



**BLACKETT
MAGUIRE+
GOLDSMITH**

BCA ASSESSMENT REPORT

**PROPOSED WAREHOUSE FACILITY
42 Raymond Ave, Matraville**

Prepared For: Hale Capital Partners

Revision 4

Date: 05.07.2022

Project No.: 210566

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REPORT STATUS				
DATE	REVISION	STATUS	AUTHOR	REVIEWED
10.12.2021	0	Preliminary Assessment – for Client & Consultant Review	DG	NQ
22.12.2021	1	Preliminary Assessment – Updated Architectural Plans	DG	NQ
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1. INTRODUCTION

1.1 BACKGROUND / PROPOSAL

Blackett Maguire + Goldsmith Pty Ltd (BM+G) have been commissioned by Hale Capital Partners, to undertake a preliminary review of the proposed development, against the deemed-to-satisfy (DTS) provisions of the Building Code of Australia 2019 Amendment 1 (BCA) pursuant to the provisions of clause 145 of the *Environmental Planning & Assessment Regulation 2000* and Clauses 24 & 25 of the *Building & Development Certifiers Regulation 2020*.

The proposed development involves the construction of a two-storey warehouse and distribution centre comprising 19,460 m² GFA including ancillary office space, landscaping, bicycle and car parking.



Figure 1 – 3D Perspective from Burrows Rd (Source: SBA Architects DA013 Rev H dated 15.05.2022)

1.2 AIM

The aim of this report is to:

- + Undertake an assessment of the proposed warehouse facility against the Deemed-to-Satisfy (DtS) Provisions of the BCA 2019 Amendment 1.
- + Identify any BCA compliance issues that require resolution/attention for the proposed development at the CC Application stage.

1.3 PROJECT TEAM

The following BM+G Team Members have contributed to this Report:

- + Dean Goldsmith (Director)
- + Nini Quach (Peer Review Assistant Building Surveyor)

1.4 DOCUMENTATION

The following documentation has been reviewed, referenced and/or relied upon in the preparation of this report:

- + BCA 2019 Amendment 1
- + Guide to the BCA 2019 Amendment 1
- + Architectural plans prepared by SBA Architects Pty Ltd, as listed below:



Drawing No.	Rev.	Date	Drawing No.	Rev.	Date
DA000	H	15.05.2022	DA104	I	15.05.2022
DA010	H	15.05.2022	DA200	G	15.05.2022
DA011	H	15.05.2022	DA201	H	15.05.2022
DA012	H	15.05.2022	DA202	H	15.05.2022
DA013	H	15.05.2022	DA203	H	15.05.2022
DA014	I	30.06.2022	DA300	G	15.05.2022
DA050	J	30.06.2022	DA310	H	15.05.2022
DA100	K	30.06.2022	DA401	G	15.05.2022
DA101	H	15.05.2022	DA500	F	15.05.2022
DA102	G	15.05.2022	DA600	B	15.05.2022
DA103	F	15.05.2022	DA601	B	15.05.2022

1.5 REGULATORY FRAMEWORK

Pursuant to clause 145 of the Environmental Planning and Assessment (EPA) Regulation 2000 all new building work must comply with the current BCA however the existing features of an existing building need not comply with the BCA unless upgrade is required by other clauses of the legislation.

1.6 LIMITATIONS & EXCLUSIONS

The limitations and exclusions of this report are as follows:

- + The following assessment is based upon a review of the architectural documentation.
- + No assessment has been undertaken with respect to the Disability Discrimination Act (DDA) 1992. The building owner should be satisfied that their obligations under the DDA have been addressed. In this regard however, the provisions of the DDA Access to Premises – Buildings Standards have been considered as they are generally consistent with the accessibility provisions of the BCA.
- + The Report does not address matters in relation to the following:
 - i. Local Government Act and Regulations.
 - ii. NSW Public Health Act 1991 and Regulations.
 - iii. Occupational Health and Safety (OH&S) Act and Regulations.
 - iv. Work Cover Authority requirements.
 - v. Water, drainage, gas, telecommunications and electricity supply authority requirements.
 - vi. DDA 1992.
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1.7 TERMINOLOGY

- + **Alternative Solution / Performance Solution**
A Building Solution which complies with the Performance Requirements other than by reason of satisfying the DtS Provisions.
- + **Building Code of Australia (BCA)**
Document published on behalf of the Australian Building Codes Board. The BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia and is adopted in QLD under the provisions of the EPA Act and Regulation. Building regulatory legislation stipulates that compliance with the BCA Performance Requirements must be attained and hence this reveals BCA's performance-based format.
- + **Construction Certificate**
Building Approval issued by the Certifying Authority pursuant to Environmental Planning & Assessment Act 1979.



+ **Construction Type**

The construction type is a measure of a building's ability to resist a fire. The minimum type of fire-resisting construction of a building must be that specified in Table C1.1 and Specification C1.1, except as allowed for—

- (i) certain Class 2, 3 or 9c buildings in C1.5; and
- (ii) a Class 4 part of a building located on the top storey in C1.3(b); and
- (iii) open spectator stands and indoor sports stadiums in C1.7.

Note: Type A construction is the most fire-resistant and Type C the least fire-resistant of the types of construction.

+ **Climatic Zone**

Is an area defined in BCA Figure A1.1 and in Table A1.1 for specific locations, having energy efficiency provisions based on a range of similar climatic characteristics.

+ **Deemed to Satisfy Provisions (DtS)**

Provisions which are deemed to satisfy the Performance Requirements.

+ **Effective Height**

The height to the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units) from the floor of the lowest storey providing direct egress to a road or open space.

+ **Fire Resistance Level (FRL)**

The grading periods in minutes for the following criteria—

- (a) structural adequacy; and
- (b) integrity; and
- (c) insulation,

and expressed in that order.

+ **Fire Source Feature (FSF)**

The far boundary of a road which adjoins the allotment; or a side or rear boundary of the allotment; or an external wall of another building on the allotment which is not a Class 10 building.

+ **National Construction Code Series (NCC)**

The NCC was introduced 01 May 2011 by the Council of Australian Governments. The BCA Volume One (Class 2 to 9 Buildings) is now referenced as the National Construction Code Series Volume One — BCA.

+ **Occupation Certificate**

Building Occupation Approval issued pursuant to the Environmental Planning & Assessment Act 1979.

+ **Open Space**

A space on the allotment, or a roof or other part of the building suitably protected from fire, open to the sky and connected directly with a public road.

+ **Performance Requirements of the BCA**

A Building Solution will comply with the BCA if it satisfies the Performance Requirements. A Performance requirement states the level of performance that a Building Solution must meet.

Compliance with the Performance Requirements can only be achieved by—

- (a) complying with the DtS Provisions; or
- (b) formulating a Performance Solution which—
 - (i) complies with the Performance Requirements; or
 - (ii) is shown to be at least equivalent to the DtS Provisions; or
- (c) a combination of [\(a\)](#) and [\(b\)](#).

+ **Sole Occupancy Unit (SOU)**

A room or other part of a building for occupation by one or joint owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant, or other occupier and includes a dwelling.



2. BUILDING CHARACTERISTICS

2.1 BUILDING CLASSIFICATION

The following table presents a summary of relevant building classification items of the proposed warehouse development:

BCA Class:	Class 5 (Office), Class 7a (Undercroft Carpark) & Class 7b (Warehouse)
Rise in Storeys:	Four (4)
Effective Height:	Greater than 12m & Less than 25m – 12.10m
Type of Construction:	Type A Construction (Large Isolated Building)
Climate Zone:	Zone 5
Maximum Floor Area:	Large Isolated Building – >18,000m ² (Note: See GFA Schedule on SBA dwg. No. DA100)
Maximum Volume:	Large Isolated Building - >108,000m ³ (TBC by Architect)

2.2 FIRE SOURCE FEATURE

The distances from the nearest Fire Source Features are:

Boundary	Distance to Fire Source Feature
Northern Boundary	>3m from the allotment boundary (and >6m from the far side of Raymond Ave)
Southern Boundary	>3m from the allotment boundary
Eastern Boundary	>3m from the allotment boundary
Western Boundary	>3m from the allotment boundary

3. BCA ASSESSMENT

BCA DEEMED-TO-SATISFY COMPLIANCE ISSUES:

The following comments have been made in relation to the relevant BCA provisions relating to the compliance issues associated with the proposed warehouse building.

