BCA ASSESSMENT REPORT

Stage 1, Talavera Business Centre
4-38 Talavera Road, Macquarie Park

Revision 0

Date: 07 September 2022

Project No.: 220270

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REPORT STATUS				
DATE	**REVISION**	**STATUS**	**AUTHOR**	**REVIEWED**
07.09.2022	0	Preliminary Assessment – For Client & Consultant Review	DG	NQ

Prepared By:

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Director

Reviewed by:

Nini Quach
Assistant Building Surveyor

1. INTRODUCTION

1.1 BACKGROUND / PROPOSAL

Blackett Maguire + Goldsmith Pty Ltd (BM+G) have been commissioned by Goodman Property Services, 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 19 of the *Environmental Planning & Assessment Regulation (Development Certification & Fire Safety) 2021 (EPA&A (DC&FS) Reg)* and Clauses 24 & 25 of the *Building and Development Certifiers Regulation 2020.*

The proposed development will occur over two construction stages.

Stage 1

4 & 6-10 Talavera Road (Single Storey Building, with warehouse units over six (6) levels, mezzanine offices, associated landscaping and car park).

Stage 2

12 – 38 Talavera Road (Multi-level building, with warehouse units over two (2) levels, five (5) levels of shared offices, mezzanine offices, associated landscaping and carpark).

Note this BCA Report will relate to Stage 1 only.

Figure 1 3D Perspective (Source: SBA Architects, Design Presentation)

1.2 AIM

The aim of this report is to:

- Undertake an assessment of the proposed warehouse buildings against the Deemed-to-Satisfy (DtS) Provisions of the BCA 2019 Amendment 1.

  Note*: The version of the BCA that is applicable to building work is the version that is in force at the time the application for* the *relevant construction certificate of complying development certificate is made. In this regard, it is highlighted that this report includes an assessment of the proposed development against the requirements of BCA 2019 Amendment 1, however, the development is likely to be subject to compliance with the draft provisions of BCA 2022 Note: The current advice from the Australian Building Codes Board is that BCA 2022 will come into effect on a voluntary basis from October 1st 2022 and will become mandatory on the 1st May 2023. The BCA 2022 provisions are still in a draft version and as such our report below will be updated upon the release of the final revision of the NCC / BCA 2022 document.*
- 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, as listed below:

Drawing No.	Rev.	Date	Drawing No.	Rev.	Date
DA000	3	11.08.2022	DA101	3	11.08.2022
DA001	3	11.08.2022	DA102	3	11.08.2022
DA002	3	11.08.2022	DA103	3	11.08.2022
DA004	3	11.08.2022	DA104	3	11.08.2022
DA005	3	11.08.2022	DA105	3	11.08.2022
DA006	2	21.07.2022	DA106	3	11.08.2022
DA007	1	21.07.2022	DA107	3	11.08.2022
DA008	1	21.07.2022	DA108	-	-
DA009	3	11.08.2022	DA110	3	11.08.2022
DA010	3	11.08.2022	DA111	3	11.08.2022
DA011	3	11.08.2022	DA112	3	11.08.2022
DA012	1	21.07.2022	DA130	3	11.08.2022
DA013	1	21.07.2022	DA131	3	11.08.2022
DA014	2	21.07.2022	DA132	3	11.08.2022
DA015	1	21.07.2022	DA133	3	11.08.2022
DA050	3	11.08.2022	DA134	3	11.08.2022
DA100	3	11.08.2022	DA135	1	29.06.2022

1.5 REGULATORY FRAMEWORK

Pursuant to clause 19 of the *Environmental Planning & Assessment Regulation (Development Certification & Fire* Safety*) 2021 (EP&A (DC&FS) Reg.)* 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.
- BM+G Pty Ltd do not guarantee acceptance of this report by Local Council, FRNSW or other approval authorities.

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.

+ **Building Permit**
Building Approval issued by the Certifying Authority pursuant to Chapter 4 of the Building Act 1975.

+ **Construction Type**
The construction type is a measure of a buildings 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.

+ **Certificate of Occupancy**
Building Occupation Approval issued pursuant to s.102 of the Building Act 1975.

+ **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 (Carpark), Class 7b (Warehouse), Class 10a *Note: The Gym & Café on the Lower Carpark Level, and the End of Trip/Bike Store on the Upper Carpark Level have not been classified separately as they occupy less than 10% of the storey in which they are located.*
Rise in Storeys:	Six (6)
Effective Height:	Over 12m: (RL72.8 - RL51.3) = 21.5m
Type of Construction:	Type A Construction
Climate Zone:	Zone 5
Maximum Floor Area:	Large Isolated Building - >18,000m^2
Maximum Volume:	Large Isolated Building - >108,000m^3
Structural Importance Level:	Level 2

2.2 FIRE SOURCE FEATURE

The distances from the nearest Fire Source Features are as follows:

Boundary	Distance to Fire Source Feature
Northern Boundary	>6m to the allotment boundary
Southern Boundary	>6m to the allotment boundary
Eastern Boundary	>6m to the allotment boundary
Western Boundary	>6m to 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 proposed warehouse buildings– 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: *A rise of six (6) story's applies to Building, based on the lower ground carparks levels and office mezzanine levels.*

+ 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.

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))

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.

