



BLACKETT  
MAGUIRE+  
GOLDSMITH

The National Construction Code Volume One

SSDA Submission

The Children's Hospital at Westmead  
Paediatric Services Building



Health  
Infrastructure

Revision 4

Date: 20 January 2021

Project No.: 190461



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REVISION STATUS				
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0	28.02.2020	Master Plan Report	Adam Durnford	David Blackett
1	03.08.2020	Concept Design Report	Adam Durnford	David Blackett
2	10.09.2020	Concept Design Report	Adam Durnford	David Blackett
3	15.12.2020	SSDA Submission	Adam Durnford	David Blackett
4	20.01.2021	SSDA Submission	Adam Durnford	David Blackett

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## A. INTRODUCTION

### A.1 BACKGROUND / PROPOSAL

Blackett Maguire + Goldsmith Pty Ltd (BM+G) have been commissioned by Health Infrastructure to undertake a preliminary Building Code of Australia (BCA) 2019 assessment of the SSDA Architectural Design for new Paediatric Services Building (PSB) at Westmead Hospital.

The proposal seeks consent for the construction of a new Paediatric Services Building (PSB) to be located adjacent to the CASB, and on the site of the decommissioned P17 car park, including development of the Hawkesbury Road forecourt and access links. This includes works associated with CHW forecourt on Hawkesbury Road to provide improved community amenity in the form of a new front entry, improved street frontage and enable a more cohesive main entrance connecting existing CHW, adjoining research facilities, and the PSB.

The scope of proposed works includes:

- + Construction of the main PSB:

The main PSB may contain the following uses: perioperative and interventional services, neonatal and paediatric intensive care units, cancer centre, acute inpatient beds, back of house and parent facilities; and

- + Alterations and additions to existing CHW KR and CASB buildings adjoining PSB site area to accommodate floor realignment and movement corridors
- + Construction of a new pedestrian canopy link through KR, connecting the main PSB with the CHW forecourt and existing hospital entrance
- + The canopy link is to be lifted 2 storeys above the CHW forecourt
- + A new ground plane / forecourt landscaped area extending from Hawkesbury Road to the proposed PSB
- + Tree removal to accommodate the construction of the PSB



Figure No. 1 – Proposed Site Plan



## A.2 AIM

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The aim of this report is to:

- + Undertake a high level assessment of the SSDA Architectural Documentation for the proposed Paediatric Services Building against the Deemed-to-Satisfy (DtS) provisions of Part C, D, E, F, G & J of the BCA 2019 Amendment No. 1.
- + Identify any key BCA compliance issues that will require resolution/attention for the proposed redevelopment.
- + Undertake a high level review of the SSDA Architectural Documentation against the Access to Premises Standards 2010.

## A.3 PROJECT TEAM

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The following BM+G Team Members have contributed to this Report:

- + Adam Durnford (Associate Director)
- + David Blackett (Director)

## A.4 DOCUMENTATION

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The following documentation has been reviewed, referenced and/or relied upon in the preparation of this report:

- + Building Code of Australia 2019 Amendment No. 1
- + Guide to the Building Code of Australia 2019 Amendment No 1.
- + Access to Premises Standards 2010
- + SSDA Architectural Drawing Nos. CHW-AR-DG-PSB-SSD000 (A), 001 (A), 002 (A), 003 (A), 004 (A), 005 (A), 010 (A), 011 (A), 012 (A), 013 (A), 014 (A), 015 (A), 016 (A), 017 (A), 018 (A), 019 (A), 020 (A), 021 (A), 022 (A), 023 (A), 024 (A), 030 (A), 031 (A), 035 (A), 036 (A) & 037 (A) prepared by Billard Leece Partnership.
- + SSDA Architectural Report prepared by Billard Leece Partnership dated 17 November 2020.

## A.5 REGULATORY FRAMEWORK

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Pursuant to clause 145 of the Environmental Planning and Assessment (EPA) Regulation 2000 all new building work must comply with the current BCA however the existing features of an existing building need not comply with the BCA unless upgrade is required by other clauses of the legislation.

## A.6 LIMITATIONS & EXCLUSIONS

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The limitations and exclusions of this report are as follows:

- + The following assessment is based upon a review of the architectural documentation.
- + The Report does not address matters in relation to the following:
  - + Local Government Act and Regulations.
  - + Occupational Health and Safety (OH&S) Act and Regulations.
  - + WorkCover Authority requirements.
  - + Water, drainage, gas, telecommunications and electricity supply authority requirements.
- + BM+G Pty Ltd do not guarantee acceptance of this report by Local Council, NSW Fire Brigades or other approval authorities.



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## A.7 TERMINOLOGY

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### *Accessible*

Means having features to enable use by people with a disability.

### *Accessway*

Means a continuous accessible path of travel (as defined by AS 1428.1) to, into or within a building.

### *Carpark*

Means a building that is used for the parking of motor vehicles but is neither a private garage nor used for the servicing of vehicles, other than washing, cleaning or polishing.

### *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.

### *Effective Height*

Means the vertical distance between the floor of the lowest storey included 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).

### *Exit*

Means

- a) Any, or any combination of the following if they provide egress to a road or open space:
  - i) An internal or external stairway.
  - ii) A ramp.
  - iii) A fire-isolated passageway.
  - iv) A doorway opening to a road or open space
- b) A horizontal exit or a fire isolated passageway leading to a horizontal exit

### *Fire Isolated Stairway*

Means a stairway within a fire resisting shaft and includes the floor and roof or top enclosing structure.



### *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 Resisting*

For the purposes of Volume One, applied to a building element, means having an FRL appropriate for that element.

### *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.

### *Flight*

Means that part of a stair that has a continuous series of risers, including risers of winders, not interrupted by a landing or floor.

### *Health-care building*

A building whose occupants or patients undergoing medical treatment generally need physical assistance to evacuate the building during an emergency and includes—

- (a) a public or private hospital; or
- (b) a nursing home or similar facility for sick or disabled persons needing full-time care;  
or
- (c) a clinic, day surgery or procedure unit where the effects of the predominant treatment administered involve patients becoming non-ambulatory and requiring supervised medical care on the premises for some time after the treatment.

### *Landing*

Means an area at the top or bottom of a flight or between two flights.

