REF: 07027-01BCA

BUILDING CODE OF AUSTRALIA REPORT

Proposed Industrial Development

5-9 Culverston Road, Minto NSW

071169-01BCA

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Date	Revision Number	No. of pages	Issue or Description of Amendment	Checked By	Approved By	Date Approved
26.04.16	01	21	Preliminary	Joel Lewis	Stephen Natilli	26.04.16

Executive Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by Reid Campbell (refer appendix A) for compliance with the Building Code of Australia 2015.

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
C2.3	Warehouse 1A Emergency vehicular access will be required to be assessed as part of the fire engineered solution as access for emergency vehicles has been provided to Eastern, Southern & Western sides in lieu of the entire building.	CP9
D1.4	Travel distances are to be addressed through the development of an alternative solution by an Accredited Fire Engineer and verified against the Performance Requirements of the BCA.	DP4 & EP2.2
E1.3	Hydrants located under an awning, (and used as an external hydrant for the purposed of coverage) will be required to be included within the fire engineered solution prepared by an Accredited Fire Engineer and verified against the Performance Requirements of the BCA.	EP1.3
E2.2	Smoke hazard management to the development is to be assessed at part of the Fire Engineered Solution prepared by an Accredited Fire Engineer and verified against the Performance Requirements of the BCA.	EP2.2
E4.5	Illuminated exit signs within the warehouse proposed to be mounted greater than 2.7m from the FFL to be addressed through the development of an alternative solution by an Accredited Fire Engineer and verified against the Performance Requirements of the BCA.	EP4.2

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 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,

Joel Lewis
Building Surveyor

1.0 Introduction

The proposed development relates to the development of 5 and 9 Culverston Road, Minto, being legally described as Lot 3 in DP 817793 and Lot 400 in DP 875711, for the purpose of a Warehouse and Logistics Hub (the Proposal).

The proposed development comprises of the development of four buildings identified as Warehouse 1A, 1B,1C and 1D. Access is provide to each building via Culverston Road.

Each speculative warehouse contains a warehouse portion with an attached office situated over two levels, on-grade car parking and loading dock facilities.

The development site is located at 5-9 Culverston Road, Minto NSW.

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 the version that is in place at the time of the application to the Certifying authority for the Construction Certificate. Should an application not be lodged with the Certifying authority before the 1st May 2016, BCA 2016 will become applicable to the project.

2.0 Building Assessment Data

Summary of Construction Determination: -

Warehouse	1A	1B	1C	1D
Classification	7b*	7b*	7b*	7b*
Number of Storeys Contained	2	2	2	2
Rise In Storeys	2	2	2	2
Type of Construction	C	C	C	C
Effective Height (m)	<12m	<12m	<12m	<12m

*Class 7b is applied to the whole of the building as the floor area to the office is less than 10% of the total floor area of the building, as per clause A3.3 of the BCA.

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

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Assumed Population	Provided Population
1A - Warehouse	7b	40,000m2	934 persons	250 persons
1A - Office	5	1,929m2	193 persons	
1B - Warehouse	7b	22,000m2	514 persons	132 persons

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Assumed Population	Provided Population
1B - Office	5	900m2	90 persons	
1C - Warehouse	7b	22,000m2	514 persons	194 persons
1C - Office	5	900m2	90 persons	
1D - Warehouse	7b	23,000m2	537 persons	153 persons
1D - Office	5	900m2	90 persons	
Total		**111,629 m²**	**2,962 persons**	**729 persons**

Notes:
1. Assumed populations have been base on the floor areas and calculations in accordance with Table D1.13 of the BCA.
2. Provided populations have been provided by the applicant for the warehouse portions of the development.
3. The floor areas have been adjusted without ancillary areas such as sanitary facilities, corridors, shelving and or racking layouts in storage areas.

3.0 Structural Provisions

Any new structural works are to comply with the applicable requirements of AS/NZS 1170.1.

Glazing is to comply with AS1288, and AS2047.

Prior to the issue of the Construction Certificate structural certification is required to be provided.

4.0 Fire Resistance

The buildings should be constructed generally in accordance with the Building Code of Australia 2015, and required to be Type C Construction as outlined in Specification C1.1.

