BLACKETT MAGUIRE+ GOLDSMITH

20 June 2016

University of Sydney
C/- Lend Lease
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Darlington NSW 2008

Attention: Ryan Thomas
Email: ryan.thomas@lendlease.com

Dear Ryan,

RE: UNIVERSITY OF SYDNEY – PROPOSED FASS BUILDING AND ALTERNATION TO RD WATT BUILDING DEVELOPMENT APPLICATION TO COUNCIL BUILDING CODE OF AUSTRALIA (BCA) CAPABILITY STATEMENT

Blackett Maguire + Goldsmith Pty Ltd have been commissioned to carry out an assessment of the proposed development against the requirements of the National Construction Code Series (Volume 1) - Building Code of Australia (BCA) 2016.

We have also undertaken a high-level assessment of the documentation against the National Construction Code Series (Volume 1) - Building Code of Australia (BCA) 2016.

It is understood that the proposed development will be subject to a Development Consent application and this BCA Capability Statement will form part of the submission to Council for their consideration as part of the determination.

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

+ National Construction Code Series (Volume 1) Building Code of Australia 2016 (BCA)
+ Guide to the Building Code of Australia 2016 (BCA Guide)
+ Environmental Planning and Assessment Act 1979 (EP&A)
+ Environmental Planning and Assessment Regulation 2000 (EP&AR)
+ Architectural plans prepared by Architectus:

Drawing No.	Revision	Date
DA0000	C	20/06/2016
DA0001	F	20/06/2016
DA0002	E	20/06/2016
DA0003	F	20/06/2016
DA1010	G	20/06/2016
DA1020	G	20/06/2016
DA1030	G	20/06/2016
DA1040	G	20/06/2016
DA1050	G	20/06/2016
DA1060	G	20/06/2016
DA1070	F	20/06/2016
DA2000	F	20/06/2016
DA2020	F	20/06/2016
DA2500	F	20/06/2016

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A. BUILDING DESCRIPTION:

The proposed development involves the construction of a six-storey university building for the purpose of teaching on the lower levels, and academic offices and support on the upper levels. This building will be known as the Faculty of Arts and Social Sciences (FASS).

There is also proposed alterations and fitout associated with the RD Watt building which will be utilised by the same university schools in the FASS building.

B. STATEMENT OBJECTIVES:

The objectives of this statement are to:

- Confirm that a preliminary review of the DA architectural documentation has been reviewed by an appropriately qualified Building Surveyor and Accredited Certifier.
- Confirm that the proposed new building works can readily achieve compliance with the BCA pursuant to clause 145 of the *Environmental Planning & Assessment Regulation 2000*.

C. LIMITATIONS & EXCLUSIONS

The limitations and exclusions of this report are as follows:

- The following assessment is based upon a review of the architectural documentation.
- No assessment has been undertaken with respect to the Disability Discrimination Act (DDA) 1992. The building owner should be satisfied that their obligations under the DDA have been addressed.
- The Report does not address matters in relation to the following:
    i. Local Government Act and Regulations.
    ii. NSW Public Health Act 1991 and Regulations.
    iii. Occupational Health and Safety (OH&S) Act and Regulations.
    iv. Work Cover Authority requirements.
    v. Water, drainage, gas, telecommunications and electricity supply authority requirements.
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D. BUILDING CODE OF AUSTRALIA 2016 COMPLIANCE:

Arising from our preliminary assessment of the proposed development against the Deemed-to-Satisfy provisions and Performance Requirements of National Construction Code Series – Volume 1 – Building code of Australia 2016, the following key compliance matters are noted.

The principal building characteristics as defined by the BCA are as follows:

	FASS	RD Watt
BCA CLASSIFICATION:	Class 5 (Offices) Class 9b (Tertiary School)	Class 5 (Offices) Class 7b (Bike Storage) Class 9b (Tertiary School)
RISE IN STOREYS:	Six (6)	Four (4)
STOREYS CONTAINED:	Six (6)	Four (4)
TYPE OF CONSTRUCTION:	Type A Construction	Type A Construction
EFFECTIVE HEIGHT:	Less than 25m	Less than 25m
MAX. FIRE COMPARTMENT SIZE:	8,000m^2 & 48,000m^3	8,000m^2 & 48,000m^3
CLIMATE ZONE:	Zone 5	Zone 5

Terminology

Alternative Solution
A Building Solution which complies with the Performance Requirements other than by reason of satisfying the DtS Provisions.

Building Code of Australia (BCA)
Document published on behalf of the Australian Building Codes Board. The BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia and is adopted in New South Wales (NSW) under the provisions of the EPA Act and Regulation. Building regulatory legislation stipulates that compliance with the BCA Performance Requirements must be attained and hence this reveals BCA's performance based format.

