



BLACKETT
MAGUIRE+
GOLDSMITH

HASH-00-SD-BC-RP-0001

BCA ASSESSMENT REPORT

Hurlstone Agricultural High School
(Hawkesbury)

Prepared for:



Education

Ref.: 160258

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REPORT STATUS				
Date	Revision	Status	Author	Reviewed
12/9/2017	0	Initial BCA Report	BM	TH
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BUILDING CODE OF AUSTRALIA ASSESSMENT

Hurlstone Agricultural High School

Blackett Maguire + Goldsmith Pty Ltd have been engaged to undertake an assessment of the State Significant Development design documentation for the proposed new Hurlstone Agricultural High School (Hawkesbury) development at the Western Sydney University - Hawkesbury Campus against the requirements of the Building Code of Australia 2016 (BCA).



Figure 1: 3D Perspective

REPORT OBJECTIVES

The objectives of this report are to:

- confirm that the DA architectural documentation has been reviewed by an appropriately qualified Building Surveyor and Accredited Certifier;
- confirm that the proposed new building works can readily achieve compliance with the BCA pursuant to *section 109R of the Environmental Planning and Assessment Act, 1979* and/or, clause 145 of the *Environmental Planning & Assessment Regulation 2000*; and
- accompany the Development Application submission to enable the Consent Authority to be satisfied that subsequent compliance with the fire & life safety and health & amenity requirements of the BCA, will not necessarily give rise to design changes to the building which may necessitate the submission of an application under Section 96 of the *Environmental Planning and Assessment Act 1979*.

It should be noted that it is not the intent of this report to identify all BCA provisions that apply to the subject development. The development will be subject further assessment following receipt of more detailed documentation at Crown Certificate stage.

REFERENCED DOCUMENTATION

Our assessment of the concept design documentation was based on the following:

- + Building Code of Australia 2016 (BCA)
- + Guide to the Building Code of Australia 2016 (BCA Guide)
- + Architectural plans prepared by *Conrad Gargett Anchor Mortlock Woolley Architects* as referenced in Appendix 3 of this report

PROJECT TEAM

The following BM+G Team Members have contributed to this Report:

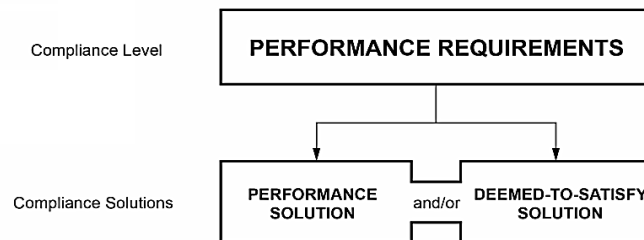
- + Brian Maguire - Project Team Leader
- + Patrick Cameron - Building Surveyor



ASSESSMENT METHODOLOGY

The Performance Requirements can only be satisfied by a:

- a) Performance Solution; or
- b) Deemed-to-Satisfy Solution; or Complying with the Deemed-to-Satisfy (DTS) Provisions; or
- c) A combination of (a) and (b).



In accordance with the above, we note that the proposed building design will achieve compliance with the BCA by way of a combination of compliance with the DTS provisions and also via Performance Solutions where appropriate, by the development and justification of Performance Solutions prepared by a C10 Accredited Fire Safety Engineer and/or an Accredited Accessibility Consultant at the Crown Certificate stage where required.

PROPOSED DEVELOPMENT

Blackett Maguire + Goldsmith Pty Ltd (BM+G) have been commissioned by *Conrad Gargett Anchor Mortlock Woolley Architects* to undertake a BCA assessment of the proposed development which comprises the construction of a series of new school buildings for the specific use as a new Hurlstone Agricultural High School (Hawkesbury) campus on the site of Hawkesbury Campus of Western Sydney University at Richmond. The development consists of four (4) education buildings of differing sizes and heights and served by an elevated unroofed walkway.

A description of the development is as follows:

- + **Building 1** – a single storey building serving as the main entrance to the school. This building includes a 'green' roof that will act as a graded active vegetation area associated with school educational operations.
- + **Building 2** – Three (3) storey education building;
- + **Building 3** – Three (3) storey education building;
- + **Building 4** – Single storey multi-purpose hall building with an upper storey enclosed plant room.
- + **Building 5** – an elevated walkway structure that connects to each building.

Note: the 'boarding accommodation' is a proposed boarding house and is not part of this assessment.

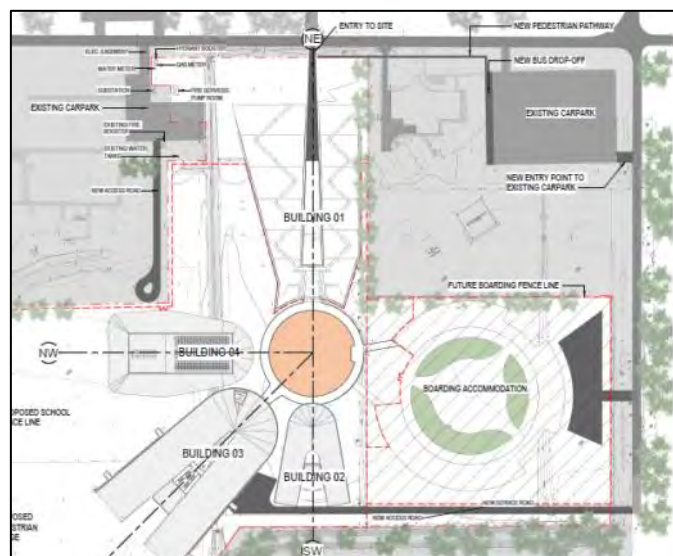


Figure 2: Site Plan



SUMMARY OF KEY COMPLIANCE ITEMS

The following comprises a summary of the key compliance items identified in the report that will need to be addressed prior to issue of the Crown Certificate:

BCA CLAUSES		DESCRIPTION
1.	Spec. C1.1	External cladding proposed to the external walls of Buildings 2, 3 and 4 must address BCA Specification C1.1 / Clause C1.12 for combustibility and / or suitability for use as an external wall element.
2.	C2.6	Spandrel protection of external walls will need to be confirmed.
3.	D2.21	Building 4 includes operable walls. The rooms need to be provided with hinged doorsets to ensure appropriate door opening hardware is provided.
4.	D2.21 / Part D3	With respect to the sliding doors in an path of travel (i.e. where a hinged door is not provided) in Building 3, sliding doors are to be provided with a 'D' type handle located between 900-1100mm above FFL and the force required at the door handle to operate the door shall not exceed 20N as per Clause 13.5.2 of AS1428.1-2009
5.	Part F2	Separate male and female staff sanitary facilities need to be provided within Building 2 this will include the provision of separate washbasins. Accessible sanitary facilities within Building 1 are not located at the same bank as the ambulant facilities in at least 50% of occasions.

SUMMARY OF MATTER TO BE RESOLVED VIA PERFORMANCE SOLUTIONS

The following comprises a summary of the key compliance items identified in the report that will need to be addressed prior to issue of the Crown Certificate:

BCA CLAUSES		DESCRIPTION	PERFORMANCE REQUIREMENT
1.	Spec C1.1	Building 4 is proposed to be designed not in accordance with Type B Construction	CP1 and CP2
2.	D1.2	The plant room in Building 4 is proposed to be provided with a single exit in lieu of the required 2 exits.	DP4
3.	D1.4	Distances exceed the maximum 40m to an exit (up to 45m) on Level 1 and 2 of Building 3	DP4 and EP2.2
4.	D1.5	Distances measured between exits in Building 3 (level 1 and 2) exceed the maximum 60m, up to 88m.	DP4
5.	D1.8	Stairs in Building 2 and 3 do not comply with the fire separating requirements of this clause (Note: this clause does not apply to Stair 2 in Building 2)	DP5
6.	E1.3	A fire hydrant system is required for the development due to the fact that buildings exceed 500m ² in floor area. The location of the hydrant will depart from the prescriptive requirements of AS2419.1-2005, ie. not being adjacent to the main vehicular entry and not being within site of the development's main entrance.	EP1.3



BUILDING 1 AND 5

BUILDING CLASSIFICATION

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

▪ BCA Classification:	Class 5 Office Class 10b (elevated walkway).
▪ Rise in Storeys:	One (1)
▪ Effective Height:	Less than 12m
▪ Type of Construction:	Type C
▪ Climate Zone:	Zone 6
▪ Floor Area / Volume	Class 9b – maximum 3,000m ² /18000m ³ *

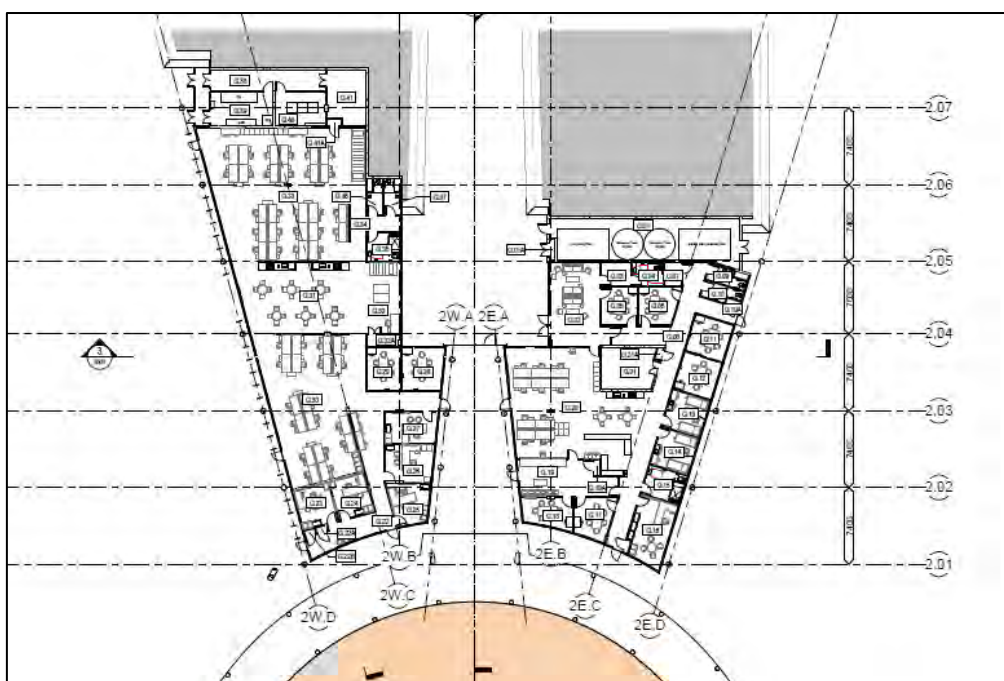


Figure 1: Building 1 Ground Floor Plan

FIRE SOURCE FEATURE

The distances from the nearest Fire Source Features (Allotment boundaries and/or Buildings situated on the same allotments that are not class 10 buildings) are noted as follows:

BOUNDARY OR BUILDING	DISTANCE TO FIRE SOURCE FEATURE
North	>6m
South	>6m
East	>6m
West	>6m



SECTION C – FIRE RESISTANCE AND COMPARTMENTATION

The building will comply with the Performance Requirements of the BCA, having regard to the following specific matters being addressed:

Clause C1.1 (Fire Resistance) The new building works are required to comply with the requirements detailed under Table 5 of Specification C1.1 for Type C Construction (See Appendix 1).

Clause C1.10 (Fire Hazard Properties) Fire hazard properties for all floor, wall and ceiling linings are to comply with BCA Specification C1.10 with regard to smoke development rates, critical radiant flux and group ratings.

In this instance, the following fire hazard properties apply:

- + Floor linings and coverings must achieve a Critical Radiant Flux of not less than 2.2kW/m² and a maximum smoke development rate of 750 percent-minutes;
- + Wall and ceiling linings are to achieve a material group number as specified in the table below and Smoke Growth Rate Index of not more than 100 or an Average Specific Extinction Area less than 250 m²/kg.