3.1 SECTION B- STRUCTURE

PART B1 – STRUCTURAL PROVISIONS

+ Clause B1.2/B1.4 – Determination of Individual Actions / Determination of Structural Resistance of Materials and Forms of Construction

Structural engineering details prepared by an appropriately qualified structural engineer to be provided to demonstrate compliance with Part B1. This will include the following Australian Standards (where relevant):

- AS 1170.0 – 2002 General Principles
- AS 1170.1 – 2002, including certification for balustrades (dead and live loads)
- AS 1170.2 – 2011, Wind loads
- AS 1170.4 – 2007, Earthquake loads
- AS 3700 – 2018, Masonry code
- AS 3600 – 2018, Concrete code
- AS 4100 – 1998, Steel Structures and/or
- AS 4600 – 2005, Cold formed steel.
- AS 2159 – 2009, Piling Design & Installation



- AS 1720 – 2010, Design of Timber Structure
- AS/NZS 1664.1 & 2 – 1997, Aluminium Structures
- AS 2047 – 1999, Windows in buildings.
- AS 1288 – 2006, Glass in buildings.
- AS 3660.1 – 2014, Termite control (or confirmation no primary building elements are timber).

Comments: Structural design and certification will be required at CC application stage.

Note: Design certification will also be required from the Architect and Services Consultants to confirm compliance with Section 8 of AS1170.4-2007 with regard to the design of non-structural parts and components and their fastenings for horizontal and vertical earthquake forces and inter-storey drift.

3.2 SECTION C – FIRE RESISTANCE

FIRE RESISTANCE AND STABILITY

+ Clause C1.1 – Type of Construction Required

The minimum type of fire-resisting construction of a building must be that specified in Table C1.1 and Specification C1.1 except as allowed for in this clause.

Comments: Type A Construction applies to the Warehouse / Office Building – see notes under Spec. C1.1, C1.9 & C1.14 below.

+ Clause C1.2 – Calculation of Rise in Storeys

The rise in storeys of a building is the sum of the greatest number of storeys at any part of the external walls of the building and any storeys within the roof space calculated in accordance with the requirements set out in this clause.

Comments: Rise of Four (4) Storeys applies to the proposed warehouse building, based on the Office levels at the northern and southern end of the building.

+ Clause C1.9 – Non-Combustible Building Elements

In a building of Type, A or B construction, the following building elements and their components must be non-combustible.

- External walls and common walls, including all components incorporated in them, including the façade covering, framing and insulation
- The flooring and floor framing of lift pits.
- Non-loadbearing internal walls where they are required to be fire-resisting

Note: C1.9(e) provides a list of materials that may be deemed as non-combustible without the need for verification testing per AS 1530.1.

BUILDING ELEMENT	TYPE B CONSTRUCTION
External wall	Non-combustible
Common wall	Non-combustible
Floor and floor framing of lift pit	Non-combustible
All loadbearing internal walls (including those of shafts)	Concrete, masonry or fire-protected timber
Loadbearing fire walls	Concrete, masonry or fire-protected timber
Non-Loadbearing Internal Walls Required to be Fire-Resistant	Non-combustible
Non-loadbearing lift, ventilating, pipe, garbage and the like shafts which do not discharge hot products of combustion.	Non-combustible (subject to conditions outlined in C1.9(b))

Comments: The external walls of the building (including all elements incorporated in the walls), the lift pits, non-loadbearing internal walls that are required to be fire rated and any services risers that connect more than 2 storeys are required to be of non-combustible construction in accordance with C1.9 (a) & (b). Details to be provided at CC application stage. See additional comments under C1.14 below regarding internal and external attachments to the external walls.



+ **Clause C1.10 – Fire Hazard Properties**

The fire hazard properties of the following linings, materials and assemblies in a Class 2 to 9 building must comply with **Specification C1.10** and the additional requirements of the **NSW Provisions** of the Code.

Comments: Design certification required at CC application stage.

+ **Clause C1.14 – Ancillary Elements**

An ancillary element must not be fixed, installed or attached to the internal parts or external face of an external wall that is required to be non-combustible unless it is one of the following:

- Gutter/downpipe/other plumbing fixture
- A flashing.
- A grate/grille <2m² associated with a building service.
- An electrical switch/GPO/cover plate, or the like.
- A light fitting.
- A required sign.
- A combustible non-required sign may be permitted if achieving a Group Number of 1 or 2 and not extending beyond one storey or fire compartment, and vertically separated by other signs by at least 2 storeys.
- A combustible awning, sunshade, canopy, blind, or shading hood may be permitted at ground storey or a storey immediately above ground storey if complying as relevant to fire hazard properties and not affecting a required exit.
- A part of a security, intercom or announcement system.
- Wiring.
- A paint, lacquer or a similar finish.
- A gasket, caulking, sealant, or adhesive associated with the above ancillary elements.

Comments: The architectural elements in the warehouse and office facades will require review to confirm that the proposed internal & external attachments to the external walls achieve compliance with the non-combustibility requirements of this clause – see comments under C1.9 also. Note: Particular attention is drawn to any proposed signage along with the sun-shading system, in this regard.

COMPARTMENTATION AND SEPARATION

+ **Clause C2.2 – General Floor Area and Volume Limitations**

Sets out the parameters for the area and volume of Class 5, 6, 7, 8 & 9 buildings as required by sub-clauses (a), (b) & (c).

Note: Table C2.2 maximum size of Fire Compartments or Atriums.

Comments: The proposed building is a Class 5, 7a, & 7b Large Isolated Buildings of Type A Construction as such the provisions for maximum fire compartment size under Table C2.2 do not apply. Refer to comments under C2.3 & C2.4 below in relation to the Large Isolated Building provisions applicable to the proposed development.

+ **Clause C2.3 – Large Isolated Buildings**

A Large Isolated Building that contains Class 5, 6, 7, 8 or 9 parts, is required to be—

- (i) protected throughout with a sprinkler system complying with Specification E1.5; and
- (ii) provided with a perimeter vehicular access complying with C2.4(b).

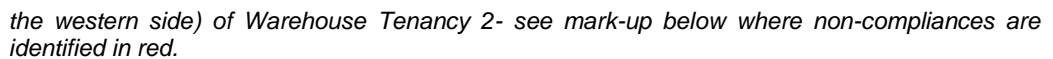
Comments: The proposed warehouse building is required to be sprinkler protected throughout and provided with perimeter vehicular access in accordance with Clause C2.4 (see notes below) pursuant to the Large Isolated Building designation under this clause.

+ **Clause C2.4 – Requirements for Open Spaces & Vehicular Access**

An open space and vehicular access required by C2.3 must comply with the requirements of sub-clauses (a) & (b) of this Part as that they must be 6m wide within 18m of the building and of a suitable bearing capacity and unobstructed height to permit the operation and passage of F&RNSW vehicles.

Comments: The perimeter vehicular access is non-compliant with the provisions of this clause in the following areas which are required to be addressed as a Performance Solution by the Fire Safety Engineer (see Appendix 2):

- + *Vehicular Access is reduced to less than 6m in width along the western and south-eastern sides (approx. 5.8 clear width measured from kerb to kerb and approx. 4.9m from kerb to bollard along*



Note 2: All gates are required to achieve no less than 6m unobstructed width or the reduced width will need to be included in the above Performance Solution.

If in a building of Type A construction, any part of a window or other opening in an external wall is above another opening in the storey next below and its vertical projection falls no further than 450 mm outside the lower opening (measured horizontally), the openings must be separated by and horizontal or vertical spandrel with an FRL of 60/60/60, and for the purposes of C2.6, window or other opening means that part of the external wall of a building that does not have an FRL of 60/60/60 or greater.

Comments: The passenger lifts in the building serving the office levels and each warehouse level are required to be fire isolated as they connect more than 3 storeys in a sprinkler protected building.



+ Clause C2.12 – Separation of Equipment

Equipment as listed below must be separated from the remainder of the building with construction complying with (d), if that equipment comprises –

- (i) Lift motors and lift control panels; or
- (ii) Emergency generators used to sustain emergency equipment operating in the emergency mode; or
- (iii) Central smoke control plant; or
- (iv) Boilers; or
- (v) A battery or batteries installed in the building that have a voltage exceeding 12 volts and a storage capacity exceeding 200kWh.

Note: Separating construction must have –

- (A) an FRL as required by Specification C1.1, but not less than 120/120/120; and
- (B) any doorway protected with a self-closing fire door having an FRL of not less than -/120/30.

