BUILDING CODE OF AUSTRALIA REPORT

Warehouse Facility & Distribution Centre for Martin Brower
Proposed Lots 5 & 6, Corner of Horsley Drive & Cowpasture Road, Horsley Park

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Date	Revision Number	No. of pages	Issue or Description of Amendment	Checked By	Approved By	Date Approved
25.06.15	A	14	Draft	Andrew Maxon	Vanessa Batty	26.06.15
02.07.15	B	14	Final	Andrew Maxon	Vanessa Batty	02.07.15

Executive Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by Australand (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
C2.4	**Perimeter Vehicular Access** Compliant perimeter vehicle access has not been provided to the Northern perimeter of the building.	CP9
D1.4 & D1.5	**Travel Distances** Office Travel distances of up to 25m to a Point of Choice and 55m to an Exit Warehouse Travel distances of up to 30m to a Point of Choice, 100m to an Exit and 120m between alternative Exits	DP4 & EP2.2
D1.10	**Discharge of Exits** Discharge of exits must be open directly to the sky, currently awnings are located above some Exits.	DP4
E1.3	**Fire Hydrants** If fire hydrants are located underneath awnings and/or if the location of the booster does not meet the prescriptive provisions these will be required to be included as part of the fire safety engineering.	EP1.3
E2.2	**Smoke Hazard Management System** The Smoke Hazard Management provisions within the facility shall be assessed as part of the fire safety engineering.	EP2.2
E4.5,E4.6 & E4.8	**Exit Signs** Mounting of Illuminated Exit Signage greater than 2.7m from the FFL	EP4.2

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

The assessment of the design documentation has revealed that the following areas require either design amendments or further detail to be submitted for our assessment.

BCA Clause	Comment
C2.12	Details for the intended use and capacity of the battery room are to be provided. Dangerous Goods Consultant is also required to confirm additional requirements.
Part D3 & AS1428.1-2009	Provisions for Wheelchair access will be required to be provided to the Receiving Dock Office.
D2.19/D2.21	Vertical sliding (forklift) doors located on a path of travel to an Exit will be required to be provided with fail safe opening devices or alternatively additional breakout doors may be located between rooms.
F2.3	Details for ambulant facilities are to be provided.

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

Andrew Maxon
Building Surveyor
McKenzie Group

1.0 Introduction

The proposed development comprises of a single storey Warehouse Facility & Distribution Centre and two storey office with on-grade carparking.

The site is located Corner of Horsley Drive & Cowpasture Road, Horsley Park

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.

2.0 Building Assessment Data

Summary of Construction Determination: -

Building Particulars	
Classification	5, 7b/8
Number of Storeys Contained	2
Rise In Storeys	2
Type of Construction	C
Effective Height (m)	<12m

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

Part of Project	**BCA Classification**	**Approx. Floor Area (m^2)**	**Assumed Population**
Office	5	3,132	150
Warehouse	7b	14,800	70
Total		**16,400m²**	**220**

Notes:
1. The above populations have been provided by the Tenant. Where the proposed occupancy are increased a review of the design for compliance is required.

3.0 Structural Provisions

Any new structural works are to comply with the applicable requirements of Part B of the BCA & relevant Australian Standards as indicated in Table A1.3. 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 Table 5 of Specification C1.1 of the Building Code of Australia 2015. The building is required to be Type C Construction.

The building has been assessed on the basis that is a single fire compartment;

Fire resistance levels for building structural members are as follows:

- Warehouse 90 minutes
- Office 90 minutes

As the building exceeds the area / volume limitations of the BCA provisions, the building has been considered a large isolated building and the following provisions will apply:

- Automatic sprinkler protection to AS2118.1 and BCA specifications E1.5 throughout the development / smoke detection and alarm system in accordance with AS1670,
- 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

Vehicular access serving the building will be required to be addressed as part of the fire engineered alternative solution for the development in accordance with Performance Requirement CP9, based on the following:

i. Continuous access for a 6.0m wide access roadway with no part further than 18m from the building has not been provided in a forward direction to the North Elevation due to the truck entry and driveway being located greater than 12m from the building line. It is also noted that water tanks to the North-West Elevation also obstruct the vehicle access.
ii. Vehicle access has potentially been obstructed to the West Elevation due to an awning. Where the clear height of the awning is less than 4.5m it will be required to be included in the fire engineering.
iii. Vehicle access to the Truck Exit is approx. 4.5m wide per lane in lieu of 6.0m unobstructed width.

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 walls or floors are 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 90mintues;
2. Any penetration through a wall or room required to have an FRL (e.g. substation, boiler room, apartment separating wall etc) 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 90mintues (or 120/120/120 where it is a room such as a substation);

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:

- Electricity supply,
- Boiler or battery rooms,
- 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.

