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88 Walker Street - BCA Pre DA Review Hotel Building Revised Design

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DOCUMENT ACCEPTANCE

	Name	Signed	Date
Prepared by	Robert Marinelli		080409

REVISION HISTORY

Revision No.	Prepared by	Description	Date
01	Robert Marinelli	Draft	090309
02		09026Capstat_20090918HotelRev3	080409
03		Revised design	180909



1.0 Introduction and Documentation

This assessment involves a review of the design to date on the Building Code of Australia (BCA) requirements of the proposed new building at 88 Walker Street.

We have reviewed the submitted architectural documentation compiled to date for the major areas of compliance and non compliance with the deemed-to-satisfy provisions of the Building Code of Australia 2009 and the relevant major Australian Standards referenced by this code. Where compliance with the deemed to satisfy provisions may not be possible a schedule of alternate solutions has been provided.

We have made every attempt to cover the main issues under Parts C, D, E and F of the Building Code of Australia. In the following phases of design we will be continuing our input and assessment of the buildings' design. It is anticipated that resolution and finalisation of compliance will be possible prior to the issue of the Construction Certificate for the works.

Methodology is principally inspection of the available documentation provided by Rice Daubney.

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Documentation available and assessed

Design architectural documentation prepared by Rice Daubney Group and reviewed.

Drawing Nos

DA 08c, DA 09c, DA 10c, DA 11c, DA 12c, DA14c, DA 15c, DA16c, DA17c, DA 18c, DA 20c, DA 21c, DA 22c, DA 23c, DA 24c, DA 25c, DA 26c.



2.0 Use and Class of Building

The assessment in question relates specifically to the new building that will take the place of the existing group of buildings and hence form the new main building redevelopment.

The use and classification is as per the following table for the parts of the building assessed.

Building Matrix			
Levels	BCA Designation	BCA Class	Use
Basement 2	Hotel	3	Hotel back of house and plant including sprinkler pump room
Basement 1	Hotel	3	Hotel back of house and plant
Lower Ground – Walker Street Hotel Entry	Hotel	3	Entry lobby, Reception, Fire control room
Lobby Void Level	Hotel	3	Lobby Bridge Link and mezzanine
Conference Level	Public Building	9b	Conference Centre
Bar Level	Retail	6	Bar
Restaurant Level	Retail	6	Restaurant and kitchen
Lower Plant Level	Ancillary	Can be class 3 5 6 or 9b	Plant rooms
Hotel Admin Level	Office	5	Office
Hotel Typical Floors	Hotel	3	Typical hotel rooms
Rooftop Plant Levels	Ancillary	3	Plant rooms

The building will be documented so that it will comply with the requirements of Type A construction. The required fire ratings are specified in the following report.

3.0 Building super structure and element fire ratings

The building is to be constructed of structural reinforced concrete and steel construction with an external facade of lightweight cladding and glazing. The building has been designed to be greater than 25 metres in effective height and just over 114 metres in height.

The assumed scope of work to the building will require that it is built to current BCA requirements. The building will need to be constructed in Type A construction.

Fire resistance

Building Matrix			
Levels/Use	BCA Designation	BCA Class	Requirements
Basement 2	Hotel	3	Generic fire resistance level is 90/90/90
Basement 1	Hotel	3	
Lower Ground – Walker Street Hotel Entry	Hotel	3	
Lobby Void Level	Hotel	3	
Conference Level	Public Building	9b	Single fire compartment needs to be to the higher fire resistance level, ie for class 6 as it has an interconnecting open stair Generic fire resistance level is 180/180/180
Bar Level	Retail	6	
Restaurant Level	Retail	6	
Lower Plant Level	Ancillary	Can be 3 5 6 or 9b	Assume serves class 6 hence generic fire resistance level is 180/180/180
Hotel Admin Level	Office	5	Generic fire resistance level is 120/120/120
Hotel Typical Floors	Hotel	3	Generic fire resistance level is 90/90/90
Rooftop Plant Levels	Hotel	3	Generic fire resistance level is 90/90/90
Basement 2	Ancillary	3	Generic fire resistance level is 90/90/90

The fire rating of the external walls within 3 metres of the boundary will need to be assessed and justified. It is noted that openings and glazing should not occur within 3 metres of the boundary, without protection.