Class of building	Fire-isolated exits and fire control rooms	Public corridors		Specific areas		Other areas
	Wall/ceiling	Wall	Ceiling	Wall	Ceiling	Wall/ceiling
Class 5, 6, 7, 8 or 9b schools						
Unsprinklered	1	1, 2	1, 2	1, 2, 3	1, 2	1, 2, 3
Sprinklered	1	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3

Figure 2: BCA Table 3 Wall and Ceiling Lining Materials (Material Groups Permitted)

Note: With respect to a Class 9b school the reference to “Specific areas” in the table above means classrooms.

- + Rigid and flexible ductwork must comply with the fire hazard properties in AS 4254 Parts 1 and 2.
- + Sarking material must achieve a Flammability Index of not more than 5.

Clause C2.2 (Floor area limitations) The floor area of the new building work does not result in buildings exceeding 3,000m² in floor area, thereby resulting in Type C Construction being applicable to Building 1.

C2.12 (Separation of Equipment) Equipment such as the following is required to be fire separated from the remainder of the building by construction achieving an FRL of 120/120/120:

- Boilers;
- Battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours
- On-site fire pumps

Details are to be provided for any such rooms contained within Building 1.

SECTION D – ACCESS AND EGRESS

The proposal demonstrates that compliance with the Performance Requirements of Section D of the BCA is readily achievable, noting the following:

Clause D1.2 (Number of Exits) Building 1 is serviced by the requisite number of exits thereby satisfying the minimum requirements for a Class 5 building.

Clause D1.4/D1.5 (Exit Distances) The travel distances to exits within the proposed building have been assessed as complying with the DTS provisions of the BCA (namely all parts of the floor area within 20m of a point where a choice of alternative exits are available; or no further than 40m to one of those alternative exits; Furthermore, the exits are less than 60m apart when measured back through that point of choice).

Clause D1.6 (Exit Width) The dimensions of exits and paths of travel to exits are to achieve a minimum 2m height and 1m width. Compliance is readily achievable.

Clause D1.10 (Discharge from Exits) The paths of travel from open space to the road for Building 1 must have an unobstructed width of not less than 1 m (whichever is the greater).

Note 1: the exit is reached when the occupants move beyond the roof or beyond the floor above.

Note 2: paths of travel to the road must not necessitate passing back beneath the building.



Clause D2.7 The construction of Electrical distribution boards to be in accordance with BCA Clause D2.7 with the enclosure bounded by a non-combustible or fire protective covering and smoke seals to the perimeter of the doors in each case.

Clause D2.15 (Thresholds): Doors must not have a ramp or step closer to the door than the width of the door leaf except where the door discharges directly to open space. In that circumstance the change in level may be a maximum of 190mm (applying generally to fire isolated exit doors only – see part D3 below for all doors associated with buildings that are required to be accessible).

Note: See D3 below for thresholds throughout 'Accessible Spaces', including the interface at the entry/exit doors.

Clause D2.16 (Barriers) Relevant Note: Applicable to Building 5 and also to the roof top 'green' area. Barriers to prevent falls (Balustrades) are to be provided to all stairways, floors, corridors, etc. where the fall to the level below is more than 1m in height. Barriers are to comply with Table D2.16a including the following:

- + Achieve a minimum height of a balustrade is 1m above the floor of the landing, walkway or the like; and 865mm above the floor of a stairway or a ramp and not permit a sphere of 125mm diameter to pass through.
- + For windows where the floor is more than 4m above the surface beneath, the window sill must be a minimum of 865mm in height above the height of the floor surface.
- + Where the floor is more than 4m above the surface beneath the balustrade, any horizontal or near horizontal members between 150mm and 760mm above the floor must not include horizontal or near horizontal members that could facilitate climbing.

Clause D2.20 (Door Swing) The hinged exit doors currently swing in the direction of egress.

Clause D2.21 (Operation of Latch) Hinged doors in a path of travel to an exit are to have a single handed downward action of pushing action on a single device located between 900mm and 1100mm from the floor, or alternatively be an automatic door which operated automatically upon fire detection.

Part D3 (Disability Access) Access for persons with a disability will be provided to the building to address BCA Part D3. In this regard a report from an independent Accredited Access Consultant will be provided for this design making recommendations for all provisions relating to Accessibility, inclusive of access via the principal public entrance.

SECTION E - SERVICES AND EQUIPMENT

Clause E1.3 (Fire Hydrant) A fire hydrant system is required to be provided in accordance with AS2419.1-2005.

It is noted that the design will be in accordance with AS2419.1-2005 with respect to location of fire hydrant landing valves:

- + Internal – within 4m of an exit;
- + External – 10m away from the building; no more than 50m from a hardstand (attack hydrant); no more than 20m from a hardstand (feed hydrant).

It is understood that a **Fire Engineered Performance Solution** for the location of any hydrant booster infrastructure will be formulated based on the likelihood of being not located adjacent to the main vehicular entry or located within site of the main entry of the building.

Clause E1.4 (Fire Hose Reel) Fire hose reels are required to this administration building. Fire Hose reels are to be located no further than 4m of an exit.

Clause E1.6 (Portable Fire Extinguishers) Portable fire extinguishers (PFE) are required to be provided as listed in Table E1.6, to serve the building in accordance with AS 2444-2001.

Clause E2.2 (Smoke Hazard Management) A fire detection and alarm system is not required for a single storey class 5 administration building.

Clause E4.2 (Emergency Lighting) Emergency lighting is required to be provided to the new works in accordance with AS/NZS 2293.1-2005.

Clause E4.5/E4.6 (Exit Signs) Exit and directional exit signage is required to be provided in accordance with AS2293.1-2005.



SECTION F – HEALTH AND AMENITY

The proposal demonstrates that compliance with the DTS provisions of Section F of the BCA is readily achievable subject to the following:

Clause F1.1 (Stormwater drainage): Stormwater drainage must be installed as per AS 3500.3 - 2003.

Clause F1.5 (Roof coverings): A roof must be covered with

- + Concrete roof tiles complying with AS 2049 and fixed as per AS 2050.
- + Cellulose cement corrugated sheeting compiling with AS/NZS 2908.1 and installed as per AS/NZS 1562.2.
- + Metal roof sheeting comply with AS 1562.1
- + Plastic roof sheeting complying with AS/NZS 4256 parts 1, 2 3 and 5 and AS/NZS 1562.3.
- + Asphalt shingles complying with ASTM D3018-90 class A.

Clause F1.6 (Sarking): Sarking must be installed to roof and walls for weatherproofing as per AS/NZS 4200.1 and 2 - 1994.

Clause F1.7 (Waterproofing of wet areas): Wet areas in the building are required to comply with AS 3740-2004.

Clause F1.13 (Glazed assemblies): Glazed assemblies in the external wall of the building are required to comply with AS 2047 requirements for resistance to water penetration. All other glazing installations are to comply with AS1288-2006

Part F2 (Sanitary Facilities) The population of the administration building is restricted to the numbers indicated below, based on the number of sanitary facilities provided (noting that a unisex Accessible WC counts once for each sex).

Employees	Facilities provided	Maximum Population
Male	Closet Pans = 3	50
	Urinals = 2	
	Washbasins = 5	
Female	Closet Pans = 5	75
	Washbasins = 5	

Part F3 (Room Heights) Rooms in this class 5 building are to achieve a minimum height of 2400mm, with the exception of storerooms, bathrooms, sanitary compartments, kitchens, which can be 2100mm minimum).

Clause F4.1 (Natural Lighting) Natural light is required to be provided to all general-purpose classrooms within the buildings. The windows to classrooms and similar spaces are to have an aggregate light transmitting area of at least 10% of the floor area of the room they serve.

Clause F4.4 (Artificial Lighting) Artificial lighting complying with AS/NZS 1680.0-2009 is required to the building where natural light cannot be provided:

- + Rooms that are frequently occupied,
- + All spaces required to be accessible,
- + All corridors, lobbies, internal stairways, other circulation spaces; and
- + Paths of egress.

Clause F4.5 (Ventilation of Rooms): The building is required to be provided with:

- + Natural ventilation consisting of permanent openings, windows, doors or other devices which can be opened in and which achieves an open area not less than 5% of the floor area of the room; or
- + a mechanical ventilation or air-conditioning system complying with AS1668.2; or

A combination of the abovementioned natural ventilation and mechanical ventilation/air-conditioning is expected to be designed for these spaces.

Clause F4.8 (Restriction of position of water closets and urinals) A room containing a closet pan or urinal must not open directly into

- + Kitchen or pantry;
- + Public dining room or restaurant;



- + Dormitory in a class 3;
- + A room used for public assembly (not being a room in an early child hood, primary school or open spectator stand;
- + Workplace normally occupies by more than 1 person.

Unless provided with an airlock, or unless the WC is provide with mechanical exhaust, and the door is screened from view.

In this instance compliance is achieved.

SECTION J – ENERGY EFFICIENCY

For Building 1, the following energy efficiency design measures will be required to be implemented into the building design to satisfy the following requirements for Climate Zone 6. Design statement is to be received with the Crown Certificate application

- + Building Fabric – the external fabric to be designed and constructed to reduce heat flow (Part J1);
- + Glazing – thermal performances, solar orientation, shading (Part J2);
- + Building sealing – doors, windows, roof lights, e.g. to avoid leakage (Part J3);
- + Air conditioning and ventilation – operation, e.g. time switches; exhaust (Part J5);
- + Artificial lighting and power – type and operation of lighting and power systems (Part J6);
- + Hot water systems – avoiding heat loss (Part J7);
- + Access for maintenance – access to time switches, shading devices, etc. (Part J8).



BUILDING 2 AND 3

BUILDING CLASSIFICATION

The following table presents a summary of relevant building classification items of Building 2 and Building 3:

+ BCA Classification:	Class 9b (School Assembly buildings)
+ Rise in Storeys:	Three (3)
+ Effective Height:	Less than 12m
+ Type of Construction:	Type A
+ Climate Zone:	Zone 6
+ Floor Area / Volume Limitations	8,000m ² / 48,000m ³

