BUILDING CODE OF AUSTRALIA REPORT

Speculative Warehouse / Industrial Facility

6 Burilda Close, Wetherill Park
Lot 3 DP1213567

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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
05.05.17	02	14	S96 Submission	Joel Lewis	Vanessa Batty	05.05.17

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 Vehicle Access** Perimeter access for emergency vehicles has not been provided and the provided access is greater than 18m to the Eastern & Western elevations. A Performance Solution is required to be sought from an accredited fire engineer and verified against the Performance Requirements of the BCA	CP9
D1.4	**Travel Distances to Exits** The following areas exceed the maximum allowable travel distance: ▪ Up to 75m to an exit in lieu of 40m. ▪ Up to 130m 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 & AS2419.1-2005	**External Hydrant System** 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
E1.4 & AS2441-2005	**Fire Hose Reels** It is proposed for the use of 50m fire hose reels to the warehouse in lieu of 36m as defined by AS2441-2005 and hose reels are to be located greater than 4m from an exit at certain locations.	EP1.1
E4.5-E4.8 and AS2293.1-2005	**Exit Signage** 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.	EP4.1

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,

Joel Lewis
McKenzie Group Consulting (NSW) Pty Ltd

1.0 Introduction

The proposed development comprises the construction of a warehouse / industrial facility with an associated office and showroom over located over two stories, hardstand, on grade car parking and landscaping.

The site is located at 6 Burilda Close, Wetherill Park and legally identified as Lot 3 DP 1213567.

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.

2.0 Building Assessment Data

Summary of Construction Determination: -

	Warehouse, Office & Showroom
Classification	5 / 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	7b	23,260m²	30
Showroom	7b	1,990m²	Ancillary
Office	5	580m²	
Warehouse Office	5	225m²	30
	Total	**26,055m²**	**60**

Notes:
1. The assumed populations have been provided by the client for the use of the building.
2. 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

The building is not afforded with perimeter vehicular access for emergency vehicles in accordance with deemed-to-satisfy clause C2.4(b). The 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 and the access provided is located greater than 18m from the building to the Southern & Western elevations, as such, a Performance Solution will be required to be sought from an accredited fire engineer against Performance Requirement CP9 of the BCA.

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 130m 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; or
- 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

Assessment of the sanitary facilities will be completed on the issuance of detailed plans.

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 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
VI-WSPT-DA-000	Title Sheet	06.04.17	Frasers Property	A
VI-WSPT-DA-001	Location Plan	06.04.17	Frasers Property	A
VI-WSPT-DA-002	Site Anyalsis	06.04.17	Frasers Property	B
VI-WSPT-DA-003	Site Plan	06.04.17	Frasers Property	A
VI-WSPT-DA-004	Truck Turning Diagrams – Sheet 1	06.04.17	Frasers Property	A
VI-WSPT-DA-005	Truck Turning Diagrams – Sheet 2	06.04.17	Frasers Property	A
VI-WSPT-DA-100	Warehouse / Industrial Plan	06.04.17	Frasers Property	A
VI-WSPT-DA-110	Warehouse Office & Main Office Plans	06.04.17	Frasers Property	A
VI-WSPT-DA-111	Showroom Plans	06.04.17	Frasers Property	A
VI-WSPT-DA-200	Elevations	06.04.17	Frasers Property	A
VI-WSPT-DA-210	Sections	06.04.17	Frasers Property	A
VI-WSPT-DA-400	Lighting Plan	06.04.17	Frasers Property	A
VI-WSPT-DA-500	Coloured elevations	06.04.17	Frasers Property	A
VI-WSPT-DA-600	Burilda Close Cul De Sac Perspective	06.04.17	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 and fire engineering report ….
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 and fire engineering report ….
8.	Fire Control Centre	BCA Spec. E1.8
9.	Fire Blankets	AS 2444 – 2001
10.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005 and fire engineering report ….
11.	Fire Hydrant System	Clause E1.3 & AS 2419.1 – 2005 and fire engineering report ….
12.	Fire Seals	BCA Clause C3.15 & AS 1530.4 – 1997
13.	Lightweight Construction	BCA Clause C1.8 & AS 1530.3 – 1999
14.	Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 1998 & AS 1668.2 – 1991
15.	Paths of Travel	EP&A Reg 2000 Clause 186 and fire engineering report ….
16.	Perimeter Vehicular Access	BCA Clause C2.4 and fire engineering report ….
17.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
18.	Smoke Hazard Management System	BCA Part E2 & AS/NZS 1668.1 – 1998 and fire engineering report ….

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	–/–/–	–/–/–	–/–/–	–/–/–