

Building Code of Australia 2022 Report

Report for BCA Compliance

PROJECT NAME: New High School at Googong
PROJECT NUMBER: GDL240469
DATE: 06/02/2025



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REVISION HISTORY

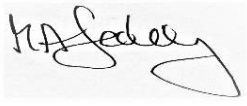

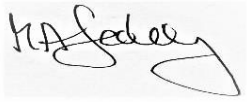

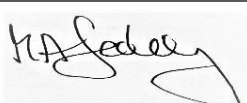
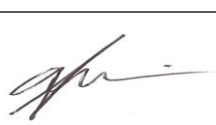
Revision	Date	Details	Authorised	
			Name/Position	Signature
A	15/11/2024	Concept Design	Prepared: Mike Gooley Associate	
			Reviewed: Justin Jones-Gardiner Director	
B	29/01/2025	Schematic Design & REF	Prepared: Mike Gooley Associate	
			Reviewed: Justin Jones-Gardiner Director	
C	06/02/2025	REF	Prepared: Mike Gooley Associate	
			Reviewed: Justin Jones-Gardiner Director	

Table 1 – Revision History

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1.0 EXECUTIVE SUMMARY

This BCA Assessment Report has been prepared by Group DLA on behalf of the NSW Department of Education (DoE) to inform a Review of Environment Factors (REF) for the proposed construction of a new high school for Googong (the activity) located at 200 Wellsville Drive, Googong, NSW (the site).

The activity relates to the construction and operation of a new educational establishment to serve the needs of the growing Googong township by accommodating up to 700 students from years 7 – 12. Specifically, the activity includes the following:

- Building A, a three to four-storey building in the northern portion of the site, fronting Glenrock Drive, which will accommodate learning spaces and administrative functions of the school.
- Building B, a three-storey building in the north-west portion of the site, fronting Observer Street, which will accommodate learning spaces and administrative functions of the school.
- Building C, fronting Glenrock Drive, which will accommodate a school hall / gymnasium and canteen.
- Outdoor recreation areas, cricket nets, playing court and playing field.
- Main pedestrian entry established from Glenrock Drive.
- Car park and accessible pedestrian entry from Wellsville Drive.
- Service entry from Observer Street.
- Associated civil works, earthworks, servicing and landscaping.
- Associated off-site works such as the construction of pedestrian crossings, drop off and pick up bays and a bus stop.
- School identification and wayfinding signage.

The REF describes the activity, documents the examination and consideration of all matters affecting, or are likely to affect, the environment, and details safeguards to be implemented to mitigate impacts. The Department of Education is the determining authority for the project under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The purpose of this report is to supplement the REF submission to demonstrate that compliance is readily achieved with the National Construction Code, Volume 1, Class 2-9 Buildings, Building Code of Australia 2022 ("BCA").

Compliance with the BCA will be achieved by a combination of Deemed to Satisfy and Performance Solutions and will be assessed further as the design progresses towards the crown certification of building works. Refer to Section 5 and 6 of this report which details departures from the DTS to be addressed by performance solutions. The design documentation will require further assessment as the design progresses within the next stage of the design documentation.

2.0 INTRODUCTION

The subject BCA review has been limited to assessment of the Schematic Design/REF – architectural drawings prepared by NBRIS which at this stage, do not detail sufficient information to allow a full BCA report to be produced. The design is yet to be developed to the extent that a complete BCA assessment can be concluded and therefore this report is preliminary only.

This BCA review has been limited to the Architectural Drawings which detail sufficient information to allow a full BCA report to be produced. However, as the design drawings develop the architectural plans will need to be reassessed as necessary to ensure a complete BCA assessment is concluded.

The report is prepared based on a review of the documentation listed in Table 6 and the information provided by the client and is intended for their use only.

2.1 Reporting Team

The information contained within this report was prepared by Mike Gooley, Registered Certifier – Unrestricted (BDC0143) and reviewed by Justin Jones - Gardiner, Registered Certifier - Unrestricted (BDC0204) from Group DLA.

2.2 Current Legislation

The applicable legislation governing the BCA version for buildings is the Environmental Planning and Assessment Act 1979.

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Whilst we await final confirmation on the building approval mechanism, it is understood at this stage that the project will follow a Crown Approval pathway (REF). The provisions of Section 6.28 of the Environmental Planning and Assessment Act (Crown Building Work), require that the building work be carried out in accordance with the Building Code of Australia (BCA). The application of compliance with the particular version of the BCA is the date on which tenders were issued for the building works. The date of tender was in December 2024. Therefore, the proposed new buildings being designed in accordance with BCA 2022.

The BCA is now updated every three (3) years, the next updated will be BCA 2025 which is anticipated to come into force on the 1st of May 2025.

2.3 Fire Brigade

As per BCA 2022 Clause A2G2(4) all Performance Solutions are required to undertake a Performance Based Design Brief (PBDB) process, NSW Fire Brigades have advised (<https://www.fire.nsw.gov.au/page.php?id=9154>) that they will only provide their stakeholder input via a Fire Engineering Brief Questionnaire (FEBQ) process prepared and lodged by the engaged Fire Safety Engineer. This applies to all projects irrespective of the approval process, Crown, REF, CDC or Construction Certificate projects, if there are any Performance Solutions affecting fire safety all need to undertake this stakeholder engagement with NSW Fire Brigade which the Fire Safety Engineering will lodge.

Section 27 of the EP&A 2021 Regs defines which fire engineering reports need to be referred, and generally relates to Category 2 Fire Safety Provisions (defined in the Act) and/or for cladding performance solutions¹, and the floor area of a fire compartment in general terms exceeds 2000 m² or the floor area of the building exceeds 6000 m², the Section 27 referral to the FRNSW is to be assessed and lodged by the engaged Registered Certifier assessing the Construction Certificate.

¹Category 2 fire safety provision means the following provisions of the Building Code of Australia, namely, CP9, EP1.3, EP1.4, EP1.6, EP2.2 and EP3.2 in Volume One of that Code.

It is common practice to adopt this Construction Certificate process on Crown projects under a voluntary submission, however this is up to the discretion of the Crown Authority if this subsequent Fire Engineer Report referral and Inspection of Fire Brigades will be adopted on a project by project. (Note: there is no option for the FEBQ process, but voluntary for the Report lodgement and request for inspection on completion which can only be made if the report is lodged initially.)

Under recent changes to the legislation and Fire brigade advice, for Section 27 referrals of the Fire Engineering Report the fire brigade is required to respond within 10 days advising whether or not they will be proceeding with a review and providing the Initial Fire Safety Report. If so, they have not more than 28 days from the initial lodgement to provide their report or the Certifier can choose to invoke the provisions of Clause 144(6A)(c) and issue the Construction Certificate after 28 days of officially lodging the Clause 144 application; further consultation is required on this issue with the engaged Certifier as in almost all cases the Certifier will await comments and adopt any recommendations made by NSW Fire & Rescue which may have programme implications to be planned for.