### *Loadbearing*

Means intended to resist vertical forces additional to those due to its weight.

### *Non-combustible*

Means

- a) Applied to a material – not deemed combustible as determined by AS 1530.1 – Combustibility Tests for Materials; and
- b) Applied to construction or part of a building – constructed wholly of materials that are not deemed combustible

### *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.

### *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 Solution*

*A method of complying with the Performance Requirements other than by a Deemed-to-Satisfy Solution.*

#### *Patient care area*

a part of a health-care building normally used for the treatment, care, accommodation, recreation, dining and holding of patients including a ward area and treatment area.

#### *Primary Building Element*

For the purposes of Volume One, means a member of a building designed specifically to take part of the loads specified in B1.2 and includes roof, ceiling, floor, stairway or ramp and wall framing members including bracing members designed for the specific purpose of action as a brace to those members.

#### *Performance Solution*

*A method of complying with the Performance Requirements other than by a Deemed-to-Satisfy Solution.*

#### *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).

#### *Self-closing*

For the purpose of Volume One, applied to a door, means equipped with a device which returns the door to the fully closed position immediately after each opening.

#### *Sole occupancy Unit (SOU)*

A room or other part of a building for occupation by one or joint owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant, or other occupier and includes a dwelling.

#### *Treatment area*

An area within a patient care area such as an operating theatre and rooms used for recovery, minor procedures, resuscitation, intensive care and coronary care from which a patient may not be readily moved.

#### *Ward area*

That part of a patient care area for resident patients and may contain areas for accommodation, sleeping, associated living and nursing facilities.



## B. BUILDING CHARACTERISTICS

### B.1 BUILDING CLASSIFICATION

The following table presents a summary of relevant building classification items of the proposed PSB:

+ <b>BCA Classification:</b>	Class 9a (Health-care Building) Class 5 (professional consultation) Class 7a (car parking) Class 3 (overnight accommodation rooms)
+ <b>Storeys Contained</b>	Fifteen (15)
+ <b>Rise in Storeys:</b>	Fifteen (15)
+ <b>Effective Height:</b>	> 50m
+ <b>Type of Construction:</b>	Type A Construction
+ <b>Sprinkler System Installed Throughout</b>	Yes – New building is proposed to be protected throughout with an Automatic Fire Suppression System
+ <b>Importance Level</b>	Importance Level 4
+ <b>Climate Zone:</b>	Energy Efficiency Zone 6
+ <b>Maximum Floor Area:</b>	Max 5,000m <sup>2</sup> compartments for Class 9a Health Care buildings. Note: 2,000m <sup>2</sup> compartments applies to all Patient Care Areas within the building.
+ <b>Maximum Volume:</b>	Max 30,000m <sup>3</sup> compartments for Class 9a Health Care buildings.
+ <b>Largest Fire Compartment</b>	To be confirmed upon development of Schematic Architectural Design

Table No. 1 – Summary of building classification items





## C. BCA ASSESSMENT

### C.1 BCA DEEMED-TO-SATISFY COMPLIANCE ISSUES:

The following comments have been made in relation to the relevant BCA compliance issues associated with the proposed Paediatric Services Building (PSB) as part of the Children's Hospital at Westmead redevelopment.

#### SECTION B - STRUCTURE

##### 1. Part B1 – Structural Provisions

Structural engineering details prepared by an appropriately qualified structural engineer to be provided to demonstrate compliance with Part B1. This will include the following Australian Standards (where relevant):

1. AS 1170.0 – 2002 General Principles
2. AS 1170.1 – 2002, including certification for balustrading (dead and live loads)
3. AS 1170.2 – 2002, Wind loads
4. AS 1170.4 – 2007, Earthquake loads
5. AS 3700 – 2001, Masonry code
6. AS 3600 – 2018, Concrete code
7. AS 4100 – 1998, Steel Structures and/or
8. AS 4600 – 2005, Cold formed steel.
9. AS 2047 – 1999, Windows in buildings.
10. AS 1288 – 2006, Glass in buildings.

The new PSB will be required to be designed and constructed in accordance with the requirements of Importance Level 4 (post disaster operations) including structure and services as detailed in Clause B1.2 of the BCA.

#### SECTION C – FIRE RESISTANCE

##### 2. Clause C1.1 – Type of Construction Required

The new building elements will be required to be constructed in accordance with the FRL's detailed in Table 3 of Specification C1.1 for Type A Construction (refer to table below).

TYPE A CONSTRUCTION		
BUILDING ELEMENT	Class 5 & 9a	
<b>EXTERNAL WALL</b> (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 –  <i>For load bearing parts-</i> less than 1.5m 1.5m to less than 3m 3m or more  <i>For non-load bearing parts-</i> less than 1.5m 1.5m to less than 3m 3m or more		
	120/120/120	180/180/180
	120/90/90	180/180/120
	120/60/30	180/120/90
	-/120/120	-/180/180
	-/90/90	-/180/120
	-/-/-	-/-/-
<b>EXTERNAL COLUMN</b> not incorporated in an external wall, where the distance from any fire source feature to which it is exposed is –		



Less than 3m		
3m or more	120/-/- -/-/-	180/-/- -/-/-
<b>COMMON WALLS &amp; FIRE WALLS</b>	120/120/120	180/180/180
<b>INTERNAL WALLS</b>		
Fire Resisting lift and stair shafts –		
Loadbearing	120/120/120	180/120/120
Non-loadbearing	-/120/120	-/120/120
Ventilating, pipe, garbage, and the like shafts not used for the discharge of hot products of combustion –		
Loadbearing	120/90/90	180/120/120
Non-loadbearing	-/90/90	-/120/120
<b>OTHER LOADBEARING INTERNAL WALLS &amp; COLUMNS</b>	120/-/-	180/-/-
<b>FLOORS</b>	120/120/120	180/180/180
<b>ROOF</b>	120/60/30	180/60/30

Table No. 2 – Required FRL's for building elements

### 3. Clause C1.9 – Non Combustible Building Elements

In a building required to be constructed of Type A Construction, external walls and all components incorporated in them including façade covering, framing, sarking and insulation etc are required to be constructed of non-combustible construction.

