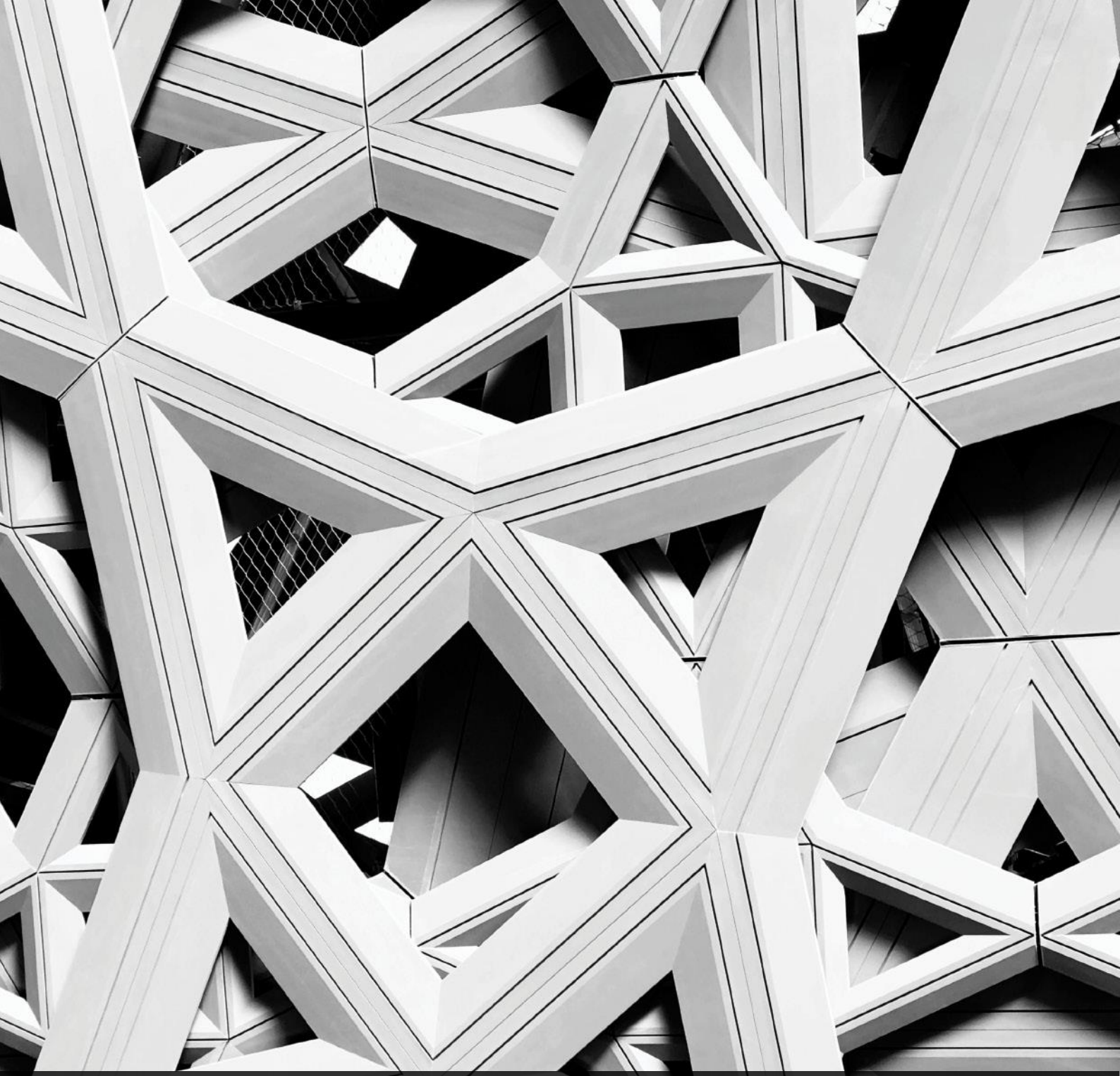


BCA Assessment Report

Proposed Multi-Level Warehouse Development
61 Milperra Road, Revesby

Prepared for:
Gateway Capital

Revision 1.1
03 April 2024
Reference: 230399

bmplusg.com.au

BCA Assessment Summary

The following comprises a summary of the key compliance issues identified under the assessment in this report that will be required to be addressed prior to the Construction Certificate application(s) for the project.

A. Matters requiring redesign or additional information at CC stage:

	+ BCA (DTS) Clause	+ Description
1.	**C2D10 / C2D14**	External Wall Disclosure Statement (Type A Construction) – Provide a copy of the External Wall Disclosure Statement with the CC Application, demonstrating that the external walls comprise only of non-combustible materials.
2.	**C3D11**	Provide confirmation from the Structural Engineer whether the proposed lift shafts are deemed as loadbearing or non-loadbearing to ensure the appropriate FRL is utilised.
3.	**C3D13 / C3D14**	Fire separation of equipment & electrical infrastructure – details demonstrating compliance are required to be provided at CC Application Stage.
4.	**D2D4**	Provide further details demonstrating compliance with the requirements of this clause, with respect to the fire isolated stairways.
5.	**D2D12**	Revised plans are to be provided demonstrating the required fire ratings to external walls where occupants are required to pass by them on the way to a road/open space, following discharge from a fire isolated stair.
6.	**D2D14**	Note: It is noted that each mezzanine level will have access to a fire isolated exit, thus, all non-fire-isolated stairways are not proposed to be used as exits as they do not discharge to a level where access to a road/open space is available.
7.	**D2D7, D2D8, D2D18 & F4D4**	The proposed population of the building is required to be confirmed by Gateway Capital to facilitate an assessment of the overall required egress widths and sanitary facility requirements.
8.	**D3D14 – D3D22**	Detailed plans of all stairways, balustrades and handrails within the proposed development must be provided for review.
9.	**D3D24/D3D25/ D3D26**	Details and certification demonstrating compliance are required to be provided at CC Application Stage for the proposed buildings.
10.	**Part D4**	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.
11.	**D4D3**	Further review is required prior to the issue of the relevant CC in relation to the accessible paths of travel between all tenancy entries & all car parking spaces. Details shall be provided illustrating the design around the principal pedestrian

		access to the main building. Relevant gradient and reference levels shall be provided.
12.	**E1D17/E2D21**	Provision of additional fire services & smoke hazard management requirements to address additional hazard resulting from any proposed storage/use.
13.	**Section J**	A separate report will be required from an Energy Efficiency consultant to outline the applicable requirements for the building.

B. Matters requiring fire safety engineered performance solutions:

+ BCA (DTS) Clause		+ Description
1.	**C3D5**	Non-compliant Perimeter Vehicular Access (PVA) – PVA deviates from the requirements set-out within clause C3D5.
2.	**C4D15**	Rationalisation of fire rating to service penetrations through 4-hour fire rated building elements.
3.	**D2D5 & D2D6**	It is understood that a Fire Engineered Performance Solution Report is proposed in relation to the egress distances in excess of the maximum permitted distance to an exit, and between alternative exits.
4.	**D2D12**	Justification of the below deviations from the DtS requirements of this clause: + Extended distance to open space & insufficient open perimeter, following discharge from the fire isolated exit serving WH1A, B, D & E. + Insufficient open perimeter, following discharge from fire isolated exits. + Rationalisation of fire ratings to external facades within 6m of external egress paths, following discharge from fire stairs. + Sout-western stair serving WH2A is accessed directly from WH2A, rather than a common area.
5.	**D3D5**	Rationalisation of separation between the rising and descending flights of the fire stair serving Warehouse 1C.
6.	**E1D2**	Design of fire hydrant systems per AS 2419.1-2021 Appendix C as the volume of each building is >108,000m^3. Justification of internal hydrants remote from exits. Justification of internal hydrants under awnings design as external hydrants.
7.	**E1D3**	Justification for the installation of 50m fire hose reels (in lieu of DtS 36m).
8.	**NSW E1D4, E1D12, E1D13**	It is understood the location of the sprinkler booster assemblies may be required to be addressed as a Performance Solution.
9.	**NSW E2D10 & E2D12/**	A Performance Solution may be prepared to justify rationalising the performance of the smoke exhaust system.