Comments: Where appropriate, details demonstrating compliance are to be included in the CC Application plans for the building. Particular attention is drawn to the need for fire separation of smoke control plant and equipment if it is to be located within the building.

+ Clause C2.13 – Electricity Supply System

- (a) An electricity substation, main switchboard which sustains emergency equipment operating in the emergency mode, located within a building must –
 - (i) Be separated from any other part of the building by construction having an FRL of not less than 120/120/120; and
 - (ii) Having any doorway in that construction protected with a self-closing fire door having an FRL of not less than -/120/30
- (i) Be separated from any other part of the building by construction having an FRL of not less than -/120/30.
- (ii) Have any doorway in that construction protected with a self-closing fire door having an FRL of not less than -/120/30.
- (b) Electrical conductors located within a building that supply

Note: Where emergency equipment is required in a building, all switchboards in the electrical installation, which sustain the electricity supply to the emergency equipment switchgear is separated from the non-emergency equipment switchgear by metal partitions designed to minimise the spread of fault from the non-emergency equipment switchgear.

Comments: Where appropriate, details demonstrating compliance are to be included in the CC Application plans for the warehouse building. The above requirements need to be taken into consideration as part of the design of the main switchroom serving the warehouse building.

PROTECTION OF OPENINGS

+ Clause C3.8 – Openings in Fire-isolated Exits

Specifies that the doorways that open into fire-isolated exits must be protected by -/60/30 fire doors that are self-closing or automatic. This clause also details the deemed-to-satisfy methods of activation. This does not apply to doors opening to a road or open space. A window in the external walls of fire-isolated exits must be protected in accordance with C3.4 if it is within 6m of and exposed to a window or other opening in a wall of the same building other than in the same fire-isolated enclosure.

Comments: Fire Doors are required to be provided to each of the door openings into the fire isolated exit stairs. Details of the proposed -/60/30 FRL fire door locations are to be provided with the CC application plans in accordance with this requirement.

+ Clause C3.9 – Service Penetrations in Fire-isolated Exits

Fire isolated exits must not be penetrated by any services other than electrical wiring as permitted by D2.7(e), ducting associated with a pressurisation system or water supply pipes for fire services.

Comments: Services Consultants to note and ensure compliance with regards to restriction of services penetrating the fire isolated stairs and passageway.

+ Clause C3.10 – Openings in Fire-isolated Lift Shafts

If lift shafts are required to be fire-isolated an entrance doorway must be protected by -/60- fire doors and the lift indicator panels must be backed by construction having an FRL of not less than -/60/60 if it exceeds 35,000mm²



- + **Comments:** Details are to be included on the Architectural Plans and certification from the lift consultant to confirm compliance is to be provided for the construction certificate application. **Clause C3.12 – Openings in Floors & Ceilings for Services**

This clause applies to the floors and ceilings in buildings of Types A, B & C Construction and sets out the methods required to limit the spread of fire through openings in these building elements, required to resist the spread of fire.

Comments: Certification will be required at OC application stage – see note below under C3.15 regarding the requirement for a Performance Solution for fire stopping in 240/240/240 FRL building elements.

- + **Clause C3.15 – Openings for Services Installations**

All opening for services installations in building elements required to be fire-resisting with respect to integrity and insulation must be protected in accordance with the provisions of Spec. C3.15.

Comments: Any services penetrations through elements with a 240/240/240 FRL may require a Performance Solution, given the lack of tested systems for fire stopping that will achieve a 4hr insulation rating in accordance with this requirement. It is recommended that this be incorporated generically in any Fire Engineered Performance Solution to avoid non-compliance issues at OC stage.

SPECIFICATIONS

- + **Specification C1.1 – Fire Resisting Construction**

The new building works are required to comply with the requirements detailed under Table 3 of Specification C1.1 for Type C Construction. In this regard the proposed building elements are required to comply.

Comments: As the building is subject to compliance with the Type A Construction provisions of Table 3 of Spec. C1.1 (see Appendix 1), all building elements (see C2.8 above) including the following are required to achieve the FRL's specified in Table 3 of Spec. C1.1 for a Class 7b building (generally 4 hours)

- + Load-bearing elements in the external walls, including the warehouse columns, and structural steel elements in the external walls of the office. (240/-/- FRL)
- + External Load-bearing Columns (240/-/- FRL)
- + Internal Load-bearing elements, including Walls, Columns, Beams, etc. on Ground to Level 1 incl. Mezz (240/-/- FRL),
- + Fire Stairs/Lift Shafts/Services (240/120/120 FRL)
- + Floors, including Office Levels and Mezzanines (240/240/240 FRL)
- + Fire Walls (240/240/240 FRL) – if proposed.
- + Roof – Non-Combustible

It is noted that a Performance Solution may be considered for deletion of FRL's to the secondary beams supporting the floor slabs in the warehouse portions of the building.

- + **Specification C1.10 – Fire Hazard Properties.**

This Specification sets out requirements in relation to the fire hazard properties of linings, materials and assemblies in Class 2 to 9 buildings as set out in the Tables.

Comments: Refer to comments under Clause C1.10 above – certification will be required at both CC and OC Application stages.

3.3 SECTION D – ACCESS & EGRESS

PROVISION FOR ESCAPE

- + **Clause D1.2 – Number of Exits Required**

This clause requires the provision of sufficient exits to enable safe egress in case of an emergency. Clause D1.2 provides that all buildings must have at least one exit from each storey and sets out circumstances in which more than one exit may be required (particularly in relation to Class 9 buildings).

Note 1: Not less than 2 exits must be provided from each storey if the building has an effective height of more than 25m.

Note 2: Not less than 2 exits must be provided from any storey that involves a vertical rise within the building of more than 1.5m unless the floor area of the storey is not more than 50m² and the distance of travel from any point on the floor to a single exit is not more than 20m.

Comments: The proposed design is compliant with the requirements of Clause D1.2. It is noted that a single exit is provided from the Level 1 Office Mezzanines – whereby the rear office stairs from this upper office



level have been assessed as non-required stairs given their discharge into the Level 1 Warehouse area below, and are compliant with D1.12 requirements.

+ Clause D1.3 – When Fire Isolated Stairways & Ramps are Required

This clause specifies the requirements for when fire isolated stairs or ramps are required in buildings based upon the number of storeys that they interconnect and the classification of the building.

Comments: The stairs serving Ground Floor to Level 1 Mezzanine Office Levels connect greater than 3 storeys in a sprinkler protected building and as such are required to be fire isolated. The proposed stairs are currently documented as being enclosed and as such details of the proposed FRL's are to be shown on the CC Application Plans to confirm compliance with D1.3 (and C3.8) – see additional comments under D1.7 also.

+ Clause D1.4 – Exit Travel Distances

This clause specifies the permitted travel distances allowable from Class 2 to Class 9 buildings. Sub-clauses (a) to (f) specify the maximum distances to be taken into account for the various uses in each Class of building.

Comments: The exit travel distances in each level of the proposed building are considered to be non-compliant with the requirements of Clause D1.4. The extent of non-compliances will require further assessment however, a summary of the non-compliances are listed below:

- + Ground Level Warehouse Tenancy 01 - 55m to the nearest exit
- + Ground Level Warehouse Tenancy 02 - 48m to the nearest exit
- + Level 1 Warehouse Tenancy 03 - 80m to the nearest exit
- + Level 1 Warehouse Tenancy 03 - 60m to the nearest exit
- + Level 1 Mezzanine Offices 03 & 04 – 26m to a single exit.

The above egress non-compliances will be required to be addressed as Performance Solutions by the Fire Safety Engineer to demonstrate compliance with Performance Requirements DP4 & EP2.2.

+ Clause D1.5 – Distances Between Alternative Exits

Exits required as alternative exits must be –

- (a) not less than 9m apart; and
- (b) not more than – 60m apart.
- (c) Located so that the alternative paths of travel do not converge such that they become less than 6m apart.

Comments: The distances between alternative exits in the warehouse building are considered to be non-compliant with the requirements of Clause D1.5. The extent of non-compliances are detailed below; however, they will be required to be addressed as Performance Solutions by the Fire Safety Engineer to demonstrate compliance with Performance Requirements DP4 & EP2.2.

- + Ground Level Warehouse Tenancy 01 - 110m between alternative exits.
- + Ground Level Warehouse Tenancy 02 – 90m between alternative exits.
- + Ground Level Breezeway – 78m between alternative exits.
- + Level 1 Warehouse Tenancy 03 – 155m between alternative exits.
- + Level 1 Warehouse Tenancy 04 – 110m between alternative exits.
- + Level 1 Breezeway - 70m between alternative exits.

