GROUPDLA

06 May 2021

Our Ref: GDL 210133

Richard Crookes Construction
Attn: Isaac Pinkerton
Level 3, 4 Broadcast Way
Artarmon NSW 2064

NEW PRIMARY SCHOOL IN EDMONDSON PARK

BUCHAN AVENUE, EDMONDSON PARK, NSW 2174

DESIGN BCA COMPLIANCE REVIEW (SSDA DESIGN STAGE)

Further to our engagement for the abovementioned project, please find attached the National Construction Code, Building Code of Australia Volume 1 2019 Amendment 1 (BCA) SSDA Design Compliance Review completed in respect to the new building / school referenced above.

Should you have any further enquiries please do not hesitate to contact the undersigned.

Yours faithfully,

Prepared by:

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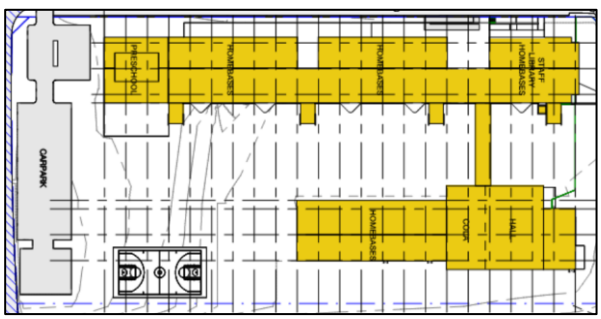
SCHEMATIC DESIGN BCA COMPLIANCE REVIEW

PRELIMINARIES

PROJECT NO.	GDL 210133
Property Details	New Primary School in Edmondson Park
Client	Richard Crookes Construction Pty Ltd
Date	18.05.2021

DEVELOPMENT DESCRIPTION

PROPOSED WORKS	DESCRIPTION
Number of Buildings	One (1) ***Note:*** *Both building portions (i. e. east and west) are physically connected thus forming a single united building.*
Classification(s) and Use	• Class 9b (school) • Office 5
Rise in Storeys	Three (3)
Type of Construction	Type A (for both buildings as connected by covered walkway)
Effective Height	Less than 12m
Importance Level (B1.2a)	Importance Level 3 (building has more than 250 Students)
Earthquake Design Category:	EDC II – Structural Engineer to confirm
Fire Compartments	One – may increase once Fire Engineering undertaken TBC
Climate Zone:	Zone 6 (Campbelltown Council Area)
Proposed Works	The proposed development includes the construction of one (1) new building to serve as a school class rooms, halls, meeting areas, staff offices, collaborative areas, and connected walkway, and Cold Shell space for a pre-school(excludes fitout and fixtures). 

BASIS OF REVIEW

This review is based upon:

- The NCC Building Code of Australia Volume 1 (BCA) 2019 – Amendment One
- The Design Documentation listed in this certificate below

EXCLUSIONS

This review relates only to the application of the Building Code of Australia to the proposed building works contained within the Design Documentation listed below and excludes:

- General (non-BCA) electrical, mechanical, hydraulic building services
- Service providers for electricity, gas, water and telecommunications
- The regulatory compliance of existing components of the premises unaffected by the works.
- Disability (Access to Premises – Buildings) Standards 2010, BCA 2019 Amendment One Part D3 and Clauses F2.4, F2.9 & E3.6.
- NSW Department of Education, Educational Facilities Standards and Guidelines (EFSG) requirements are excluded as not a BCA referenced document/standard.

STATEMENT OF COMPLIANCE

We hereby confirm that the proposed design shall accord with the relevant principles and provisions of the Building Code of Australia 2019 Amendment One subject to:

- Compliance with any condition of approval; and
- Certification of the installation of the nominated fire safety systems

EXCUTIVE SUMMARY OF MATTERS FOR CONSIDERATION

The items below have been considered potential non-compliant issues against the BCA provisions which could achieve compliance via design modification or through a justification via a Performance Solution.

No	DTS Non-Compliance	Comment	DTS Clause	Performance Requirement	Status
1.	It has been confirmed that both building portions will be physically connected by the covered walkway thus forming a single united building.	Required Type A Construction and Services etc are to be provided as if the buildings are one building.	Part A7	Various	TBC
2.	To provide a spandrel separation between vertically aligned openings on the external walls.	Elevations to be provided –Performance Solution may be required.	C2.6	CP2	TBC
3.	General reduction of FRL's where requested.	If necessary – Performance Solution may be required if requested.	Spec C1.1	CP1, CP2	TBC
4.	General FRL reduction to Resistance to Incipient Spread of Fire (RISF) ceiling where requested.	If necessary – Performance Solution may be required if requested.	Spec C1.1	CP1, CP2	TBC
5.	Use of combustible sarking material inside the external walls.	Pursue a non-combustible material or sarking that complies with BCA Clause C1.9.	C1.9	CP2, CP4	TBC
6.	Use of plywood timber noggings/reinforcement (for food code cavity infill, handrails/grabrails/walls mounted wet areas system such as WHBs, etc) in cavities of fire rated walls (internal or external)	Pursue a non-combustible material for noggings – Performance Solution may be required if necessary.	Spec C1.1	CP2, CP4	TBC
7.	Extended travel distances to an exit of more than 20m to point of choice and more than 40m to closest exit (approx. 44m)	More Detail of doors internally, egress paths, and layout to be provided, however even with this travel distances with the current location of stairs may not be achievable via DTS compliance.	D1.4, D1.5	DP4, EP2.2	TBC
8.	Travel distances between alternative exits are compliant, however some close to the limit (60m).	Compliant – subject to the above being clarified, as some points of choice (nearly all) are located inside the Homebase areas and not the external walkways, so exit signage, door provision, egress hardware all need to align to support this approach.	D1.4	DP4, EP2.2	No action
9.	Discharge of exit to open space must not pass under the/other building (bridges overhead, re-entry) before reaching road / open space	Architect to confirm, this is to ensure there is an egress path other than that which needs to pass under the covered walkway or any other roof feature. As Exits must reach an open to the sky area and not pass under a roof structure again until the public road is reached for BCA compliance to be achieved.	D1.7	DP4	TBC
10.	Location of the fire hydrants at external stairs to be located not more than 4m from the top step of the stair	Pursue compliant hydrant location, no Hydrants Indicated, and external coverage may be provided.	E1.3 AS2419 .1	EP1.3.	TBC