C. Other matters requiring performance solutions:

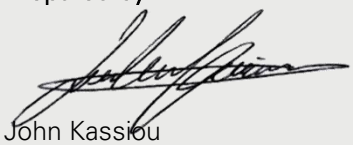
+ BCA (DTS) Clause		+ Description
1.	**F3P1**	A Performance Solution report is to be provided by the Architect / Façade Engineer to demonstrate how the external walls are designed to prevent the penetration of water into the building.

+ Contents

Report Status

Date	03.04.2024
Revision	1.1
Status	Preliminary Assessment – Minor Update
Author	John Kassiou
Reviewed	Jackson Boyd

Prepared by:



John Kassiou
Cadet Building Surveyor
bm+g

Reviewed by:

Jackson Boyd
Building Surveyor
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Revision History

Revision	0	**Date**	11.12.2023
Status	Preliminary Assessment – Report for Client & Consultant Review		
Revision	1	**Date**	19.02.2024
Status	Preliminary Assessment – Updated Following Client & Consultant Review		
Revision	1.1	**Date**	03.04.2024
Status	Preliminary Assessment – Minor Update		

1.0 Description of Project

1.1 Proposal

bm+g have been commissioned by Gateway Capital to undertake an assessment of the proposed Multi-Level Warehouse Development at 61 Milperra Road, Revesby against the relevant provisions of the Building Code of Australia 2022 (BCA). This report has been prepares to accompany a detailed State Significant Development Application (SSDA) for a two-storey warehouse and distribution centre development proposal at 61 Milperra Road, Sydney. The site is legally described as Lot 12 in Deposited Plan (DP) 734453.

1.2 Executive Summary

This BCA Assessment Report has been prepared by bm+g to accompany a detailed State Significant Development Application (SSDA) for a two-storey warehouse and distribution centre development proposal at 61 Milperra Road, Sydney. The site is legally described as Lot 12 in Deposited Plan (DP) 734453.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-63664708).

This report concludes that the proposed two-storey warehouse and distribution centre is suitable and warrants approval subject to the implementation of the following mitigation measures.

+ Finalisation of the design queries & requirements outlined in the BCA Assessment Summary section of this report, specifically section A, 'Matters requiring redesign or additional information at CC stage'.
+ Preparation of a Fire Engineering Performance Solution Report (Fire Engineering Report) addressing the relevant items outlined in the BCA Assessment Summary section of this report, specifically sub-section B, 'Matters requiring fire safety engineered performance solutions'.

  Alternatively, these issues may be addressed through design modifications, such that the proposal achieves compliance with the Deemed-to-Satisfy provisions of the BCA.
+ Preparation of a Performance Solution Report, by an appropriately qualified/experienced consultant, addressing the relevant items outlined in the BCA Assessment Summary section of this report, specifically sub-section C, 'Other matters requiring performance solutions'.

  Alternatively, these issues may be addressed through design modifications, such that the proposal achieves compliance with the Deemed-to-Satisfy provisions of the BCA.

Following the implementation of the above mitigation measures, the remaining impacts are appropriate.

1.3 Introduction

This report has been prepared to accompany an SSDA seeking consent for the construction and operation of a two-storey warehouse and distribution centre development at 61 Milperra Road, Revesby (SSD-63664708).

Specifically, development consent is sought for:

- Demolition of all existing structures and buildings on site.
- Removal of 63 trees on site.
- Site remediation works.
- Bulk earthworks including 'cut and fill' to level the site
- Design, construction and operation of a two-storey warehouse and distribution centre including:
  - Approximately 44,003m^2 of total GFA comprising:
    - 38,591m^2 of warehouse and distribution GFA;
    - 4,944m^2 GFA of ancillary office space; and
  - 468m^2 GFA of lobby space.
  - Maximum building height of RL 46 (24.2m height from proposed ground level)
  - Operation 24 hours per day seven days per week.
- Provision of internal vehicle access routes, two-level central breezeway and loading docks.
- New access driveways to Mons Street for truck and car access.
- Provision of 222 car parking spaces and 32 bicycle parking spaces in an at grade car park around the perimeter of the site. Provision of end of-of-trip facilities including showers, lockers and change rooms.
- Site landscaping works total approximately 3,657m^2 (or 7.26% of the site), including a 10m landscape setback to the Milperra Road frontage and a 3m landscape setback to Mons Street, and the following provisions:
  - 3,214m^2 or 6.4% of deep soil landscaping; and
  - 3,637 or 7.2% tree canopy coverage.
- Provision of building/business identification signage.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (**SEARs**) dated 25 October 2023 and issued for the SSDA (**SSD-63664708**). Specifically, this report has been prepared to respond to the SEARs requirement issued below.

Item	Description of Requirement
4	Built Form and Urban Design: + Explain and illustrate the proposed built form, including a detailed site and context analysis to justify the proposed site planning and design approach. + Demonstrate how the proposed built form (layout, height, bulk, scale, separation, setbacks, interface and articulation) addresses and responds to the context, site characteristics, streetscape and existing and future character of the locality. + Demonstrate how the building design will deliver a high-quality development, including consideration of façade design, articulation, materials, finishes, colours, any signage and integration of services. + Assess how the development complies with the relevant accessibility requirements.

1.4 The Site

The site for the purposes of this SSDA is a single allotment identified as 61 Milperra Road, Revesby and legally described as Lot 12 in Deposited Plan 734453. The site has an area of 5.03ha (or 50,339m2) and is identified in Error! Not a valid bookmark self-reference..

The site is located in the northern portion of Revesby, approximately 13km south of the Parramatta CBD and 19km south-west of the Sydney CBD. Bankstown Airport is located approximately 2.5km to the north-west. Specifically, the east-west runway of the Bankstown Airport is located approximately 1.5km to the north-west. The surrounding buildings are characterised by a mix of industrial uses to the north, east and west. Low-density residential areas are located to the south and adjoining the site to the north-east. The site has a primary frontage to Milperra Road which is a classified road.

The site is currently occupied by two detached single-storey warehouse building components used for steel manufacturing purposes. The secondary warehouse building runs along the northern boundary. The main warehouse building is surrounded by a ring road for large vehicle access and a large hardstand area is situated in the eastern portion of the site for storage of steel materials. A large hardstand area for car parking is within the front setback to Milperra Road with some lawn space. An ancillary administration building is located in the south-east corner of the site with a hardstand parking area for staff situated to the north.

Large canopy tree planting runs along the southern boundary of the site fronting Milperra Road. Other tree planting exists along the eastern property boundary with scattered tree planting throughout the site.

Figure 1 Aerial Photograph

Source: Urbis

1.5 Aim & Methodology

The aim & methodology of this report is to:

- Undertake an assessment of the proposed development against the deemed-to-satisfy provisions of the BCA.
- Identify matters that require plan amendments in order to achieve compliance with the BCA.
- Identify matters that are to be required to be addressed by Performance Solutions.
- Enable the certifying authority to satisfy its statutory obligations under Clause 19(1) of the Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021.

1.6 Assessment & Findings

The assessment & findings of this report are summarised in the 'BCA Assessment Summary' section of this report.

1.7 Cumulative Impact

The assessment within this report is predominantly limited to a BCA assessment of the proposed works, except for where the BCA requires consideration of the proposed development with respect to adjacent allotments. Where relevant, commentary has been provided within this report addressing such issues.