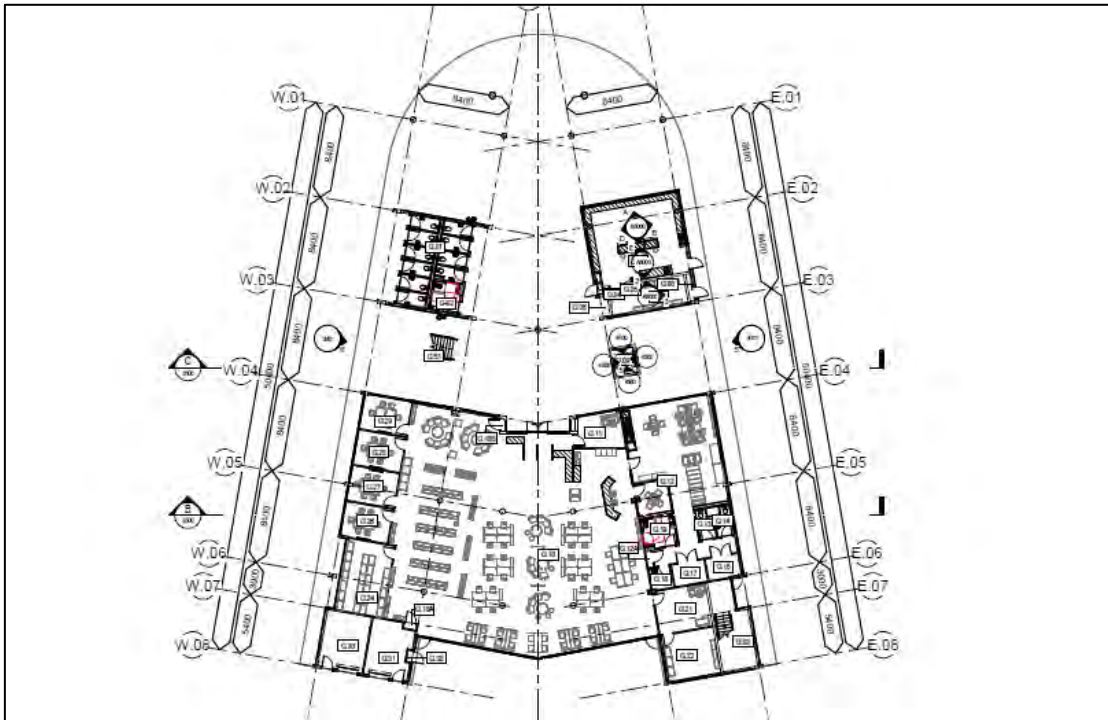


Figure 1: Building 2

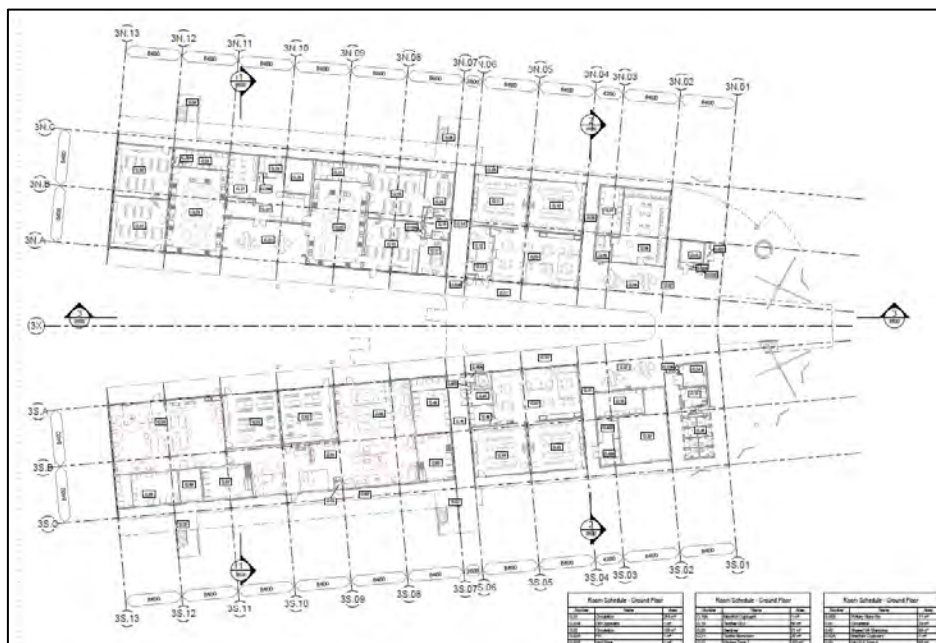


Figure 2: Building 3

FIRE SOURCE FEATURE

The distances from the nearest Fire Source Features (Allotments and/or Buildings situated on the same allotments) are noted as follows:

Building 2

BOUNDARY	DISTANCE TO FIRE SOURCE FEATURE
North	>6m to building 1 (noting that Building 5 is a class 10b)
South	>6m to the rear boundary
East	>6m to the boarding accommodation building (not in this scope)
West	>6m Building 3

Building 3

BOUNDARY	DISTANCE TO FIRE SOURCE FEATURE
North	>6m to Building 4
South	>6m to the rear boundary
East	>6m to Building 2
West	>6m to the side boundary



BUILDING CODE OF AUSTRALIA ASSESSMENT

SECTION B – STRUCTURE

Part B1 Structural engineering details prepared by an appropriately qualified structural engineer are to be provided to demonstrate compliance with Part B1. This will include the following Australian Standards (where relevant):

- | | |
|--|---|
| + AS 1170.0 – 2002: General Principles | + AS 2047-2014: External Glazing |
| + AS 1170.1 – 2002 | + AS 3700 – 2011: Masonry Structures |
| + AS 1170.2 – 2011: Wind Actions | + AS 3600 – 2009, Concrete Structures |
| + AS 1170.4 – 2007: Earthquake Actions | + AS 4100 – 1998: Steel Structures |
| + AS 1288 – 2006, Glass in Buildings | + AS 4600 – 2005: Cold Formed Steel Structures. |

SECTION C – FIRE RESISTANCE AND COMPARTMENTATION

The buildings will comply with the relevant Deemed-to-satisfy requirements of the BCA, having regard to the following specific matters being addressed:

Clause C1.1 (Fire Resisting Construction) All building elements are to achieve the required FRL in accordance with Table 3 in BCA Specification C1.1 for Type A Construction as applicable to Class 9b (See Appendix 1). In this regard the following is noted with respect to our assessment of the development:

- + Due to the fact that the building is required to be constructed of Type A Construction, the FRL to building elements applies in both directions i.e. the FRL must be achieved from both sides of the external wall. Note: Non-loadbearing external walls need not be fire rated, with the exception of the spandrel protection portion.
- + All *loadbearing internal* walls are to be of concrete and/or masonry construction.
- + The following non-loadbearing elements are to be of non-combustible construction:
 - o Internal walls required to be fire-resisting; and
 - o A lift, ventilating, pipe, garbage, or similar shaft that is not for the discharge of hot products.
- + In the storey immediately below the roof, *internal* columns need not have an FRL.
- + The floor of the class 9b building is to achieve an FRL of 120/120/120 inclusive of the 'outboard' learning spaces, as seen in Building 3 below.

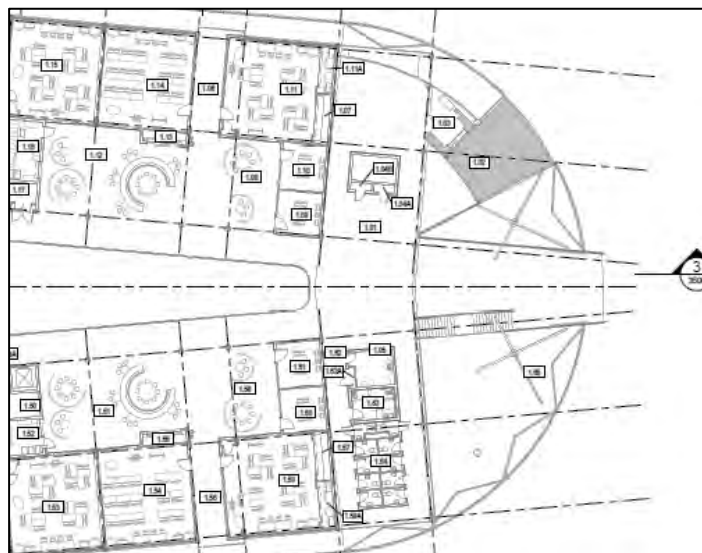


Figure 3: Building 3 'outboard' learning spaces

- + All cladding to external walls will need to be assessed for its ability to comply with BCA Spec C1.1, namely:
 - o Clause 2.4 where the product is proposed as an attachment to a wall;
 - o Non-combustible construction where it forms part of the external wall.



Clause C1.10 (Fire Hazard Properties) Fire hazard properties for all floor, wall and ceiling linings within the building are to comply with BCA Specification C1.10 with regard to smoke development rates, critical radiant flux and group ratings. In this instance, the following fire hazard properties apply:

- + Floor linings and coverings must achieve a Critical Radiant Flux of not less than 2.2kW/m² and a maximum smoke development rate of 750 percent-minutes;
- + Wall and ceiling linings are to achieve a material group number as specified in the table below and Smoke Growth Rate Index of not more than 100 or an Average Specific Extinction Area less than 250 m²/kg.

Class of building	Fire-isolated exits and fire control rooms	Public corridors		Specific areas		Other areas
	Wall/ceiling	Wall	Ceiling	Wall	Ceiling	Wall/ceiling
Class 5, 6, 7, 8 or 9b <i>schools</i>						
Unsprinklered	1	1, 2	1, 2	1, 2, 3	1, 2	1, 2, 3
Sprinklered	1	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3

Figure 4: BCA Table 3 Wall and Ceiling Lining Materials (Material Groups Permitted)

Note: With respect to a Class 9b school the reference to “Specific areas” in the table above means classrooms.

- + Rigid and flexible ductwork must comply with the fire hazard properties in AS 4254 Parts 1 & 2.
- + Sarking material must achieve a Flammability Index of not more than 5.

Clause C2.2 (Compartmentation) For a building of Type A Construction, the proposed maximum floor area and volume limitations are 8,000m² / 48,000m³. Compliance is readily achievable with these requirements.

Clause C2.6 (Spandrels) Spandrel protection is required where 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 450 mm outside the lower opening (measured horizontally).

Compliance is readily achievable the provision of:

- + A horizontal projection (balcony) which achieves an FRL of 60/60/60 having an outwards projection from the external face of the wall of 1100 mm or more, and an extension along the wall beyond the openings of at least 450 mm; or
- + A vertical spandrel which achieves an FRL of 60/60/60 having an overall height of 900 mm or more, extending at least 600 mm or more above the upper surface of the intervening floor (see figure below)

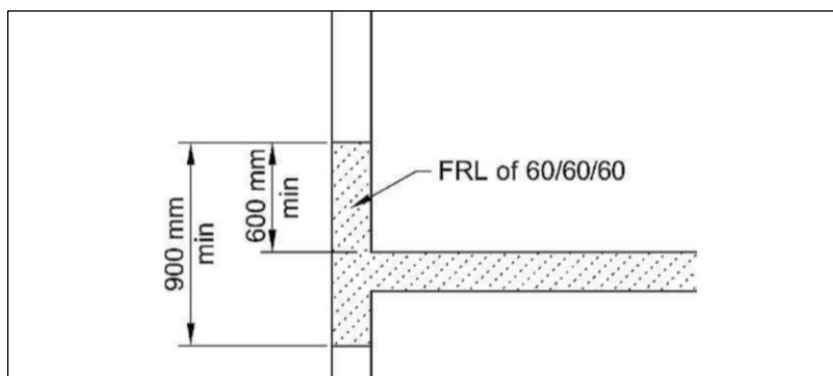


Figure 5: Section showing the use of a spandrel to separate openings

Note: Within the context of the BCA Clause C2.6, a window or other opening means any part of the external wall of a building that does not have an FRL of 60/60/60 or greater.

C2.10 (Separation of Lift Shafts) The proposed lift connects more than 2 storeys and is therefore required to be separated from the remainder of the building by a shaft which achieves an FRL of 120/120/120 if loadbearing or -/120/120 if non-loadbearing. Compliance is readily achievable noting that the lift is designed within its own shaft.

C2.12 (Separation of Equipment) Equipment such as the following is required to be fire separated from the remainder of the building by construction achieving an FRL of 120/120/120:

- Lift motors/control panels;
- Emergency generators – emergency equipment in emergency mode;



- Central smoke control plant;
- Boilers;
- Battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours
- On-site fire pumps

Details are to be provided for any such rooms contained within any of the buildings.

Clause C2.13 (Electricity Supply) Any switchboard sustaining emergency equipment operating in emergency mode must be separated from the remainder of the building with construction achieving an FRL of 120/120/120 with any doors to be -/120/30 self-closing fire doors.

Clause C3.2 (Protection of openings) Openings with a distance of less than 6m to a fire-source feature and 3m to the boundary are required to be protected in accordance with Clause C3.4. In this instance, the buildings proposed are not exposed to a fire source feature.

No further action is required.

Clause C3.10 (Openings in Fire isolated lift shafts) The lift is required to be provided with FRL -/60/- lift car doors, complying with AS1735.11. Lift indicator panels must also be backed by construction which achieves an FRL of -/60/60 if they exceed 35,000m² in area.

Clause C3.12 / C3.13 (Openings in floors and ceiling for services / and openings in shafts) Openings to service shafts are required to be protected by -/30/30 panel (if in a sanitary compartment), or a self-closing--/60/30 fire door, or a -/60/30 access panel. If the shaft is a garbage shaft, a door hopper of non-combustible construction is permitted to be installed. Architect to document the fire separating construction around the service shafts on the compartmentation plan accordingly.