Comments: *The external walls of the proposed buildings (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 C1.13 – Fire-Protected Timber: Concession

Fire Protected Timber may be used wherever an element is required to be non-combustible, if it is located in a separate stand-alone building, or it occupies part of a building separated by a Fire Wall, and the building is sprinkler protected, is provided with non-combustible insulation in cavities within the timber elements, and has cavity barriers between floors per Spec. C1.13.

Comments: The concession for the use of mass timber where non-combustible building elements may be utilised in relation to the mass timber structure proposed to the offices, however further details demonstrating compliance with C1.13(c), (d), and Spec. C1.13 are required to confirm.

+ 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 warehouses 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 in this regard – details to be provided by Goodman.*

COMPARTMENTATION AND SEPARATION

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

Sets out the parameters for the maximum floor area and volume of Class 5, 6, 7, 8 & 9 buildings as required by sub-clauses (a), (b) & (c). Note: Table C2.2 details the maximum size of Fire Compartments or Atriums in the Type of Construction of each classification.

Comments: *The proposed buildings are 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 buildings are 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 proposed warehouse building complies with the provisions of C2.4 with the exception of the areas marked in red, and blue on the mark-up below which are required to be addressed as a Performance Solution by the Fire Safety Engineer. The Vehicular Access is greater than 18m along the north east, south-east and south-west elevations and is discontinuous around the North of Building.*

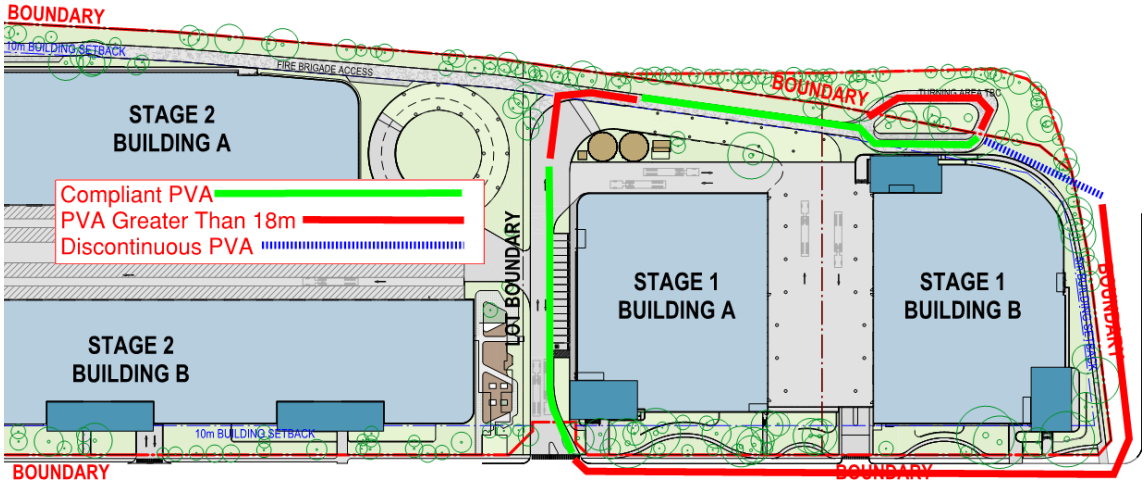

Figure 2 – Perimeter Vehicular Access

+ Clause C2.6 - Vertical Separation of Openings in External Walls Limitations

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: Although the proposed building is of Type A Construction spandrel protection between the levels is NOT required as the building is proposed to be provided with a sprinkler system throughout in accordance with Spec. E1.5.

+ Clause C2.7 – Fire Walls

Separation of Fire Compartments must be constructed in accordance with the following per C2.7(a) & (c):

- FRL in accordance with Table 4 of Spec. C1.1 and extend to the underside of a floor with the same FRL, or to the underside of a non-combustible roof covering.
- Any openings in a fire wall must not reduce the FRL, except where permitted by the Deemed-to-Satisfy Provisions of Part C3 (i.e. fire doors; protection of services).
- Building elements, other than roof battens with dimensions of 75 mm x 50 mm or less or sarking-type material, must not pass through or cross the fire wall unless the required fire resisting performance of the fire wall is maintained.

Comments: Any Fire Walls that are proposed to separate the different classifications (Class 5 & 7b on Levels Ground to L1 Mezz of both Building A and Building B) per Clause C2.8 below are required to be designed in accordance with C2.7(a) and (c) and will require the greater FRL of the classifications they are separating per Table 3 of Spec. C1.1 ie. an FRL of 240/240/240. Details to be included on the CC Application Plans.

Note: Where the C1.13 concessions are proposed to be utilised in the design, a Fire Wall between the mass timber Class 5 structure and the Class 7b warehouse will be required.

+ Clause C2.8 – Separation of Classifications in the Same Storey

If a building has parts of different classifications located alongside one another in the same storey, each element must have the required higher FRL for the classifications concerned.

Alternatively, the parts must be separated by a fire wall having the higher FRL for the classifications prescribed in Table 3 or 4 of BCA Specification C1.1 (for Type a or Type B Construction), or Table 5 for Type C Construction.

