BLACKETT MAGUIRE+ GOLDSMITH

PRELIMINARY BCA REPORT
SSDA

Macquarie University
Arts Precinct Project

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1.0 INTRODUCTION

1.1 BACKGROUND

This report comprises a review of the Schematic Design documentation for the proposed Macquarie University W6 & W6A Redevelopment against the NCC Building Code of Australia 2016 (BCA)

1.2 OBJECTIVE OF REPORT

The objective of this report is to:

+ Confirm that the referenced Schematic Design documentation has been reviewed by an appropriately qualified Building Surveyor and Accredited Certifier.
+ Outline the BCA Compliance Strategy for the building and certification pathway for the project.
+ Identify BCA compliance matters that require further resolution.
+ Identify matters that are to be required to be addressed by Alternative Solutions prior to issue of the S.109R Crown Certificate.
+ Identify the relevant essential fire safety measures that are applicable to the proposed development.
+ Accompany the SSDA submission to enable the Consent Authority to be satisfied that subsequent compliance with the fire & life safety and health & amenity requirements of the BCA, will not necessarily give rise to design changes to the building which may necessitate the submission of an application under Section 96 of the Environmental Planning and Assessment Act 1979.

It should be noted that it is not the intent of this report to identify all BCA provisions that apply to the subject development. The development will be subject further assessment following receipt of more detailed documentation during Design Development phase and prior to issue of the Crown Certificate.

1.3 REFERENCED DOCUMENTATION

The following documentation was relied upon when preparing this Report:

+ Building Code of Australia 2016 (BCA)
+ Guide to the Building Code of Australia 2016
+ Schematic Design Plans prepared by Budden Nangle Michael & Hudson Architects issued 3 August 2017.

1.4 LIMITATIONS AND EXCLUSIONS

The limitations of this report are as follows:

+ This report is based on a review of the referenced documents together with an inspection of the accessible areas of the building on the 30 March 2017. Concealed spaces such as voids, shafts, and the like were not inspected. Systems were not tested and building fabric was not removed to determine the method of construction.
+ No assessment has been undertaken with respect to access for people with disabilities and the Disability Discrimination Act 1992 (DDA). The building owner should be satisfied that their obligations under the DDA have been addressed. In this instance, we note that an Access Consultant has been engaged to advise further in this regard,
+ The Report does not address issues in relation to the following:
  i. The design, maintenance or operation of any existing electrical, mechanical, hydraulic or fire protection services.
  ii. Occupational Health and Safety Act and Regulations.
  iii. Water, drainage, gas, telecommunications and electricity supply authority requirements.
+
+ This report is based solely on client instructions, and therefore should not be used by any third party without prior knowledge of such instructions.

2.0 PROJECT OVERVIEW

2.1 DESCRIPTION OF DEVELOPMENT

The project site is located within the west zone of the Campus adjacent to Wally's Walk and Western Road and the Lotus Theatre.

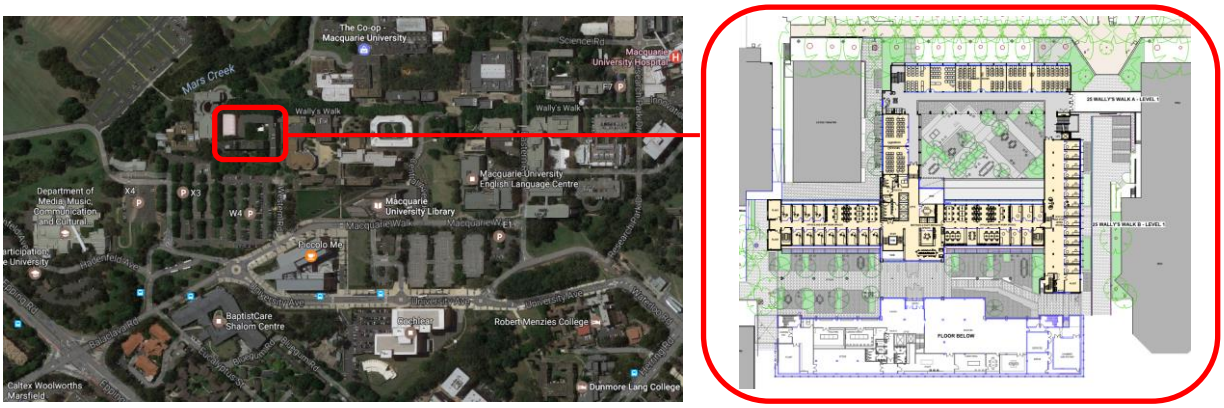


Figure 1: Site Location & Proposed Level 1 Floor Plan
Source: Google maps

The Precinct comprises of Buildings W6A, W6B and the associated courtyard being one of the original precincts developed at Macquarie University.

W6A: Currently accommodates academic and administrative workspace for the Faculty of Arts (with some ancillary functions) across 8 levels. The proposed works consist of reconfiguration to Building W6A including eight storey extensions to the eastern and western ends of the building and a nine-storey extension (including plant room level) to the central portion of the northern façade of the building. In addition, replacement and relocation of the central lifts and stairs is proposed.

W6B: Currently accommodates teaching and some ancillary support functions across 3 levels. The proposed works consist of reconfiguration to Building W6B (comprising three buildings, each of three levels).

Southern frontage of W6A: this vacant land will be used for the expansion of W6A providing a new building to house the Faculty of Arts Museum with new landscaping improvements.

