STEVE WATSON
& PARTNERS

BUILDING CODE CONSULTANTS
BUILDING SURVEYORS & CERTIFIERS
SYDNEY • MELBOURNE • BRISBANE

Loreto Kirribilli – Western Precinct

PRELIMINARY BCA ASSESSMENT

REPORT 2016/1744 R1.4

17 July 2017

Prepared for APG

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Report Revision History

SWP Quality System

Job Number/Ref:	2016/1744	Revision Number:	1.4	Issue Date:	17 July 2017

Revision History

Rev No	Date	Revision Details	Author	Verifier
1.0	23/11/16	High Level Comments	Steven Vukman	-
1.1	01/12/16	Preliminary Drawings	Steven Vukman	Guiseppe Graziano
1.2	27/02/16	Revised Drawings	Steven Vukman	Guiseppe Graziano
1.3	22/03/17	Final Drawings	Steven Vukman	Guiseppe Graziano
1.4	17/07/17	Revised Drawings following consultation	Steven Vukman	Guiseppe Graziano

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Introduction

This report presents the findings of an assessment undertaken of the proposed design against the Deemed-to-Satisfy (DtS) provisions of Building Code of Australia (BCA) 2016.
It has been prepared by building regulations consultants and certifiers Steve Watson and Partners for Artazan Property Group.

Purpose

The assessment is undertaken for the purpose of, and to the extent necessary for, submission with the State Significant Development Application to The Department of Planning and Environment under Part 4 of the Environmental Planning and Assessment Act.

Limitations:

The scope of this assessment is limited to the design documentation reference din Appendix A of this Report

Limitations:

The following limitations apply to the assessment:

- Generally the assessment does not incorporate the detailed requirements of the Australian Standards.

Description of proposed development

The proposed development involves the demolition of the existing B Block Buildings and the construction of a new Innovation Centre building. The works also involve modification to the existing gymnasium and a new connection in the Centenary Hall.

Summary of Construction Determination

The type of construction required for the proposed design is summarised in the table below.

Classification	9b
Number of storeys contained	7
Rise in storeys	7
Type of construction required	A
Effective height	<25m (approx. 20.5m)

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Assessment

A preliminary review of the proposed design that will form part of the State Significant Development Application to The Department of Planning and Environment has been undertaken. We confirm the design as shown on the drawings referenced in Appendix A is capable of achieving compliance with the BCA subject to further detail at the design development stage. Some aspects of the design are proposed to be addressed by way of a fire engineered Alternative Solution to meet the relevant Performance Requirements of the BCA. These aspects include but are not limited to the items specified on page 9-10, which will need to be addressed by an Accredited C10 Fire Engineer and verified by Steve Watson and Partners prior to the issue of a Construction Certificate.

Section C – Fire Resistance:

- The building is required to be erected to Type A fire resisting construction requirements. This generally requires that the structural achieve a 120/120/120 FRL in accordance with Appendix B.
- The proposed gymnasium and innovation centre has an effective height of 20.5m.
- The existing Marion Centre is proposed to be connected to the new Innovation Centre via A covered connection on Ground floor and 2 bridge links on Level 1 and Level 2. In accordance with Clause C2.7, it is proposed to separate the buildings by a fire wall so that they can be treated as separate buildings for the purposes of Section C, D and E of the BCA. A fire engineered solution is required to be obtained to address the performance based fire wall at the ground floor and bridge links which are proposed to contain glazed wall and a glass lift.

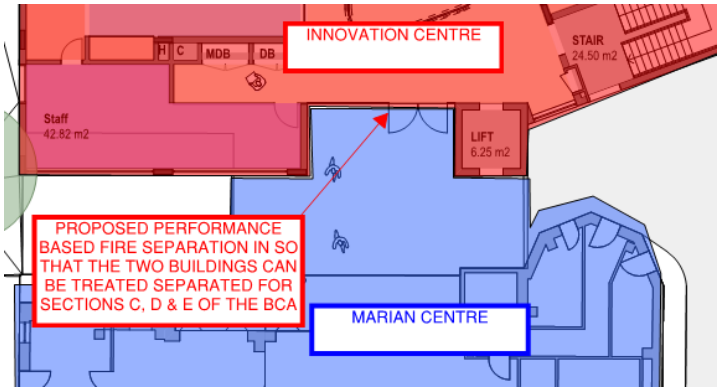
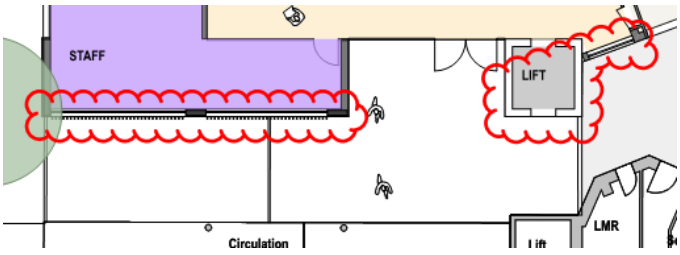


Figure 1 - Performance based separation at ground floor. Level 1 and 2 to also be addressed

- The external walls of the new innovation centre and the existing Marian Centre are less than 6m apart in some areas. As a result, any openings that are within 6m of the external wall of the opposite building must be protected in accordance with C3.4 (i.e. fixed shut windows with drenchers, self closing fire doors, or self closing doors with drenchers). A fire engineered solution can be investigated where compliant protection of openings is not provided.
- Furthermore, the glazed openings on the ground floor clouded below, occupy more than 1/3 of the external wall they are located in. A fire engineered solution is required to be investigated.



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- The BCA reports completed for the centenary hall identifies that the building was built to type C fire resisting construction whilst the Junior School was built to Type B fire resisting construction. As a result, the gymnasium/innovation centre are proposed to be fire separated from the adjoining Centenary Hall and Junior School.
- The fire walls separating the compartments will not fully comply with Clause C2.7. A fire engineered solution is proposed to be investigated for a performance based fire wall for the separation of each of the buildings. It is proposed that the fire wall design separates each of the 3 buildings (Innovation Centre/Gymnasium; Centenary Hall; and Junior School) so that they may be **treated as separated buildings for the purposes of Section C, D and E of the BCA.**

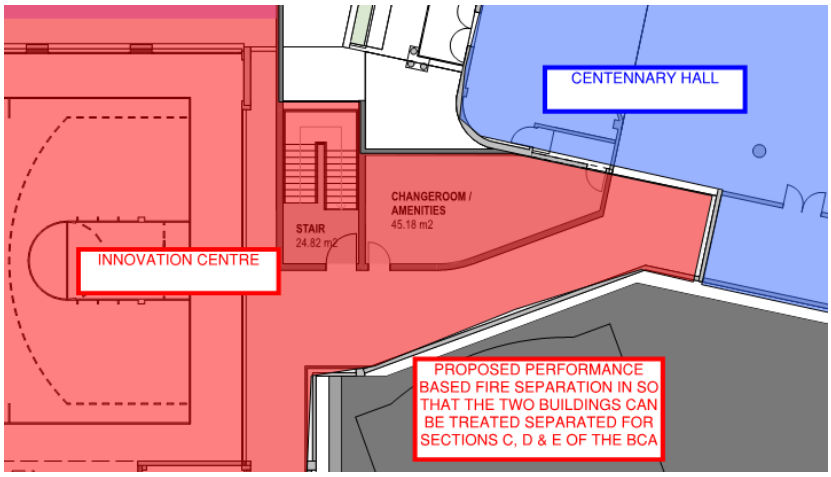

Figure 2 - Performance based separation between Innovation Centre and Centenary Hall