Comments: See comments under Spec. C1.1 regarding FRL requirements, however, the higher Class 7b FRL's can apply to the whole building per C2.8(a) OR in accordance with C2.8(b) a compliant fire wall (240/240/240 FRL) to separate the Class 7b Warehouse from the Class 5 Office on the ground floor Mezzanine and Level 1 Mezzanine will be required (See Fig 3 and Fig 4 below). Details are to be included

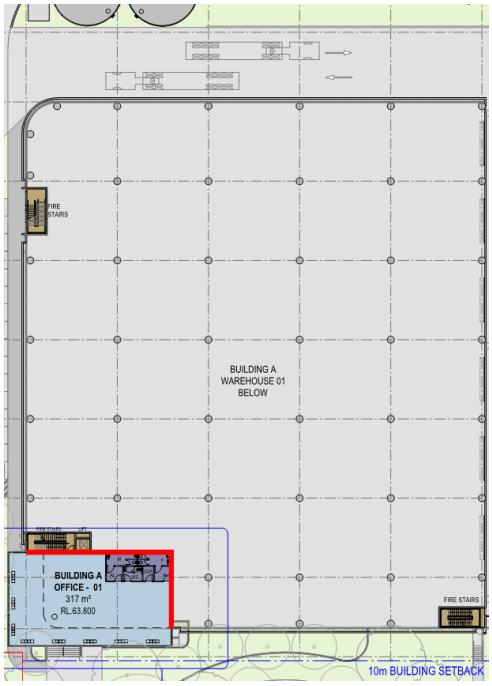

Figure 3 – Separation between Class 5 & 7b Fire Compartments on Ground Mezzanine in Bld. A.

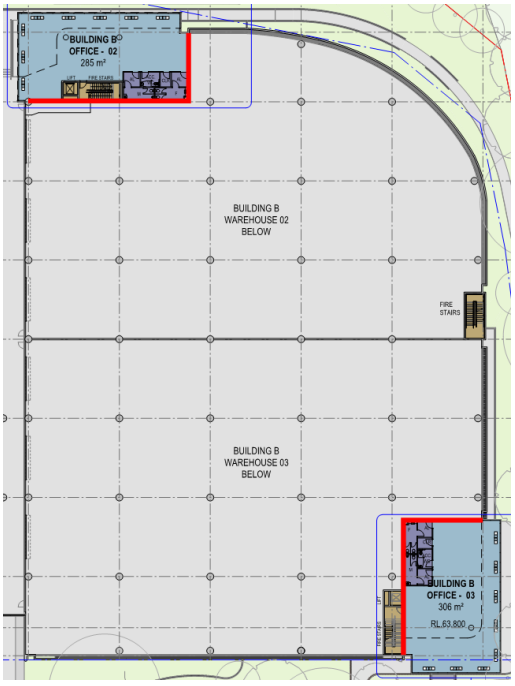

Figure 4 – Separation between Class 5 & 7b Fire Compartments on Ground Mezzanine in Bld. B.

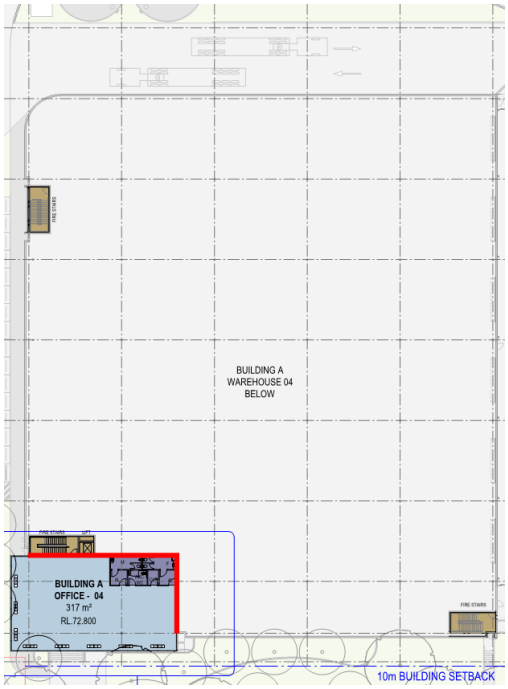

Figure 5 – Separation between Class 5 & 7b Fire Compartments on Level 1 Mezzanine in Bld. A.

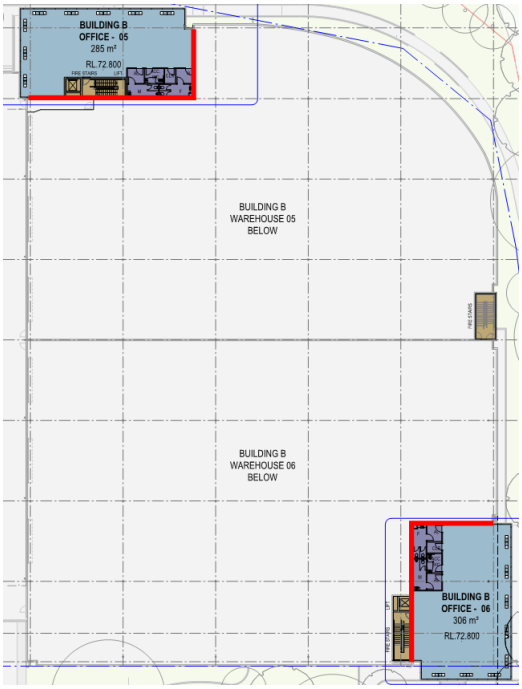

Figure 6 – Separation between Class 5 & 7b Fire Compartments on Level 1 Mezzanine in Building A.

