D2.14 when tested in accordance with AS4586.

A nosing strip with a slip resistance classification not less than that listed in D2.14 when tested in accordance with AS4586.

Action: Please update Construction Certificate plans and specifications.

- BCA D2.16 – Barriers to prevent falls.

This clause applies to all stairways and ramps within the building. Insufficient details are provided on the plans. Table D2.16a – Barrier Construction provides the Dts requirements.

Action: Update Construction Certificate plans and specifications.

- BCA D2.17 – Handrails

Handrails to be added to plans and specifications. At least 1 handrail to each ramp and stairway and fixed at a height not less than 865mm measured above the stair nosing's.

Action: Update Construction Certificate plans and specifications.

- BCA D2.19 – Doors and Doorways able to comply with DtS provisions

Action: Update Construction Certificate plans and specifications to demonstrate compliance with BCA D2.19 (a) and (b)

- *BCA D2.21 – Operation of Latch* - Not part of this assessment, perceived that latch operation can achieve compliance with DtS at CC stage. General requirements are that a door in a required exit or forming part of a required exit or in the path of travel to a required exit must be readily operable without a key from the side

Action: Update Construction Certificate plans and specifications to demonstrate compliance.

- *BCA D3.1 General building access requirements* – Access to be provided to and within all other areas normally used by the occupants. The enclosed mezzanine and class 4 parts are not required to be accessible.
PCA have formed the view that the proposed design generally in accordance with BCA DtS general access requirements.
- *BCA D3.2 - Access to buildings* – Access ways to the building and within the building must comply with AS1428.1-2009 – primary entrance included.

There is not enough information on the assessed plans to verify compliance. The proposal is deemed able to comply.

Action: Please update Construction Certificate plans and specifications to demonstrate compliance with the general requirements of AS1428.1 - 2009

- *BCA D3.5 - Accessible car parking* – One (1) accessible parking space required for every Fifty (50) – DtS compliance achieved for the provision of the disabled parking spot however there is not enough information in current plans to demonstrate compliance with Australian standards specifically provision of a shared zone, bollard protection, demarcation and signage. Please refer to AS2890.6 - 2009

Action: Please update Construction Certificate plans and specifications to demonstrate compliance with the general requirements of AS2890.6 - 2009

- *BCA D3.6 – Signage* - not part of assessment, can be readily achieved at CC stage.
- *BCA D3.8 – Tactile Indicator*; DtS readily achievable at CC stage – TSGI noted at applicable locations on drawing assessed by PCA.

Action: Please update Construction Certificate plans and specifications to demonstrate compliance with the general requirements of AS1428.1 – 2009 and all BCA clauses in relation to D3

- *BCA E1.3 – Fire Hydrant* – Fire Hydrant system required in accordance with AS2419.1 for the whole of the building.

Street coverage is not achievable. A fire hydrant booster assembly will be required and will need to be in accordance with (AFSS)– AS2419.1 requires hydrant to be not less than 10m from the building it is protecting, unless safeguarded by construction having an FRL of 90/90/90, extending 2m each side of the hydrant and not less than 3m above ground (AS2419.1; 3.2.2.2).

Action: Full hydraulic design required to be submitted with the Construction Certificate application.

- *BCA E1.4 (b) – Building is over 500 square metres Fire Hose Reels required to whole of the building on all levels and within 4m of an exit – FHR must serve the entire area of the building. Water supply to achieve pressure as required by AS2441 or pump/water storage may be required.*

Action: Update CC drawings with approximate locations of FHR's. Hydraulic design to specify exact locations and in accordance with coverage requirements of AS2441.

- *BCA E1.6 - Portable fire extinguishers required in kitchen area of level 1 and required in the whole of the building as per Table E1.6. PFE to include each level adjacent to each required exit.*

Action: Update CC drawings with approximate locations of PFE's.

- *BCA E4.2 - Emergency lighting requirements for whole of building:*

in every storey of a Class 5, 6, 7, 8 or 9 building where the storey has a floor area more than 300 m²—

(i) In every passageway, corridor, hallway, or the like, that is part of the path of travel to an exit; and

(ii) in any room having a floor area more than 100 m² that does not open to a corridor or space that has emergency lighting or to a road or open space; and

(iii) In any room having a floor area more than 300 m².

- *BCA E4.5 – Exit Signs – readily achievable at CC stage*

Action: Update CC drawings with approximate locations of Exit signs.