In this instance any proposed panels to be used on the external walls of the building will be required to comply with the requirements of Clause C1.9 i.e. single piece of pre-finished metal sheeting having a combustible surface finish not exceeding 1mm thickness and where the Spread of Flame Index of the product is not greater than 0.

*Note: No form of Aluminium Composite Panel can be installed on the external façade of the building.*

### 4. Clause C2.2 – General Floor Area and Volume Limitations

The maximum size of any fire compartment with a Class 9a cannot exceed 5,000m<sup>2</sup> & 30,000m<sup>3</sup>.

The maximum size of the fire compartment containing the Class 6 retail space cannot exceed 5,000m<sup>2</sup> & 30,000m<sup>3</sup>.

Note: the size of fire compartments within patient care areas is limited to a maximum of 2,000m<sup>2</sup>.

### 5. Clause C2.5 – Class 9a Buildings

Fire & Smoke separation is to be as per BCA specifications C2.5 and C3.4.

Patient care areas are required to be separated into fire compartments with a maximum floor area of 2,000m<sup>2</sup> with fire walls having a minimum FRL of 120/120/120.

Ward and Treatment Areas are required to be designed in accordance with the following table.



Area Use		Max. Compartment Size		
Patient Care Area (max 2,000m <sup>2</sup> )	Ward Area	Where total floor area is <u>less</u> than 500m <sup>2</sup> :	Where total floor area is <u>greater</u> than 500m <sup>2</sup> , but <u>less</u> than 1000m <sup>2</sup> :	Where total floor area is <u>greater</u> than 1000m <sup>2</sup> :
		Separate from other areas with Smoke Walls	Separate with smoke walls into areas less than 500m <sup>2</sup>	Separate with smoke walls with an FRL of not less 60/60/60 into areas less than 1000m <sup>2</sup>
	Treatment Area	Where total floor area is <u>less</u> than 1000m <sup>2</sup> :	Where total floor area is <u>greater</u> than 1000m <sup>2</sup> :	
		Separate from other areas with Smoke Walls	Separate with smoke walls into areas less than 1000m <sup>2</sup>	
	Note: Walls identified above which are required to achieve an FRL or be smoke separated must be of non-combustible construction i.e. no timber framed stud walls.			

Table No. 3 – Required fire and smoke compartmentation for patient care areas

It is considered likely that fire and smoke compartment sizes throughout patient care areas will in a number of circumstances exceed the maximum limitations of Clause C2.5 in order to for the building design to align with clinical planning requirements of the 'Sydney Children's Hospital Network'.

Any excessive fire and smoke compartment sizes will be assessed as part of a Fire Engineering Performance Assessment to be undertaken by Mott MacDonald in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

All excessive compartment sizes will need to be reviewed by BM+G and Mott MacDonald to ensure that they are within acceptable fire engineering analysis limitations. This will be undertaken and completed as part of the s6.28 Crown Certification process following SSDA Approval.

## 6. Clause C3.3 – Separation of External Walls and Other Openings in Different Fire Compartments

Where an internal fire wall intersects at the junction of an external wall, the external walls of the different compartments and any associated openings that are exposed to one another are required to be protected in accordance with Clause C3.3.

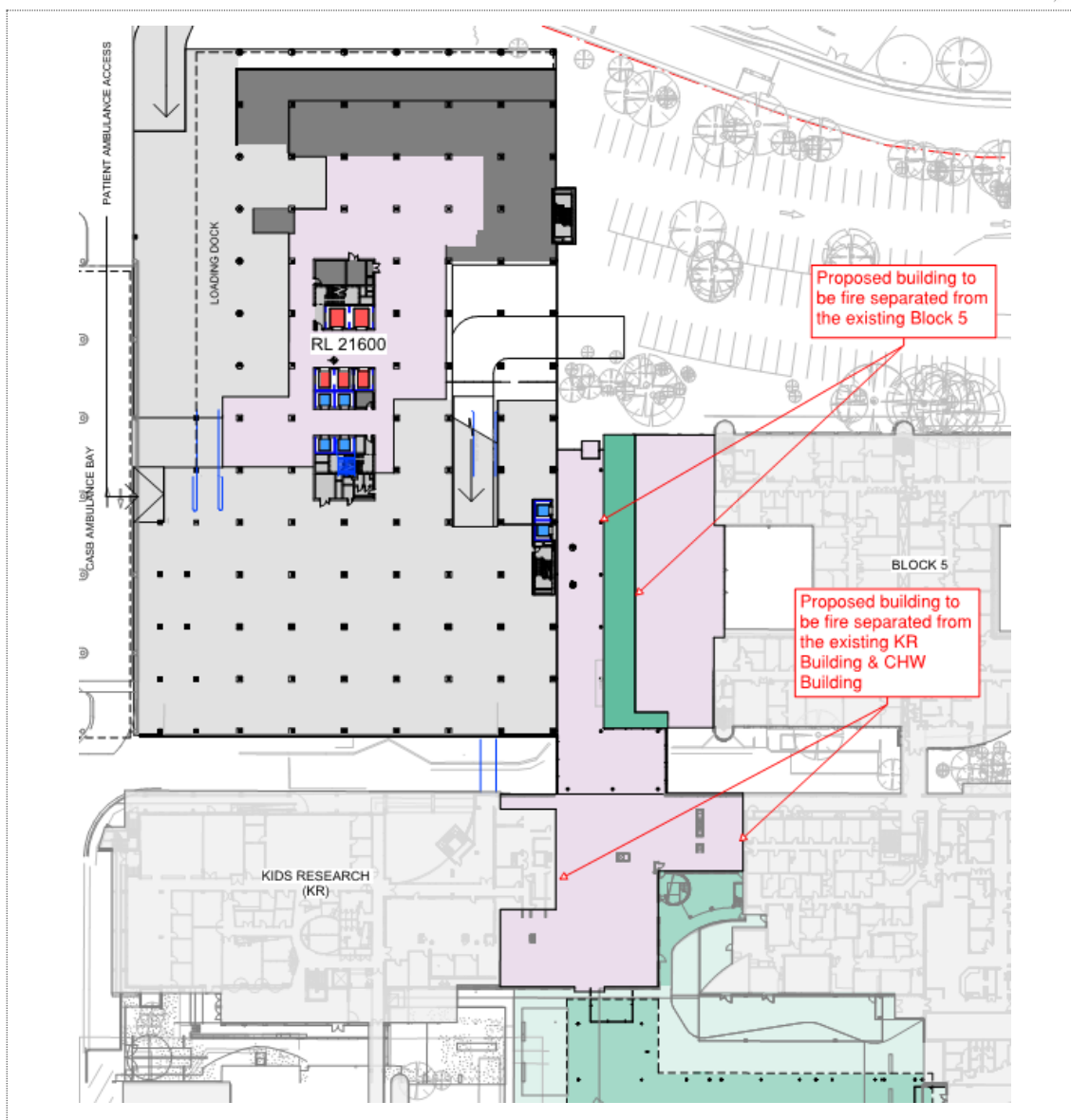
There are numerous locations throughout the building where exposure occurs between external walls and their associated openings of difference fire compartments.