2.4 Limitations

This report does not constitute or include, nor imply or audit any assessment of the following;

- This assessment is limited to the developed documentation at the date of this report and as referenced within the "Documentation Assessed" section of the Report.
- Preparation of performance provisions of the BCA are excluded from this report.
- This report does not include assessment of the documentation against the provisions of the Disability Discrimination Act 1992 or (Access to Premises Buildings) Standards 2010.
- Any roof top plant or the like has been assessed (assumed) as open to the sky. Covered areas to roof tops may constitute an extra storey thus BCA requirement for the entire building may change.
- Travel distances have been assessed on an open plan basis with an allowance made for travel around pending fixed structures. No consideration has been given to any future fixed structures and accordingly, further assessment will be required in the event of floor plan or fixture amendments if and when these are provided formally.
- This report excludes any form of Certification Work as defined in the regulations, and is for BCA Compliance purposes only
- Generally, the assessment does not include a detailed assessment of Australian Standards.
- Requirements of other Regulatory Authorities including, but not limited to, Telstra, Telecommunications Supply Authority, Water Supply Authority, Electricity Supply Authority, Work Cover, Roads and Maritime Services (RMS), Local Council, ARTC, Department of Planning, Liquor Licensing Act 1997 and the like; and
- Demolition Standards not referred to by the BCA;
- Work Healthy and Safety Act 2011 (Safety in Design);
- The National Construction Code – Plumbing Code of Australia Volume 3;
- BCA Report lists Clauses and Specifications are based on the Draft version of BCA 2022, should changes occur in the issued/adopted version then any changes are excluded and the actual clause in the BCA will supersede anything listed in the Report.
- The capacity of design of any Electrical, Fire, Hydraulic or Mechanical Services;
- Structural and services drawings have not been reviewed, nor any consideration given to the structural capacity (or inherent FRL's) of the building.
- Fire Ratings and FRL listings - Where the BCA / NCC requires an FRL, unless noted otherwise the fire rating is required to be in both directions of fire i.e. inside and outside for example, and not one way fire rated, where one way fire rating is allowed the BCA identifies that, and not the other way around.

3.0 SITE DESCRIPTION

The site is identified in Figure 4 and the activity is shown in Figure 1.



Figure 4– Site Location Plan

Source: Mecone

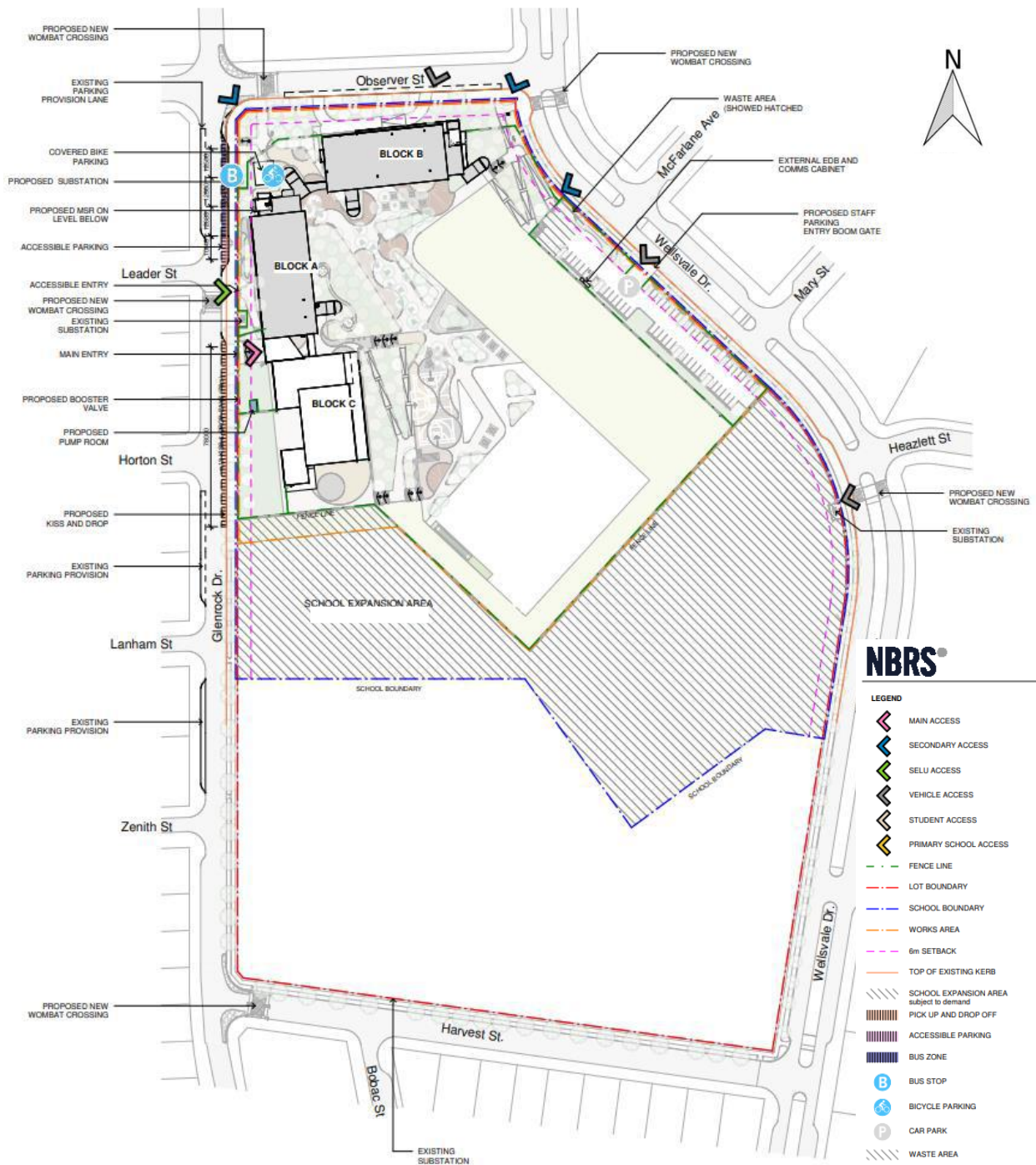


Figure 1 – New High School in Googong– indicative only, subject to detailed design

Source: NBRS, 29/01/2024

Googong is a new release area within the Queanbeyan-Palerang Local Government Area (LGA), located approximately eight kilometres south of Queanbeyan and 17 kilometres southeast of the Canberra Central Business District (CBD). Googong Reservoir, a significant waterbody, is located approximately 3 kilometres east of the subject site. Canberra Airport is located approximately 12 kilometres north of the subject site.

The site is legally described as Lot 829 in Deposited Plan 1277372. The proposed new high school site within this Lot has an area of approximately 5.84 hectares.

The site is currently zoned as R1 General Residential in the Queanbeyan-Palerang Local Environmental Plan (LEP) 2022 and is located within Neighbourhood 2 of the Googong Masterplan, within the Googong DCP 2010.

The site is surrounded by low-density residential development, recreational areas and a future local centre adjoining the site to the north.

