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17 March 2021

**Our Ref:** ACT20061 DA Letter  
**Revision:** Rev A  
**Subject:** Canberra Hospital Expansion Project (CHEP)- Building 5, The Canberra Hospital (TCH) – Development Application Fire Engineering Review Letter  
**Address:** Yamba Drive, Garran, ACT  
**Site:** Block 1, Section 58, Garran  
**Building owner:** Canberra Health Services | ACT Health Directorate

Dear Tino,

### Introduction

Lit Consulting has been engaged as the fire safety engineers for the Canberra Hospital Expansion (CHE) Project, The Canberra Hospital, Garran, ACT.

The purpose of this letter is to confirm that the fire engineering performance solutions identified by the design team to date can be supported without major changes to the proposed DA design (subject to authority approvals). The details of the proposed performance solutions are subject to the outcome of a fire engineering assessment to be carried out during the detailed design stage. A fire engineering brief with stakeholders including the ACT Fire & Rescue has not been undertaken.

The performance solutions will be documented in a fire engineering report for submission to the relevant approval authorities during detailed design.

### Building description

The building will comprise 9 storeys of healthcare and associated uses. The new CHE Project will connect to the existing Building 1 and 2 via an enclosed link bridge at Level 3, and a semi-enclosed link located at Level 2 (natural ground level). The main entrance to CHE will be via Hospital Road. A helipad will be located on the roof adjacent to mechanical plant equipment. The building will be located on The Canberra Hospital Campus along Hospital Road and has an effective height of greater than 25m.

The documentation assessed is listed in Appendix A. The review was undertaken at the request of Multiplex.

The intent of the review was to determine whether the proposed design can be demonstrated to achieve compliance with the performance requirements of the National Construction Code 2019 Volume One Amendment One (NCC) Building Code of Australia (BCA) (Australian Building Codes Board, 2020) without major changes to the proposed development application (DA) design.

A summary of the main building characteristics for the purpose of determining compliance with the BCA is given in the table below<sup>1</sup>. Only the characteristics for the areas within the scope of works are included in this table.

Characteristic	BCA clause	Description		
<b>Type of construction</b>	C1.1	Type A		
<b>Effective height</b>	A1.1	Approximately 35.35m (greater than 25m)		
<b>Rise in storeys</b>	C1.2	9		
<b>Storeys contained</b>	-	9		
<b>Classification</b>	Part A6	Level 1	Loading dock	7b / 8
			Plant Space (Ancillary Use / Non Patient Care Areas)	9a
			Back of House Hospital (Ancillary Use / Non Patient Care Areas)	9a
		Level 2	Medical Imaging, Resus, emergency (Treatment Area / Patient Care Areas)	9a
			Retail Tenancy	6
		Level 3	Operating Theatres / Recovery (Treatment Area / Patient Care Areas)	9a
		Level 4	Plant Space (Ancillary Use / Non Patient Care Areas)	9a
			Administration Areas (Office space)	5
			Sterilisation areas (Ancillary Use / Non Patient Care Areas)	9a
			Café and associated terrace space (Occupiable Outdoor Space)	6
		Level 5	Ward Areas (Patient Care Areas) and terrace spaces (Occupiable Outdoor Space)	9a
		Level 6	6 Ward Areas (Patient Care Areas)	9a
		Level 7	Ward Areas (Patient Care Areas)	9a
Level 8	Plant Space (Ancillary Use / Non Patient Care Areas)	9a		

<sup>1</sup> Canberra Hospital Expansion Project – BCA 2019 Amendment 1 Compliance review, Revision 1, 23 February 2021, BCA Certifiers Australia

Characteristic	BCA clause	Description		
		Level 9	Helipad and Plant space (Ancillary Use / Non Patient Care Areas)	9a

### Required fire safety measures

A holistic overview of the preventative and protective measures that are must be provided in the building are described in the table below. It should be noted that this list is a high-level summary only and should be confirmed with the building certifier.

Fire safety system	Standard of performance
Automatic sprinkler system	BCA Clause E1.5 and AS 2118.1:2017
Emergency lighting	Part E of the BCA and AS 2293.1:2018
Exit and directional signs	Part E of the BCA and AS 2293.1:2018
Emergency warning and intercommunication system (EWIS)	Part E of the BCA and AS 1670.4:2018
Fire hydrant system with internal hydrants	BCA Clause E1.3 and AS 2419.1:2017 (via performance solution)
Fire and smoke rated construction	Part C of the BCA
Fire rated doorsets	Part C of the BCA and AS 1905.1-2015
Fire stopping of service penetrations	Part C of the BCA
Fire hose reel system	BCA Clause E1.4 and AS 2441-2005
Portable fire extinguishers	BCA Clause E1.6 and AS 2444-2001 and ACT Health Fire Protection Services Specification Standard Inclusions document (May, 2019)
Smoke detection system	BCA specification E2.2a and AS 1670.1:2018
Smoke doors	BCA Clause C2.5 and Specifications C2.5 and C3.4
Stair pressurisation system	Part E of the BCA and AS 1668.1:2015
Zone pressurisation system	Part E of the BCA and AS 1668.1:2015

