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100023

Preliminary BCA Assessment Report

Ingham Health Research Institute

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IHRI Liverpool

Executive Summary

The proposed development the subject of this report, is located at Liverpool Hospital.

An assessment of the building has been undertaken in accordance with the relevant provisions of the Building Code of Australia 2009, (BCA) namely Sections C, D, E, F, H, G and J. From our assessment we can confirm that the following matters have been identified as key items requiring clarification or in need of being resolved to ensure that the Development Application documentation can address the relevant Performance Requirements of the BCA:

- Main entry door to swing outwards.
- Rising and descending stairs to be smoke separated with non-combustible construction to ensure there is no direct connection.
- Fire Engineer to be engaged to pursue the alternative solution for the following:
    a. Allow reduction in fire resistance levels (from 4 hours to 2 hours for the laboratory parts.
    b. Reduced fire resistance for separation of new and existing building.
    c. Allow the central “open” stair to remain and also act as an exit from levels 2 and 3.
    d. Reduce the level of construction of the atrium in the building less than what is required under BCA Part G3.
    e. Egress from Level 5, i.e. the fire rated alternative exit from the floor discharges into level 4.
- Excessive distance to a point of choice between alternative exits is to be addressed within the Level 5 plant room (i.e. maximum 20m).
- AS1428.1 compliance is required for circulation throughout the floors.
- Fire hydrants to be located within the fire isolated exit.
- Location of fire hydrant / sprinkler booster system to be confirmed.

Documentation

The following documentation was relied upon when preparing this Report:

- Building Code of Australia 2009, (BCA).
- Architectural drawings of the building prepared by MSJ Architects numbered SK 01 04; SK02 04; SK 03 04; Sk04 04, SK05 01, SK06 04, SK 07 01 dated 23 February 2010.

BUILDING CODE OF AUSTRALIA 2009

Building Description

The project involves the construction of a new five (5) storey research institute building of approximately 800sqm per storey attached to the existing Community Health & Ambulatory Care building at Liverpool Hospital (corner of Campbell and Forbes Streets). The activities proposed for the Institute include health services research; population health research; clinical trials and clinical / biomedical research.

The building is to design for future links to the existing 4 storey (plus roof top plant area) building to the west (ongoing refurbishment being undertaken within), and also the Hospital building to the south (across the internal road). The building uses are detailed per floor as follows:

- Basement Level – Storage; biological Resources unit.
- Level 1 Plan – Main entry; "interaction" space; seminar rooms, interview areas, administration areas; Clinical trial space, sanitary areas.
- Level 2 – Administration areas, sanitary facilities.
- Level 3 – Medical Physics area; "hot desks", work stations, meeting room, sanitary facilities.
- Level 4 – Laboratories and coolroom storage, administration areas.
- Level 5 – Wet and Dry laboratories; mechanical and hydraulic plant.
- Roof, including open plant deck.

We understand the building will be sprinkler protected throughout.

Building Classification

The new building is classified as follows:

BCA CLASSIFICATION:	Class 5 (administration, dry labs), Class 8 (wet labs).
RISE IN STOREYS:	5
TYPE OF CONSTRUCTION:	Type A
EFFECTIVE HEIGHT:	TBA
CLIMATE ZONE:	6

Fire Resistance

1. Type A construction applies to this development and therefore table 3 of BCA Specification applies throughout.

Building element	Class of building — FRL: (in minutes)	
	Structural adequacy/ Integrity/ Insulation	
	5 and 8*	
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any fire-source feature to which it is exposed is—		
For loadbearing parts—		
less than 1.5 m	120/120/120	
1.5 to less than 3 m	120/ 90/ 90	
3 m or more	120/ 60/ 30	
less than 1.5 m	- /120/120	
1.5 to less than 3 m	- / 90/ 90	
3 m or more	- / - / -	
EXTERNAL COLUMN not incorporated in an external wall, where the distance from any fire-source feature to which it is exposed is—		
less than 3 m	120/ - / -	
3 m or more	- / - / -	
COMMON WALLS and FIRE WALLS—	120/120/120	
INTERNAL WALLS—		
Fire-resisting lift and stair shafts—		
Loadbearing	120/120/120	
Non- loadbearing	- /120/120	
Bounding public corridors, public lobbies and the like—		
Loadbearing	120/ - / -	
Non- loadbearing	- / - / -	
Between or bounding sole-occupancy units—		
Loadbearing	120/ - / -	
Non- loadbearing	- / - / -	
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion—		
Loadbearing	120/ 90/ 90	
Non- loadbearing	- / 90/ 90	
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES		
and COLUMNS—	120/ - / -	
FLOORS	120/120/120	
ROOFS	120/ 60/ 30	