		Note: If External Hydrant coverage proposed ensure Hydrant is located a min of 10m from the roof overhang (not just the walls) of the building as per AS 2419.1-2005.			
11.	The location of the Fire Hydrant Booster to be within sight of each building entry on the site	Pursue compliant location – Performance Solution may be required if necessary.	E1.3 AS2419 .1	EP1.3.	TBC
12.	Potential omission of FHR's serving areas other than classrooms and associated corridors such as the Hall for example.	FHR's to be provided where necessary or Performance Solution may be required if requested.	E1.4	EP1.1	TBC
13.	Stage in Communal Hall to have a floor area of less than 50m^2 otherwise heat-vents or smoke exhaust systems to be provided.	Architect to amend plans to reduce the stage size to less than 50m2 in area.	Table E2.2b	CP2, CP9, E2.2	TBC
14.	External walls and roof to be waterproofed. However, BCA does not have any DTS provisions in order to comply with FP1.4.	Performance Solution required from Architect, Façade Consultant or Modular Façade Designer to address Performance Clause FP1.4	Nil	FP1.4	TBC
15.	Required number of sanitary facilities	School Design - Toilet Based on the following populations the design achieves compliance with the toilet facilities in the SD Stage design: • School Staff – between 40-60 Staff • School Students – between 1000-1100 Students Note: this assumes that the Purple space on the North Eastern toilet block on each level contains a Unisex Disabled Toilet. ***Pre School (Early Childhood centre) – Toilets Required*** For the proposed population of 40 Children (below school age) and 7 staff the following toilets are required: • Students - 3 Toilets, and 3 Wash basins required (Caters for up to 45 Children) • Staff – 1 Unisex Disabled Toilet will be required (caters for up to 10 staff) Additional Children facilities will depend on the ages to establish bath, shower, kitchens, laundry, nappy changing benches etc. Note Re Pre-School – Student toilets needs to be designed to comply with BCA Table F2.3 and Clause F2.3 i.e. low height small toilets and facilities.	F2.3	--	Complies for School Use
16.	Number of occupants for the school	Number of occupants have been indicated in Aconex RCC-GCOR-000389 for the school on 12 May 2021. • School Students – 1012	D1.13	--	No Action

		• Staff – 59 Staff • Pre-School Students – 40 • Pre-School Staff - 7			
17.	**Important:** External stairs in lieu of fire-isolated stairs are located closer than 6m from the external wall.	Relocation of stairs is necessary to provide the 6m separation, Alternatively, additional fire protection to walls and openings in front of the stairs would be required or fire engineering via Performance solution. Note: if separation from the lower level is proposed this cannot be provided with a door for circulation internally so will limit the ease of operation via DTS, so could be more flexible via Performance Solution subject to Fire Engineers review of course.	D1.8	DP4, DP6	TBC
	Population / Egress Requirements	Northern Wing/Building • Ground Floor – 400 persons (TBC on egress paths) • 1st Floor – 800 Persons • 2nd Floor – 800 Persons Southern Wing/Building • Ground Floor – 650 persons (TBC as depends on Egress ability from buildings to open space) External Path to Road from Buildings • 1m egress path required (or 850mm clear gate for any secured gates) accessible from all buildings without the need to pass underneath the awning or roof coverings and be level or if any grade exceeds 1:8 be provided with Stairs. Note: if stairs required then concreate stairs with nosing's and dual handrails a min of 1m clear are required for any level changes. Note 2: the above floor limits are assumed to be managed by the school to achieve compliance. Note 3: this Northern wing assessment is based on 2m clear stairs, should they be less than 2m clear then the population will be reduced accordingly.	D1	-	TBC
18.	Early Child Care Area (pre-School Area) – Base Building Requirements	The BCA has certain requirements for Early Childcare facilities, it is noted that the design at this stage is for a Cold Shell the following requirements may apply depending on the scope of works: • Two (2) Exits required (D1.3) from the level • Exits to provide Direct Egress to Open space (not need to pass under the building / roof to reach the road) (D1.3)	Part D, F	-	TBC

		• Door Latching – may be secured or high level with operator control as long as complying with D2.21 • Toilets, Kitchen, Washing, Bath etc facilities to be allowed for as per BCA Clause F2.3 • Playrooms must have windows a min of 10% of the floor area of the Playroom (F4.2) • Windows – 50% of the windows to Playrooms must have sill heights below 500mm of Finished Floor level (F4.2) • Fencing for Outdoor play areas must comply with BCA Clause G1.3.			

ESSENTIAL FIRE SAFETY MEASURES (EFSM)

The following essential fire safety measures are considered/envisaged required.

Fire Safety Measure	Standard	BCA Clause(s)
Access panels, doors & hoppers to fire resisting shafts	AS 1530.4 – 2014	C3.13
Automatic fire detection & alarm systems (associated to automatic shut-down system)	AS 1670.1 – 2018	Clause 6 of BCA Spec E2.2
Emergency lighting	AS 2293.1 – 2018	E4.2, E4.4
Exit signs	AS 2293.1 – 2018	E4.5, NSW E4.6 & E4.8,
Fire dampers	AS 1668.1 – 2015	Spec E2.2a
Fire hose reel systems (Hall only)	AS 2441 – 2005	E1.4
Fire hydrant systems	AS 2419.1 – 2005	E1.3
Fire seals (protecting openings in fire resisting components of the building)	AS 4072.1 – 2005 AS 1530.4 – 2014	C3.12, C3.13, C3.15
Lightweight construction	--	C1.8, Spec C1.8
Mechanical air handling systems (Auto shutdown)	AS 1670.1 – 2018	Clause 6 of BCA Spec E2.2
Portable fire extinguishers & fire blankets	AS 2444 – 2001	E1.6
Fire Engineering Performance Solutions prepared by TBC Fire Engineering. Rev: TBC, date: TBC	TBC	TBC

Note: This table is indicative at this stage, this will change as the design progresses

DESIGN DOCUMENTATION

The following Schematic Architectural Drawings (Issue for Coordination) prepared by TKD Architects Pty Ltd, dated 29.04.2021, was reviewed as part of this assessment:

Drawing Number	Title	Issue
AR-W-DW-0000	Cover sheet	A
AR-W-DW-1001	Site plan	A
AR-W-DW-2100	Ground floor plan	B
AR-W-DW-2101	Level 01 floor plan	B
AR-W-DW-2102	Level 02 floor plan	B
AR-W-DW-2103	Roof plan	B
AR-W-DW-3100	External building elevations – sheet 01	A
AR-W-DW-3101	External building elevations – sheet 02	A
AR-W-DW-3102	Internal building elevations – sheet 01	A
AR-W-DW-3400	Building cross sections	A
AR-W-DW-3401	Building long sections	A

