



**BUILDING CODE OF AUSTRALIA  
REPORT**

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**The Sandstone Buildings, Sydney  
Prepared for Patina**

**Table of Contents**

**Executive Summary ..... 3**

**1.0 Introduction ..... 5**

**2.0 Building Assessment Data ..... 7**

**3.0 Structural Provisions ..... 7**

**4.0 Fire Resistance ..... 7**

**5.0 Egress ..... 9**

**6.0 Fire Services & Equipment ..... 15**

**7.0 Ventilation and Smoke Hazard Management ..... 16**

**8.0 Lift Services ..... 16**

**9.0 Sanitary Facilities ..... 17**

**10.0 Sound Transmission & Insulation ..... 17**

**11.0 Energy Efficiency ..... 18**

**Appendix A - Design Documentation ..... 20**

**Appendix B - Draft Fire Safety Schedule ..... 23**

**Appendix C- Fire Resistance Levels ..... 24**

**Appendix D – Proposed Schedule of Performance Based Solutions ..... 26**

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## **Executive Summary**

As Accredited Certifiers, we have reviewed the architectural design documents prepared by Make Architects (refer appendix A) for compliance with the **Building Code of Australia 2016**.

The Sandstone Buildings are of State heritage significance as defined in the *State Heritage Act*. The unique nature of the development including a mix of uses, environmental design factors and the scale is expected to require the development of tailored building specific compliance solutions. This particularly relates to fire safety with a holistic performance based project solution to be developed utilising fire engineering analysis to form the most appropriate compliance solutions for the project.

It falls within the discretion of consent authority under Clause 94 of the *Environmental Planning and Assessment Regulation 2000, (EPAR)* as part of the determination of the development Application for the development, to require an upgrade of the existing work to comply with current legislative requirements. This Report has been prepared to accompany the Development Application and contains an assessment of the proposal against current legislative requirements. Also included in the report is the extent of upgrade proposed to the existing heritage components of the building.

Achieving compliance with the BCA Performance requirements is a statutory obligation of a development. Compliance with the Performance Requirements can be achieved by:-

- a) Complying with the deemed-to-satisfy provisions; or
- b) Formulating an alternative solution; or
- c) A combination of (a) and (b).

Following advice from relevant consultants, and input from the design team, the following report has been prepared to summarise the proposed approach to satisfying the regulatory requirements to achieve BCA compliance with regards to the existing heritage fabric and provide an assessment of the new building works.

This report is preliminary as further investigatory works, design documentation and consultant reports are required to verify design compliance.

The assessment of the design documentation has revealed that the building will be the subject to both prescriptive design compliance with the BCA, with performance solutions in order to demonstrate, where necessary, that the design is capable of achieving compliance with the Performance provisions of the BCA. Performance based solutions are proposed to address fire and life safety, access, acoustic and energy efficiency, and will be prepared by suitably qualified professionals.

The basis of the building fire safety strategy is the provision of appropriate active fire safety measures including automatic sprinkler protection, smoke management and, firefighting equipment in addition to passive measures including fire resisting construction, separation and provision of appropriate emergency exits. The fire engineered solution for the building will include category 2 measures, EP1.3, EP1.6, EP2.2 & EP3.2, and as such, will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

Notwithstanding the above, provisions do exist for Council or NSW Fire Brigades to undertake an inspection of the building and request an upgrade where occupant safety in relation to egress or risk of spread of fire to an adjoining property may be compromised.

**BCA ASSESSMENT REPORT**  
**The Sandstone Buildings**  
**Sydney**

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Further review of the compliance strategy is to be conducted when additional design details and professional opinions have been provided from the design team in relation to the heritage structure, fire safety, accessibility and the provision of services in the building.

The application for Construction Certificate shall be assessed under the relevant provisions of the Environmental Planning & Assessment Act 1979 (As Amended) and the Environmental Planning & Assessment Regulation 2000.

Assessed By

Andrew Brohier  
Senior Building Surveyor

## **1.0 Introduction**

The redevelopment of the Sandstone Precinct Buildings located at 23-39 Bridge Street, Sydney, will create one of the finest hotels in the world in the heart of Sydney's Central Business District. This will be achieved through the careful restoration and reinvention of the Lands Building and the Education Building.

Due to the unique nature of these buildings and the nature of the heritage significance of the building, the BCA Compliance strategy has been developed to consider this Heritage significance in consultation with the nominated Heritage Architect. The strategy for compliance will include:

1. items which will be designed to achieved compliance with the prescriptive requirements of the BCA; and
2. items which will be assessed against the current performance requirements of the BCA; and
3. existing features which will have a reduced upgrade requirement (under EPAR) due to existing constraints (e.g. heritage)

The upgrading requirements for the development include specialist input from the Heritage Architect, Structural Engineer, Fire Engineer, Access Consultant, Energy Efficiency Engineer and Acoustic Engineer, regarding matters to be upgraded to achieve the performance requirements of the BCA relating to:-

- Structure (Part B and C)
- Accessibility (Part D3)
- Provisions for Egress (Part C, Part D1 and D2)
- Energy Efficiency (Part J)
- Fire Safety Measures (Part E)
- Acoustics (Part F5)

The compliance strategy reports prepared by the respective disciplines form an integral part of the BCA compliance strategy for the building and as such, this report must be read in conjunction with these reports.

Where the heritage nature of the building is likely to preclude a full upgrade, discretionary provisions under Clause 94 of the Environmental Planning and Assessment Regulations pertaining to the requirements for upgrade are requested by the Consent Authority, specific areas will be identified in each of the specialist reports, however, the following items have been identified as:-

- Treads and risers of stairs
- Landing dimensions
- Location of door hardware and operation of door hardware
- Provision for nosings
- Tactile indicators of heritage stairs
- Handrails of heritage stairs
- Thresholds at balconies
- Damp and weather proofing of the existing structure
- Structural upgrades for earthquake loadings

Performance solutions will also be required from the access consultant to address the requirements of the access to premises standards in relation to some of the existing heritage items listed above.