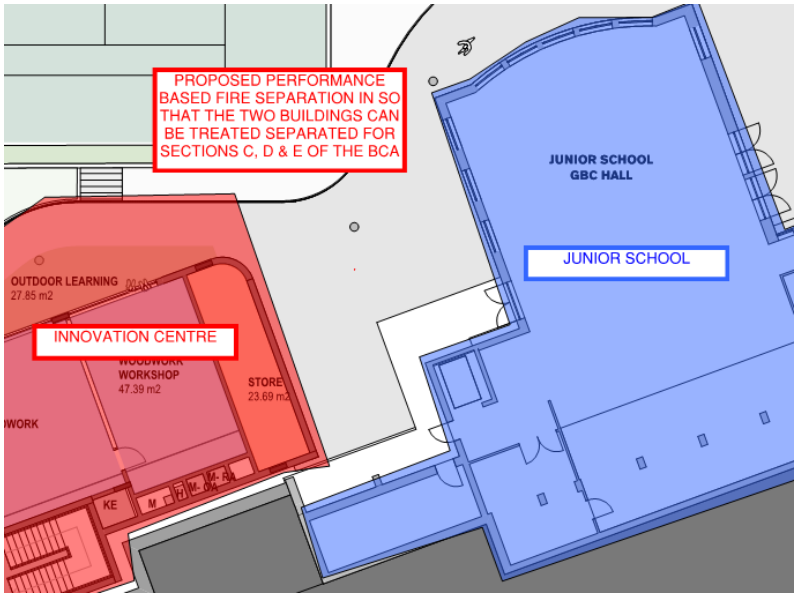

Figure 3 - Performance based separation between Innovation Centre and Junior School

- External walls of the Centenary Hall and Junior School which are within 6m of an external wall of the new innovation centre/gymnasium are required to achieve a 2hr FRL. As a result, any openings that are within 6m of the external wall of the opposite building must be protected in accordance with C3.4 (i.e. fixed shut windows with drenchers, self closing fire doors, or self closing doors with drenchers). A fire engineered solution can be investigated where compliant protection of openings is not provided.
- Openings within 3m of the side boundary are required to be protected in accordance with Clause C3.4 of the BCA.

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Section D – Access and Egress:

- The communication stair currently connects 7 storeys. Clause D1.3 of the BCA requires stairways to be fire isolated when they connect more than 3 storeys. The fire engineer will not be able to justify an open stair, however preliminary discussions should be had with the fire engineer to determine if it is capable to provide a performance based isolated stair with drenchers, toughened glass and automatically closing doors. This will need to be investigated with the fire engineer to determine if it is possible.
- The performance based fire isolated stair is proposed to discharge to the outdoor learning area on Lower Ground 4. A path of travel should be provided from the outdoor learning area to connect the exit to the street. The discharge of both fire isolated exits must have path which connects it to the road via a stairway or ramp not steeper than 1:8.
- In accordance with Clause D1.7, where the discharge from either of the two exit stairways necessitates passing within 6m of an opening in an external wall, those openings must be protected in accordance with C3.3 i.e. windows fixed shut with drenchers and self closing fire rated doorways. The protection is only required where the path of travel is exposed to openings measured at right angles. A fire engineered solution can be investigated to reduce the extent of protection if possible. Note, the existing low level louvers in the western elevation of the existing gymnasium should be filled in to achieve an FRL of 120/120/120.

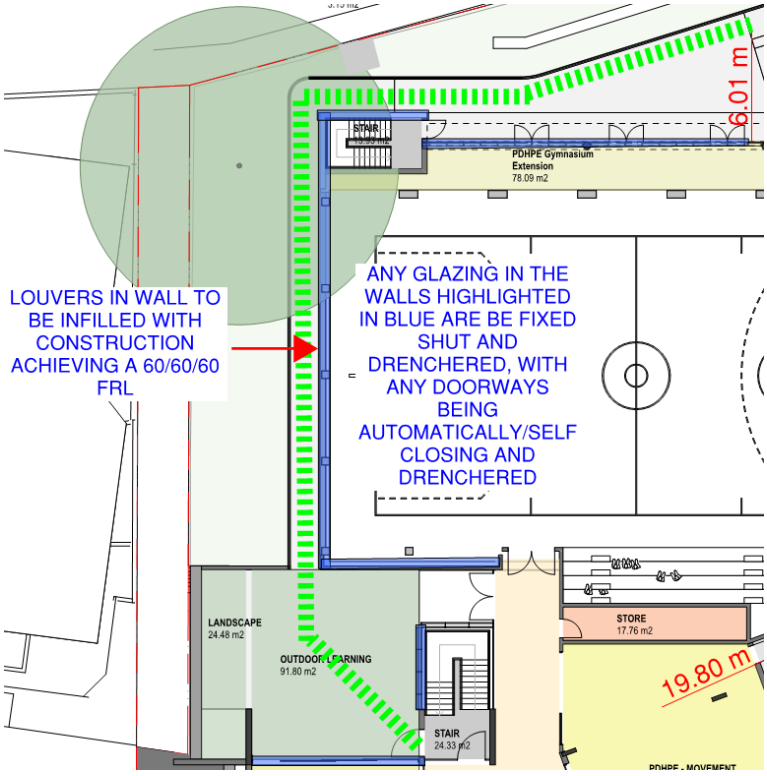

Figure 4 – Protection of openings from discharge of stairway

- 4.5m egress width should be provided from the gymnasium floor. Consideration should be provided to locating exits doors along the northern elevation to provide sufficient egress width and travel distances.
- The connection between the rising and descending stair flights complies with Clause D2.4 of the BCA given that this clause only applies where the flight is below the lowest level of access to a road or open space. Given that the lowest level of the gymnasium still provides access to open space, the rising and descending stair flights are not considered.

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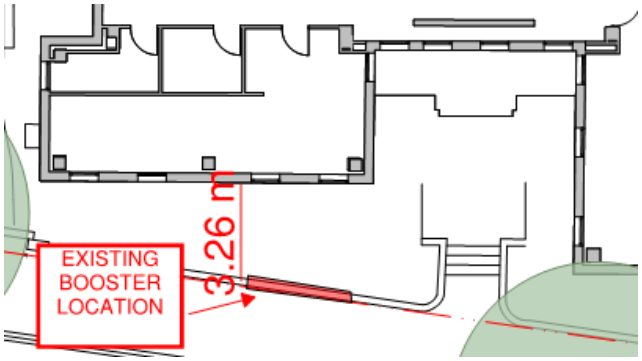
Exit Travel Distances:

- **Lower Ground 4:**
  - Travel distances comply with the DTS provisions of Clause D1.4 and D1.5
- **Lower Ground 3:**
  - Travel distances comply with the DTS provisions of Clause D1.4 and D1.5
- **Lower Ground 2:**
  - 25m to a point of choice in lieu of the 20m permitted by Clause D1.4 of the BCA (cool room/pantry)
- **Lower Ground 1:**
  - 25m to a point of choice in lieu of the 20m permitted by Clause D1.4 of the BCA (metal workshop and store room)
  - Distance to first exit and between alternative exits complies
- **Ground:**
  - 25m to a point of choice in lieu of the 20m permitted by Clause D1.4 of the BCA (store room)
  - Distance to first exit and between alternative exits complies
- **Level 1:**
  - 25m to a point of choice in lieu of the 20m permitted by Clause D1.4 of the BCA (store rooms)
  - Distance to first exit and between alternative exits complies
- **Level 2:**
  - 25m to a point of choice in lieu of the 20m permitted by Clause D1.4 of the BCA (Outdoor learning area)
  - Distance to first exit and between alternative exits complies

Section E - Fire Services:

- Fire hydrants are to be provided throughout the buildings in accordance with BCA Clause E1.3 and AS2419.1 – 2005. The existing booster assembly block plan confirmed that the construction of the booster assembly already complied to current standards. Fire hydrant coverage to Marion centre and junior school to also be reviewed to ensure we haven't impacted coverage as a result of the proposed works.
- The existing booster assembly is located within 10m of the Marion Centre which does not comply with AS2419.1 – 2005. However there does not appear to be any existing fire engineered solutions to address this non compliance. Given that this project will require other alternative solution which will require brigade referral, it is recommended that this existing booster locations be addressed as part of a new fire engineered solution.



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- Fire hose reels are to be provided throughout the gymnasium levels.
- Portable fire extinguishers are to be provided throughout the innovation centre.
- A sprinkler system is generally not required for a building which does not exceed 25m in effective height. However, no sprinklers would result in compliant 60 minute fire rated spandrels being provided around the façade of the building to separate storeys. This will be problematic with the proposed façade design. Furthermore, the proposed interconnecting stair will only be capable of being approved as a performance based fire isolated stairway if sprinklers are provided within the building. As a result, we note that **sprinklers will need to be provided within the building.**
- Sprinklers are not proposed to be provided within the adjoining Centenary hall or Junior School. Sprinklered and non sprinklered areas are to be separated by a 2hr fire wall. A fire engineered solution is proposed to be obtained for the performance based fire wall.

Section E2 – Smoke Hazard Management:

- Air handlings systems must automatically shut down upon activation of smoke detection or sprinkler system
- A smoke detection system in accordance with Clause 5 of Specification E2.2a and spaced in accordance with AS 1670.1 – 2015 is required to be provided throughout the building in order to operate the shutdown of the air handling systems.
- Smoke exhaust is not required to the gymnasium or classrooms as it receives a concession under Table E2.2 (Other Assembly Buildings).
- The centenary hall is not provided with smoke exhaust or smoke and heat vents as the compartment is less than 2000m2. The proposed works will involve a fire wall that will separate the centenary hall from the gymnasium/innovation centre, and as a result the compartment sizes will remain under 2000m^2.

Section E3 – Lifts:

- The proposed lift must comply with the requirements of Table E3.6 and AS1735.12 – 1999.
- The lift must be a minimum 1400mm wide by 2000mm deep in order to accommodate for a stretcher facility in accordance with Clause E3.2 of the BCA

Section E4 – Visibility in an Emergency, Exit Signs and Warning Systems:

- Emergency lighting and exit signs must be provided in accordance with AS2293.1 – 2005
- A Sound System and Intercom System for Emergency Purposes (SSISEP) also known as EWIS must be provided throughout the building in accordance with AS1670.4 – 2015.

Section F – Health and Amenity:

- Natural lighting must be provided to all classrooms spaces in accordance with Part F4 of the BCA
- New sanitary facilities are proposed to be provided within the new gymnasium and Innovation Centre based on the student and staff numbers. Accessible and ambulant sanitary facilities are also required to be provided in accordance with AS1428.1 – 2009.
- Sanitary facilities are not required on every floor provided sufficient facilities are provided on other floors
- Separated sanitary facilities must be provided for students and staff.

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Section G3 – Atrium Construction:

- There are two voids throughout the building, however they only ever connect two storeys. As a result, the atrium provisions of Part G3 do not apply.

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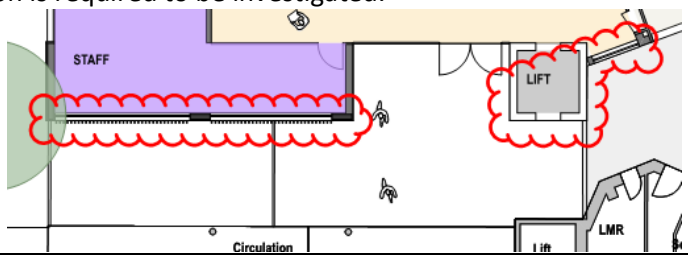
Fire Engineered Solutions:

The following issues are proposed to be investigated to be addressed on a performance basis by an Accredited C10 Fire Engineer:

Clause	Non Compliance	Performance Requirement
C2.7, C3.2, C3.3 and Spec C1.1	The innovation centre/gymnasium is proposed to be fire separated from the adjoining Marian Centre by a performance based fire wall to separate the buildings so that they may be treated separated for the purposes of Section C, D and E of the BCA. The fire wall is proposed to include glazing and a glazed lift.	
C2.7, C3.2, C3.3 and Spec C1.1	The innovation centre/gymnasium is proposed to be fire separated from the adjoining Junior School and Centenary Hall by a performance based fire wall to separate the buildings so that they may be treated separately for the purposes of Section C, D and E of the BCA	
C2.10 and Spec C1.1	A fire engineered solution is proposed to be investigated for the proposed glass lift shaft.	
C3.2 and C3.4	The Marion Centre, Junior School and Centenary hall may have openings located closer than 6m to the new innovation centre and may not be proposed to be protected in accordance with the DTS provisions of Clause C3.4.	
C3.2(b)	The glazed openings on the ground floor clouded below, occupy more than 1/3 of the external wall they are located in. A fire engineered solution is required to be investigated. 	
D1.3 and Spec C1.1	The main communication stairway is proposed to connect more than 3 storeys and not be fire isolated. It currently connects 7 storeys. Discussions will need to be had with the fire engineer regarding whether it is possible to connect all 7 storeys via a performance based fire isolation with toughened glass, self closing doors and drenchers. If this is not possible to be addressed as part of a fire engineered solution, we may need to limit the extent of the performance based stairway.	
D1.4 and D1.5	The following exit travel distances are proposed to be addressed as part of a fire engineered solution: **Lower Ground 2:** • 25m to a point of choice in lieu of the 20m permitted by Clause D1.4 of the BCA (cool room/pantry) **Lower Ground 1:** • 25m to a point of choice in lieu of the 20m permitted by Clause D1.4 of the BCA (metal workshop and store room) • Distance to first exit and between alternative exits complies **Ground:** • 25m to a point of choice in lieu of the 20m permitted by Clause D1.4 of the BCA (store room)	

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	• Distance to first exit and between alternative exits complies **Level 1:** • 25m to a point of choice in lieu of the 20m permitted by Clause D1.4 of the BCA (store rooms) • Distance to first exit and between alternative exits complies **Level 2:** • 25m to a point of choice in lieu of the 20m permitted by Clause D1.4 of the BCA (Outdoor learning area) • Distance to first exit and between alternative exits complies	
D1.7	A fire engineered solution can be investigated if the openings along the path of travel discharging from the fire stairs aren't protected completely in accordance with Clause D1.7.	
E1.3	The existing hydrant booster assembly is located within 10m of the building and does not comply with AS2419.1 - 2005	
E1.5	AS2118.1 – 1999 requires sprinklered and non sprinklered spaces to be separated by 2hr construction. The adjoining junior school and centenary hall will not be provided with a DTS 2hr fire wall.	