The overall upgrade and expansion (approximately 15,000m^2), refurbishment, renewal & interior fit-out works of buildings W6A, W6B, for use by various administrative, academic, research, and teaching and outreach functions (gallery and museum spaces) + the proposed new building will be constructed to bring the facility in line with the requirements of both modern (and future) working, research and teaching environments in line with the MQ Master Plan.

2.2 APPROVALS PATHWAY

We note that a Development Application will be submitted for the proposed development.

While typically a Construction Certificate is required to be obtained following issue of a Development Consent and prior to commencement of works, building works undertaken by an Australian university (within the meaning of the Higher Education Act 2001) may be deemed Crown Building Work pursuant to Section 109R of the Environmental Planning & Assessment Act 1979.

Section 109R of the Section 109R of the Environmental Planning & Assessment Act 1979 states that Crown building work cannot be commenced unless the Crown building work is certified by or on behalf of the Crown to comply with the technical provisions of the State's building laws. In this regard, BM+G have been engaged to issue a Section 109R Crown Certificate prior to commencement of the proposed W6 & W6A Redevelopment.

2.3 BCA COMPLIANCE METHODOLOGY & STATUTORY REQUIREMENTS FOR BCA UPGRADE

The new building works are to comply with the current provisions of the BCA as required by Section 109R of the Section 109R of the Environmental Planning & Assessment Act 1979 (refer to section 2.4 below).

With respect to any statutory requirements to upgrade the existing building, in determining a Development Application, Clause 94 of the Environmental Planning & Assessment Regulation 2000 requires the Consent Authority is to take into consideration whether it would be appropriate to require the existing building to be brought into total or partial conformity with the Building Code of Australia where (in the case of the subject building):

(a) the proposed building work, together with any other building work completed or authorised within the previous 3 years, represents more than half the total volume of the building, as it was before any such work was commenced, measured over its roof and external walls;
or
(b) the measures contained in the building are inadequate:
(i) to protect persons using the building, and to facilitate their egress from the building, in the event of fire, or
(ii) to restrict the spread of fire from the building to other buildings nearby.

As the Development Consent has yet to be obtained, it is unknown as to whether the Consent Authority would require full upgrade to the existing building. In any case, given the extent of refurbishment works, upgrade of the existing buildings to comply with the current provisions of the BCA would be considered appropriate in this instance. As such, if a BCA upgrade condition is imposed upon the Development Consent, it is considered that upgrade works are being incorporated within the design to address compliance with such a condition and that the redevelopment will generally comply with the current provisions of the BCA upon completion.

2.4 RELEVANT VERSION OF THE BCA

Crown building work cannot be commenced unless the Crown building work is certified by or on behalf of the Crown to comply with the technical provisions of the State's building laws in force as at:

(a) the date of the invitation for tenders to carry out the Crown building work, or

(b) in the absence of tenders, the date on which the Crown building work commences, except as provided by this section.

The current version of the BCA is the BCA 2016, with the next version of the BCA coming into effect on 1 May 2019. In this regard, and for the purpose of this review, it is assumed that the invitation for tenders to carry out the Crown building work will be issued prior to 1 May 2019. As such, this review has been undertaken against the BCA 2016.

3.0 BCA REVIEW

3.1 BCA CLASSIFICATION

The building is classified as follows:

+ **BCA CLASSIFICATION:**	Class 5 Offices Class 9b Assembly Building (School) Class 9b Museum
+ **STOREYS CONTAINED (INCL. PLANT):**	Nine (9)
+ **RISE IN STOREYS:**	Eight (8)
+ **TYPE OF CONSTRUCTION:**	Type A Construction
+ **EFFECTIVE HEIGHT:**	Less than 25m (22.465m)
+ **CLIMATE ZONE**	Zone 5
+ **LARGEST FIRE COMPARTMENT:**	>10,000m^2
+ **IMPORTANCE LEVEL (STRUCTURAL):**	3
+ **SPRINKLER PROTECTED THROUGHOUT:**	Yes

NOTE: *25WWA (Building A), 25WWB (Building B) and the Museum Building (Building C) have been assessed as one building under the BCA given their inter-connection and the common services that will serve all three parts.*

3.2 STRUCTURE

1. New building works are to comply with the structural provisions of the BCA 2016 and referenced standards including AS 1170.
2. The structural engineer will need to certify that the structural capacity of the existing buildings will not be reduced as a result of the new works and that the building is considered structurally adequate for its intended use.
3. Structural engineer to verify FRL's of existing W6 & W6a building structure to be retained as part of the redevelopment, including floors, columns and any other concrete or masonry building elements to be retained.
4. The Importance Level for the building has been determined as Level 3 pursuant to BCA Table B1.2a.

3.3 FIRE RESISTANCE AND COMPARTMENTATION

1. Arising from the BCA classification and Type of Construction (Type A) required, the following minimum fire ratings generally apply (as per BCA Spec. C1.1):

+ Loadbearing external walls:	120/120/120 FRL
+ Internal loadbearing walls and columns:	120/-/- FRL
+ Internal loadbearing walls and columns (in storey below roof):	60/60/60 FRL
+ Floors:	120/120/120 FRL
+ Roof:	No FRL required
+ Fire Walls:	120/120/120 FRL
+ Stair, lift and services shafts:	120/120/120 FRL

It is considered that the new works can readily achieve compliance with the above FRL. Furthermore, the Structural Engineer has confirmed that the FRL of existing building elements to be retained will achieve a minimum 2hr fire rating as required above.