+ Clause D1.6 – Dimensions of Exits

This clause details the minimum dimensions such as height and width of paths of travel from Class 2 to 9 buildings. It also specifies the minimum dimensions of doorways from the various compartments and the width of exit doors from buildings depending on the uses and functions carried out within them.

Comments: Population numbers for the proposed building have been calculated based on the square metre rates listed in Table D1.13 to facilitate an assessment of the provisions of D1.6 – see D1.13 below - and as a result it is considered that compliance with D1.6(c) & (d) is readily achievable.

In addition to the above, it is to be noted that all exit paths are required to have a minimum clear height of 1m and 1980mm through doorway openings per D1.6(a).

+ Clause D1.7 – Travel by Fire Isolated Stairways and Ramps

A doorway from a room must not open directly into a stairway, passageway or ramp that is required to be fire-isolated unless it is from—

- (i) a public corridor, public lobby or the like; or



- (ii) a sole-occupancy unit occupying all of a storey; or
- (iii) a sanitary compartment, airlock or the like.

Fire isolated exits are required to discharge to open space or a covered area complying with D1.7(b).

Where a path of travel from the point of discharge of a fire isolated exit necessitates passing within 6m of any part of an external wall of the same building, measured horizontally at right angles to the path of travel, that part of the wall must have –

- an FRL of not less than 60/60/60; and
- Any openings protected internally in accordance with BCA Clause C3.4; and
- For a distance of 3m above or below, as appropriate, the level of the path of travel, or for the height of the wall, whichever is the lesser.

In addition, the discharge of fire stairs into undercroft areas is permitted, subject to at least 2/3 of the perimeter of the undercroft being open and an unimpeded discharge path from the fire stairs to open space must not exceed 20m.

Comments: The discharge of the fire isolated exit serving the office levels comply with the above requirements of D1.7, however, as the discharge paths from the fire stairs serving Office Tenancy 02 & 04 will pass within 6m of the external walls of Warehouse Tenancy 02, either fire rated walls or a Performance Solution will be required.

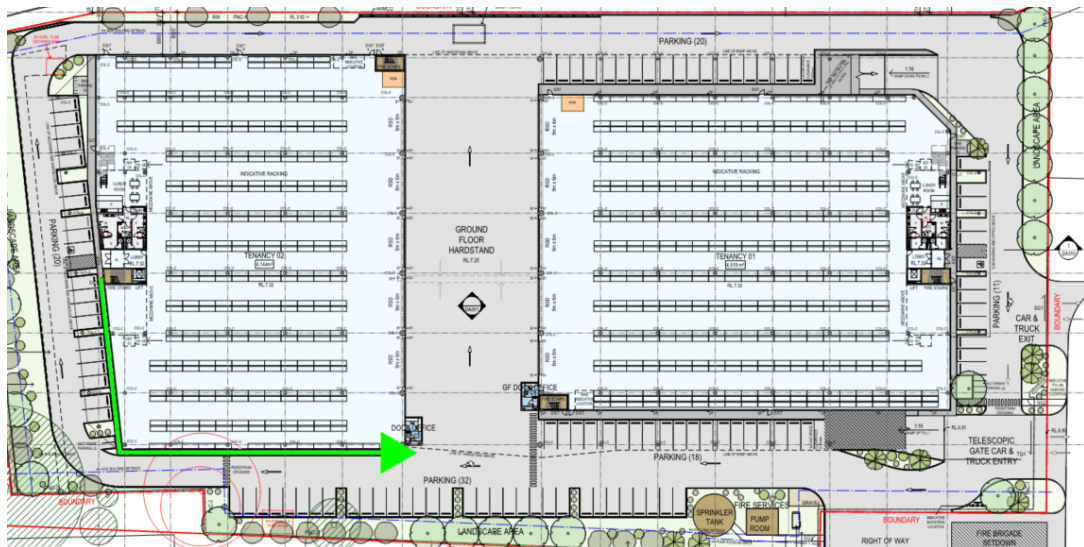


Figure 3 – Fire Stair discharge paths within 6m of external walls

+ Clause D1.10 – Discharge From Exits

Requires that an exit must not be blocked at the point of discharge. Barriers such as bollards must be installed to prevent vehicles from blocking the discharge from exits.

This clause also provides the methods of construction, location and separation, at exit discharge points for all building Classes.

Comments: All exit discharge points from the buildings are required to be protected in accordance with the requirements of this clause.

+ Clause D1.13 – Number of Persons Accommodated

Clause D1.13 and Table D1.13 are used to calculate the anticipated number of people in particular types of buildings so that minimum exit widths and the required number of sanitary and other facilities can be calculated. This clause and table are not to be used for non-BCA purposes.

Comments: As indicated in the comments under D1.6 above the population numbers have been calculated for each level in accordance with Table D1.13 as follows:

- Warehouse Tenancy 01: 76 persons (based on 50% of the floor area at 30m²/person)
- Warehouse Tenancy 02: 70 persons (based on 50% of the floor area at 30m²/person)
- Ground & Level 1 Docks Offices (x4): 2 persons per office (10m²/person)



- Office Tenancy 01: 44 persons (10m²/person)
- Office Tenancy 02 – 45 persons (based on 10m²/person)
- Warehouse Tenancy 03: 76 persons (based on 50% of the floor area at 30m²/person)
- Warehouse Tenancy 04: 77 persons (based on 50% of the floor area at 30m²/person)
- Office Tenancy 03: 44 persons (10m²/person)
- Office Tenancy 04 – 44 persons (based on 10m²/person)

CONSTRUCTION OF EXITS

+ **Clause D2.2 – Fire Isolated Stairways and Ramps**

A stairway or ramp (including any landings) that is required to be within a fire-resisting shaft must be constructed—

- of non-combustible materials; and
- so that if there is local failure it will not cause structural damage to, or impair the fire-resistance of, the shaft.

Comments: Architect & Structural Engineer to note. Details are to be provided with the Construction Certificate documentation.

+ **Clause D2.3 – Non-fire-isolated Stairways & Ramps**

This clause requires that required non-fire-isolated stairways and ramps must be either constructed in accordance with D2.2 or the alternative options set out in D2.3 (a) to (c).

Comments: The requirements of D2.3 apply to the proposed stairs serving the Ground Level Mezzanine Offices 01 & 02 - details are to be provided of the stair design at CC application stage.

+ **Clause D2.7 – Installations in Exits & Paths of Travel**

This clause restricts the installation of certain services in fire-isolated exits, non-fire-isolated exits and certain paths of travel to exits. Sub-clauses (a) to (e) prescribes which services **shall not be installed** as well as the circumstances in which certain services **may be installed** in fire-isolated and non-fire-isolated exits.

Comments: This requirement applies to all cupboards containing electrical distribution boards or comms. equipment that are located in a path of travel to an exit. In this regard, such cupboards are to be enclosed in non-combustible materials and are to be suitably sealed against the spread of smoke.

+ **Clause D2.8 – Enclosure of Space under Stairs and Ramps**

The space below a required fire-isolated stairway or ramp in a fire-isolated shaft must not be enclosed to form a cupboard or other enclosed space. If the required stairway or ramp is non-fire-isolated, (including an external stairway) any cupboard underneath must have an FRL of 60/60/60, with a self-closing -60/30 door.

Comments: No enclosures are permitted under the Fire Isolated Exit Stairs serving the building and any enclosure under the non-fire isolated exits must be fire separated in 60/60/60 FRL construction – details to be provided on the CC Application plans.

+ **Clause D2.13 – Goings & Risers**

This clause sets out the detailed requirements for the construction and geometry of the goings and risers in required stairways. These details are set out in sub-clauses (a) to (c) and Table D2.13 Riser and Going Dimensions.

Comments: All stairs are to be designed with compliant dimensions per Table D2.13 below, have solid risers, and are to have contrasting nosings, slip resistant surfaces throughout in accordance with clause 11 of AS1428.1-2009. Refer to the slip resistance for stairs below under Clause D2.14.

Riser and Going Dimensions (mm)			
	Riser (R)	Going (G)	Quantity (2R + G)
Maximum	190	355	700
Minimum	115	250	550



+ **Clause D2.14 – Landings**

The dimensions and gradients of landings in stairways are set out in this clause; the configuration will depend on the proposed use of a building. Sub-clause (b) details the layout for a Class 9a building to allow for the movement of a stretcher.