## Identified performance solutions

The following potential performance solutions have been identified:

No	Description of Issue	BCA DTS Provision	Performance Requirements
1.	It is proposed to allow a reduction in FRLs from 4 and 3 hours for the class 7b/8 and class 6 parts of the building respectively to 2 hours	Clause C1.1 and specification C1.1	CP1 and CP2
2.	<p>The fire and smoke compartments of the building are permitted to be up to:</p> <p><b>Treatment areas</b></p> <ul style="list-style-type: none"> <li>2,185m<sup>2</sup> fire compartments instead of 2,000m<sup>2</sup></li> <li>1,120m<sup>2</sup> smoke compartments instead of 1,000m<sup>2</sup></li> </ul> <p><b>Ward areas</b></p> <ul style="list-style-type: none"> <li>620m<sup>2</sup> smoke compartment instead of 500m<sup>2</sup></li> <li>1,220m<sup>2</sup> 60/60/60 FRL fire zones instead of 1,000m<sup>2</sup></li> <li>2,185m<sup>2</sup> fire compartments instead of 2,000m<sup>2</sup></li> </ul>	Clause C2.5 and specification C2.5	CP2 and CP3
3.	Toughened glazing protected with either Tyco WS/CWS or Reliable WP56 wall wetting sprinklers are proposed to be provided to portions of fire walls on level 2 and level 3 adjacent to the void instead of fire rated construction.	Clause C2.5, C2.7 and Specification C1.1	CP2
4.	Openings on the link bridge are within 6m of the non-sprinklered Building 2 on level 2 and 3. Sprinkler protection is provided to both sides of the external walls of the link bridge instead wall wetting sprinklers to both buildings external walls (ie double-treatment to the link bridge instead of single treatment to both fire compartments).	Clauses C3.2 and C3.4	CP2
5.	Openings within external walls of adjacent fire compartments are within the distances in table C3.3 and are not fire rated or protected in accordance with clause C3.4.	Clauses C3.3 and C3.4	CP2
6.	Water filled metal pipes are proposed to be fire stopped in accordance with BCA Clause C3.15(a)(i) with the exception of the insulation criteria of the required FRL where there is likely to be combustible materials (ie. PVC pipes, electrical wiring, etc) located within 100mm of the pipes for a distance of 2m from the fire rated pipe penetrations.	Clause C3.15	CP2 and CP8

No	Description of Issue	BCA DTS Provision	Performance Requirements
7.	Toughened glazing protected with either Tyco WS/CWS or Reliable WP56 wall wetting sprinklers are proposed to be provided to portions of the fire-isolated stair 5 instead of fire rated construction on levels 2-4.	Clause D1.3 and Specification C1.1	CP2 and DP5
8.	It is proposed to omit a fire-isolated shaft to the open stair connecting the L3 operating theatres and L4 staffrooms.	Clause D1.3	CP2 and DP5
9.	The open stair connecting the L3 operating theatres and L4 staffrooms discharges occupants to a point that is up to 46m from a fire-isolated stairway instead of 30m.	Clause D1.9	DP4
10.	The open stair connecting the L3 operating theatres and L4 staffrooms is discontinuous – ie does not discharge occupant to a road or open space via its own flights and landings. The stairway requires occupants to discharge from the stairway and travel across the floor plate to a fire-isolated stairway to reach a road or open space.	Clause D1.9	DP4
11.	<p>The class 5, 6, 7b and 8 parts of the building incorporates the following extended travel distances:</p> <ul style="list-style-type: none"> <li>• Up to 30m to a point of choice instead of 20m.</li> <li>• Up to 70m between alternative exits in the tunnels instead of 60m.</li> </ul>	Clauses D1.4 and D1.5	DP4 and EP2.2
12.	<p>The class 9a parts of the building incorporates the following extended travel distances:</p> <ul style="list-style-type: none"> <li>• Up to 16m to a point of choice (ground floor consultation rooms).</li> <li>• Up to 17m to a point of choice from the MRI rooms.</li> <li>• Up to 40m to the nearest of two or more alternative exits.</li> <li>• Up to 70m between alternative exits (note some smoke walls will need to upgrade to be fire walls achieving a 60min fire rating and may also require some relocations – eg L3 grid 26-27).</li> </ul>	Clauses D1.4 and D1.5	DP4 and EP2.2
13.	The discharge point of fire isolated stairs requires occupants to pass within 6m of unprotected openings to reach road.	Clause D1.7	CP2, DP4 and DP5