NOTE: The above FRL's are provided as a guide only. Reference should be made to BCA Specification C1.1 clauses 2 & 3.

2. Arising from the requirement for Type A Construction, the following fire compartment and volume limitations apply to the building pursuant to BCA Table C2.2a:

   + Floor area: Maximum 8,000m^2
   + Volume: Maximum 48,000m^2

   As the total floor area of the development (including the proposed atrium/covered zone) exceeds 8,000m^2, fire compartmentation will be required.

   When determining appropriate lines of fire separation, it should be noted that the proposed atrium will result in a single fire compartment comprising the Buildings B (25WWB), the Atrium and Building C (Museum) unless 2hr fire separation is provided between these parts.

   The extent of fire compartmentation will need to be developed through consultation between the Architect, appointed Fire Safety Engineer and BM+G. In this regard, preliminary fire compartment plans have been developed by the Fire Safety Engineer and are provided in Appendix A.

   The preliminary fire compartment plans also indicate the extent of protection of openings in external walls of different fire compartments which will be rationalised under a fire engineered Performance Solution.

3. The roof is required to be non-combustible under the BCA DTS provisions. A product is only deemed 'non-combustible' if tested against AS 1530.1 or if exempt under BCA clause C1.12.

   The proposed ETFE roofing to the atrium has not been tested against AS 1530.1, nor is it exempt under BCA clause C1.12. As such, a fire engineered Performance Solution will be required in this instance.

4. Vertical separation of openings (spandrels) are not required under the BCA DTS provisions on the basis that the building will be sprinkler protected throughout.

5. Separation of different BCA classifications (i.e. Class 5 and 9b) is not required as both classifications require the same FRL's. The extent of fire separation will be driven by the fire compartment sizes as per Item 2 above.

6. Openings in external walls are required to be protected where situated less than 6m from another building on the allotment.

   While the existing and proposed buildings are noted as generally more than 6m from any other buildings on campus, the setbacks circled to the right in Figure 2 are to be confirmed in order to determine if any protection is required. In this regard, protection may also be required to the adjoining buildings in addition to the W6 precinct where the setbacks are less than 6m.

   Where protection is required, protection must comply with BCA clause C3.4 e.g. external wall-wetting sprinklers, or a fire engineered Performance Solution documented.

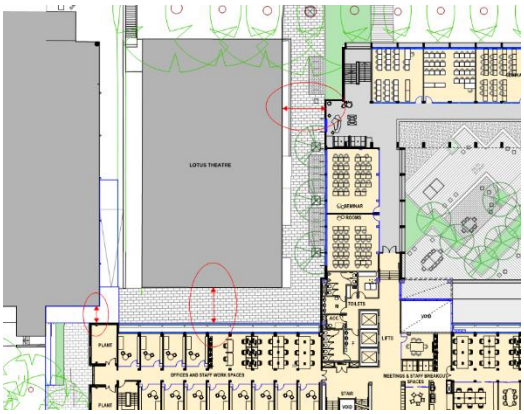
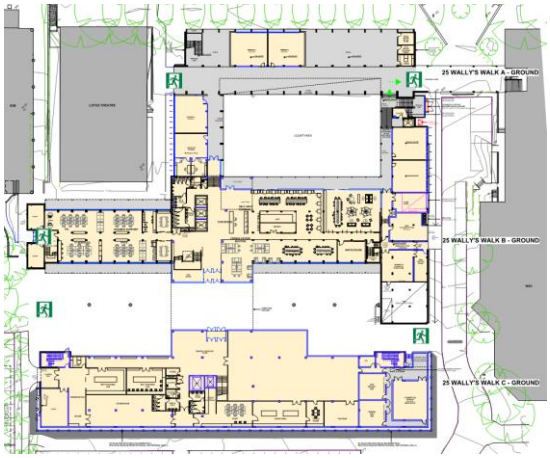


Figure 2: Distances between buildings to be confirmed

3.4 PROVISION FOR ESCAPE (EGRESS)

1. Indicative locations of exits (including Horizontal Exits) serving the building are shown in Figure 3 below.



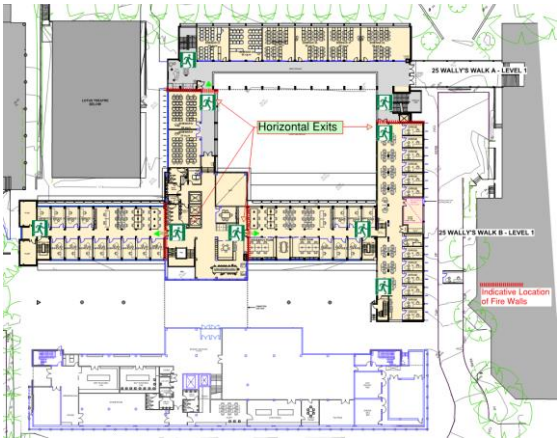


Figure 3: Indicative Exit Locations

2. The BCA DTS provisions state that no point on the floor should be more than 20m to an exit, or from a point at which travel in different directions to two exits is available, in which case the maximum distance to one of those exits is 40m. The referenced plans show that travel distances generally comply with the BCA DTS provisions with the exception of travel distance to one of two alternative exits from within the covered area/atrium between Buildings B & C, which will necessitate a fire engineered Performance Solution.
3. The BCA DTS provisions state that the maximum distance between alternative exits (when measured through the point of choice) is 60m. While compliance is readily achievable, a fire engineered Performance Solution will be required to allow extended distance between alternative exits within the covered area/atrium between Buildings B & C.