Conclusion

This statement has been prepared to accompany the State Significant Development Application to The Department of Planning and Environment following a preliminary assessment of the proposed design. The preliminary assessment has found the design is capable of achieving compliance with the BCA subject to further detail at the design development stage. The assessment has also identified a number of non-compliances which are proposed to be addressed by Fire Engineered Alternative Solutions. Notwithstanding, the development adequately satisfies the intent of being able to comply with the requirements of the BCA for the purpose of DA submission.

If you have any queries, please do not hesitate to contact me.

Kind regards

Steven Vukman
Building Regulations Consultant
Steve Watson & Partners Pty Ltd

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Appendix A – Referenced Documentation

The following documentation was used in the preparation of this report:

Drawing No.	Title	Issue	Date	Drawn By
DA-2001	Demolition Plans Masterplan Demolition Plan – LG4 LG3	01	07/07/17	FJMT
DA-2002	Demolition Plans Masterplan Demolition Plan – LG2 LG 1	01	07/07/17	FJMT
DA-2003	Demolition Plans Masterplan Demolition Plan – G L1	01	07/07/17	FJMT
DA-2004	Demolition Plans Masterplan Demolition Plan – L2 L3	01	07/07/17	FJMT
DA-2005	Demolition Plans Masterplan Demolition Plan – L4 L5	01	07/07/17	FJMT
DA-2201	Western Precinct Plans Western Precinct Learning Hub – Lower Ground 4	01	07/07/17	FJMT
DA-2202	Western Precinct Learning Hub – Lower Ground 3	01	07/07/17	FJMT
DA-2203	Western Precinct Learning Hub – Lower Ground 2	01	07/07/17	FJMT
DA-2204	Western Precinct Learning Hub – Lower Ground 1	01	07/07/17	FJMT
DA-2205	Western Precinct Learning Hub – Ground Level	01	07/07/17	FJMT
DA-2206	Western Precinct Learning Hub – Level 1	01	07/07/17	FJMT
DA-2207	Western Precinct Learning Hub – Roof – Outdoor Terrace	01	07/07/17	FJMT
DA-2208	Western Precinct Plans Roof	01	07/07/17	FJMT
DA-3002	Elevations Elevations 1 – Western Precinct Learning Hub	01	07/07/17	FJMT
DA-3003	Elevations Elevations 2 – Western Precinct Learning Hub	01	07/07/17	FJMT
DA-4001	Sections Section 1 – Western Precinct Learning Hub	01	07/07/17	FJMT
DA-4002	Sections Section 2 – Western Precinct Learning Hub	01	07/07/17	FJMT

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Appendix B – Construction Details

TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS				
Building element		**Class of building - FRL:** (in minutes) Structural adequacy/Integrity/Insulation		
	2, 3 or 4 part	**5, 9 or 7a**	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any fire-source feature to which it is exposed is-				
For loadbearing parts-				
less than 1.5m	90/90/90	**120/120/120**	180/180/180	240/240/240
1.5 to less than 3 m	90/60/60	**120/ 90/ 90**	180/180/120	240/240/180
3 or more	90/60/30	**120/ 60/ 30**	180/120/90	240/180/ 90
For non-loadbearing parts-				
less than 1.5 m	-/90/90	**- /120/120**	- /180/180	- /240/240
1.5 to less than 3 m	-/60/60	**- / 90/ 90**	- /180/120	- /240/180
3 m or more	- / - / -	**- / - / -**	- / - / -	- / - / -
EXTERNAL COLUMN not incorporated in an external wall, where the distance from any fire-source feature to which it is exposed is-				
less than 3 m	90/ - / -	**120/ - / -**	180/ - / -	240/ - / -
3 m or more	- / - / -	**- / - / -**	- / - / -	- / - / -
COMMON WALLS and FIRE WALLS	90/90/90	**120/120/120**	180/180/180	240/240/240
INTERNAL WALLS-				
Fire-resisting lift and stair shafts-				
Loadbearing	90/90/90	**120/120/120**	180/120/120	240/120/120
Non-loadbearing	- /90/90	**- /120/120**	- /120/120	- /120/120
Bounding public corridors, public lobbies and the like-				
Loadbearing	90/90/90	**120/ - / -**	180/ - / -	240/ - / -
Non-loadbearing	- /60/60	**- / - / -**	- / - / -	- / - / -
Between or bounding sole-occupancy units-				
Loadbearing	90/90/90	**120/ - / -**	180/ - / -	240/ - / -
Non-loadbearing	- /60/60	**- / - / -**	- / - / -	- / - / -
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of Combustion-				
Loadbearing	90/90/90	120/ 90/ 90	180/120/120	240/120/120
Non-loadbearing	- /90/90	- / 90/ 90	- /120/120	- /120/120
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS	90/ - / -	**120/ - / -**	180/ - / -	240/ - / -
FLOORS	90/90/90	**120/120/120**	180/180/180	240/240/240
ROOFS	90/60/30	**120/ 60/ 30**	180/60/30	240/ 90/ 60

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Loreto Kirribilli – Connectors to Northern, Eastern and Southern Precinct

PRELIMINARY BCA ASSESSMENT

REPORT 2016/1744 R1.2

17 July 2017

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Report Revision History

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Job Number/Ref:	2016/1744	Revision Number:	1.2	Issue Date:	17 July 2017

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1. INTRODUCTION

This report presents the findings of an assessment undertaken of the proposed design of the Connectors at Loreto Kirribilli against the Deemed-to-Satisfy (DtS) provisions of Building Code of Australia (BCA) 2016.

It has been prepared by building regulations consultants and certifiers Steve Watson and Partners for Artazan Property Group.

2. PURPOSE

The assessment is undertaken for the purpose of, and to the extent necessary for, submission with the State Significant Development Application to The Department of Planning and Environment under Part 4 of the Environmental Planning and Assessment Act.

3. LIMITATIONS

The following limitations apply to the assessment:

- Generally the assessment does not incorporate the detailed requirements of the Australian Standards.

4. DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed development involves the following:

Northern Precinct Connectors:
Construction of a new stairway and lift to provide improved accessibility and circulation throughout the Science building and Centenary Hall

Eastern Precinct:
Construction of a new ramp to provide improved access between the Science and Mary Ward Building

Southern Precinct:
Refurbishment of the existing link connection between the Chapel and J Block Building including installation of a new lift for improved access.

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5. SUMMARY OF CONSTRUCTION DETERMINATION

Northern Precinct Connector

The type of construction required for the proposed design is summarised in the table below.

Classification	9b
Number of storeys contained	5
Rise in storeys	5
Type of construction required	A
Effective height	L4 slab RL = 27.00 Carpark RL = 13.470 Effective Height = 13.53m

Southern Precinct Connector

The type of construction required for the proposed design is summarised in the table below.

Classification	9b
Number of storeys contained	4
Rise in storeys	4
Type of construction required	A
Effective height	<25m

Eastern Precinct Connector (Science Building)

The type of construction required for the proposed design is summarised in the table below.

