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AND FIRE SAFETY CONSULTANTS

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Proposed Redevelopment of former Rachel Forster Hospital Site 150 Pitt Street, REDFERN, NSW

BCA Capability Report

8 June 2007

Compiled for

Redfern Waterloo Authority
C/- Lippmann Associates
570 Crown Street
SURRY HILLS NSW 2010

Attention: Mr Tim O'Sullivan

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1.0 Introduction and Designation

At the request of Redfern Waterloo Authority through Lippmann Associates, this commission involves the assessment of proposed Concept Design redevelopment of the existing Rachel Forster Hospital into residential apartments. It is understood the development will comprise around 150 units. This preliminary report is based on the concept plans listed below.

Due to the concept nature state of the documents, certain assumptions were made during the assessment. It is assumed that the lowest storey that has direct egress to the road or open space for Buildings 1 and 3 is at Basement RL 31.65. As for Buildings 2 and 4, it is assumed at Level 1 RL 35.00.

The proposal will consist of four residential towers sitting on top of two basement car parks. The southern tower and northern tower are known as Building 1 and Buildings 3 respectively. Two smaller towers, known as Building 2 and Building 4, occupy the central part of the site.

Rise in Storeys - Building 1 has a rise in storey of seven and Building 3 has a rise in storey of four by virtue of the basement residential level. Buildings 2 and 4 each have a rise in storey of three. For the purpose of determining the Type of construction, all the buildings are considered as one building for which Type A construction applies.

The design is at a point where the inherent BCA philosophies have been checked for a concept stage.

The drawings assessed are architectural drawings prepared by Lippmann Associates as follows:

Drawing No.	Drawing Title
A 001	Site Plan
A 002	Lower Basement Floor Plan
A 003	Basement Floor Plan
A 004	Level 1 Floor Plan
A 005	Level 2 Floor Plan
A 006	Level 3 Floor Plan
A 007	Level 4 Floor Plan
A 008	Level 5 Floor Plan
A 009	Level 6 Floor Plan
A 011	Elevations – South and East
A 012	Elevations – East and West
A 010	Sections 1 and 2

2.0 Use and Class of Buildings - Typical

Location	Use	Classification
Lower Basement	Car Park	7a
Basement	Apartments (Buildings 1 & 3) Car park	2 7a
Level 1	Apartments (Buildings 1,2,3 & 4)	2
Level 2	Apartments (Buildings 1,2,3 & 4)	2
Level 3	Apartments (Buildings 1,2,3 & 4)	2
Levels 4 to 6	Apartments (Building 1 only)	2

3.0 Construction

Fire Resistance

The buildings have an effective height of less than 25m. Building 1 has a rise in storey of seven and an effective height of 16.75m as per the definition in the BCA. Hence, the passenger lift in Building 1 must be able to accommodate a raised stretcher. For the purpose of determining the Type of construction, all the buildings are considered as one building and as Building 1 has a rise in storey of seven, Type A construction is required for the whole development.

Refer to Appendix A for details of the required Fire Resistance Levels (FRL's) of various building elements. As the basement car park consists of more than 40 car spaces, it requires an automatic sprinkler system. It is also required to separate the sprinklered carpark from the non-sprinkler parts of the building in 120/120/120 FRL.

In this regard, the slab above the car park must have an FRL of 120/120/120 and the walls separating the car park and the apartments in Basement Level must also have the same FRL. The columns needing to be 300mm thick in the carpark.

Other requirements to note for Type A construction are:

An FRL of not less than 90/90/90 FRL applies to the Class 2 apartments - this will result in columns being 250mm thick as per AS3600.

The north western external wall of Building 3 is less than 1m from the site boundary, the external wall must have an FRL of 90/90/90 (loadbearing) or -/90/90 (non-loadbearing).

The western external wall of the car park in Lower Basement and Basement abuts the west boundary. If the wall is below the finished ground along this boundary, then no FRL is required. Otherwise, 120/120/120 FRL (loadbearing) or -/120/120 FRL (non-loadbearing) is required.

The walls bounding each apartment must have an FRL of 90/90/90 (loadbearing) or -/60/60 (non-loadbearing).

The stair shaft, lift shaft and services shaft must be 90/90/90 (loadbearing) or -/90/90 (non-loadbearing).

The roof covering must be non-combustible and the internal fire rated walls bounding the apartments must be extended to the underside of the roof covering. Only roof battens with dimensions of 75mm x 50mm or less and roof sarking may cross the fire rated internal walls.

Other Important Requirements

Building materials will have various fire hazard properties listed in Spec C1.10a for floor materials and floor coverings and also wall and ceiling lining materials.

Any sunshade structure or canopy to the external wall must be non-combustible construction to prevent fire spread via the façade of the building.