The site is currently vacant with no existing structures and has been cleared of all trees and native vegetation. The site has an approximately 12 metre fall from the southwest corner of the site at RL ~763.550m Australian Height Datum AHD to the northeast at RL ~751.570m AHD.

3.1 Building Description

BCA Class	Level	Description/Use Proposed
Class 5	Level 1 – Building A	Offices (school administration)
Class 9b	Block A and B	Educational purposes (classrooms)
Class 9b	Level 2 – Block B	School Library
Class 9b	Block C	Multi-purpose Hall and COLA
Class 10a	Main Entry	Covered Walkways/Awnings

Table 4 – Building Class (or part)

Characteristic	Block A and B (Classrooms)	Block C (Hall & COLA)
BCA Classifications:	5 and 9b	9b
Type of Construction:	Type A	Type C
Floor Area of Whole Building:	< 8,000m ²	1,600m ²
Volume of Whole Building:	< 21,600m ³ (#)	12,000m ³ (#)
Max Fire Compartment Size (Floor Area):	8,000m ²	3,000m ²
Max Fire Compartment Size (Volume):	48,000m ³ (#)	18,000m ³ (#)
Fire Compartments:	Building A and B	Building C
Rise in Storeys:	Four (4) (*)	One (1)
Levels Contained:	Four (4) (*)	One (1)
BCA Effective Height:	Less than 25m (i.e. 11.25m)	Less than 25m
Climate Zone:	7	7
Importance Level (BCA Table B1D3a):	3	3

Table 5 – Building Characteristic

(*)	Block A and B has been assessed as a single building based upon walkways being connected within each storey. The lowest level of Block A has been assessed as a storey for the purposes to determine the rise in storeys. This portion of the building has a rise in storey of 4, while Block B has a rise in storey of 3. The rise in storey for the united building is 4.
(#)	The ceiling height of Block A & B has been assessed at 2.7m to calculate the volume of the Buildings. The ceiling height of Block C has been assessed as 7.5m to calculate the volume of this Building.

Note 1:	The awnings between Block A and C are free standing and have been assessed as Class 10a structure.
Note 2:	“Effective height means the vertical distance between the floor of the lowest storey included in a determination 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).” The effective height has been measured as 11.25m.

3.2 Documentation Assessed

The architectural plans are still under development to the extent that a complete BCA assessment can be concluded and therefore this report is preliminary only for information. This report is based on the following documentation prepared by NBRS (dated 20 Jan 2025).

Description	Drawing No.	Revision
Cover & Drawing List	GGHS-NBRS-ZZ-ZZ-DR-A-000001	2
Consolidated Schedule of Accommodation	GGHS-NBRS-ZZ-ZZ-DR-A-000003	2
Site Analysis Sheet 01	GGHS-NBRS-ZZ-ZZ-DR-A-000051	2
Stacking Plan	GGHS-NBRS-ZZ-ZZ-DR-A-000100	2
3D Axonometric Diagram	GGHS-NBRS-ZZ-ZZ-DR-A-000110	2
Boundary Site Plan	GGHS-NBRS-ZZ-ZZ-DR-A-000200	2
Site Plan	GGHS-NBRS-ZZ-ZZ-DR-A-000201	2
Shadow Diagram	GGHS-NBRS-ZZ-ZZ-DR-A-000500	2
GFA Plans	GGHS-NBRS-ZZ-ZZ-DR-A-003000	1
Overall Ground Plan	GGHS-NBRS-ZZ-ZZ-DR-A-001000	2
Overall Level 1 Plan	GGHS-NBRS-ZZ-ZZ-DR-A-001001	2
Overall Level 2 Plan	GGHS-NBRS-ZZ-ZZ-DR-A-001002	2
Overall Level 3 Plan	GGHS-NBRS-ZZ-ZZ-DR-A-001003	2
Overall Roof Plan	GGHS-NBRS-ZZ-ZZ-DR-A-001005	2
Site Elevations	GGHS-NBRS-ZZ-ZZ-DR-A-003001	2
Site Sections	GGHS-NBRS-ZZ-ZZ-DR-A-004001	2
Typical Walkways Screen Design	GGHS-NBRS-ZZ-ZZ-DR-A-005601	2
Signage	GGHS-NBRS-ZZ-ZZ-DR-A-008600	3
External Finishes	GGHS-NBRS-ZZ-ZZ-DR-A-009011 & 12	2

Table 6 – Documentation Assessed

3.3 Assumptions

Assumptions made in the preparation of the report are identified below;

1. A total population of up to 700 students with 55 staff is proposed throughout the school campus.
2. Importance Level: Guide to the BCA indicates importance level 3 apply to buildings and facilities with a primary school, a secondary school or day care facilities with a capacity greater than 250.
3. The external balconies and walkways are open circulation areas with sterile finishes. Consequently, the use of these areas does not contribute to the fire load for the purposes of assessment under Part C3 of the BCA.
4. Disabled Access, Section J energy Efficiency are excluded from this report, and details relating to these elements are located in others reports/documentation.

4.0 BCA COMPLIANCE DISCUSSION & DESIGN CONSIDERATIONS

The following assessment will provide an overview of the compliance with the BCA and identify issues that require particular attention at this stage of the development.

Section B – Structure

1. Structural Engineer to review and provide compliant design in accordance with Part B, Part C and Clauses D3D4 of BCA 2022, and all listed / referenced Australian Standards.
2. Structural Engineer is to outline and provide to the Consultant Team (Façade designer, Architect and Services Consultants) the calculated expected Earthquake actions and expected forces expected on non-structural components to be designed for, from Section 8 of AS 1170.4-2007 as referenced in BCA 2022.
3. Services Consultants to provide confirmation of compliance of non-structural elements in accordance with Sections 8 of AS1170.4-2007 or alternatively Structural Engineer to provide specific design statement referencing non-structural elements as outlined in Section 8 of AS1170.4-2007 Note: This may require input from Structural engineer as per Item 2 above.
4. Architect to provide confirmation of compliance of non-structural elements in accordance with Sections 8 of AS1170.4-2007 or alternatively Structural Engineer to provide specific design statement referencing non-structural elements as outlined in Section 8 of AS1170.4-2007. Note: This may require input from Structural engineer as per Item 2 above.