No	Description of Issue	BCA DTS Provision	Performance Requirements
14.	Horizontal exits are counted as required exits, however they do not discharge occupants into a fire compartment that is provided with at least one non-horizontal exit.	Clause D1.11	DP4
15.	Sliding doors are provided within patient care areas which do not open directly to a road or open space.	Clause D2.19	DP2
16.	Several fire and smoke doors do not swing in the direction of egress. Note: this only applies to singular rooms or small areas where there is unlikely to be non-ambulant patients. All other fire and smoke doors in main thoroughfares are to swing in both directions.	Clause C2.5, D2.20 and specification C2.5	DP2
17.	The fire hydrant/sprinkler test and waste drains are proposed to be located within the fire isolated stairways, however are not technically considered 'water supply pipes for fire services' as required in clause C3.9.	Clause C3.9	CP2 and CP8
18.	Fire rated dampers tested to Australian Standards do not have the required performance functionality for the pressure relief requirements of a gas suppression system. It is proposed to allow EN1363.1 with reference to the specific use of the pressure relief vent within server room fire walls for ventilation of the room after the gas suppression system operates. Note: further information is required from WS&P on the proposed system. Also, this performance solution may only be required if the server room is provided with gas suppression instead of automatic sprinklers and is also fire separated from the remainder of the building.	Clause C3.15	CP2 and CP8
19.	Fire hydrant coverage is proposed to be achieved with two lengths of firefighting hose instead of a single 30m length from internal hydrants as required by AS 2419.1:2017. The maximum distance is approximately 50m – 55m (40m + 10m spray).	Clause E1.3	EP1.3
20.	Fire hydrant coverage is proposed to be omitted from the tunnel (fire-isolated passageways) which are more than 70m in length.	Clause E1.3	EP1.3
21.	The fire hydrant system may be designed in accordance with AS 2419.1:2017 instead of the BCA referenced AS 2419.1-2005.	Clause E1.3	EP1.3

No	Description of Issue	BCA DTS Provision	Performance Requirements
22.	Internal attack hydrant valves are permitted to be up to 6m from an exit instead of 4m.	Clause E1.3	EP1.3
23.	The FBBA is permitted to be more than 20m from the main pedestrian entrance to the building.	Clause E1.3	EP1.3
24.	Partial fire hydrant coverage of the helipad (level 9) is proposed to be from attack hydrant valves located at a different storey of which it is serving – ie at Level 8.	Clause E1.3	EP1.3
25.	Fire hose reels are permitted to further than 4m from an exit and may not be along paths of travel.	Clause E1.4	EP1.1
26.	Partial FHR coverage of the helipad (level 9) is proposed to be from FHRs located at a different storey of which it is serving – ie at Level 8.	Clause E1.4	EP1.1
27.	Fire hose reel coverage is omitted from small/singular rooms that are fire or smoke separated. Additional portable fire extinguishers are likely to be required.	Clause E1.4	EP1.1
28.	Fire hose reel coverage to portions of plant rooms require passing through fire barriers. Additional portable fire extinguishers are likely to be required.	Clause E1.4	EP1.1
29.	<p>The automatic sprinkler system is proposed to be installed in accordance with AS 2118.1:2017 Amdt 2 instead of AS 2118.1-2017 Amdt 1.</p> <p>Note: further information is required on the specific differences between Amdt 1 and 2. Additional information to be provided by WS&amp;P.</p>	Clause E1.5	EP1.4
30.	<p>Sprinkler coverage is omitted from high-level building overhangs, canopies or the like with a depth of more than 2.5m where there are no significant fire loads below.</p> <p>Note: clarification is required from WS&amp;P as to number and location of where these areas are.</p>	Clause E1.5	EP1.4
31.	<p>Class B monitored isolation valves are proposed to be provided in accordance with AS 2118.1:2017 with the monitored isolation valves being located within the fire-isolated stairways or within the pump room instead of a ceiling space, secure area or a room with access restricted by means of a security device or system.</p> <p>Note: this is not a common proposed performance solution and will rely on ACTF&amp;R support.</p>	Clause E1.5 and AS 2118.1:2017	EP1.3 and EP1.4