Comments: Architect to note.

Application	Surface conditions	
	Dry	Wet
Ramp steeper than 1:14	P4 or R11	P5 or R12
Ramp steeper than 1:20 but not steeper than 1:14	P3 or R10	P4 or R11
Tread or landing surface	P3 or R10	P4 or R11

+ **Clause D2.15 – Thresholds**

The threshold of a doorway must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless –

- the doorway opens to a road or open space, external stair landing or external balcony; and
- the door sill is not more than 190mm above the finished surface of the ground, balcony, or the like, to which the doorway opens.

Comments: Architect to note, details demonstrating compliance will be required to be included in the CC plans.

+ **Clause D2.16 – Balustrades or Other Barriers**

This clause details where balustrades are required to be provided and sets out in specific detail the construction requirements. Typically, the following will apply to this class of building:

- Balustrades are required where the fall to the level below is more than 1m in height. The minimum height of a balustrade is 1m above the floor of the landing, walkway or the like; and 865mm above the floor of a stairway or a ramp.
- For a fall of more than 4m to the surface level below, a window sill must be a minimum of 865mm in height above the height of the floor surface.
- Where the floor is more than 4m above the surface beneath the balustrade any horizontal or near horizontal members between 150mm and 760mm above the floor must not facilitate climbing.
- Balustrades must be constructed so as to not permit a sphere of 125mm diameter to pass through. The exception to this is within fire isolated exits within the building, or internal stairs within a Class 7b or 8 building, where the rails can be positioned a maximum of 460mm apart, so long as a bottom rail is located so a sphere of 150mm cannot pass through the opening between the nosing of the stair treads and the rail or between the floor of the landing, balcony or the like. External stairs associated with a Class 7b or 8 building are required to have gaps no greater than 125mm.

Comments: Details demonstrating compliance are to be submitted with the CC Application drawings for assessment against the above criteria.

+ **Clause D2.17 – Handrails**

This Clause sets out the requirements regarding the location, spacing and extent of handrails required to be installed in buildings.

Comments: Architect to note, details demonstrating compliance will be required to be included in the CC plans. Handrails serving all stairs and ramps both internally and externally to the buildings are required to comply with the accessibility requirements of Clause D3.3 and AS 1428.1-2009.

+ **Clause D2.19 – Doorways and Doors**

This clause applies to all doorways and refers to the types of doors that cannot be used in buildings of prescribed uses, the use of power operated doors and the force required to operate sliding doors.

If the door is also power operated, it must be opened manually under a force of not more than 110N if there is a malfunction or failure to the power source; or upon the activation of a fire or smoke alarm anywhere in the fire compartment served by the door.

Comment: Architect to note – compliance readily achievable.



+ Clause D2.20 – Swinging Doors

A swinging door in a required exit or forming part of a required exit must be installed to the requirements of sub-clauses (a), (b) & (c). This clause only applies to swinging doors in doorways serving a required exit or forming part of a required exit. It does not apply to other doorways – see notes in the Guide to the BCA.

Comments: The proposed egress doors from the building and into the fire isolated exits are required to swing in the direction of egress in accordance with D2.20(a) – compliance is readily achievable.

+ Clause D2.21 – Operation of Latch

A door in a required exit or forming part of a required exit and in a path of travel to a required exit must be readily openable without a key from the side that faces a person seeking egress, by a single downward action or pushing action on a single device which is located between 900mm & 1.1m from the floor. This clause prohibits the use of devices such as deadlocks and knobs where knobs must be operated in a twisting motion in accordance with sub-clauses (a) & (b). D2.21 also sets out exceptions in relation to buildings where special security arrangements are required in relation to the uses carried out.

Comments: Architect to note, details demonstrating compliance will be required to be included in the CC plans.

ACCESS FOR PEOPLE WITH A DISABILITY

+ Clause D3.2 – Access to Buildings

Access must be provided to and within all areas normally used by occupants (as required by Clause D3.1) within this building from the main points of pedestrian entry at the allotment boundary; from another accessible building connected by a pedestrian link; and any accessible car parking space.

Access must be provided through the principal pedestrian entrance and through not less than 50% of all pedestrian entrances (including the principal pedestrian entry). In addition, as the buildings are greater than 500m², the non-accessible entrance must not be greater than 50m from an accessible entrance.

Comments: Compliant access is required from the allotment boundary to the main entry of the building from accessible parking spaces to each building and throughout all areas in each building in accordance with AS 1428.1-2009. Refer to D3.3 and D3.4 below & Access Consultant Report.

+ Clause D3.3 – Parts of the Building to be Accessible

This part specifies the requirements for accessways within buildings and where the requirements of AS 1428.1-2009 are applicable.

Note: If compliant access is not proposed to be provided to the Warehouse areas in the building, comment will be required from an Access Consultant as to whether a concession under D3.4 or a performance solution can be considered.

Comments: As indicated above, the proposed building is required to be accessible throughout in accordance with AS1428.1-2009; however, details and design certification will be required to be provided at CC Application stage.

The following is a summary of some of the key matters which need to be considered from Clause D3.3 and AS 1428.1-2009:

- *Access for persons with disabilities must be provided, at a minimum, to and within all areas normally used by the occupants, which is readily achievable given the proposed passenger lifts within the office portions of the building.*
- *An accessway is required to be provided to the main office entry from Raymond Ave to both Office 01 and 02 main entry points.*
- *The minimum width of an accessible doorway must have a clear opening width of not less than 850mm in accordance with AS1428.1.*
- *All doorways on a continuous path of travel shall have a minimum luminance contrast of 30% provided between: door leaf and door jamb; or door leaf and adjacent wall; or architrave and wall; or door leaf and architrave; or door jamb and adjacent wall. The minimum width of the area of luminance contrast shall be 50mm.*
- *In accordance with Clause D3.3; the non-fire-isolated stairways must comply with Clause 11 & 12 of AS 1428.1-2009, and the fire isolated exits must comply with Clauses 12 and 11 (f) & (g) of AS 1428.1-2009.*



- Clause D3.3(g) and (h) requires that the pile height or pile thickness shall not exceed 11mm and the carpet backing thickness shall not exceed 4mm. Moreover, the carpet pile height or pile thickness dimension shall not exceed 11mm, the carpet backing thickness dimension shall not exceed 4mm and their combined dimension shall not exceed 15mm.
- Circulation space to the new doorways that are required to be accessible are to comply with Section 13 of AS1428.1-2009.
- Turning Spaces and Passing Spaces in all areas are required to be provided on each level of the building in accordance with Clauses 6.4 & 6.5 of AS 1428.1-2009.

Stairways

- Every common area stairway must be constructed in accordance with Clause 11 of AS1428.1, except if they are within a fire isolated exit or serve the areas in the building that a D3.4 Exemption has been applied to. As such, the stairways must be designed to comply with the accessibility requirements of Clause 11 of AS1428.1-2009 and details will need to be confirmed on the plans for CC.
- Stairs shall have opaque risers (i.e. Solid)
- Stair nosing's shall comply with the following diagram, which achieve a colour contrast luminance of 30% to the background (tread).
- Stairways are to be served by Tactile Ground Surface Indicators in accordance with AS1428.4.1, except if they are within a fire isolated exit.

Handrails

- Handrails shall be installed along stairways as follows:
 - Shall be continuous through the flight and where practicable, around landings and have no obstruction on or above up to a height of 600mm,
 - Installed along both sides of the stairway (giving consideration also to 1m unobstructed width),
 - Shall have a compliant hand clearance in accordance with Figure 29 of AS 1428.1-2009.

+ **Clause D3.4 – Exemptions**

This part provides exemptions to the Deemed-to-Satisfy provisions for access by people with a disability. This part provides details on buildings or parts of buildings not required to be accessible under the BCA where providing access would be inappropriate because of the nature of the area or the tasks undertaken.

Comments: It is noted that advice has been obtained from an accredited Access Consultant in this regard – refer to Access Consultant Report.

+ **Clause D3.5 – Accessible Carparking**

This part provides details of the number of accessible carparking spaces required in a carpark depending on the classification of the building.

Comments: In the case of Class 5 & 7b buildings 1 compliant accessible space is required for every 100 parking spaces or part thereof. In this regard we note that two (2) accessible parking spaces are proposed on the site which will achieve compliance with the requirements of D3.5.

+ **Clause D3.6 – Signage**

This section provides requirements for signage in buildings required to be accessible By Part D3.