+ Clause C2.9 – Separation of Classification in Different Storeys

This clause specifies the required separation between parts of a building which are of a different classification, situated one above another, to minimise the risk of a fire in one classification causing the failure of building elements in another classification in a different storey.

Comments: The floor level above each different classification in the proposed building is to achieve the applicable FRL for floors applying to the lower level. Note: In regard the floor slab above the Class 7a Carpark is required to achieve a minimum FRL of 120/120/120, whilst the floor slabs above the Class 7b warehouse levels are required to achieve a minimum FRL of 240/240/240 in accordance with Table 3 of Spec. C1.1 – compliance is readily achievable in this regard. Note: This clause does not apply to the Office portion of the development as Class 5 applies to all levels.

+ Clause C2.10 – Separation of Lift Shafts

Applies to all classes of buildings and specifies the protection requirements for openings for lift shafts and lift landing doors. The requirements are set out in sub-clauses (a), (b) (c) & (d) which relate to openings in Type A, B and C construction. Also note the Deemed to Satisfy Provisions of Clause C3.10.

Comments: The passenger lifts in the proposed building, serving the office levels and warehouse levels 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 –

- Lift motors and lift control panels; or
- Emergency generators used to sustain emergency equipment operating in the emergency mode; or
- Central smoke control plant; or
- Boilers; or
- 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: Details demonstrating compliance are to be included in the CC Application plans for the proposed 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

An electricity substation or main switchboard which sustains emergency equipment operating in emergency (along with associated electrical conductors supplying the substation & main switchboard), located within a building must –

- Be separated from any other part of the building by construction having an FRL of not less than 120/120/120; and
- Having any doorway in that construction protected with a self-closing fire door having an FRL of not less then -/120/30.

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 switch rooms serving each building.

PROTECTION OF OPENINGS

+ Clause C3.3 – Separation of External Walls and Associated Openings in Different Fire Compartments

Any part of an external wall including openings must be protected where they are located adjacent to another external wall in an adjoining fire compartment in accordance with the orientation and setback distances specified in Table C3.3. Where protection is required the external walls must achieve a minimum FRL of 60/60/60 and openings protected per Clause C3.4.

<u>Comments:</u> Where a Clause C2.8(b) Fire Wall between Class 7b & Class 5 parts of the building is proposed in the design the external walls & associated openings on either side of the Fire Walls will require protection per C3.3 for 4m on either side of the intersection of the fire wall (see examples in Fig.7-10 below).

Details demonstrating compliance and/or a Performance Solution from the fire engineer will be required to be provided at the CC Application stage.

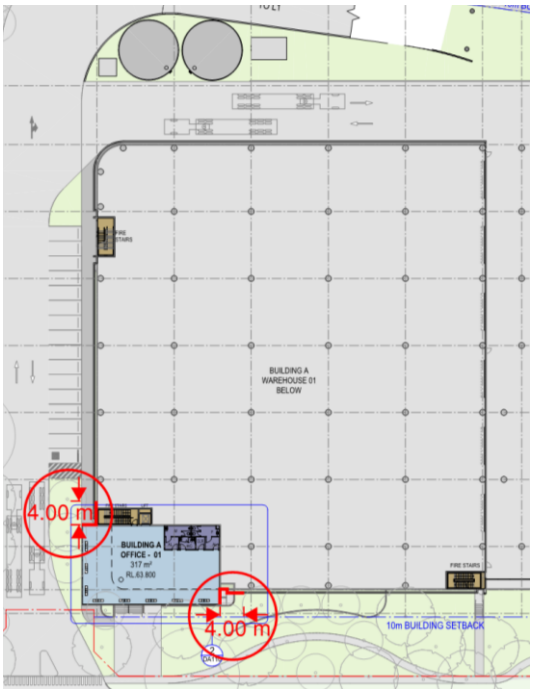

Figure 7 – Separation of External Walls between Class 5 & 7b Fire Compartments on Ground Mezzanine in Building A.

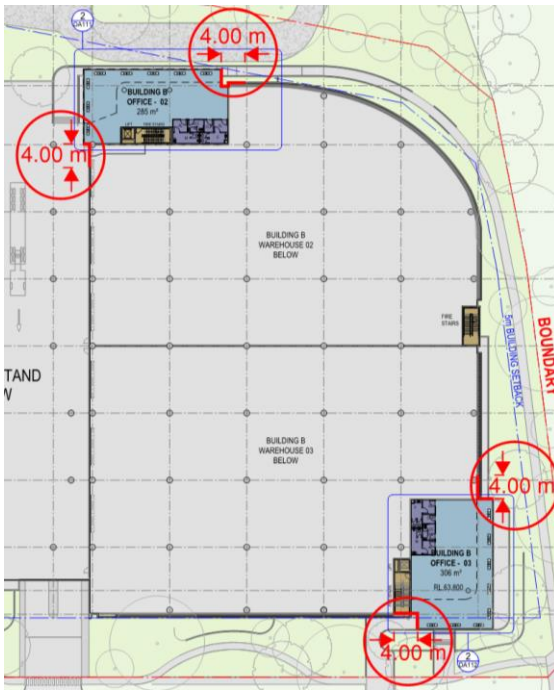

Figure 8 – Separation of External Walls between Class 5 & 7b Fire Compartments on Ground Mezzanine in Building B.

