

BUILDING CODE OF AUSTRALIA PRELIMINARY REPORT

PROPOSED OFFSITE RESERVE FACILITY

Site H – Templar Road, Erskine Park

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EXECUTIVE SUMMARY

McKenzie Group Consulting was engaged by Hansen Yuncken to conduct a BCA assessment of the proposed Off Site Reserve Facility located at Site H – Templar Road, Erskine Park.

This report nominates relevant BCA prescriptive ('deemed to satisfy') provisions together with areas in which an alternate performance based solution will need to be developed to comply with the performance requirements of the BCA.

The report also provides an overview of relevant provisions for health and amenity for occupants including sanitary facilities for both able bodied occupants and occupants with disabilities as well as general access provisions.

The report highlights key compliance areas associated with the provision of appropriate access and facilities for occupants with disabilities.

The fire safety engineered solution must be referred to the NSW Fire Brigade as part of the Construction Certificate process. Initial consultation with the fire brigade during the development of the FEB.

Item for consideration by Relevant Authorities and Fire Safety Engineer

1. The metal clad external walls along the subdivision boundary will be subject to a fire safety engineering assessment to achieve compliance with the performance requirements of the BCA.
2. The fire brigade perimeter access will be subject to a fire safety engineering assessment in consultation with the New South Wales Fire Brigade.
3. The egress travel distances within the facility area are in excess of the prescriptive travel distances and should be assessed against the relevant provisions of DP4 as follows:
 - a. Travel distance to a point of choice to alternative exits will exceed 20 metres (DP4),
 - b. Travel distance within the warehouse areas to required exits will exceed 40 metres (DP4 & EP2.2);
 - c. Distance between alternate exits within the warehouse area of approximately will exceed 60 metres (DP4 and EP2.2).
2. The smoke hazard management provisions within the facility shall be assessed as part of the fire safety engineering report to verify compliance with performance requirement EP2.2 of the BCA.
3. Proposed Exit Sign Mounting Height greater than 2.7m, to be addressed in accordance with performance requirement EP4.2 of the BCA.
4. Based upon extended travel distances it is likely there will be a shortfall with fire hydrant coverage. A performance based assessment will be required to demonstrate compliance with performance requirement EP1.3.
5. For future leasing flexibility a performance based solution will be required to be undertaken by a fire engineer to address location of hose reels greater than 4m from an exit with regards to performance requirement EP1.1 of the BCA.

The abovementioned matters will be suitable addressed at the construction certificate stage to ensure that the proposed building will comply with the BCA.



1.0 INTRODUCTION

The development site includes the construction of three individual warehouse buildings and associated on-grade parking located on Site H – Templar Road, Erskine Park.

This assessment is for the design and construction of the Target Warehouse Facility.

The proposal involves the construction of a industrial warehouse building with truck loading facilities, single level office portion and on-grade parking for 80 carspaces. Perimeter vehicular access will be provided around the building. This will require the registration of easement over adjoining land to the south in the event of a land subdivision.

The purpose of this report is to provide a general overview of the proposed industrial warehouse building in terms of compliance with the provisions of the BCA (2008).

The issues within the report should be used as an early design guide to the compliance of the proposed new building with the BCA and is generic insofar as the design has progressed. Further checking is required throughout the design process.

Limitations and Exclusions

The information contained within this report is based upon a review of the preliminary architectural drawings (refer to appendix A) and does not include:

- Determining compliance with the Disability Discrimination Act (DDA);
- Determining compliance with Council policies;
- Assessment of architectural drawings against the Occupation Health and Safety legislation.

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 application of compliance with the particular version of the BCA is the date of application is made for a construction certificate with the Certifying Authority.



2.0 PRELIMINARIES

1. Building Assessment Data:

The following BCA Parameters will apply to this Building:

The building has been assessed as a large-isolated building and must be designed to comply with Clause C2.3 and C2.4 of the BCA.

Part of Project	Building C
Classification	5, 7b
Number of Storeys Contained	1
Rise In Storeys	1
Type of Construction	Type C
Effective Height (m)	12 m

The proposed new warehouse building has been divided into the following uses and classifications:

Part of Project	BCA Classification	Approx. Floor Area (m ²)	Approx. Volume (m ³)	Assumed Population
Warehouse	7b	12, 700 m ²	152,400 m ³	50*
Offices	5	200 m ²	480 m ³	20*
Total		12,900 m²	152, 880 m³	246

Notes:

- * Please note that the estimated population numbers contained in the above table have been derived based upon advice from the applicant. Persons proposed to be accommodated will be assessed in more detail at the construction certificate stage.
- The floor areas have been adjusted without ancillary areas such as sanitary facilities, corridors, shelving and or racking layouts in storage areas.
- A building height of 12 metres has been allowed for in the warehouse/ processing facility thus the above table has allowed 12 metres for the purposes of this report.