The entry door to each apartment must be protected with -/60/30 self closing fire doors.

4.0 Compartmentation

There is no fire compartment limit for sprinklered car park (Class 7a) and the residential apartments (Class 2). Proposal complies.

5.0 Protection of Openings

Any opening in the external wall which is within 3m of the site boundary must be protected with external wall-wetting sprinklers, fire shutter or fire door as appropriate. This requirement is applicable to the Building 3 north western external wall and part of the return wall within 3m of the

site boundary. The same applies to the western external wall of the car park, if exposed above ground.

Where wall-wetting sprinkler protection is required to the affected openings in Building 3 described above, the windows must be fixed glazing. This will affect the natural ventilation unless mechanical ventilation is provided to the affected apartments.

Clause C2.12 and C2.13 - Separation of the main switch room and lift motor room: Such rooms will require 2 hour fire separation from the remainder of the building.

Vertical Separation of Openings in External Walls

For Type A construction, protection of openings in the external walls is required to prevent fire spread. The construction required is either –

- A 60/60/60 vertical spandrel greater than 900mm high which extends 600mm above the upper floor level, OR
- A 60/60/60 horizontal construction that projects 1100mm outwards from the external face of the wall and extends 450mm beyond the openings concerned.

Generally, a balcony slab can be used as a complying horizontal construction. It is important to note that any service penetration in the balcony slab must be fire stopped to maintain the 60/60/60 FRL.

Details at concept stage are not available.

Public corridors in a Class 2 Building

The length of the public corridor in a Class 2 building must not exceed 40m. If more than 40m in length, it must be divided at intervals of not more than 40m with smoke-proof walls complying with clause 2 of Specification C2.5 of BCA. Details at concept stage are not available.

6.0 Access and Egress

For a car park, the travel distance to a single exit must not exceed 20m. If two or more exits are required, the distance to a point of choice of two exits must not exceed 20m a further 20m to the nearest exit. The distance between exits measured through the point of choice must not exceed 60m. The alternative path of travel must be at least 6m apart. ***Excessive travel distance are noted in the car park, where only 2 exits are available and travel distances of up to 75m to a single exit in lieu of 40m apply. Additional exits will need to be nominated beyond concept design stage .***

For residential apartments, the distance from the entry doorway of the apartment to an exit must not be more than 6m or 6m to a point of choice, if two exits are accessible. Concessions are given to the Ground floor units where the distance to the exit is extended to 20m. No details of apartment access or egress are shown as concept stage.

Travel via fire isolated stairs must comply with D1.7 of BCA. Each fire isolated stair and ramp must provide independent egress and discharge directly, or by its own fire isolated passageway: to a road or open space; or into a covered area that adjoins a road or open space with >1/3 open around its perimeter and has clear height of 3m including at the perimeter opening. The point of discharge must be <6m from open space.

Where path of travel from point of discharge is within 6m of the external wall of the same building, measured at right angle, the wall must have an FRL of 60/60/60 and any openings within must be protected with internal wall-wetting sprinklers. At concept stage there is insufficient detail provided, however this needs to be considered when the design is further developed.

Balustrades must be designed in accordance with Clause D2.16 of BCA. The gaps within the balustrade must not exceed 125mm. The height of balustrades to balconies must be 1m (from

finished floor level) and must not incorporate horizontal climbing elements where a drop of 4m or greater occurs.

Disabled Access and the Disability Discrimination Act 1992

Under the terms of the BCA a Class 2 and associated 7a building does not need to meet Part D3 of the BCA 2007, ***notwithstanding and having regard to the DDA and any Access DCP likely to be imposed at any time that is recommended disabled access be provided as a minimum from the street to the main entry, to at least one sole occupancy unit and to at least one accessible car space*** - details yet to be provided but compliance readily achievable.

7.0 Fire Services and Equipment

The following essential fire safety measures will be installed (where necessary) throughout the building:

DESIGN / INSTALLATION STANDARD			
Item	**Measure**	**BCA Clause**	**Relevant Australian Standard**
1.	Automatic Fire Sprinkler Systems (basement carpark only)	BCA Clause E1.5 & BCA Spec. E1.5	AS 2118.1-1999 (Amdt 1, June 2000)
2.	Automatic Fire Detection & Alarm System	BCA Spec. E2.2a	AS 1670.1-2004 (Amdt 1, Nov. 2005)
3.	Emergency Lighting	BCA Clause E4.4	AS/NZS 2293.1 - 2005
4.	Exit Signs	BCA Clauses E4.5, E4.6 & E4.8	AS/NZS 2293.1-2005
5.	Fire Doors	BCA Clause C3.8, C3.10	AS 1905.1-2005, AS 1905.2-2005, AS 1735.11-1986
6.	Fire Hose Reels	BCA Clause E1.4	AS 2441-2005
7.	Fire Hydrant Systems	BCA Clause E1.3	AS 2419.1-2005
8.	Fire hazard properties of materials and assemblies	BCA Clause C1.10, Spec C1.10 & Spec C1.10a	AS/NZS 1530.3-1999, AS 4254-1995 AS ISO 9705-2003
9.	Portable Fire Extinguishers	BCA Clause E1.6	AS 2444-2001
10.	Smoke Doors	BCA Clause C2.14 & Spec. C3.4	
11.	Wall-Wetting Sprinklers	BCA Clause C3.4	AS 2118.1-1999 (Amdt 1, Jun 2000)