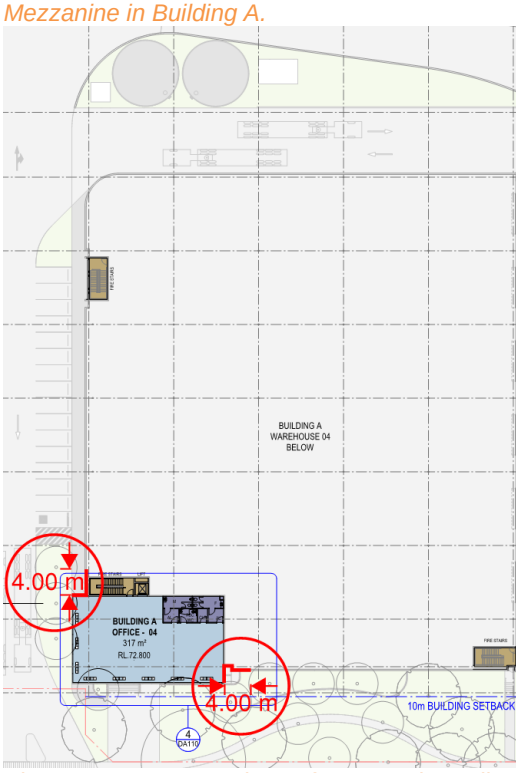

Figure 9 – Separation of External Walls between the Class 5 & 7b Fire Compartments on Level 1 Mezzanine in Building A.

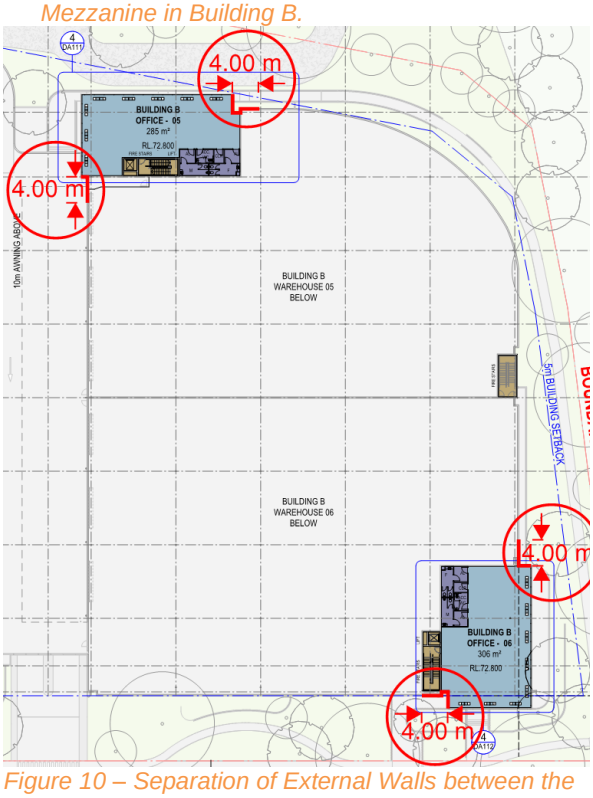

Figure 10 – Separation of External Walls between the Class 5 & 7b Fire Compartments on Level 1 Mezzanine in Building B.

+ Clause C3.5 – Doorways in Fire Walls

Openings in fire walls, that are not part of a horizontal exit, must be protected in accordance with one of the methods set out in this clause and must achieve an equivalent fire rating to the fire wall.

Fire shutters installed to openings in fire walls must be self-closing or automatic in accordance with the requirements set out in this clause.

Comments: Doors in the Fire Wall separating the offices from the warehouse must be protected with fire doors that achieve a minimum FRL of -/240/30 FRL. Details demonstrating compliance are to be included on the CC Application plans in accordance with this requirement.

+ 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 and passageways. 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 though openings in these building elements, required to resist the spread of fire.

Comments: Certification will be required at CC application stage – see notes below under C3.15 regarding the requirements 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 service penetrations thought 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 proposed 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 on Basement Carpark Level, including the columns. (120/-/- FRL).

- External Load-bearing Columns (240/-/- FRL).
- Internal Load-bearing elements, including Walls, Columns, Beams, etc. on Ground to Level 2 (240/-/- FRL), and on Basement Carpark Level (120/-/- FRL).
- Fire Stairs/Lift Shafts/Services (240/120/120 FRL).
- Floors, including Office Levels and Warehouse Mezzanines (240/240/240 FRL).
- Floor Slab above Basement Carpark – 120/120/120.
- Fire Walls (240/240/240 FRL) – if proposed.
- Roof – Non-Combustible.

Note 1: It is noted that a Performance Solution may be considered for rationalised FRL's to the secondary beams supporting the floor slabs in the warehouse portions of the building.