## 1.1 Current Legislation

The applicable legislation governing the design of buildings is the Environmental Planning and Assessment Act 1979. The Environmental Planning and Assessment Regulation 2000 provides further framework on benchmarks for developments on the matters pertaining to fire safety and general BCA Compliance. The items below are a summary of these statutory requirements-

EPAR Clause	Matter	Comment	Compliance Proposal
94	Consent Authority may require buildings to be upgraded	In determining the development application, the consent authority may take into consideration whether it would be appropriate to require the existing building to be brought in to partial or total conformity with the BCA.	Discretionary provisions are able to be utilised in areas in which upgrading to current standards would create a significant construction issue with no compensating increase in health, safety and amenity.
143(1)	Fire Protection and Structural Adequacy	<p>The Certifying Authority must ensure that the fire protection and structural capacity will be appropriate for the new use and comply with the Category 1 fire safety provisions applicable to the new building use:</p> <p>Category 1 fire safety provisions are:</p> <ul style="list-style-type: none"> <li>▪ EP1.3 –Hydrants</li> <li>▪ EP1.4 – Sprinklers</li> <li>▪ EP1.6 – Fire control centre</li> <li>▪ EP2.1 – Smoke detection</li> <li>▪ EP2.2 – Smoke hazard management</li> <li>▪ EP3.2 – Emergency lifts</li> </ul>	<p>Given the heritage nature of the buildings, the existing structure will require certification.</p> <p>A combination of prescriptive and performance based solutions will be proposed and form a single fire safety strategy to ensure that the fire protection is appropriate to the new use.</p>
145	New Works	The Certifying Authority must ensure that the new buildings works comply with the Building Code of Australia.	<p>Where possible all new works will comply with the provisions of the Building Code of Australia.</p> <p>Existing features will remain.</p>

The version of the BCA applicable to the development, is version that in place at the time of the application to the Certifying authority for the Construction Certificate.

## 2.0 Building Assessment Data

Summary of Construction Determination:

	<b>Lands</b>	<b>Education</b>
Classification	3,6,9b	3,6,7a,9b
Number of Storeys Contained	8	14
Rise In Storeys	7	11
Type of Construction	A	A
Effective Height (m)	>25m*	>25m*

Note:

1. The proposal has been considered a united building in accordance with Part A4 of the BCA as a result of the subterranean link tunnel which connects the basements of the Lands and Education buildings.
2. Effective height will be confirmed once final reduced levels have been provided
3. Further review of any storage areas will be required as design evolves. In the event that storage areas are greater than 10% the floor area, they are considered class 7b which requires an FRL of 240/240/240

## 3.0 Structural Provisions

Any new structural works are to comply with the applicable requirements of AS/NZS 1170 and Part B of the BCA.

Existing structure to be retained will be verified by a suitably qualified structural engineer to confirm that the structural adequacy appropriate to the new use.

The structural engineer has reviewed the existing heritage structure against the current provisions of Part B1 of the BCA and the existing structure does not comply with the loading requirements of AS 1170.4:2007 Earthquake actions in Australia. The lateral stability of the structure has been assessed under earthquake loading in accordance with 'AS 3826:1998 strengthening existing buildings for earthquake' which allows for a reduction in loading for buildings constructed prior to current Australian Standards. The structure complies with this reduced loading.

Upgrading the structure to comply with the current requirements of AS 1170.4-2007 would result in the permanent and irreplaceable removal of heritage fabric.

Glazing is to comply with AS1288, and AS2047.

Prior to the issue of the Construction Certificate structural certification is required to be provided.

## 4.0 Fire Resistance

The Lands and Education buildings should be constructed generally in accordance with Table 3 of Specification C1.1 of the **Building Code of Australia 2016**.

The proposal is required to be Type **A** Construction.

It is noted that the existing structure is of heritage significance and required to be retained. As such, testing of existing materials and potential performance based alternative solutions may be required as the sandstone has not been tested in accordance with AS1530.

The proposal has been assessed on the basis of the following deemed to satisfy fire separation/compartmentation within the development;

- Basement level 3 is considered as one compartment,
- Each additional level of basement is considered an individual compartment
- Each level of retail is considered as one compartment,
- Fire separation of each sole-occupancy unit,
- Fire compartmentation of the building at each floor level,
- Bounding construction to the sole occupancy units of 90 minutes,
- Separation of the loading bay of 120 minutes,
- Separation between the function areas and retail portions of 180 minutes,
- Separation between the basement back of house levels and the retail portions of 180 minutes,
- Separation between the hotel class 3 portions and retail portions of 180 minutes,

Fire resistance levels for building structural members are as follows:

- Retail portions            180 minutes
- Loading bay portion    120 minutes
- Assembly portions      120 minutes
- Hotel portions            90 minutes

The level 3 basement is considered a single compartment due to the subterranean tunnel linking the buildings at this level.

The fire resistance levels of the existing heritage structure will be tested. In the event that the existing FRL's do not meet the requirements of Specification C1.1 a performance solution will be prepared by the accredited fire safety engineer.