1.8 Project Team

The following BM+G team members have contributed to this Report:

- **Dean Goldsmith** – Report Review (Director) | Building Surveyor-Unrestricted
- **Jackson Boyd** – Team Leader | Building Surveyor
- **John Kassiou** – Cadet Building Surveyor

1.9 Referenced Documentation

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

- Building Code of Australia 2022 (BCA)
- The Guide to the Building Code of Australia 2019 Amendment 1
- The Guide to the Building Code of Australia 2022

  Note: At the time of writing of this report, the BCA 2022 Guide has been partially issued only.
- Architectural Plans prepared by Watson Young Architects Pty Ltd numbered:

+ Drawing No.	+ Revision	+ Date
DA01	A	15.03.2024
DA02	A	15.03.2024
DA03	A	15.03.2024
DA04	A	15.03.2024
DA05	A	15.03.2024
DA06	A	15.03.2024
DA07	A	15.03.2024
DA08	A	15.03.2024
DA09	A	15.03.2024
DA10	A	15.03.2024
DA11	A	15.03.2024
DA12	A	15.03.2024
DA13	A	15.03.2024
DA14	A	15.03.2024

+ Drawing No.	+ Revision	+ Date
DA15	A	15.03.2024
DA16	A	15.03.2024
DA17	A	15.03.2024
DA18	A	15.03.2024
DA19	A	15.03.2024
DA20	A	15.03.2024
DA21	A	15.03.2024
DA22	A	15.03.2024
DA23	A	15.03.2024
DA24	A	15.03.2024
DA25	A	15.03.2024
DA26	A	15.03.2024
DA27	A	15.03.2024
DA28	A	15.03.2024

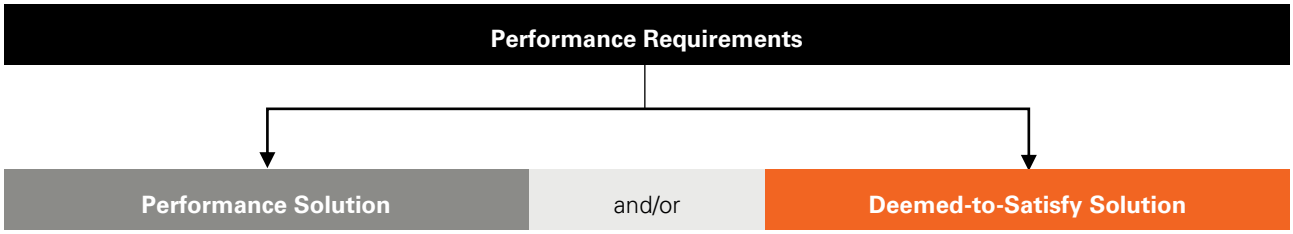
1.10 Regulatory Framework

- Pursuant to Section 19(1) of the Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 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.
- The assessment has been undertaken in accordance with Clause 24 and 25 of the Building and Development Certifiers Regulation 2020. bm+g are the proposed Registered Certifier and the advice provided in this Report is limited to whether submitted documentation complies with the Building Code of Australia or a legislative requirement.

1.11 Relevant Version of the NCC Building Code of Australia

Pursuant to Section 19 of the Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 the proposed building is subject to compliance with the relevant requirements of the BCA as in force at the day on which the application for the Construction Certificate is made. The current version of the BCA is BCA 2022, with the next revision of the BCA coming into effect 1 May 2025. As the Construction Certificate application will be lodged after 1 May 2023, this report assesses the design against compliance with the requirements of BCA 2022.

1.12 Compliance with the National Construction Code



Compliance with the NCC is achieved by complying with:

- the Governing Requirements of the NCC; and
- the Performance Requirements.

Performance Requirements are satisfied by one of the following, as shown in the Figure below:

- A Performance Solution.
- A Deemed-to-Satisfy Solution.
- A combination of the above two options.

1.13 Limitations and Exclusions

The limitations and exclusions of this report are as follows:

- This report is prepared in accordance with the Conflicts of Interest provisions of Part 4 of the Building and Development Certifiers Regulation 2020. bm+g confirm that this report is prepared specifically to address the requirements of Clause 25(5) and (9) of the Regulation with respect to the role of the Registered Certifier. This assessment report is not to be construed as extending any further into providing design advice, which would be contrary to the aims of this legislation.
- No assessment has been undertaken with respect to the Disability Discrimination Act 1992 (DDA). The building owner needs be satisfied that their obligations under the DDA have been addressed.
- Please note that whilst the BCA specifies a minimum standard of compliance with AS1428 (Parts 1-3) and Part D4 of the BCA for access and facilities for people with disabilities, compliance with such requirements may not necessarily preclude the possibility of a future complaint made under the DDA 1992. The DDA is a complaint based legislation and is presently

not identified by the State Building Codes and Regulations. In this regard the building owner should be satisfied that their obligations under the DDA have been addressed.

+ No assessment has been undertaken with respect to SEPP (Housing) 2021. It is understood that suitably qualified consultants will be engaged to determine the relevance of any Council planning requirements or SEPP requirements and provided detailed assessment reports where applicable.

  Where relevant to this development, it is assumed that these assessments will be undertaken by others.

+ This report does not consider BCA Part G5 (Volume 1) which makes provision for construction of buildings in bushfire-prone areas, therefore no assessment has been undertaken in consideration of RFS, Planning for Bushfire Protection and AS 3959. Where Part G is applicable to the site, then it is required that assessment / due diligence is undertaken by a specialist consultant to verify compliance.

+ This report does not constitute a detailed assessment of the architectural documentation against the requirements of Section J. It is understood that a suitably qualified consultant will be engaged to determine compliance in this regard.

+ bm+g has not undertaken an assessment of any Performance Solution Reports at the time of the preparation of this report.

+ The Report does not address matters in relation to the following Local Government Act and Regulations:
  - Work Health and Safety Act and Regulations.
  - Work Cover Authority requirements.
  - Water, drainage, gas, telecommunications and electricity supply authority requirements.
  - Disability Discrimination Act 1992.

+ bm+g cannot guarantee acceptance of this report by Local Council, Fire & Rescue NSW or other approval authorities.

+ No part of this document may be reproduced in any form or by any means without written permission from bm+g. This report is based solely on client instructions, and therefore should not be used by any third party without prior knowledge of such instructions.

1.14 Report Terminology

Building Code of Australia – 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 NSW under the provisions of the Environmental Planning & Assessment Act & Regulation.

Climatic Zone – Means an area defined in Figure 2 and in Table 2 (of BCA Schedule 3) for specific locations, having energy efficiency provisions based on a range of similar climatic characteristics.

Construction Certificate – Building Approval issued by the Certifying Authority pursuant to Part 6 of the EP&A Act 1979.

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 C2D2 and Specification 5, except as allowed for:

+ certain Class 2, 3 or 9c buildings in C2D6; and

+ a Class 4 part of a building located on the top storey in C2D4(2); and

+ open spectator stands and indoor sports stadiums in C2D8.

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

Deemed-to-Satisfy (DtS) Provisions of the BCA – Means the prescriptive provisions of the BCA which are deemed to satisfy the performance requirements.

Effective Height – The vertical distance between the floor of the lowest storey included in the calculation of rise in storeys and 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).

Exit – Any, or any combination of the following if they provide egress to a road or open space:

+ An internal or external stairway.
+ A ramp.
+ A fire-isolated passageway.
+ A doorway opening to a road or open space.

Fire Compartment – The total space of the building; or when referred to in

+ The Performance Requirements – any part of a building separated from the remainder by barriers to fire such as walls and/or floors having an appropriate resistance to the spread of fire with any openings adequately protected; or
+ The Deemed-to-Satisfy Provisions – any part of a building separated from the remainder by walls and/or floors each having an FRL not less than that required for a fire wall for that type of construction and where all openings in the separating construction are protected in accordance with the Deemed-to-Satisfy Provisions of the relevant part.

Fire Resistance Level (FRL) – The grading periods in minutes for the following criteria:

+ structural adequacy; and
+ integrity; and
+ insulation.

and expressed in that order.

Fire Source Feature (FSF) – The far boundary of a road adjoining 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 1 May 2011 by the Council of Australian Governments (COAG). The BCA Volume One (Class 2 to 9 Buildings) is now referenced as the National Construction Code Series Volume One — BCA.

Occupiable outdoor area means a space on a roof, balcony or similar part of a building:

+ that is open to the sky; and
+ to which access is provided, other than access only for maintenance; and
+ that is not open space or directly connected with open space.

Occupation Certificate (OC) – Building Occupation Approval issued by the Principal Certifying Authority pursuant to Part 6 of the EPA Act 1979.

Open Space – Means 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-Based Design Brief – Means the process and the associated report that defines the scope of work for the performance-based analysis, the technical basis for analysis, and the criteria for acceptance of any relevant Performance Solution as agreed by stakeholders.

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.