8.0 Sanitary Facilities

Facilities required in the apartments include clothes washing facilities, comprising at least one washtub and space for a washing machine, clothes dryer or clothes line hanging space. Having over 10 apartments a sanitary facility for employees will need to be provided.

9.0 Room Sizes

The ceiling height to all habitable spaces must not be less than 2.4m. Compliance achievable.

10.0 Light and ventilation

The apartments located at basement level of Buildings 1 and 3 being situated partly below ground 3, will need to be assessed when future design allows to ensure the required natural light and ventilation criteria are met. This will need to be closely examined at the next stage of design and it is suggested this could be overcome with provision of mezzanine type apartments within the basement & Level 1.

11.0 Part F5 – Sound Transmission and Insulation

Sound insulation ratings will only apply to the Class 2 parts of the building. Sound insulation of floors require an Rw+Ctr (airborne) not less than 50 and an Lnw+Ci not less than 62 (impact) and apply to:

- Floors separating Sole Occupancy Units (sou's); and Floors separating sou's and plant rooms, lift shaft, public corridors, stairways, or the like.

- Sound insulation of walls require an Rw+Ctr or not less than 50 if separating sou's. Sound insulation of walls require an Rw of not less than 50 if separating an sou from a plant room, lift shaft, public corridor, stairway, or the like.
- Sound insulation of walls require a 20mm cavity between the 2 separate leaves with no mechanical linkage, apart from at the periphery (excepting resilient ties) for Sou's separating a plant room or lift shaft; and Wall separating a bathroom, sanitary compartment, laundry, or kitchen in one sou from a habitable room in an adjoining unit.
- A doorway separating a sou from a public corridor, stairway, public lobby, or the like must have an Rw of not less than 30.
- Where a wall requires a sound insulation rating, the connecting floor, or roof above must be constructed to the underside of the above roof or floor, or provide the equivalent sound insulation rating as per the wall.
- If a duct, soil, waste or water supply pipe passes through more than 1 sou, the service must have an Rw of not less than 40 if adjacent to a habitable room, or an Rw of not less than 25 if adjacent to a non-habitable room. A storm water pipe requires the same ratings, however, it only needs to pass through 1 sou to require a sound insulation rating.

12.0 BCA Part J –Energy Efficiency

Energy Efficiency Part J: The proposed development must comply with BASIX and the relevant parts of Part J of BCA and NSW variations. The design will need to be verified by a qualified Energy Consultant.

13.0 Appendix A – Table for Type A construction

Building element	**Class of building-FRL: (in minutes) Structural adequacy/Integrity/Insulation**			
	2	**7a or 9**		
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 1.5m	90/90/90	120/120/120		
1.5 to less than 3m	90/60/60	120/90/90		
3m or more	90/60/30	120/60/30		
For non-loadbearing parts				
Less than 1.5m	-/90/90	-/120/120		
1.5 to less than 3m	-/60/60	-/90/90		
3m or more	-/-/-	-/-/-		
EXTERNAL COLUMN not incorp in external wall, where the distance from any fire-source feature to which it is exposed is-				
Less than 3m	90/-/-	120/-/-		
3m or more	-/-/-	-/-/-		
COMMON WALLS and FIRE WALLS-	90/90/90	120/120/120		
INTERNAL WALLS				
Fire- resisting lift and stair shafts-				
Loadbearing	90/90/90	120/120/120		
Non-loadbearing	-/90/90	-/120/120		
Bounding public corridors, public lobbies and the like-				
Loadbearing	90/90/90	120/-/-		
Non-loadbearing	-/60/60	-/-/-		
Between or bounding sole-occupancy units-				
Loadbearing	90/90/90	120/-/-		
Non-loadbearing	-/60/60	-/-/-		
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion				
Loadbearing	90/90/90	120/90/90		
Non-loadbearing	-/90/90	-/90/90		
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES				
and COLUMNS-	90/-/-	120/-/-		
Floors	90/90/90	120/120/120		
Roofs	90/60/30	120/60/30		