2. It is proposed to undertake a Fire Safety Engineering Performance Solution to allow a reduction in the required FRLs of the laboratory part of the building from 240/240/240 down to 120/120/120.

3. The proposed building adjoins the existing 4 storey Clinic building of which the method of fire separation is proposed to be addressed by a Performance Solution from a fire safety engineer to allow reduced fire resistance levels (FRLs) and also to allow window openings to remain in the building. The existing external wall adjoining the proposed building will need to be upgraded to achieve a minimum of 120/120/120 FRL, consistent with the proposed fire safety engineering assessment.

4. The building is considered to be a single fire compartment and therefore maximum floor area and volume requirements for the building are to adhere to the following:

Classification		Type of construction of building		
		Type A		
5	max floor area—	8 000 m^2		
	max volume—	48 000 m^3		
8	max floor area—	5 000 m^2		
	max volume	30 000 m^3		

5. Any loadbearing internal walls need to be of concrete or masonry construction

6. Fire hazard properties for all floor, wall and ceiling linings are to comply with BCA Specification C1.10a, and other materials (such as sarking or insulation) to comply with BCA Specification C1.10.

7. The main switch room in the building is to be enclosed with an FRL achieving 120/120/120 (i.e. if there are requirements for pumps for wall wetting drencher systems to the stair – see comments later in the report).

Access and Egress

8. A minimum of two exits are required from each storey of the building and in the current design we note the following designated exits (note – this is based on a suitable Performance Solution being justified by a Fire Safety Engineer with respect to the open stair):

    a. Basement level –

        i. Dedicated exit stair to the northern road;

        ii. Fire isolated exit stair at the north west corner of the building

    b. Level 1 –

        i. Inward swinging double door discharging southwards at the main entry;

        ii. Outward swinging double door leading to the northern courtyard.

        iii. Fire isolated exit stair at the north eastern corner.

    c. Level 2 and 3 –

        i. Internal pedestrian stair adjacent to the passenger lifts.

        ii. Fire isolated exit stair at the north eastern corner.

    d. Level 4 –

        i. Horizontal exits (2 off) through to adjoining building.

        ii. Fire isolated exit stair at the north eastern corner.

    e. Level 5 –

        i. Fire isolated exit at the north eastern corner.

        ii. Fire rated/enclosed stair that connects to level 4 only and discharges adjacent to the horizontal exit below.

    In this regard we can confirm that, with the exception of level 5, the number of exits per storey; the travel distances to the exits and distances between alternative exits within the building have been assessed as satisfactory.

9. Fire Isolated Exits. Required exit stairs that connect or pass by more than 2 storeys are required to be fire isolated in accordance with BCA Clause D1.3. In this regard we note that the stair in the north eastern corner can achieve compliance with this requirement, however the central stair is designed as an open stair.

   In reference to previous discussions regarding maintaining the open central stair we note that a fire engineered alternative solution is proposed for the stair to allow exits at level 2 and 3. The fire engineered alternative solution will need to address BCA Clause D1.7 and Performance Requirements CP2 and DP5.

10. The distance to a point of choice between alternative exits within the Level 5 plant room will need to be addressed (i.e. maximum 20m).

11. Aggregate exit widths have been assessed and results in a maximum occupant number of 200 persons per floor.

12. Discharge from the fire isolated exit (north east) is not to be exposed to external walls or openings of the building unless 60/60/60 FRL is achieved within 6m (measured perpendicular to the path of travel) and any openings are protected in accordance with BCA Clause C3.4.