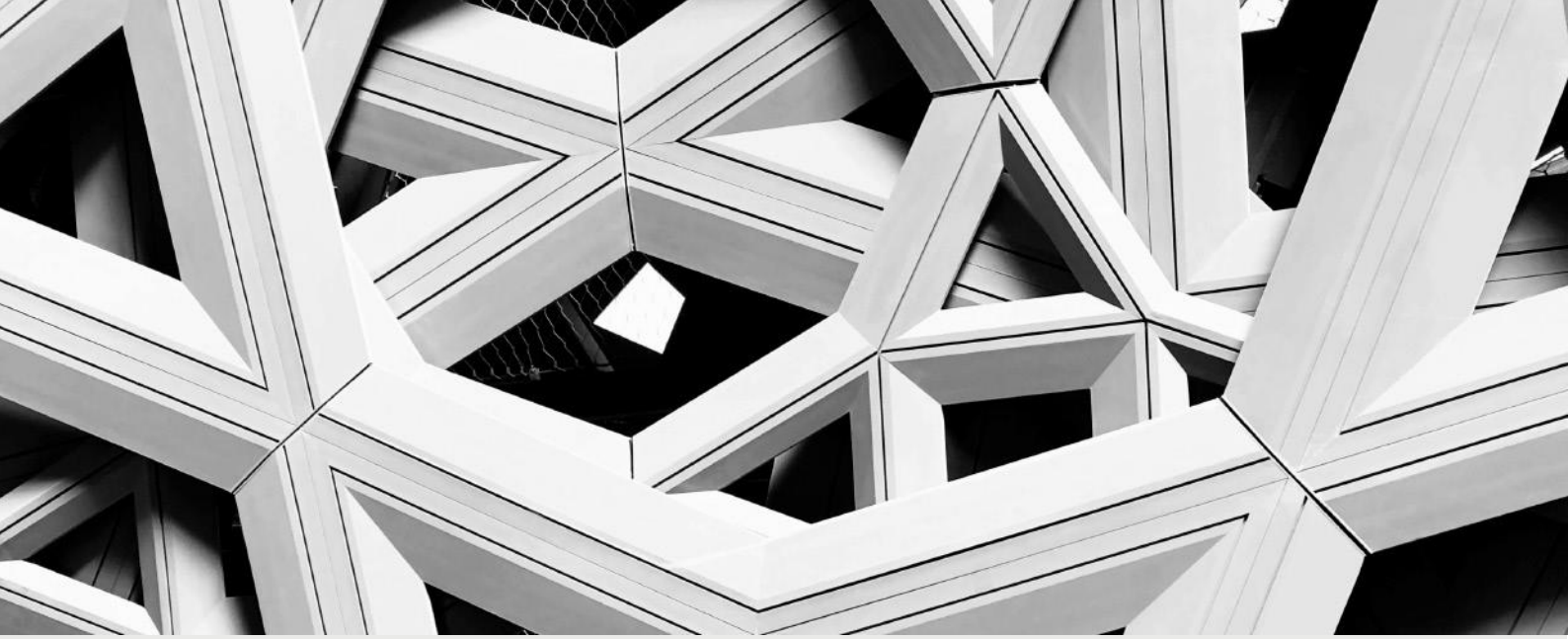
Compliance with the Performance Requirements can only be achieved by-

a. complying with the Deemed-to-Satisfy Provisions; or

b. formulating an Performance Solution which-
   - complies with the Performance Requirements; or
   - is shown to be at least equivalent to the Deemed-to-Satisfy Provisions; or

c. a combination of (a) and (b).

Performance Solution – Means a method of complying with the performance requirements other than by a Deemed-To-Satisfy Solution.



2.0 Building Characteristics

2.1 Proposed Development

The proposed development consists of relevant building classification items of the proposed Warehouse development.

The building is classified as follows:

BCA Classifications:	Class 5 (Office) Class 7a (Carpark) Class 7b (Warehouse) Class 10b (On-grade carparking, retaining walls & ancillary structures)
Rise in storeys:	Four (4)
Storeys Contained:	Four (4)
Type of Construction:	Type A Construction
Importance Level (Structural)	Importance Level 2 (TBC by Structural Engineer)
Sprinkler Protected Throughout	Yes (See comments under C3D4 & E1D4)
Effective Height	14.025m (RL35.025 – RL21.800)
Floor Area	Approx 74,100m^2 i.e. >18,000m^2
Volume	Approx 790,000m^3 i.e. >108,000m^3
Climate Zone	Zone 5

Note: *The proposed on-grade car parking attracts a Class 10b classification, to which the provisions of BCA Volume 1 do not apply, however, the area in which the car parking is covered is subject to the provisions of the BCA Volume 1.*

2.2 Fire Compartment Floor Area Limitations

Maximum size of fire compartment/atria is:

+ Classification		+ Type A	+ Type B	+ Type C
7	Max. floor area	5,000m^2	3,500m^2	2,000m^2
	Max. volume	30,000m^3	21,000m^3	12,000m^3
5	Max. floor area	8,000m^2	5,500m^2	3,000m^2
	Max. volume	48,000m^3	33,000m^3	18,000m^3

Note: The above fire compartmentation sizes do not apply to large isolated buildings.

2.3 Distance to Fire Source Features

Based upon a review of the plans, it is noted that each elevation of the building is located within the following distances from fire source features on the site.

+ Elevation	+ Fire Source Feature	+ Distance
North	Northern Allotment Boundary	>6m
East	Eastern Allotment Boundary	>6m
West	Western Allotment Boundary	>6m
South	Far Side of Milperra Road	>6m

Note: Fire Source Feature (FSF) – The far boundary of a road adjoining 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.

3.0 BCA Assessment

We note the following BCA compliance matters with relation to proposed building works are capable of complying with the BCA. Please note that this is not a full list of BCA clauses, they are the key requirements that relate to the proposed work and the below should be read in conjunction with the BCA.

3.1 Section B – Structure

Part B1

- New building works are to comply with the structural provisions of the BCA 2022 and the following referenced standards including:
  - AS 1170.0 – 2002 General Principles
  - AS 1170.1 – 2002, including certification for balustrades (dead and live loads)
  - AS 1170.2 – 2021, Wind loads
  - AS 1170.4 – 2007, Earthquake loads
  - AS 3700 – 2018, Masonry Structures
  - AS 3600 – 2018, Concrete Structures
  - AS 4100 – 1998, Steel Structures and/or
  - AS 4600 – 2018, Cold formed steel Structures
  - AS 2159 – 2009, Piling Design &Installation
  - AS 1720 – 2010, Design of Timber Structure
  - AS/NZS 1664.1 & 2 – 1997, Aluminium Structures
  - AS 2047 – 2014, Windows and External Glazed Doors in buildings
  - AS 1288 – 2006, Glass in buildings
  - AS 3660.1 – 2014, Termite control (or confirmation no primary building elements are timber).
- 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.
- In accordance with B1D3(a)(iv) a notional additional load of not less than 0.15kPa to support the addition of solar photovoltaic panels is to be applied to the roof structure.
- *The Importance Level provisions of BCA (Section B) are to be acknowledged by the Structural Engineer and addressed to the degree necessary.*

Comment: Structural design details and certification will be required at CC application stage

3.2 Section C – Fire Resistance

C2D2 & Spec 5

Type of Construction Required: The building is required to comply with the requirements of Type A Construction as stated within Specification 5. The table below provides an overview of the requirements of each. Refer to Table 4 of Appendix 1 for the FRL requirements of Type A Construction.