The fundamental concept of fire rating for the new building works will be as per the following table:

Building Component	Class 3	Class 7a, 5 & 9b	Class 6
External walls (load-bearing)	90/60/30	120/60/30	180/120/90
Fire walls	90/90/90	120/120/120	180/180/180
Shaft walls (lift and stairs)	90/90/90	120/120/120	180/180/180
Service shafts	90/90/90	120/90/90	180/120/120
Between sole occupancy units (load-bearing)	90/90/90	120/-/-	180/-/-
Between sole occupancy units (non-load bearing)	-/60/60	-/-/-	-/-/-
Load-bearing columns, internal walls, internal beams and trusses	90/-/-	120/-/-	180/-/-
Floors	90/90/90	120/120/120	180/180/180
Roofs (in buildings with no concessions – see below)	90/90/90	120/120/120	180/180/180



Different occupancy classes are to be fire separated via a firewall or alternatively both adjoining components may adopt the higher FRL requirements. This we assume has occurred to the lower levels of the building, ie at conference bar and restaurant levels.

Load-bearing internal walls are to be constructed of concrete or masonry.

The roof covering is to be non-combustible construction where the building is provided with sprinkler protection.

The following services are to be separated from the remainder of the building via a 120/120/120 FRL:-

- Sub-station / switchroom
- Lift motor rooms
- Boilers
- Batteries
- Smoke exhaust plant

Protection of Openings

The Hotel building is bounded by public roads on 2 sides with Spring Street to the west, Walker Street to the north. Windows are in some cases located within 3 metres of the adjoining allotment boundary and hence within 3 metres to the fire source feature. These openings will need wall wetting sprinklers offering protection in accordance with C3.4 of the Building Code of Australia.

Variance from this requirement will require fire engineering justification.



4.0 Compartmentation for Type A construction buildings

In a building required to be of Type A construction the following needs to be applied to the architectural and structural design of the elements according to the Building Code of Australia:-

- external walls, common walls and the flooring and floor framing of lift pits must be non-combustible; and
- any internal wall required to have an FRL with respect to integrity and insulation must extend to—
 - (i) the underside of the floor next above; or
 - (ii) the underside of a roof complying with Table 3; or
 - (iii) if the roof needs no fire rating, the underside of the non-combustible roof covering and, except for roof battens with dimensions of 75 mm x 50 mm or less or roof sarking, must not be crossed by timber or other combustible building elements; or
 - (iv) a ceiling that is immediately below the roof and has a resistance to the incipient spread of fire to the roof space between the ceiling and the roof of not less than 60 minutes; and
- a loadbearing internal wall and a loadbearing fire wall (including those that are part of a loadbearing shaft) must be of concrete or masonry; and
- a non-loadbearing—
 - (i) internal wall required to be fire-resisting; and
 - (ii) lift, ventilating, pipe, garbage, or similar shaft that is not for the discharge of hot products of combustion, must be of non-combustible construction.

Fire compartment areas and volumes

The maximum floor areas and volumes according to Part C of the Building Code of Australia for the proposed design does not apply as each of the sole occupancy units will need to be fire rated in their own right.

The fire compartment size applicable to the class 5, 6 and 9b compartment is as follows

Floor areas - max allowed is 5000m²

Compartment Volumes – max allowed is 30000m³

As the building is greater than 25 metres the building will require sprinkler protection in any case.

Variations from the above will need to be assessed and justified using fire engineering where possible.



5.0 Access and Egress

Principles

The buildings' egress system has been assessed and designed to ensure compliance with the following principles:

Generic requirements

- Every floor of the building is provided with an exit and where the distance of travel requires at least two exits.
- All stairs will be fire isolated where they connect more than three levels in a sprinklered building.
- The distance between alternate exits is to be not less than 9 metres.
- The construction and discharge of stairs, landings, thresholds, balustrades and handrails will need to meet the requirements of the BCA.
- Access for disabled persons will need to meet the requirements of AS1428.1.
- Corridors that exceed 40 metres will need to be provided with smoke doors to reduce the corridor length.
- All paths of travel are to be a minimum of 1000mm in clear width.

Residential

- The maximum distance of travel to an exit within the residential common areas is to be not greater than 6 metres to a single exit or 6 metres to a point of choice to two exits.
- The distance between alternate exits will not exceed 45 metres for residential floors

Non Residential

- The maximum distance of travel to an exit to areas other than residential apartment floors is 40metres, and to a point of choice is 20metres.
- The distance between alternate exits will not exceed 60 metres for non residential floors

It is proposed to fire engineer the following

- A review of the paths of travel to basement 2 is required once the layouts are confirmed.
- The distance of travel to a point of choice on the residential hotel levels is greater than 6 metres
- The open stair from the conference level to the bar level connects three levels, however does not connect the ground, hence is not in accordance with the BCA.