#### **4.1 Protection of Openings**

The prescriptive provisions of the BCA stipulate that openings within building elements required to have an FRL shall be protected as follows:

1. Any external opening within 3m of the fire source feature protected by -/60/- fire rated construction, or externally located wall wetting sprinklers, or an alternate solution be provided to verify CP2 of the BCA.
2. Penetrations through fire rated floors to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a fire rated shaft achieving an FRL of 120 minutes (90 minutes to residential portions);
3. Any penetration through a wall or room required to have an FRL (e.g. substation, boiler room, apartment separating wall etc) is to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a shaft achieving an FRL of 120 minutes (90 minutes to residential portions) (or 120/120/120 where it is a room such as a substation);
4. Self-closing -/60/30 fire doors to the doors opening to the fire isolated stairs (note that this also includes the access doors to the condenser units on the plant platforms).

Note that where fire dampers, fire collars, etc are utilised, allowance needs to be made for access hatches to be provided within the walls / ceilings to ensure that maintenance access is provided.

*Fire source feature is defined as;*

- (a) *The far boundary of a road, river, lake or the like adjoining an allotment,*
- (b) *The side or rear boundary of the allotment,*
- (c) *The external wall of another building on the allotment which is not a class 10 building.*

Note: the proposal is not located within 6m of the far side of the surrounding roads and as such openings are not required to be protected.

#### **4.2 Public Corridors: Class 2 and 3 Buildings**

Public corridors exceeding 40m in length are to be divided into intervals of not more than 40m by smoke proof walls in accordance with Specification C2.5. Public corridors throughout the hotel areas exceed 40m and as such must be separated by smoke proof construction.

It is anticipated that a fire engineered solution will be proposed as part of the proposal to address this item in both the Lands and Education buildings.

#### **4.3 Passive Fire Protection**

Other passive fire protection issues that will need to be addressed in detailed documentation phase include:

- Lift motor rooms,
- Electricity supply,
- Hydrant Pump rooms,
- Sprinkler Pump Rooms,

To be separated from the remainder of the building by construction achieving a minimum fire resistance level of 120 minutes.

Egress stairs and lifts are located within a single shaft in lieu of separate shafts and will be required to be addressed as part of the fire engineered solution for the proposal.

#### **4.4 Fire Hazard Properties**

The fire hazard properties of fixed surface linings and mechanical ductwork will also need to be addressed within the detailed documentation phase pursuant to Specification C1.10 Building Code of Australia.

#### **5.0 Egress**

The egress provisions from the proposed building are provided by:

- Fire isolated stairways
- External perimeter doorways
- Required non-fire isolated stairways

Other detailing issues that will need to be addressed include:

- Door hardware

**BCA ASSESSMENT REPORT**  
**The Sandstone Buildings**  
**Sydney**

- Exit door operation
- Stair construction
- Handrail and balustrade construction
- Discharge from the fire isolated exits
- Details of the egress provisions to the road

Due to the existing heritage nature of the building performance solutions will be prepared to address the existing treads, risers and landings.

**Number of exits required**

<b>Lands Building</b>		
<b>Level</b>	<b>Number of exits required</b>	<b>Number of exits provided</b>
Basement 3 (shared)	2	2
Lower Ground	2	2
Ground	2	2
Level 01	2	3
Level 02	2	3
Level 03	2	3
Level 04	2	1
Level 05	2	1
Level 06	2	1
Level 07	2	1
Level 08	2	1
Level 09	2	1
Level 10	2	1
Level 11	2	1
Level 12	2	1
<b>Education Building</b>		
<b>Level</b>	<b>Number of exits required</b>	<b>Number of exits provided</b>
Basement 3 (shared)	2	2
Basement 02	2	2
Basement 01	2	2
Lower Ground	2	3
Ground	2	3
Level 01	2	3
Level 02	2	2
Level 03	2	2
Level 04	2	2
Level 05	2	2
Level 06	2	2
Level 07	2	2
Level 08	2	2
Level 09	2	2

All levels are provided with the required 2 exits except for levels 4 and above in the Lands building. This is to be addressed through design development or, where feasible, a performance solution prepared by the fire safety engineer.

## **5.1 Exit Travel Distances**

The locations of the proposed exits would appear to indicate that travel distances will need to be assessed as part of a fire engineered solution.

The deemed to satisfy provisions nominate that travel distances to exits should not exceed:

Class 6,7a 9b –Retail, Loading bay, Function areas

- 20m to a single exit or point of choice and where two exits are provided, a maximum of 40m to one of those exits; and
- exits shall be located to not be more than 60m apart and not closer than 9m

Class 3- Hotel

- 6m from an exit or from a point of choice
- 20m from a single exit at the level of egress to a road or open space
- Alternate exits not more than 45m apart

The below extended travel distances will be addressed as part of the fire engineered solution for the proposal to BCA Performance Requirements DP4 and EP2.2 by the fire safety engineer:

### **LANDS BUILDING**

#### **Hotel**

##### Ground

- Travel distance is up to 32.4m to an exit.

##### Level 01-02

- Travel distance is up to 40.3m to an exit.

### **EDUCATION BUILDING**

#### **Basement**

##### Basement Level 03

- Travel distance is up to 51.2m in lieu of 40m

##### Basement Level 02

- Travel distance to a point of choice is up to 24.9m in lieu of 20m

##### Basement Level 01

- Travel distance to a point of choice is up to 23.7m in lieu of 20m.
- Travel distance is up to 55m in lieu of 40m.

#### **Retail and ancillary back of house**

##### Lower Ground Floor

- Travel distance to a point of choice is up to 30m in lieu of 20m.
- Travel distance is up to 49.5m in lieu of 40m.

#### **Hotel**

##### Level 01-04

- Travel distance is up to 31.5m to an exit

##### Level 05

- Travel distance is up to 27.8m to an exit.

Level 06-08

- Travel distance is up to 23.4m to an exit.

Level 09

- Travel distance is up to 12.7m to an exit.