Clause C3.15 Where service installations penetrate the walls or floors required to have an FRL with respect to integrity and insulation they are to be protected by fire seals (fire stopping system) having an FRL of the building element concerned. Fire Seals are to comply with the requirements of BCA Clause C3.15 and Specification C3.15 noting the following:

- + Fire seals needs to have been tested on the substrate it has been used on i.e. concrete, masonry, fire rated plasterboard, Hebel etc. – a fire stopping system tested in masonry cannot be relied upon for use in Hebel.
- + The maximum size of the services and the penetrations cannot exceed those tested for the fire stopping system
- + The fire stopping system needs to be used in the same orientation that it has been tested on i.e. floor or wall. A fire stopping system tested through a wall only cannot be relied upon when used for a service penetrating a floor.
- + The fire stopping system needs to have been tested on the service it is used to seal i.e. metal pipes, UPVC/PVC pipes, conduits, electrical cables etc. A fire stopping system tested on a PVC pipe cannot be relied upon for cables.
- + The test fire stopping system needs to include all elements specified to achieve the required FRL i.e. intumescent wraps are commonly required/used to achieve the insulation value (when required) for metal pipes, cable trays and large bundles of cables.
- + Where the mechanical ventilation system penetrates floors or walls that require an FRL, the installation is to comply with AS/NZS 1668.1 - 2015.



SECTION D – ACCESS AND EGRESS

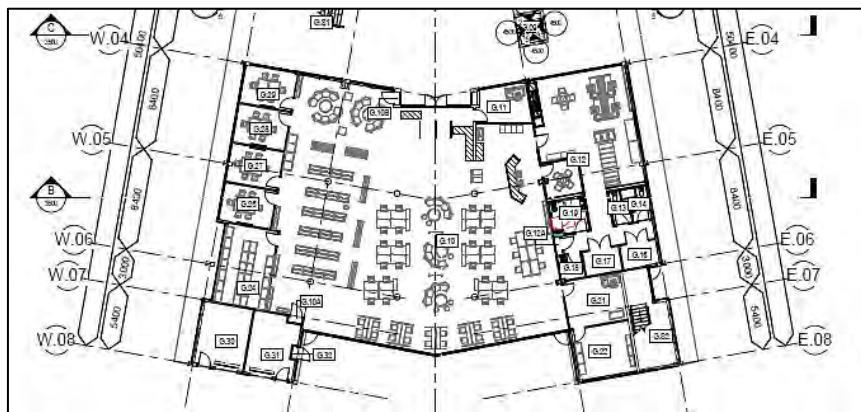
The proposal demonstrates that compliance with the Performance Requirements of Section D of the BCA is readily achievable, noting the following:

Clause D1.2 (Number of Exits) Each storey within the building is served by not less than two (2) exits thereby satisfying the minimum requirements for a Class 9b building.

Clause D1.3 (Fire Isolated Exits) This clause is applicable to the building as the stairways connect 3 storeys, however, in this instance, and with the exception of Stair 2 in Building 2, it is noted that the stairways have been designed as External Stairs in Lieu of a fire isolated exit. See Clause D1.8 below for requirements for External Stairs.

Clause D1.4 (Exit Travel Distances) The travel distances to exits within the building are required to be not more than 20 metres to a single exit, or a point where travel in different directions to two or more exits is available. Where there is a point of choice of two or more exits, all points on the floor are required to be within 40 metres to one of those exits.

- + **Building 2:** The current design complies with this clause, noting that an additional exit is to be located at the rear of the Ground Floor library.





Clause D1.5 (Distance between alternative exits) The travel distances between alternative exits within the building are to be no more than 60m apart and no less than 9m apart when measured back through the point of choice.

- + Building 2: Complies.
- + Building 3: There is up to 88m (level 2) and 82 m (level 1) measured between alternative exits on Level 1 and Level 2. It is understood that this will be justified in a Fire Engineered Performance Solution due to the open nature of the building and the natural venting within the open balconies and open corridors.

Clause D1.6 (Dimensions of Exits and paths of travel to Exits) The unobstructed height throughout an exit or a path of travel to an exit must be not less than 2 metres, except for doorways which may be reduced to not less than 1980mm. In addition, the unobstructed width of an exit or a path of travel to an exit must be not less than 1 metre or the required exit width determined under D1.6. Note: All doorways must have a minimum clear width of 850mm.

The current design indicates compliance has been achieved, subject to meeting the minimum widths.

Clause D1.8 (External stairways in lieu of fire-isolated exits) External stairways are proposed to be provided in lieu of fire-isolated stairways. In this instance it is noted that the stairs are not proposed to comply with the below requirements:

- + The external stairs are to be non-combustible and achieve a minimum FRL of 60/60/60 – when tested from the inside.
- + Openings in the external wall of the building within 3m of the external stair are to be removed/relocated >3m or alternatively, or alternatively separated by a blade wall which achieves an FRL of 60/60/60.
- + Walls within 6m of the external stair must achieve an FRL of 60/60/60 and doorways must be provided with -/60/30 fire doorsets.
- + Openings which are located within >3m-6m of the external stair are to be protected in accordance with BCA Clause C3.4 (if drenchers are used they are to be located internally).

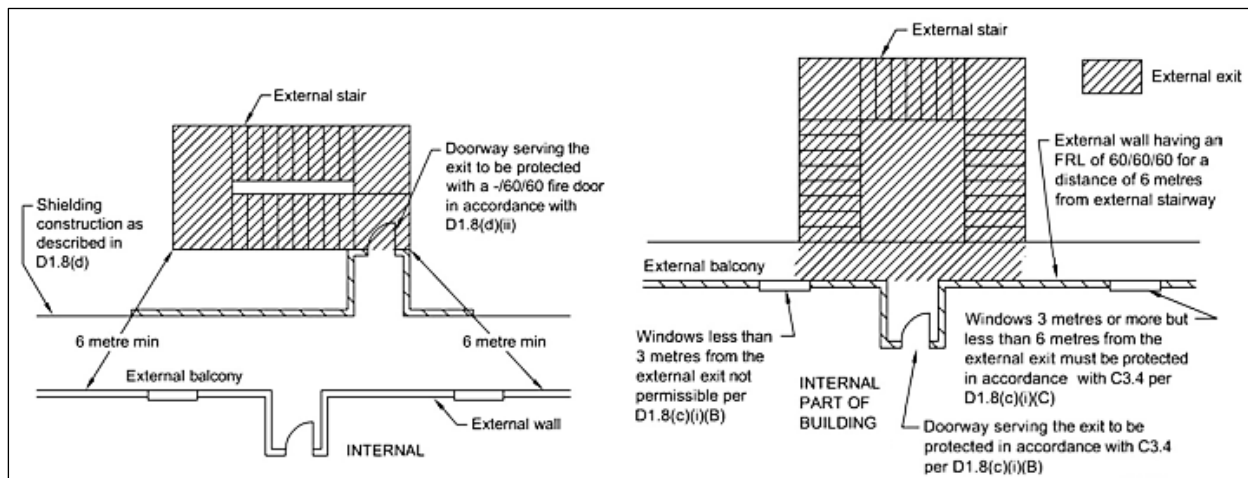


Figure 6: Examples of methods of protection for external stairways

Accordingly a **Fire Engineered Performance Solution** is proposed to be formulated to justify this departure, based on the introduction fire/some detection and early warning, and also based on the open sided nature of the buildings.

Clause D1.9 (Travel via non-fire-isolated stairways or ramps) The travel distance to open space via the non-fire-isolated stairway or non-fire-isolated stairs must not exceed 80m.

Clause D1.10 (Discharge from Exits) The path of travel from open space to the road for the building must have an unobstructed width of not less than the minimum width of the required exit or 1 m (whichever is the greater).

Note 1: the exit is reached when the occupants move beyond the roof or beyond the floor above.

Note 2: paths of travel to the road must not necessitate passing back beneath the building.

Clause D1.12 (Non-required stairways, ramps or escalators) The internal stair associated with Building 3 is not a designated exit. Accordingly it is only permitted to connect 2 storeys.

Clause D2.7 (Installations in Exits and Paths of Travel) The construction of Electrical Distribution Boards within building is to be in accordance with BCA Clause D2.7 with the enclosure



bounded by a non-combustible or fire protective covering and smoke seals provided around the perimeter of the doors in each case.

Clause D2.8 (Enclosure of Space under Stairs and Ramps) The space below the required non-fire-isolated stairways (including an external stairway) must not be enclosed to form a cupboard or other enclosed space unless:

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

Clause D2.13 (Treads and Risers) All stairs to and within the building are to have solid risers, and are to have contrast nosings throughout in accordance with Clause 11.1 of AS1428.1-2009. Furthermore the stairs are required to be slip resistant in accordance with the requirements of Table D2.14 when tested in accordance with AS4586-2014. The following will apply:

- + Stairway must have not more than 18 and not less than 2 risers in each flight.
- + Goings and risers within the stair flights must be constant throughout.
- + Goings and risers are to be in accordance with BCA Table D2.13 as noted below:

	Riser (R)	Going (G)	Quantity (2R+G)
Maximum	190	355	700
Minimum	115	250	550

Figure 7: Table D2.13 Riser and Going Dimensions (mm)

Clause D2.14 (Landings): Landings must have a maximum gradient of 1:50 and must:

- + be not less than 750mm long, and where this involves a change in direction, the length is measured 500mm from the inside edge of the landing; and
- + have a non-slip finish throughout or an adequate non-skid strip near the edge of the landing where it leads to a flight below.

Clause D2.15 (Thresholds): Doors must not have a ramp or step closer to the door than the width of the door leaf except where opening to open space, where the change in level may be a maximum of 190mm (applying generally to external stair exit doors only).

Note: See Part D3 below for thresholds throughout 'Accessible Spaces', including the interface at the balconies, and also the entry/exit doors.

Clause D2.16 (Barriers) Barriers to prevent falls (Balustrades) are to be provided to all stairways, floors, corridors, etc. where the fall to the level below is more than 1m in height. Barriers are to comply with Table D2.16a including the following:

- + Achieve a minimum height of a balustrade is 1m above the floor of the landing, walkway or the like; and 865mm above the floor of a stairway or a ramp and not permit a sphere of 125mm diameter to pass through.
- + Where the floor is more than 4m above the surface beneath the balustrade, any horizontal or near horizontal members between 150mm and 760mm above the floor must not include horizontal or near horizontal members that could facilitate climbing.

Note: Particular attention will need to be paid to the interface between handrails and barriers at Level 2 where the height of the floor is more than 4m above the surface beneath the balustrade.

- + For windows where the floor is more than 4m above the surface beneath, the window sill must be a minimum of 865mm in height above the height of the floor surface.

Clause D2.17 (Handrails) Handrails are required for stairs and ramps in the building and must be designed to include extensions at the top of the stair (minimum of 300mm) and bottom of the stair (minimum of 300mm + 1 tread width) with either a 180° turn-down or be turned 90° back to the wall as per the diagram from AS1428.1-2009. Refer also to Clause D2.16 above regarding floors more than 4m above the surface below.

The provisions relating to a second height handrail do not apply due to the fact that this building does not include primary school students.

Clause D2.19 (Doorways and doors) The current design indicates that there are no sliding doors proposed to serve as a required exit. Notwithstanding, should any sliding door be nominated as a required exit, the door must be able to be opened manually under a force of not more than 110N and 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. Refer to comments under Part D3 for additional requirements relating accessibility for the sliding doors proposed on all levels.

Clause D2.20 (Swinging doors): A swinging door in a required exit or forming part of a required exit must swing in the direction of egress. The current design indicates that compliance



has generally been achieved noting that the proposed sliding doors will need to address the requirements of the door furniture in Clause D2.21 below.

Clause D2.21 (Operation of latch) Hinged doors in a path of travel to an exit must be readily openable without a key from the side that faces a person seeking egress and have a single handed downward action of pushing action on a single device located between 900mm and 1100mm from the floor.

Further, the sliding doors in the building that are required for a path of travel to an exit will need to be addressed for single handed downward or pushing action on a single device.