2. Structural Provisions:

Any new structural works are to comply with the applicable requirements of AS/NZS1170.1.

Glazing is to comply with AS1288, and AS2047.

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

3. Development Consent:

Development consent is required for the development. A copy of the approval and associated endorsed drawings will be required prior to issuing the Construction certificate for that component of works. The endorsed drawings and all relevant conditions will need to be satisfied and accurately reflect the construction drawings.



3.0 SECTION C – FIRE RESISTANCE

1. Fire Resistance:

The building must be designed to comply with Type C Construction with the fire resistance of building elements complying with Table 5 of Specification C1.1 (refer to summary of FRL's – Appendix 2).

The southern external walls of the building will be situated within 3.0m from the proposed subdivision boundary alignment. Based upon the external walls being metal clad construction which will not achieve the required fire resistance, a fire safety engineering assessment must be development to achieve compliance with the performance requirements of the BCA.

2. Fire Compartmentation

The building has been assessed as a large-isolated building in accordance with Clause C2.3 of the BCA. The floor area of the building is approximately 12,900 m² with the volume exceeding 108, 000 m³.

The proposed building shall be served by the following:

1. protected throughout with an automatic sprinkler in accordance with Spec. E1.5; and
2. smoke exhaust system; or
3. smoke-and-heat vents in accordance with specification E2.2c;
4. Perimeter vehicular access.

The fire brigade perimeter access will rely upon an easement for right-of-way across the adjacent allotment to the south. The width of the fire brigade access along the western side will be less than 6.0m. A fire safety engineering assessment will be developed in consultation with the New South Wales Fire Brigade.

Smoke hazard management will require a fire engineered assessment to verify compliance with performance requirement EP2.2 of the BCA.

The office portion must be fire-separated from the warehouse by a firewall or each building element in the storey must be designed to have the higher FRL prescribed in specification C1.1 for the element for the classification concern.

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

- Emergency power supply,
- Emergency generators,
- 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.

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.



4.0 SECTION D – ACCESS EGRESS

1. Provision for Escape:

The egress provisions from the proposed building are provided via external doorways dispersed around the perimeter of the building.

A review of the travel distances to required exits has identified non-compliances with the DTS provisions of the BCA. These include:

1. The travel distance within the high racking area to the point of choice to alternative exits exceeds 20.0m;
2. The travel distances from the furthest point within the warehouse to the closest exit doorway exceeds 40.0m;
3. Due to the size of the warehouse the travel distances to alternative exits exceeds 60.0m

The abovementioned extended travel distances will be assessed as part of the fire engineering assessment of the building to achieve compliance with the performance requirements of the BCA. The relevant performance requirement in this instance include DP4 and EP2.2.

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 current design documentation has adequate egress widths from all areas of the building with the fire isolated stairs being 1.0 metres clear in width.

Doorways are permitted to contain a clear opening width of 750mm with a height of 1980mm as part of the egress requirements. Access for persons with disabilities however requires a clear doorway opening width of 800mm (i.e. minimum 870mm door). The details provided allow for the correct egress widths.

2. Construction of Exits

The construction of exits will be designed to comply with the DTS provisions of the BCA. This will be assessed at the construction certificate stage.

Electrical distribution boards and switchboards along the path of travel to required exits must be enclosed in non-combustible construction with doorways suitably sealed against the smoke spreading from the enclosure.

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.

3. Access for Occupants with Disabilities:

Access for people with disabilities can be provided via the main entrance doorways of the building and to the disabled toilet and areas normally used by the occupants, within the ground floor level.

Access to be provided to and within the building pursuant to AS1428.1 as follows:

Doorways:

All doors within the ground floor level being designed to ensure that the clear widths and circulation spaces are in accordance with AS1428.1 (generally 870mm minimum door and 470mm latch side clearance). Detailed information will need to be developed as part of the design.

Car parking:

Generally parking spaces complying with AS2890.1 and should be provided at a rate of 1 in 100 required spaces for persons with disabilities, in accordance with Table D3.5 of the BCA.