4. Based on the exits identified above, and the proposed uses associated with the development, it is considered that the building will have adequate aggregate egress width serving each storey.

   Notwithstanding the above, to confirm compliance and to ensure consistency with Macquarie University operational requirements for the building, proposed occupant numbers are to be provided to BM+G for further review.

5. The discharge of the fire isolated exits, particularly into the proposed covered area, will necessitate a fire engineered Performance Solution.

3.5 CONSTRUCTION OF EXITS AND SAFE MOVEMENT

1. Stairway balustrades and handrails are to be upgraded to current provisions of the BCA. In this regard we note the following:
   - All internal balustrades must achieve a minimum 1m height above FFL. Consideration should also be given to 1.2m balustrade heights where considered appropriate having regard to Safety in Design requirements.
   - Other than within fire isolated exits, openings in all balustrades must not exceed 125mm.
   - Openings in balustrades within fire stairs must not exceed 300mm; or where rails are installed a maximum 150mm opening between the nosing line of the stair treads and the rail or between the rail and the floor of the landing, balcony or the like, and the opening between rails must not be more than 460mm.
   - Where fire stairs are used for circulation, then handrails will be required to both sides in accordance with AS 1428.1-2009 and openings in balustrades must not exceed 125mm. Tactile indicators may also be required (subject to advice from the Access Consultant).
   - For floors more than 4 m above the surface beneath, any horizontal or near horizontal elements between 150 mm and 760 mm above the floor must not facilitate climbing.
2. With respect to the existing stairways that will be retained:
   - Handrails and balustrades are to be upgraded to comply with the BCA.
   - Colour contrast non-slip stair nosing's are to be installed to all stair treads in accordance with AS 1428.1 – 2009.
   - Riser and going dimensions and quantity (2R+G) to be reviewed and verified as compliant with BCA Table D2.13. Rectification works will be required where the existing stairs do not comply with current BCA provisions.
   - Existing stair treads and landings together with ramps are to be verified as complying with the slip resistance requirements of BCA Table D2.14.
3. The two (2) central stairways within 25WWB & 25WWC have been assessed as non-required non-fire isolated stairways. As these stairways will not comply with the separating construction required under BCA Specification C1.12 a fire engineered Performance Solution will be required.
4. The existing fire isolated exits serving 25WWB that will be retained currently have external windows that will bound the proposed atriums. It is noted that these windows will be infilled in lieu of being protected by drenchers under a Performance Solution.
5. The threshold of a doorway must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless opens to a road or open space external stair landing or external balcony and the door sill is not more than 190 mm above the finished surface of the ground, balcony, or the like, to which the doorway opens.

   Where access for people with disabilities is required through the doorway, then the doorway must be provided with a threshold ramp or step ramp in accordance with AS 1428.1. In this regard, it is noted that several existing doorways to classrooms that open from the open terrace currently incorporate steps at the doors which do not comply with AS 1428.1-2009. Access Consultant to review.

3.6 ACCESS FOR PEOPLE WITH DISABILITIES

1. The Disability (Access to Premises-Buildings) Standards 2010 (the Access to Premises Standards) requires the building to comply with the Access Code (BCA Part D3 & AS 1428.1-2009).

   With respect to the new works, compliance with the Access Code is achieved if the building complies with:
   - BCA clauses D3.1 to D3.12;
   - BCA clause E3.6;
   - BCA clauses F2.2 and F2.4.

Furthermore, the Access to Premises Standards also requires the 'Affected Part' to be upgraded to comply with the access code. In this regard, the Affected Part is the accessible path of travel from the principal entry to the new works.

Detailed documentation demonstrating compliance with the above BCA provisions and AS 1428.1-2009 will be required for assessment the appointed Access Consultant. Accessibility Compliance Report prepared by a suitably qualified Access Consultant will be required prior to issue of the Crown Certificate.