Section C – Fire Resistance

1. Structural Engineer and Architect to review and provide compliant design with respect to required FRL's for a Type A and Type C - 9b structure, including all loadbearing structures which provide direct vertical or lateral support to those elements with a required FRL.
2. The architectural drawings indicate Block A and B are connected via walkways and the roof structure to form a single combined building. This building has been assessed as required to be design for Type A Construction. The multi-purpose hall and COLA being single storey is required to be designed as Type C construction. The main entry has a covered awning which must be designed to be free standing so can be assessed as a Class 10a structure. Therefore, Buildings A-B and Building C have been assessed as two separate buildings.
3. The maximum size of fire compartments for a Class 5 and 9b building of Type A construction is 8,000m² with volume up to 48,000m³. Whilst a Class 9b building of Type C construction being 3,000m² with a volume up to 18,000m³. The overall floor area and volume of the building being established to determine the appropriate location of firewalls to provide fire separation in accordance with Table C3D3 of the BCA.
4. The buildings with a rise in storey of 3 must be designed to comply with Type A construction. The windows between storeys must be suitably fire-separated by spandrel which achieve compliance with Clause C3D7 of the BCA. The architectural design drawings being suitable detailed to satisfy these requirements.
5. Lift Shaft – should the lift shaft/s be designed to be non-loadbearing; the Structural engineer is to provide the required Earthquake information to the consultant designing the lift shafts to meet the requirements of Section 8 of AS 1170.4-2007 as referenced in BCA 2022.
6. Architect / Façade Consultant is to provide a Detailed statement outlining each part/element contained in the makeup of the external wall system and any other elements required to be non-combustible in accordance with C2D10 (external walls) & C2D14 (Ancillary Elements). Current fire test reports required to be provided in accordance with AS1530.1 for each element required to be non-combustible in accordance with C2D10 & C2D14.

- (1) In a building *required* to be of **Type A** construction—
- (a) each building element listed in Tables S5C11a to S5C11g and any beam or column incorporated in it, must have an FRL not less than that listed in those Tables for the particular Class of building concerned; and
 - (b) 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 Tables S5C11a to S5C11g; or
 - (iii) if under S5C15 the roof is not *required* to comply with Tables S5C11a to S5C11g, 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
 - (c) 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) Subject to (2), *fire-protected timber*; or
 - (iv) any combination of (i) to (iii); and
 - (d) the FRLs specified in Tables S5C11a to S5C11g 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
- (2) For the purposes of (1)(c)(iii), fire-protected timber may be used, provided that—
- (a) the building 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 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 (other than a FPAA101D or FPAA101H system) throughout complying with Specification 17; 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 9
- (3) For the purposes of Table S5C11a and Table S5C11b, includes any column and other building element incorporated within it or other external building element

Table S5C11a: Type A Construction: FRL of loadbearing parts of external walls

Distance from a fire-source feature	FRL (in minutes): Structural adequacy/ Integrity / Insulation			
	Class 2, 3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Less than 1.5m	90/90/90	120/120/120	180/180/180	240/240/240
1.5 to less than 3m	90/60/60	120/90/90	180/180/120	240/240/180
3m or more	90/60/30	120/60/30	180/120/90	240/180/90

Table S5C11b: Type A Construction: FRL of non-loadbearing parts of external walls

Distance from a fire-source feature	FRL (in minutes): Structural adequacy/ Integrity / Insulation			
	Class 2, 3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Less than 1.5m	—/90/90	—/120/120	—/180/180	—/240/240
1.5 to less than 3m	—/60/60	—/90/90	—/180/120	—/240/180
3m or more	—/—/—	—/—/—	—/—/—	—/—/—

Table S5C11c: Type A construction: FRL of external columns not incorporated in an external wall

Column Type	FRL (in minutes): Structural adequacy/ Integrity / Insulation			
	Class 2, 3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Loadbearing	90/-/-	120/-/-	180/-/-	240/-/-
Non-Loadbearing	-/-/-	-/-/-	-/-/-	-/-/-

Table S5C11d: Type A construction: FRL of common walls and fire walls

Wall Type	FRL (in minutes): Structural adequacy/ Integrity / Insulation			
	Class 2, 3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Loadbearing or Non-loadbearing	90/90/90	120/120/120	180/180/180	240/240/240

Table S5C11e: Type A construction: FRL of loadbearing internal walls

Distance from a fire-source feature	FRL (in minutes): Structural adequacy/ Integrity / Insulation			
	Class 2, 3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Fire-resisting lift and stair shafts	90/90/90	120/120/120	180/120/120	240/120/120
Bounding public corridors, public lobbies and the like	90/90/90	120/-/-	180/-/-	240/-/-
Between or bounding sole-occupancy units	90/90/90	120/-/-	180/-/-	240/-/-
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion	90/90/90	120/90/90	180/120/120	240/120/120

Table S5C11f: Type A construction: FRL of non-loadbearing internal walls

Location	FRL (in minutes): Structural adequacy/ Integrity / Insulation			
	Class 2, 3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Fire-resisting lift and stair shafts	-/90/90	-/120/120	-/120/120	-/120/120
Bounding public corridors, public lobbies and the like	-/60/60	-/-/-	-/-/-	-/-/-
Between or bounding sole-occupancy units	-/60/60	-/-/-	-/-/-	-/-/-
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion	-/90/90	-/90/90	-/120/120	-/120/120

Table S5C11g: Type A construction: FRL of other building elements not covered by Tables S5C11a to S5C11f

Building element	FRL (in minutes): Structural adequacy/ Integrity / Insulation			
	Class 2, 3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
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

Roof: Concession

A roof need not comply with Tables S5C11a to S5C11g if its covering is *non-combustible* and the building—

- has a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification 17 installed throughout; or
- has a **rise in storeys of 3 or less**; or
- is of Class 2 or 3; or
- 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**

- Building A and B have a rise in storey of four (4). Consequently, the roof concession cannot be applied in this case. The ceiling immediately below the roof must be provided with a resistance to the incipient spread of fire to the roof space of not less than 60 minutes. Consideration may be given to performance solution from a fire engineer to delete this DtS provision. This can be further discussed with the appointed fire engineer.

Section D – Access & Egress

8. Number of Exits Required:
9. The BCA prescribes that not less than 2 require exits must be provided from each storey in a Class 9b – Primary/secondary School building. Compliance will be achieved with these provisions of the BCA.
5. Travel Distance to Exits and between Alternative Exits:
 - Travel distances on the floor must be more than 20m to an exit or a point in which travel in different directions to 2 exits is available, in which case, the maximum distance to 1 exit cannot exceed 40m; and
 - Travel distances between alternative exits must be at least 9.0m apart and not exceed a distance of 60m in all other classes, uniformly distributed with access to 2 exits if required and not converge so they become less than 6m apart.
 - Initial review of the architectural drawings indicates exit doorways have not yet been sufficient detailed on the floor plan layouts. Please refer to Appendix B of this report which has nominated where additional exit doorways will need to be provided to achieve compliant travel distances. At this stage our assessment has identified some extended travel distances to point of choice to alternative exits. Consideration being given to adjustment of layout plans to achieve compliant travel distances or documentation of a fire engineering – performance solution to address any departures from the DtS provisions.
6. External stairway in lieu of fire-isolated exits:
 - An external stairway may serve as a required exit in lieu of a fire-isolated exit serving a storey below an effective height of 25m, if the stairway is non-combustible throughout and protected in accordance with Clause D2D13 if it is within 6m of and exposed to any part of the external wall of the building it serves.
 - Bounding walls of external stairway or the external wall of the building situated within 6.0m of the external wall of the building to achieve an FRL 60/60/60 with glazed doorways and windows protected by wall-wetting drenchers.

Please note: Doorway or window openings are not permitted within 3.0m to the external stairways.