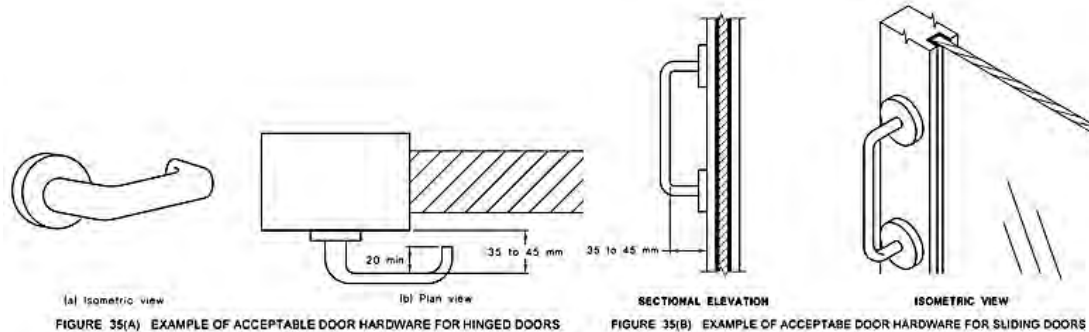


Figure 8: Examples of acceptable door hardware

Clause D2.23 (Signs on Doors): Not applicable given the stairs are not fire isolated, and there are no doors leading into the stairs.

Clause D2.24 (Protection of Openable Windows) Not applicable. The building is not a class 9b early childhood centre.

Part D3 (Access for people with disabilities) Access for persons with a disability will be provided to the new building to address BCA Part D3. In this instance, it is understood that an Accredited Access Consultant will be engaged to assess compliance for both Part D3 provisions and the DDA Access to Premises – Buildings Standards.

The following matters at a minimum will need to be addressed:

- + Access from the street to the principal pedestrian entrance of the building is to be provided in accordance with AS1428.1-2009.
- + All new doors to an within are required to have a clear width of not less than 850mm and comply with the circulation space requirements under AS 1428.1 - 2009.
- + Where an entry door is proposed to have multiple door leaves (except an automatic opening door) one of the door leaves must have a clear width of not less than 850mm.
- + Sliding doors are to be provided with a 'D' type handle located between 900-1100mm above FFL and the force required at the door handle to operate the door shall not exceed 20N as per Clause 13.5.2 of AS1428.1-2009
- + The door thresholds to external areas cannot contain any step or change in level exceeding 3mm.
- + 30% luminance contrasts are to be provided to all new doorways e.g. contrasting between door leaf & jamb; or door leaf & wall; or architrave & wall; or door leaf & architrave and/or door jamb & adjacent wall.
- + All frameless glass panels or fully glazed doors on an accessway are to be clearly marking in accordance with AS 1428.1/AS1288. In this instance, all frameless glass panel or fully glazed doors, including glazing capable of being mistaken for a doorway or opening, shall be marked with a full width solid non transparent contrast line not less than 75mm wide is
- + Walking surfaces to be slip resistant and certification in respect to the slip resistance of any tiles and vinyl will be required at the Occupation Certificate stage to verify compliance with AS/NZS 4586.
- + Every accessible stairway in the building is required to satisfy requirements under Clause 11 of AS 1428.1 – 2009. This includes, contrast stair nosing's between 50 and 75mm deep across the full width of the path of travel. The strip may be set back 15mm from the front of the nosing and must possess a minimum luminance contrast of 30% to the background. The strip must not extend down the riser more than 10mm. This includes the fire EXIT stairs.



- + Handrails are required to both sides of non-fire isolated stairs with 300mm extensions (top) and 1 tread width +300mm extensions (bottom) and full 180 degree turn downs in accordance with Section 11 of AS1428.1-2009.
- + Tactile Ground Surface Indicators are to be provided to all stairs in a building (noting the exits are designed as external stairs in lieu of fire isolated exit stairs) required to be accessible. In addition, tactile indicators will need to be provided to an accessway meeting a vehicular way adjacent to a pedestrian entry if there is no kerb or kerb ramp.
- + All door hardware, light switches and GPO's controls are to comply with Sections 13 and 14 of AS1428.1-2009 respectively.
- + Braille tactile signage is to be provided to all exits.

SECTION E - SERVICES AND EQUIPMENT

Clause E1.3 (Fire Hydrants) A fire hydrant system is required to be provided in accordance with AS2419.1-2005 (as the floor area exceeds 500m²).

Internal Fire Hydrant landing valves are to be located on the landing of the external stairs.

Details are to be provided with respect to the location of the fire hydrant booster assembly and its proximity to the building. See comments in Building 1 with respect to hydrant booster infrastructure.

Clause E1.4 (Fire Hose Reels) Fire hose reels are not required to serve the classroom portions of Buildings 12 and 3. Accordingly the following areas will need to be covered:

- + Building 2 Library;
- + Building 2 Staff areas

Clause E1.6 (Potable Fire Extinguishers) Portable fire extinguishers (PFE) are required to be provided as listed in Table E1.6, to serve the building in accordance with AS 2444-2001.

Clause E2.2 A fire detection and alarm system to AS1670.1-2015 is not required as the building has a rise in storeys of 3 or less.

Note 1: Should a ducted air-handling system (other than non-ducted individual room units <1,000l/s) be designed to the new building, the system must be shut down automatically upon the activation of smoke detectors installed complying with Cl. 5 of Spec. E2.2a i.e. AS1668.1-2015).

Note 2: The Building 2 and 3 consist solely of school classrooms and therefore the provisions applying to smoke exhaust etc. do not apply.

Clause E3.3 (Warning Against use of Lifts in Fire): Signage stating "DO NO USE LIFT IF THERE IS A FIRE" is to be provided near the lift call button in letters not less than 10mm in height.

Clause E3.6 (Facilities for People with Disabilities): As the lift is required to be provided for accessibility, it must be compliant with a lift specified under Table E3.6a (as appropriate) and the provisions of AS1735.12, with the primary matters as below:

- + Have minimum internal floor dimensions of 1400 x 1600mm.
- + Have doors with a minimum clear opening width of 900mm
- + Be fitted with a series of door opening sensory devices / passenger protection devices.

Clause E4.2 Emergency lighting is required to be provided within the building accordance with AS/NZS 2293.1-2005.

Clause E4.5/E4.6 Exit and directional exit signage is required to be provided within the building in accordance with AS/NZS 2293.1-2005.



SECTION F – HEALTH AND AMENITY

The proposal demonstrates that compliance with the DTS provisions of Section F of the BCA is readily achievable subject to the following:

Clause F1.1 (Stormwater drainage): Stormwater drainage must be installed as per AS 3500.3 - 2003.

Clause F1.5 (Roof coverings): A roof must be covered with

- + Concrete roof tiles complying with AS 2049 and fixed as per AS 2050.
- + Cellulose cement corrugated sheeting compiling with AS/NZS 2908.1 and installed as per AS/NZS 1562.2.
- + Metal roof sheeting comply with AS 1562.1
- + Plastic roof sheeting complying with AS/NZS 4256 parts 1, 2 3 and 5 and AS/NZS 1562.3.
- + Asphalt shingles complying with ASTM D3018-90 class A.

Clause F1.6 (Sarking): Sarking must be installed to roof and walls for weatherproofing as per AS/NZS 4200.1 and 2 - 1994.

Clause F1.7 (Waterproofing of wet areas): Wet areas in the building are required to comply with AS 3740-2004.

Clause F1.9/F1.10 (Damp and weatherproofing) Damp and weatherproofing by way of external walls, roofs, and waterproofing of wet areas is to be detailed on the architectural drawings.

Clause F1.13 (Glazed assemblies): Glazed assemblies in the external wall of the building are required to comply with AS 2047 requirements for resistance to water penetration. All other glazing installations are to comply with AS1288-2006.

Part F2 (Sanitary and Other Facilities) A preliminary calculation of the maximum population number for students has been completed based on sanitary facilities noted and assumed to be provided within the building.

- + Building 2. It is assumed that the students of Building 2 will utilise Building 3's facilities. The current design includes provision of 2 x ambulant + 1 x Accessible WC on each floor. There is no designation of male and female for this building, nor is it designated for staff or students. This will need to be addressed so we can assign accordingly and identify compliance.
- + Building 3: the sanitary facilities within the building include 11 facilities per floor.

Student	Facilities provided	Maximum Population
Male	Closet Pans = 10	700
	Urinals = 8	
	Washbasins = 18	
Female	Closet Pans = 18	750
	Washbasins = 18	

Note: Refer to Clause F2.6 regarding calculation of sanitary facilities with respect to urinals in lieu or WCs and required washbasins.

Clause F2.4 (Facilities for people with disabilities) The Access Consultant will need to review the proposed design and sanitary compartment layouts for accessible and ambulant sanitary facilities to confirm compliance with AS1428.1-2009. However, the following is noted with respect to the proposed sanitary facilities:

- + The sanitary facilities located within the building will need to ensure both Male and Female student facilities are designed as ambulant where necessary.
- + Particular attention will need to be given to ensure that the dimensions of the ambulant compartments comply with the requirements of AS1428.1-2009.

Clause F2.6 (Interpretation: Urinals and Washbasins) The calculation of sanitary facilities referenced in Part F2 (above) has incorporated the following:

- + The unisex accessible sanitary facility at each level has been counted once for each sex in accordance with BCA Clause F2.3.
- + Closet pans have been counted as urinals as permitted BCA Clause F2.6(a)(iii) to allow for a greater population.



Part F3 (Room Heights) Rooms are to achieve a minimum floor to ceiling height of:

- + GLS parts, study areas and other parts which accommodate *less than* 100 persons — 2.4m;
- + GLS parts, study areas and other parts which accommodate *more than* 100 persons – 2.7m;
- + Corridors serving parts of the building which accommodate less than 100 persons – 2.4m;
- + Corridors that serve parts of the building which accommodate *more than* 100 persons – 2.7m;
- + Office and admin areas – 2.4m;
- + Public corridors in the office and admin areas – 2.1m;
- + All bathrooms, sanitary compartments, kitchens, store rooms etc. – 2.1m;
- + Above a stairway, ramp, landing or the like — 2m measured vertically above the nosing line of stairway treads or the floor surface of the ramp, landing or the like.

Note: Architectural Sections and Elevations will be required to verify compliance.

Clause F4.1 (Natural Lighting) Natural light is required to be provided to all general-purpose classrooms within the buildings. The windows to classrooms and similar spaces are to have an aggregate light transmitting area of at least 10% of the floor area of the room they serve.

Clause F4.4 (Artificial Lighting) Artificial lighting complying with AS/NZS 1680.0-2009 is required to the following rooms/spaces where natural light cannot be provided, and the periods of occupation or use will create undue hazard to occupants seeking egress in an emergency:

- + Rooms that are frequently occupied,
- + All spaces required to be accessible,
- + All corridors, lobbies, internal stairways, other circulation spaces; and
- + Paths of egress.

Clause F4.5 (Ventilation of Rooms): The building is required to be provided with:

- + Natural ventilation consisting of permanent openings, windows, doors or other devices which can be opened in and which achieves an open area not less than 5% of the floor area of the room; or
- + a mechanical ventilation or air-conditioning system complying with AS1668.2; or
- + A combination of the abovementioned natural ventilation and mechanical ventilation/air-conditioning.

Clause F4.8 (Restriction of position of water closets and urinals) A room containing a closet pan or urinal must not open directly into

- + Kitchen or pantry;
- + A room used for public assembly (not being a room in an early child hood, primary school or open spectator stand;
- + Workplace normally occupies by more than 1 person.

Unless provided with an airlock, or unless the WC is provide with mechanical exhaust, and the door is screened from view, such a design will need to be addressed.

In this instance, the design demonstrates that compliance has been achieved.

SECTION J – ENERGY EFFICIENCY

The following energy efficiency design measures will be required to be implemented into the design of the building to satisfy the requirements for Climate Zone 6. In this respect, we note that the following requirements of BCA Section J will apply to the building (of which the applicant may engage the services of an Energy Efficiency Consultant):

- + J1: Building Fabric - the external fabric to be designed and constructed to reduce heat flow
- + J2: External Glazing - Thermal performances, solar orientation, shading
- + J3: Building Sealing - Doors, windows, roof lights i.e. to avoid leakage
- + J5: Air-conditioning and ventilation systems - operation, e.g. time switches; exhaust
- + J6: Artificial lighting and power - type and operation of lighting and power system
- + J7: Hot water supply - avoiding heat loss
- + J8: Access for maintenance - access to time switches, shading devices, etc.