Comments: Signage will be required to identify exits, accessible facilities, an ambulant accessible facility and the paths to accessible pedestrian entries (where required) – refer to Access Consultant Report.

+ **Clause D3.8 – Tactile Indicators**

This clause provides for the installation of tactile indicators in buildings required to be accessible and must be provided to warn people who are blind or have a vision impairment that they are approaching a stairway, escalator, passenger conveyor, ramp, overhead obstruction or an accessway meeting a vehicular way, except for areas exempted by D3.4.

Comments: Compliant tactile indicators are required in all areas of the buildings to all ramps, stairs, paths approaching a driveway and any overhead obstructions less than 2m in height – refer to Access Consultant Report.

+ **Clause D3.11 – Ramps**



Ramps may be used as part of an accessway where there is a change of level and must comply with the requirements set out in AS1428.1.

Comments: Architect to note, details demonstrating compliance will be required to be included in the CC plans – refer to Access Consultant Report.

+ Clause D3.12 – Glazing on an Accessway

This part requires the provision of a contrasting strip, chair rail, handrail or transom across all frameless or fully glazed doorways and surrounding glazing capable of being mistaken for an opening.

Comments: Glazing capable of being mistaken for an opening as listed above must be clearly marked for its full width with a solid and non-transparent contrasting line being not less than 75mm wide and the lower edge must be located between 900mm and 1000mm above the plane of the finished floor level – refer to Access Consultant Report.

3.4 SECTION E – SERVICES AND EQUIPMENT

FIRE FIGHTING EQUIPEMENT

+ Clause E1.3 - Fire hydrants

E1.3(a) – A fire hydrant system must be provided to serve a building having a total floor area greater than 500m² and where a fire brigade is available to attend a building fire.

E1.3(b) – Requires that the fire hydrant system must be installed in accordance with the provisions of AS2419.1 and also details where internal hydrants must be located.

Comments: The proposed building is required to be served by a compliant hydrant system incorporating ring mains. Details demonstrating compliance with the provisions of E1.3 and AS 2419.1-2005 are required to be provided at CC Application stage.

Note: The location of the hydrant booster on Raymond Ave is within sight of the main entry of the building (to Office Tenancy 01) and is setback at least 10m from any substation & other HV electrical equipment.

It is considered likely that a Performance Solution for the design of the hydrant system for the building (with particular regard to location and protection of external hydrants) will be required from the Fire Engineer to address Performance Requirement EP1.3 – TBC by Fire Engineer.

+ Clause E1.4 – Fire hose reels

A fire hose reel system must be provided to serve a building where one or more internal fire hydrants are installed or in a building with a floor area greater than 500m².

This clause requires that the fire hose reel system must be installed in accordance with AS 2441 and sets out the detail for location and uses of fire hose reels.

Comments: The building is required to be served by a compliant fire hose reel system within the Class 7b areas only (excluding the Class 5 Office areas). Details demonstrating compliance are to be provided at the CC application stage.

+ Clause E1.5 – Sprinklers

A sprinkler system must be installed in a building or part of a building when required by Table E1.5 and comply with Specification E1.5. Table E1.5 sets out which types of building occupancies and Classes which are required to have sprinkler systems installed in them.

Specification E1.5 sets out requirements for the design and installation of sprinkler systems.

Comments: The proposed Large Isolated Building is required to be sprinkler protected throughout in order to address the requirements of Clause C2.3 and Table E1.5. Details demonstrating compliance are to be provided at the CC application stage. Note: As the sprinkler booster is accessed via the adjoining "right of way" a Performance Solution will be required from the Fire Engineer to address Performance Requirement EP1.4.

+ Clause E1.6 – Portable fire extinguishers

Portable fire extinguishers must be provided as listed in Table E1.6 and must be selected, located and distributed in accordance with Sections 1, 2, 3 and 4 of AS 2444.



Comments: Fire extinguishers will be required to be installed in the proposed building in accordance with Table E1.6 and AS 2444-2001.

+ **Clause E1.8 – Fire Control Centres**

A fire control centre facility in accordance with Specification E1.8 must be provided for a building having an effective height of more than 25m and in a Class 6, 7, 8 or 9 building with a total floor area of more than 18,000m².

Specification E1.8 describes the construction and content of required fire control centres or rooms.

Comments: The proposed warehouse building (including the Breezeways) exceeds 18,000m² and as such is required to be provided with a Fire Control Centre that complies with Clauses 2-5 of BCA Spec. E1.8. Details demonstrating compliance are to be included on the CC Application plans.

SMOKE HAZARD MANAGEMENT

+ **Clause E2.2 – General Requirements**

Class 2 to 9 buildings must comply with the provisions of this Clause to remove smoke during a fire, to control the operation of air handling systems and to prevent the spread of smoke between compartments.

Buildings must comply with the provisions of **Table E2.2a**, as applicable to Class 2 to 9 buildings. It deals with the design and construction of air handling systems that are part of a smoke hazard management system and air handling system that are not part of a smoke hazard management system.

The details relating to the installation and operation of the systems are set out in **Specifications E2.2a, E2.2b and E2.2c**.

Comments: As the volume of the building is greater than 108,000m³ a smoke exhaust system is required to be provided per Spec. E2.2b. In this regard, it is noted that a Performance Solution to the required smoke hazard management requirements may be under consideration by the Fire Engineer and will need to demonstrate compliance with Performance Requirement EP2.2.

PART E3 LIFT INSTALLATIONS

+ **Clause E3.2 – Stretcher Facilities in Lifts**

Stretcher facilities, complying with this clause, must be provided in lifts in at least one emergency lift as required by E3.4 or in a storey above an effective height of 12m.

A stretcher facility must accommodate a raised stretcher with a patient lying on it horizontally by providing a clear space not less than 600mm wide x 2000mm long x 1400mm high above the floor level.

Comments: The lifts within the building serve storeys above an effective height of 12m and as such are required to accommodate a stretcher in accordance with the requirements of the clause above. Design certification required at CC Application stage.

+ **Clause E3.3 – Warning Against use of Lifts in Fire**

Warning signs required be provided must be displayed where they can be readily seen and must comply with the details and dimensions of **Figure 3.3**.

Comments: Applies to the proposed lift in the building - Lift Contractor to note.

+ **Clause E3.5 – Landings**

E3.5(c) Access and egress to and from lift well landings must comply with the Deemed-to-Satisfy Provisions of Part D along with AS 1428.1-2009.

Comments: Design certification from the lift supplier shall be provided with the documentation submitted with the Construction Certificate application.

+ **Clause E3.6 – Passenger Lifts**

In an accessible building, every passenger lift must be one of the types identified in **Table E3.6a**, have accessible features in accordance with **Table E3.6b** and not rely on a constant pressure device for its operation if the lift car is fully enclosed.

Comments: Design certification from the lift supplier shall be provided with the documentation submitted with the Construction Certificate application.



+ Clause E3.7 – Fire Service Controls

In passenger lifts designed in accordance with AS 1735 Parts 1 and 2, all lift cars serving any storey above an effective height of 12m must be provided with fire service controls.

Comments: As the lifts in the building serves storeys with an effective height greater than 12m, they are required to be provided with fire service controls in accordance with this clause. Design certification from the lift supplier shall be provided with the documentation submitted with the Construction Certificate application.

+ Clause E3.9 – Fire Service Recall Operations Switch

Each group of lifts must be provided with one fire service control switch (required by Clause E3.7 above) that activates the fire service recall operation. This clause details the switch, the labelling, the key and operation procedures for a fire service recall operation.

Comments: Design certification from the lift supplier shall be provided with the documentation submitted with the Construction Certificate application.

+ Clause E3.10 – Lift Car Fire Service Drive Control Switch

The lift car fire service drive control switch required by E3.7 must be activated from within the lift car. This clause details the switch, the initiation, the labelling and operation for the fire service drive control switch.

Comments: Design certification from the lift supplier shall be provided with the documentation submitted with the Construction Certificate application.

EMERGENCY LIGHTING, EXIT SIGNS AND WARNING SYSTEMS

+ Clause E4.2 – Emergency Lighting Requirements

This clause details when emergency lighting must be installed in Class 2 to 9 buildings. The requirements for buildings and parts of buildings are detailed in sub-clauses (a) to (i) and each sub-clause must be considered as more than one may apply to any single building

Comments: Emergency Lighting is required throughout the building in accordance with E4.2, E4.4 and AS/NZS 2293.1-2005.