Note 2: A Performance Solution may be considered for deletion of FRL's to the mass timber elements that form the office structures on the northern and southern sides 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 50m^2 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, in that a minimum of 2 exits are provided to all parts of the building (as the effective height exceeds 25m).*

+ 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 the building connects more 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).*

+ 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 the carpark and warehouse portions 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:*

- Lower Carpark – Up to 58m to an exit.
- Upper Carpark – Up to 50m to an exit.
- Ground Floor – Up to 65m to an exit in Warehouses 1-3 and 45m from the hardstand.
- Ground Floor Mezzanine – Complies
- Level 1 – Up to 59m to an exit from Warehouses 4-6.

- Level 1 Mezzanine – Complies.

These 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 in the carpark and warehouse portions of the proposed 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.*

- Lower Carpark - Up to 125m between alternate exits.
- Upper Carpark – Up to 99m between alternate exits.
- Ground Floor - Up to 130m between alternate exits in Warehouses 1-3 and 90m between alternate exits in the Hardstand.
- Level 1 - Up to 120m between alternate exits in Warehouses 4-6.

+ 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 per summary below:*

- Warehouse levels 0-1 – Required exit width for max 82 persons = 1m
- Office Level 0-2 – Required exit width for max 32 persons = 1m

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.

Comments: Details of the discharge from the fire stairs on the Lower Carpark, Upper Carpark and Ground Level to open space are to be included on the CC plans. Note: A Performance Solution may be required for the discharge of the fire stair adjacent to Unit 02 lobby.

+ 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 building are required to be protected in accordance with the requirements of this clause. Additionally, the paths of travel to the road from each exit must have an unobstructed width throughout of not less than 1m.*

+ **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:*

- Lower Carpark - 100 persons
- Upper Carpark - 137 persons + End of Trip – 11 persons
- Unit 1 – Warehouse 80 persons, Office 32 persons
- Unit 2 – Warehouse 43 persons, Office 29 persons
- Unit 3 – Warehouse 49 persons, Office 31 persons
- Unit 4 – Warehouse 82 persons, Office 32 persons
- Unit 5 – Warehouse 44 persons, Office 29 persons
- Unit 6 – Warehouse 49 persons, Office 31 persons

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 D2.7 – 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.*

+ **Clause D2.12 – Roof as Open Space**

In the event that an exit discharges onto the roof of a building as the point of open space, the roof must have an FRL of not less than 120/120/120 and must not have any openings within 3m of the path of travel to a road or open space. In addition, the roof as open space must be served by a compliant external stair or ramp that provides discharge from the exit to the level of the road per D1.10.

Comments: *The hardstand areas shaded in green below are deemed roof as open space and are subject to compliance with D2.12 and also require a compliant external stair or ramp discharge to the Ground Level per D1.10. A Performance Solution will be required from the fire engineer for the use of a fire isolated exit stair as the discharge from the area designated as roof as open space.*

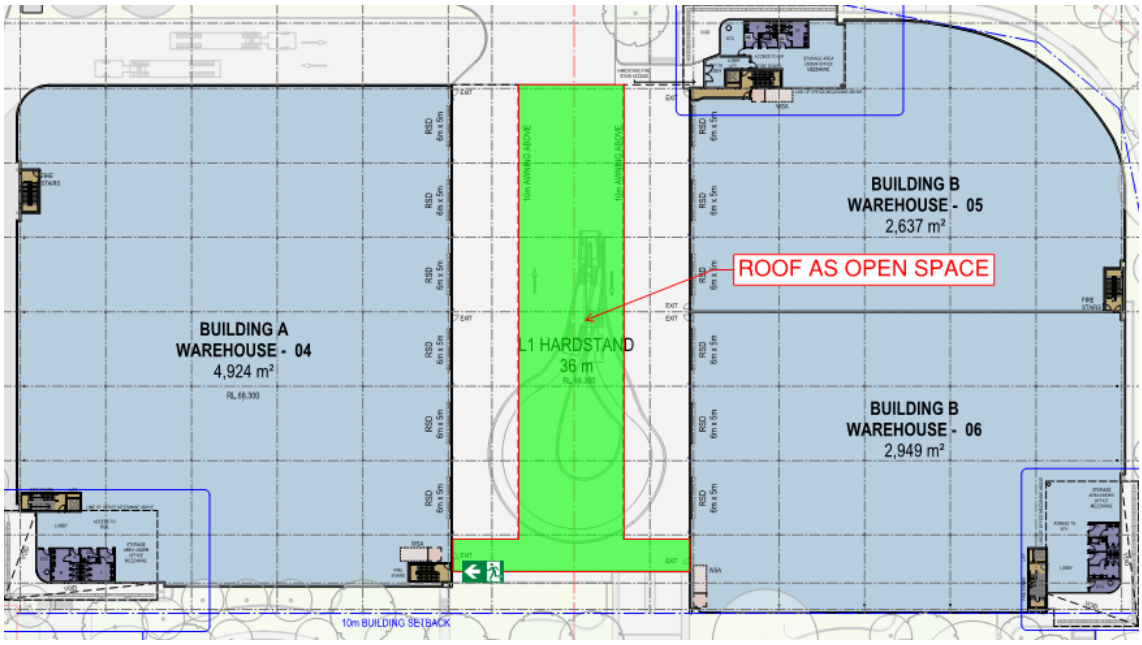

Figure 10 –

+ 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.

