REF: 062451-01BCA

PRELIMINARY BUILDING CODE OF AUSTRALIA REPORT

Interim Exhibition Facility
Sydney International Convention, Exhibition and Entertainment Precinct (SICEEP)

Dated: **12 November 2012**

Prepared for: **APP Corporation**

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MANAGING COMPLIANCE

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Date	Revision Number	No. of pages	Issue or Description of Amendment	Checked By	Approved By	Date Approved
09.10.12	A	12	Draft Report for DA Submission	Vanessa Hinge	Brigette Thearle	09.10.12
12.11.12	B	12	Final Report for DA Submission	Vanessa Hinge	Brigette Thearle	12.12.12

Executive Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by Woods Bagot (refer appendix A) for compliance with the Building Code of Australia 2012.

The assessment of the design documentation has revealed that the following areas are required to be assessed against the relevant performance requirements of the BCA. The submission for Construction certificate will need to include verification from a suitably accredited fire engineer: -

DTS Clause	Description of Non-Compliance	Performance Requirement
C1.1 and Specification C1.1	Fire Resistance Levels Prescriptive provisions of the Building Code of Australia 2012 would require the development to be constructed to Type C Construction as outlined in Table 5 of Specification C1.1 where external building elements within 1.5m of the site boundary require an FRL of 90minutes. It is proposed that the buildings will have a reduced FRL which is subject to an alternative solution prepared by the Fire Engineer.	CP1 and CP2
C2.3 and C2.4	Perimeter Vehicular Access Perimeter access for emergency vehicles is proposed to vary from the prescriptive requirements of the BCA. Access will not be afforded to all sides of the building and the width of the access road is to be reduced at various points to less than the prescribed 6m. This non-compliance is to be included in the alternative solution and accepted in liaison with Fire and Rescue New South Wales	CP9
D1.5 and D1.4	Travel Distances Extended distances of travel to and between exits, within the Stage 1 works, as follows: - ▪ 70m to an exit in lieu of 40m ▪ 110m between alternative exits in lieu of 60m	DP4 and EP2.2
E1.5 & C2.3	Automatic Sprinkler Protection The proposed development is to deviate from the prescriptive requirements of the BCA, with the omission of sprinkler protection throughout.	EP1.4, CP2
Table E2.2	Smoke Hazard Management The performance of the Smoke Exhaust System will be required to be included within Fire Engineered Solution for the development in accordance with Performance Requirement EP2.2 of the BCA.	EP2.2

The fire engineered solution relating to CP9, EP1.3 and EP2.2 will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

The documentation will need further detailing such as door hardware, specifications, service design as detailed within this report.

The application for Construction Certificate shall be assessed under the relevant provisions of the Environmental Planning & Assessment Act 1979 (As Amended) and the Environmental Planning & Assessment Regulation 2000.

Assessed By

Vanessa Hinge
Senior Associate
McKenzie Group Consulting

1.0 Introduction

As Accredited Certifiers, we have reviewed architectural design documents prepared by Woods Bagot (refer appendix A) for compliance with the Building Code of Australia 2012.

The DA seeks approval for:

- construction and use of a new purpose-built temporary exhibition facility comprising:
  - 25,000m^2 of exhibition space (part of which may only be used intermittently);;
  - formal entrance and foyer area;
  - registration / reception area;
  - pre-function space; and
  - public facilities including food and beverage outlets and bathroom amenities;
- use of the site as an exhibition centre, 'function centre' and 'food and drink premises';
- hours of operation;
- building signage and advertising structures;
- design and construction of a new link road onto Robert Street and roundabout on Sommerville Road;
- vehicular access from James Craig Road to the south-west and exit onto Sommerville Road and Robert Street to the north-west;
- construction of internal access roads;
- car parking for 1,000 vehicles;
- construction of a temporary private wharf within the waterway adjacent to the north-east corner of the site; and
- dismantling and removal of structures.

The DA also seeks development consent for the use of the short-stay car park at White Bay 5 as detailed in the approved White Bay Cruise Passenger Terminal Part 3A project (MD 10_0069) when the Cruise Passenger Terminal is not in use and land at White Bay 4 for overflow car parking.

1.1 Current Legislation

The applicable legislation governing the design of buildings is the Environmental Planning and Assessment Act 1979. This Act requires that all new building works must be designed to comply with the BCA.

The version of the BCA applicable to the development, is version that in place at the time of the application to the Certifying authority for the Construction Certificate. For the purposes of this assessment, BCA 2012 has been used as the benchmark for assessment being the version of the BCA applicable at the time of preparation of this report.