The subject external walls and openings will be assessed as part of a Fire Engineering Performance Assessment to be undertaken by Mott MacDonald in order to demonstrate compliance with the nominated Performance Requirements of the BCA. This will be undertaken and completed as part of the s6.28 Crown Certification process following SSDA Approval.

### Separation of PSB from Adjoining Hospital Buildings

The new PSB will be required to be adequately fire and smoke separated from all existing hospital buildings that are directly connected to the PSB via enclosed linkways, walkways and Kids Way Atrium Structure. In this instance adequate fire separation will be required to be provided at the interface between the PSB and the existing CASB, KRI and Children's Hospital Buildings.

All new linkways, enclosed corridors, atrium structures will be assessed as part of the PSB and will be required to be adequately fire and smoke separated from the existing hospital buildings



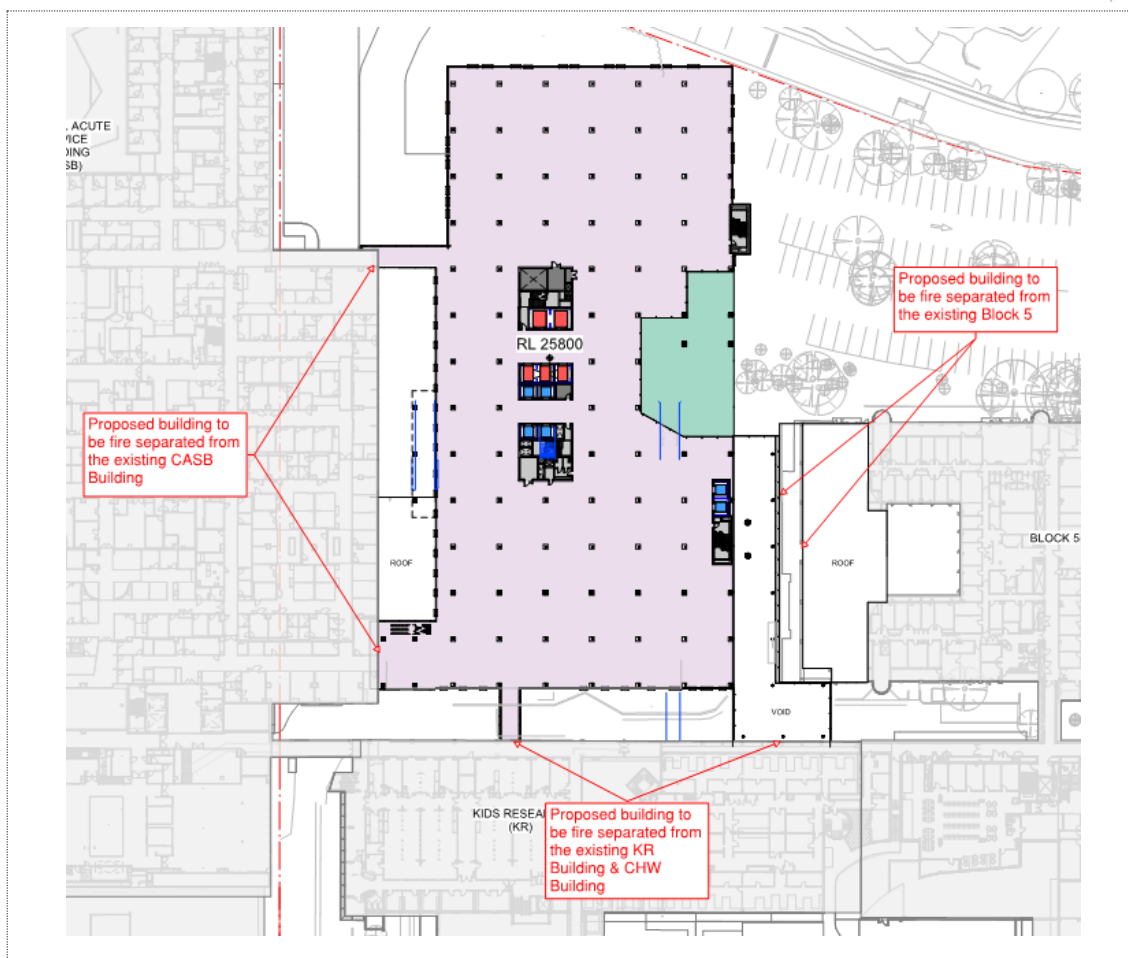


Figure No. 2 – Required separation of PBS from existing adjoining Hospital Buildings on Levels 02 & 03

## **SECTION D - ACCESS & EGRESS**

### **7. Clause D1.2 – Number of Exits Required**

A minimum of two (2) exits (in addition to any horizontal exit) must be provided from each part of each storey within the building based on the building having an effective height greater than 25m.

### **8. Clause D1.3 – When Fire Isolated Stairs are Required**

All stairways serving the PSB will be required to be fire isolated stairways.

Non-fire isolated stairways are permitted to be located within non patient care areas if they do not connect more than 3 storeys and a fire and smoke separated from patient care areas.

### **9. Clause D1.4 – Exit Travel Distances**

Egress travel distances from all areas used by patients must be within a maximum distance of 12m to an exit or to a point of choice of two alternative exits in which case a maximum travel distance of 30m is permitted to the nearest exit.

Egress from the non-patient care areas is permitted to extend to 20m to a point of choice and a maximum distance of 40m to an alternative exit.