Classification	9b
Number of storeys contained	3
Rise in storeys	3
Type of construction required	A
Effective height	16.42m (39.97 -23.55)

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6. BCA ASSESSMENT

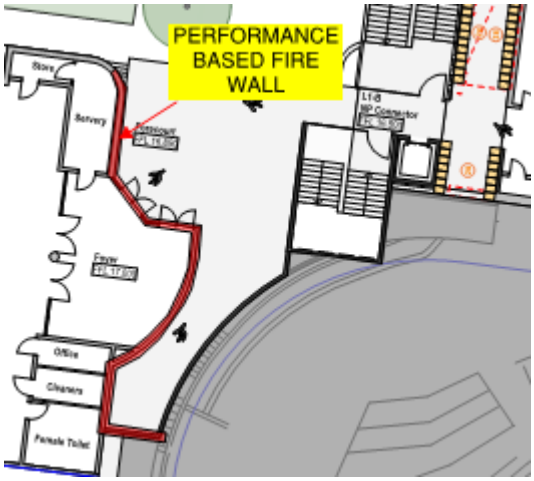
A preliminary review of the proposed design that will form part of the State Significant Development Application to The Department of Planning and Environment has been undertaken. We confirm the design as shown on the drawings referenced in Appendix A is capable of achieving compliance with the BCA subject to further detail at the design development stage. Some aspects of the design are proposed to be addressed by way of a fire engineered Alternative Solution to meet the relevant Performance Requirements of the BCA. These aspects include but are not limited to the items specified on page 9-10, which will need to be addressed by an Accredited C10 Fire Engineer and verified by Steve Watson and Partners prior to the issue of a Construction Certificate.

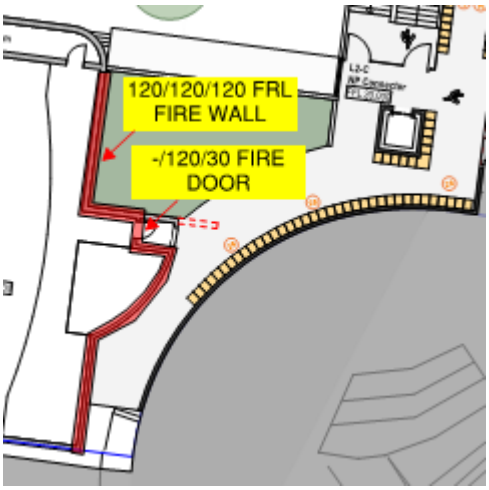
NORTHERN PRECINCT CONNECTOR

A preliminary review of the proposed design that will form part of the State Significant Development Application to The Department of Planning and Environment has been undertaken. We confirm the design as shown on the drawings referenced in Appendix A is capable of achieving compliance with the BCA subject to further detail at the design development stage. Some aspects of the design are proposed to be addressed by way of a fire engineered Alternative Solution to meet the relevant Performance Requirements of the BCA. These aspects include but are not limited to the items specified on page 9-10, which will need to be addressed by an Accredited C10 Fire Engineer and verified by Steve Watson and Partners prior to the issue of a Construction Certificate.

Section C – Fire Resistance:

- The building is required to be erected to Type A fire resisting construction requirements. This generally requires that the structural elements such as floors, columns, beams, loadbearing walls achieve a 120/120/120 FRL.
- The BCA reports completed for the centenary hall identifies that the building was built to type C fire resisting construction whilst the Science block building Type B fire resisting construction. As a result, the centenary Hall and Science building are proposed to be fire separated on a performance basis via a fire engineered solution.





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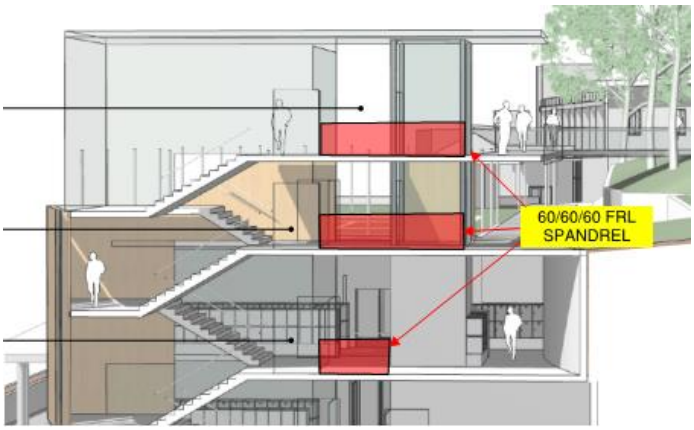
- The fire walls separating the compartments will not fully comply with Clause C2.7 due to the glazing and glass doors opening into the foyer of the Centenary Hall. A fire engineered solution is proposed to be investigated for a performance based fire wall for the separation of the buildings. It is proposed that the fire wall design separates the two buildings so that they may be **treated as separated buildings for the purposes of Section C, D and E of the BCA.**
- The new external walls are required to be provided with spandrels complying with Clause C2.6 to stop vertical fire spread. Spandrels are not required to external walls only serving the lobby.



Alternaveitly a fire engineered solution can be investigated to eliminate spandrels given the low fuel load in this space.

- A lift connecting more than 2 storeys is required to be in a fire resisting shaft achieving an FRL of -/120/120. Fire separation between the class 7a carpark and the class 9b levels above is also required to be achieved through the lift shaft. Should a glass lift be proposed, a fire engineered solution will be required to be investigated to determine if it can be achieved on a performance basis. The fire engineering investigation would need to take into account the fact that the glass lift landing door would breach the separation between the class 7a carpark and class 9b portion above. If compliance cannot be achieved on a performance level, a fire rated lift shaft and lift landing doors will be required in accordance with Clause C2.10 of the BCA
- The roof is required to be non combustible and be provided with a ceiling immediately below the roof that has a resistance to the incipient spread of fire of not less than 60 minutes. A fire engineered solution can be investigated to remove the requirement to have a 60 minute incipient spread ceiling below the roof serving the stairway/lobby.

Section D – Access and Egress:

- Access to 2 exits is provided from each area in accordance with Clause D1.2
- The stair from the basement is not required to be fire isolated as it only connects two storeys. However, the stair should remain fire separated with 2hr fire rated construction and a self closing -/120/30 fire door to maintained the fire separation between the class 7a basement and class 9b storey above.
- BCA Clause D1.3 permits a stairway to connect only 2 storeys before it is required to be fire isolated. The new stairway connects 4 storeys is proposed to connect 4 storeys however it is not proposed to be fire isolated. A fire engineered solution is proposed to be investigated to permit the stair to be non fire isolated given that the upper 2 storeys are only contain a lobby space with minimal floor area.

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- An additional doorway should be provided at the discharge of the stairway opening directly to the outside in order to comply with Clause D1.7.
- The travel distances within all areas of the science lab building complies with Clause D1.4, D1.5 and D1.9 of the BCA.
- Travel distances in the carpark still comply with Clause D1.4 and D1.5 of the BCA via the central stairway and 2 other exits opening onto the street adjacent the carpark entries
- The discharge of the DTS fire isolated stairway currently does not comply with Clause D1.7 as it discharges within the building. A door should be provided so the exit discharges directly to open space
- The new stairway is required to fully comply with AS1428.1 – 2009 (handrails, tactiles, colour contrasting nosings etc)

Section E1 - Fire Services:

- Fire hydrants are to be relocated and installed to suit the new works in accordance with BCA Clause E1.3 and AS2419.1.
- Fire hose reels are to be relocated to suit the new layout in accordance with Clause E1.4 and AS2441.

