BUILDING CODE OF AUSTRALIA REPORT

Speculative Warehouse / Distribution Centre & Industrial Facility

Proposed Lot 3 in Lot 5 DP1212087, Burilda Close, Wetherill Park

Table of Contents

Date	Revision Number	No. of pages	Issue or Description of Amendment	Checked By	Approved By	Date Approved
30.09.16	01	13	DA Submission	Vanessa Batty	Geoff Pearce	30.09.16

Executive Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by Frasers Property Australia (refer appendix A) for compliance with the Building Code of Australia 2016.

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 Performance Based Solution	Performance Requirement
C2.4	**Perimeter Vehicular Access** The building is not afforded with perimeter vehicular access for emergency vehicles in accordance with deemed-to-satisfy clause C2.4(b).	CP9
D1.4	**Travel Distances to Exits** The following areas exceed the maximum allowable travel distance: ▪ Up to 70m to an exit in lieu of 40m. ▪ Up to 90m between alternative exits in lieu of 60m. These travel distances in excess of that prescribed by the deemed-to-satisfy provisions of the BCA are to be verified for compliance with the Performance Requirements of the BCA through the development of a Fire Engineered Solution.	DP4 and EP2.2
E1.3 and AS2419.1-2005	**Hydrant System** The location of external hydrants under awning is also to be verified for compliance with the performance requirements of the BCA by the Fire Engineer through the development of an alternative solution.	EP1.3
E4.5-E4.8 and AS2293.1-2005	**Exit Signage** The height of installation of exit signage is proposed to exceed the limitations within AS2293.1-2005; a performance based solution is proposed to be developed by the fire engineer to verify compliance of an alternative design with the Performance Requirements of the BCA.	EP4.1
E2.2 and Specification E2.2b	**Smoke Hazard Management** The design and performance of the smoke hazard management system is to be rationalised by the fire engineer though a performance based solution which verifies compliance with the Performance Requirements of the BCA.	EP2.2

The fire engineered solution relating to CP9, E1.3 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:
Vanessa Batty
McKenzie Group Consulting (NSW) Pty Ltd

1.0 Introduction

The proposed development comprises the construction of a warehouse / industrial facility with ancillary offices and on grade car parking. The warehouse / industrial facility is proposed to be constructed in two (2) stages to allow for the two (2) warehouse / industrial facilities and loading areas to be divided and separately tenanted as part of the Stage 2 works.

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 Building Code of Australia (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 purpose of this report, BCA 2016 has been utilised as the benchmark for assessment as latest version of the BCA.

2.0 Building Assessment Data

Summary of Construction Determination: -

Classification	5, 8and/or 7b
Number of Storeys Contained	2
Rise In Storeys	2
Type of Construction	Type 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
Warehouse 01	7b/8	13695	80[2]
Office Mezzanine 01	5	500	50[1]
Entry Foyer 01	5	40	Ancillary
Warehouse 02	7b/8	8682	80[2]
Office Mezzanine 02	5	500	50[1]
Entry Foyer 01	5	40	Ancillary[3]
	Total	**23455m²**	**260**

Notes:
1. The above populations for office areas have been base on the floor areas and calculations in accordance with Table D1.13 of the BCA.
2. The above populations for Warehouse areas are indicative only and are subject to qualification with tenants.

3. The Carpark areas and Foyer Spaces 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.

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 5 of Specification C1.1 of the Building Code of Australia 2016. The building is required to be Type C Construction.

As the building exceeds the Fire Compartment sizes specified in BCA Table C2.2, the building has been assessed as a Large isolated Building in accordance with BCA Clause C2.3, and the following provisions will apply:

- Automatic sprinkler protection to AS2118.1 and BCA specifications E1.5 throughout the development; and
- Perimeter emergency vehicular access 6m wide located within 18m of the entire building perimeter; and
- Smoke exhaust required throughout the development in accordance with BCA Table E2.2a and Spec E2.2b; and
- A Hydrant ringmain provided around the building in accordance with AS2419.1-2005

An assessment of the provisions for the Large Isolated Building as identified that the following matters are to be addressed as part of a Performance Based Solution for the development, prepared by the Fire engineer:

1. The building is not afforded with perimeter vehicular access for emergency vehicles in accordance with deemed-to-satisfy clause C2.4(b).
2. The provisions for smoke hazard management including smoke exhaust system is proposed to be rationalised through the development

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);
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)

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.

Fire source feature is defined as;
(a) The far boundary of a road, river, lake or the like adjoining an allotment,
(b) The side or rear boundary of the allotment,

(c) The external wall of another building on the allotment which is not a class 10 building.

4.4 Passive Fire Protection

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

- Electricity supply,
- Boilers or batteries,
- 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.

4.4 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 deemed-to-satisfy provisions of the BCA nominate travel distances to exits within the development 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:

- Up to 70m to an exit in lieu of 40m.
- Up to 90m between alternative exits in lieu of 60m.

These travel distances in excess of that prescribed by the deemed-to-satisfy provisions of the BCA are to be verified for compliance with the Performance Requirements of the BCA through the development of a Fire Engineered Solution.

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).

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.