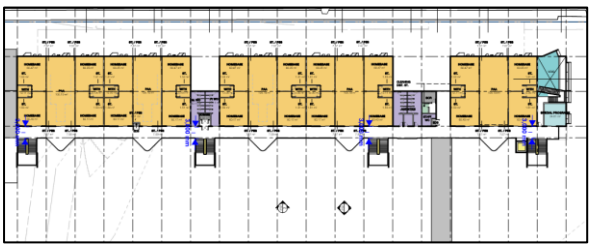
BCA PROVISIONS & REQUIREMENTS

BCA CLAUSE	COMMENTS
Part A3	**Building Classification** The buildings are classified as Class 9b (School/Early Childhood Centre) and Class 5 (Office).
Part B	**Structural Provisions** Structural engineer to confirm that the building/structure, associated materials and forms of construction will resist the loads determined by the Australian Standards included in this part. Structural Engineer to note and comply as relevant prior to Construction Certificate (CC). BCA compliance is achievable.
Pat B / AS 1170.4	**Earthquake Provisions** – the non-structural elements and services for the building are to be designed to comply with Section 8 of AS 1170.4 as referenced in BCA 2019 Amendment 1. This relates to the non-structural elements of the design, being all services, architectural elements and walls, ceiling etc Architect and Services consultants to ensure detailed/specified to achieve compliance, or engage Structural Engineer to review designs to provide confirmation if not able to undertake for insurance or capability reasons.
C1.1	**Type of Construction** The building is to be constructed of Type A Construction. • See FRL's requirements in BCA Table 3 Type A Construction of Specification C1.1 Appendix A. • External walls of the building must be 6m min. away from the fire-source features (i. e. boundary, another building, etc). ***Note:*** *Site survey will be required in order to confirm that external walls on all facades of the building are not exposed to the fire source features (boundaries)* Architect to note and comply accordingly.
C1.2	**Calculation of rise in storeys** The rise in storeys is the greatest number of storeys at any part of the external walls of the building above the finished ground next to that part. It excludes a single level of plant room only, and any storeys completely below ground. From the information provided, the rise in storeys for the proposed building is three (3).
C1.8	**Lightweight Construction** Lightweight construction used to achieve an FRL may be in-compliance with Specification C1.8. Architect to note and comply accordingly. BCA compliance is achievable.
C1.9	**Non-combustible building elements** In a building required to be Type A Construction, external walls, common walls, fire resisting non-loadbearing internal walls, shafts, loadbearing internal walls and loadbearing fire walls, must be non-combustible (including façade covering, framing, insulation, sarking with flammability index, internal lining, noggings, etc).

BCA CLAUSE	COMMENTS
	Note: Internal linings to external walls are also applicable such as acoustic treatments, joinery etc, as well as Signs to external walls. Note: This applies to all buildings as all are Type A Construction due to connection by walkway. Architect to note and comply accordingly. ***Note:*** *This clause outlines the list of materials that are considered non-combustible from the BCA point of view (i. e. plasterboard, fibrous-plaster sheets, fire-reinforced cement sheeting, pre-finished metal sheeting, some sarking materials, some bonded laminated materials, etc.)* *BCA compliance is achievable with detailed design thinking; however, it is highly possible this will need a Performance Solution from the Fire Engineer if any details/linings are needed to the external walls of the hall (plywood acoustic panels for example are not compliant if fixed to the inside face of external walls) or the classrooms joinery or acoustic panels fixed to external walls for example.*
C1.10	**Fire Hazard Properties** Fire hazard properties of new materials must comply with C1.10 of the BCA and Specification C1.10, including floor, walls and ceiling linings, air handling ductwork, insulations, sarking-type materials and attachments, or be considered non-combustible. • Flooring: Critical radiant flux of not less than 2.2kW/m^2 (non-sprinklered buildings) (except audience seating) • Walls & Ceilings: Group Material of 1 or 2. • Any air-handling ductwork: As per AS4254.1 & AS4251.2. • Internal Wall insulation – Spread of Fire of 9 or less and Smoke Developed Indices of 8 or less as tested to AS 1530.3-2014 ***Note:*** Insulation and linings to external walls needs to be non-combustible as tested to AS 1530.1, and compliance with BCA Clause C1.10 does not achieve compliance with C1.9, so materials in or on external walls are not covered by this clause of the BCA. Details of proposed insulation, wall, ceiling and floor finishes to be provided for review prior to Crown Certificate Stage by the designer/specifier of the internal linings.
C1.14	**Ancillary Items** An ancillary element must not be fixed, installed or attached to the internal parts or external face of an external wall that is required to be non-combustible except plumbing fixtures, required signs, wiring, paint, a non-combustible element, etc. Architect to note and comply accordingly. *BCA compliance is achievable with detailed design thinking; however, it is highly possible this will need a Performance Solution from the Fire Engineer if any details/linings are needed to the external walls of the hall (plywood acoustic panels for example are not compliant if fixed to the inside face of external walls) or the classrooms joinery or acoustic panels fixed to external walls for example.* ***Note:*** *Aluminium Composite Panels (ACP) used as cladding are not allowed.*
C2.2	**General Floor Area Limitations** Table C2.2 limits the size of fire compartments to Class 9b & 5 (Type A) is 8,000m^2 & 48,000m^3