2.0 Building Assessment Data

Summary of Construction Determination: -

Classification	9b
Number of Storeys Contained	1
Rise In Storeys	1
Type of Construction	Type C
Effective Height (m)	<25m

Summary of the floor areas and relevant populations where applicable: -

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Assumed Population
Exhibition Hall 1	9b	5000	1250
Exhibition Hall 2	9b	5000	1250
Exhibition Hall 3	9b	5000	1250
Registration and Administration Area	9b and 5	700	70
Expansion Hall	9b	10000	2500
Pre-function area	9b	1820	3640
Ancillary Areas (including plant, amenities and loading areas)	9b	1835	62
	Total	**29355m²**	**10022**

Notes:
1. The above populations have been based on the floor areas and calculations in accordance with Table D1.13 of the BCA.
2. The Carpark areas have been considered ancillary to the use for the purposes of population numbers

3.0 Structural Provisions

Any new structural works are to comply with the applicable requirements of AS/NZS 1170.1. Please note that with the adoption of BCA2012, AS1170.2-2011 is applicable to the development.

Glazing is to comply with AS1288, and AS2047.

Further details are to be provided of the proposed "sprung structure" and structural frame. Details are to be provided by the Structural Engineer as to the structure's ability to comply with the provision of the BCA relative to structural provisions and fire resistance.

4.0 Fire Resistance

Prescriptive provisions of the Building Code of Australia 2012 would require the development to be constructed to Type C Construction as outlined in Table 5 of Specification C1.1. It is proposed that the buildings will have a reduced FRL which is subject to an alternative solution prepared by the Fire Engineer.

The development exceeds the area and volume limitations of the BCA provisions, as such, the building is considered a large isolated building the following provisions are prescribed in the BCA:

- Automatic sprinkler protection to AS2118.1 and BCA Specification E1.5 throughout the development,
- Perimeter emergency vehicular access 6m wide located within 18m of the entire building perimeter,
- Smoke exhaust or smoke and heat vents required throughout the development.
- A Hydrant Ring main is to be provided in accordance with AS2419.1-2005

The current design does not afford perimetre vehicular access in accordance with the provisions of BCA Clause C2.4. Continuous vehicular access is not afforded around the entire building, with a width of 6m, in addition, the facility is not proposed to be provided with Sprinkler protection. These non-compliances are to be verified in the Fire Engineered Solution for compliance with relative Performance Requirement of the BCA, and is subject to liason with Fire and Rescue New South Wales.

4.1 Protection of Openings

The prescriptive provisions of the BCA stipulate that openings within building elements required to have an FRL shall be protected as follows:

1. Penetrations through fire rated floors to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a fire rated shaft achieving an FRL of 120/120/120;
2. Any penetration through a wall or room required to have an FRL is to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a shaft achieving an FRL of 120/120/120 ;
3. Self-closing -/60/30 fire doors to the doors opening to the fire isolated stairs (note that this also includes the access doors to the condenser units on the plant platforms).

Note that where fire dampers, fire collars, etc are utilised, allowance needs to be made for access hatches to be provided within the walls / ceilings to ensure that maintenance access is provided.

4.2 Passive Fire Protection

Other passive fire protection issues that will need to be addressed in detailed documentation phase include:

- Emergency power supply,
- Electricity supply,
- Hydrant Pump rooms,

To be separated from the remainder of the building by construction achieving a minimum fire resistance level of 120 minutes.

4.3 Fire Hazard Properties

The fire hazard properties of fixed surface linings and mechanical ductwork will also need to be addressed within the detailed documentation phase pursuant to specification C1.10 Building Code of Australia.

5.0 Egress

The egress provisions from the proposed building are provided by:

- External perimeter doorways
- Required non-fire isolated stairways

Other detailing issues that will need to be addressed include:

- Door Hardware
- Exit door operation
- Stair construction
- Handrail and balustrade construction
- Details of the egress provisions to the Road.

5.1 Exit Travel Distances

The location of exits from the Exhibition Centre are yet to be incorporated into the design documentation and will be further assessed for compliance with the provisions of the BCA through design development.

For compliance with the prescriptive provisions of the BCA, travel distances to exits should not exceed:-

- 20m to a single exit or point of choice and where two exits are provided, a maximum of 40m to one of those exits; and
- exits shall be located to not be more than 60m apart and not closer than 9m

The following areas exceed the maximum allowable travel distance:

- 70m to an exit in lieu of 40m
- 110m between alternative exits in lieu of 60m

5.2 Dimensions of Exits

Minimum dimensions of 1000mm and 2000mm height to be provided within exits, with the paths of travel should provide a minimum width of 1000mm (note that all maintenance access, cat walks, etc may comply with AS1657 in which case a 600mm clear width is required).