3.7 FIRE SERVICES & EQUIPMENT

1. The following comprises a preliminary proposed fire safety schedule for the building:

Statutory Fire Safety Measure	Design / Installation Standard
Access Panels, Doors & Hoppers	BCA Clause C3.13 & AS 1530.4 – 2005 and Manufacturer's specifications
Alarm Signalling Equipment	AS 1670.3 – 2004
Automatic Fail Safe Devices	BCA Clause D2.21
Automatic Fire Detection & Alarm System	BCA Spec. E2.2a & AS 1670.1 – 2015
Automatic Fire Suppression System (sprinklers) *Throughout the development*	BCA Spec. E1.5 & AS 2118.1 – 1999 or AS 2118.4, 6 – 1995
Building Occupant Warning System activated by the Sprinkler System	BCA Spec. E1.5, Clause 8 and / or Clause 3.22 of AS 1670.1 – 2015
Emergency Lighting	BCA Clause E4.4 & AS 2293.1 – 2005
Exit Signs	BCA Clauses E4.5, E4.6 & E4.8; and AS 2293.1 – 2005
Fire Blankets	AS 3504 – 1995 & AS2444 – 2001
Fire Dampers	BCA Clause C3.15, AS 1668.1 – 1998 & AS 1682.1 & 2 – 1990 and manufacturer's specification
Fire Doors	BCA Clause C2.12, C2.13, C3.5, C3.7 & C3.8, and AS 1905.1 – 2005 and manufacturer's specification
Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
Fire Hydrant Systems	BCA Clause E1.3 & AS 2419.1 – 2005 Fire Engineering Report
Fire Seals	BCA Clause C3.15, AS 1530.4 & AS 4072.1 – 2005 and manufacturer's specification
Fire Shutters (TBC)	BCA Spec C3.4 & AS 1905.2 – 2005
Fire Windows (TBC)	BCA Spec C3.4
Lightweight Construction	BCA Clause C1.8 & AS 1530.3 – 1999 and manufacturer's specification
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
Pressurisation systems (fire stairs)	BCA Clause E2.2 & AS/NZS 1668.1 – 2015 Fire Engineering Report
Smoke Exhaust System/Smoke and Heat Vents	BCA Part E2, BCA Spec E2.2b, AS/NZS 1668.1 – 1998 Fire Engineering Report
Sound System & Intercom Systems for Emergency Purposes (SSISEP)	BCA E4.9, Clause 5 of BCA Spec G3.8 and AS1670.4-2004 Fire Engineering Report
Stand-by Power Systems	BCA Clause E1.3, E3.4, E4.2 & E4.5; and AS 3000 – 1991
Wall-wetting sprinklers	BCA Clause C3.3, C3.4, C3.8 and Part G3 Fire Engineering Report
Warning & Operational Signs	Section 183 of the EP&A Regulation 2000, AS 1905.1 – 2005, BCA Clause C3.6, D2.23, D3.6 & E3.3
Fire Engineered Performance Solutions	BCA Performance Requirements Fire Engineering Report

Note: Additional fire safety measures may be required arising from any fire engineered Performance Solutions.

2. As the development will be deemed a separate building to that of other/adjoining university building, the above fire services should operate independently of the other buildings. In this instance, the building should be served by its own fire hydrant/sprinkler booster assemblies, fire pump room, and Fire Indicator Panel, etc.

   The following DTS requirements should be noted with respect to the above measures:

   + Fire Hydrant Booster Assembly must be located:
     - In sight of the main entry (being where the FIP is located).
     - A minimum 10m from the building, or affixed to the building with fire rated construction (90/90/90 FRL) for 2m either side and 3m above the outlets.
     - Consideration must also be given the FRNSW vehicular access to the building when determining appropriate location for the booster assembly.
     - The building must be served by external hydrants. Internal hydrants are only to be provided where required for coverage.
   + Fire Pump Room: Must be accessed directly from open space.
   + Fire Indicator Panel: Must be located at the main entry.
   + Sprinkler valve set: Must be accessible directly from open space.

   We note that a Performance Solution will be documented with respect to the fire hydrant booster location and the FIP location.

3. External fire hydrants must be provided to serve the building. External fire hydrants must be located 10m from the building or protected in accordance with AS 2419.1-2005.

   As internal fire hydrants will also be required for coverage, they must be located within fire isolated exits or within 4m of a non-fire isolated exit. Where the fire hydrants within the fire stairs do not provide coverage throughout the storey in which they are located, then additional internal fire hydrants provided for coverage must satisfy FRNSW operational requirements. In this regard, we note that FRNSW requires that when working from an internal hydrant (either from within a fire isolated exit or passageway, within 4m of an exit or another additional hydrant) the next additional hydrant should be located not more than 25m from that hydrant.

3.8 HEALTH & AMENITY

1. The number of facilities will need to comply with BCA Table F2.3, and include an accessible toilet facility at each level and ambulant facilities complying with AS 1428.1-2009.

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Class 9b — *schools*						
Male employees	1 — 20 > 20	1 Add 1 per 20	1 — 10 11 — 20 21 — 45 >45	0 1 2 Add 1 per 30	1 — 30 > 30	1 Add 1 per 30
Female employees	1 — 5 >5	1 Add 1 per 15			1 — 30 > 30	1 Add 1 per 30
Male students	1 — 25 26 — 75 76 — 150 151 — 200 > 200	1 2 3 4 Add 1 per 100	1 — 50 51 — 100 >100	1 2 Add 1 per 100	1 — 10 11 — 50 51 — 100 > 100	1 2 3 Add 1 per 75
Female students	1 —10 11 — 25 26 — 100 > 100	1 2 Add 1 per 25 Add 1 per 50			1 — 10 11 — 50 51 — 100 > 100	1 2 3 Add 1 per 75

   While the referenced plans show the location of proposed sanitary facilities, we will need the following information in order to confirm compliance with BCA clause F2.3:

   + The maximum number of staff and students that will occupy the building (at any given time).
   + Separate facilities must be provided for staff and students. As such, the plans must clearly allocate sanitary facilities as staff or student facilities.

2. At least one unisex accessible toilet facility is required on every storey containing sanitary compartments; and where a storey has more than one bank of sanitary compartments containing male and female sanitary compartments, at not less than 50% of those banks.

3. At each bank of toilets where there are one or more toilets in addition to an accessible unisex sanitary compartment at that bank of toilets, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS 1428.1 must be provided for use by males and females.

4. With the exception of an accessible toilet facility complying with BCA cl. F2.4, separate sanitary facilities for males and females must be provided (i.e. unisex facilities are not permitted).
5. A minimum 2.7m ceiling height is required to all area accommodating more than 100 people (including rooms, corridors and circulation spaces). Otherwise, generally 2.4m ceiling height is required, and 2.1m is permitted to amenities and non-habitable rooms.