 - Considerations may be given to relocating the external stairways from the external walls of the building to achieve a separation of not less than 6.0m. The external stairway incorporates part of the external balcony as the communal thoroughfare for occupants exiting via the external stair and is therefore considered part of the external exit. As the width of the stairway is approximately 2.3m wide, the landings at each level are assessed as part of the stairway and the 6.0m setback being measured to this circulation zone.

Section E –Services & Equipment

7. Fire Services and Mechanical Consultants to provide compliant design in accordance with Part E, for the purposes of the building design at this stage the following fire services are anticipated/expected:
 - Fire Hydrant system to BCA Clause E1D2 and AS 2419.1-2021;

A fire hydrant booster assembly is required to be within sight of the pedestrian entrance to the building and adjacent to the property boundary and the vehicle access for the fire brigade. The fire hydrant system for the new building being designed to comply with the requirements of AS 2419.1-2021.

Any departures being addressed by way of performance solution from a fire engineer.

- Fire Hose Reels is not required to serve a class 9b – classrooms or class 5 offices. Fire Hose Reels are required to serve the Multi-purpose Hall and Library areas. The location being within 4.0m to required exits (i.e. Stair 2 & 4). Consideration may be given to the deletion of FHR's subject to a performance solution from a fire engineer.
- Portable Extinguishers to BCA Clause E1D14 and AS 2444-2001.

Section E2 – Smoke Hazard Management

8. Smoke Detection and Alarm System:

- The BCA prescribes a smoke detection and alarm system must serve a class 5 and 9b building with a rise in storey greater than 3. As the rise in storeys exceed 3 storeys a Smoke Detection and Alarm system to AS 1670.1-2018 and BCA E2D9 is required by BCA 2022.
- Smoke detection system that is provided to satisfy the requirements for automatic shutdown of air-handling system in accordance with NSW E2D16 and S20C6 of the BCA;
- EWIS – Block A and B has a rise in storey of more than 3 and is required to be served by an emergency warning and intercom system complying with BCA Clause E4D9 and AS 1670.4.

9. Mechanical Ventilation System – Auto Shut Down:

- Mechanical Ventilation System - Auto Shut Down of any air-handling system as per BCA Clause E2D16 (other than non-ducted individual room units with a capacity not more than 1000 L/s and miscellaneous exhaust air systems installed in accordance with Section 5 and 6 of AS 1668.1) which does not form part of the smoke hazard management system, on the activation of smoke detectors installed in accordance with S20C6.

Stage 2 – Multi-purpose Hall:

Stage 2 will include the expansion of the Multi-purpose Hall to include stage area greater than 50sqm. The stage area is required to be served by automatic smoke and heat vents complying with NSW 14D59, in a single storey building or top storey of two storey building.

Section E4 – Emergency Lighting, exit signs and Intercom Systems

10. Exit Signs and Emergency Lighting to BCA Part E4 and AS 2293.1-2005.
11. An emergency warning and intercom system complying, where applicable with AS 1670.4 must be installed in a Class 9b building used as a theatre, public hall, or the like, having a floor area more than 1,000m² or a rise in storeys of more than 2. SINSW to confirm that the hall will not be accessible to the public. As such, the requirements of EWIS, detection system or BOWS are not applicable to the building.
12. An emergency warning and intercom system complying where applicable with AS 1670.4 must be installed in a Class 9b building used as a *school* and having a *rise in storeys* of more than 3. Based upon Building A and B have a rise in storey of four (4), the building must be served with An emergency warning and intercom system complying with AS 1670.4.

Section F – Health and Amenity

➤ Damp and Weatherproofing

There are new requirements that a roof, balcony, podium or similar horizontal surface part of a building must be provided with a waterproofing membrane in accordance with AS 4654.1 and AS 4651.2.

This is a new requirement coming into effect as of 1 May 2022 and careful design consideration will need to be applied in the areas of the balconies and the like in this development. This may be applicable for the proposed trafficable rooftop area of the design.

There may be conflict with the accessible provisions of Part D4 of the BCA which will need to be comment on further by the access consultant, as this Standard may require hobs at the thresholds to the rooftop, see Figure 9 below. There is relief available as the Standard does allow for a gutter system at the threshold of the door sill, which is to be fitted with an AS1428.1-2009 approved grate, in lieu of a hob (Ref: AS 4654.2). However, such detail should only be determined in accordance with the hydraulic engineer and the access consultant. Note that the accessible Standard contains restrictions on heights differences between abutting surfaces, such as the flooring and door sill, and a review of Section 7 of AS 1428.1-2009 (note the designer will need to review the 2021 version of this standard as this will be applicable at the time of the Construction Certificate) should be considered as part of the threshold designs.

Figure 9 below also illustrates the membrane termination heights which are given in Table A1 of Appendix of the Waterproofing Standard. Note that the heights are related to the determined wind class from AS 4055-2012 and should only be determined by the appropriate project engineer, i.e., structural, hydraulic or façade engineer.

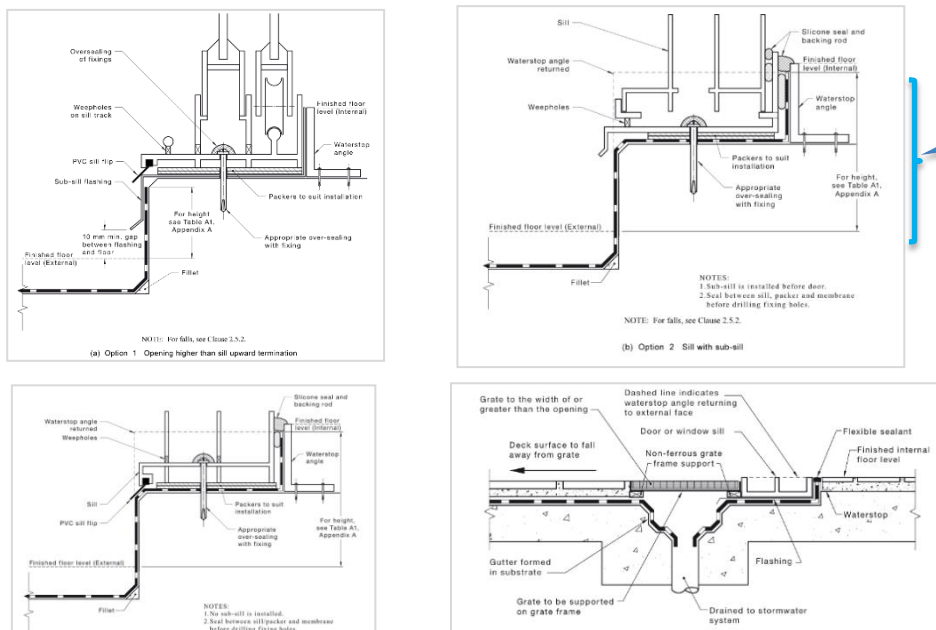


Figure 9 - Various waterproofing options at threshold and outlets.