Comments: 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: Doors 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 500m^2, 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 each tenancy, from accessible parking spaces in the building and throughout all areas in each building in accordance with AS 1428.1-2009. Refer to D3.3 and D3.4 below and Access Consultant's Report.*

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

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

Comments: *As indicated above, the proposed building is required to be accessible throughout in accordance with AS1428.1-2009 – Refer to Access Consultant Report for further details.*

+ 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 recommended that advice be obtained from an accredited Access Consultant at the CC Application stage, however, consideration to an exemption for the Warehouse & Hardstand areas may be appropriate on this project. Confirmation will be required from the occupant that includes a request for cconcession, where this would be applied and the reasons why it would be inappropriate for access for people with disabilities within the facility.*

+ 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 four (4) accessible parking spaces on the lower carpark and six (6) accessible parking spaces on the upper carpark 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 D3.7 – Hearing Augmentation

This part provides requirements for provision of hearing augmentation in accessible buildings, i.e. to be provided where an in-built amplification system (other than one used for emergencies), is installed:

- In a room in a Class 9b building;
- In an auditorium, conference room, meeting room, or room for judiciary purposes;
- At any ticket office, teller's booth, reception area or the like where the public is screened from the service provider.

Comments: *Details and design certification demonstrating compliance will be required to be included in the CC plans.*

+ 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: *Subject to D3.4 above, stairways and ramps serving the building, any overhead projection less than 2m in height and any paths leading directly to a driveway or roadway without a kerb will need to be provided with tactile ground surface indication in accordance with AS1428.4. Details and design certification demonstrating compliance will be required to be included in the CC plans.*

+ **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.*

+ **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: Architect to note.

3.4 SECTION E – SERVICES AND EQUIPMENT

FIRE FIGHTING EQUIPMENT

+ **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.*

Hydrant booster assemblies are required to be accessible to the brigade, located within sight of the main entry of the building, at least 10m from any proposed substation, and adjacent to the main vehicular and pedestrian entry into the site. Details of the proposed hydrant booster location are to be provided for review to determine if compliance is achieved or if a Performance Solution is required from the Fire Engineer.

Additionally, it is noted a Performance Solution will be required to treat hydrants that are located outside the building which are not open to the sky (e.g. located under an awning or the like) as external hydrants and to omit the requirement for radiant heat shields to external hydrants.

+ **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 proposed Warehouse and carpark portions of the building are required to be served by a compliant fire hose reel system; however, the Office areas do not require coverage as they are subject to the Class 5 concession. 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.*

In accordance with Clause 4.14.1 of AS2118.1-2017, sprinkler boosters are required to comply with the requirements of AS2419.1-2005 for a hydrant booster, which is required to be addressed as a Performance Solution from the Fire Engineer.

+ **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 Large Isolated building has floor area that is greater than 18,000m² and as such is required to be provided with a Fire Control Centre (FCC) that complies with Clauses 2-5 of BCA Spec E1.8. Details demonstrating compliance are to be included in the CC Application plans. Note if a change in level is required o access the FCC of >300mm a Performance Solution will eb required to be prepared by the Fire Engineer to demonstrate compliance with Performance Requirement EP1.8.*

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 proposed 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. In addition, any fire isolated passageways that exceed 80m in length are required to be pressurised in accordance with AS 1668.1-2015.*

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 2000mmm 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 2293.1-2018.

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

Every required emergency lighting system must comply with AS/NZS 2293.1-2018.

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 2293.1-2018and 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 provided with the CC application.*

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 and have been subsequently used to assess the required toilet facilities within the buildings to achieve compliance with Table F2.3. Based on the aggregate population numbers, for each proposed use in the building the following minimum sanitary facilities apply. Note: No allocation has been made for the carpark as the population of this part of the building can also be attributed to the Class 5 or Class 7b parts of the building.*

- Unit 1 - Warehouse: *40 Males: 2 Closet Pans, 2 Urinals, 2 Washbasins; 40 Females: 3 Closet Pans, 2 Washbasins.*, Office *16 Males: 1 Closet Pan, 1 Urinal, 1 Washbasin; 16 Females: 2 Closet Pans, 1 Washbasin*
- Unit 2 – Warehouse *22 Males: 2 Closet Pans, 2 Urinals, 2 Washbasins; 22 Females: 2 Closet Pans, 2 Washbasins*; Office *15 Males: 1 Closet Pan, 1 Urinal, 1 Washbasin; 15 Females: 1 Closet Pan, 1 Washbasin*
- Unit 3 – Warehouse *25 Males: 2 Closet Pans, 2 Urinals, 2 Washbasins; 25 Females: 2 Closet Pans, 2 Washbasins;* Office *16 Males: 1 Closet Pan, 1 Urinal, 1 Washbasin; 16 Females: 2 Closet Pans, 1 Washbasin*
- Unit 4 – Warehouse *41 Males: 3 Closet Pans, 2 Urinals, 3 Washbasins; 41 Females: 3 Closet Pans, 3 Washbasins*; Office *15 Males: 1 Closet Pan, 1 Urinal, 1 Washbasin; 15 Females: 1 Closet Pan, 1 Washbasin*

- Unit 5 – Warehouse *22 Males: 2 Closet Pans, 2 Urinals, 2 Washbasins; 22Females: 2 Closet Pans, 2 Washbasins*, Office *16 Males: 1 Closet Pan, 1 Urinal, 1 Washbasin; 15 Females: 1 Closet Pan, 1 Washbasin*
- Unit 6 – Warehouse *25 Males: 2 Closet Pans, 2 Urinals, 2 Washbasins; 25 Females: 2 Closet Pans, 2 Washbasins; Office 16 Males: 1 Closet Pan, 1 Urinal, 1 Washbasin; 6 Females: 2 Closet Pans, 1 Washbasin*

Note*: Details of sanitary facilities on a floor by floor basis to be provided for assessment at the CC Application stage.*

+ **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 disable facilities and the standard, AS 1428.1, are set out in sub-clauses (a) to (i).