Section E2 – Smoke Hazard Management:

- Smoke detectors are to be installed throughout the new area in accordance with BCA Clause 4 of Specification E2.2a and AS1670.1 – 2004
- Building Occupant Warning speakers are to be provided throughout the new areas in accordance with BCA Clause 6 of Specification E2.2a and AS1670.1 – 2004
- Air handlings systems must automatically shut down upon activation of smoke detection or sprinkler system
- Smoke exhaust is not required to the classrooms as it receives a concession under Table E2.2 (Other Assembly Buildings).
- The centenary hall is not provided with smoke exhaust or smoke and heat vents as the compartment is less than 2000m2. The proposed works will involve a fire wall that will separate the centenary hall from the Science building and as a result the compartment sizes will remain under 2000m2.

Section E3 – Lifts:

- The lift must be capable of accommodating a stretcher facility and therefore must be a minimum 2000mm long by 1400mm wide in accordance with Clause E3.2 and Table E3.6.
- The proposed lift must comply with the requirements of Table E3.6 and AS1735.12 – 1999.

Section E4 – Visibility in an Emergency, Exit Signs and Warning Systems:

- Emergency lighting and exit signs must be provided in accordance with AS2293.1 – 2005

Section F – Health and Amenity:

- No increase in staff or students numbers occurs as a result of the works and therefore no additional sanitary facilities are required as part of this development.

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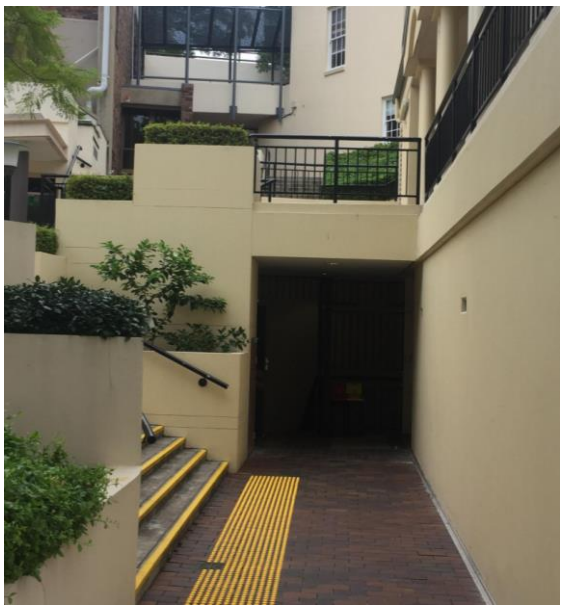
Section J – Energy Efficiency:

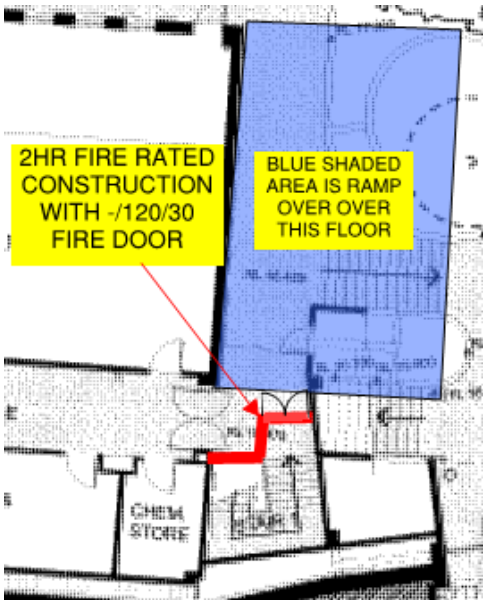
- The new building fabric must comply with BCA Part J 1
- The new building glazing must comply with BCA Part J2. Glazing calculation from ABCB website to be provided as part of the CC documentation
- Building sealing is to comply with BCA Part J3
- Any new Air conditioning and ventilation systems must comply with BCA Part J5
- Any new artificial lighting and power must comply with BCA Part J6

EASTERN PRECINCT CONNECTOR

Section C:

- The construction of the ramp directly above the discharge of the exit stairway from the carpark has significantly enclosed the space picture below. This results in the class 7a carpark having a direct connection to the class 9b area above. As a result, the top of the stairway is required to be provided with a -/120/30 fire door to ensure that separation of the classifications has been maintained.





Section D:

- Travel distances from the Science Building and carpark area still comply with Clause D1.4 and D1.5 even with the extended distance to open space as a result of the ramp
- The new ramp must fully comply with AS1428.1 – 2009 including handrails, tactiles, landings widths and kerbs.

Section E:

- The external hydrant located in the direct vicinity of the new ramp would need to be relocated to be a minimum 10m the building. Coverage to be assessed prior to the issue of the CC
- An exit sign must be provided above the new fire door from within the stairway from the basement carpark in accordance with BCA Part E4 and AS2293.1 – 2005

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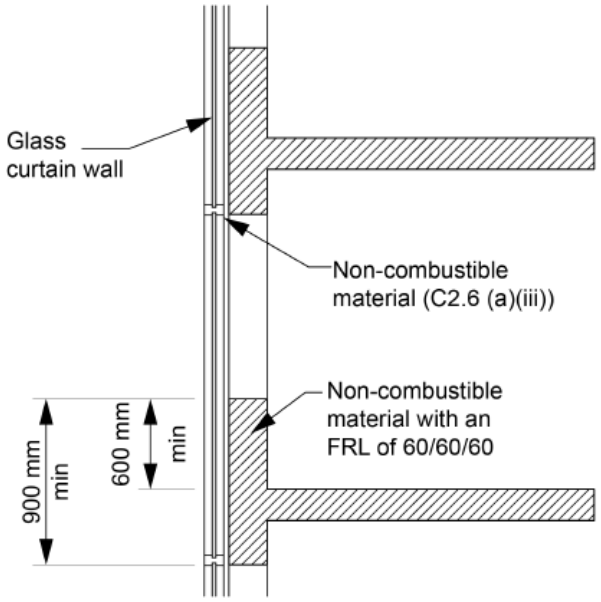
SOUTHERN PRECINCT CONNECTOR - ASSESSMENT

Section C:

- The J-Block, Chapel and Elamang buildings are considered to be united buildings as they are connected by a series of bridge links and other openings.
- Any new structure is generally required to achieve a 2hr FRL i.e. floors, columns, beams and other loadbearing elements
- As the building is required to be erected to Type A construction, vertical separation of openings in external walls is required with spandrels. The spandrel must be a minimum 900mm in height and extend no less than 600mm above the upper surface of the floor. Extract from the guide to the BCA detailing compliant spandrels shown below.



Section

Spandrels will need to be provided to the external walls of the new connector. They will also be required to the new balcony pods. Additional details of the proposed spandrels are to be provided prior to the issue of the CC

- A lift connecting more than 2 storeys is required to be in a fire resisting shaft achieving an FRL of -/120/120. The proposed lift connects/passes by 5 storeys and therefore should be in a fire resisting shaft in accordance with Clause C2.10. Should a glass lift be proposed, a fire engineered solution will be required to be investigated to determine if it can be achieved on a performance basis.
- Note, even with a glass lift being installed combining each of the floors, the compartment size of the whole united building is 7587m2 and therefore still complies with Table C2.2.
- The roof is required to be non combustible and be provided with a ceiling immediately below the roof that has a resistance to the incipient spread of fire of not less than 60 minutes. A fire engineered solution can be investigated to remove the requirement to have a 60 minute incipient spread ceiling below the roof.