Note: Further review of spa and associated areas on level 5 to be reviewed once the design is finalised.

The below extended distances between alternative exits will be required to be addressed as part of the fire engineered solution for the proposal:

**LANDS BUILDING**

**Hotel**

Ground Floor

- Distance between alternative exits is up to 50.5m in lieu of 45m.

Level 01-02

- Distance between alternative exits is up to 49.7m in lieu of 45m.

**EDUCATION BUILDING**

**Basement**

Basement 03

- Distance between alternative exits is up to 78.3m in lieu of 60m.

**Retail and ancillary back of house**

Lower Ground

- Distance between alternative exits is up to 70.5m in lieu of 60m.

Ground

- Distance between alternative exits is up to 61.3m in lieu of 60m.

**Hotel**

Level 01-04

- Distance between alternative exits is up to 53.2m in lieu of 45m.

Level 05

- Distance between alternative exits is up to 48.6m in lieu of 45m.

**5.2 Dimensions of Exits**

Minimum dimensions of 1000mm and 2000mm height to be provided within exits, with the paths of travel should provide a minimum width of 1000mm (note that all maintenance access, cat walks, etc may comply with AS1657 in which case a 600mm clear width is required).

It is noted that the path of travel is 700mm in lieu of the minimum 1000mm near the spiral stairs in the Lands Building and will be require a performance based solution.

A performance based solution is required to address the total aggregate egress required for the retail level in the Lands Building which has been proposed to accommodate up to 480 occupants based on Table D1.13.

Doorways are permitted to contain a clear opening width of 750mm with a height of 1980mm as part of egress requirements. Access for persons with disabilities however requires a clear doorway opening width of 850mm (i.e minimum 870 mm doors).

Note: The exit width requirements outlined above will be required to be a minimum of 2m as 2 exits are required to each level.

### **5.3 Fire Isolated Exits**

The nature of the existing building, including the current arrangements for egress, will be assessed by the Fire Engineer against the Performance Requirements of the BCA.

Each fire-isolated stairway or fire-isolated ramp must provide independent egress from each storey served and discharge directly, or by way of its own fire-isolated passageway to:

- A road or open space; or
- To a point within the confines of the building, that is used only for pedestrian movement, car parking or the like and is open for at least 2/3 of its perimeter; and from which an unimpeded path of travel, not further than 20 m, is available to a road or open space; or
- Into a covered area that adjoins a road or open space, is open for at least 1/3 of its perimeter, has an unobstructed clear height throughout, including the perimeter openings, of not less than 3 m and provides an unimpeded path of travel from the point of discharge to the road or open space of not more than 6 m.

Where a path of travel from the point of discharge of a fire-isolated exit necessitates passing within 6m of any part of an external wall of the same building, measured horizontally at right angles to the path of travel, that part of the wall must have an FRL of not less than 60/60/60 and any openings protected internally in accordance with C3.4, for a distance of 3 m above or below, as appropriate, the level of the path of travel, or for the height of the wall, whichever is the lesser.

The existing stairs which will be used for egress and connect throughout the building are non-fire-isolated. In addition to this, doorways from rooms open directly into stairs which are required to be fire-isolated. It is anticipated that the configuration of exits will be assessed as part of the fire engineered solution.

Non-fire isolated stairs serving as a required exit must provide a continuous means of travel by its own flights and landings from every storey served to the level at which egress to the road or open space is provided. As the non-fire isolated stairs discharge within the confines of the building, a performance solution will be proposed to assess Clause D1.8 of the BCA.

The distance from a Sole Occupancy Unit to the point of open space is greater than 60m and the non-fire isolated stairs which discharge within the building is greater than 30m to the road or open space. This is required to be addressed through a performance solution.

### **5.4 Balustrading and Handrail**

Balustrading to a height of 1000mm with a maximum opening of 125mm in any direction should be provided adjacent to balconies, landings, corridors etc will be located adjacent to a change in level exceeding 1000mm.

Where it is possible to fall more than 4m to the finished floor below, the balustrade shall not contain any horizontal or near horizontal members that facilitate climbing.

Any windows with a sill height of less than 1.7m in bedrooms or 865mm in all other cases with a fall of more than 2m for windows, 4m for all other cases, openings are to be restricted or a protective barrier that does not allow a 125mm sphere to pass through.

The existing balustrades and handrails in the building are not proposed to be brought into compliance with the current provisions of the BCA where the works would impact the heritage items. Consideration will be given to the provisions for accessibility in this regard through consultation with the Access Consultant and climbable elements are to be assessed by a risk consultant.

**5.5 Access for Persons with a Disability**

Access for people with disabilities shall be provided to and within the building in accordance with the requirements of Part D3 of the BCA 2016. Parts of the building required to be accessible shall comply with the requirements of AS1428.1-2009.

The design solutions pertaining to Accessibility will be a combination of both prescriptive and performance based compliance solutions and will require verification by an Accredited Access Consultant to demonstrate that the Performance Requirements of the BCA have been met.

Assessment of design compliance with the Accessibility provisions of the BCA will be ongoing throughout design development. The proposed compliance strategy for the building is outlined in the Report accompanying this Development Application submission, prepared by MGAC.

The current design is capable of compliance with the Performance Requirements of the BCA though prescriptive and performance based solutions. Ongoing review is being undertaken as to door widths, circulation, etc. Further details are to be provided or access to these areas is to be assessed by an access consultant.

*General*

Access to be provided to and within the building pursuant to AS1428.1-2009 as follows:

- Via the principle public entry and at least 50% of all other entrances.
- From another accessible building connected by a pedestrian link.
- To and within not less than 1 of each type of room or space for use in common including the swimming pool.
- All areas used by the public.