Construction Certificate
Building Approval issued by the Certifying Authority pursuant to Part 4A of the EP&A Act 1979.

Construction Type
The construction type is a measure of a buildings ability to resist a fire. The minimum type of fire-resisting construction of a building must be that specified in Table C1.1 and Specification C1.1, except as allowed for—

(i) certain Class 2, 3 or 9c buildings in C1.5; and

(ii) a Class 4 part of a building located on the top storey in C1.3(b); and

(iii) open spectator stands and indoor sports stadiums in C1.7.

Note: Type A construction is the most fire-resistant and Type C the least fire-resistant of the types of construction.

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

Deemed to Satisfy Provisions (DtS)
Provisions which are deemed to satisfy the Performance Requirements.

Exit
An exit means –

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

Effective Height

The vertical distance between the floor of the lowest storey included in the calculation of rise in storeys and the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units).

Fire Resistance Level (FRL)
The grading periods in minutes for the following criteria-

(a) structural adequacy; and

(b) integrity; and

(c) insulation,

and expressed in that order.

Fire Source Feature (FSF)
The far boundary of a road which adjoins the allotment; or a side or rear boundary of the allotment; or an external wall of another building on the allotment which is not a Class 10 building.

National Construction Code Series (NCC)
The NCC was introduced 01 May 2011 by the Council of Australian Governments. The BCA Volume One (Class 2 to 9 Buildings) is now referenced as the National Construction Code Series Volume One — BCA.

Occupation Certificate
Building Occupation Approval issued by the Principal Certifying Authority pursuant to Part 4A of the EPA Act 1979.

Open Space
A space on the allotment, or a roof or other part of the building suitably protected from fire, open to the sky and connected directly with a public road.

Performance Requirements of the BCA
A Building Solution will comply with the BCA if it satisfies the Performance Requirements. A Performance requirement states the level of performance that a Building Solution must meet.

Compliance with the Performance Requirements can only be achieved by-

(a) complying with the DtS Provisions; or

(b) formulating an Alternative Solution which-

(i) complies with the Performance Requirements; or

(ii) is shown to be at least equivalent to the DtS Provisions; or

(c) a combination of (a) and (b).

E. SUMMARY OF KEY COMPLIANCE ISSUES

The following comprises a summary of the key compliance issues that will need to be addressed prior to issue of the Crown/Construction Certificate:

1) Clause C1.1 – Type of Construction Required: The minimum type of fire-resisting construction of a building must be that specified in Table 3 of Specification C1.1 for Type A Construction. The building will comply with the following FRLs:-

Table 3 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, 7a or 9	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any fire-source feature to which it is exposed is—				
For loadbearing parts—				
less than 1.5 m	90/ 90/ 90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/ 60/ 60	120/ 90/ 90	180/180/120	240/240/180
3 m 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

2) Clause C2.2 – General Floor Area and Volume Limitations: The maximum fire compartment size is proposed to be less than the maximum of 8,000m^2 and 48,000m^3.

3) Clause C3.2 – Protection of Openings in External Walls: All openings in external walls are proposed to be greater than 3m of a side or rear property boundary. Certain openings between the FASS and RD Watt building will be within 6m of each other and will be subject to a fire engineered performance solution.

4) Clause C3.15 – Openings for service installations: Where service installations penetrate the walls or floors required to have an FRL with respect to integrity and insulation they are to be protected by fire seals having an FRL of the building element concerned. Fire seals are required to comply with Specification C3.15.

5) Clause D1.2 – Number of Exits Required: Two exits are required from all storeys of the FASS building.

6) Clause D1.3 – When fire-isolated stairways are required: All stairways in the building are required to be fire-isolated (or external stairways in lieu of fire-isolated stairways). The discharge of stairway 1 is within the building and will be subject to a fire engineered performance solution.

   The RD Watt stairway is not proposed to be fire-isolated and will be subject to a fire engineered performance solution.

7) Clause D1.4 – Exit Travel Distance: Exit travel distances within the building are required to be not more than 20m to a single exit, or a point of choice of two exits. Where there is a point of choice of two exits, all points on the floor are required to be within 40m to one of the exits. The level 6 roof area will have an excessive travel distance to an exit which will be addressed by a fire engineered alternative solution.

   Travel distances within RD Watt will exceed 20m to a single exit and will be subject to a fire engineered performance solution.

8) Clause D1.5 – Distance between alternative exits: The distance between alternative exits is up to 85m throughout the building and will be subject to a fire engineered performance solution.

9) Clause D1.6 – Dimensions of paths of travel to an exit: The minimum clear height through all egress paths is required to be no less than 2m, and a minimum of 1m wide (this width dimension is measured clear of any obstructions such as handrails and joinery).