Indicative fire schedule:

<i>Fire Safety Measures</i>	<i>Proposed Standard of Performance</i>
Automatic Fire Detection and Alarm System	BCA Clause E2.2a Clause 4 and 6 and AS1670.1 - 2015
Emergency lighting	BCA E4.2, E4.4 & AS 2293.1- 2005
Exit signs	BCA E4.6. & E4.7 AS/NZS 2293.1-2005
Fire hydrant systems (whole of building)	BCA E1.3 & AS2419.1-2005
Fire Hose Reels	BCA E1.4 & AS2441
Portable fire extinguishers	BCA E1.6 & AS2444-2001
Fire Rated Construction – Internal separation between compartments, Roof to have an FRL and FRL requirements of external walls and columns. Include any Lightweight construction C1.8 as required.	BCA Specification C1.1 – Table 3 for Type A construction.

- *BCA F1.7 – Waterproofing of wet areas must comply with AS 3740-2006.*

Any WC containing urinals to have floor waste installed and floor graded appropriately.

- *BCA F2.3 - Facilities in Class 3 to 9 buildings: Number of facilities achieves DtS in accordance with Table F2.3 SANITARY FACILITIES IN CLASS 3, 5, 6, 7, 8 OR 9 BUILDINGS.*

- The building occupancy numbers are determined by D1.13 – Maximum (worst case) occupancy loading across all classes = 40 persons. Coverage required per F2.3 is achieved. **Action:** Update CC drawings. All sanitary facilities to be dedicated as unisex.

- *BCA F2.4 - Accessible sanitary facilities*

1/50 floor plans and elevations will be required at CC stage in order to verify compliance with AS1428.1-2009. There is not sufficient detail in current plans

Action: Update CC drawings. All sanitary facilities to be dedicated as unisex.

BCA F4.2 – Habitable rooms must be provided with minimum natural light requirements of this clause – generally 10% - Applicable only to the class 4 part. DtS should be readily achievable at CC stage.

- *BCA Section J – Energy Efficiency*

General compliance is required with all parts of section J - Whilst any new building is generally deemed able to achieve compliance, the plans presented do NOT demonstrate any compliance with the following:

1. J0 – Energy efficiency,
2. J1 – Building Fabric,
3. J2 – Glazing,
4. J3 – Building Sealing,
5. J5 – Air conditioning and ventilation systems,
6. J6 – Artificial lighting and power,

Action: Commission a Section J report for the building and to include a BASIX certificate for the class 4 part. Any specific or generalised requirements of Section J can be updated to final CC drawings.

4 Conclusion

This report contains an assessment of the referenced architectural documentation for the proposed building works. The building works involve construction of a new building. The site is assumed to be excavated and free of existing structure/s

PCA have formed the view that the proposed new building is capable of complying with the DtS provisions of required Type A construction related to a Class 7a, 7b, 5 and 4 structures with a RIS of four (4) – subject to amendments discussed in this report:

Significant Dts non-compliances identified, and to be addressed by design change or consideration under a Performance Based Solution are:

- Exit travel distances to each level,
- The class 4 part must not discharge directly into the fire isolated stair. The class 4 part does not occupy all of the storey in which it is located and therefore, either remove the storage room or re-arrange the exit.

Please contact Richard Evans at richard@pcaservices.com.au or on 9907-6300 should any further information be required.

3. TYPE A FIRE-RESISTING CONSTRUCTION

3.1 Fire-resistance of building elements

In a building *required* to be of Type A construction—

- (a) each building element listed in **Table 3** and any beam or column incorporated in it, must have an FRL not less than that listed in the Table for the particular Class of building concerned; and
- (b) * * * * *
- (c) any *internal wall required* to have an FRL with respect to *integrity* and *insulation* must extend to—
 - (i) the underside of the floor next above; or
 - (ii) the underside of a roof complying with **Table 3**; or
 - (iii) if under **Clause 3.5** the roof is not *required* to comply with **Table 3**, the underside of the *non-combustible* roof covering and, except for roof battens with dimensions of 75 mm x 50 mm or less or *sarking-type material*, must not be crossed by timber or other *combustible* building elements; or
 - (iv) 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; and
- (d) a *loadbearing internal wall* and a *loadbearing fire wall* (including those that are part of a *loadbearing shaft*) must be constructed from—
 - (i) concrete; or
 - (ii) masonry; or
 - (iii) *fire-protected timber*, provided that—
 - (A) the building is a Class 2, 3 or 5 building which is—
 - (aa) a separate building; or