	Type A Construction: + Load-bearing external walls and columns must achieve an FRL regardless of distance from boundary / separate building. + Non load-bearing external walls (and columns incorporated within) need not achieve an FRL if >3m from a boundary or separate building. + Floors must achieve a 2-hour FRL. + Roof must be of non-combustible construction. + Internal columns on the floor immediately below the roof need not achieve an FRL. **Comment:** As the rise in storeys is four (4), Type A Construction applies to the proposed building – See notes within Appendix 1 below.
C2D3	**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. **Comment:** The proposed development has a rise in storeys of four (4).
C2D10 & C2D14	**Non-Combustible Building Elements:** All materials and or components incorporated in an external wall or fire-rated wall must be non-combustible. This includes but not limited to: + Any external wall claddings. + Any framing or integral formwork systems, e.g. timber framing, sacrificial formwork, etc. + Any external linings or trims, e.g. external UPVC window linings, timber window blades, etc. + Any sarking or insulation contained within the wall assembly. This is not an exhaustive list, and any element incorporated within any external wall assembly must be identified and approved prior to the issue of a Construction Certificate. Refer to Table 1 in Appendix 1 for the elements required to be non-combustible. **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 in accordance with this clause. **Comment**: The proposed development is of Type A Construction, therefore the external walls are required to be non-combustible. Design documentation is to be provided at CC stage.
C2D11 & Spec. 7	**Fire Hazard Properties:** A schedule of all wall, floor, and ceiling linings along with associated test reports are to be provided for review to ensure compliance with the fire hazard property requirements of the BCA. Noting: + Minimum Group Numbers apply to wall and ceiling linings. AS 5637 test reports must be provided to determine compliance. + Minimum Critical Radiant Flux values apply to floor linings. AS ISO 9239.1 test reports must be provided to determine compliance Refer to Table 2 and 3 in Appendix 1 below for the required fire hazard properties. **Comment**: Design certification required at CC application stage and installation certification (including relevant test reports confirming the critical radiant flux of floor linings and group number of wall and ceiling linings) required at OC stage.
C3D3	**General Floor Area and Volume Limitations:** The building is to achieve fire compartment sizes not in excess of the DtS requirements of this clause. **Comment**: The proposed building is a Class 7b Large Isolated Building and as such the provisions for maximum fire compartment size under Table C3D3 do not apply. Refer to comments under C3D4 & C3D5 below in relation to the Large Isolated Building provisions applicable to the proposed development.
C3D4	**Large Isolated Buildings:** A Large Isolated Building that contains Class 5, 6, 7, 8 or 9 parts, is required to be— + Protected throughout with a sprinkler system complying with Specification 17; and

+ Provided with a perimeter vehicular access complying with C3D5(2).

Comment: The proposed warehouses are required to be sprinkler protected and provided with a 6m wide perimeter vehicular accessway in accordance with Clause C3D5(2) throughout (see notes below).

Note 1: Any proposed gates are to achieve no less than 6m unobstructed width or the reduced width will need to be included in the above Performance Solution.

Note 2: The driveways providing vehicular perimeter access must be designed with adequate loading capacities, gradients and swept paths to accommodate a fire truck, having regard to the FRNSW Fire Safety Guideline – Access for Fire Brigade Vehicles and Firefighters.

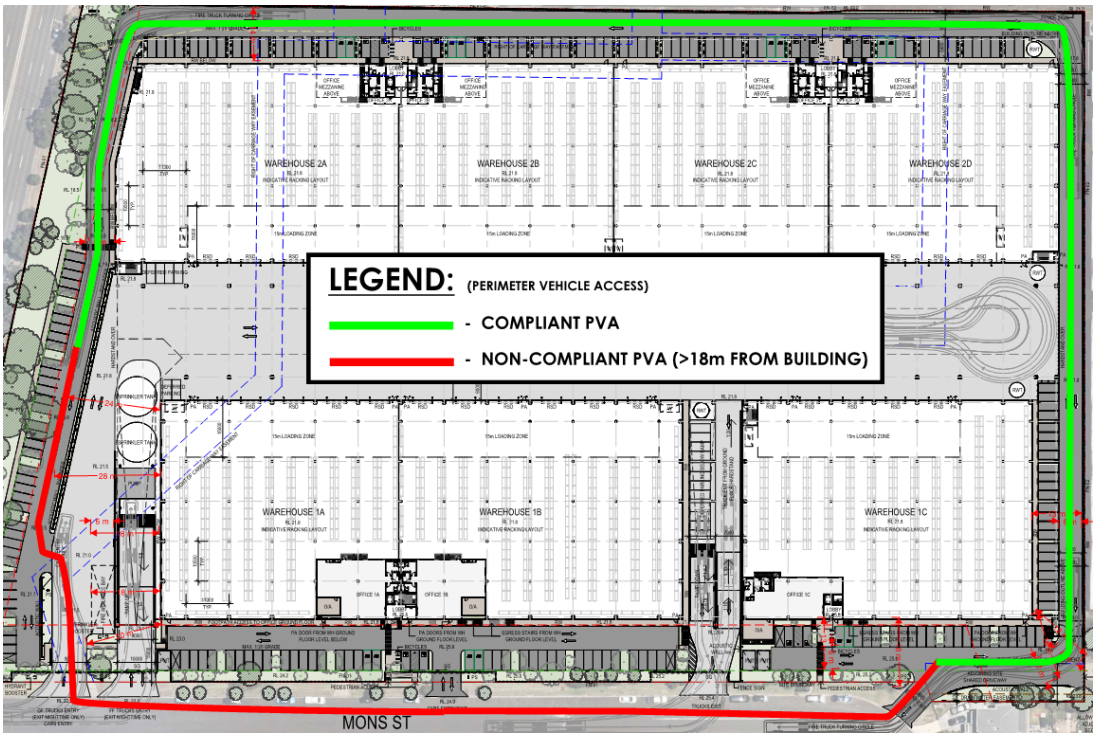
Note 3: The Fire Engineering assessment must take into consideration and detail the proposed security access to the site and how this may impact on FRNSW vehicular access.

C3D5

Requirements for Open Spaces and Vehicular Access: Open space and vehicular access required by C3D4 must comply with the requirements of sub-clauses (a) & (b) of this Part whereby they must be 6m wide within 18m of the external walls of the building and of a suitable bearing capacity and unobstructed height to permit the operation and passage of FRNSW vehicles.

Comment: The perimeter vehicular access around the proposed development deviates from the above requirements as follows:

+ Greater than 18m from the external walls in the eastern and southern areas.



C3D7

Vertical Separation of Openings in External Walls: 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 a fire-rated spandrel, or a horizontal fire-rated extension.

Comment: Spandrel protection is not required where sprinkler systems are provided. No action is required in this regard.

C3D8

Separation by Fire Walls: Separation of Fire Compartments must be constructed in accordance with the following:

+ FRL in accordance with Tables S5C11a – S5C11g of Spec. 5 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. **Comment:** No fire compartmentation walls have been proposed to separate compartments as the buildings proposed are large isolate buildings and do not require internal compartmentation. Refer to comments under cl. C3D13 & C3D14 regarding separation of equipment.
C3D9 & C3D10	**Separation of Classifications:** Separate classifications will either need to be separated by a fire wall achieving the higher FRL requirement between the two classes, or alternatively the higher FRL must apply to both areas subject to Spec 5. Note: Refer to C3D8 comments above in regards to structural elements crossing a fire wall at roof level. **Comment**: As it is understood that fire separation between the offices (Class 5), car park (Class 7a) and the warehouse (Class 7b) is not proposed, the more onerous FRL is required to be applied throughout, i.e. 4 hour FRLs will be generally required (refer to further commentary under Spec. 5 & Appendix 1 within this report).
C3D11	**Separation of Lift Shafts:** Lift shafts are required to achieve a FRL as they connect greater than 2 storeys. **Comment:** The lift shafts are required to be fire rated to 240/120/120 where loadbearing, or -/120/120 where non-loadbearing. The Structural Engineer is to confirm whether the lift shafts are deemed as loadbearing.
C3D12	**Stairways and Lifts in One Shaft:** A stairway and a lift must not be in the same shaft if either the stairway or the lift is required to be in a fire resisting shaft. **Comment:** Details demonstrating compliance are to be included in the CC Application plans.
C3D13	**Separation of Equipment:** Equipment as listed below must be separated from the remainder of the building with construction that achieves an FRL of 120/120/120 (or that required by Spec C1.1, whichever is greater) and doorways being self-closing -/120/30 fire doors: + Lift motors and lift control panels; or + Emergency generators used to sustain emergency equipment operating in emergency mode; or + Central smoke control plant; or + Boilers; or + A battery or battery system installed in the building that has a voltage of 12 volts or more and a storage capacity of 200kWh or more. Confirmation is required as to whether any of the above will be applicable to this development. **Comment:** To be noted by the Architect. Details demonstrating compliance are to be included in the CC Application plans.
C3D14	**Electricity Supply System:** An electricity substation, electrical conductors & main switchboards which sustain 'emergency equipment' operating in the emergency mode, 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 Electrical conductors which supply a substation or main switchboard sustaining emergency equipment operating in the emergency mode – + Have a classification in accordance with AS/NZS 3013 of not less than— o If located in a position that could be subject to damage by motor vehicles — WS53W; or o Otherwise — WS52W; or

