VIC LILLI
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BCA CAPABILITY REPORT

FOR

Hassall Ltd

PREMISES

Penrith Health Campus Redevelopment

ICU – Level 3

Date: 24 August 2009

Ref. No. J090142-ICU-L3-2

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Table of Contents

CONTENTS Page No.

1.0 Executive Summary

1.1 – Report purpose

This report has been prepared to identify the extent of compliance achieved by the architectural documentation depicting the proposed construction of a new training and plantroom area over the proposed ICU addition against the relevant provisions of the Building Code of Australia (BCA) 2009.

The works will be carried out to the North Block of the existing Nepean Hospital.

The subject works are required to comply with the technical provisions of the State's building laws under Section 116G of the Environmental Planning and Assessment Act 1979.

This report provides guidance as to the necessary provisions that must be adhered to as part of the approval process.

1.2 – Report methodology

This report has been prepared on the basis of architectural documentation prepared by Hassall reflecting the proposed works as detailed in Part 6.0 of this report.

1.3 – Recommendations

To achieve compliance with the relevant provisions of the Building Code of Australia it is recommended that the following matters be addressed.

(i) Alternative solutions must be evaluated by a fire safety engineer with regard to the following aspects of the design

   a. The provisions for egress via the non-fire-isolated stairway serving the Level 3 area against BCA Performance Requirements DP4 & EP2.2

   b. The omission of sprinklers and zone smoke control from the design against BCA Performance Requirement EP2.2

   c. The construction of the existing external wall of West Block adjacent to new building against BCA Performance Requirement CP2.

(ii) All exit doorways and horizontal exits must swing in the direction of egress

(iii) Statutory fire safety measures must be provided to the building as detailed in Section 4 of this report

(iv) All proposed building elements must achieve compliance with the requirements of BCA Section J

2.0 Property Description

2.1 – Location

The proposed works will be completed over the proposed ICU addition, being the new Level 3 of the existing North Block of Nepean Hospital, the hospital being situated at Derby Street, Kingswood.

2.2 –Description of works

The proposed works comprise the construction of a new Level 3 addition over the proposed ICU extension.

2.3 – Building Description

Use/Classification	The building area the subject of this report has been assessed as being classified as follows • Class 5 – Administration & consulting areas • Class 9b – Meeting rooms
Rise in Storeys	The existing building has a rise of two (2) storeys The proposed addition will result in the North Block having a rise in storeys of three (3).
Type of Construction	Type A construction required
Floor Area	The maximum permissible floor area of a fire compartment 5,000m²
Effective Height	The building has an effective height of less than 25m.

3.0 Building Code of Australia Assessment

3.1 – Fire Resistance (BCA Section C)

Item	Comment
Fire Resistance	The new structural walls and columns must achieve a fire resistance level to comply with the requirements of Clause C1.1 and Specification C1.1, for building of Type A construction. By virtue of the additional level, the type of construction required for North Block will be increased to Type A Construction. This increase in the construction type incorporates a necessity to provide a 120/120/120 to floors within the building. A preliminary visual inspection of the existing building indicates that there is a high likelihood that the existing structure already achieves this rating. The lightweight roof need not achieve an FRL under the concession contained in Clause 3.5 of BCA Specification C1.1. With the exception of the 120/120/120 fire walls, the internal structure of the building situated immediately below the lightweight roof of the building need not achieve an FRL under the concession contained in Clause 3.7 of BCA Specification C1.1.
Compartmentation and Separation	The proposed addition is separated from the adjoining hospital buildings by fire walls having an FRL not less than 120/120/120 that are continuous through the full height of the building. The existing fire wall separation between the North and South Blocks must be maintained. In the areas where the proposed additional building area will abut the existing West Block, the fire wall dividing the buildings must extend at least 6m above the roof level of the proposed North Block addition, or to the underside of the West Block roof covering, whichever is lower. Any openings in that portion of the wall must be protected in accordance with BCA Clause C3.5. All fire walls must be constructed to the requirements of BCA Clause C2.7. Fire doors must be installed to comply with BCA Specification C3.4 and AS 1905.1-2005. All door and window openings that are adjacent to an adjoining building must be protected by fire doors or drenchers as

	appropriate to the requirements of BCA Clause C3.4.
Openings in fire rated elements for service penetrations	Services penetrating fire rated elements of the building must be protected to the requirements of BCA Clause C3.15 and Specification C3.15.
Openings in fire rated walls	All fire doors located within fire walls are to achieve an FRL not less than -/120/30. Where fire doors are to be provided as automatic closing doors, that automatic closing operation must be activated by a smoke detector located within 1.5m of each side of the door as well as the detection system in either of the fire compartments located on each side of the door. Doors provided to fire isolated exits must achieve an FRL not less than -/60/30.
Fire hazard properties	The fire hazard properties of wall and floor linings are to comply with Specification C1.10 and C1.10a.