+ Clause E4.4 – Design & Operation of Emergency Lighting

Every required emergency lighting system must comply with AS2293.1.

Comments: Electrical Consultant to note

+ Clause E4.5 – Exit Signs

An exit sign must be clearly visible to persons approaching the exit and must be installed on, above or adjacent to each door providing egress from a building. Sub-clauses (a) to (d) set out the situations where exit signs are required to be installed.

Comments: Electrical Consultant to note, details demonstrating compliance will be required to be included in the CC plans.

+ Clause E4.6 – Direction Signs

If an exit is not readily apparent to persons occupying or visiting the building then exit signs must be installed in appropriate positions in corridors, hallways, lobbies, and the like, indicating the direction to a required exit.

Comments: Electrical Consultant to note, details demonstrating compliance will be required to be included in the CC plans.

+ Clause E4.8 – Design & Operation of Exit Signs

Every required exit sign must comply with AS/NZS 2293.1 and be clearly visible at all times when the building is occupied by any person having the legal right of entry into the building.

Comments: Electrical Consultant to note, details demonstrating compliance will be required to be included in the CC plans. It is noted that compliant exit signs are unlikely to be provided in the automated portions of the warehouse and as such the lack of exit signs to these areas are to be addressed as a Performance Solution by the Fire Engineer to demonstrate compliance with Performance Requirement EP4.2.



3.5 SECTION F – HEALTH & AMENITY

DAMP AND WEATHERPROOFING

+ Performance Requirement FP1.4

A roof and external wall (including openings around windows and doors) must prevent the penetration of water that could cause

- a) Unhealthy or dangerous conditions, or loss of amenity for occupants; and
- b) Undue dampness or deterioration of building elements.

Note 1: There are no Deemed-to-Satisfy provisions for this Performance Requirement in respect to External Walls. Note 2: Refer to Clause F1.5 for roof coverings.

Comments: Design statement and a documented Performance Solution is to be provided with the Construction Certificate application, either by using:

- The Verification Methods in Clause FV1; or
- Other verification methods deemed acceptable by the Certifier; or
- Evidence to support that the use of the material or product, form of construction or design meets the Performance Requirements or the DTS provisions, such as a Certificate of Conformity (eg. CodeMark); or
- By way of Expert Judgement.

+ Clause F1.1 – Stormwater drainage

Stormwater drainage must comply with AS/NZ 3500.3-2018.

Comments: Details of stormwater disposal, from a suitably qualified consultant are required to be submitted with documentation for the CC.

+ Clause F1.5 – Roof Coverings

This clause details the materials and appropriate standards, with which roofs must be covered with. The roofing requirements are set out in sub-clauses (a), (b) (c), (d), (e) & (f) which set out the types of materials that may be used and the adopted Australian Standards that apply to their quality and installation.

Comments: Note – design certification required at CC Application stage.

SANITARY AND OTHER FACILITIES

+ Clause F2.3 – Facilities in Class 3 to 9 Buildings

This clause provides the requirements for sanitary facilities to be installed in Class 3, 5, 6, 7, 8 and 9 buildings in accordance with **Table F2.3**. The requirements and variations are set out in sub-clauses (a)-(h).

Comments: As indicated in D1.13 above the proposed population numbers have been calculated per Table D1.13 to assess if the proposed toilet facilities within the buildings are adequate to achieve compliance with Table F2.3. Based on these population numbers, the proposed sanitary facilities numbers are required to be provided – compliance is readily achievable.

- Warehouse Tenancy 01 - Male: 2 Pans, 2 Urinals, 2 Wash Basins; Female: 3 Pans, 2 Wash Basins.
- Office Tenancy 01 - Male: 2 Pans, 1 Urinal, 1 Wash Basin; Female: 2 Pans, 1 Wash Basin.
- Warehouse Tenancy 02 - Male: 2 Pans, 2 Urinals, 2 Wash Basins; Female: 3 Pans, 2 Wash Basins.
- Office Tenancy 02 - Male: 2 Pans, 1 Urinal, 1 Wash Basin; Female: 2 Pans, 1 Wash Basin.
- Warehouse Tenancy 03 - Male: 2 Pans, 2 Urinals, 2 Wash Basins; Female: 3 Pans, 2 Wash Basins.
- Office Tenancy 03 - Male: 2 Pans, 1 Urinal, 1 Wash Basin; Female: 2 Pans, 1 Wash Basin.
- Warehouse Tenancy 04 - Male: 2 Pans, 2 Urinals, 2 Wash Basins; Female: 3 Pans, 2 Wash Basins.
- Office Tenancy 04 - Male: 2 Pans, 1 Urinal, 1 Wash Basin; Female: 2 Pans, 1 Wash Basin.

+ Clause F2.4 – Accessible Sanitary Facilities

Accessible unisex sanitary compartments must be provided, in accordance with **Table F2.4(a)** and unisex showers must be provided in accordance with **Table F2.4(b)**, in buildings or parts that are required to be accessible. The details for the provision of disabled facilities and the standard, AS 1428.1, are set out in sub-clauses (a) to (i).



Comments: The proposed accessible toilet facilities and ambulant sanitary facilities on each level of the building are considered to achieve compliance with the provisions of Table F2.4 (particularly in relation to the minimum 50% of toilet banks requirement per storey). Details demonstrating that the design of each facility complies with AS 1428.1 are to be provided at the CC application stage, however, compliance is readily achievable – refer to Access Consultant Report.

LIGHT AND VENTILATION

+ **Clause F4.4 – Artificial Lighting**

Artificial lighting is required where it is necessary to minimise the hazard to occupants during an emergency evacuation. Sub-clauses (a), (b) & (c) sets out the places where artificial lighting is always required in all classes of buildings and the standard to which it must be installed.

Comments: Design certification to be submitted at CC Application Stage for the building.

+ **Clause F4.5 – Ventilation of Rooms**

A habitable room, office, shop, factory, workroom, sanitary compartment, bathroom, shower room, laundry and any other room occupied by a person for any purpose must have natural ventilation complying with F4.6 or a mechanical or air-conditioning system complying with AS1668.2 and AS/NZS 3666.1.

Note: NSW F4.5(b) a mechanical ventilation or air-conditioning system complying with AS 1668.2 – the reference to AS/NZS 2666.1 is deleted from the BCA in NSW as the need to comply with this standard is regulated under the relevant section of the Public Health Act 1991.

Comments: Design certification to be submitted at CC Stage for the building.

3.6 SECTION J – ENERGY EFFICIENCY

+ **Part J1 – Building Fabric**

The provision of insulation of the building envelope will be required in the proposed Building, in accordance with **Clauses J1.0 to J1.6**, and the **Tables therein**, including Thermal Construction General, Roof and Ceiling Construction, Rooflights, Walls, and Floors. Design details and/or certification of design will be required to be provided in this regard.

Comments: This section applies to any air-conditioned spaces proposed within the warehouse building. Design details and/or certification of building envelope design will be required to be submitted with the application for a Construction Certificate – refer to Sec.J/ESD Consultant Report.

+ **Part J3 – Building Sealing**

The proposed building envelope will be required to be sealed to prevent air infiltration in accordance with the requirements of **Clauses J3.0 to J3.6**. Details or certification that the proposed building design complies with the requirements of **Part J3** is required to be provided.

*Comments: This section applies to any air-conditioned spaces proposed within the warehouse building. Details or certification that the proposed design complies with the requirements of **Part J3** will need to be submitted with the application for a Construction Certificate – refer to Sec.J/ESD Consultant Report.*

+ **Part J5 – Air-Conditioning & Ventilation Systems**

Details and/or design certification which confirm that any proposed air-conditioning system or unit within the proposed building achieves compliance with the relevant requirements of **Part J5** will be required to be provided from the mechanical engineer.

Comments: Details or certification demonstrating compliance will need to be submitted with the application for a Construction Certificate for the building – refer to Sec.J/ESD Consultant Report.

+ **Part J6 – Artificial Light & Power**

Details and/or design certification which confirm that all artificial lighting, power control, and boiling/chilled water units within the proposed building achieves compliance with the relevant requirements of **Part J6** will be required to be provided from the electrical engineer.

Comments: Details or certification demonstrating compliance will need to be submitted with the application for a Construction Certificate for the building – refer to Sec.J/ESD Consultant Report.



+ Part J7 – Hot Water Supply, & Swimming Pool & Spa Pool Plant

Details and/or design certification which confirm that any proposed hot water supply system within the proposed building achieves compliance with the relevant requirements of **Part J7** (Section 8 of AS 3500.4) will be required to be provided from the hydraulic engineer.