CONCLUSION

In view of the above assessment we can confirm that subject to the above measures being undertaken that compliance with the Performance Requirements of the BCA is readily achievable (by way of complying with the DTS provisions, or by the formulation of a Performance Solution). In addition, it is considered that such matters can adequately be addressed in the preparation of the tender documentation design documentation without giving rise to any inconsistencies with the development consent or REF.

Should you wish to discuss please do not hesitate to contact me on 9211 7777.

Yours sincerely,

Brian J. Maguire (JP)
Accredited Certifier (BPB Accreditation No.0241)
Director – Blackett Maguire + Goldsmith



APPENDIX 1

TYPE A CONSTRUCTION (Building 2 and 3): FRL OF BUILDING ELEMENTS

BUILDING ELEMENT	CLASS 9b
Loadbearing external wall (including any column and other building element incorporated therein) <ul style="list-style-type: none"> + Less than 1.5m to a fire source feature + 1.5 to less than 3m to a fire source feature + 3m or more to a fire source feature 	120/120/120 120/90/ 90 120/60/ 30
Non-Loadbearing external wall <ul style="list-style-type: none"> + Less than 1.5 m to a fire source feature + 1.5m to less than 3 m to a fire source feature + 3m or more to a fire source feature 	- /120/120 - / 90/ 90 - / - / -
External column not incorporated in an external wall <ul style="list-style-type: none"> + Less than 3m to a fire source feature + 3m or more to a fire source feature 	120 / - / - - / - / -
Common walls and fire walls	120/120/120
Fire-resisting lift and stair shafts <ul style="list-style-type: none"> + Loadbearing + Non-loadbearing 	120/120/120 - /120/120
Internal walls bounding sole occupancy units <ul style="list-style-type: none"> + Loadbearing + Non-loadbearing 	120 / - / - - / - / -
Internal walls bounding public corridors, public lobbies and the like: <ul style="list-style-type: none"> + Loadbearing + Non-loadbearing 	120 / - / - - / - / -
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion <ul style="list-style-type: none"> + Loadbearing + Non-loadbearing 	120/90/90 - /90/90
Other loadbearing internal walls, beams trusses and columns	120 / - / -
Floors	120/120/120
Roofs	120/60/30



BUILDING 4

Building 4 consists of a primarily single storey dwelling to be used as a Multi-purpose sports hall.



Figure 1: (3D Render)

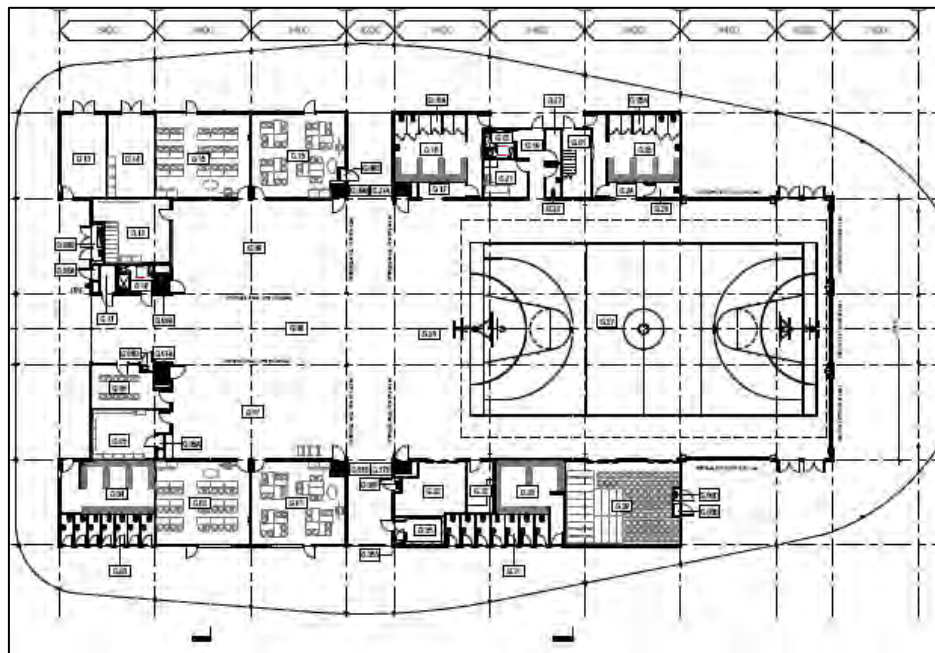


Figure 2: Level 1 Floor Plan



BUILDING CLASSIFICATION

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

+ BCA Classification:	Class 9b: Multi-purpose hall building
+ Rise in Storeys:	Two (2), as a result of the enclosed plant room
+ Effective Height:	Less than 12m
+ Type of Construction:	Type B Construction
+ Climate Zone:	Zone 6
+ Maximum Floor Area / Volume Limitations	5,500m ² / 33,000m ³ (complies)

FIRE SOURCE FEATURE

The distances from the nearest Fire Source Features (Allotments and/or Buildings situated on the same allotments) are noted as follows, noting the line of the external wall is considered to be the relevant part of the bundling to be measured in this instance:

BOUNDARY	DISTANCE TO FIRE SOURCE FEATURE
North	> 6m
South	> 6m to Building 3
East	> 6m
West	> 6m



BUILDING CODE OF AUSTRALIA ASSESSMENT

SECTION B – STRUCTURE

Part B1 Structural engineering details prepared by an appropriately qualified structural engineer are to be provided to demonstrate compliance with Part B1. This will include the following Australian Standards (where relevant):

- | | |
|--|---|
| + AS 1170.0 – 2002: General Principles | + AS 2047-2014: External Glazing |
| + AS 1170.1 – 2002 | + AS 3700 – 2011: Masonry Structures |
| + AS 1170.2 – 2011: Wind Actions | + AS 3600 – 2009, Concrete Structures |
| + AS 1170.4– 2007: Earthquake Actions | + AS 4100 – 1998: Steel Structures |
| + AS 1288 – 2006, Glass in Buildings | + AS 4600 – 2005: Cold Formed Steel Structures. |

SECTION C – FIRE RESISTANCE AND COMPARTMENTATION

The building will comply with the relevant Deemed-to-satisfy requirements of the BCA, having regard to the following specific matters being addressed:

Clause C1.1 (Fire Resisting Construction) All building elements are to achieve the required FRL in accordance with Table 4 in BCA Specification C1.1 for Type B Construction as applicable to Class 9b (See Appendix 1). In this regard the following is noted with respect to our assessment of the development:

- + Due to the fact that the building is required to be constructed of Type B Construction there are a number of fire rating requirement that apply:
 - o External walls that are located within 18m of a fire source feature are to be fire rated (See appendix below as to the FRLs). Note: The FRL to building elements applies in both directions i.e. FRL must be achieved from both sides of the external wall. Note: the non-loadbearing parts of the external walls need not be fire rated.
 - o Any columns are proposed to supporting the floor of the plant room are required to achieve an FRL of 120/-/-.
 - o Walls supporting the plant room floor are to achieve an FRL of 120/120/120 and are to be constructed of masonry or concrete.
 - o The floor of the plant room is required to achieve a 30/30/30 FRL or be of Fire Protective Covering, or have a 60 minute insipient spread ceiling.

Note: it is understood that the proponent will be formulating a **Fire Engineered Performance Solution** to address the above three (3) items based on the premise that the Plant Room 'storey' ought not be considered to add to what would otherwise be a Type C Construction building.

- + The following non-loadbearing elements are to be of non-combustible construction:
 - o Internal walls required to be fire-resisting; and
 - o A lift, ventilating, pipe, garbage, or similar shaft that is not for the discharge of hot products
- + The internal columns that support the roof above the plant room need not be fire rated, given the concession available in Spec C1.1 for internal columns not to be fire rated. In the storey immediately below the roof, internal columns need not have an FRL.
- + Cladding will need to be assessed for its ability to comply with BCA Spec C1.1, namely:
 - o Clause 2.4 where the product is proposed as an attachment to a wall;
 - o Non-combustible construction where it forms part of the external wall.

Clause C1.10 (Fire Hazard Properties) Fire hazard properties for all floor, wall and ceiling linings within all buildings are to comply with BCA Specification C1.10 with regard to smoke development rates, critical radiant flux and group ratings. In this instance, the following fire hazard properties apply:

- + Floor linings and coverings must achieve a Critical Radiant Flux of not less than 2.2kW/m² and a maximum smoke development rate of 750 percent-minutes;
- + Wall and ceiling linings are to achieve a material group number as specified in the table below and Smoke Growth Rate Index of not more than 100 or an Average Specific Extinction Area less than 250 m²/kg.



Class of building	Fire-isolated exits and fire control rooms	Public corridors		Specific areas		Other areas
	Wall/ceiling	Wall	Ceiling	Wall	Ceiling	Wall/ceiling
<i>Class 5, 6, 7, 8 or 9b schools</i>						
Unsprinklered	1	1, 2	1, 2	1, 2, 3	1, 2	1, 2, 3
Sprinklered	1	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3

Figure 4: BCA Table 3 Wall and Ceiling Lining Materials (Material Groups Permitted)

Note: With respect to a Class 9b school the reference to “Specific areas” in the table above means classrooms.

- + Rigid and flexible ductwork must comply with the fire hazard properties in AS 4254 Parts 1 and 2.
- + Sarking material must achieve a Flammability Index of not more than 5.

Clause C2.2 (Compartmentation) The proposed development complies with the maximum floor area and volume limitations of 5,500m² / 33,000m³.

C2.12 (Separation of Equipment) Equipment such as the following is required to be fire separated from the remainder of the building by construction achieving an FRL of 120/120/120:

- + Emergency generators – emergency equipment in emergency mode;
- + Central smoke control plant;
- + Boilers;
- + Battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours

Details are to be provided for any such rooms contained within Building 4.

Clause C2.13 (Electricity Supply) Any switchboard sustaining emergency equipment operating in emergency mode must be separated from the remainder of the building with construction achieving an FRL of 120/120/120 with any doors to be -/120/30 self-closing fire doors.

Clause C3.2 (Protection of openings) Openings with a distance of less than 6m to a fire-source feature and 3m to the boundary are required to be protected in accordance with Clause C3.4. In this instance, the buildings proposed are not exposed to a fire source feature.

No further action is required.

Clause C3.12 / C3.13 (Openings in floors and ceiling for services / and openings in shafts) Applicable to this Type B Construction building if the floor of the plant room is fire rated.

Clause C3.15 (Openings For Service Penetrations) Where service installations penetrate the walls or floors required to have an FRL with respect to integrity and insulation they are to be protected by fire seals (fire stopping system) having an FRL of the building element concerned. Fire Seals are to comply with the requirements of BCA Clause C3.15 and Specification C3.15 noting the following:

- + Fire seals needs to have been tested on the substrate it has been used on i.e. concrete, masonry, fire rated plasterboard, Hebel etc. – a fire stopping system tested in masonry cannot be relied upon for use in Hebel.
- + The maximum size of the services and the penetrations cannot exceed those tested for the fire stopping system
- + The fire stopping system needs to be used in the same orientation that it has been tested on i.e. floor or wall. A fire stopping system tested through a wall only cannot be relied upon when used for a service penetrating a floor.
- + The fire stopping system needs to have been tested on the service it is used to seal i.e. metal pipes, UPVC/PVC pipes, conduits, electrical cables etc. A fire stopping system tested on a PVC pipe cannot be relied upon for cables.
- + The test fire stopping system needs to include all elements specified to achieve the required FRL i.e. intumescent wraps are commonly required/used to achieve the insulation value (when required) for metal pipes, cable trays and large bundles of cables.
- + Where the mechanical ventilation system penetrates floors or walls that require an FRL, the installation is to comply with AS/NZS 1668.1 - 2015.