The building has been assessed against the relevant provisions of a 'large isolated Building' in accordance with Clause C2.3 of the Building Code of Australia. Therefore the following elements shall apply:

- Automatic sprinkler protection to AS2118.1-1999 and BCA specifications E1.5 throughout the development
- Perimeter emergency vehicular access 6m wide located within 18m of the entire building perimeter,
- Hydrant system is to be in accordance with AS2419.1-2005, also to incorporate a ring main.
- Smoke hazard mangement to be assessed against EP2.2 of the BCA as part of the Fire Engineering Solution.

The fire brigade perimeter access will be required to be assessed as part of the fire engineered solution for the development as continuous access for emergency vehicles in a forward direction has not been provided to Warehouse 1A due to the car parking located on the Northern elevation, assessment against performance requirement CP9 of the BCA is required.

In addition, the solution will be required to be developed in consultation with NSW fire brigade prior to the submission for Construction Certificate.

4.1 Passive Fire Protection

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

- Hydrant Pump rooms,
- Sprinkler Pump Rooms,

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

4.2 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 and internal stairways within the office portions.

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 locations of the proposed exits would appear to indicate that the deemed to satisfy requirements in terms of distances between alternative exits and egress widths would not be satisfied to warehouse areas.

The travel distances to exits should not exceed:

Class 5-9

- 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 travel distance to an exit have been assessed to exceed the deem-to-satisfy provisions of the BCA therefore an alternate solution is to be sought from a fire engineer to verify the performance requirement DP4 and EP2.2 of the BCA

5.2 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 below, 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 alongside of all ramps and stairs.

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.

5.3 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 2011. Parts of the building required to be accessible shall comply with the requirements of AS1428.1-2009.

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.

6.0 Fire Services & Equipment

The following fire services are required to be provided throughout all buildings:

- An automatic sprinkler system in accordance with the relevant provision of clause E1.5 of the BCA and AS 2118.1-1999 throughout,

- 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. Illuminated exit signs

within the warehouse proposed to be mounted greater than 2.7m from the FFL to be addressed in accordance with Performance Requirement EP4.2 of the BCA.

- Smoke hazard management to be provided in accordance with the Fire engineered report verifying EP2.2 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.

A booster assembly as part of the fire hydrant requirements. The booster is required to be located attached to the building at the main entry. If remote from the building at the main vehicle entry or within sight of the main entry of the building within 20m of a hardstand area.

In addition, please note that any hydrant located under an awning, (and used as an external hydrant for the purposed of coverage) will be required to be included within the fire engineered solution in accordance with Performance Requirement EP1.3 of the BCA.

6.2 Fire Hose Reels

A Fire Hose Reel System is required to be provided to BCA Clause E1.4 and AS2441-2005.
To be located within 4m of exits and provide coverage within the building based on a 36m hose length.

6.3 Automatic Sprinkler Protection

An Automatic Fire Suppression System is required to be provided to Specification E1.5 and AS2118.1-1999

An occupant warning system that is triggered upon activation of the sprinkler system is required to be provided in accordance with BCA Specification E1.5.

7.0 Ventilation and Smoke Hazard Management

Smoke hazard management shall be provided throughout the buildings 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,

- Automatic Smoke Detection and Alarm System in accordance with the requirements of BCA Spec E2.2a and AS 1670.1-2004.

It is noted that the above smoke hazard management is to be assessed at part of the Fire Engineered Solution prepared by an Accredited Fire Engineer and verified against the Performance Requirements of the BCA.

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 room. 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.

8.0 Lift Services

The passenger lift required to be provided to the office area to all buildings are to be provided with the following: -

- A handrail in accordance with AS 1735.12
- Minimum internal floor dimensions as specified in AS 1735.12,
- Fitted with a series of door opening sensory devices which will detect a 75mm diameter or across the door opening between 50mm and 1550mm above floor level,
- Have a set of buttons for operating the lift located at heights above level complying with AS 1735.12.

9.0 Sanitary Facilities

Sanitary facilities will be required to be provided to comply with the provisions of clause F2.3 of the BCA. Please provide drawings which detail the number sanitary facilities to be provided for further assessment.

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 AS1428.1-2001.

Where detailed fitout is pending analysis will be undertaken once tenants and indicative layouts/tenant numbers are known. No allowance has been made for corridors etc that would be provided.

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 6.