Comments: *The provision of 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.*

ROOM HEIGHTS

+ **Clause F3.1 – Height of Rooms and Other Spaces**

The ceiling heights in Class 2 to 9 buildings must not be less than required in sub-clauses (a) to (f) of this clause.

The ceiling minimum heights for a Class 5, 6 & 7a buildings are as follows:

- Corridor or passage – 2.1m;
- Bathroom, storeroom, etc – 2.1m
- Habitable Rooms – 2.4m.

Comments: Architect to ensure compliance – details to be included in CC Application plans.

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 proposed 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 proposed 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 buildings. Design details and/or certification of building envelope design will be required to be submitted with the application for a Construction Certificate.

+ **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 main warehouse buildings. 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.*

+ **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 buildings.

+ **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 buildings.

+ **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.

+ **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 will need to be submitted with the application for a Construction Certificate.

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.	C2.7, C2.8, C2.9, C3.3, Spec. C1.1	Confirmation is required as to whether the proposed fire safety strategy includes the provision of a 4hr Fire Wall between the Class 7b & Class 5 parts of the building in order to confirm compliance with the FRL requirements of Spec. C1.1 and the protection between fire compartment requirements of C3.3.
3.	C2.12 & C2.13	Details of 2 hr fire rated construction to rooms containing C2.12 equipment and main electrical switch rooms on Level 0 to be provided for review.

	BCA Clause/s	Description
4.	Part D3 & AS 1428.1-2009	A separate report will be required from an Access Consultant to outline the applicable requirements for the building. Specific details regarding the possible application of D4D5 to the various Class 7b portions of the building will also be required.
5.	E1.8	Details of the proposed Fire Control Centre location to be provided for review.
6.	E3.2/E3.4	Stretcher and Emergency Lift requirements to be detailed at each bank of lifts in the building.
7.	FP1.4	A Performance Solution report is to be provided by the Architect / Façade Engineer to demonstrate how the external walls & roof are designed to prevent the penetration of water into the building.
8.	Section J	A separate report will be required from an Energy Efficiency consultant to outline the applicable requirements for the building.

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 a number of secondary structural elements supported the floor slabs in the warehouses.
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 greater than 18m from the building in a number of locations. + The vehicular access is discontinuous in the NE corner of the site.
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 within the building will not comply with D1.4 & D1.5 – respectively.
5.	D1.7	Discharge location and protection of the discharge path from the fire stair adjacent to the Unit 02 Lobby on Ground Level.
6.	D2.12	Discharge from the Roof as Open Space to the Ground Level via a fire isolated stair in lieu of an external stair.
7.	E1.3 (inter alia AS 2419.1-2005) and E1.5	To allow external fire hydrants to be located beneath the awnings/breezeway and proposed non-compliant hydrant & sprinkler booster locations.
8.	E2.2	It is noted that a rationalised smoke hazard management system throughout the buildings may be considered.

5. CONCLUSION

This report contains an assessment of the referenced architectural documentation for the proposed warehouse/industrial development at 4-38 Talavera Road, Macquarie Park against the Deemed-to-Satisfy Provisions of the BCA 2019 Amendment 1. 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;

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

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
Automatic Fire Suppression Systems	BCA Spec. E1.5 & AS 2118.1-2017
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 Clause E4.4 & AS 2293.1 - 2018
Fire Control Centre	BCA Spec E1.8 Clauses 2-5
Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
Fire Hydrant Systems	BCA Clause E1.3 & AS 2419.1 – 2005
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
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
Required Exit Doors (power operated)	BCA Clause D2.19(d)
Stretcher Lifts	BCA Clause E3.2
Smoke Hazard Management Systems (Smoke Exhaust System)	BCA Part E2, Spec. E2.2b & AS/NZS 1668.1 - 2015
Warning & Operational signs	Section 183 of the EP & A Regulations 2000, AS 1905.1 - 2015, BCA Clause D2.23, E3.3

APPENDIX 1 – TYPE A CONSTRUCTION SPEC. C1.1 FRL REQUIREMENTS

Building Element	Class of building — FRL: (in minutes) *Structural adequacy/Integrity/Insulation*			
	2, 3 or 4 part	**5, 7a or 9**	**6**	**7b or 8**
EXTERNAL WALL (including any column and other building element incorporated 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:

1. *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.*
2. *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.*
3. *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)*

4. *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.*
5. *Lift shafts are required to be enclosed at the top of the shaft with fire rated construction having an FRL of 120/120/120.*
6. *Fire isolated exits are to be provided with a fire rated "lid" that achieves an FRL of 120/120/120.*
7. *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.*
8. *Any loadbearing internal walls or loadbearing fire walls are to be masonry or concrete.*
9. *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.*
10. *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*