Comments: Details or certification demonstrating compliance will need to be submitted with the application for a Construction Certificate for the building – refer to Sec.J/ESD Consultant Report.

+ Part J8 – Facilities for Energy Monitoring

Provision for monitoring of energy consumption must be provided to a building where the floor area exceeds 500m², and must be capable of recording the consumption of gas and electricity. In addition, where the floor area of the building exceeds 2,500m² the energy monitoring facilities must be capable of individually recording air-conditioning, lighting, appliance power, central hot water supply, lifts/escalators, and other ancillary plant.

Comments: Details or certification demonstrating compliance with Clauses J8.3(b) & (c) will need to be submitted with the application for a Construction Certificate – refer to Sec.J/ESD Consultant Report.

4. SUMMARY OF KEY COMPLIANCE ISSUES

The following comprises a summary of the key compliance issues identified under the assessment contained above this report. These matters are to be addressed prior to issue of the Construction Certificate.

4.1 MATTERS REQUIRING FURTHER RESOLUTION/PLAN AMENDMENTS

BCA Clause/s		Description
1.	C1.9 & C1.14	Details of the non-combustible external walls to the Office and Warehouse, along with the vertical aluminium fins are required to be provided for assessment.
2.	Part D3 & AS 1428.1-2009	Access to the building is required from the following: + All main entry points on the allotment boundary; and + Any accessible car parking within the site. The requirements of the Access Consultant Report are required to be incorporated into the CC Application plans.
3.	Section J	The requirements of the Sec.J/ESD Consultant Report are required to be incorporated into the CC Application plans.

4.2 MATTERS REQUIRING FIRE SAFETY ENGINEERED PERFORMANCE SOLUTIONS

BCA Clause/s		Description
1.	Spec. C1.1	Proposed reduction and/or deletion of FRL's to secondary structural elements supported the floor slabs in the warehouse.
2.	C2.4	The following compliance issues have been identified with respect to the proposed perimeter vehicular access serving the Site: + The vehicular access is less than 6m wide in two locations around the perimeter of the building.
3.	C3.15	Fire Stopping of services penetrations in 240/240/240 FRL building elements.
4.	D1.4 /D1.5	The current plans indicate that exit travel distances, and distances between alternative exits will not comply with D1.4 & D1.5 – respectively.
5.	E1.3 (inter alia AS 2419.1-2005) and E1.5	TBC by Fire Engineer and Hydraulic Engineer. Note: Performance Solution required for access to sprinkler booster via "right of way" on adjoining allotment.
6.	E2.2	It is noted that a rationalised automatic smoke exhaust system throughout the building may be considered.



5. CONCLUSION

This report contains an assessment of the referenced architectural documentation for the proposed warehouse development at 42 Raymond Ave, Matraville against the Deemed-to-Satisfy Provisions of the BCA 2019. Arising from the review, it is considered that the proposed development can readily achieve compliance with the relevant provisions of the BCA.

The following essential fire safety measures will be required for the building;

Essential Fire and Other Safety Measures	Standard of Performance
Alarm Signaling Equipment	AS1670.3 – 2018
Automatic Fail-Safe Devices	BCA Clause D2.21
Automatic Fire Detection System	BCA Spec. E2.2a & AS/NZS 1668.1 – 2015 and *Fire Engineered Alternative Solution
Automatic Fire Suppression Systems	BCA Spec. E1.5 & AS 2118.1-2017 and *Fire Engineered Performance Solution
Building Occupant Warning System activated by the Sprinkler System	BCA Spec E1.5 Clause 8 and/ or AS 1670.1 – 2018
Emergency Lighting	BCA Clause E4.4 & AS 2293.1 - 2018
Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS 2293.1 – 2018 and *Fire Engineered Performance Solution
Fire Control Centre	BCA Spec E1.8
Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
Fire Hydrant Systems	BCA Clause E1.3 & AS 2419.1 – 2005 and *Fire Engineered Performance Solution
Mechanical Air Handling Systems	BCA Clause E2.2, AS/NZS 1668.1 - 2015 & AS 1668.2 – 2012
Paths of Travel	EP & A Regulation Clause 186 and *Fire Engineered Performance Solution
Perimeter Vehicular Access	BCA Clause C2.4 and *Fire Engineered Alternative Solution
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
Required Exit Doors (power operated)	BCA Clause D2.19(d)
Stretcher Lift	BCA Clause E3.2
Smoke Hazard Management Systems (Smoke Exhaust System)	BCA Part E2 & AS/NZS 1668.1 - 2015 *Fire Engineered Alternative Solution
Warning & Operational signs	Section 183 of the EP & A Regulations 2000, AS 1905.1 - 2015, BCA Clause D2.23, E3.3

Note the above fire safety schedule is indicative only and could be subject to change as result of design changes.



APPENDIX 1 – SPEC. C1.1 FRL REQUIREMENTS

Building Element	Class of building — FRL: (in minutes)			
	<i>Structural adequacy/Integrity/Insulation</i>			
	2, 3 or 4 part	5, 7a or 9	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated within it) or other external building element, where the distance from any fire-source feature to which it is exposed is—				
For loadbearing parts—				
less than 1.5 m	90/ 90/ 90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/ 60/ 60	120/ 90/ 90	180/180/120	240/240/180
3 m or more	90/ 60/ 30	120/ 60/ 30	180/120/ 90	240/180/ 90
For non- loadbearing parts—				
less than 1.5 m	–/90/ 90	–/120/120	–/180/180	–/240/240
1.5 to less than 3 m	–/60/ 60	–/90/ 90	–/180/120	–/240/180
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an external wall —				
For loadbearing columns—	90/–/–	120/–/–	180/–/–	240/–/–
For non- loadbearing columns—	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS—	90/ 90/ 90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS—				
Fire-resisting lift and stair shafts —				
Loadbearing	90/ 90/ 90	120/120/120	180/120/120	240/120/120
Non- loadbearing	–/ 90/ 90	–/120/120	–/120/120	–/120/120
Bounding public corridors , public lobbies and the like—				
Loadbearing	90/90/ 90	120/–/–	180/–/–	240/–/–
Non- loadbearing	–/60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding sole-occupancy units —				
Loadbearing	90/90/ 90	120/–/–	180/–/–	240/–/–
Non- loadbearing	–/60/ 60	–/–/–	–/–/–	–/–/–
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion—				
Loadbearing	90/90/ 90	120/ 90/ 90	180/120/120	240/120/120
Non- loadbearing	–/90/90	–/90/90	–/120/120	–/120/120
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS—				
	90/–/–	120/–/–	180/–/–	240/–/–
FLOORS	90/90/ 90	120/120/120	180/180/180	240/240/240
ROOFS	90/60/ 30	120/60/ 30	180/60/ 30	240/90/ 60

Notes:

- Any lightweight construction in a fire wall or an internal wall required to have an FRL is to comply with Specification C1.8.
- A loadbearing internal wall and a loadbearing fire wall (including those that are part of a loadbearing shaft) must be constructed from; concrete or masonry.
- The method of attaching or installing a finish, lining, ancillary element, or service installation to a building must not reduce the fire-resistance of that element to below that required.



4. *Fire rated shafts are required to be enclosed at the top and bottom by construction having an FRL of not less than what the shaft requires (in both directions)*
5. *The concession granted under clause C3.5 results in the roof of the building not being required to be fire rated (the building is provided throughout with sprinklers). Notwithstanding, the Atrium provisions override this general concession in BCA Specification C1.1.*
6. *Lift shafts are required to be enclosed at the top of the shaft with fire rated construction having an FRL of 120/120/120.*
7. *Fire isolated exits are to be provided with a fire rated "lid" that achieves an FRL of 120/120/120.*
8. *Where roof lights are proposed they are required to be located not less than 3 metres from a roof light in an adjoining fire separated part; and must not be more than 20% of the area of the roof.*
9. *Any loadbearing internal walls or loadbearing fire walls are to be masonry or concrete.*
10. *External walls must be non-combustible construction. Non-loadbearing parts of an external wall that are more than 3m from a fire source feature need not be fire rated.*
11. *Internal columns in this building (being less than 25m in effective height) that are in the storey immediately below the roof, can be constructed as follows:*
 - a. *Building with a rise in storeys exceeding 3 – FRL 60/60/60*
 - b. *Building with a rise in storeys not exceeding 3 – no FRL*