Note: Table D3.1 of the BCA outlines the number of accessible sole-occupancy unit required based on the number sole-occupancy unit proposed and is shown below:

If the building or group of buildings contain—	To and within—
1 to 10 sole-occupancy units	1 accessible sole-occupancy unit.
11 to 40 sole-occupancy units	2 accessible sole-occupancy units.
41 to 60 sole-occupancy units	3 accessible sole-occupancy units.
61 to 80 sole-occupancy units	4 accessible sole-occupancy units.
81 to 100 sole-occupancy units	5 accessible sole-occupancy units.
101 to 200 sole-occupancy units	5 accessible sole-occupancy units plus 1 additional accessible sole-occupancy unit for every 25 units or part thereof in excess of 100.

201 to 500 sole-occupancy units more than	9 accessible sole-occupancy units plus 1 additional accessible sole-occupancy unit for every 30 units or part thereof in excess of 200.
500 sole-occupancy units	19 accessible sole-occupancy units plus 1 additional accessible sole-occupancy unit for every

## **6.0 Fire Services & Equipment**

The following fire services will need to be provided throughout the building:

- An automatic sprinkler system in accordance with the relevant provision of clause E1.5 of the BCA and AS 2118.1-1999 throughout the building,
- Fire hydrants in accordance with clause E1.3 of the BCA and AS 2419.1-2005,
- Fire hose reels in accordance with clause E1.4 of the BCA and AS 2441-2005,
- Portable Fire Extinguishers in accordance with Clause E1.6 of the BCA and AS 2444-2001,
- Sound System & Intercom System for Emergency Purposes in accordance with AS 1670.4-2015,
- Emergency lighting, exit signage and directional exit signage is required throughout the building in accordance with Part E of the BCA and AS/NZS 2293.1-2005

As the proposal has been considered a united building as outlined in Clause A4 of the BCA, a single fire control centre and associated fire brigade infrastructure will be used to service the proposal.

The development shall be provided with a single Main Fire Indicator Panel (FIP) within the fire control centre. Due to their being multiple entrances to the building, the location of the fire control centre is proposed to be addressed as part of the fire engineered solution for the proposal.

### **6.1 Fire Hydrants**

A system of Fire Hydrants is required to be provided to BCA Clause E1.3 and AS 2419.1-2005.

A booster assembly is required as part of the fire hydrant requirements. Due to their being multiple entrances to the building, the location of the booster assembly is to be assessed as part of the alternate solution to BCA Performance Requirement EP1.3.

Fire hydrants are to be within 4m for required exits in fire isolated stairs.

### **6.2 Fire Hose Reels**

A Fire Hose Reel System is required to BCA Clause E1.4 and AS2441 to all portions except the class 3 portions.

To be located within 4m of exits and provide coverage within the building based on a 36m hose length.

Please note that fire hose reel coverage cannot pass through fire or smoke doors.

### **6.3 Automatic Sprinkler Protection**

An Automatic Fire Suppression System is required in accordance with Specification E1.5 and AS2118.1-1999 throughout.

An occupant warning system that is triggered upon activation of the sprinkler system should be provided in accordance with BCA Specification E1.5.

### **7.0 Ventilation and Smoke Hazard Management**

Smoke hazard management shall be provided throughout the building by means of the following systems:

#### **Throughout:**

- Automatic Air Pressurisation to all fire isolated exits to AS/NZS 1668.1-2015
- Automatic Fire Suppression System (Sprinklers) to AS 2118.1-1999

#### **Basement**

- Mechanical ventilation system in accordance with AS 1668.2

#### **Commercial/Retail/Assembly Portions:**

- Zone Smoke Control System to AS/NZS 1668.1-2015
- Smoke detection and alarm system complying with AS 1670.1-2015 to be provided in retail and commercial areas which activates the BOWS system.
- A performance solution will be proposed for the smoke exhaust associated with the atrium.

#### **Hotel Portions:**

- Smoke detection and alarm system complying with AS 3786-2014 to be provided within each sole occupancy unit.
- Smoke detection and alarm system complying with AS 1670.1-2015 to be provided to the common areas in residential portions of the building which activates the BOWS system.

A fire indicator panel is required as part of the detection system in both the Lands and Education buildings. This panel is to be located within 4m of the main entry and should be incorporated within the fire control room. Any variation to the prescriptive provisions will require the consent of the fire brigade and should form part of the fire safety engineering report to verify the performance requirements of the BCA.

Throughout the development the provision of natural or mechanical ventilation is required to all habitable rooms in accordance with F4.5 Building Code of Australia and AS 1668 and AS/NZS 3666.1.

Note: It is anticipated that a fire engineered solution will be proposed for the smoke hazard management and stair pressurisation to the existing heritage stairs.

### **8.0 Lift Services**

The passenger lifts to be installed in the Lands and Education buildings are required to comply with the following:

- fitted with warning signs, fire service controls in accordance with AS 1735.2
- Stretcher facilities are to be provided within the lifts with minimum dimensions of 600mm wide, 2000mm long and 1400mm high.
- At least two emergency lifts with stretcher facilities in accordance with part E3.4 of the BCA. The two emergency lifts shall be located in separate shafts where possible. Note two emergency lifts are to serve every level.
- Be provided with the following:
  - A handrail in accordance with AS 1735.12,
  - Minimum internal floor dimensions as specified in AS 1735.12,
  - Fitted with a series of door opening sensory devices which will detect a 75mm diameter or across the door opening between 50mm and 1550mm above floor level,
  - Have a set of buttons for operating the lift located at heights above level complying with AS 1735.12.

An emergency lift has not been provided to all levels in the Lands building and based on the floor area within the tower it is anticipated that a performance solution will be proposed to address this item.