Deemed-to-Satisfy Provisions

- (bb) a part of a building—
 - (AA) which only occupies part of a *storey*, and is separated from the remaining part by a *fire wall*; or
 - (BB) which is located above or below a part not containing *fire-protected timber* and the floor between the adjoining parts is provided with an FRL not less than that prescribed for a *fire wall* for the lower *storey*; and
 - (B) the building has an *effective height* of not more than 25 m; and
 - (C) the building has a sprinkler system throughout complying with **Specification E1.5**; and
 - (D) any insulation installed in the cavity of the timber building element *required* to have an FRL is *non-combustible*; and
 - (E) cavity barriers are provided in accordance with **Specification C1.13**; or
- (iv) any combination of (i) to (iii).
- (e) * * * * *
- (f) the FRLs specified in **Table 3** for an external column apply also to those parts of an internal column that face and are within 1.5 m of a *window* and are exposed through that *window* to a *fire-source feature*.

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	Class of building — FRL: (in minutes)			
	<i>Structural adequacy/Integrity/Insulation</i>			
	2, 3 or 4 part	5, 7a or 9	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated within it) or other external building element, where the distance from any <i>fire-source feature</i> to which it is exposed is—				
For <i>loadbearing</i> parts—				
less than 1.5 m	90/ 90/ 90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/ 60/ 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- <i>loadbearing</i> parts—				
less than 1.5 m	—/ 90/ 90	—/120/120	—/180/180	—/240/240
1.5 to less than 3 m	—/ 60/ 60	—/ 90/ 90	—/180/120	—/240/180
3 m or more	—/—/—	—/—/—	—/—/—	—/—/—

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS — continued

Building element	Class of building — FRL: (in minutes)			
	<i>Structural adequacy/Integrity/Insulation</i>			
	2, 3 or 4 part	5, 7a or 9	6	7b or 8
EXTERNAL COLUMN not incorporated in an <i>external wall</i> —				
For <i>loadbearing</i> columns—				
	90/—/—	120/—/—	180/—/—	240/—/—
For non- <i>loadbearing</i> columns—				
	—/—/—	—/—/—	—/—/—	—/—/—
COMMON WALLS and FIRE WALLS—	90/ 90/ 90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS—				
<i>Fire-resisting</i> lift and stair <i>shafts</i> —				
<i>Loadbearing</i>	90/ 90/ 90	120/120/120	180/120/120	240/120/120
<i>Non-loadbearing</i>	—/ 90/ 90	—/120/120	—/120/120	—/120/120
Bounding <i>public corridors</i> , public lobbies and the like—				
<i>Loadbearing</i>	90/ 90/ 90	120/—/—	180/—/—	240/—/—
<i>Non-loadbearing</i>	—/ 60/ 60	—/—/—	—/—/—	—/—/—
Between or bounding <i>sole-occupancy units</i> —				
<i>Loadbearing</i>	90/ 90/ 90	120/—/—	180/—/—	240/—/—
<i>Non-loadbearing</i>	—/ 60/ 60	—/—/—	—/—/—	—/—/—
Ventilating, pipe, garbage, and like <i>shafts</i> not used for the discharge of hot products of combustion—				
<i>Loadbearing</i>	90/ 90/ 90	120/ 90/ 90	180/120/120	240/120/120
<i>Non-loadbearing</i>	—/ 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

3.2 Concessions for floors

A floor need not comply with **Table 3** if—

- (a) it is laid directly on the ground; or
- (b) in a Class 2, 3, 5 or 9 building, the space below is not a *storey*, does not accommodate motor vehicles, is not a storage or work area, and is not used for any other ancillary purpose; or

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- (c) it is a timber *stage* floor in a Class 9b building laid over a floor having the *required* FRL and the space below the *stage* is not used as a dressing room, store room, or the like; or
- (d) it is within a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part of a building; or
- (e) it is an open-access floor (for the accommodation of electrical and electronic services and the like) above a floor with the *required* FRL.

3.3 Floor loading of Class 5 and 9b buildings: Concession

If a floor in a Class 5 or 9b building is designed for a live load not exceeding 3 kPa—

- (a) the floor next above (including floor beams) may have an FRL of 90/90/90; or
- (b) the roof, if that is next above (including roof beams) may have an FRL of 90/60/30.