Appendix A - Design Documentation

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

Drawing No.	Title	Date	Drawn By	Revision
A0006	Site Masterplan (Overall)	24.03.16	Reid Campbell	5
A007	Site Elevations	24.03.16	Reid Campbell	
A008	Site Sections	24.03.16	Reid Campbell	1
A0010	Perspective A	24.03.16	Reid Campbell	1
A00011	Perspective B	24.03.16	Reid Campbell	1
A1001	Warehouse 1A – Site Plan	24.03.16	Reid Campbell	2
A1002	Warehouse 1A – Floor Plan	24.03.16	Reid Campbell	2
A1003	Warehouse 1A – Roof Plan	24.03.16	Reid Campbell	2
A1004	Warehouse 1A – Office Floor Plan	24.03.16	Reid Campbell	2
A1005	Warehouse 1A – Elevations 1	24.03.16	Reid Campbell	2
A1006	Warehouse 1A – Elevations 2	24.03.16	Reid Campbell	2
A1007	Warehouse 1A – Section AA, BB, CC	24.03.16	Reid Campbell	22
A1010	Warehouse 1A – External Finishes Board	24.03.16	Reid Campbell	1
A2001	Warehouse 1B – Site Plan	24.03.16	Reid Campbell	1
A2002	Warehouse 1B – Floor Plan	24.03.16	Reid Campbell	1
A2003	Warehouse 1B – Roof Plan	24.03.16	Reid Campbell	1
A2004	Warehouse 1B – Office Floor Plan	24.03.16	Reid Campbell	1
A2005	Warehouse 1B – Elevations 1	24.03.16	Reid Campbell	1
A2006	Warehouse 1B – Elevations 2	24.03.16	Reid Campbell	1
A2007	Warehouse 1B – Section AA, BB, CC	24.03.16	Reid Campbell	1
A2010	Warehouse 1B – External Finishes Board	24.03.16	Reid Campbell	1
A3001	Warehouse 1C – Site Plan	24.03.16	Reid Campbell	1
A3002	Warehouse 1C – Floor Plan	24.03.16	Reid Campbell	1
A3003	Warehouse 1C – Roof Plan	24.03.16	Reid Campbell	1
A3004	Warehouse 1C – Office Floor Plan	24.03.16	Reid Campbell	1
A3005	Warehouse 1C – Elevations 1	24.03.16	Reid Campbell	1
A3006	Warehouse 1C – Elevations 2	24.03.16	Reid Campbell	1

A3007	Warehouse 1C – Section AA, BB, CC	24.03.16	Reid Campbell	1
A3010	Warehouse 1C – External Finishes Board	24.03.16	Reid Campbell	1
A4001	Warehouse 1D – Site Plan	24.03.16	Reid Campbell	1
A4002	Warehouse 1D – Floor Plan	24.03.16	Reid Campbell	1
A4003	Warehouse 1D – Roof Plan	24.03.16	Reid Campbell	1
A4004	Warehouse 1D – Office Floor Plan	24.03.16	Reid Campbell	1
A4005	Warehouse 1D – Elevations 1	24.03.16	Reid Campbell	1
A4006	Warehouse 1D – Elevations 2	24.03.16	Reid Campbell	1
A4007	Warehouse 1D – Section AA, BB, CC	24.03.16	Reid Campbell	1
A4010	Warehouse 1D – External Finishes Board	24.03.16	Reid Campbell	1

Appendix B - Draft Fire Safety Schedule

	Essential Fire Safety Measures	Standard of Performance
1.	Automatic Fire Detection and Alarm System	BCA Spec. E2.2a & AS 1670 – 2004
2.	Automatic Fire Suppression System	BCA Spec. E1.5 & AS 2118.1 – 1999, AS 2118.6 – 1995 (Combined sprinkler & hydrant)
3.	Building Occupant Warning System activated by the Sprinkler System	BCA Spec. E1.5 & AS 1670 – 2004
4.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005
5.	Emergency Evacuation Plan	AS 3745 – 2002
6.	Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2005 and fire engineered solution …..
7.	Fire Control Centre	BCA Spec. E1.8
8.	Fire Blankets	AS 2444 – 2001
9.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
10.	Fire Hydrant System	Clause E1.3 & AS 2419.1 – 2005
11.	Paths of Travel	EP&A Reg 2000 Clause 186 and fire engineered solution …..
12.	Perimeter Vehicular Access	BCA Clause C2.4
13.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
14.	Smoke Hazard Management System	BCA Part E2 & AS/NZS 1668.1 – 1998 and fire engineered solution …..

Appendix C - Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2015:

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	–/–/–	–/–/–	–/–/–	–/–/–