   Notwithstanding the above, it is acknowledged that due to constraints associated with the existing building 25WWB, 2.7m will not be achievable within this building.

3.9 Ancillary Provisions (Atriums)

1. Arising from the proposed covered area between Building B (25WWB) & C (25WWC), the building will contain a central atrium connecting (indirectly) seven (7) storeys. As the atrium will not comply with the BCA DTS provisions, fire engineered Performance Solutions will be required with respect to the following:

   + G3.3: Separation of atrium by bounding walls.
   + G3.4: Construction of bounding walls.
   + G3.8 & Spec. G3.8: Fire & Smoke control systems (particularly smoke control system).

3.10 Energy Efficiency

1. The development is to achieve to compliance with the Energy Efficiency Provisions of Section J relating to:

   + J1: Building Fabric
   + J2: External Glazing
   + J3: Building Sealing
   + J5: Air-conditioning and ventilation systems
   + J6: Artificial lighting and power
   + J7: Heated Water Supply
   + J8: Facilities for Energy Monitoring

   The Crown Certificate documentation from the architect, mechanical, electrical, and hydraulic engineers are to incorporate details demonstrating compliance with the above provisions (as applicable to their respective disciplines). Furthermore, a 'Section J Energy Efficiency Report' or 'JV3 Report' (where applicable) will be required from an appropriately qualified ESD consultant prior to issue of the Crown Certificate.

4.0 MATTERS REQUIRING FIRE SAFETY ENGINEERED PERFORMANCE SOLUTIONS

The following BCA DTS non-compliances will necessitate a fire engineered Performance Solutions prior to issue of the S.109R Crown Certificate.

	BCA CLAUSE/S	DESCRIPTION
1.	C1.1 & Spec. C1.1, cl. 3.5	To allow ETFE roofing to the atrium which has not been tested against AS 1530.1 as being non-combustible, nor is it exempt under BCA clause C1.12.
2.	C1.1	To allow the use of Dincel to external walls which contains a combustible lining.
3.	C2.2 & C2.7	Fire compartmentation and construction of fire walls separating fire compartments (particularly where bounding the atrium).
4.	C3.3	Rationalisation of protection of openings in external walls of different fire compartments.
5.	D1.4	Exit travel distances will exceed 40m to one of two alternative exits within the atrium.
6.	D1.5	Distances between alternative exits will exceed 60m within the atrium.
7.	D1.7(b)	Discharge of fire stairs serving Buildings B (25WWB) & C (Museum– 25WWC) into covered area/atrium.
8.	D1.9	Non-fire isolated stair serving Building B (25WWB) Level 8 Plant does not discharge at a level that provides access directly to road or open space.
9.	D1.10	The path of travel to the road following discharge of several exits serving Buildings A & B into the Central Courtyard necessitates passing under Building A (25WWA).
10.	D1.12 & Spec. D1.12	The construction bounding the two non-required non-fire isolated central stairways within 25WWB & 25WWC will not be in accordance with BCA Spec. D1.12
11.	E1.3	Fire hydrant booster: + The fire hydrant booster will not be in sight of the main entry.
12.	E2.2/AS 1670.1-2015	The FIP will not be in site of the main entry.
13.	E2.2/G3.8	Rationalisation of smoke exhaust system serving the atrium.
14.	E2.2/G3.8	Rationalisation and/or deletion of stair pressurisation to exits (x2) bounding the atrium, and two (2) exits to Building C (Museum)).
15.	E2.2 & E4.9	+ Rationalisation of SSISEP system with respect to cascading of evac tones to reduce the likelihood of false alarms. + To allow the omission of Manual Control Points (MCP).
16.	G3.3 & G3.4	Rationalisation of bounding construction to the atrium.

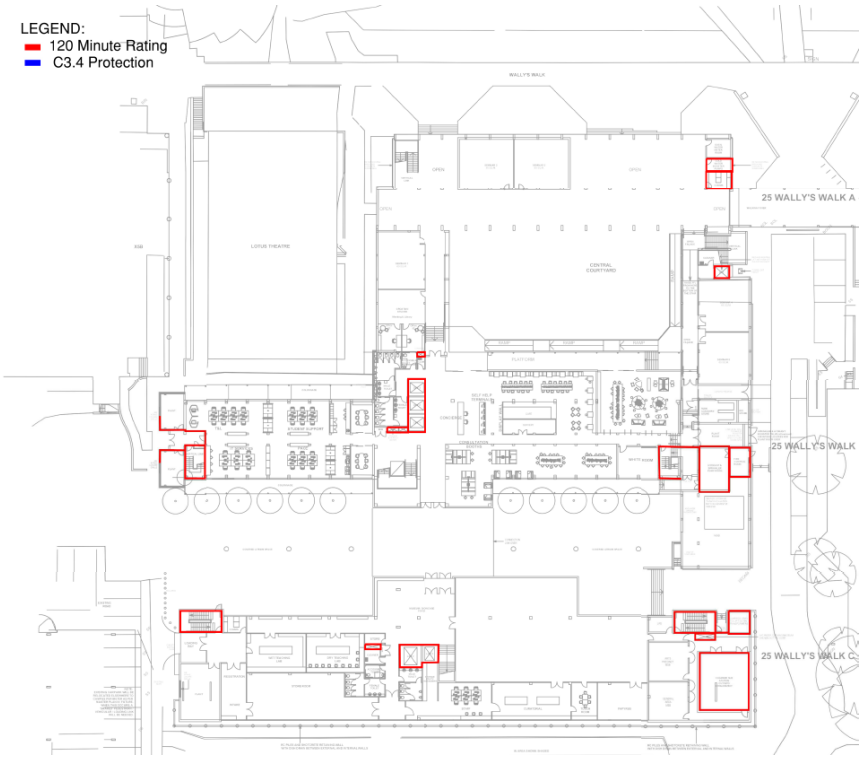
Please note that the above items have been identified as a result of our review of the current schematic design documentation. Additional matters may be identified during preparation of further detailed documentation.