BCA CLAUSE	COMMENTS
	The estimated floor area of the building is over the 8,000m^2 limitation (8,300m^2 approx.) in non-compliance with this clause. Thus, Architect to calculate floor area more accurately and confirm if any fire separation (fire walls) would be pursued. BCA compliance is achievable but as presently designed only via Fire Safety Engineering.
C2.6	**Vertical Separation of Openings in External Walls** The following applies to building of Type A Construction that are not provided with a sprinkler system installed throughout. Where the vertical projection of an opening in an external wall falls no further than 450 mm outside an opening in the storey next below, the openings must be provided with vertical separation complying with Clause C2.6, that is: • They must be protected with a 900mm high (FRL 60/60/60) spandrel extending at least 600mm above the separating slab, or • They must be provided with a 1.1m horizontal projection (FRL 60/60/60) also extending at least 450mm either side of the openings. ***Note:*** *The above does not apply to openings within the same stairway.* ***Note:*** *When the BCA requires an FRL the fire rating is required to come from both directions, from outside in and from inside out.* It is expected that modular building may not be able to be provided with a 1hr FRL spandrel separation in a DTS compliant configuration in accordance with this clause and BCA Spec C1.1, thus required to be justified via a Performance Solution.
C2.10	**Separation of Lift Shafts** • Any passenger lift connecting more than 2 storeys will require a fire rated shaft (can connect up to 3 storeys if the building is sprinkler protected). • Lift shafts are to be separated from the fire-isolated stairs shafts. • The FRL's of the lift shaft must be in accordance with Table 3 of Specification C1.1 (See Appendix A). A single passenger lift is proposed (connecting 3 storeys), thus a fire-isolated shaft is required in accordance with this clause. Note: only a Concrete or Masonry shaft is able to be provided, with a concrete lid of the same fire rating, use of plasterboard, glass shafts or the like is not DTS compliant.
C2.12	**Separation of Equipment** Equipment comprising lift motors and control plant, emergency generators or central smoke control plant; boilers or batteries are required to be separated from the remainder of the building by construction achieving a FRL of 120/120/120 with openings protected by self-closing fire doors having an FRL of not less than (–/120/30). Architect to note and comply accordingly. ***Note:*** *Separation of on-site fire pumps must comply with the requirements of AS2419.1-2005.* BCA compliance is achievable.
C2.13	**Electricity Supply System** IF a substation located within a building or main switchboard sustains emergency equipment such as fire pumps or smoke exhaust systems, the room must be

BCA CLAUSE	COMMENTS
	separated from the remainder of the building by construction achieving a FRL of not less than 120/120/120. Note: This is not normally required for schools so is more a note and will be assessed as the design progressed if these scenarios occur.
C3.12	**Openings in floors for services** The flooring of the building can achieve an appropriate fire protection level via various methods as outlined in Clause 4.1 (i) of Specification C1.1. The services penetrating elements that require an FRL (or a fire protection level) can be provided by a shaft that will not reduce the fire performance of the building elements (i. e. floor, covering, ceiling) it penetrates, or a fire stopping method in accordance with Claus C3.15. Services / Architect / Modular Building Designer is to ensure design achieves compliance note and comply accordingly. BCA compliance is achievable with details provided from others to confirm.
C3.15	**Openings for Service Installation** Services (i. e. piping, cabling, ducting, etc) penetrating elements (i. e. slabs, walls, shafts) that require an FRL must be fire-stopped in accordance with this clause and Specification C3.15. Penetration must be constructed to be identical with the tested prototype. Passive Fire Specialist to review details of the proposed penetrations prior to CC Stage. BCA compliance is achievable.

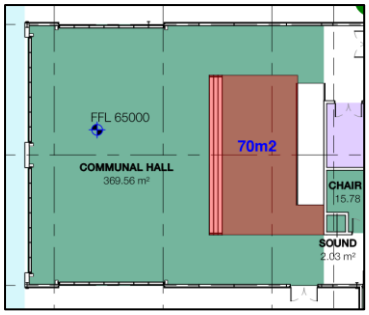
D1.2, D1.3, D1.4, D1.5, D1.8 & D1.9	**Travel Distances and Exits** • The building is required to have at least two (2) exits available to all occupants/areas on each floor/storey. • Travel distances to an exit to be less than 40m and less than 20m to a point of choice in accordance with this clause. • Travel distance between alternative exits (passing through the point of choice) to be less than 60m in accordance with this clause. • Travel distances on ground floor are to be measured to the true exit which is a point at which open sky is reached and not pass under any other awning or roof element. • It appears that the proposed design pursues the inclusion of "external stairs in lieu of fire-isolated stairs" where connecting more than 2 consecutive storeys. - Stairs must be made of non-combustible material throughout; and - To be located at least 6m from the external wall of the building with an FRL of less than 60/60/60 and unprotected openings The external stairs are interconnecting 3 storeys and located closer than 6m (4m approx.) from the external walls, thus additional protection in accordance with Clause D1.8 will be necessary, or the stairs are to be pushed away from the building further to achieve compliance. As the stairs serving 3 levels are not fire isolated stairs, it appears that the proposed design pursues the inclusion of "external stairs in lieu of fire-isolated stairs" in compliance with Clause D1.8 which is considered suitable. However, please ensure the following requirements are met: - Stairs must be made of non-combustible material throughout; and - Stair egress is to be located at least 6m from the external wall of the building as a minimum. Alternatively, the following measures may be pursued: - Walls portions closer than 6m from the stairs (3-6m) are to be provided with 1hr FRL for a wide distance and any associated openings to be protected in accordance with Clause C3.4. No openings closer than 3m are allowed to the stair or - Provide sprinkler system throughout the buildings (all of them), or - Design the stair to ensure it does not provide access (no Circulatuion internally) and it is separated from the extra storey (1 storey) by a 90 mins FRL construction and smoked proofed on the Ground Floor. - Pursue a Fire Engineering Performance Solution.  • See the identified exits and most critical travel distances in the Appendix B at the back of this report. • Non-fire isolated stairs used as required exits must provide a distance from any point on the floor to a point of egress which not to exceed 80m.

	• Non-fire isolated stairs must provide a stairway discharge to a point of not more than: - 20m to an exit - 40m to one of 2 exits From the information provided, the travel distances are able to comply except a Level 1 Library (marked in red). Please see mark ups with the most critical travel distances in Appendix B at the back of this report. Note: There are numerous areas where the BCA point of choice is located inside the classrooms, so exit signage, door latching and provision of exit doors will need to be detailed to ensure compliance is provided. BCA compliance is achievable, but redesign as the detailed design progresses will be required to avoid Fire Safety engineering.
D1.6	**Dimensions of Exits and Paths of Travel** • Required egress paths of travel to an exit must be provided with at least 1m clear width and 2m height. • Doorways to have at least 850mm clear width and 1980mm height (accessibility purposes that requires 850mm opening plus circulation spaces). • Aggregate exit width is to be calculated according to occupancy number from Clause D1.13. See this clause below as we need Population Numbers to determine compliance. • Generally, 1m exit width (stair width) can accommodate egress up to 100 people, thus the stairs with 2m width (or more) must be provided with additional handrails where additional aggregated egress width is needed. Levels 1 and 2 are served by 4 external stairs of 2m width approximately each, therefore each stair can accommodate up to 200 people which is considered sufficient. Operator to provide number of occupants (Clause D1.13) in order to confirm this assumption. BCA compliance is achievable.
D1.13	**Number of Persons Accommodated** The number of persons accommodated can be calculated via one of the following: • Floor area and use-ratio of the area • Fit out (i. e. number of chairs, desks, workstation, etc) • Any other more accurate means. Such as being given details of the population of each classroom/areas The number of students and staff has been provided by School/SINSW/DoE via Aconex RCC-GCOR-000389 dated 12 May 2021 which is the based of the assessment.
D2.3	**Non-fire Isolated Stairs** Required non-fire isolated stairways must be constructed of either: • reinforced or pre-stressed concrete. • 6mm thick steel. • 44mm thick timber. From the information provided it is understood that all external stairs will be constructed of reinforced concrete and / or steel in compliance with this clause. Internal required stairs are to also be in compliance with this clause. BCA compliance is achievable.