3.4 Roof superimposed on concrete slab: Concession

A roof superimposed on a concrete slab roof need not comply with **Clause 3.1** as to *fire-resisting construction* if—

- (a) the superimposed roof and any construction between it and the concrete slab roof are *non-combustible* throughout; and
- (b) the concrete slab roof complies with **Table 3**.

3.5 Roof: Concession

A roof need not comply with **Table 3** if its covering is *non-combustible* and the building—

- (a) has a sprinkler system complying with **Specification E1.5** installed throughout; or
- (b) has a *rise in storeys* of 3 or less; or
- (c) is of Class 2 or 3; or
- (d) has an *effective height* of not more than 25 m and the ceiling immediately below the roof has a *resistance to the incipient spread of fire* to the roof space of not less than 60 minutes.

3.6 Rooflights

If a roof is *required* to have an FRL or its covering is *required* to be *non-combustible*, rooflights or the like installed in that roof must—

- (a) have an aggregate area of not more than 20% of the roof surface; and
- (b) be not less than 3 m from—
 - (i) any boundary of the allotment other than the boundary with a road or public place; and
 - (ii) any part of the building which projects above the roof unless that part has the FRL *required* of a *fire wall* and any openings in that part of the wall for 6 m vertically above the rooflight or the like are protected in accordance with **C3.4**; and
 - (iii) any rooflight or the like in an adjoining *sole-occupancy unit* if the walls bounding the unit are *required* to have an FRL; and
 - (iv) any rooflight or the like in an adjoining fire-separated section of the building; and

- (c) if a ceiling with a *resistance to the incipient spread of fire* is *required*, be installed in a way that will maintain the level of protection provided by the ceiling to the roof space.

3.7 Internal columns and walls: Concession

For a building with an *effective height* of not more than 25 m and having a roof without an FRL in accordance with [Clause 3.5](#), in the *storey* immediately below that roof, internal columns other than those referred to in [Clause 3.1\(f\)](#) and *internal walls* other than *fire walls* and *shaft walls* may have—

- (a) in a Class 2 or 3 building: FRL 60/60/60; or
- (b) in a Class 5, 6, 7, 8 or 9 building—
 - (i) with *rise in storeys* exceeding 3: FRL 60/60/60
 - (ii) with *rise in storeys* not exceeding 3: no FRL

3.8 Open spectator stands and indoor sports stadiums: Concession

In an *open spectator stand* or indoor sports stadium, the following building elements need not have the FRL specified in [Table 3](#):

- (a) The roof if it is *non-combustible*.
- (b) Columns and *loadbearing* walls supporting only the roof if they are *non-combustible*.
- (c) Any non-*loadbearing* part of an *external wall* less than 3 m—
 - (i) from any *fire-source feature* to which it is exposed if it has an FRL of not less than -/60/60 and is *non-combustible*; or
 - (ii) from an *external wall* of another *open spectator stand* if it is *non-combustible*.

3.9 Carparks

- (a) Notwithstanding [Clause 3.1](#), a *carpark* may comply with [Table 3.9](#) if it is an *open-deck carpark* or is protected with a sprinkler system complying with [Specification E1.5](#) and is—
 - (i) a separate building; or
 - (ii) a part of a building—
 - (A) which only occupies part of a *storey*, and is separated from the remaining part by a *fire wall*; or
 - (B) which is located above or below another classification, and the floor separating the classifications complies with [C2.9](#); or
 - (C) which is located above another Class 7 part of the building not used for carparking, and the floor separating the parts complies with [Table 3](#) for a Class 7 part other than a *carpark*; or
 - (D) which is located below another Class 7 part of the building not used for carparking, and the floor separating the parts complies with [Table 3.9](#).
- (b) For the purposes of this Clause, a *carpark*—
 - (i) includes—
 - (A) an administration area associated with the functioning of the *carpark*; and
 - (B) where the *carpark* is sprinklered, is associated with a Class 2 or 3 building and provides carparking for separate *sole-occupancy units*, each carparking area with an area not greater than 10% of its *floor area* for purposes ancillary to the *sole-occupancy units*; but
 - (ii) excludes—
 - (A) except for [\(b\)\(i\)](#), any area of another classification, or other part of a Class 7 building not used for carparking; and
 - (B) a building or part of a building specifically intended for the parking of trucks, buses, vans and the like.