It is noted that it is likely having regard to the need to design the building to align with clinical planning requirements of the SCHN that travel distance to a point of choice and to an alternative exit throughout the building will exceed the DtS Provisions.

The extended travel distances will be assessed as part of a Fire Engineering Performance Assessment to be undertaken by Mott MacDonald in order to demonstrate compliance with the nominated Performance Requirements of the BCA. This will be undertaken and completed as part of the s6.28 Crown Certification process following SSDA Approval.



#### **10. Clause D1.5 – Distances Between Alternative Exits**

The maximum travel distance between alternative exits from within patient areas cannot exceed 45m.

The maximum travel distance between alternative from non patient care areas is 60m.

It is noted that it is likely having regard to the need to design the building to align with clinical planning requirements of the SCHN that travel distance between alternative exits throughout the building will exceed the DtS Provisions.

The extended travel distances will be assessed as part of a Fire Engineering Performance Assessment to be undertaken by Mott MacDonald in order to demonstrate compliance with the nominated Performance Requirements of the BCA. This will be undertaken and completed as part of the s6.28 Crown Certification process following SSDA Approval.

#### **11. Clause D1.7 – Travel via Fire Isolated Exits**

The fire isolated exits serving the PSB will be required to be designed in a manner whereby they discharge directly to open space.

It is noted that there are three (3) fire isolated stairways that discharge on Level 01 that do not discharge directly to open space but rather within the building envelope.

The discharge of the fire isolated stairways will be assessed as part of a Fire Engineering Performance Assessment to be undertaken by Mott MacDonald in order to demonstrate compliance with the nominated Performance Requirements of the BCA. This will be undertaken and completed as part of the s6.28 Crown Certification process following SSDA Approval.

#### **12. Clause D1.11 – Horizontal Exits**

A technical non-compliance will occur in terms of travel via horizontal exits from within fire compartments within building. In accordance with the BCA, a horizontal exit may be counted as a required exit if the path of travel from a fire compartment leads by one or more horizontal exits directly into another fire compartment which has at least one required exit which is not a horizontal exit.

Having regard to the proposed design, there will be instances whereby occupants will egress from one compartment into an adjoining compartment which will not be provided with direct access to a fire isolated stairway or exit discharging directly to open space.

The proposed design will be assessed as part of a Fire Engineering Performance Assessment to be undertaken by Mott MacDonald in order to demonstrate compliance with the nominated Performance Requirements of the BCA. This will be undertaken and completed as part of the s6.28 Crown Certification process following SSDA Approval.

#### **13. Clause D1.12 – Non required stairways, ramps and escalators**

The proposed non-required non-fire isolated stairway situated within the Kids Way Atrium area which connects Levels 2 – 3 is permitted in accordance with the DtS Provisions subject to all patient care areas being fire separated from the front of house area in which the open stairway directly connects.

No patient care areas can be directly connected to or open onto the front of house area without being fire separated.

The discharge of horizontal exits into the front of house area occupied by the non-required non-fire isolated stairway and void will be required to be assessed as part of the Fire Engineering Strategy developed for the building. This will be undertaken and completed as part of the s6.28 Crown Certification process following SSDA Approval.

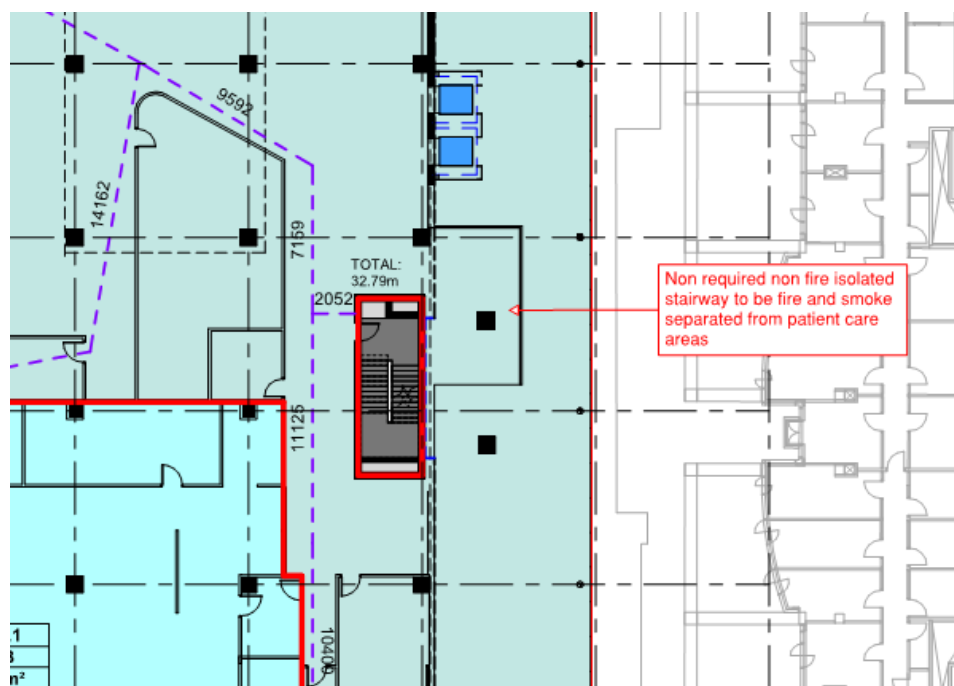


Figure No. 3 – Non required non-fire isolated stairway within the Kids Atrium connecting Levels 02 & 03

#### 14. D3 – Access Requirements for People with Disabilities

Access for a person with a disability will be required to be provided from the allotment boundary along with the new multi storey car park (and any accessible car parking spaces associated with the new PSB) to and within the new PSB and interconnected buildings.

Access will also be required to be provided to and from all existing adjoining buildings that are interconnected via the new linkways to the new PSB. This will in essence ensure the design satisfies the requirements of the DDA.

The design at present is capable of complying with the requirements pertaining to access for a person with a disability.

Access for persons with disabilities must be provided, at a minimum, to and within all areas normally used by the occupants. This includes to and within all beds, throughout all patient care areas, staff areas and communal areas.

Access need not be provided to:

- + An area where access would be inappropriate because of the particular purpose for which the area is used.
- + An area that would pose a health or safety risk for people with a disability.
- + Any path of travel providing access only to an area exempted by (a) or (b).