D2.8	**Enclosure of Space beneath Stairs** The space beneath the non-fire isolated stairs are not to be enclosed unless in 60/60/60 construction with 60/60/30 fire doors. From the information provided no storage enclosures underneath stairs are proposed. BCA compliance is achievable as long as no storage/enclosed rooms are detailed below any of the stairs in the buildings.
D2.9	**Width of Stairs** Width of required stairways are to be measured clear of all obstructions and the stair must extend a minimum 2.0m above nosing (unless specified elsewhere to require a greater height). Aggregate exit width on wide stairs required in Clause D1.6 can be counted up to 2m unless handrails are located every 2m. Each external stair provides 2m width. ***Note:*** *See also Clause H1.4 below in relation to the tiered-type seating areas in Class 9b buildings if proposed.* BCA compliance is achievable. Note: Based on the plans a clear width of 2m clear for the stairs appears to be detailed, will need to be documented as the design progresses.
D1.12	**Non-required stairways, ramps or escalators** Library stair (ST05) connecting Levels 1 & 2 has been assessed as a non-required stair used for communication purposes only (not an exit) as not connected to the ground floor, and if it were to do that would connect too many levels. **Note**: The Circulation stair in the library up cannot be counted as an exit and must not be provided with an exit sign. It is assumed that this stair is for day to day circulation only and is not being designed/considered as an exit for BCA compliance reasons.
D2.13	**Treads and Risers** Proposed stairs to be in-compliance with Table D2.13, including the follows: • Minimum 2 risers / maximum 18 in each flight. • Risers 115mm min 190 mm max - going 250mm min 355mm max - 2R+G 550mm min 700mm max. • Goings and risers to be constant in geometry. • Risers not to permit 125mm sphere to pass through (note: risers to be solid for AS1428.1-2009 purposes). • Treads to be slip resistant as per Table D2.14. • No stepped quarter landings. Architect to note and detail accordingly, builder to ensure constructed to achieve compliance. ***Note:*** *Colour contrasting and slip resistance nosing strips are needed for AS1428.1-2009 purposes.*
D2.14	**Landing and Slip Resistance** • Proposed landings at stairways & ramps are to achieve maximum gradient not exceeding 1:50 and be a minimum 750 long measured from the inside edge of the landing. • Slip resistance to be in accordance with Table D2.14 (extract shown below).

	<table><tr><th rowspan="2">Application</th><th colspan="2">Surface Conditions</th></tr><tr><th>Dry</th><th>Wet</th></tr><tr><td>Ramp Steeper than 1:14</td><td>P4 or R11</td><td>P5 or R12</td></tr><tr><td>Ramp steeper than 1:20 but flatter than 1:14</td><td>P3 or R10</td><td>P4 or R11</td></tr><tr><td>Tread or Landing Surface</td><td>P3 or R10</td><td>P4 or R11</td></tr><tr><td>Nosing or landing edge strip</td><td>P3</td><td>P4</td></tr></table> Architect to note and detail/specify accordingly.
D2.15	**Thresholds** • No step or ramp at any point closer to the door than the width of the door leaf. • If the building is required to be accessible the doorways that open to road or open space and must be provided with a threshold ramp or step ramp in accordance with AS1428.1-2009 (except for D3.4 exempted areas) From the information provided, it is understood that all internal and external corridors will be level. BCA compliance is achievable.
D2.16	**Balustrades** A continuous balustrade or barrier of a minimum 1m in height must be provided as follows: • Any stairway or ramp above ground surface if more than 1m height (fall) is present. • Non-fire isolated stairs must not have openings greater than 125mm sphere. • Balustrades located on floors above 4m the surface beneath must be non-climbable (no horizontal elements). However, this is recommended throughout the building. All balustrades are assumed to be 1m min. height in compliance with this clause. ***Note:*** *Frameless glass balustrades may be a feasible option to achieve compliance with the BCA (AS1288-2006) subject to structural code review.* BCA compliance is achievable.
D2.17	**Handrails** • Handrails required along one side and on both sides of stairs over 2m in width, 865mm above nosing's and be continuous. • Handrails must be accessible. - Access Consultant to ensure the stair handrails can be installed at constant height (i. e. staggered treads, handrail extensions, etc). - Access Consultant to ensure two handrails are provided in all non-fire isolated stairs. • Double handrails are required in Class 9b buildings used as primary schools. - One handrail located not less than 865mm height. - Second handrail located between 665-750mm height. All egress stairs will be provided with 2 handrails (both sides of the stair) and a minimum width between handrails of at least 1m (including stairs to stage in Communal Hall)
D2.19	**Doorways and Doors** • A doorway serving as a required exit (or forming part of a required exit) must not be revolving door, roller shutter or tilt door. • Can be fitted with a sliding door if it leads directly to open space and can be opened manually under a force of not more than 110N and be fitted with a fail-safe device if the door is power operated.

	Architect to note and comply accordingly. BCA compliance is achievable.
D2.20	**Door Swinging** • Must not encroach more than 500mm into the required width of the stair or 100mm when fully open, and • Must swing in the direction of egress. The egress stairs are not served by doorways. ***Note:*** *All classroom/office doorways used in the path of travel to an exit are shown swinging in the direction of egress.* BCA compliance is achievable.
D2.21	**Operation of Latch** Door latching (new doors) to be located 900mm to 1100mm above the floor and be openable with a single-handed downward action. It must be such that the hand must not slip, i. e. "D" shaped handle and have a clearance between the handle and the back of the door of not less than 35 mm and not more than 45 mm. It is understood all doors will be operable without a key, provided with leaver handles and /or fail-safe device in compliance with this clause. Communal Hall must be provided with panic bars in accordance with this clause. ***Note:*** *Fail-safe unlock is* ***not*** *permitted unless there is a fire detection and alarm system provided to AS 1670.1-2018 (unlikely as no full smoke detection and alarm system is required/proposed and a shutdown of mechanical detection system cannot be used to release doors).* BCA compliance is achievable; however details of which doors are to be secured needs to be considered to ensure that egress paths are provided with lever action door hard ware to enable egress 24/7 even when doors are secured.
Part D3	**Access for People with Disabilities** The entire buildings is required to be accessible. See the access assessment Report / Sign off conducted by Disabled Access Consultant.
Part E1	**Fire Fighting Equipment** The following fire-fighting equipment is required: • Fire Hydrant System AS2419.1-2005 (Clause E1.3). • Fire Hose Reels System AS2441-2005 (Clause E1.4). Except classrooms & associated corridors, and offices. • Portable Fire Extinguishers AS2444-2001 (Table E1.6). Fire Services consultants are to demonstrate compliance prior to CC. ***Note***: Hydrant Booster location is to be detailed and is to be located in a AS 2419.1 compliant position and be visible from the main entry of the building/s on site.