The following table summarises the exit widths required:

Floor Level	Exit Width Provided	Number of people (as provided)	Exit Width required
Whole of facility	79	10022	68

As each of the exhibition halls cater for up to 1250 occupants, provision is to be made for 11m aggregate egress from each of the halls.

Doorways are permitted to contain a clear opening width of 750mm with a height of 1980mm as part of egress requirements. Access for persons with disabilities however requires a clear doorway opening width of 850mm (i.e minimum 870 mm doors).

5.3 Balustrading and Handrail

Balustrading to a height of 1000mm with a maximum opening of 125mm in any direction should be provided adjacent to balconies, landings, corridors etc where located adjacent to a change in level exceeding 1000mm.

Where it is possible to fall more than 4m to the finished floor, the balustrade shall not contain any horizontal or near horizontal members that facilitate climbing.

Handrails should generally be provided at a minimum height of 865mm along side of all ramps and stairs.

Handrails are to be provided to each side of the stair, where the stair exceeds a width of 2m. Where an egress stair exceeds 2m in width, an additional handrail is required to ensure that the egress width of 2m is accounted.

The main public stairs and ramps should be designed in accordance with the requirements of AS1428.1 for persons with disabilities. This requires a handrail on each side of the stair and ramp and for the handrail to extend approximately 550mm – 600mm past the last tread / end of ramp.

5.4 Access for Persons with a Disability

Access for people with disabilities shall be provided to and within the building in accordance with the requirements of Clause D3.2, D3.3 and D3.4 of the BCA 2012. Parts of the building required to be accessible shall comply with the requirements of AS1428.1-2009.

The design will comply with the prescriptive provisions of the BCA with additional ongoing review being undertaken as to door widths, circulation, etc. Further details are to be provided or access to these areas is to be assessed by an access consultant.

Where the main public entrance is via a ramp, tactile indicators shall be provided in accordance with AS 1428.4 at the top and bottom. Parking shall be provided for people with disabilities in accordance with in accordance with Clause D3.5 of the BCA. Facilities services and features of the building accessible to people with disabilities shall be identified by signage complying with Clause D3.6 of the BCA.

General

Access to be provided to and within the building pursuant to AS1428.1-2009 as follows:
- Via the principle public entry and at least 50% of all other entrances
- From designated car parking spaces for the use of occupants with a disability.
- From another accessible building connected by a pedestrian link.
- All areas used by the public.

Note that entrances that are not accessible are to be located within 50m of an entrance that is accessible.

A hearing augmentation-listening system shall be installed throughout the building in accordance with the requirements of Clause D3.7 of the BCA.

6.0 Fire Services & Equipment

The following fire services will need to be provided throughout the building:

- Fire hydrants in accordance with clause E1.3 of the BCA and AS 2419.1-2005,
- Fire hose reels in accordance with clause E1.4 of the BCA and AS 2441-2005,
- Portable Fire Extinguishers in accordance with Clause E1.6 of the BCA and AS 2444-2001,
- Emergency lighting, exit signage and directional exit signage is required throughout the building in accordance with Part E of the BCA and AS/NZS 2293.1-2005

The omission of Automatic Sprinkler Protection is to be verified by the Fire Engineer in consultation with Fire and Rescue New South Wales as part of the Alternative Solution process.

A fire Control centre shall be provided in accordance with Clause E1.8 of the BCA.

6.1 Fire Hydrants

A system of Fire Hydrants is required to be provided to BCA Clause E1.3 and AS 2419.1-2005. We will reply upon design certificate from a Hydraulic Consultant.

A booster assembly as part of the fire hydrant requirements. If remote from the building at the main vehicle entry or with sight of the main entry of the building within 20m of a hardstand area.

Where possible, fire hydrants are to be located externally.

6.2 Fire Hose Reels

A Fire Hose Reel System is required to BCA Clause E1.4 and AS2441.

To be located within 4m of exits and provide coverage within the building based on a 36m hose length.

7.0 Ventilation and Smoke Hazard Management

Smoke hazard management shall be provided throughout the building by means of the following systems:

- Automatic Smoke Exhaust System activated by Automatic Smoke Detection & Alarm System in accordance with the requirements of BCA Spec E2.2b, or
- Smoke and Heat Vents in accordance with the requirements of BCA Spec E2.2b

And;

- Automatic Shutdown of Mechanical Systems in accordance with the requirements of AS/NZS 1668.1-1998 upon activation of the sprinkler system or detection system to BCA Specificaton E2.2a;

A fire indicator panel is required as part of the detection system. This panel is to be located within 4m of the main entry and should be incorporated within the fire control Centre. Any variation to the prescriptive provisions will require the consent of the fire brigade and should form part of the fire safety engineering report to verify the performance requirements of the BCA.