### SECTION E – SERVICES AND EQUIPMENT

#### 15. Part E1 – E4 – Essential Fire Safety Measures

The following essential fire safety measures are required to be installed within the building based on an effective height greater than 50m:

Essential Fire and Other Safety Measures	Standard of Performance
Access Panels, Doors & Hoppers	BCA Clause C3.13 AS 1530.4 - 2005
Alarm Signalling Equipment	AS1670.3 – 2004



Essential Fire and Other Safety Measures	Standard of Performance
Automatic Fail Safe Devices	BCA Clause D2.21
Automatic Fire Detection & Alarm System	BCA Spec. E2.2a AS 1670.1 - 2018.
Automatic Fire Suppression System	BCA Spec. E1.5 AS2118.1 - 2017
Emergency Lighting	BCA Clause E4.4 AS/NZS 2293.1 - 2018
Emergency Lifts	BCA Clause E3.4 AS 1735.2 - 2001
Emergency Evacuation Plan	AS 3745 - 2002
Emergency Warning & Intercommunication System	BCA Clause E4.9 AS 1670.1 - 2018
Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 AS/NZS 2293.1 – 2018
Fire Dampers	BCA Clause C3.15 AS/NZS 1668.1 - 2015 AS 1682.1 & 2 – 2015
Fire Doors	BCA Clause C2.12, C2.13, C3.5, C3.7, C3.8 AS 1905.1 – 2015
Fire Hose Reels	BCA Clause E1.4 AS 2441 – 2005
Fire Hydrant Systems	Clause E1.3 AS 2419.1 - 2005
Fire Seals	BCA Clause C3.15 AS 1530.4 – 2014 AS 4072.1 – 2005
Fire Walls	BCA Spec. C1.1
Lightweight Construction	BCA Clause C1.8 & AS 1530.4 – 2014
Manual Call Points	BCA Section E
Mechanical Air Handling Systems (automatic shutdown)	BCA Clause E2.2 AS/NZS 1668.1 - 2015 AS 1668.2 – 2012





Essential Fire and Other Safety Measures	Standard of Performance
Paths of Travel	EP & A Regulation Clause 186
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
Pressurisation Systems (Fire Isolated Stairways and associated Passageways)	BCA Clause E2.2 AS/NZS 1668.1 - 2015 AS 1668.2 – 2012
Required Exit Doors (power operated)	BCA Clause D2.19(d)
Smoke Dampers	AS/NZS 1668.1 – 2015 AS 1682.1 & 2 – 2015
Smoke Doors	BCA Spec. C3.4 & C2.5
Smoke Seals	BCA Spec C3.4
Smoke Walls	BCA Spec. C2.5
Smoke Hazard Management System – (Zone Smoke Control System)	BCA Clause E2.2, AS/NZS 1668.1 - 2015 AS 1668.2 – 2012
Wall-Wetting Sprinklers	BCA Clause C3.4 AS 2118.2 – 2010
Warning & Operational signs	Section 183 of the EP & A Regulations 2000 BCA Clause D2.23, E3.3 AS 1905.1 – 2015

Table No. 4 – Required essential fire safety measures

## 16. Clause E1.3 – Fire Hydrants

A fire hydrant service is required to be provided throughout the entire building. The system will be required to be designed in accordance with AS 2419.1 – 2005.

### *System Performance*

Based on the fact that the building contains 3 storeys or more together with the fact that the Fire Compartments will exceed 500m<sup>2</sup>, the maximum number of fire hydrants that are required to flow simultaneously is 2 in accordance with Table 2.1 of AS 2419.1 – 2005.

Having regard to the above, the hydraulic consultant is to provide confirmation that the flow rate of the hydrant system has been designed for the required number of hydrants simultaneously flowing at the appropriate flow rate i.e. 2 hydrants flowing simultaneously at 10 l/s which equates to a minimum flow rate of 20 l/s.

### *System Design*

Due to the fact that the building has an effective height greater than 25 m, the following additional provisions are required to be provided as part of the fire hydrant system design:

- + Provision of on-site water storage tanks to meet the minimum capacity as required by Clause 4.3 of AS 2419.1 – 2015.



- + Provision of a fire hydrant ring main (incorporated as part of the combined fire sprinkler and fire hydrant system).

### Fire Hydrant Booster

A fire hydrant booster needs to be located in a manner where it is within sight of the main entrance of the building and adjoins a primary vehicular entrance and is situated within 8m of a hardstand access to permit Brigade access.

In this regard it is noted that FRNSW access to the site is typically from either Redbank Road to the rear of the proposed development or via the main entry off Hawkesbury Road. A new fire hydrant booster will be required to be provided for the PSB. We note that the site has an existing booster and fire control centre (located from the Hawkesbury Road side) which will likely be re-positioned as part of the proposed works to align with the proposed booster location due to the fact that the main entry / access will be impacted by the new KIDSPARK forecourt which will prevent access to the existing booster.

The proposal for a rear booster position does align with the recently completed Central Acute Services Building (CASB) located adjacent to the proposed PSB.

The location of the booster in terms of proximity and sight to the main entrance of the building will be required to be assessed as part of the Fire Engineering Assessment to be undertaken by Mott MacDonald in order to demonstrate compliance with the nominated Performance Requirements of the BCA. This will be undertaken and completed as part of the s6.28 Crown Certification process following SSDA Approval.