## **9.0 Sanitary Facilities**

The sanitary & other facilities within the development would generally consist of:

### **Hotel Portion**

For the hotel portion, the following facilities are to be provided:

- a bath or shower; and
- a closet pan and washbasin,

for each 10 residents for whom private facilities are not provided, except that if one urinal is provided for each 25 males up to 50 and one additional urinal for each additional 50 males or part thereof, one closet pan for each 12 males may be provided.

### **Retail Portion**

- Closet pan and washbasin for males,
- Closet pan, washbasin and adequate means of disposal of sanitary towels for female

### **Function areas/Leisure**

- Closet pan, urinals and washbasin for males,
- Closet pan, washbasin and adequate means of disposal of sanitary towels for female.

Please note the Unisex facilities provided for people with disabilities may be counted once for each sex. These facilities are to be provided in accordance with AS1428.1-2009.

## **10.0 Sound Transmission & Insulation**

The sound transmission and insulation requirements for the Class 2 and 3 portions shall be provided in accordance with Part F5 of the BCA 2016 for the following elements:

- A floor separating sole-occupancy units or a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification:

- Rw + Ctr (airborne) not less than 50
- Ln,w+CI (impact) not more than 62
- A wall separating sole-occupancy units
  - Rw + Ctr (airborne) not less than 50,
- A wall separating a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification
  - Rw (airborne) not less than 50,
- A wall separating a bathroom, sanitary compartment, laundry or kitchen in one sole-occupancy unit from a habitable room (other than a kitchen) in an adjoining unit; or a sole-occupancy unit from a plant room or lift shaft.
  - Rw (airborne) not less than 50
  - Discontinuous Construction
- A door assembly separating a sole-occupancy unit from a stairway, public corridor, public lobby or the like,
  - Rw not less than 30
- All walls required to have a impact sound insulation rating are of discontinuous construction

As a result of the existing heritage fabric associated with the proposal, it is not anticipated that the sound transmission and insulation will be brought into full compliance with the current provisions for Part F5 of the BCA.

### **11.0 Energy Efficiency**

The proposed new works are to comply with Part J of the BCA. To achieve compliance, there are two options available:

The building will be verified against a reference building as per Verification Method JV3. This requires that the proposed building and its services be shown to have an annual energy consumption of equal or less than the reference building which has been modelled as per the requirements of Part J of the BCA.

A JV3 Report and Certification from an appropriately qualified engineer will be provided with the application for a Construction Certificate, outlining how compliance is achieved.

Access for maintenance is to be provided to the building in accordance with the requirements of BCA Part J8.

The proposed site will be located in a **Climate Zone 6**.

Due to the heritage nature of the existing building it is not proposed to upgrade the building to meet full compliance with the requirements of Section J. Further review of energy efficiency will be conducted as the design evolves by an accredited energy efficiency consultant.

### **11.1 Access for Maintenance**

Access is to be provided to all plant, equipment and components associated with the provision of the above energy requirements i.e.

- Adjustable or monitored shading devices

- Time switches and motion detectors
- Room temperature thermostats
- Plant thermostats such as boilers or refrigeration units
- Motorised air dampers and central valves
- Reflectors, Lenses and Diffusers of light fittings
- Heat transfer equipment

**Appendix A - Design Documentation**

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

<b>Drawing No.</b>	<b>Title</b>	<b>Date</b>	<b>Drawn By</b>	<b>Revision</b>
SP-DA-G-0001	Drawing Register	11/10/2016	Make Architects	01
SP-DA-G-2696	Proposed GFA Plans – Education Building – Basement Level 03	11/10/2016	Make Architects	01
SP-DA-G-2697	Proposed GFA Plans – Education Building – Basement Level 02	11/10/2016	Make Architects	01
SP-DA-G-2698	Proposed GFA Plans – Lands Building – Lower Ground Education Building – Basement Level 01	11/10/2016	Make Architects	01
SP-DA-G-2699	Proposed GFA Plans – Lands Building – Lower Ground Education Building – Lower Ground	11/10/2016	Make Architects	01
SP-DA-G-2700	Proposed GFA Plans – Lands Building – Level 01 Education Building –Ground	11/10/2016	Make Architects	01
SP-DA-G-2701	Proposed GFA Plans – Lands Building – Level 02 Education Building – Level 01	11/10/2016	Make Architects	01
SP-DA-G-2702	Proposed GFA Plans – Lands Building – Level 03 Education Building – Level 02	11/10/2016	Make Architects	01
SP-DA-G-2703	Proposed GFA Plans – Lands Building – Level 04 Education Building – Level 03	11/10/2016	Make Architects	01
SP-DA-G-2704	Proposed GFA Plans – Lands Building – Level 05 Education Building – Level 04	11/10/2016	Make Architects	01
SP-DA-G-2705	Proposed GFA Plans – Lands Building – Level 06 Education Building – Level 05	11/10/2016	Make Architects	01
SP-DA-G-2706	Proposed GFA Plans – Lands Building – Level 07 Education Building – Level 06	11/10/2016	Make Architects	01
SP-DA-G-2707	Proposed GFA Plans – Lands Building – Level 08 Education Building – Level 07	11/10/2016	Make Architects	01
SP-DA-G-2708	Proposed GFA Plans – Lands Building – Level 09 Education	11/10/2016	Make Architects	01