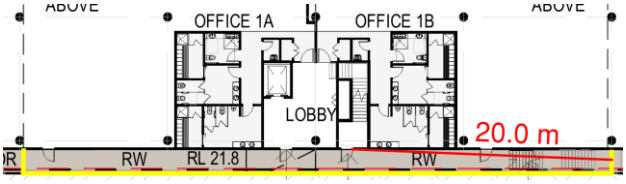
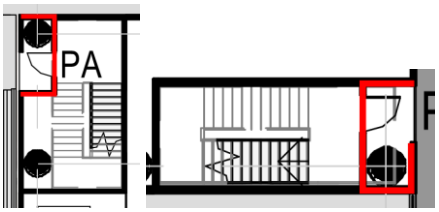
	+ Be enclosed or otherwise protected by construction having an FRL of not less than 120/120/120. Where emergency equipment is required in a building, all switchboards in the electrical installation, which sustain the electricity supply to the emergency equipment switchgear must be separated from the non-emergency equipment switchgear by metal partitions designed to minimise the spread of fault from the non-emergency equipment switchgear. **Note:** For the purpose of this clause, 'emergency equipment' includes (but is not limited to) fire pumps, air handling systems for smoke control, emergency lifts, control & indicating equipment, EWIS. **Comment:** To be noted by the Architect. Provide plans demonstrating compliance as part of the CC application package.
C4D3 & C4D5	**Protection of Openings in External Walls:** Openings that are less than 3m from the allotment boundary are required to be protected in accordance with BCA Clause C4D5. **Comment:** All fire-source-features are located greater than 6m from any point of the external walls. Therefore, this clause is not applicable to the proposed development.
C4D9	**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 C4D5 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. **Comment:** Fire Doors are required to be provided to each of the doorways leading into a Fire-Isolated Exit and must be protected by –/60/30 that are self or automatically closing.
C4D10	**Service Penetrations in Fire-isolated Exits:** Fire isolated exits must not be penetrated by any services other than electrical wiring as permitted by D3D8(6), ducting associated with a pressurisation system or water supply pipes for fire services. **Comment:** Services Consultant to note and ensure compliance with regards to restriction of services penetrating through fire isolated exits.
C4D11	**Openings in Fire-Isolated 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. **Comment:** To be noted by the Architect. Provide plans demonstrating compliance as part of the CC application package.
C4D13	**Openings in Floors and Ceilings for Services:** This clause applies to the floors and ceilings in buildings of Type A 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. **Comment:** Certification will be required at OC application stage. It is understood that no Fire Engineered Performance Solution is presently proposed to address the reduction of FRLs maintained by services penetrating 240 min. fire rated floors & ceilings.
C4D15	**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. 13. **Comment:** Penetrations through fire rated walls/floors/ceilings are to be protected in accordance with a tested system. It is understood that rationalisation of fire rating to service penetrations through 240 min. building elements is proposed via a Fire Engineered Performance Solution, due to the absence of particular tested systems for the protection of services through a 4 hour rated walls/floors/ceilings.
Spec. 5	Fire Resisting Construction: The new building works are required to comply with the requirements detailed under Specification 5. The below details the FRL requirements for

	building elements for each proposed warehouse. **Comment**: The proposed warehouse development will be subject to compliance with the Type A Construction provisions of tables S5C11a to S5C11g as summarised below: + All loadbearing external walls & loadbearing elements incorporated in or attached to an external wall are to achieve the required FRL per Table S5C11a. + All non-loadbearing parts of external walls are to achieve the required FRL per Table S4C11b. + All loadbearing external columns are to achieve the required FRL per Table S5C11c. + Any Fire Walls that are proposed to separate different classifications per C3D9 above are to achieve the required FRL per Table S5C11d for Class 7b. + Lift shafts are to achieve the required FRL per Table S5C11e (for loadbearing lift shafts) and S5C11f (for non-loadbearing lift shafts). + Fire stair shafts are to achieve the required FRL per Table S5C11e (for loadbearing fire stairs) and S5C11f (for non-loadbearing fire stairs). + Services shafts are to achieve the required FRL per Table S5C11e (for loadbearing service shafts) and S5C11f (for non-loadbearing service shafts). + All loadbearing internal columns, walls, beams and trusses throughout are to achieve the required FRL per Table S5C11/ S5C11f. + Floors are to achieve the required FRL per Table S5C11f and not less than the FRL of the classification with the highest FRLs in the storey below. + The roof is required to achieve the required FRL per Table S5C11g or the coverings are required to be non-combustible in accordance with Clause S5C15. + Where a part of the building required to have an FRL depends on direct vertical or lateral support from another part to maintain its FRL, that supporting part must achieve an FRL in accordance with Clause S5C3 of Spec. 5 and be non-combustible, unless one of the concessions in S5C3 (2) can be applied. Note: Any proposal to reduce the FRLs of building elements that are required to be fire rated must be addressed as a Performance Solution from the Fire Engineer, though it is understood that no such solution is proposed at this stage.
Spec. 7	**Fire Hazard Properties:** As noted above, this Specification sets out the requirements in relation to the fire hazard properties of linings, materials and assemblies in Class 2 to 9 buildings. Table S7C2 outlines the applicable requirements of Spec. 7 to the different types of Linings, Materials and Assemblies. Comment: Certification will be required to be provided at both CC and OC application stages.
Spec. 12	**Fire Doors, Smoke Doors, Fire Windows and Shutters:** Fire doors and smoke doors must comply with the requirements of this specification. Comment: To be noted by the Architect. Provide Plans demonstrating compliance as part of the CC application package.

3.3 Section D – Access and Egress

D2D3	**Number of Exits Required:** 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. **Comment:** A single exit is required from each storey/part of the subject building. The plans demonstrate compliance in this regard.
D2D4	**When Fire-Isolated Stairways and 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. **Comment:** The Fire isolated stairs serving the building connect more than 3 storeys (in a sprinkler protected building) and as such are required to be fire isolated. Details demonstrating compliance with the FRL requirements of this clause are to be provided at CC Application stage.
D2D5	**Exit Travel Distances:** This clause specifies the permitted travel distances allowable from Class 2 to Class 9 buildings. Sub-clauses (1) to (6) specify the maximum distances to be taken into account for the various uses in each Class of building. In a Class 5, 6, 7, 8 & 9 Buildings no point on a floor must be more than 20m for a single exit or to a point of choice to alternative exits; and no point on a floor must be more than 40m to an exit where 2 or more alternative exits are available for egress. **Comment:** The exit travel distances in each level of the proposed warehouses and associated offices are non-compliant with the requirements of this clause. Further design development will be required with respect to this issue, though it is understood a Fire Engineered Performance Solution is proposed to be prepared to rationalise these distances. The most excessive travel distances on each floor are as follows: <u>Ground Floor:</u> + Warehouse 1B – Up to 80m to an exit. + Hardstand – Up to 70m to an exit. <u>Ground Floor Mezzanine:</u> + Office 1A, 1B, 1C, 2A, 2B, 2C & 2D – Up to 30m to a single exit. <u>Level 1:</u> + Warehouse 2F – Up to 85m to an exit. + Hardstand – Up to 90m to an exit. <u>Level 1 Mezzanine:</u> + Office 2E, 2F, 2G & 2H – Up to 30m to a single exit.
D2D6	**Distance Between Alternative Exits:** Exits required as alternative exits must be – + Distributed as uniformly as practicable within or around the storey served and in positions where unobstructed access to at least 2 exits is readily available from all points on the floor including lift lobby areas; and + Not less than 9m apart; and + Not more than – 60m apart. + Located so that the alternative paths of travel do not converge such that they become less than 6m apart. **Comment:** The distances between alternative exits in the warehouse building are non-compliant with the requirements of this clause. Further design development will be required with respect to this issue, though it is understood a Fire Engineered Performance Solution is proposed to be prepared to rationalise these distances. The most excessive travel distances between alternative exits on each floor are as follows: <u>Ground Floor:</u> + Warehouse 1B – Up to 155m between alternate exits. + Hardstand – Up to 170m between alternate exits. <u>Level 1:</u> + Warehouse 2F – Up to 170m between alternate exits. + Hardstand – Up to 175m between alternate exits.
D2D7, D2D8, D2D9, D2D10 &	**Dimensions of Paths of Travel to an Exit:** The minimum clear height through all egress paths is required to be no less than 2m, and a minimum of 1m wide (this width dimension is measured clear of any obstructions such as handrails and joinery). Aggregate exit widths must be achieved which are driven by occupancy numbers of each floor.