Part E2	**Smoke Hazard Management** The following smoke hazard management equipment is required: • Automatic Shut-down System of any air-handling system (other than non-ducted aircon) is required to all Class 9b buildings in NSW. • Automatic Smoke Detection and Alarm System AS1670.1-2018 (associated to shut-down system). Dry Fire Services consultant to demonstrate compliance prior to CC. Please note that stages with a floor area of more than 50m^2 would trigger additional smoke hazard management features (NSW E2.2). For the purpose of this assessment, it is assumed that the stage will be re-designed to not exceed 50m^{2in} area and is to be measured as per the red below, currently irt appears to be shown as being 70m^2 in floor area which is too large.  Should a 70m2 Stage be required for the school then please advise so that the additional requirements can be assessed/detailed to be provided.
Part E3	**Lift Installations** • Passenger lift car and lift shaft to comply with this part. • Passenger lift to comply with Tables E3.6a & E3.6b in size (i. e. 1100x1400mm when travelling less than 12m). • Passenger lift to be accessible (it may require a larger size plus accessible features) Lift car is scaled 1900x1400mm thus in compliance with this clause is possible, subject to detailed review by Disabled Access consultant.
Part E4	**Emergency Lighting, Exit and Warning Systems** The following warning systems are required: • Emergency lighting AS2293.1-2018 (Clause E4.2) • Exit signs AS2293.1-2018 (Clause E4.5) Electrical Consultant to demonstrate compliance prior to CC. BCA compliance is achievable, Designer is to note the egress travel paths and design accordingly for the exit signage.
Part F1	**General Health and Amenity** • Roof covering must comply with required Australian Standard outlined in clause F1.5 • Sarking to comply with AS4200. • Water proofing of wet areas within a building to comply with AS3740. • Damp-proofing where required to be installed in accordance with AS/NZS2904 or AS3660.1. • Damp-proofing for floors laid on the ground is to be installed in accordance with AS2870.

	The roof and external walls of the building must be weatherproofed in accordance with FP1.4. However, please note that the BCA does not have Deemed-to-Satisfy Provisions to enable compliance with the Performance Requirement FP1.4, therefore a Performance Solution will be necessary. Architect / Façade Designer / Modular Consultant or in combination to note and document and provide the required details accordingly.
Part F2	**Sanitary Facilities** Sanitary facilities must be provided in accordance with Table F2.3 and F2.2. • Male and female sanitary facilities are to be separated and signed as male and female toilets (not unisex, except for the unisex disabled accessible toilet) and nominated in accordance with Clause F2.3 (a). • Staff and students' sanitary facilities must be separated. • Unisex accessible toilets to be provided in accordance with Clause F2.4. • Ambulant features (male & female) are required in an additional toilet at the bank where an accessible toilet is provided inside the male and female banks of toilets. • Where clear space between closet pan and doorway is less than 1.2m, doors must open outwards, slide or be readily removable from outside. Toilets numbers designed in the SD Plans achieve compliance with the proposed populations given in Aconex RCC-GCOR-000389 dated 12 May 2021, the following numbers of toilet are required for BCA compliance and to be provided with signage accordingly: • Male Students – 11 Pans, 5 Wash Basins • Female Students – 10 Pans, 5 Washbasins • Unisex Disabled Facilities – Four (4) for student use • Male Staff – 3 Pan, 1 Wash basin • Female Staff – 3 Pan, 1 Wash basin • Unisex Disabled Facilities – One (1) for Staff Use • Pre School – 3 Pans, 3 Washbasins (Junior pans required) • Pre School Staff – One (1) Unisex Disabled Facility
Part F3	**Ceiling Height** Class 9b school/Pre School/Hall;: • Rooms and corridors (less than 100 people): 2.4m min. • Rooms and corridors (more than 100 people): 2.7m min. Class 5 offices: • Rooms: 2.4m min. • Corridors: 2.1m min. General: • Bathrooms, storerooms, etc: 2.1m min. • Stairways clearance above the stairs or the like: 2.0m min. Architect to note and detail accordingly. BCA compliance is achievable.
Part F4	**Light and Ventilation** • Provision of natural light is required to all general purposes classrooms and Playrooms in the Pre School via windows to outside a min of 10% of the Floor area of the classroom/playroom.

	• Artificial lighting to be in-compliance with AS1680.0-2009 to all other areas. • The building will be provided with natural ventilation or mechanical ventilation in compliance with AS1668.2-2012 & AS3666.1-2011. • WC's must not open directly to workspaces occupied by more than one person – ensure screening from view is provided otherwise. • It is understood that all WC's will be mechanically ventilated. • Pre School Playrooms – in addition to the 10% of the Floor area of the playroom being Natural Light (window glass area) , a minimum of 50% of the windows, the sills need to be less than 500mm above the FFL (BCA F2.3 (d)) Architect to detail and comply accordingly, for the natural lighting to ensure adequate windows/glazing is proposed to achieve compliance, and this is the area of transmittable area i.e. extent of glass, not the window size which may have frames etc that block light. Pre School – as the location of playrooms is yet to be determined this will need to be established / indicated indicatively for the operators to ensure 10% of floor area is window and the sill heights are compliant. Mechanical / Electrical consultants to conform compliance to relevant provisions related to this part of the BCA. BCA compliance is achievable, but details required to be confirmed as design progresses.
H1.4	**Class 9b Buildings** If the Communal Hall stage is provided with tiered-type seating areas, compliance with this clause is necessary for the tiered seating design/provisions and for the Hall in general.
Section J	**Energy Efficiency** BCA Section J (Energy Efficiency) assessment is required from an Accredited ESD Consultant and / or relevant Services Consultant. Important Note: Thermal Breaks in external walls must be non-combustible as tested to AS 1530.1, at the moment only a few products are on the market that achieve compliance and plastic or other non-AS 1530.1 tested materials are not BCA compliance with Clause C1.9 for this Type of Building. ***Note:*** *Please note that Section J has dramatically changed in BCA 2019 Amdt 1, thus ESD Consultant is to reflect the correct BCA and assessment in their assessment report and include a review of the detailed wall/façade design and confirm compliance.* Section J Report will be required for review, and is to provide confirmation that the for Construction Plans have been reviewed for the façade and are detailed to achieve compliance.
Fire Engineering	**Fire Engineering** Fire Engineering Report (FER) is necessary to address all fire related non-compliances associated to this development. Fire Engineer to be an Accredited C10 specialist. Fire Engineering Report will be required for review and approval. Elements at this stage expected to be Fire Engineered are as follows: - Oversized Fire compartment (exceeds 8,000m2) - Spandrels not being DTS compliant for the building. - Reduction of FRL to the low rise part of the building/for separation elements/construction.