Section D – Access and Egress:

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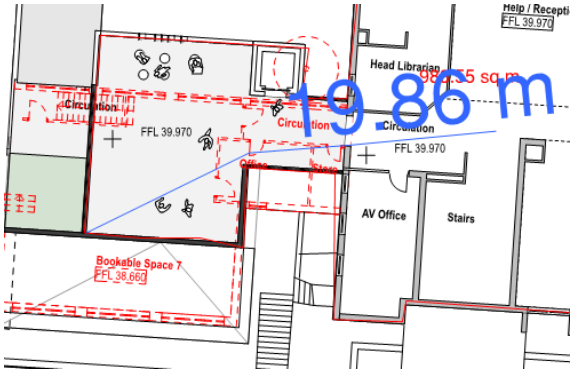
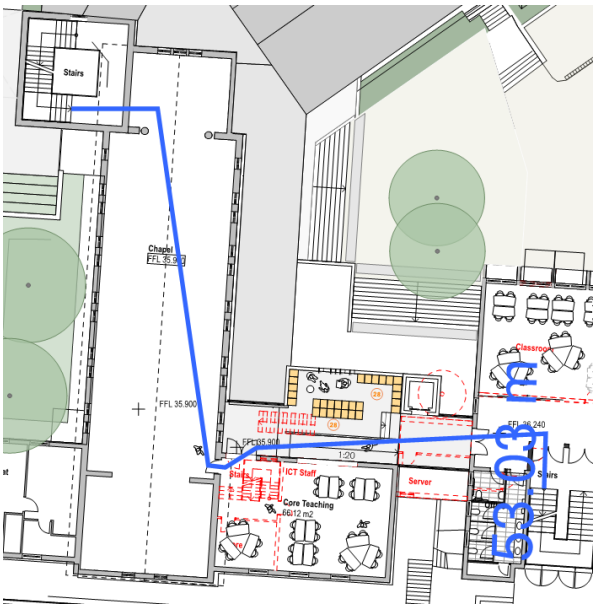
- Access to 2 exits is provided from each area in accordance with Clause D1.2.
- The existing stairway within the J Block connects 4 storeys and is not fire isolated and therefore does not comply with BCA Clause D1.3. However, we note that this is an existing non compliance which is not being further exacerbated by the proposed works. As a result, a CC can still be issued for the works as there has been no reduction in fire safety in accordance with the EP&A Regulation.
- The travel distances throughout the new areas comply with Clause D1.4 and D1.5 of the BCA. The travel distances are as follows:
    - Level I – 20m to a point of choice is available from the new area to the existing stairway within the J block.



    - Level H – Travel distances within the chapel and new link area comply. A 20m point of choice can be obtained and the distance between alternative exits still complies via the stair to the rear of the Chapel. Confirmer to be provided that there is a door leading into the Chapel stairway.



    - Level G, F and E – The travel distances on each of these floors still complies

- All new and modified stairways is required to fully comply with AS1428.1 – 2009 (handrails, tactiles, colour contrasting nosings etc)
- The new ramp must fully comply with AS1428.1 – 2009 including gradients, handrails and tactiles etc

Section E1 - Fire Services:

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- Fire hydrants are to be relocated and installed to suit the new works in accordance with BCA Clause E1.3 and AS2419.1.
- Fire hose reels are to be relocated to suit the new layout in accordance with Clause E1.4 and AS2441.

Section E2 – Smoke Hazard Management:

- Smoke detectors are to be installed throughout the new area in accordance with BCA Clause 4 of Specification E2.2a and AS1670.1 – 2004
- Building Occupant Warning speakers are to be provided throughout the new areas in accordance with BCA Clause 6 of Specification E2.2a and AS1670.1 – 2004
- Air handlings systems must automatically shut down upon activation of smoke detection or sprinkler system
- Smoke exhaust is not required as schools receive a concession under Table E2.2 (Other Assembly Buildings).

Section E3 – Lifts:

- The lift must be capable of accommodating a stretcher facility and therefore must be a minimum 2000mm long by 1400mm wide in accordance with Clause E3.2 and Table E3.6.
- The proposed lift must comply with the requirements of Table E3.6 and AS1735.12 – 1999.

Section E4 – Visibility in an Emergency, Exit Signs and Warning Systems:

- Emergency lighting and exit signs must be provided in accordance with AS2293.1 – 2005

Section F – Health and Amenity:

- No increase in staff or students numbers occurs as a result of the works and therefore no additional sanitary facilities are required as part of this development.

Section J – Energy Efficiency:

- The new building fabric must comply with BCA Part J 1
- The new building glazing must comply with BCA Part J2. Glazing calculation from ABCB website to be provided as part of the CC documentation
- Building sealing is to comply with BCA Part J3
- Any new Air conditioning and ventilation systems must comply with BCA Part J5
- Any new artificial lighting and power must comply with BCA Part J6

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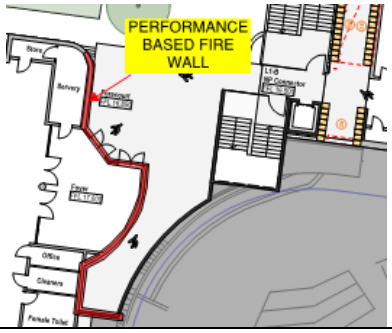
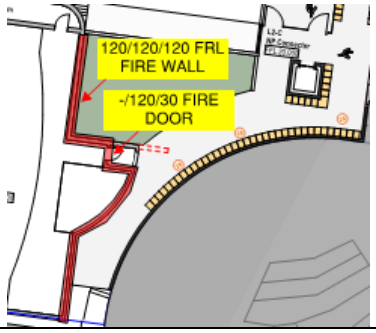
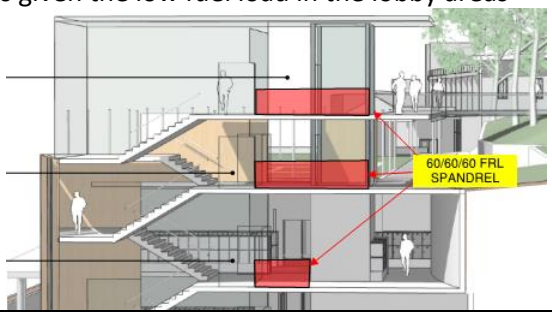
7. SUMMARY OF FIRE ENGINEERED SOLUTIONS REQUIRED:

The following issues are proposed to be investigated to be addressed on a performance basis by an Accredited C10 Fire Engineer:

Northern Precinct Connector:

Clause	Non Compliance	Performance Requirement
C2.7 and Spec C1.1	The Centenary Hall and Science building are proposed to be fire separated on a performance basis via a fire engineered solution. The performance based fire wall is proposed to separate the buildings so that they may be treated separately for the purposes of Section C, D and E of the BCA  	
C2.6	A fire engineered solution can be investigated to eliminate the need for spandrels given the low fuel load in the lobby areas 	
C2.10	Should a glass lift be proposed, a fire engineered solution will be required to be investigated to permit the lift to connect 5 storeys without be in a fire resisting shaft. The fire engineering investigation would need to take into account the fact that the glass lift landing door would breach the separation between the class 7a carpark and class 9b portion above. If compliance cannot be achieved on a performance level, a fire rated lift shaft and lift landing doors will be required in accordance with Clause C2.10 of the BCA	
Spec C1.1	The roof is required to be non combustible and be provided with a ceiling immediately below the roof that has a resistance to the incipient spread of fire of not less than 60 minutes. A fire engineered solution can be investigated to remove the requirement to have a 60 minute incipient spread ceiling below the roof serving the stairway/lobby.	
D1.3	BCA Clause D1.3 permits a stairway to connect only 2 storeys before it is required to be fire isolated. The new stairway connects 4 storeys is proposed to connect 4 storeys however it is not proposed to be fire isolated. A fire engineered solution is proposed to be investigated to permit the stair to be non fire isolated given that the upper 2 storeys are only contain a lobby space with minimal floor area.	