Variations from the above will need to be assessed and justified using fire engineering where possible.

Disabled access considerations

- Access for persons with disabilities must meet the requirements of AS 1428.1.
- Access for persons with disabilities will be needed to the entry door to all tenancies and floors i.e. 850mm clear. All doors need to be 920mm leaf so as to open at least 800mm clear;
- Lifts – All lifts to have disabled access features in accordance with E3.6. At least two emergency lifts should be installed in accordance with E3.4 and at least one of these lifts should be provided with a stretcher facility.
- Braille and tactile signage complying with AS 1428.1 is required to identify each sanitary facility for persons with disabilities.

Please refer to accessibility report.



6.0 Service and Equipment

The following is a status of the services required to the building.

Fire Systems

Fire Hydrants	Fire hydrants are to be provided throughout to AS 2419. A ring main will be required to each hydrant riser. Boosters and tanks are required to the building in accordance with the requirements of the Australian Standards
Fire Hose-Reels	Fire hose-reels should be arranged to provide for full coverage to the building in accordance with AS 2444. Fire hose-reels are to be located within 4 metres of an exit or a fire hydrant.
Sprinklers	A sprinkler system complying with AS 2118.1 is to be provided.
Sprinklers - External Wall Wetting	Any openings within the prescribed distances in BCA for openings where exposed to a fire source feature may be protected with external wall wetting sprinkler heads.

Variations from the above will need to be assessed and justified using fire engineering where possible.

Smoke hazard management

Fire isolated exits	Requirements
A fire isolated stairway including any associated fire isolated passageway or fire isolated ramp serving – (i) any storey above an effective height of 25m; or (ii) more than 2 below ground storeys, not counted in the rise in storeys in accordance with C1.2, must be provided with an automatic air pressurisation system for fire isolated exits in accordance with AS/NZS 1668.1	<ul style="list-style-type: none"> Needs an automatic air pressurisation system for fire isolated exits in accordance with AS/NZS 1668

Buildings more than 25m in effective height	Requirements
A Class 2 and 3 building or part of a building and Class 4 part of a building- (a) must be provided with an automatic smoke detection and alarm system complying with Specification E2.2a; and	<ul style="list-style-type: none"> Needs a smoke detection and alarm system in accordance with E2.2a
A Class 5, 6, 7b, 8 and 9b building or part of a building must be provided with a zone smoke control system in accordance with AS/NZS 1668.1	<ul style="list-style-type: none"> Needs a zone pressurisation system installed to the lower class 6 and 9b levels This is due to the concession for floor areas less than 2000m²

All air handling systems in the building will shut down in the case of fire. Activation of the mechanical air handling systems will be upon the activation of a smoke detector or other alarm or sensory device.

The installation will need to comply with E2.2 (a) to (d) for the protection of ductwork through the fire and smoke walls to the building ie. fire and smoke dampers are required where the ducts pass through fire and smoke walls.

It is proposed to fire engineer the following

- smoke exhaust system to all of the retail areas to be reduced from the requirements of the BCA

Variations from the above will need to be assessed and justified using fire engineering where possible.



Lift systems

A minimum of two emergency lifts will need to be provided to the building as the effective height is greater than 25 metres. The emergency lifts may be combined with the passenger lifts as the passenger lifts serve every storey.

It should be noted that the upper ground floor level lift for persons with disabilities needs to be an emergency lift.

The proposed lifts will need to be detailed to ensure compliance with the emergency lift designation. Two emergency lifts must serve every level of the building including the basement levels (that is two lifts to each level as a minimum that comply with the requirements for an Emergency Lift). All lift cars must be provided with fire service controls in accordance with AS 1735.2.

- Internal floor dimensions not less than 1400mm x 1100mm.
- Clear opening of the doorway to be not less than 900mm.
- Fitted with door opening sensory devices.

Emergency Lighting, Exit Signs And Warning Systems

Exit and emergency lighting	A system of emergency lights and exit signage will be installed in the building to AS2293.
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Sound system and intercom systems for emergency purposes	A sound system and intercom system for emergency purposes complying where applicable with AS 1670.4 must be installed in hospitals where they have a <i>floor area</i> more than 1000 m ² or a <i>rise in storeys</i> of more than 2.
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Fire Control Room

A Fire Control Centre in a specialised area at ground floor level is to be provided in accordance with Specification E1.8. Any variations from Spec E1.8 to be approved by NSWFB. As the building is greater than 50 metres in effective height there is a need for a fire control room.

It is proposed to fire engineer the following

- Location and arrangement of the fire control room to the building

Variations from the above will need to be assessed and justified using fire engineering where possible.