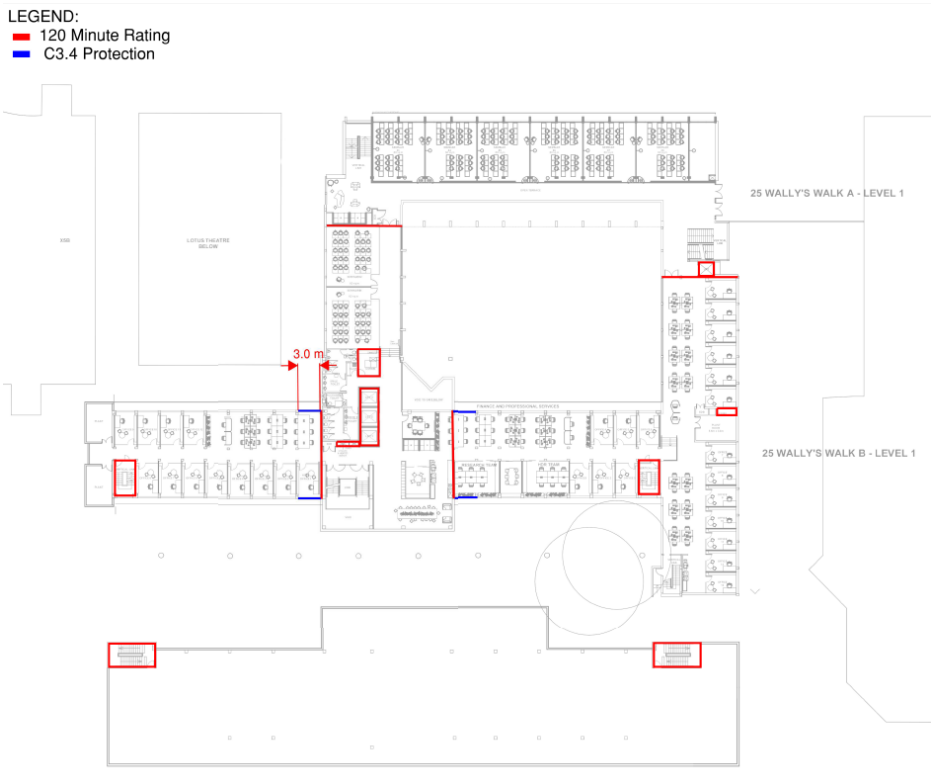
5.0 CONCLUSION

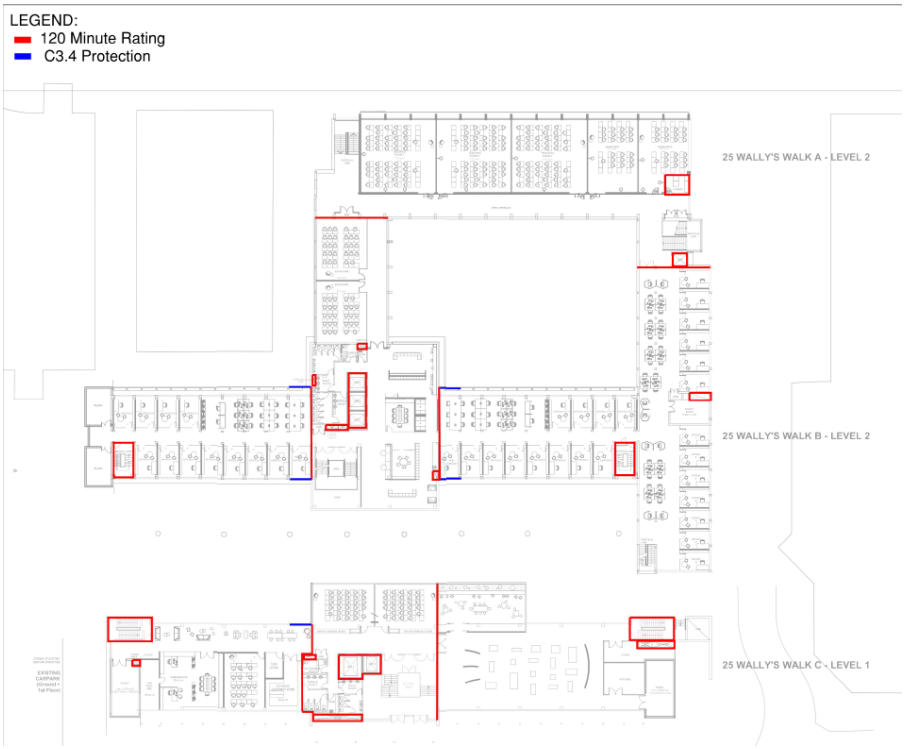
This report comprises a review of the Schematic Design Documentation for the Macquarie University Arts Precinct Project against the provisions of the Building Code of Australia 2016 (BCA 2016).