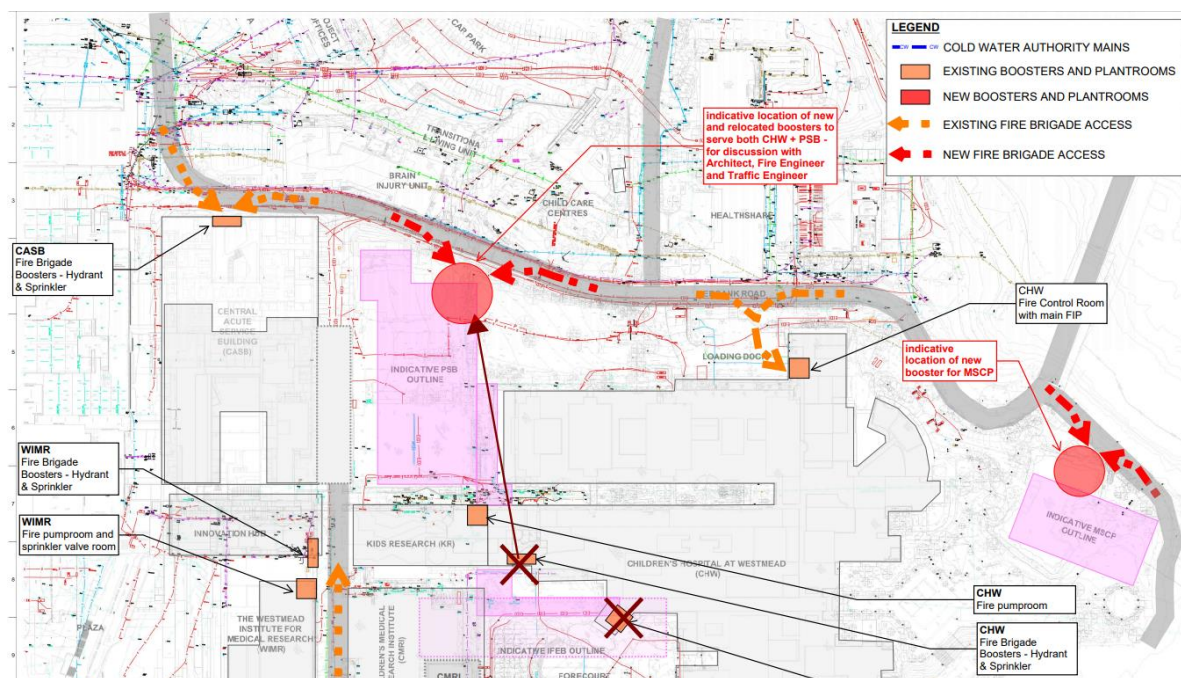


Figure No. 4 – Indicative location of fire hydrant booster serving the proposed PSB

## 17. Clause E1.5 – Sprinklers

An Automatic Fire Suppression System will be required to be installed throughout the entire PSB. It is understood that the sprinkler system is being design as part of a combined Sprinkler and Fire Hydrant System designed in accordance with AS 2118.6 – 2012 and AS 2118.1 – 2017.

### System Design

Due to the fact that the building has an effective height exceeding 25m & 50m, the following additional measures are required to be installed as part of the Automatic Fire Suppression System installation:



- + Provision of a Grade 1 Water Supply; and
- + Provision of on-site water storage tanks.

#### *Fire Sprinkler Booster*

A fire sprinkler booster needs to be located in a manner where it is within sight of the main entrance of the building and adjoins a primary vehicular entrance and is situated within 8m of a hardstand access to permit Brigade access.

In this regard it is noted that FRNSW access to the site is typically from either Redbank Road to the rear of the proposed development or via the main entry off Hawkesbury Road. A new fire sprinkler booster will be required to be provided for the PSB. We note that the site has an existing booster and fire control centre (located from the Hawkesbury Road side) which will likely be re-positioned as part of the proposed works to align with the proposed booster location due to the fact that the main entry / access will be impacted by the new KIDSPARK forecourt which will prevent access to the existing booster.

The proposal for a rear booster position does align with the recently completed CASB located adjacent to the proposed PSB.

The location of the booster in terms of proximity and sight to the main entrance of the building will be required to be assessed as part of the Fire Engineering Assessment to be undertaken by Mott MacDonald in order to demonstrate compliance with the nominated Performance Requirements of the BCA. This will be undertaken and completed as part of the s6.28 Crown Certification process following SSDA Approval.

### **18. Clause E1.8 – Fire Control Centres**

Due to the building having an effective height greater than 50m, a dedicated fire control room must be constructed as a separate room that is fire separated from the remainder of the building with two points of access (if installed within the building).

It is understood that existing fire control room will be relocated as part of the construction of the PSB. The location of the fire control centre remote from the building will be a technical non-compliance and will be required to be assessed as part of the Fire Engineering Assessment to be undertaken by Mott MacDonald in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

### **19. Clause E2.2 – Smoke Hazard Management**

In terms of the requirements for smoke hazard management throughout the building, the following key items are noted:

#### *Automatic Fire Detection & Alarm System*

An Automatic Fire Detection & Alarm System is required to be installed throughout the building in accordance with AS 1670.1 - 2018. Photoelectric type smoke detectors are required to be installed in patient care areas and in paths of travel to exits from patient care areas.

Manual call points are required to be installed in evacuation routes so that no point on a floor is more than 30m from a manual call point.

#### *Zone Smoke Control System*

A Zone Smoke Control System is required to be installed throughout the PSB having regard to the fact that the building has an effective height exceeding 25m.

The Zone Smoke Control System will be required to be designed in accordance with Table E2.2a and AS 1668.1 – 2015.

*Note: Pressure differential requirements are only required to be achieved between vertically separated fire compartments.*



### *Smoke Exhaust System*

If the Kids Way Atrium structure which contains Class 6 retail spaces has a floor area exceeding 2,000m<sup>2</sup>, then a smoke exhaust system will be required to be provided to the atrium structure in accordance with Specification E2.2b and AS 1668.1.

### *Mechanical Air Handling Systems*

Any air-handling system which does not form part of the Zone Smoke Control System (other than non-ducted systems with a capacity not more than 1000 litres/second, systems serving critical treatment areas and miscellaneous exhaust air system installed in accordance with Sections 5 and 6 of AS/NZS 1668.1) must shut down automatically on the activation of the Automatic Fire Detection & Alarm System and Automatic Fire Suppression System.

### *Fire Isolated Stairway Pressurisation*

Each of the fire isolated stairways are required to be provided with a system of Stairway Pressurisation in accordance with AS 1668.1 – 2015. The pressurisation system is required to be extended throughout the entire fire isolated stairway system.

### *Fire Indicator Panels*

For any buildings which are physically connected to the new tower via direct internal connections or alternatively via enclosed link ways etc there will be a requirement for connectivity between the FIP's between the buildings so that staff can be made aware of the fact that there may be a fire related emergency in the adjoining building.

## **20. Clause E3.4 – Emergency Lifts**

A minimum of two (2) Emergency Lifts are required to serve each level of the building that are served by passenger lifts.