Any windows with a sill height of less than 1.7m in bedrooms or 865mm in all other cases with a fall of more than 2m for windows, 4m for all other cases, openings are to be restricted or a protective barrier that does not allow a 125mm sphere to pass through.

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 2016. 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.

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.

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.
- Fire hydrant system 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,
- Building Occupant Warning System activated by the Sprinkler System in accordance with BCA Specification E2.2a, Clause 6.
- 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

A Fire Control Centre shall be provided in accordance with Clause E1.8 of the BCA.

The height of installation of exit signage is proposed to exceed the limitations within AS2293.1-2005; a performance based solution is proposed to be developed by the fire engineer to verify compliance of an alternative design with the Performance Requirements of the BCA.

The location of external hydrants under awning is also to be verified for compliance with the performance requirements of the BCA by the Fire Engineer through the development of an alternative solution.

7.0 Ventilation and Smoke Hazard Management

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

- Automatic Shutdown of Mechanical Systems in accordance with the requirements of AS/NZS 1668.1-1998;
- Automatic Smoke Exhaust System activated by Automatic Smoke Detection & Alarm System in accordance with the requirements of BCA Spec E2.2b

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.

The design and performance of the smoke hazard management system is to be rationalised by the fire engineer though a performance based solution which verifies compliance with the Performance Requirements of the BCA.

8.0 Lift Services

The passenger lifts to be installed are to be provided for access to the Mezzanine Offices, lifts are to be provided with: -

- fitted with warning signs, fire service controls in accordance with AS 1735.2
- Stretcher facilities are to be provided within the lifts with minimum dimensions of 600m wide, 2000mm long and 1400mm high.
- 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: -

Description of building or part	Occupant Number	Population No.		Required		
				WC	Urinals	Basins
Warehouse 01	80	Male	40	2	2	2
		Female	40	3	NA	2
Office 01	50	Male	25	2	1	2
		Female	25	2	NA	2
Warehouse 02	80	Male	40	2	2	2
		Female	40	3	NA	2
Office 02	50	Male	25	2	1	2
		Female	25	2	NA	2

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.

The design documentation indicates that the sanitary facility numbers as nominated in the table above have been accommodated in the design.

10.0 Energy Efficiency

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

3. 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

4. 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.

Appendix A - Design Documentation

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

Drawing No.	Title	Date	Drawn By	Revision
SP4-WSPT-P1-000	Title Sheet	27.09.16	Frasers Property	A
SP4-WSPT-P1-001	Location Plan	27.09.16	Frasers Property	A
SP4-WSPT-P1-002	Site Analysis	27.09.16	Frasers Property	A
SP4-WSPT-P1-003	Site Plan	27.09.16	Frasers Property	A
SP4-WSPT-P1-004	Truck Driving Diagrams	27.09.16	Frasers Property	A
SP4-WSPT-P1-005	Truck Driving Diagrams	27.09.16	Frasers Property	A
SP4-WSPT-P1-006	Staging Plans	27.09.16	Frasers Property	A
SP4-WSPT-P1-100	Warehouse / Industrial Facility Plan	27.09.16	Frasers Property	A
SP4-WSPT-P1-110	Office 01 – Floor Plans	27.09.16	Frasers Property	A
SP4-WSPT-P1-111	Office 02 – Floor Plans	27.09.16	Frasers Property	A
SP4-WSPT-P1-200	Elevations	27.09.16	Frasers Property	A
SP4-WSPT-P1-210	Sections	27.09.16	Frasers Property	A
SP4-WSPT-P1-400	Lighting Plan	27.09.16	Frasers Property	A
SP4-WSPT-P1-500	Coloured Elevations	27.09.16	Frasers Property	A
SP4-WSPT-P1-600	Office 01 – Perspective	27.09.16	Frasers Property	A
SP4-WSPT-P1-610	Office 02 - Perspective	27.09.16	Frasers Property	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.	Automatic Fire Detection and Alarm System	BCA Spec. E2.2a & AS 1670 – 2004
3.	Automatic Fire Suppression System	BCA Spec. E1.5 & AS 2118.1 – 1999,
4.	Building Occupant Warning System activated by the Sprinkler System	BCA Spec. E1.5 & AS 1670 – 2004
5.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005
6.	Emergency Evacuation Plan	AS 3745 – 2002
7.	Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2005
8.	Fire Control Centre	BCA Spec. E1.8
9.	Fire Blankets	AS 2444 – 2001
10.	Fire Dampers	BCA Clause C3.15, AS 1668.1 – 1998 & AS 1682.1 & 2 – 1990
11.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
12.	Fire Hydrant System	Clause E1.3 & AS 2419.1 – 2005
13.	Fire Seals	BCA Clause C3.15 & AS 1530.4 – 1997
14.	Lightweight Construction	BCA Clause C1.8 & AS 1530.3 – 1999
15.	Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 1998 & AS 1668.2 – 1991
16.	Paths of Travel	EP&A Reg 2000 Clause 186
17.	Perimeter Vehicular Access	BCA Clause C2.4
18.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
19.	Required Exit Doors (power operated)	BCA Clause D2.19(d)
20.	Smoke Hazard Management System	BCA Part E2 & AS/NZS 1668.1 – 1998

Appendix C- Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2016:

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	–/–/–	–/–/–	–/–/–	–/–/–