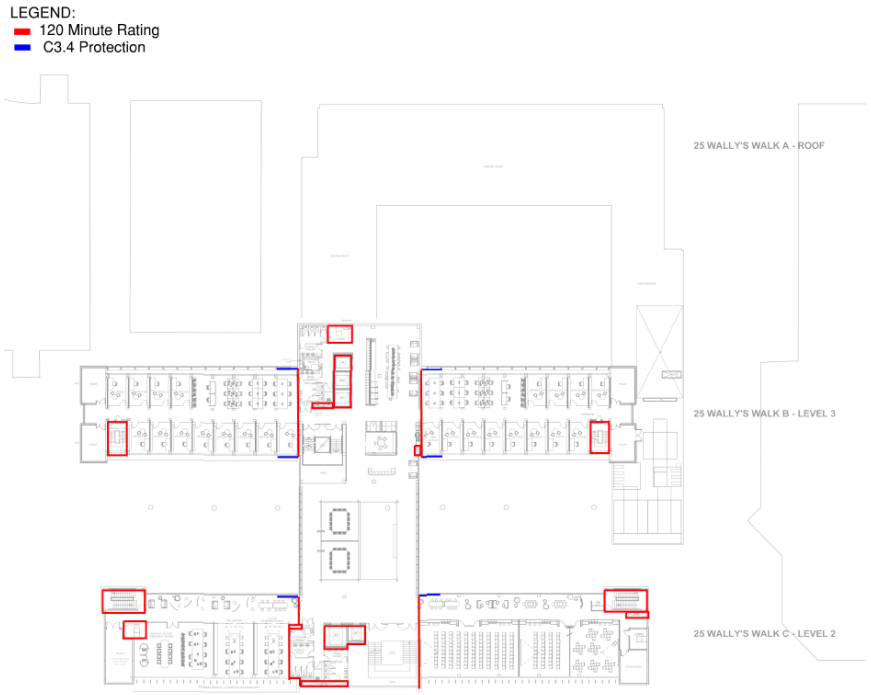
Arising from our review, it is considered that the proposed development can readily achieve compliance with the relevant provisions of the BCA, however further assessment of the design documentation will be required as the design is further development to ensure that compliance with BCA is achieved.

APPENDIX A – PRELIMINARY FIRE COMPARTMENT PLANS





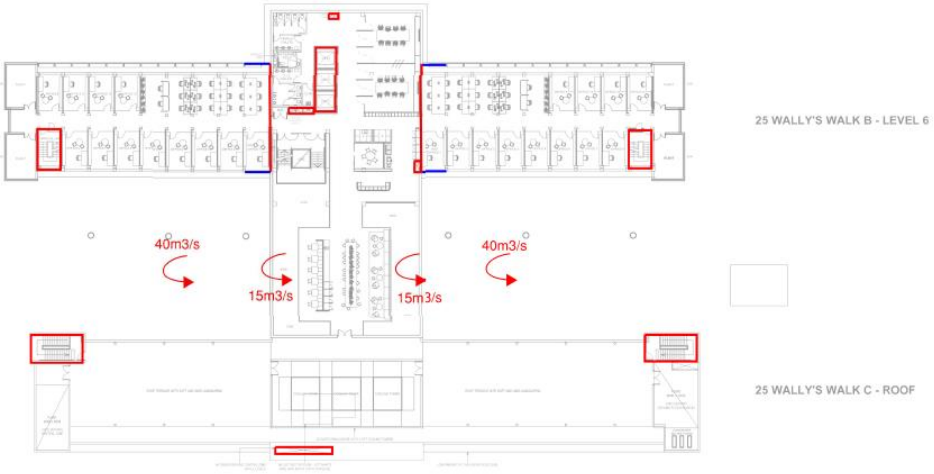

LEGEND:
120 Minute Rating
C3.4 Protection
25 WALLY'S WALK A - LEVEL 2
25 WALLY'S WALK B - LEVEL 2
25 WALLY'S WALK C - LEVEL 1


LEGEND:
120 Minute Rating
C3.4 Protection
25 WALLY'S WALK A - ROOF
25 WALLY'S WALK B - LEVEL 3
25 WALLY'S WALK C - LEVEL 2

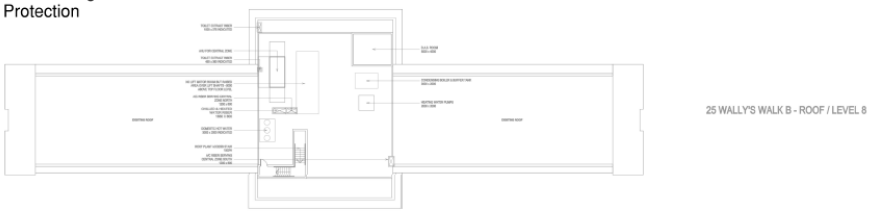
LEGEND:
120 Minute Rating
C3.4 Protection

LEGEND:
120 Minute Rating
C3.4 Protection

LEGEND:
120 Minute Rating
C3.4 Protection
Smoke Extraction



LEGEND:
120 Minute Rating
C3.4 Protection



Source: Wood & Grieve Engineers