	- Cavity infill material for the Canteen not being non-combustible as tested to AS 1530.1 and located in the external wall. - External Egress stair location within 6m of the external wall of the building. This will be further re-assessed as the design progresses and this list may grow or reduce and is indicative of the elements expected to be fire engineered at this stage of the design.
Accessibility	**Disabled Access Assessment** Access Report is necessary to assess the building against the disabled access provisions of the BCA (Part D3, Clauses F2.4, F2.9 & E3.6) associated to this development. Access Assessment Report will be required for review and approval.

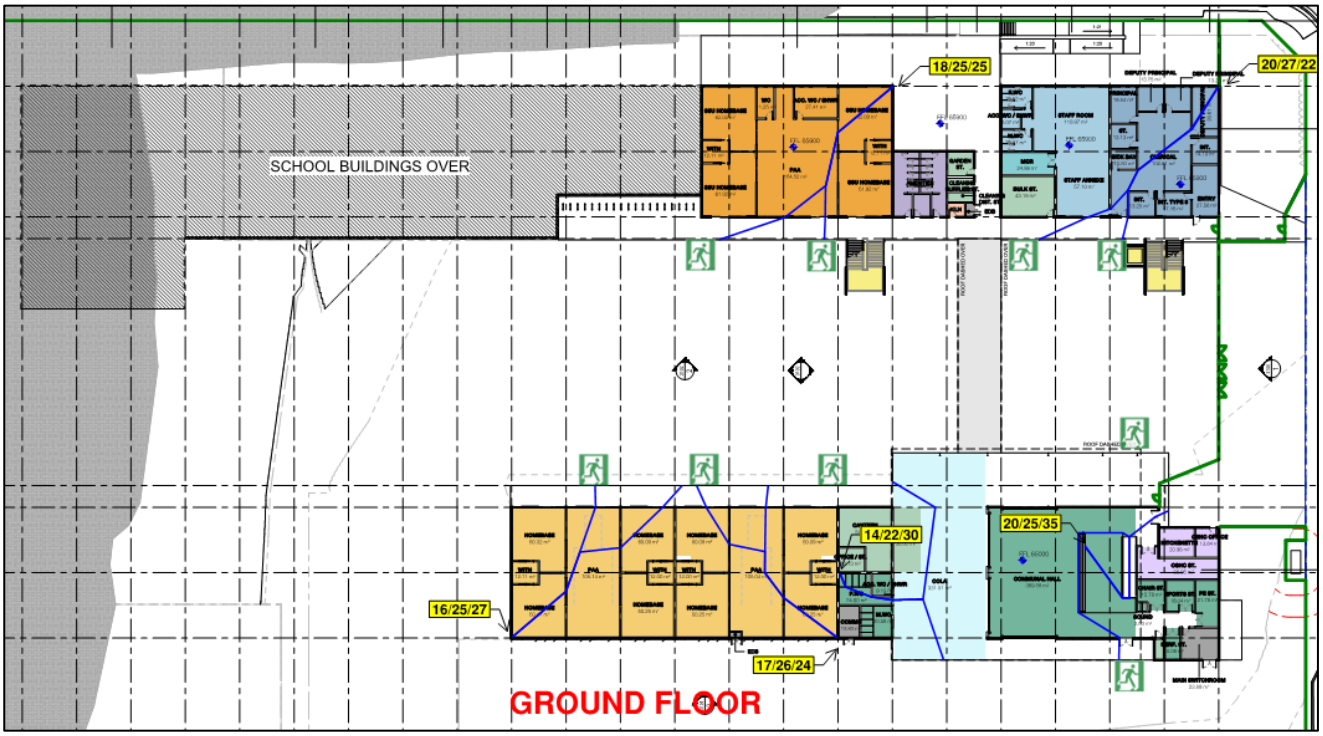
APPENDIX A – REQUIRED FRL's

Specification C1.1, BCA Table No. 3 – Type A Construction: FRL of Building Elements