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Signage:

As part of the detailed design package, specifications will need to be developed indicating:

- Sanitary Facility Identification Signs (note that they are to comply with BCA Specification D3.6 and include the use of Braille, tactile, etc and be placed on the wall on the latch side of the facility);
- “Disabled” sanitary facility sign in accordance with the universal standard (as detailed in AS1428.1).

5.0 SECTION E – SERVICE AND EQUIPMENT

1. Fire Services:

The following fire services are 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 (Including Occupant Warning),
- 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

2. Fire Hydrants

The building is required to be provided with a booster assembly as part of the fire hydrant requirements. The location being in close proximity to the public roadway.

The buildings must be served by fire hydrants located in order to provide coverage in accordance with AS 2419.1-2005.

Based upon extended travel distances it is likely there will be a shortfall with fire hydrant coverage. A performance based assessment may be required to demonstrate compliance with performance requirement EP1.3.

3. Fire Hose Reels:

The facilities will need to be provided fire hose reels in accordance with 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.

For future leasing flexibility a performance based solution will be required to be undertaken by a fire engineer to address location of hose reels greater than 4m from an exit with regards to performance requirement EP1.1 of the BCA.



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4. Sprinkler System

Based upon the building being assessed as a large-isolated building then the whole building must be served by an automatic sprinkler system in accordance with specification E1.5 and AS 2118.1. Special consideration being given to the design of the sprinkler system that serves the high rack storage area within the warehouse which is defined as an 'occupancy of excessive hazard' under table E1.5 of the BCA.

The sprinkler valve enclosure being situated within an enclosure which has direct access to a road or open space suitable for use by the fire brigade.

5. Fire Control Centre

A fire Control centre is required to serve a building with a floor area greater than 18,000m². Based upon the total floor area of the building being approximately 12,700sqm. The building is not required to be served by a fire control centre.

The fire indicator panel (FIP) must be situated within the entrance foyer of the building to comply with the relevant Australian standards.

6. Smoke Hazard Management:

Smoke hazard management provisions are required as part of the fire safety engineering assessment to verify compliance with performance requirement EP2.2 of the BCA. However allowance should be made for smoke clearance facility as required by the NSW fire Brigades.

7. Exit Signs & Emergency Lighting:

Emergency Lighting and signs indicating exit location and paths of travel to exits to be provided in accordance with Part E4 of the BCA and AS2293. The design documentation currently provided emergency lighting and exit signage.

Please note that as Exit Signs are proposed to be mounted higher than 2.7m from the FFL, owing to the operational requirements of the subject development, this scenario will be required to be assessed as part of the Fire Engineering Solution for the subject site, in accordance with Performance Requirement EP4.2 of the BCA.

Note: The exit signs are to be the 'running man' symbol.



6.0 HEALTH AND AMENITY

1. Sanitary Facilities:

Persons with Disabilities

The sanitary facility for persons with a disability is to comply with the associated provisions of AS1428.1.

Bathroom Construction

Where bathrooms or rooms containing water closets have the WC within 1200mm of the doorway, the door shall be either sliding, open outwards, or be provided with removable hinges. The current details allow for the accessible sanitary facilities to have an outward swinging doorway.

The facility would require the following sanitary facilities should the area be fully occupied:

Building	Occupant Number	WC	Urinal	Basin
Warehouse	Male 40	2	2	2
	Female 10	1	N/A	1
	Unisex Wheel Chair Accessible	1	N/A	1
Office	Male 10	1	1	1
	Female 10	1	N/A	1
Total Required	Male	2+1Dis=3	3	2+1Dis=3
	Female	2+1Dis=2	-	1+1Dis=2

Based upon the calculated population of the building the number of sanitary facilities to be provided being based upon the above schedule.

If the estimated population numbers are inaccurate, please provide revised numbers for our office to assess the number of sanitary facilities required based upon calculated persons accommodated within the building.

2. Light and Ventilation:

Artificial lighting complying with AS/NZS1680.0 is to be incorporated with the final detailed design to be developed to confirm this.

Mechanical ventilation and artificial light is to be provided in accordance with Part F4 of the BCA.



7.0 ENERGY EFFICIENCY

1. Energy Efficiency:

The office portion of the building that shall be conditioned (i.e. any form of climate control) and therefore be required to comply with the energy provisions of the BCA 2008.