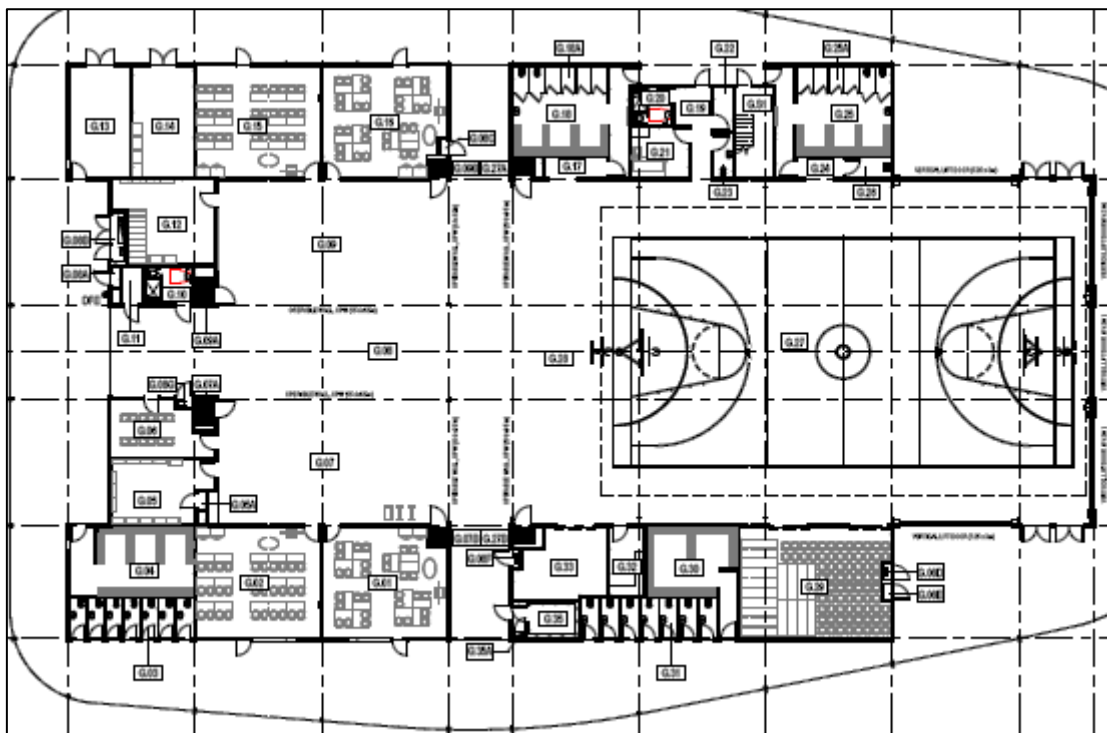


SECTION D – ACCESS AND EGRESS

The proposal demonstrates that compliance with the Performance Requirements of Section D of the BCA is readily achievable, noting the following:

Clause D1.2 (Number of Exits) Each storey within the building must be serviced by a minimum of 2 exits (i.e. each storey in a primary or secondary school with a rise in storeys of 2 or more). In this regard it is noted that the plant room has only a single exit, therefore departing from the requirements of this clause, albeit this is not a habitable space nor is it accessed by staff or students. Accordingly we expect that this will be addressed as a **Fire Engineered Performance Solution** to justify a single exit to the plant room, based on compliance with the distance to exits requirements.

Clause D1.4 (Exit Travel Distances) The travel distances to exits within the building are required to be not more than 20 metres to a single exit, or a point where travel in different directions to two or more exits is available. Where there is a point of choice of two exits, all points on the floor are required to be within 40 metres to one of the exits. In this instance, compliance with the requirements of this clause has been achieved for Building 4.



Clause D1.5 (Distance between alternative exits) The travel distances between alternative exits within the building comply with the DTS provisions of the BCA, being no more than 60m apart and no less than 9m apart when measured back through the point of choice.

Clause D1.6 (Dimensions of Exits and paths of travel to Exits) The unobstructed height throughout an exit or a path of travel to an exit must be not less than 2 metres, except for doorways which may be reduced to not less than 1980mm. In addition, the unobstructed width of an exit or a path of travel to an exit must be not less than 1 metre or the required exit width determined under D1.6. Note: All new doorways must have a minimum clear width of 850mm.

Building 4 has approximately 15m of exit width available from within the Gymnasium area, inclusive of the 2 sets of double doors to both sides of the eastern side and also the permanently open breezeway entries from north/south and also to the west.

Clause D1.9 (Travel via non-fire isolated exits) Applies to the Plant Room level. The travel distance to open space via the non-fire-isolated stairway or non-fire-isolated stairs does not exceed 80m – Complies.

Clause D1.10 (Discharge from Exits) The path of travel from open space to the road for all buildings must have an unobstructed width of not less than the minimum width of the required exit or 1 m (whichever is the greater). Where the exit discharges to open space that is at a different level than the public road to which it is connected, the path of travel to the road must be by on grade ramps and/or stairs that comply with BCA Clauses D2.13 and D2.17.



Clause D2.7 (Installations in Exits and Paths of Travel) The construction of Electrical Distribution Boards within the buildings are to be in accordance with BCA Clause D2.7 with the enclosure bounded by a non-combustible or fire protective covering and smoke seals provided around the perimeter of the doors in each case.

Clause D2.8 (Enclosure of Space under Stairs and Ramps) The space below the required non-fire-isolated stairways (including an external stairway) must not be enclosed to form a cupboard or other enclosed space unless:

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

Clause D2.13 (Treads and Risers) treads and risers to the plant room are to comply with AS1657 (See D2.17/D2.18 below)

Clause D2.15 (Thresholds): Doors must not have a ramp or step closer to the door than the width of the door leaf except where opening to open space, where the change in level may be a maximum of 190mm (applying generally to fire isolated exit doors only).

Note: See D3 below for thresholds throughout 'Accessible Spaces', including the interface at the balconies, and also the entry/exit doors.

Clause D2.16 (Barriers) Barriers to the plant room are to address AS1657 (See below in D2.17/18).

Clause D2.17/D2.18 (Handrails) Handrails are required for the stair to the plantroom, and this can achieve compliance with AS1657 rather than the requirements of D2.17.

Clause D2.19 (Doorways and doors) Should any sliding doors be proposed to serve as a required exit, the door must be able to be opened manually under a force of not more than 110N and 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. Refer to comments under Part D3 for accessibility requirements for the proposed sliding doors.

Clause D2.20 (Swinging doors): A swinging door in a required exit or forming part of a required exit must swing in the direction of egress. The current design for Building 4 indicates compliance has been achieved.

Clause D2.21 (Operation of latch) Hinged doors in a path of travel to an exit must be readily openable without a key from the side that faces a person seeking egress and have a single handed downward action of pushing action on a single device located between 900mm and 1100mm from the floor.

Further, the operable walls will need to include appropriate hinged door sections so as to enable use of the door opening devices accordingly. Particular attention is to be given to the operable walls associated with the Gymnasium, where more than 1 hinged door will be required to address aggregate egress width requirements.

Panic bars are to be provided to the doors to the gymnasium, given the likelihood of non-school use by members of the public from time to time.



Part D3 (Access for people with disabilities) Access for persons with a disability will be provided proposed building, to address BCA Part D3. In this instance, it is understood that an Accredited Access Consultant will be engaged to assess compliance for both Part D3 provisions and the DDA Access to Premises – Buildings Standards.

The following matters at a minimum will need to be addressed:

- + Access from the street to the principal pedestrian entrance of the building is to be provided in accordance with AS1428.1-2009.
- + All new doors to an within are required to have a clear width of not less than 850mm and comply with the circulation space requirements under AS 1428.1 - 2009.
- + Where an entry door is proposed to have multiple door leaves (except an automatic opening door) one of the door leaves must have a clear width of not less than 850mm.
- + The door thresholds to external areas cannot contain any step or change in level exceeding 3mm.
- + 30% luminance contrasts are to be provided to all new doorways e.g. contrasting between door leaf & jamb; or door leaf & wall; or architrave & wall; or door leaf & architrave and/or door jamb & adjacent wall.
- + All frameless glass panels or fully glazed doors on an accessway are to be clearly marking in accordance with AS 1428.1/AS1288. In this instance, all frameless glass panel or fully glazed doors, including glazing capable of being mistaken for a doorway or opening, shall be marked with a full width solid non transparent contrast line not less than 75mm wide is
- + Walking surfaces to be slip resistant and the slip resistance of any tiles and vinyl is to be in accordance with AS/NZS 4586.
- + All door hardware, light switches and GPO's controls are to comply with Sections 13 and 14 of AS1428.1-2009 respectively.
- + Braille tactile signage is to be provided to all exits.

SECTION E – SERVICES AND EQUIPMENT

Clause E1.3 (Fire Hydrants) A fire hydrant system is required to be provided to the building in accordance with AS2419.1-2005.

Internal Fire Hydrant landing valves are to be located within 4m of the exit, and any external hydrant landing valve is to be located >10m from the building or be shielded by a 90/90/90 wall that is 4m high and approx. 4m wide.

The location of the fire hydrant booster assembly and its proximity to the building.

Clause E1.4 (Fire Hose Reels) Fire hose reels are not required to serve the Class 9b portion GLS of the building. However, they are required to serve the remainder of the Gym and workshops and sanitary facility areas, in accordance with AS 2441.1 and will need to be located within 4m of an exit.

Clause E1.6 (Potable Fire Extinguishers) Portable fire extinguishers (PFE) are required to be provided as listed in Table E1.6, to serve the building in accordance with AS 2444-2001.

Clause E2.2(Smoke Hazard Management) A fire detection and alarm system to AS1670.1-2015 is not required for Building 4 as it does not have a rise in storeys of more than 3. *See notes below for additional information on this matter.*

Note 1: Should a ducted air-handling system (other than non-ducted individual room units <1,000l/s) be designed to the new building, the system must be shut down automatically upon the activation of smoke detectors installed complying with Cl. 5 of Spec. E2.2a, i.e. AS1668.1-2015).

Note 2: The stage does not generate the need to include smoke exhaust given it does not exceed 50m² in floor area;

Note 3: Where the floor area of the fire compartment is more than 2,000m², the fire compartment will need to be provided with smoke exhaust (or smoke and heat vents). However, given the building is less than 5,000m² and the building has a rise in storeys of 2 or less, the smoke exhaust/heat vents can be replaced with an automatic fire detection and alarm system to AS1670.1-2015 (or a sprinkler system).

The above requirements for smoke exhaust in Note 3 do not apply to the following:

- + Sporting complexes other than indoor sports stadiums with total spectator seating for more than 1000 persons;



- + Churches and other places solely for religious worship;
- + School classrooms.

Consequently, Building 4 has a fire compartment $>2,000\text{m}^2$ and $<5,000\text{m}^2$ and therefore the options of including a fire detection and alarm system in the building as a DTS solution to smoke hazard management is available.

Clause E3.3 (Warning Against use of Lifts in Fire): Not applicable. There is not an upper level of habitable space that requires passenger lift access.

Clause E3.6 (Facilities for People with Disabilities): Not applicable. There is not an upper level of habitable space that requires passenger lift access.

Clause E4.2 Emergency lighting is required to be provided to all buildings in accordance with AS/NZS 2293.1-2005.

Clause E4.5/E4.6 Exit and directional exit signage is required to be provided in accordance with AS2293.1.

Clause E4.9 If the Gymnasium is to be used as a Public Hall and it is in an open mode that results in a floor area of the Hall being $>1,000\text{m}^2$, EWIS is required to be installed.

SECTION F – HEALTH AND AMENITY

The proposal demonstrates that compliance with the DTS provisions of Section F of the BCA is readily achievable subject to the following:

Clause F1.1 (Stormwater drainage): Stormwater drainage must be installed as per AS 3500.3 - 2003.