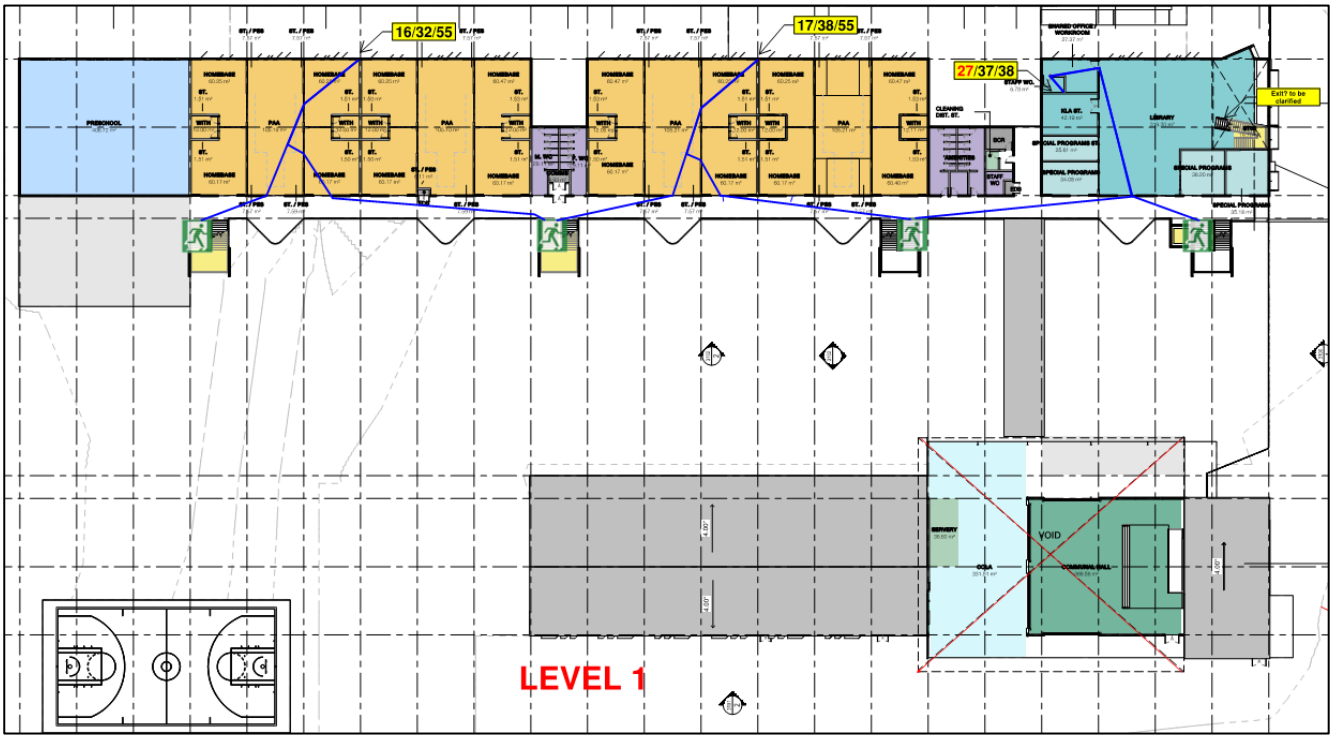
Item	Class 9b & 5
Loadbearing External Walls • Less than 1.5m to a fire source feature • 1.5 – less than 3m from a fire source feature; • 3m or more from a fire source feature	120/120/120 120/90/90 120/60/30
Non-Loadbearing External Walls • Less than 1.5m to a fire source feature • 1.5 – less than 3m from a fire source feature; • 3m or more from a fire source feature	-/120/120 -/90/90 -/-/-
External Columns • Loadbearing • Non-loadbearing	120/-/- -/-/-
Common Walls & Fire Walls	120/120/120
Stair and Lift Shafts required to be fire-resisting • Loadbearing • Non-loadbearing	120/120/120 -/120/120
Internal walls bounding sole occupancy units • Loadbearing • Non-loadbearing	120/-/- -/-/-
Internal walls bounding public corridors, public lobbies and the like: • Loadbearing • Non-loadbearing	120/-/- -/-/-
Ventilating, pipe, garbage and like shafts: • 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

Note: *See concessions in Spec C1.1 for concessions to these above tabulated requirements, as this may reduce or remove fire rating requirements subject to certain criteria and haven't been captured in this report.*

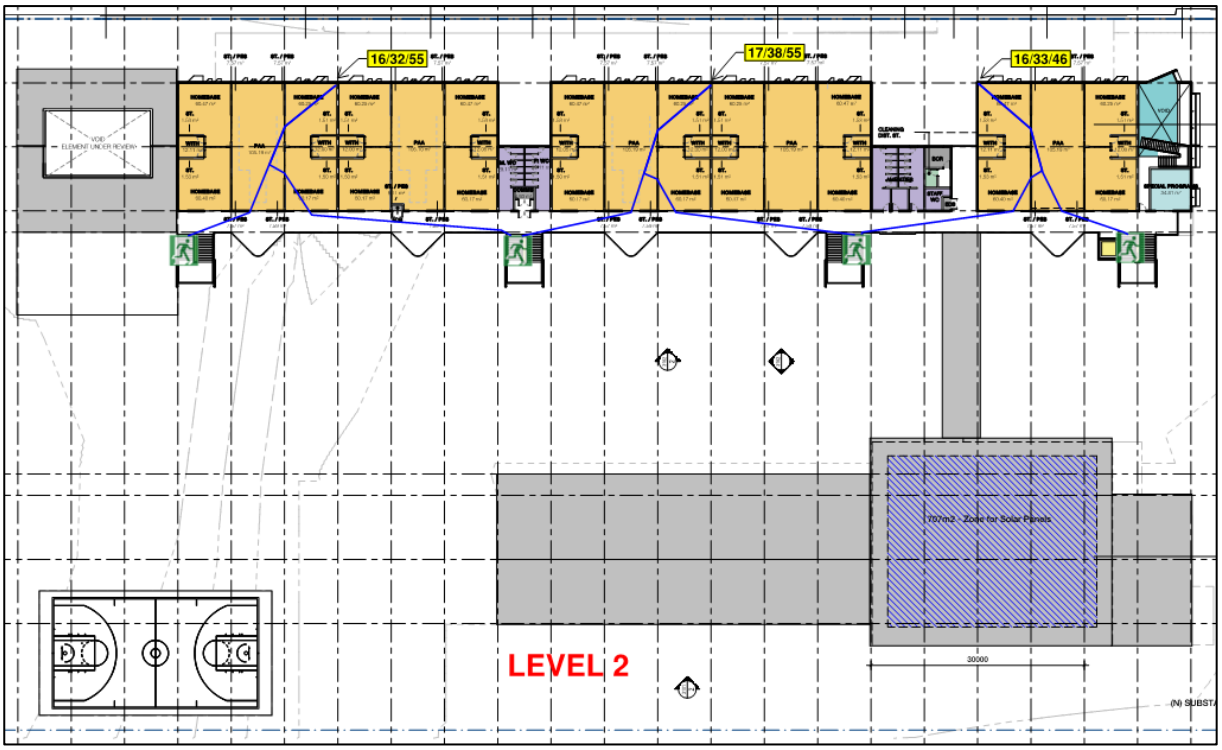
APPENDIX B – IDENTIFIED EXITS & TRAVEL DISTANCES



Note: Alternative Exit Routes on Ground Floor area are needed to be detailed, as points of choice need greater seperation.



Note: Alternative Exit Routes on 1st Floor area are needed to be detailed, as points of choice need to egress through other home base and sliding doors, so latching and exit sign detailing to be provided
Note 2: Circulation stair in Library is not an exit, and for BCA Compliance cannot be used as an exit..



Important Note: In order to achieve the 20m to a point of choice, egress splits internally with the Home bases / Buildings as indicated – this will need to be coordinated with Architect (door latching/provision), Electrical Consultant for Exit sign locations to indicate alternative egress paths and security to ensure doors in paths of travel are not secured and provided with 24/7 egress as no Fail Safe release is possible in this school.