4.3 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

Other detailing issues that will need to be addressed include:

- Door Hardware
- Exit door operation
- Vertical sliding (forklift) doors located on a path of travel to an Exit.

5.1 Exit Travel Distances

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 proposed travel distances within the building will exceed the prescriptive provisions of the BCA and therefore will be required to be assessed as part of the buildings fire engineering addressing performance requirements DP4 and EP2.2 of the BCA:

<u>Office</u>

- Travel distances of up to 25m to a Point of Choice and 50m to an Exit

<u>Warehouse</u>

- Travel distances of up to 30m to a Point of Choice, 70m to an Exit and 100m between alternative Exits

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
Office	1.5m	150	2.5m
Warehouse	1.0m	70	2.5m

The following doors being designed to swing in the direction of egress:
- Eastern Exit to Office

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).

5.4 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.

5.5 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 2015. Parts of the building required to be accessible shall comply with the requirements of AS1428.1-2009.

The design would generally 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.

Parking shall be provided for people with disabilities in accordance with in accordance with Clause D3.5 of the BCA, which requires 3 accessible spaces to be provided based upon 250 proposed carparking spaces at a ratio of 1 per 100.

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.

6.0 Fire Services & Equipment

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

- An automatic sprinkler system in accordance with the relevant provision of clause E1.5 of the BCA and AS 2118.1-1999
- 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
- 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,
- Smoke hazard management system in accordance with BCA Part E2.2 and AS1668.1-1998
- 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 will be required as part of the fire hydrant requirements. The booster is required to be located within sight of the main entry. If remote from the building, it may be located at the main vehicle entry and within 20m of a hardstand area.

Where hydrants are located underneath awnings they are required to be considered as internal hydrants for the purposes of coverage unless otherwise addressed via a fire engineered alternative solution addressing performance requirements EP1.3.

6.2 Fire Hose Reels

A Fire Hose Reel System is required to BCA Clause E1.4 and AS2441 and 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 / not required to Specification E1.5 and AS 2118.1-1999.

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

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

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 lifts to be installed are to be: -

- fitted with warning signs, fire service controls in accordance with AS 1735.2
- 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

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

Class	Occupant Numbers		WC	Urinal	Basin
5 & 7b	Male	180*max	6*	8	6*
	Female	225*max	12*	N/A	11*
	Unisex	N/A	3*	0	3*

*Please note:-

1. 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.

Both accessible and ambulant facilities are required to be provided to the bank of sanitary facilities in accordance with AS1428.1-2009.

Handrail transfers to accessible facilities are also required to be alternated.

10.0 Energy Efficiency

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

2. 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

3. 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.

Due to special nature of the building some energy provisions may not be appropriate.

10.1 Access for Maintenance

Access if to be provided to all plant, equipment and components associated with the provision of the above energy requirements i.e.

- Adjustable or monitored shading devices
- Time switches and motion detectors
- Room temperature thermostats
- Plant thermostats such as boilers or refrigeration units
- Motorised air dampers and central valves
- Reflectors, Lenses and Diffusers of light fittings
- Heat transfer equipment

Appendix A - Design Documentation

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

Drawing No.	Title	Date	Revision
MB-WSPT-DA-000-A	Title Sheet	30.06.15	P1
MB-WSPT-DA-001-A	Location Plan	30.06.15	P1
MB-WSPT-DA-002-A	Site Analysis	30.06.15	P1
MB-WSPT-DA-003-A	Site Plan	30.06.15	P1
MB-WSPT-DA-100-A	Warehouse Plan	30.06.15	P1
MB-WSPT-DA-110-A	Office Ground Floor Plan	30.06.15	P1
MB-WSPT-DA-111A	Office First Floor Plan	30.06.15	P1
MB-WSPT-DA-112-A	Receiving Office Floor Plan	30.06.15	P1
MB-WSPT-DA-200-A	Elevations	30.06.15	P1
MB-WSPT-DA-210-A	Sections	30.06.15	P1

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.	Automatic Fire Suppression System	BCA Spec. E1.5 & AS 2118.1 – 1999,
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.	Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2005
6.	Fire Control Centres	BCA Spec. E1.8
7.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
8.	Fire Hydrant System	Clause E1.3 & AS 2419.1 – 2005
9.	Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 1998 & AS 1668.2 – 1991
10.	Paths of Travel	EP&A Reg 2000 Clause 186
11.	Perimeter Vehicular Access	BCA Clause C2.4
12.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
13.	Required Exit Doors (power operated)	BCA Clause D2.19(d)
14.	Smoke and Heat Vents	BCA Spec. E2.2c & AS 2665 – 2001
15.	Smoke Hazard Management System	BCA Part E2 & AS/NZS 1668.1 – 1998

Appendix D- 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	–/–/–	–/–/–	–/–/–	–/–/–