   In a required exit or path of travel to an exit there is concession for the unobstructed width of a doorway to be reduced to 850mm min in lieu of 1m, and the unobstructed height for an exit doorway can be reduced to 1,980mm min.

10) Clause D1.7 – Discharge from Fire Isolated Exits: The discharge of the fire isolated exits at ground floor will necessitate protection of openings in the external façade of the building. We understand that this will, in part, be rationalised by a fire engineered alternative solution.

    Openings within 6m of the discharge path of travel are required to be protected in accordance with BCA Clause C3.4.

11) Clause D2.7 – Installations in Exits and Paths of Travel: Electricity and communications cupboards located within a nominated egress paths within the proposed building will be required to be suitably smoke sealed and enclosed in non-combustible construction in accordance with D2.7(d).

12) Clause D2.13 – Goings and Risers: Stairways are required to have risers and goings in accordance with Table D2.14 and most have no winders in the required egress stairways.

13) Clause D2.16 – Balustrades or other barriers: Balustrades are required where the fall to the level below is more than 1m in height. The minimum height of a balustrade is 1m above the floor of the landing, walkway or the like; and 865mm above the floor of a stairway or a ramp. Balustrades must be constructed so as to not permit a sphere of 125mm diameter to pass through. No horizontal climbable elements permitted between 150-760mm above FFL.

14) Clause D2.20 – Swinging Doors: All swinging doorways in a required exit (final exit doors and fire-isolated stairway doors) are required to swing in the direction of egress. There will be smoke doors that are proposed to not swing in the direction of egress in a path of travel and will be subject to a fire engineered performance solution.

15) Part D3 – Access for People with a Disability: The extent of access required depends on the classification of the building. Buildings and parts of buildings must be accessible as set out in Table D3.1 unless exempted by Clause D3.4. The building is required to comply with AS1428.1-2009.

    The proposed compliance in relation to Part D3 and AS1428 suite of standards is demonstrated through by an accessibility report provided by Morris-Goding Accessibility Consulting.

16) Clause E1.3 – Fire Hydrants: Fire hydrants are required to serve the building and comply with AS2419.1-2005. The fire hydrant booster assembly and pumproom is to be finalised at Crown Certificate stage.

It is understood that the booster assembly will not be within site of the main entry and additional internal fire hydrants will not be within fire-isolated stairways. Both of these items will be subject to a fire engineered performance solution

17) Clause E1.4 – Fire Hose Reels: Fire hose reel coverage is required to be provided to all parts of the building and achieve compliance with AS 2441-2005. There will be a particular requirement where no fire hose reels are to pass through the numerous fire and smoke doors within the building.

18) Clause E1.5 – Sprinkler System: The whole building will be provided with a sprinkler system throughout in accordance with AS2118.1-1999 due to the atrium. The RD Watt building is provided with an existing sprinkler system that will be upgraded to the degree necessary to satisfy the requirements of the fire engineering assessment.

19) Clause E1.6 – Portable Fire Extinguishers: Portable fire extinguishers are required to serve the whole building and comply with AS2444-2001.

20) Part E2 – Smoke Hazard Management: A smoke detection system is required to be provided in accordance with Specification E2.2a.

    Stairway pressurisation and a smoke exhaust system are required to be provided in accordance with this part and AS 1668.1-2015 due to the atrium design.

21) Part E3 Lift Installations: The proposed passenger lift will be compliant with AS1428 in relation to access and facilities for people with disabilities and will also facilitate accommodate of an upright stretcher.

    The building is required to have lifts capable of being used as a stretcher facility in accordance with Clause E3.2.

22) Clause F2.3 – Facilities in residential buildings: Sanitary facilities are required to be provided in accordance with Table 2.3. A breakdown of the required sanitary facilities is provided below:

FASS							
Level 1 and 2 (students) – Population 695 (348 M/F)							
	Closet Pans		Urinals		Washbasins		Complies
	Required	Proposed	Required	Proposed	Required	Proposed	Yes/No
Male	6	8	5	6	7	9	Yes
Female	10	12	N/A	N/A	7	10	Yes
Level 3-6 (staff) – Population 374 (187 M/F)							
	Closet Pans		Urinals		Washbasins		Complies
	Required	Proposed	Required	Proposed	Required	Proposed	Yes/No
Male	10	13	7	7	7	12	Yes
Female	14	14	N/A	N/A	7	13	Yes

RD WATT							
Level 1 (students)– Population 120 (60 M/F) Level 2-5 (staff) – Population 150 (75 M/F)							
	Closet Pans		Urinals		Washbasins		Complies
	Required	Proposed	Required	Proposed	Required	Proposed	Yes/No
Male	6	7	6	TBA	6	6	TBA
Female	9	9 (TBA*)	N/A	N/A	6	7	TBA

23) Clause F2.4 – Accessible Sanitary Facilities: Accessible sanitary facilities are provided at one bank of sanitary facilities on each storey of the building.