7.0 Part J - Energy Efficiency

The works will need to be assessed in accordance with the requirements of Part J of the Building Code of Australia for compliance with the revised Energy Efficiency requirements

An independent assessment by an energy consultant and certification by the design engineers will need to be provided for the building.

The building will be in Climate Zone 4 and will be required to comply with Parts J1 through to J8 (excluding part J4). An Energy Efficiency Consultant should be consulted regarding compliance for the building and the appropriate modelling completed for the design prior to finalisation of SDP.

Access for maintenance

The following criteria must be observed in the special design of the plant areas apart from the issues that may be raised by the Energy consultants.

NSW SECTION J ENERGY EFFICIENCY

NSW J8.2 Access for maintenance

Access for maintenance must be provided to—

- (a) all services and their components, including—
 - (i) time switches and motion detectors; and
 - (ii) room temperature thermostats; and
 - (iii) plant thermostats such as on boilers or refrigeration units; and
 - (iv) outside air dampers; and
 - (v) reflectors, lenses and diffusers of light fittings; and
 - (vi) heat transfer equipment; and
- (b) adjustable or motorised shading devices.



8.0 Health and amenity issues

The design of the building allows for sanitary facilities for patrons and staff to the three public areas according to the Building Code of Australia.

As per F2.2 (c), in calculating the number of sanitary facilities to be provided, a unisex sanitary facility required for people with disabilities, may be counted once for each sex.

Swing and operation of doors to the WC's

Doors to fully enclosed sanitary compartments to open outwards, or slide or have 1.2m clear space between door and closet plan or be readily removable from the outside of the sanitary compartment.

Light and ventilation

Natural lighting and ventilation must be provided in Class 3 buildings to all habitable rooms. Natural light to be provided in accordance with F4.2 of the BCA2009. Natural ventilation in accordance with F4.6 or mechanical ventilation to AS 1668.2 to be provided.

Room Sizes

The ceiling minimum height of 2.4m is required to areas except corridors, sanitary facilities and storage areas. Compliance is readily achievable. Plant rooms need to be checked and the correct heights allowed in the design.

9.0 Sound Transmission and Insulation (apartments)

The following table identifies the required sound insulation criteria for the buildings:-

Clause	Requirement	Compliance
F5.4 Sound Transmission of floors.	$R_w + C_{tr}$ of not less than 50; and $L_{n,w} + C_i$ of not more than 62.	Acoustic consultant to validate and confirm compliance.
F5.5 Sound Transmission of walls between units and internal public / service spaces.	$R_w + C_{tr}$ of not less than 50.	Acoustic consultant to validate and confirm compliance.
F5.5 Sound Transmission of walls between a bathroom, sanitary compartment, laundry or kitchen and a habitable room in adjoining unit or an adjoining plant room or lift shaft.	$R_w + C_{tr}$ of not less than 50 + discontinuous construction.	Acoustic consultant to validate and confirm compliance.
F5.6 Soil and waste pipes to be separated.	Where a soil or waste pipe passes through more than 1 sole occupancy unit an R_w of 40 required (adjacent to habitable room, except kitchen) or R_w of 25 if adjacent room is a kitchen or any other room.	Acoustic consultant to validate and confirm compliance.

An acoustic report will need to be provided for the building design.

10.0 Window cleaning

The following item identifies the requirements for the window cleaning to the buildings on the site.

Clause	Comment	Compliance
NSWG1.101 Provision of cleaning windows	Buildings must provide a safe manner of cleaning any windows located greater than 3 or more storeys above ground level.	All windows to building proposed to be cleaned wholly from within the building. Failing this a method of cleaning these windows complying with the Occupational Health and Safety Act 2000 and regulations made under that Act.

11.0 Alternate solutions / fire engineering

The major alternate solutions identified at this stage for the building and proposed by the architect, where there are areas of deviation from the deemed to satisfy provisions of the Building Code of Australia 2009, include however are not limited to:-

1. The distance of travel to a point of choice is exceeded to the hotel suite levels greater than 6 metres
2. Single fire exit off the link level
3. Windows on the boundary relying on the sprinkler protection of the adjoining buildings above a height of 25 metres
4. Generic fire ratings to be 90/90/90 throughout
5. Three level open stair not connecting the ground floor level



12.0 Approvals from the New South Wales Fire Brigade

The following issues will need approval from the New South Wales Fire Brigade with respect to section 188 departures from the deemed to satisfy provisions:-

- Access to the fire control room
- Location of the boosters for the sprinklers and hydrants
- Location of relay pumps up the building