D2D11	**Comment:** The provided plans indicate that compliance is readily achievable. Architect to note. Specific attention is drawn to the external passages adjacent external walls incorporating downpipes, roof access ladders and other permanent attachments to the façade, noting that these attachments mustn't impinge on the required egress width, nor interfere with compliance of the handrails or the like. Additionally, it is noted that provisions relating to widths through accessible paths of travel are applicable in accessible areas. Refer to commentary under Part D4 in this regard.
D2D12	**Travel via Fire Isolated Exits:** A fire isolated stairway is required to provide independent egress from each storey that it serves and discharge directly – + To a road open space; or + To a point – - In a storey or space, within the confines of the building, that is used only for pedestrian movement, car parking or the like and is open for at least 2/3 of its perimeter; and - From which an unimpeded path of travel, not further than 20m, is available to a road or open space External walls and openings exposed to the discharge path of a fire-isolated stairway (less than 6m, measured perpendicular to the path of travel) must be protected with a 1-hour fire-rating for external walls, and C4D5 for openings. **Comment:** Discharge from the fire stairs serving Warehouses 1A & 1B is into a covered area, that is less than 1/3 open, and the path of travel to open space is >6m (up to 20m). It is understood this is to be addressed via a Fire Engineered Performance Solution. Refer to the below excerpt identifying the egress paths in red, and the line of the building over in yellow.  The point of discharge for the fire stairs adjacent Warehouse 1C & 2D is not sufficiently open, i.e. <1/3 (refer to the below excerpt, identifying the enclosed perimeter in red). Revised plans demonstrating compliance are to be provided with the CC application. Alternatively, it is understood this issue may be addressed via a Fire Engineered Performance Solution.  Rationalisation of fire rating to external walls on at the point of discharge of fire isolated stairs identified below is understood to be proposed via a Fire Engineered Performance Solution, as the egress paths necessitate passing within 6m of the façade. 

The fire stair serving Warehouse 2A, located in the south-west corner, is accessed directly from WH2A, rather than from a common area, which does not achieve compliance with the requirements of this clause. It is understood this is to be rationalised via a Fire Engineered Performance Solution.

The fire stairs serving Warehouse 2A & 1B, accessed off the hardstand, also require fire rated walls protecting occupants following discharge at ground floor. Plans demonstrating compliance are to be provided with the CC application.

D2D14

Travel via Non-Fire-Isolated Required Stairways: A non-fire-isolated stairway or non-fire-isolated ramp serving as a required exit must provide a continuous means of travel by its own flights and landings from every storey served to the level at which egress to a road or open space is provided.

The distance from any point on the floor to a point of road or open space must not exceed 80m. The stair must discharge at a point not more than 20m to a point of road or open space, or from a fire-isolated passage, or 40m from one of two such points.

Comment: It is understood that the office mezzanine levels each have access to the fire isolated stairs & thus none of the non-fire isolated stairs are proposed to be used as egress stairs.

It is further noted that the non-fire isolated stairs providing access between the office mezzanines & Level 1 are not permitted to be used for egress as they do not provide access to a level where access to a road/open space is available.

D2D18

Number of Persons Accommodated: Clause D2D18 and Table D2D18 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.

Comment: We request that indicative population numbers be provided to inform the calculations as part of the BCA report (particularly regarding aggregate egress width & sanitary facilities). , based on the aggregate population numbers in accordance with the BCA, and allowing for 50% of warehouse use to be occupied by fit-out (i.e. racking), the proposed development have been calculated per table D2D18.

Warehouse 1			Warehouse 2		
Tenancy	Warehouse Area (Persons)	Office Area (Persons)	Tenancy	Warehouse Area (Persons)	Office Area (Persons)
1A	60	40	2A	65	40
1B	70	40	2B	50	40
1C	75	45	2C	50	40
1D	60	35	2D	55	40
1E	70	35	2E	70	35
1F	80	35	2F	55	40

D3D3

Fire-Isolated Stairways & Ramps: A stairway or ramp, including landings that are required to be within a fire-resisting shaft must be constructed of non-combustible materials to protect the structural integrity of the shaft.

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

D3D4

Non-Fire Isolated Stairways and Ramps: In a building with a rise in storeys of more than 2, required, non-fire-isolated stairways and ramps must be either constructed of

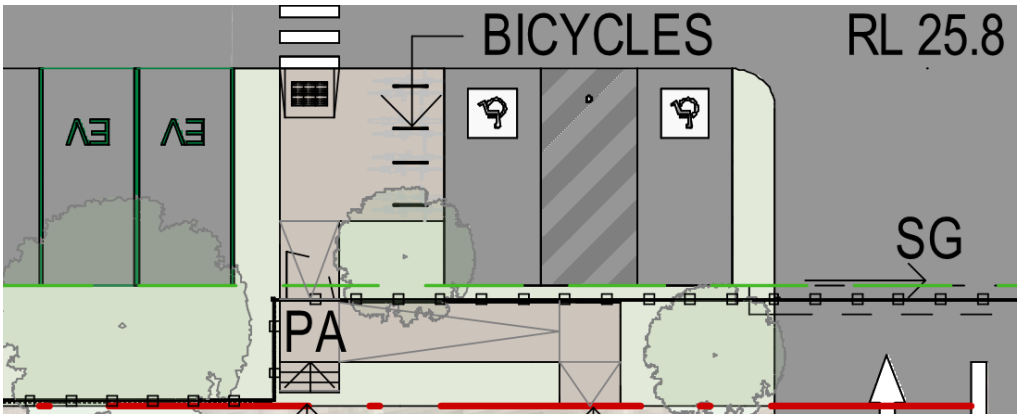
- Reinforced or prestressed concrete; or
- Steel at least 6mm thick at all points; or
- Timber that has a finished thickness of at least 44mm, has an average density of at least 800 kg/m3 at a moisture content of 12% and has not been joined by means of glue unless it has been laminated and glued with resorcinol/phenol formaldehyde; or
- Non-combustible materials, and such that if there is a structural failure it will not cause damage to or impair the fire-resistance of the shaft in which the stair is located.

Comment: The requirements of D3D4 will apply to any non-fire isolated exit stairs to be utilised as exits, though it is noted that the egress strategy outlined within this report does not rely on