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Southern Precinct Connector:

Clause	Non Compliance	Performance Requirement
C2.10	A lift connecting more than 2 storeys is required to be in a fire resisting shaft achieving an FRL of -/120/120. The proposed lift connects/passes by 5 storeys and therefore should be in a fire resisting shaft in accordance with Clause C2.10. Should a glass lift be proposed, a fire engineered solution will be required to be investigated to determine if it can be achieved on a performance basis. If compliance cannot be achieved on a performance level, a fire rated lift shaft and lift landing doors will be required in accordance with Clause C2.10 of the BCA	
Spec C1.1	The roof is required to be non combustible and be provided with a ceiling immediately below the roof that has a resistance to the incipient spread of fire of not less than 60 minutes. A fire engineered solution can be investigated to remove the requirement to have a 60 minute incipient spread ceiling below the roof serving the stairway/lobby.	

Conclusion

This statement has been prepared to accompany the State Significant Development Application to The Department of Planning and Environment following a preliminary assessment of the proposed design. The preliminary assessment has found the design is capable of achieving compliance with the BCA subject to further detail at the design development stage. The assessment has also identified a number of non-compliances which are proposed to be addressed by Fire Engineered Alternative Solutions. Notwithstanding, the development adequately satisfies the intent of being able to comply with the requirements of the BCA for the purpose of DA submission.

If you have any queries, please do not hesitate to contact me.

Kind regards

Steven Vukman
Building Regulations Consultant
Steve Watson & Partners Pty Ltd

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Appendix A – Referenced Documentation

The following documentation was used in the preparation of this report:

Drawing No.	Title	Issue	Date	Drawn By
DA-2001	Demolition Plans Masterplan Demolition Plan – LG4 LG3	01	07/07/17	FJMT
DA-2002	Demolition Plans Masterplan Demolition Plan – LG2 LG 1	01	07/07/17	FJMT
DA-2003	Demolition Plans Masterplan Demolition Plan – G L1	01	07/07/17	FJMT
DA-2004	Demolition Plans Masterplan Demolition Plan – L2 L3	01	07/07/17	FJMT
DA-2005	Demolition Plans Masterplan Demolition Plan – L4 L5	01	07/07/17	FJMT
DA-2301	Norther Precinct Plans Northern Precinct – Lower Ground 4	01	07/07/17	FJMT
DA-2302	Norther Precinct Plans Northern Precinct – Lower Ground 3	01	07/07/17	FJMT
DA-2303	Norther Precinct Plans Northern Precinct – Lower Ground 2	01	07/07/17	FJMT
DA-2304	Norther Precinct Plans Northern Precinct – Lower Ground 1	01	07/07/17	FJMT
DA-2305	Norther Precinct Plans Northern Precinct – Ground Level	01	07/07/17	FJMT
DA-2306	Norther Precinct Plans Northern Precinct – Level 1 (Roof)	01	07/07/17	FJMT
DA-2401	Eastern Precinct Plans Eastern Precinct – Lower Ground 2 – Stage 1	01	07/07/17	FJMT
DA-2501	Southern Precinct Plans Southern Precinct – Lower Ground 1	01	07/07/17	FJMT
DA-2502	Southern Precinct Plans Southern Precinct – Ground Level	01	07/07/17	FJMT

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Drawing No.	Title	Issue	Date	Drawn By
DA-2503	Southern Precinct Plans Southern Precinct Level 1	01	07/07/17	FJMT
DA-2504	Southern Precinct Plans Southern Precinct Level 2	01	07/07/17	FJMT
DA-2505	Southern Precinct Plans Southern Precinct Level 3	01	07/07/17	FJMT
DA-2506	Southern Precinct Plans Southern Precinct Level 4	01	07/07/17	FJMT
DA-2507	Southern Precinct Plans Southern Precinct Level 5	01	07/07/17	FJMT
DA-2508	Southern Precinct Plans Southern Precinct Roof	01	07/07/17	FJMT

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Appendix B – Construction Details

TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS				
Building element		**Class of building - FRL:** (in minutes) Structural adequacy/Integrity/Insulation		
	2, 3 or 4 part	**5, 9 or 7a**	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any fire-source feature to which it is exposed is-				
For loadbearing parts-				
less than 1.5m	90/90/90	**120/120/120**	180/180/180	240/240/240
1.5 to less than 3 m	90/60/60	**120/ 90/ 90**	180/180/120	240/240/180
3 or more	90/60/30	**120/ 60/ 30**	180/120/90	240/180/ 90
For non-loadbearing parts-				
less than 1.5 m	-/90/90	**- /120/120**	- /180/180	- /240/240
1.5 to less than 3 m	-/60/60	**- / 90/ 90**	- /180/120	- /240/180
3 m or more	- / - / -	**- / - / -**	- / - / -	- / - / -
EXTERNAL COLUMN not incorporated in an external wall, where the distance from any fire-source feature to which it is exposed is-				
less than 3 m	90/ - / -	**120/ - / -**	180/ - / -	240/ - / -
3 m or more	- / - / -	**- / - / -**	- / - / -	- / - / -
COMMON WALLS and FIRE WALLS	90/90/90	**120/120/120**	180/180/180	240/240/240
INTERNAL WALLS-				
Fire-resisting lift and stair shafts-				
Loadbearing	90/90/90	**120/120/120**	180/120/120	240/120/120
Non-loadbearing	- /90/90	**- /120/120**	- /120/120	- /120/120
Bounding public corridors, public lobbies and the like-				
Loadbearing	90/90/90	**120/ - / -**	180/ - / -	240/ - / -
Non-loadbearing	- /60/60	**- / - / -**	- / - / -	- / - / -
Between or bounding sole-occupancy units-				
Loadbearing	90/90/90	**120/ - / -**	180/ - / -	240/ - / -
Non-loadbearing	- /60/60	**- / - / -**	- / - / -	- / - / -
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of Combustion-				
Loadbearing	90/90/90	120/ 90/ 90	180/120/120	240/120/120
Non-loadbearing	- /90/90	- / 90/ 90	- /120/120	- /120/120
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS	90/ - / -	**120/ - / -**	180/ - / -	240/ - / -
FLOORS	90/90/90	**120/120/120**	180/180/180	240/240/240
ROOFS	90/60/30	**120/ 60/ 30**	180/60/30	240/ 90/ 60

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