No	Description of Issue	BCA DTS Provision	Performance Requirements
32.	<p>Clause 6(a) of specification E1.5 of the BCA states that '<i>sprinkler alarm valves must be located in a secure room or enclosure which has direct egress to a road or open space.</i>'</p> <p>The combined sprinkler and hydrant system are proposed to incorporate flow control assemblies that are comparable in function to a single sprinkler system's alarm valve but are not the same pieces of equipment. Their locations at fire stair landings are compliant with AS 2118.6-2012.</p>	Clause E1.5	EP1.4
33.	<p>The stairway connecting the L3 operating theatres and L4 staffrooms is required to be a fire-isolated stairway, however due to L3 being open, stair pressurisation will not operate as intended.</p> <p>A performance solution is considered feasible to rationalise the requirement for stair pressurisation in the stairway connecting the L3 operating theatres and L4 staffrooms.</p> <p>Note: confirmation is required from the building certifier as to whether this needs to be assessed. Also confirmation from Multiplex/CHS as to whether this stair can be within a fire isolated shaft and pressurised.</p>	Table E2.2a	EP2.2
34.	<p>EWIS speakers are proposed to omitted from specific areas such as ICU, Operating theatres, birthing/nursery, and seclusion rooms within mental health areas.</p>	Clause E4.9	EP4.3
35.	<p>It is proposed to provide WIP handsets to the emergency control staff stations for use in an emergency instead of the requirement for them to be adjacent to the designated exits of each emergency zone.</p> <p>Note: this performance solution will rely on ACT Health and CHS emergency evacuation procedures and confirmation from them that this is appropriate.</p>	Clause E4.9	EP4.3
36.	<p>The fire hydrants, fire hose reels, portable fire extinguishers and manual call points are located in locked cupboards.</p>	Clauses E1.3, E1.4 and E1.6 and Clause 4 of specification E2.2a	EP1.1, EP1.2, EP1.3, EP2.2 and EP4.3



## Conclusion

It is our opinion that the identified fire engineering performance solutions can be supported without major changes to the proposed DA design (subject to authority approvals). The details of the proposed performance solutions are subject to the outcome of a fire engineering assessment to be carried out during the detailed design stage. A fire engineering brief with stakeholders including the ACT Fire & Rescue has not been undertaken.

The performance solutions will be documented in a fire engineering report for submission to the relevant approval authorities during detailed design.

Preliminary discussions have been undertaken with ACT Fire & Rescue and are currently on-going and unresolved due to concerns with site accessibility for emergency vehicles. No formal design acceptance has been received from ACT Fire & Rescue. They have confirmed that formal review and comment will be provided via the formal DA submission process.

Please contact this office on 02 6176 3414 if you have any questions.

Yours Sincerely



Jack Tam  
Director  
**CPEng NER (fire safety)**  
**Lit Consulting**



Brendan Rocha  
Director  
**CPEng NER (fire safety)**  
**Lit Consulting**

## Appendix A Project documentation

This letter is based on the documentation listed in this section.

**Table A.1 Project documentation assessed**

Title	Reference	Rev	Date	Author
Section 7 – Marked up Plans (from BCA Certifiers BCA 2019 Compliance report)	-	-	23/02/2021	BCA Certifiers Australia
GENERAL ARRANGEMENT PLAN - LEVEL 01	58208-ARC-DRW-TCH05-11B-01-0001	16	05/03/2021	BVN
GENERAL ARRANGEMENT PLAN - LEVEL 02	58208-ARC-DRW-TCH05-11B-02-0001	16	05/03/2021	BVN
GENERAL ARRANGEMENT PLAN - LEVEL 03	58208-ARC-DRW-TCH05-11B-03-0001	16	05/03/2021	BVN
GENERAL ARRANGEMENT PLAN - LEVEL 04	58208-ARC-DRW-TCH05-11B-04-0001	16	05/03/2021	BVN
GENERAL ARRANGEMENT PLAN - LEVEL 05	58208-ARC-DRW-TCH05-11B-05-0001	16	05/03/2021	BVN
GENERAL ARRANGEMENT PLAN - LEVEL 06	58208-ARC-DRW-TCH05-11B-06-0001	16	05/03/2021	BVN
GENERAL ARRANGEMENT PLAN - LEVEL 07	58208-ARC-DRW-TCH05-11B-07-0001	16	05/03/2021	BVN
GENERAL ARRANGEMENT PLAN - LEVEL 08	58208-ARC-DRW-TCH05-11B-08-0001	16	05/03/2021	BVN
GENERAL ARRANGEMENT PLAN - LEVEL 09	58208-ARC-DRW-TCH05-11B-09-0001	16	05/03/2021	BVN
GENERAL ARRANGEMENT PLAN - ROOF	58208-ARC-DRW-TCH05-11B-10-0001	05	05/03/2021	BVN

Title	Reference	Rev	Date	Author
Canberra Hospital Expansion Project – BCA 2019 Amendment 1 Compliance review (including drawings marked up as an appendix)	-	1	23/02/2021	BCA Certifiers Australia
CHE - Example of performance solutions	-	-	10/02/2021	Warren Smith & Partners