3.2 – Access & Egress (BCA Section D)

Item	Comment
Number of exits required, exit travel distance and distance between alternative exits	The following exit travel distance requirements are applicable to the building: Maximum of 20m to a point where a choice of travel in different directions to alternative exits is available – Complies with egress through the West Block building. Maximum distance of travel of 40m to the nearest exit and maximum of 60m between alternative exits – Complies with egress through the West Block building. An alternative means of egress will be provided via West Block from the southern portions of the proposed plant area. The total distance of travel, via the non-fire-isolated stairway, to open space exceeds 80m and as such does not comply with BCA Clause D1.9 (c). The discharge point of the non-fire-isolated stairway is located more than 40m from a doorway being an exit to open space. It is recommended that where the egress system cannot be redesigned to achieve a compliant exit system, the proposed design should be reviewed by a fire safety engineer against BCA Performance Requirements DP4 & EP2.2.
Dimensions of exits	The dimensions of the proposed exits generally comply with the requirements of BCA Clause D1.6.
Horizontal exits	The proposed exit system will utilise a horizontal exit to Level 3 of the West Block building. The horizontal exit requires the following (i) The fire wall in which the horizontal exit is situated must be constructed to the requirements of BCA Clause C2.7. (ii) The exit doorway must swing in the direction of egress
Stairway design	The non-fire-isolated stairway must be constructed of concrete or steel no less than 6mm thick. The stairway must have goings and risers designed to the requirements of BCA Clause D2.13.

Egress Doors	All exit doorways and doorways in the path of travel to an exit are swinging doors as specified by BCA Clause NSW D2.19. All doorways servings as exits must swing in the direction of egress.
Balustrades and handrails	Balustrades complying with BCA Clause D2.16 must be provided to all stairways and other areas where occupants may fall more than 1m. Handrails must be provided to all stairways and at least one side of all corridors used by patients.
Latches	Latches to exit doors and doors in the path of travel to an exit are to be operable without a key with a single handed downward or pushing action on a single device in accordance with BCA Clause D2.21. Doors may also be automatically unlocked by a fail-safe device on activation of a detection system installed within the building.
Access for people with disabilities	Access for people with disabilities will be provided to the Level 3 training facility via the connection to West Block. The accessible path of travel must be designed to the requirements of AS 1428.1-2001. Tactile indicators must be provided to all publicly accessible areas to the requirements of BCA Clause C3.8 and AS 1428.4-1992

3.3 – Services and Equipment (BCA Section E)

Item	Comment
Hydrant system	The existing fire hydrant service must be extended to serve the proposed Level 3 area.
Fire hose reels	Fire hose reels must be provided to serve the proposed new area. Fire hose reels must be located within 4m of an exit in a location that provides full coverage to the building without having a fire hose pass through a fire or smoke door.
Sprinklers	Not applicable
Portable Fire Extinguishers	Portable fire extinguishers are to be provided as appropriate to the fire risk in accordance with the requirements of AS2444-2001.
Smoke Hazard Management	The building must be provided with a smoke detection and alarm system complying with BCA Specification E2.2a and AS 1670.1-2004. The mechanical system serving the area must be automatically shut-down on activation of the smoke detection system. Resulting from the proposal to construct consulting rooms & training rooms and a plant room to Level 3 above the existing ICU in North Block, the building as proposed will contain three storeys. The additional area to Level 3 will not be occupied by patients that will require assistance and as such need not be classified as a Class 9a health care building. The area in question will be classified as being Class 5 & 9b and will have a floor area of approximately 600-700m². The Building Code of Australia requires a Class 9a building containing more than 2 storeys to be provided with either of the following: a) A sprinkler system; or b) A zone smoke control system In this case, whilst the building contains more than 3 storeys and is predominately Class 9a, the additional area, making up the entirety of the third storey of the North Block building, will not be

	classified as Class 9a. Were the remainder of the building to have a similar classification to the area in question the BCA would not require the provision of the services in question. It is proposed that the current design (having sprinklers and zone smoke control omitted) be evaluated against the provisions of BCA Performance Requirement EP2.2 on the basis that the proposed use (being Class 5 & 9b) and configuration of that additional area does not result in such a danger to fire safety that it warrants the provision of sprinklers or zone smoke control to the entirety of the North Block building.
Emergency Lighting	Emergency lighting must be provided to all areas in accordance with BCA Clause E4.4 and AS2293.1-2005.
Exit Signs	Exit signs must be provided within the building to suit the proposed layout in accordance with BCA Clause NSW E4.6 and AS 2293.1-2005.
Sound Systems and Intercom Systems for Emergency Purposes (formally EWIS)	The building must be provided with a 'Sound system and intercom system for emergency purposes' to the requirements of AS 1670.4-2004.