The building has been identified as being located within a Climate Zone 6.

Options available are:

- Comply with Verification method JV3
Or
- Comply with the deemed to satisfy provisions in relation to:
 - Building Fabric
 - External Glazing
 - Building dealing
 - Air movement
 - Air conditioning and ventilation systems
 - Artificial light and power
 - Hot water supply

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

Deemed to Satisfy Design

The following deemed to satisfy energy measures would be applicable to the project.

Roof and Ceiling Construction:

Roofs and or ceilings are to be constructed to provide an R rating of 3.2.

External Walls:

External walls are to be constructed to provide an R rating of 1.8.

Floors:

Floors are to achieve an R rating of 1.0.

Glazing:

This section relates to the conductance and solar heat gain of the windows, taking into consideration of the type of window frame, orientation and whether there are overhangs / shadings.

A glazing calculator will be required to be undertaken and results provided for assessment.

Building Sealing:

A seal to restrict air infiltration must be fitted to each edge of the external doors and openable windows. The seals may be foam or compressible strip, fibrous seal or the like. The main entry doors must have either an airlock, or self closing doors, or a revolving door.

Miscellaneous exhaust fans must be fitted with a sealing device such as a self closing damper.

An evaporative cooler must be fitted with a self closing damper.



Air conditioning & Ventilation systems:

An air conditioning unit must be capable of being inactivated when the building is not in use, and where the system has motorized outside air and return dampers, close the dampers when the air conditioning unit or system is inactivated.

Where it is proposed to zone areas, thermostats for each area are to be provided.

When the air flow rate is greater than 1000 L/s the total motor shaft power of the fans in the system should not exceed 15 W/m².

Time Switch:

Power supply to an air conditioning system, or ventilation system or heating system by a timer.

Heating and chilling systems:

Systems that provide heating and chilling for air conditioning must have piping insulated.

An air cooled condenser fan motor, other than one that is part of a package system must not use more than 15W of motor shaft power for each kW of heat rejected.

The fan of a closed circuit cooler must not use more than:

- Propeller or axial – 500W of motor shaft power for each l/s of cooled fluid,
- Centrifugal – 670W of motor shaft power for each l/s of cooled fluid.

The fan of an evaporative condenser must not use more than:

- Propeller or axial – 18W of motor shaft power for each l/s of heat rejected,
- Centrifugal – 22W of motor shaft power for each l/s of heat rejected.

Interior Artificial Lighting:

The maximum design illumination load is not to exceed 10W/m².

Artificial lighting must be controlled by a time switch or occupant sensor.



APPENFIX A – DESIGN DOCUMENTATION

The following architectural plans prepared by Sspace Design was used in the assessment and preparation of this report:-

DRAWING NO.	TITLE	ISSUE	DATE
TA-LE-DA-001	Development Application Site Plan	PA	03.12..08
TA-LE-DA-201	Development Application Part Elevations	P2	19.11.08
TA-LE-DA-200	Development Application Elevations	P2	19.11.08



APPENFIX D – DRAFT FIRE SAFETY SCHEDULE

Based upon the documentation reviewed to date, the following schedule of essential fire measures and other measures must be installed within the building.

(Pursuant to Clause 168 of the Environmental Planning and Assessment Regulation 2000)

	Items to be inspected or tested as nominated by the relevant authority	Deemed to satisfy installation standard/code/conditions of approval
1.	Automatic Fire Suppression System	BCA Spec. E1.5 & AS 2118.1 – 1999, AS 2118.4 – 1995 (Residential) AS 2118.6 – 1995 (Combined sprinkler & hydrant)
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 – 1998
4.	Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 1998
5.	Fire Hose Reels (*)	BCA Clause E1.4 & AS 2441 – 1988
6.	Fire Hydrant System (*)	Clause E1.3 & AS 2419.1 – 1994
7.	Mechanical Air Handling System (*) (Smoke Exhaust System)	BCA Clause E2.2, AS/NZS 1668.1 – 1998 & AS 1668.2 – 1991
8.	Paths of Travel	EP&A Reg 2000 Clause 186
9.	Perimeter Vehicular Access	BCA Clause C2.4
10.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
11.	Smoke and/or Heat Alarm System	BCA Spec. E2.2a & AS 3786 – 1993
12.	Warning and Operational Signs	Section 183 of the EP & A Regulations 2000

Notes:

* These essential fire safety measures will be subject to a fire safety engineering assessment.