Doors and windows onto external waterproof areas are required to comply with either of the 4 options above. Consideration must be given to access for people with disabilities which requires 5mm tolerance in difference with floor levels at door thresholds. Therefore – Clause 2.8.3 from AS 4654.2 requires grates to be provided as per figure 2.9 in front of doorways along the balconies within each storey. The architectural and Hydraulic details will be further developed to achieve compliance with these provisions of the BCA.

➤ **Occupant Numbers and Assessment of Sanitary Facilities:**

A total population of up to 700 students with 55 staff is proposed throughout the school campus. Based on this population the below minimum number of sanitary facilities will be required:

Stage 1 – Sanitary Facilities required based upon Design Occupancy

Student – Sanitary Facilities

	Population	Pans	Urinals	Washbasins
Male	350	5	5	7
Female	350	8		7
	Unisex Accessible		1 per bank of toilets	

Staff – Sanitary Facilities

	Population	Pans	Urinals	Washbasins
Male	28	2	2	1
Female	28	2		1
	Unisex Accessible		1 per bank of toilets	

Notes:

1. Each urinal for males can be substituted with a water closet.
2. An accessible unisex facility required for people with a disability may be counted once for each sex. This concession means that for each wash basin and closet pan counted above, you may deduct for each accessible unisex facility provided.
3. Ambulant facilities must be provided with the block of sanitary facilities in accordance with BCA and AS 2419.1-2009.

Provision of Natural Light to Classrooms:

Natural light must be provided in a Class 9b building – to all general-purpose classrooms in primary and secondary schools and all playrooms or the like for the use of children in an early childhood centre. Method and extent of natural lights must be provided by windows that comply with the following:

- Have an aggregate light transmitting area measured exclusive of framing members, glazed bars or other obstructions of not less than 10% of the floor area of the room; and
- Are open to the sky or face a court or other space open to the sky or an open verandah, carport or the like.

Sanitary Compartments:

- Sanitary compartments must not open directly into a workspace. The entry doors to the toilets within the Learning Commons and General Learning space being adequately screen from the view or area being reconfigured to open into a corridor rather than an open workspace.
- Unisex sanitary facilities required partitions from the ground to underside of ceiling;
- Sanitary facilities will require doors to swing outwards or provide lift off hinges to be able to remove the doorway.

Section G – Ancillary Provisions

1. The Deemed-to-Satisfy provisions apply in a designated bushfire prone area to a building located in an area subject to a Bushfire Attack Level (BAL) not exceeding BAL – 12.5, determined with AS 3959 that is a Class 9b – primary or secondary school.
2. Bushfire – Opportunities and Constraints Assessment Report for Googong High School by ECO Logical Australia dated 25 March 2024 has assessed the following:

“The subject land is currently partially mapped as bush fire prone land (BFPL) and shown in Figure 2 however, this mapping is outdated and does not reflect surrounding approved development and subsequent bushfire prone vegetation removal/management. QPRC updated the BFPL map for the area on 20 March 2024 (Figure 3) which removes the BFPL layer from the subject land.”

Based upon the land being not within the mapped BFPL, the application of Part G5 and specification 43 will not be applicable for this development.

Section J – Energy Efficiency

1. ESD Consultant to review project and provide compliance statement/report for Section J.

Note: this is expected to include a review of the detailed design sections and detail of external walls for thermal break and make-up of the façade elements in the review, and not a high-level report outlining the required values only, this is due to the detailed assessment nature for Section J of external walls and roofs in of BCA 2022 which will be implemented from 1 May 2023.

5.0 PERFORMANCE SOLUTIONS

The following items have been noted as items of interest at this stage of the review. The Following are Performance Solutions proposed or expected as a result of our assessment of the listed documentation:

Fire Engineering Performance Solutions

The Following measures are proposed to be justified via Performance Solutions for the proposed building/works as follows

Fire Safety Performance Solution:

Item	Query or DTS Non- Compliance	BCA Clause	BCA Performance Requirements
1.	<p><u>Travel Distance exceed the DtS provisions:</u></p> <p><u>Block A and B – Stage 1:</u></p> <ul style="list-style-type: none"> a. Travel distance to POC > 20.0m; b. Travel distance to required exit > 40.0m; c. Distance between alternative exit > 60.0m apart. <p>Refer to Appendix B – Travel Distance Assessment.</p>	D2D5 & D2D6	D1P4, E2P2
2.	<p><u>External stairway in lieu of fire-isolated exits:</u></p> <p>An external stairway may serve as a required exit in lieu of a fire-isolated exit, if the stairway is non-combustible throughout and protected in accordance with Clause D2D13 if it is within 6m of and exposed to any part of the external wall of the building it serves.</p> <p>The northern fire stair to Block A and B has doors to sanitary facilities which are situated within 6.0m to the external stairway and not proposed to be protected by a self-closing fire door.</p>	D2D13	D1P4, E2P2
3.	<p>Building A and B have a rise in storey of four (4). Consequently, the roof concession cannot be applied in this case. The ceiling immediately below the roof must be provided with a resistance to the incipient spread of fire to the roof space of not less than 60 minutes.</p> <p>Consideration may be given to performance solution from a fire engineer to delete this DtS provision. This can be further discussed with the appointed fire engineer.</p>	S5C15	C1P2
4.	Fire Hose Reels is not required to serve a class 9b – classrooms or class 5 offices. Fire Hose Reels are	E1D3	E1P1

Item	Query or DTS Non- Compliance	BCA Clause	BCA Performance Requirements
	required to serve the Multi-purpose Hall and Library areas. The location being within 4.0m to required exits. The location of FHR along the external balconies/walkway may be problematic.		

Table 2 – DtS Non-compliances Summary

Disabled Access Performance Solutions

Disabled Access consultant is to advise if any Performance Solutions are proposed for any Disabled Access matters for the building – see separate Access consultant's report for details.

Section J Energy Efficiency

It is expected that a Verification Method approach is proposed for the building based off the design, if that is the case then the Provision of the Section J report will be required to meet the requirements of the relevant Verification Clause of Section J and be provided as part of the Construction Certificate/Crown Certificate/Complying Development Certificate Application to the Certifier.

See Section J Consultants report for requirements relating to the design of the building and services requirements, which may differ from the BCA clauses contained in this report.

Weatherproofing of External Walls

As the materials that can be used as external walls under the DTS provisions (BCA Clause F3D5) are limited, and the proposed design is expected to contain other external wall material/cladding a Performance Solution to BCA Clause F3P1 is to be provided as part of the Construction Certificate/Crown Certificate/Complying Development Certificate Application to the Certifier.

Note: Design team is to establish which consultant will be preparing this Report, and the required PBDB for it as well, this is not as simple as a Design Statement but involves the preparation of a Performance Solution Report.

Important Note to Design Team / Consultants

Should the Architect or any Design Consultants believe that additional items need to be the subject of a Performance Solution or the Deemed to Satisfy provisions of the BCA or referenced Australian Standard is not able to be achieved for the design.