3.5 – Health & Amenity (BCA Section F)

Item	Comment
Damp proofing	All wet areas must be provided with waterproofing to the requirements of AS 3740-2004.
Sanitary facilities	Staff sanitary facilities have been provided to the requirements of BCA Table F2.3.
Ventilation	Ventilation must be provided to the building to the requirements of AS 1668.2-1991.

3.6 – Energy Efficiency (BCA Section J)

Item	Comment
Section J Energy efficiency	All proposed building must achieve compliance with the requirements of BCA Section J. In that regard the following requirements will be applicable ▪ The roof/ceiling structure must achieve an R rating not less than 3.2 ▪ Ceilings that are situated below a non-conditioned space such as a plant room or the like must achieve an R rating not less than 1.6 ▪ External walls must achieve an R rating not less than R1.8 ▪ All glazing must be selected using the Australian Building Codes Board glazing calculator http://www.abcb.gov.au/index.cfm?objectid=F8CA7C6C-91EA-77BE-D49C7FBD3306C1B3 ▪ The building must be sealed to the requirements of BCA Part J3 ▪ Any mechanical ventilation or air-conditioning system must comply with the requirements of BCA Part J5. ▪ The lighting power load achieved must be within the limitations of BCA Part J6

4.0 Fire safety and other measures

4.0 – Fire Safety Measures

The following schedule represents the likely fire safety measures that will be required for the area of the building being the subject of the proposed works

Fire Safety Measure	Standard of performance
Automatic doors	BCA Clause C3.4
Automatic fail safe devices	BCA Clause C3.4, D2.21, AS 1670.1-2004
Automatic fire detection and alarm system	BCA Spec E2.2a, AS 1670.1-2004
Emergency lighting	BCA Clause E4.2 & E4.4, AS 2293.1-2005
Emergency warning and intercommunication system	BCA Clause E4.9 AS 1670.4-2004
Exit signs	BCA Clause E4.5 & E4.8, AS 2293.1-2005
Fire dampers	AS/NZS 1668.1-1998, AS1682.1&2 -1990
Fire doors	BCA Spec C3.4, AS 1905.1-2005
Fire hose reel system	BCA Clause E1.4, AS 2441-2005
Fire hydrant systems	BCA Clause E1.3, AS 2419.1-2005
Fire seals (protecting openings in fire resisting components of the building)	BCA Clause C3.15
Lightweight fire rated construction	BCA Clause C1.8, BCA Spec C1.8
Mechanical air handling systems Automatic shutdown	AS/NZS 1668.1-1998
Portable fire extinguishers	BCA Clause E1.6, AS 2444-2001
Wall wetting sprinkler and drencher systems	BCA Clause C3.4, AS 2118.2-1995
Warning and operational signage (eg stairway notices)	BCA Clause D2.23

5.0 Recommendations & Conclusion

5.1 – Recommendations

Subsequent to the above assessment, it is recommended that the following matters be addressed in the design of the proposed east block building

(i) Alternative solutions must be evaluated by a fire safety engineer with regard to the following aspects of the design

a. The provisions for egress via the non-fire-isolated stairway serving the Level 3 area against BCA Performance Requirements DP4 & EP2.2

b. The omission of sprinklers and zone smoke control from the design against BCA Performance Requirement EP2.2

c. The construction of the existing external wall of West Block adjacent to new building against BCA Performance Requirement CP2.

(ii) All exit doorways and horizontal exits must swing in the direction of egress

(iii) Statutory fire safety measures must be provided to the building as detailed in Section 4 of this report

(iv) All proposed building elements must achieve compliance with the requirements of BCA Section J

5.0 – Conclusion

Following an assessment of the proposed building works it is the opinion of this office that on the completion of design works in accordance with the recommendations of this report the building design will comply with the relevant requirements of the Building Code of Australia.

Author,

Mark Brentnall
for **Vic Lilli & Partners**

6.0 References

6.1 – Basis of Report

This BCA Capability report has been prepared on the basis of the following-

(i) Architectural Plans as prepared by Hassall Ltd

Drawing No.	Title	Revision
SK170609-03	ICU Level 3 Option 10B	-

(ii) Building Code of Australia (BCA) 2009;

(iii) Environmental Planning and Assessment Act, 1979, and Regulations;