**BCA ASSESSMENT REPORT**  
**The Sandstone Buildings**  
**Sydney**

Building – Level 08				
SP-DA-G-2709	Proposed GFA Plans – Lands Building – Level 10 Education Building – Level 09	11/10/2016	Make Architects	01
SP-DA-G-2710	Proposed GFA Plans – Lands Building – Level 11 Education Building – Roof	11/10/2016	Make Architects	01
SP-DA-G-2711	Proposed GFA Plans – Lands Building – Level 12 Education Building – Roof	11/10/2016	Make Architects	01
SP-DA-G-2712	Proposed GFA Plans – Lands Building – Level Roof Education Building – Roof	11/10/2016	Make Architects	01
SP-DA-G-3000	Lands Building –South Education Building – South	11/10/2016	Make Architects	02
SP-DA-G-3001	Existing Elevations – Existing Elevations – Lands Building – West	11/10/2016	Make Architects	02
SP-DA-G-3002	Existing Elevations – Lands Building – North – Education Building – North	11/10/2016	Make Architects	02
SP-DA-G-3003	Existing Elevations –Education Building – East	11/10/2016	Make Architects	02
SP-DA-G-3004	Existing Elevations –Education Building – East	11/10/2016	Make Architects	02
SP-DA-G-3005	Existing Elevations –Education Building – West	11/10/2016	Make Architects	02
SP-DA-G-3200	Proposed Elevations – Lands Building –South Education Building – South	11/10/2016	Make Architects	02
SP-DA-G-3201	Proposed Elevations – Lands Building – West	11/10/2016	Make Architects	02
SP-DA-G-3202	Proposed Elevations – Lands Building – North Education Building – North	11/10/2016	Make Architects	02
SP-DA-G-3203	Proposed Elevations – Education Building – East	11/10/2016	Make Architects	02
SP-DA-G-3203	Proposed Elevations – Lands Building – East	11/10/2016	Make Architects	02
SP-DA-G-3204	Proposed Elevations – Lands Building – East	11/10/2016	Make Architects	02
SP-DA-G-3205	Proposed Elevations – Education Building – West	11/10/2016	Make Architects	02

**BCA ASSESSMENT REPORT**  
**The Sandstone Buildings**  
**Sydney**

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SP-DA-G-3300	Existing Sections – Lands Building – Section 01	11/10/16	Make Architects	02
SP-DA-G-3301	Existing Sections – Lands Building – Section 02	11/10/16	Make Architects	02
SP-DA-G-3302	Existing Sections – Education Building – Section 03	11/10/16	Make Architects	02
SP-DA-G-3500	Proposed Sections – Lands & Education Building – Section 01	11/10/16	Make Architects	02
SP-DA-G-3501	Proposed Sections – Lands Building – Section 02	11/10/16	Make Architects	02
SP-DA-G-3502	Proposed Sections – Education Building – Section 03	11/10/16	Make Architects	02

**Appendix B - Draft Fire Safety Schedule**

<b>Essential Fire Safety Measures</b>	<b>Standard of Performance</b>
1. Access Panels, Doors and Hoppers	BCA Clause C3.13
2. Automatic Fire Detection and Alarm System	BCA Spec. E2.2a & AS 1670 – 2015
3. Automatic Fire Suppression System	BCA Spec. E1.5 & AS 2118.1 – 1999, AS2118.6:2012
4. Building Occupant Warning System activated by the Sprinkler System	BCA Spec. E1.5 & AS 1670 – 2015
5. Emergency Lifts	BCA Clause E3.4 & AS 1735.2 – 2001
6. Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005 Amdt 1 & 2
7. EWIS	BCA Clause E4.9 & AS 1670.4 - 2004
8. Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2005 Amdt 1 & 2
9. Fire Control Centres	BCA Spec. E1.8 Performance solution by accredited fire safety engineer
10. Fire Blankets	AS 2444 – 2001
11. Fire Dampers	BCA Clause C3.15, AS 1668.1 – 2015 & AS 1682.1 & 2 – 1990
12. Fire Doors	BCA Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8 and AS 1905.1 – 2015
13. Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005 Amdt 1
14. Fire Hydrant System	Clause E1.3 & AS 2419.1 – 2005 Amdt 1 Performance solution by accredited fire safety engineer
15. Fire Seals	BCA Clause C3.15 & AS 1530.4 – 2014
16. Lightweight Construction	BCA Clause C1.8 & AS 1530.3 – 1999
17. Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012
18. Paths of Travel	EP&A Reg 2000 Clause 186 Performance solution by accredited fire safety engineer
19. Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
20. Pressurising Systems	BCA Clause E2.2 & AS/NZS 1668.1 – 2015 Performance solution by accredited fire safety engineer
21. Smoke Hazard Management System	BCA Part E2 & AS/NZS 1668.1 – 2015 Performance solution by accredited fire safety engineer
22. Smoke and/or Heat Alarm System	BCA Spec. E2.2a & AS 3786 – 2014
23. Smoke Dampers	AS/NZS 1668.1 – 2015
24. Smoke Doors	BCA Spec. C3.4
25. Warning and Operational Signs	Section 183 of the EP & A Regulations 2000, AS 1905.1 – 2005, BCA Clause C3.6, D2.23, E3.3

**Appendix C- Fire Resistance Levels**

The table below represents the Fire resistance levels required in accordance with BCA 2016:

**Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS**

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



**Appendix D – Proposed Schedule of Performance Based Solutions**

**Fire Safety Performance Based Solutions**

<b>The Lands Building</b>		
<b>DTS Clause</b>	<b>Description of Non-Compliance</b>	<b>Performance Requirement</b>
Spec C1.1	<b>Fire-Resisting Construction/Reduced FRL's/Testing</b> Rationalisation of reduced FRL's if the testing of existing heritage structure does not meet the requirements of Specification C1.1.	CP1 & CP2
C2.11	<b>Stairways and lift in single shaft</b> Egress stairs and lifts are located within a single shaft in lieu of separate shafts.	CP1 & CP2
C2.14	<b>Public Corridors</b> Residential public corridors exceed 40m in length and are not separated.	EP2.2
D1.2	<b>Number of Exits</b> Level 4-9 have been provided with a single exit in lieu of 2 exits as required for a building with an effective height greater than 25m.	DP4 & EP2.2
D1.3	<b>Fire-isolated Stairs</b> The existing heritage stairs which are non-fire isolated connect more than 3 storeys. The stairs shown in the tower also connect greater than 3 storeys.	DP5
D1.4	<b>Exit Travel Distances</b> Extended travel distances will be required to be addressed through a combination of design and a fire engineered solution. Refer to section 5.1 for further details.	DP4 & EP2.2
D1.5	<b>Distance between Alternative Exits</b> The below extended travel distances will be required to be addressed as part of the fire engineered solution for the proposal. Refer to section 5.1 for further details.	DP4 & EP2.2
D1.6	<b>Aggregate Egress Width</b> A performance based solution is required to address the total aggregate egress required for the retail level which has been proposed to accommodate up to 480 occupants based on Table D1.13.	DP4, DP6 & EP2.2
D1.7	<b>Travel via fire-isolated exits</b> Doorways from rooms open directly into stairs required to be fire-isolated. Fire-isolated stairs discharge within the confines of the building and the perimeter is not 2/3 open and is greater than 20m from discharge point to road or open space.	DP4
D1.9	<b>Non-fire isolated Stairs</b> The distance from a Sole Occupancy Unit to the point of open space is greater than 60m and the non-fire isolated stairs which discharge within the building is greater than 30m to the road or open space.	DP5
D1.10	<b>Discharge from exits</b> Path of travel is 700mm in lieu of the minimum 1000mm near the spiral stairs.	DP1, DP2 & DP6
D2.2 & D2.3	<b>Fire-isolated stairways</b> The materials of the existing heritage stairs are required to be tested	DP5

to confirm combustibility as these stairs are required to be combustible.

D2.4	<b>Separation of rising and descending stairs</b> The egress stairs connect from the basement through to levels above the level of egress.	DP4
E1.3	<b>Fire Hydrants</b> The design proposal indicates that there are multiple entrances – Hydrant booster not in sight of the main entrance AS2419.1-2005.	EP1.3
E1.8	<b>Fire Control Centres</b> The fire control centre will not be located at the main entrance due to multiple entries to the building.	EP1.6
Spec E2.2a & Spec E2.2b	<b>Smoke Hazard Management</b> Stair pressurisation and smoke hazard management will rationalised.	EP2.2
E3.4	<b>Emergency Lifts</b> An emergency lift has not been provided to all levels in the building.	EP3.2

<b>The Education Building</b>		
<b>DTS Clause</b>	<b>Description of Non-Compliance</b>	<b>Performance Requirement</b>
Spec C1.1	<b>Fire-Resisting Construction/Reduced FRL's/Testing</b> Rationalisation of reduced FRL's if the testing of existing heritage structure does not meet the requirements of Specification C1.1.	CP1 & CP2
C2.11	<b>Stairways and lift in single shaft</b> Egress stairs and lifts are located within a single shaft in lieu of separate shafts.	CP1 & CP2
C2.14	<b>Public Corridors</b> Residential public corridors exceed 40m in length and are not separated.	EP2.2
D1.3	<b>Fire-isolated Stairs</b> The existing heritage stairs which are non-fire isolated connect more than 3 storeys. The stairs shown in the tower also connect greater than 3 storeys.	DP5
D1.4	<b>Exit Travel Distances</b> Extended travel distances will be required to be addressed through a combination of design and a fire engineered solution. Refer to section 5.1 for further details.	DP4 & EP2.2
D1.5	<b>Distance between Alternative Exits</b> The below extended travel distances will be required to be addressed as part of the fire engineered solution for the proposal. Refer to section 5.1 for further details.	DP4 & EP2.2
D1.7	<b>Travel via fire-isolated exits</b> Doorways from rooms open directly into stairs required to be fire-isolated. Fire-isolated stairs discharge within the confines of the building and the perimeter is not 2/3 open and is greater than 20m from discharge point to road or open space.	DP4
D1.9	<b>Non-fire isolated Stairs</b>	DP5

	The distance from a Sole Occupancy Unit to the point of open space is greater than 60m and the non-fire isolated stairs which discharge within the building is greater than 30m to the road or open space.	
D2.2 & D2.3	<b>Fire-isolated stairways</b> The materials of the existing heritage stairs are required to be tested to confirm combustibility as these stairs are required to be combustible.	DP5
D2.4	<b>Separation of rising and descending stairs</b> The egress stairs connect from the basement through to levels above the level of egress.	DP4
E1.3	<b>Fire Hydrants</b> The design proposal indicates that there are multiple entrances – Hydrant booster not in sight of the main entrance. AS2419.1-2005.	EP1.3
Spec E1.8	<b>Fire Control Centres</b> The fire control centre will not be located at the main entrance due to multiple entries to the building.	EP1.6
Spec E2.2a & Spec E2.2b	<b>Smoke Hazard Management</b> Stair pressurisation and smoke hazard management will be rationalised.	EP2.2

#### Accessibility Performance Based Solutions

DTS Clause	Description of Non-Compliance	Performance Requirement
D3.1	The egress width to suite LB.G.11.A will require a call button at the corridor threshold as the accessibility through the entry door is limited by the available clearance between the existing wall and the existing spiral staircase.	DP1
	A performance solution has been proposed to address this.	
D3.1	A performance solution has been proposed for the gym and meeting rooms which have not been provided with wheelchair access.	DP1
D3.1	A performance solution is required for the level 4 areas within the Lands Building which have not been provided with access.	DP1