Throughout the development the provision of natural or mechanical ventilation is required to all habitable rooms in accordance with F4.5 Building Code of Australia and AS 1668 and AS/NZS 3666.1.

9.0 Sanitary Facilities

The sanitary & other facilities within the development would generally consist of: -

Class	Occupant	Pop	Required

	Number		WC	Urinals	Basins
9b	Male	5011	26	24	26
	Female	5011	53	NA	26

Where multiple banks of sanitary facilities are proposed, 50% of those banks are to be provided with an adjacent accessible sanitary facility and an ambulant toilet for males and females. Please note the Unisex facilities provided for people with disabilities may be counted once for each sex. These facilities are to be provided in accordance with AS1428.1-2009.

10.0 Energy Efficiency

The proposed development shall comply with Part J of the BCA. To achieve compliance, there are two options available:

1. The building can comply with the deemed-to-satisfy provisions of the BCA, relating to the following areas:
   - Building Fabric
   - Glazing
   - Building Sealing
   - Air Conditioning & Ventilation Systems
   - Artificial Lighting & Power
   - Hot Water Supply

2. The building can be verified against a reference building as per Verification Method JV3. This requires that the proposed building and its services be shown to have an annual energy consumption of equal or less than the reference building which has been modelled as per the requirements of Part J of the BCA.

Certification from an appropriately qualified engineer should be provided for either option with a report / computations outlining how compliance is achieved.

Access for maintenance is to be provided to the building in accordance with the requirements of BCA Part J8.

The proposed site will be located in a climate zone 5.

Appendix A - Design Documentation

The following documentation was used in the assessment and preparation of this report: -

Drawing No.	Title	Date	Drawn By	Revision
A1000	Location Plan	12.11.12	Woods Bagot	A
A1001	Site Analysis Plan	12.11.12	Woods Bagot	A
A1002	Site Plan	12.11.12	Woods Bagot	A
A2200	Floor plan	12.11.12	Woods Bagot	A
A2700	Carpark A and B	12.11.12	Woods Bagot	A
A2701	Carpark C and D	12.11.12	Woods Bagot	A
A3000	Elevations	12.11.12	Woods Bagot	A
A3100	Sections	12.11.12	Woods Bagot	A
A4500	Travel Strategy Plan	12.11.12	Woods Bagot	A
A8000	Landscape Plan	12.11.12	Woods Bagot	A
A9400	Anzac Bridge View Analysis	12.11.12	Woods Bagot	A
A9401	White Bat Park view Analysis	12.11.12	Woods Bagot	A

Appendix B - Draft Fire Safety Schedule

	Essential Fire Safety Measures	Standard of Performance
1.	Automatic Fail Safe Devices	BCA Clause D2.19 & D2.21
2.	Building Occupant Warning System activated by the Sprinkler System	BCA Spec. E1.5 & AS 1670 – 2004
3.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005
4.	Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2005
5.	Fire Control Centres	BCA Spec. E1.8
6.	Fire Doors	BCA Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8 and AS 1905.1 – 2005
7.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
8.	Fire Hydrant System	Clause E1.3 & AS 2419.1 – 2005
9.	Fire Seals	BCA Clause C3.15 & AS 1530.4 – 1997
10.	Lightweight Construction	BCA Clause C1.8 & AS 1530.3 – 1999
11.	Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 1998 & AS 1668.2 – 1991
12.	Paths of Travel	EP&A Reg 2000 Clause 186
13.	Perimeter Vehicular Access	BCA Clause C2.4
14.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
15.	Smoke and Heat Vents	BCA Spec. E2.2c & AS 2665 – 2001
16.	Smoke Hazard Management System	BCA Part E2 & AS/NZS 1668.1 – 1998
17.	Warning and Operational Signs	Section 183 of the EP & A Regulations 2000, AS 1905.1 – 2005, BCA Clause C3.6, D2.23, E3.3

Appendix C - Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2012:

Table 5 TYPE C CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	Class of building—FRL: (in minutes)			
	Structural adequacy/ Integrity/ Insulation			
	2, 3 or 4 part	**5, 7a or 9**	**6**	**7b or 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—				
Less than 1.5 m	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
1.5 to less than 3 m	–/–/–	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
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 1.5 m	90/–/–	90/–/–	90/–/–	90/–/–
1.5 to less than 3 m	–/–/–	60/–/–	60/–/–	60/–/–
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS—	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
INTERNAL WALLS-				
Bounding *public corridors*, public lobbies and the like—	60 / 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—	60/ 60/ 60	–/–/–	–/–/–	–/–/–
Bounding a stair if *required* to be rated—	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
ROOFS	–/–/–	–/–/–	–/–/–	–/–/–