## **21. Clause E4.9 – Emergency Warning & Intercom Systems**

An Emergency Warning & Intercom System (EWIS) is required to be installed throughout the entire building in accordance with AS 1670.4 – 2018.

It is noted that all external areas from which an occupant is required to re-enter the building (e.g. courtyards, balconies, terraces etc.) are also required to be provided with compliant EWIS speakers to ensure that occupants in external areas are aware of the activation of the fire alarm system.

It is noted that EWIS speakers are proposed to be rationalised within ward and treatment rooms including patient bedrooms, operating theatres and other sensitive environments where the activation of the speaker within the room may cause trauma to the patient.

The rationalisation of EWIS system from within patient care areas is noted and will be required to be assessed as part of the Fire Engineering Assessment undertaken by Mott MacDonald in order to demonstrate compliance with the nominated Performance Requirements of the BCA. This will be undertaken and completed as part of the s6.28 Crown Certification process following SSDA Approval.

Speakers will be required to be provided to all corridors and other rooms within Patient Care Areas etc where the omission is not addressed as part of the Fire Engineering Assessment.

## **SECTION F – HEALTH & AMENITY**

## **22. Clause F2.3 – Facilities in Class 3 to 9 Buildings**

The Class 9a facility is required to have:

- + Kitchen facilities
- + Laundry facilities
- + A shower for each 8 patients or part thereof
- + One island-type plunge bath in each storey containing Ward Areas



### Required Sanitary Facilities

- + BCA2019 Part F requires sanitary facilities with the Class 9a facilities as follows: -

#### (a) Facilities for Staff: -

Toilet facilities for staff are to be provided in accordance with the following: -

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Male Employees	1-20	1	1	0	1-30	1
			11-25	1		
	>20	Add 1 per 20	26-50	2	>30	Add 1 per 30
			>50	Add 1 per 50		
Female Employees	1-15	1	N/A		1-30	1
	> 15	Add 1 per 15			> 30	Add 1 per 30

Table No. 5– Sanitary facilities required for staff members

#### (b) Facilities for Patients:

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Male Patients	1-16	1			1-8	1
	> 16	Add 1 per 16			>8	Add 1 per 8
Female Patients	1-16	1			1-8	1
	> 16	Add 1 per 16			> 8	Add 1 per 8

Table No. 6– Sanitary facilities required for patients

## 23. Clause F2.3 – Facilities in Class 3 to 9 Buildings

Facilities for a person with a disability must be provided in accordance with the following:

- + Accessible sanitary facilities for use by a person with a disability are required to be provided on each floor adjacent to a bank of male and female sanitary facilities.
- + Where more than 1 bank of sanitary compartments containing male and female sanitary compartments is provided on a level, an accessible unisex facility must be provided at not less than 50% of those banks.

*Note: -*

*Ensuites associated with beds in Ward Areas are not required to be accessible wc's in accordance with AS 1428.1.*

- + Within each bank of male and female sanitary facilities, an ambulant sanitary compartment must be provided for each sex for use by a person with an ambulant disability.
- + The design should allow for the following for patients / members of the public on each level of the building having regard to the size and layout of each floor:
  - + A suitable number of unisex accessible sanitary facilities distributed throughout the floor so that all patients / members of the public have access to
  - + A suitable number of unisex ambulant sanitary compartments distributed throughout the floor.

*Note 1: The provision of unisex ambulant sanitary compartments will require to be assessed as a Performance Solution.*

*Note 2: The accessible sanitary facilities should be a mix of LH and RH installations throughout.*



- + The design is to allow adequate provision of accessible sanitary facilities for members of staff on each level of the building have regard to the size and layout of each floor:
- + A suitable number of unisex accessible sanitary facilities distributed throughout the floor
- + A suitable number of unisex ambulant sanitary compartment available for staff use.

*Note 1: The provision of unisex ambulant sanitary compartments will be required to be assessed as a Performance Solution.*

#### **24. Clause F4.1 – Provision of Natural Light**

Natural light is required to be provided to all ward areas used for sleeping purposes.

Natural light is technically required to be provided to all overnight rooms that are used by family members and staff.

The provision of natural light to existing buildings that the new PSB adjoins in close proximity will be reviewed to ensure that there is no detrimental impact on the provision of natural light.

### **SECTION G – ANCILLARY PROVISIONS**

#### **25. Part G3 – Atrium Construction**

The Atrium Provisions of Part G3 will not be applicable to the proposed atrium formed between Levels 02 – 04 based on the fact that the atrium connects only three (3) storeys with each storey provided with an Automatic Fire Suppression System and one of the storeys is situated at a level at which there is direct egress to a road or open space.

The Atrium structure cannot contain any patient care areas located within it and will be required to be adequately fire and smoke separated from all patient care areas on Levels 02 – 04.

### **SECTION J – ENERGY EFFICIENCY**

#### **26. Parts J1 – J8**

The energy efficiency provisions of Section J are applicable to the new PSB.

In this regard Parts J1 - Building Fabric, J3 - Building Sealing, J5 Air Conditioning and Mechanical Ventilation, Part J6 - Artificial Lighting and Power, and Part J7 - Hot water supply & Part J8 – Access for Maintenance is required to be provided.

If the proposed design will not comply with the DtS provisions of the BCA, then a JV3 Assessment will be required to be undertaken to demonstrate compliance with the Performance Requirements of the BCA.



## D. CONCLUSION

This report contains a preliminary BCA2019 Amendment 1 and Access to Premises Standards 2010 assessment of the SSDA Architectural Documentation for the new PSB at The Children's Hospital Westmead.

Further reviews will be undertaken by Blackett Maguire + Goldsmith and Mott MacDonald as the Architectural Design progresses to ensure that the development is capable of complying the requirements of the Building Code of Australia.

Once the design has developed to a stage where specific non compliances have been identified with the design, preliminary consultation will be undertaken with FRNSW to ensure that the proposed design meets the operational requirements of the Brigades.

Arising from our assessment we are satisfied that the project design can satisfy the requirements of the BCA2019 Amendment 1 if the works are designed and constructed in accordance with the requirements of the BCA and associated Australian Standards and that there are no non-compliances identified within the SSDA Architectural Documentation that require modification that would render the design not consistent with the approved Development Consent to be issued by the Consent Authority.