Clause F1.5 (Roof coverings): A roof must be covered with

- + Concrete roof tiles complying with AS 2049 and fixed as per AS 2050.
- + Cellulose cement corrugated sheeting complying with AS/NZS 2908.1 and installed as per AS/NZS 1562.2.
- + Metal roof sheeting comply with AS 1562.1
- + Plastic roof sheeting complying with AS/NZS 4256 parts 1, 2 3 and 5 and AS/NZS 1562.3.
- + Asphalt shingles complying with ASTM D3018-90 class A.

Clause F1.6 (Sarking): Sarking must be installed to roof and walls for weatherproofing as per AS/NZS 4200.1 and 2 - 1994.

Clause F1.7 (Waterproofing of wet areas): Wet areas in the building are required to comply with AS 3740-2004.

Clause F1.13 (Glazed assemblies): Glazed assemblies in the external wall of the building are required to comply with AS 2047 requirements for resistance to water penetration. All other glazing installations are to comply with AS1288-2006.

Part F2 (Sanitary and Other Facilities) Further discussion will be undertaken with respect to toilet numbers, based on the notion that students using the building will also be using facilities within other building such as Building 3.

Clause F2.4 (Facilities for people with disabilities) The Access Consultant will review the proposed design and sanitary compartment layouts for accessible and ambulant sanitary facilities to confirm compliance with AS1428.1-2009. However, the following is noted with respect to the proposed sanitary facilities:

- + There are three (3) banks of sanitary facilities, however there is only 1 single occasion where an Accessible Facility is located adjacent to a bank (a departure from the requirement for this to occur 50% of the time). This may need modification.
- + Particular attention will need to be given to ensure that the dimensions of the ambulant compartments comply with the requirements of AS1428.1-2009.

Part F3 (Room Heights) Rooms within all buildings are to achieve a minimum floor to ceiling height of:

- + GLS and other parts which accommodate *less than* 100 persons – 2.4m;
- + Other part of the Homebase building which accommodate *more than* 100 persons – 2.7m;
- + Corridors serving parts of the building which accommodate less than 100 persons – 2.4m;
- + Corridors that serve parts of the building which accommodate *more than* 100 persons – 2.7m;



- + All bathrooms, sanitary compartments, kitchens, store rooms etc. – 2.1m;
- + Above a stairway, ramp, landing or the like — 2m measured vertically above the nosing line of stairway treads or the floor surface of the ramp, landing or the like.

Clause F4.1 (Natural Lighting) Natural light is required to be provided to all general-purpose classrooms within the buildings. The windows to GLS are to have an aggregate light transmitting area of at least 10% of the floor area of the room they serve.

Clause F4.4 (Artificial Lighting) Artificial lighting complying with AS/NZS 1680.0-2009 is required to the following rooms/spaces where natural light cannot be provided, and the periods of occupation or use will create undue hazard to occupants seeking egress in an emergency:

- + Rooms that are frequently occupied,
- + All spaces required to be accessible,
- + All corridors, lobbies, internal stairways, other circulation spaces; and
- + Paths of egress.

Clause F4.5 (Ventilation of Rooms): The building is required to be provided with:

- + Natural ventilation consisting of permanent openings, windows, doors or other devices which can be opened in and which achieves an open area not less than 5% of the floor area of the room; or
- + a mechanical ventilation or air-conditioning system complying with AS1668.2; or
- + A combination of the abovementioned natural ventilation and mechanical ventilation/air-conditioning

Clause F4.8 (Restriction of position of water closets and urinals) A room containing a closet pan or urinal must not open directly into

- + Kitchen or pantry;
- + Public dining room or restaurant;
- + Dormitory in a class 3;
- + A room used for public assembly (not being a room in a early child hood, primary school or open spectator stand;
- + Workplace normally occupies by more than 1 person.

Compliance is achieved for Building 4.

SECTION J – ENERGY EFFICIENCY

This class 9b building has potential for being likely to be conditioned, i.e. at times when operable walls are fully extended. The GLS areas will also be likely to be conditioned as a result of their use.

Accordingly, the following energy efficiency design measures will be required to be implemented into the design of the buildings to satisfy the requirements for Climate Zone 6. In this respect, we note that the following requirements of BCA Section J will apply to the building (of which the applicant may engage the services of an Energy Efficiency Consultant):

- + J1: Building Fabric - the external fabric to be designed and constructed to reduce heat flow
- + J2: External Glazing - Thermal performances, solar orientation, shading
- + J3: Building Sealing - Doors, windows, roof lights i.e. to avoid leakage
- + J5: Air-conditioning and ventilation systems - operation, e.g. time switches; exhaust
- + J6: Artificial lighting and power - type and operation of lighting and power system
- + J7: Hot water supply - avoiding heat loss
- + J8: Access for maintenance - access to time switches, shading devices, etc.



CONCLUSION

In view of the above assessment we can confirm that subject to the above measures being undertaken that compliance with the Performance Requirements of the BCA is readily achievable. In addition, it is considered that such matters can adequately be addressed in the preparation of the tender documentation design documentation without giving rise to any inconsistencies with the development consent.

Should you wish to discuss please do not hesitate to contact me on 9211 7777.

Yours sincerely,

Brian J. Maguire (JP)
Accredited Certifier (BPB Accreditation No.0241)
Director – Blackett Maguire + Goldsmith



APPENDIX 1

TABLE 5 TYPE B CONSTRUCTION: FRL OF BUILDING ELEMENTS

BUILDING ELEMENT	Class of building—FRL: (in minutes)			
	Structural Adequacy/Integrity/Insulation			
	2, 3 or 4	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	–/–/–	–/–/–	–/–/–	–/–/–

Note: the FRLs above apply to Building 4, unless otherwise detailed in a Fire Engineering Performance Solution report.



APPENDIX 2

PRELIMINARY LIST OF FIRE SAFETY MEASURES

Based on the preliminary assessment of the development, the following fire safety measures are required within the building:

Building 1

Statutory Fire Safety Measure	Design / Installation Standard
Emergency lighting	BCA Clause E4.2 and E4.4 & AS 2293.1-2005
Exit Signs	BCA Clause E4.5, E4.6, E4.8 & AS 2293.1-2005
Fire Hydrants	BCA Clause E1.3 and AS2419.1 - 2005
Fire Hose Reels	BCA Clause E1.4 and AS2441-2005
Paths of Travel	EP&A Regulation Clause 186
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 - 2001
Fire Engineering Performance Solution	TBC

Building 2 and 3

Statutory Fire Safety Measure	Design / Installation Standard
Emergency lighting	BCA Clause E4.2 and E4.4 & AS 2293.1-2005
Exit Signs	BCA Clause E4.5, E4.6, E4.8 & AS 2293.1-2005
Fire Blankets	AS 3504 - 1995 & AS2444 - 2001
Fire Dampers	BCA Clause C3.15
Fire Hydrants	BCA Clause E1.3 and AS2419.1 - 2005
Fire Hose Reels	BCA Clause E1.4 and AS2441-2005
Fire Seals	BCA Clause C3.15
Mechanical Air handling (Automatic shutdown)	BCA Clause E2.2 and AS1668.1-2015
Paths of Travel	EP&A Regulation Clause 186
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 - 2001
Warning & Operational Signs	Section 183 of the EP&A Regulation 2000, AS 1905.1 - 2005, BCA Clause D3.6, E3.3
<i>Fire Engineering Performance Solution:</i>	<i>TBC - may include Fire Detection and Alarm System Monitoring (ASE)</i>

Building 4

Statutory Fire Safety Measure	Design / Installation Standard
Automatic Fire Detection and Alarm system	NSW BCA Clause E2.2 and AS1670.1-2015
Building Occupant Warning System	
Emergency lighting	BCA Clause E4.2 and E4.4 & AS 2293.1-2005
Exit Signs	BCA Clause E4.5, E4.6, E4.8 & AS 2293.1-2005
<i>EWIS (if used as a public hall)</i>	<i>BCA Clause E4.9 and AS1670.1-2015</i>
Fire Blankets	AS 3504 - 1995 & AS2444 - 2001
Fire Hydrants	BCA Clause E1.3 and AS2419.1 - 2005
Fire Hose Reels	BCA Clause E1.4 and AS2441-2005
Mechanical Air handling (Automatic shutdown)	BCA Clause E2.2 and AS1668.1-2015



Statutory Fire Safety Measure	Design / Installation Standard
Paths of Travel	EP&A Regulation Clause 186
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
Stage <50m ²	BCA Spec E2.2
<i>Fire Engineering Performance Solution</i>	<i>TBC</i>



APPENDIX 4

ARCHITECTURAL PLANS PREPARED BY CGAMW ARCHITECTS

DRAWING NUMBER	REV	DATE	DRAWING NUMBER	REV	DATE
HASH-00-SD-AR-DR-1000	C	22.08.2017	HASH-00-SD-AR-DR-1001	C	22.08.2017
HASH-00-SD-AR-DR-1010	C	22.08.2017	HASH-00-SD-AR-DR-1011	C	22.08.2017
HASH-00-SD-AR-DR-1012	C	22.08.2017	HASH-00-SD-AR-DR-1013	C	22.08.2017
HASH-00-SD-AR-DR-1102	B	22.08.2017	HASH-00-SD-AR-DR-1100	B	22.08.2017
HASH-00-SD-AR-DR-1103	B	22.08.2017	HASH-01-SD-AR-DR-2100	E	22.08.2017
HASH-01-SD-AR-DR-2800	C	22.08.2017	HASH-01-SD-AR-DR-3000	C	22.08.2017
HASH-01-SD-AR-DR-3500	C	22.08.2017	HASH-02-SD-AR-DR-2100	D	22.08.2017
HASH-02-SD-AR-DR-2110	D	22.08.2017	HASH-02-SD-AR-DR-2120	D	22.08.2017
HASH-02-SD-AR-DR-2800	C	22.08.2017	HASH-02-SD-AR-DR-3000	C	22.08.2017
HASH-02-SD-AR-DR-3001	B	22.08.2017	HASH-02-SD-AR-DR-3500	B	22.08.2017
HASH-03-SD-AR-DR-2100	D	22.08.2017	HASH-03-SD-AR-DR-2110	D	22.08.2017
HASH-03-SD-AR-DR-2120	D	22.08.2017	HASH-03-SD-AR-DR-2800	C	22.08.2017
HASH-03-SD-AR-DR-3000	D	22.08.2017	HASH-03-SD-AR-DR-3001	C	22.08.2017
HASH-03-SD-AR-DR-3002	B	22.08.2017	HASH-03-SD-AR-DR-3500	C	22.08.2017
HASH-04-SD-AR-DR-2100	D	22.08.2017	HASH-04-SD-AR-DR-2800	C	22.08.2017
HASH-04-SD-AR-DR-3000	D	22.08.2017	HASH-04-SD-AR-DR-3001	B	22.08.2017
HASH-04-SD-AR-DR-3500	C	22.08.2017			



APPENDIX 5

BUILDING CODE OF AUSTRALIA TERMINOLOGY

Performance 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 New South Wales (NSW) under the provisions of the EP&A Act.

Climatic Zone

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

Crown Certificate

Approval issued by the Certifying Authority pursuant to s.109R(2) 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 allowed for—

- (i) certain Class 2, 3 or 9c buildings in C1.5; and
- (ii) a Class 4 part of a building located on the top storey in C1.3(b); and
- (iii) 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.

Deemed to Satisfy Provisions (DtS)

Provisions which are deemed to satisfy the Performance Requirements.

Exit

An exit means –

- i. Any of a combination of the following if they provide egress to a road or open space:
 - a. An internal or external stairway
 - b. A ramp;
 - c. A fire isolated passageway
 - d. A doorway leading to a road or open space
- ii. A horizontal exit or a fire isolated passageway leading to a horizontal exit

Effective Height

The vertical distance between the floor of the lowest storey included in the calculation of rise in storeys and 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).

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.

Fire Resistance Level (FRL)

The grading periods in minutes for the following criteria-

- (a) structural adequacy; and
 - (b) integrity; and
 - (c) insulation,
- 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.

Open Space

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