Then please advise Group DLA, Project Manager and Design Team as soon as possible to ensure that the team is informed to ensure captured, and solutions evaluated by the relevant consultant as soon as possible and before the design progresses to completion. Please do not assume elements will be included, if they are not listed in the above section of the Report then they are not and either the design will need to change to ensure compliance, or an additional Performance Solution will need to be discussed and assessed by the relevant consultant preparing the Performance Solution.

6.0 Mitigation Measures

Further BCA Documentation at Detailed Design/Crown Certificate Stage:

The following items will be assessed further as the design progresses towards the crown certification of building works.

In order for Group DLA to confirm the design complies with the BCA, the following items listed in Table 3 below are required to be clarified, submitted, illustrated, etc. as the case may be:

1.1 Additional Information required for further assessment at Design Development

Item No.	Item	Comment	BCA Clause
A.	<u>Fire-rating of Building Elements:</u> Structural steel columns incorporated within the external walls together with external columns to the fire-source feature must achieve the required FRL's.	Architect/structural engineer to detail compliance with the provisions of the BCA.	Tables S5C21a to S5C21f
B.	<u>Fire-Rating of Building Elements:</u> Architectural elevations reflect structural cross bracing (galvanised metal) between loadbearing columns within the undercroft area.	Further advise from the structural engineer weather these structural cross bracing provide lateral support to the structure and will require an FRL to comply with Specification 5.	Tables S5C21a to S5C21f
C.	<u>External Walls – Non-combustible Construction:</u> The elements that make up an external wall must be tested and certified as non-combustible (i.e., wall assembly, insulation, sarking and attachments).	Architectural design to be development.	C2D10
D.	<u>Spandrel Separation:</u> The two (2) storey primary school building has a floor area greater than 5,500sqm and must be designed to comply with Type A construction. The windows between storeys must be suitable separated by spandrel which achieve compliance with Clause C3D7 of the BCA.	The architectural design drawings being suitable detailed to satisfy these provisions of the BCA.	C3D7.
E.	<u>Fire Hydrant system:</u> A fire hydrant booster assembly is required to be within sight of the pedestrian entrance to the building and adjacent to the property boundary and the vehicle access for the fire brigade.	The FH Booster Assembly is proposed to be located at the driveway entrance along Kyogle Street which is the principal entry to the school campus. Further consideration being given to provide street access for the fire brigade to the booster assembly.	E1D2

Item No.	Item	Comment	BCA Clause
F.	<p><u>Fire Hose Reels:</u></p> <p>(a) Primary School:</p> <p>Fire Hose Reels are required to serve the Multi-purpose Hall and Library areas. The location being within 4.0m to required exits.</p>	<p><u>Primary School:</u></p> <p>FHR's have been provided at each required exit stairway. Please note – FHR can be deleted from FS1 and FS2.</p> <p>Consideration may be given to the deletion of FHR's subject to a performance solution from a fire engineer.</p>	E1D3
G.	<p><u>Sanitary Facilities:</u></p> <p>Sanitary facilities to serve the early childhood centre being provided as per item 12 on Page 23 of this report.</p>	<p>Architectural drawings being suitable updated to provide sanitary facilities.</p>	F4D4
H.	<p><u>Damp and Weatherproofing:</u></p> <p>There are new requirements that a roof, balcony, podium or similar horizontal surface part of a building must be provided with a waterproofing membrane in accordance with AS 4654.1.</p>	<p>Architectural, hydraulic services and structural design to detail the waterproof membrane in accordance with AS 4654.1 and AS 4651.2</p>	F1D5

The list above is not an exhaustive list, however, reflects BCA items to be incorporated into the design as the development progresses into detailed design application for a crown certificate.

Evaluation of Environmental Impacts

Compliance with the BCA will be achieved by a combination of Deemed to Satisfy and Performance Solutions and will be assessed further as the design progresses towards the crown certification of building works.

Performance solution Reports as identified within this report will be prepared and verified by appropriate qualified persons prior to the preparation and issue of crown certification of building work.

7.0 ESSENTIAL FIRE SAFETY MEASURES (EFSM)

Below is a list of essential fire safety services that are required/expected to be installed / designed for the building, and the relevant standards of performance for each measure to be designed/constructed to. This table may be required to be updated as the design develops.

Stage 1 - Googong High School Campus:

Fire Safety Measure	Standard of Performance	BCA 2022 Clause/Specification(s)
Access panels, doors & hoppers to fire resisting shafts	AS 1530.4 – 2014	C4D14
Automatic fail-safe devices	--	D3D26, Specification 12
Automatic fire detection & alarm systems	AS 1670.1 – 2018	Part E2, Specification 20
Emergency lighting	AS 2293.1 – 2018	E4D2, E4D4, E4D8
Emergency Warning and Intercom Systems	AS 1670.4 – 2018	E4D9, S31C19
Exit signs	AS 2293.1 – 2018	E4D5, E4D6, NSWWE4D6, E4D8, Spec 25
Fire dampers	AS 1668.1 – 2015 AS 1682.1 & 2-2015	C4D15
Fire doors	AS 1905.1 – 2015	C4D7, Spec 12
Fire Doors – Lift Landing Doors	AS 1735.11-1986	C4D11
Fire hose reel systems	AS 2441 – 2005	E1D3
Fire hydrant systems	AS 2419.1 – 2021	E1D2, Spec 18
Fire seals (protecting openings in fire resisting components of the building)	AS 4072.1 – 2005 AS 1530.4 – 2014	C4D15, C4D16, Spec 13
Lightweight construction (#)	-	C2D9, Spec 6
Mechanical air handling systems <ul style="list-style-type: none"> Auto shutdown 	AS 1668.1 – 2015 AS 1668.2 –2012	E2D16, Spec 17, Spec 22
Portable fire extinguishers	AS 2444 – 2001	E1D14
Fire Blankets	AS 2444-2001	E1D14
Stage 2 - Smoke and Heat Vents	AS 2665-2001	Spec 22, Spec 31
Wall wetting sprinklers & drencher systems (#)	AS 2118.1 – 2017 AS 2118.2	D2D13, Spec 14
Warning and operational signs	-	C4D7, E3D4, D3D28 & Spec 17
(#)	Bounding walls of external stairway or the external wall of the building situated within 6.0m of the external wall of the building to achieve an FRL 60/60/60 with glazed doorways and windows protected by wall-wetting drenchers.	