24) Part F3 – Room Sizes: The floor to ceiling heights in the building are required to be 2.4m where the population for that part is <100 persons. Where the population of the part or corridor is >100 persons the ceiling height must be 2.7m from FFL.

25) Part F4 – Light and Ventilation: Any installations of artificial lighting system are required to comply with Clause F4.4 and AS 1680. All mechanical or air-conditioning installations must be undertaken in accordance with Clauses F4.5(b) and AS 1668.2-2012.

26) Part G3 Atrium Construction: An atrium is proposed through all six storeys of the building and will have a number of departures from the clauses within this Part of the BCA. The complete atrium design will be subject to a fire engineered performance solution.

27) Section J – Energy Efficiency: The building is subject to compliance with the Energy Efficiency Provisions of BCA 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: Hot water supply
- J8: Access for maintenance

The proposed compliance in relation to Section J is subject to a JV3 verification report prepared by Surface Design.

E.1 - Fire Engineering Strategies

In accordance with the above, BM+G verify that the proposed building design will entail a combination of compliance with the DTS provisions and Performance Requirements of the BCA, by the development and justification of Performance Based Alternative Solutions prepared by suitably Accredited Consultants.

The fire engineered performance solutions will be prepared in relation to the Crown/Construction Certificate documentation for the assessment and approval of the Certifying Authority.

E.2 - Proposed Essential Fire & Other Safety Measures:

Based on the information provided to date, the following fire safety measures are required to be incorporated into the design to satisfy the requirements of the BCA.

Statutory Fire Safety Measure	Design / Installation Standard	Proposed
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 Systems	BCA Spec. E1.5 & AS 2118.1 – 1999	✓
Building Occupant Warning System activated by the Sprinkler System	BCA Spec. E1.5, Clause 8 and Clause 3.22 of AS 1670.1 – 2015	✓
Emergency Lighting	BCA Clause E4.4 & AS 2293.1 – 2005	✓
Emergency Evacuation Plan	AS 3745-2010	✓
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, C3.4, C3.5, C3.6, 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 Seals	BCA Clause C3.15, AS 1530.4 & AS 4072.1 – 2005 and manufacturer's specification	✓

Statutory Fire Safety Measure	Design / Installation Standard	Proposed
Lightweight Construction	BCA Clause C1.8 & AS 1530.3 – 1999 and manufacturer's specification	✓
Mechanical Air Handling Systems	BCA Clause E2.2, AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012	✓
Paths of Travel	EP&A Regulation Clause 186	✓
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001	✓
Smoke Hazard Management Systems (smoke exhaust system to the atrium)	BCA Part E2 & AS/NZS 1668.1 – 2015	✓
Smoke Hazard Management Systems (stairway pressurisation system)	BCA Part E2 & AS/NZS 1668.1 – 2015	✓
Smoke Dampers	AS/NZS 1668.1 – 2015	✓
Smoke Doors	BCA Spec C3.4	✓
Sound System & Intercom Systems for Emergency Purposes (SSISEP)	BCA E4.9, Clause 5 of BCA Spec G3.8 and AS1670.4-2015	✓
Stand-by Power Systems	BCA Clause E1.3, E3.4, E4.2 & E4.5; and AS 3000 – 1991	✓
Wall-Wetting Sprinklers	BCA Clause C3.4 & AS 2118.2 – 1995	✓
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	✓

Note: The above measures may be subject to further change pending the outcomes of the final Fire Safety Engineering Review to confirm the works are permissible and do not contradict the base building Alternative Solutions.

F. CONCLUSION:

This report contains an assessment of the referenced architectural documentation for the proposed FASS building development and RD Watt building alteration located at the University of Sydney, against the Deemed-to-Satisfy provisions and Performance Requirements of the National Construction Code Series (Volume 1) Building Code of Australia 2016.

In view of the above assessment we can confirm that subject to the above measures being appropriately addressed by the project design team, compliance with the provisions of the BCA is readily achievable.

In addition, it is considered that such matters can adequately be addressed in the preparation of the Crown/Construction Certificate documentation without giving rise to any inconsistencies with the Development Approval.

Should you require further assistance or clarification please do not hesitate to contact the undersigned on 02 9211 7777 or michael@bmplusg.com.au .

Yours sincerely

Michael Potts
Building Surveyor
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A1 Accredited Certifier (NSW) – BPB Accreditation No. 2516