13. Separation of rising and descending stairs in the northern fire isolated exit is to be addressed in accordance with BCA Clause D2.4. In this regard we assume that the stair discharges at Level 1 in an easterly direction, and therefore there needs to be non-combustible construction and smoke separation to result in no direct connection between the flights.

14. Electrical distribution boards at each floor and communication boards will need to be provided in enclosures that are non-combustible and also smoke sealed (where they are located in paths of travel).

15. Main entry door to be rectified to swing in the direction of egress.

16. Access is required to be provided for persons with a disability to and within the building in accordance with BCA Table D3.2, i.e.

    f. Common areas and unique features at the main entrance level, in accordance with AS1428.1.

    g. Circulation spaces within the administration areas will need to be addressed, i.e. minimum 1m in width generally, and additional widths are required to comply with AS1428.1 for office entries and the like.

    h. 5mm tolerance (maximum) is permitted for any level changes at door entries> Tactile ground surface indicators are to be provided to the Stair 2 and the external Stair 3.

Notwithstanding the above, where the client wishes to explore their obligations further under the Disability Discrimination Act we recommend the services of a practising Access Consultant to be engaged to provide recommendations where additional measures should be provided.

Services and Equipment

17. Based on the architectural documentation submitted to date we the note the following essential fire safety measures will be required to be installed within the building (items that are italicised for further confirmation).

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
Automatic Fire suppression system	BCA Clause E1.5 and AS2118.1-1999.
Emergency Lighting	BCA Clause E4.4 & AS2293.1 - 2005
Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS 2293.1 - 2005
Fire Blankets	AS 3504 - 1995 & AS 2444 – 2001
Fire Dampers	BCA Clause C3.15, AS 1668.1 - 1998 & AS 1682.1 & 2 - 1990
Fire Doors	BCA Clause C3.2, C3.4, C3.5, C3.6 & C3.7, C3.8, C3.11 and AS 1905.1 – 2005
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 - 2005
Mechanical Air Handling Systems	BCA Clause E2.2, AS/NZS 1668.1 - 1998 & AS 1668.2 – 1991
Paths of Travel	EP & A Regulation Clause 186
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
Warning & Operational signs	Clause 183 of the EP & A Regulations 2000, AS 1905.1 - 2005, BCA Clause D2.23, E3.3

18. Location of the fire hydrant booster system / sprinkler booster system is yet to be resolved.

19. Portable fire extinguishers are to be installed throughout in accordance with AS2444, and where provided to serve a switch room they are to be not within 2m of the switchroom.

Health and Amenity

20. We are yet to undertake an assessment of minimum toilet numbers for the building, however we note the generic provision of sanitary facilities on all floors and consider that compliance with BCA Clause F2.3 is readily achievable.

21. Ceiling heights to the building are to maintain a minimum of 2400mm for the habitable spaces such as offices and accommodation. Sanitary compartments, kitchen, storerooms and the like can be reduced to 2100mm in accordance with the DTS provisions of the BCA.

22. Light and ventilation will need to be provided to the building in accordance with BCA Clause F4.2; F4.4; F4.5 and F4.6 as appropriate.

Minor Structures and Components

23. The building has a void that connects in excess of 3 storeys (in a sprinklered building) and therefore is subject to the requirements of Atrium Construction as indicated in BCA Part G3. In this regard, a fire safety engineering assessment is proposed to be undertaken to address the relevant Performance Requirements of the

BCA in relation to method of construction, smoke detection, smoke hazard management (exhaust and pressurisation), and emergency generators.

Energy Efficiency

23. The requirements of BCA Section J will apply to the building of which it will need to be demonstrated that the below has been addressed, i.e. (for Climate Zone 6):

    a. Building Fabric – thermal construction and insulation of walls and roofs;

    b. External Glazing – solar heat gain through windows;

    c. Building sealing – construction of doors, windows, rooflights, etc;

    d. Air conditioning and ventilation – mechanical consultant to confirm;

    e. Artificial lighting and power – electrical consultant to confirm;

    f. Hot water systems - Hydraulic consultant to confirm;

    g. Access for maintenance – access to time switches, shading devices, etc.

If you have any questions regarding any of the above or would like to discuss any matter in further detail please do not hesitate to contact me on 9211 7777.

Regards

Brian Maguire
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