Table 7 – Essential Fire Safety Measures (EFSM)

Appendix A:

Ancillary Information

- Travel Distances
- Stair Precip Table

Travel Distances – Assessment:

Location	DTS Travel Distance Requirement	Current condition	Performance Requirement	Resolution
Block A – Level 1	<ul style="list-style-type: none"> 20m max. to a point of choice. 40m max. to an exit (where min of Two. provided). 60m max between alternative exits 9m min. between alternative exits 	22/47/67	D1P4, E2P2	Consideration being given to the documentation of a performance solution from a fire engineer to address the extended travel distances to required exits.
Block A – Level 2	<ul style="list-style-type: none"> 20m max. to a point of choice. 40m max. to an exit (where min of Two. provided). 60m max between alternative exits 9m min. between alternative exits 	28/47/62	D1P4, E2P2	Consideration being given to the documentation of a performance solution from a fire engineer to address the extended travel distances to required exits.
Block A – Level 3	<ul style="list-style-type: none"> 20m max. to a point of choice. 40m max. to an exit (where min of Two. provided). 60m max between alternative exits 9m min. between alternative exits 	22/47/62	D1P4, E2P2	Consideration being given to the documentation of a performance solution from a fire engineer to address the extended travel distances to required exits.
Block B – Ground Floor Level	<ul style="list-style-type: none"> 20m max. to a point of choice. 40m max. to an exit (where min of Two. provided). 60m max between alternative exits 9m min. between alternative exits 	31/40/60	D1P4, E2P2	Consider to review the layout to investigate the opportunity to provide access to alternative exit or documentation of a performance solution from a fire engineer.

Block B – Level 1	<ul style="list-style-type: none"> • 20m max. to a point of choice. • 40m max. to an exit (where min of Two. provided). • 60m max between alternative exits • 9m min. between alternative exits 	22/50/63	D1P4, E2P2	Consideration being given to the documentation of a performance solution from a fire engineer to address the extended travel distances to required exits.
Block B – Level 2	<ul style="list-style-type: none"> • 20m max. to a point of choice. • 40m max. to an exit (where min of Two. provided). • 60m max between alternative exits • 9m min. between alternative exits 	23/52/63	D1P4, E2P2	Consideration being given to the documentation of a performance solution from a fire engineer to address the extended travel distances to required exits.
Block C – Multi-purpose Hall	<ul style="list-style-type: none"> • 20m max. to a point of choice. • 40m max. to an exit (where min of Two. provided). • 60m max between alternative exits • 9m min. between alternative exits 	20/40/60	D1P4, E2P2	Compliance can readily achieve with the DtS provisions of the BCA.

Stair / Ramp Precisis:

Stairs	Access requirement	Handrails	Balustrade	Slip Resistance	Treads, Risers, Widths, Other	TGSI	Common Issues
FIS & Communication Stairs	YES	<p>YES: Fully accessible handrails required to both sides as follows</p> <ul style="list-style-type: none"> • 180 degrees handrail turndown or return to wall, • 30 to 50 mm diameter with a 270 degrees clearance around the top of the handrail, • 50 mm clearance to back of handrail, and to a height of 600 mm above the handrail. • Located between 865 mm and 1 m above nosing line. And must be at consistent height through the stairs and landings. • Continuous rail, no handhold breaks • Clear area for 270 degrees to the top of the handrail. <p>Ref: BCA D2.17, D3.3(a)(ii) & CI 11 & 12 of AS 1428.1-2009.</p>	<p>YES: No Less than 865 mm above stair nosing line, no less than 1 m above landings. No openings greater than 125 mm. No climbable members between 150 and 760 mm where the floor level is 4 m or more above the surface beneath.</p> <p>Ref: BCA D2.16(g)(h)(ii)</p>	<p>YES: P3 rated slip resistance and highlighted nosing's to no less than 30% luminance contrast to the background. Nosing widths to be between 50 & 75 mm. Strip may be set back 15 mm from the front edge of the nosing but where it is not set back the luminance contrast must not extend down the riser by more than 10 mm. The lip between the tread and strip must not exceed 3 mm, or 5 mm where the edges are chamfered.</p> <p>Ref: BCA D2.13, D2.14, D3.3(a)(iii) & CI 11, 7.2, 7.3 of AS 1428.1-2009.</p>	<p>Tread: 250 to 355 mm. (Public) Tread: 240 to 355 mm. (Private) Riser: 115 to 190 mm. Quantity: Must be between 550 to 700 when applying (2 x Riser + Tread.) Open Riser: Not permitted, must be opaque. Riser Splay Back: Be vertical or max 25 mm. Stair Width: Minimum unobstructed width of 1000 mm, measured clear of handrails. Note: 1000 mm clear width will only allow for 100 persons, occupancy quantity review may be required. Stair Height: No less than 2 m. Ref: BCA D2.13, D1.6</p>	<p>YES: Required to the top and bottom of landings. No requirement for the mid landing. Ref: BCA D3.8, AS/NZS 1428.4.1-2009</p>	<ul style="list-style-type: none"> • Lip of the nosing strip excessive in height. • Outer handrail not continuous due to allowing for fire hydrant equipment. • No site allowance for balustrade tolerances. • If separate handrail and balustrade is not used, this usually causes a conflict with the requirement to have the same heights throughout the landings and stairs. • Tread and riser dimensions not constructed uniform in dimension.
Accessible Ramp (1:14 max. gradient)	YES	<p>YES: Fully accessible handrails required to both sides as follows:</p> <ul style="list-style-type: none"> • 180 degrees handrail turndown or return to wall, • 30 to 50 mm diameter with a 	<p>YES: No Less than 865 mm above stair nosing line, no less than 1 m above</p>	<p>YES: P3 (dry) and P4 (wet) rated slip resistance and highlighted nosing's to no less than 30% luminance contrast to</p>	<p>Ramp Width: Minimum unobstructed width of 1000 mm, measured clear of handrails. Note: 1000 mm clear width will only allow for 100</p>	<p>YES: Required to the top and bottom of landings. No requirement</p>	<ul style="list-style-type: none"> • Handrails extension protruding over traverse path or side boundary. <p>Note: TGSI are not required for residential</p>

Stairs	Access requirement	Handrails	Balustrade	Slip Resistance	Treads, Risers, Widths, Other	TGSI	Common Issues
		270 degrees clearance around the top of the handrail, <ul style="list-style-type: none"> • 50 mm clearance to back of handrail, and to a height of 600 mm above the handrail. • Located between 865 mm and 1 m above the surface. And must be at consistent height through the ramp and mid-landings. • Continuous rail, no handhold breaks. • Continuous kerbing on both sides in compliance with AS1428.1 Figures (18 & 19). • Handrails not to protrude into over the traverse path. • Clear area for 270 degrees to the top of the handrail. Ref: BCA D2.17, D3.3(a)(i) & Cl 1.3 & 12 of AS 1428.1-2009.	landings. No openings greater than 125 mm. No climbable members between 150 and 760 mm where the floor level is 4 m or more above the surface beneath. Ref: BCA D2.16(g)(h)(ii)	the background. Nosing widths to be between 50 & 75 mm. Strip may be set back 15 mm from the front edge of the nosing but where it is not set back the luminance contrast must not extend down the riser by more than 10 mm. The lip between the tread and strip must not exceed 3 mm, or 5 mm where the edges are chamfered. Ref: BCA D2.13, D2.14, D3.3(a)(iii) & Cl 11, 7.2, 7.3 of AS 1428.1-2009.	persons, occupancy quantity review may be required. Ref: BCA D2.13, D1.6	for the mid landing. Ref: BCA D3.8, AS/NZS 1428.4.1-2009	aged care and nursing homes buildings.

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