	use of these stairs. Where the egress strategy requires use of these stair details demonstrating compliance with this clause will be required to be provided with the CC application.
D3D5	**Separation of Rising and Descending Stair Flights:** In a required fire-isolated stairway there must be no direct connection between – + A flight rising from a storey below the level of access to open space; and + A flight descending from a storey above that level. Any construction that separates or is common to the rising and descending flights must be non-combustible and smoke proof. **Comment:** Revised plans demonstrating compliance with the requirements of this clause are to be provided with the CC application, as it is noted that the rising and descending flights of the fire stair serving warehouse 1C are not presently provided with separating construction. Alternatively, the above may be addressed via a Fire Engineering Performance Solution.
D3D8	**Installations in Exits and 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 (1) to (6) prescribe 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. **Comment:** To be noted by the Architect. Provide plans demonstrating compliance as part of the CC application package.
D3D9	**Enclosure of Space under Stairs and Ramps:** The space below a required, non-fire isolated stairway/ramp must not be enclosed to form a cupboard or other enclosed space, unless the cupboard is bound by construction achieving an FRL of at least 60/60/60, with a self-closing -/60/30 door. **Comment:** To be noted by the Architect. Provide plans demonstrating compliance as part of the CC application package.
D3D14, D3D15, D3D16 & D3D22	**Stairways, Balustrades, and Handrails:** Stairways: + A stairway must have no more than 18, nor less than 2, risers in each flight. + Landings must be not less than 750mm in length. Balustrades: + All balustrades must achieve a minimum height of 1m above finished floor level. + Balustrades (except for fire-isolated stairs) must not permit a 125mm sphere to pass through any opening. + Balustrades in fire-isolated exits must comprise no gap larger than 150mm between nosing line (or landing) and bottom rail. Other openings in the balustrade must not exceed 460mm. If the fire-isolated exit also functions as a circulation stair, the 125mm gap requirement applies in lieu of these reduced provisions. Handrails: + Handrails must be located on both sides of all stairways and ramps except for fire-isolated stairs. Handrails must comply with AS 1428.1 as relevant. **Comment:** Details demonstrating compliance are required to be provided at CC Application Stage for the proposed buildings. Architect to note. On-site slip testing will be required at OC Application stage.
D3D17, D3D18, D3D19, D3D20 & D3D21	**Balustrades or Other Barriers:** These clauses detail 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. + Note: any wire barriers must be complaint with D3D21 and tables D3D21(a) to D3D21(c). **Comment:** Details demonstrating compliance are required to be provided at CC Application Stage for the proposed buildings.
D2D22	**Handrails:** This Clause sets out the requirements regarding the location, spacing and extent of handrails required to be installed in buildings. **Comment:** Details demonstrating compliance are required to be provided at CC Application Stage for the proposed buildings.
D2D23	**Fixed Platforms, Walkways, Stairways and Ladders:** A fixed platform, walkway, stairway, ladder, any going and riser, landing, handrail or barrier attached thereto may comply with AS 1657 if it only serves a machinery room, boiler house, lift-machine rooms, plant rooms or the like. **Comments:** Details demonstrating compliance are required to be provided at CC Application Stage for the proposed buildings.
D3D24	**Doorways and Doors:** This clause applies to all doorways that form an exit 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 an exit door is 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; and it must open automatically if there is a power failure to the door and upon the activation of a fire or smoke alarm anywhere in the fire compartment served by the door. **Comment:** Details demonstrating compliance are required to be provided at CC Application Stage for the proposed buildings.
D3D25, D3D26	**Doors and Latching:** All egress doorways must swing in the direction of egress and must be readily openable without a key from the side that faces a person seeking egress, by a single handed downward or pushing action on a single device which is located between 900mm and 1100mm from the floor. **Comment:** Details demonstrating compliance are required to be provided at CC Application Stage for the proposed buildings. The provided plans demonstrate compliance with this clause is readily achievable.
D4D2 & D4D3	**General Building Access Requirements:** The extent of access required depends on the classification of the building. Buildings and parts of building must be accessible as set out in sub-clauses (1)-(10) unless exempted by Clause D4D5. Access is required to and within all areas normally used by the occupants, for Class 5, 6, 7b & 9b buildings and any levels in a Class 7a building containing accessible carparking spaces. **Comment:** Compliant access is required from the allotment boundary to the main entry of each tenancy in the building, from accessible parking spaces in the building and throughout all areas in accordance with AS 1428.1-2009. Refer to further commentary under cl. D4D4 and D4D5 below. + A detailed review is required to be undertaken by the in relation to the accessible path of travel for non-ambulant persons between tenancies. Similarly and all tenancies are required to be provided with an accessible path of travel from all accessible car parking spaces. Compliance with this requirement is to be achieved also.

- Details are to be provided to illustrate the gradient of this ramp and the details relating to handrails and tactiles (if required).



D4D4

Parts of the Building to be Accessible: This clause specifies the requirements for accessways within buildings which must be accessible. In accordance with Clause D4D4; ramps & stairways must comply with Clause 10 & 11 of AS 1428.1-2009 (respectively), whilst fire isolated stairs must comply with Clauses 11.1(f) & (g) of AS 1428.1-2009 only. In addition, any storey with a floor area more than 200m² must be served by a passenger lift that is designed to comply with Part E4, and all accessways must include passing & turning spaces per AS 1428.1-2009.

Clause D4D4(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.

Comment: The following is a summary of key matters to be considered with respect to the above:

- An accessible path of travel complying with AS 1428.1 2009 is to be provided from the allotment boundary and from the accessible car spaces and is to be detailed on the Construction Certificate plans. Where a kerb is proposed, a kerb ramp is to be provided so the accessible path is free from steps.
- Every ramp, except a fire-isolated ramp, must comply with clause 10 in AS 1428.1-2009.
- Every stairway, except a fire-isolated stairway, must comply with clause 11 of AS 1428.1-2009.
- Every fire-isolated stairway must comply with clause 11.1(f) and (g) of AS 1428.1-2009.
- Every passenger lift must comply with clause E3D7 and E3D8.
- Accessways must have passing spaces complying with AS1428.1-2009 at a maximum 20m intervals on those parts of the accessway where a direct line of sight is not available and turning spaces complying with AS1428.1-2009 within 2m of the end of accessways and at a maximum 20m intervals along the accessway.
- Clause D4D4(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.
- The minimum width of an accessible doorway must have a clear opening width of not less than 850mm in accordance with AS 1428.1.
- 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.
- Circulation space to the doorways that are required to be accessible are to comply with Section 13 of AS1428.1-2009, as detailed below.
- 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 AS 1428.1, except if they serve the areas in the building that a D4D5 Exemption has been applied to. Details will need to be confirmed on the plans for CC. + Stairs shall have opaque risers (i.e. solid). + Stair nosings shall comply with Figure 27 in AS 1428.1-2009, 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 AS 1428.4.1, except if they are within a fire isolated exit. Handrails + Handrails shall be installed along stairways as follows: o Shall be continuous through the flight and where practicable, around landings and have no obstruction on or above up to a height of 600mm, o Installed along both sides of the stairway (giving consideration also to 1m unobstructed width) o Shall have a compliant hand clearance in accordance with Figure 29 of AS 1428.1-2009.
D4D5	**Exemptions:** This clause 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/use or the tasks undertaken. **Comment:** Consideration to an exemption to the Warehouse areas may be appropriate on this project. Confirmation from Gateway Capital/the tenant will be required at the CC Application stage that includes; a request for concession; the extent of the concession; and the rationale as to why it would be inappropriate for access for people with disabilities.
D4D6	**Accessible Parking:** This clause provides details of the number of accessible carparking spaces required in a carpark depending on the classification of the building. **Comment:** In the case of Class 5, 7a & 7b buildings 1 compliant accessible space is required for every 100 parking spaces or part thereof. In this regard, we note that twelve (12) accessible parking spaces are proposed on the site, thus demonstrating compliance with the number of car parking facilities required by this clause.
D4D7	**Signage:** Braille and tactile signage must be provided to required accessible sanitary facilities, spaces with hearing augmentation, ambulant sanitary facilities, pedestrian entrances that are not accessible, and to each door required by Clause E4D5 to be provided with an exit sign. The latter is to state "EXIT" and state the level e.g. "LEVEL 1". **Comment:** Signage will be required to identify exits, accessible facilities, an ambulant accessible facility and the paths to accessible pedestrian entries (where required).
D4D9	**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 D4D5. **Comment:** Subject to D4D5 above, stairways and ramps serving the building, any overhead projections 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 Indicators in accordance with AS1428.4. Details and design certification demonstrating compliance will be required to be included in the CC plans
D4D12	**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. **Comment:** Architect to note, details and design certification demonstrating compliance will be required to be included in the CC plans.

D4D13	**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. **Comment:** Architect to note, details and design certification demonstrating compliance will be required to be included in the CC plans.

3.4 Section E – Services and Equipment

E1D2	**Fire Hydrants:** + E1D2(1) – 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. + E1D2(2) – Requires that the fire hydrant system must be installed in accordance with the provisions of AS2419.1-2021 and details where internal hydrants must be located. + E1D2(3) – details concessions to AS 2419.1-2021 compliance associated with Class 8 Electricity Network Substations, and Hydrant Booster assembly locations where buildings are sprinkler protected. + E1D2(4) – states that internal fire hydrants must serve the level in which they are installed. **Comment:** The building must be served by a compliant hydrant system which is designed in accordance with AS 2419.1-2021 Appendix C, i.e. via a Fire Engineered Performance Solution, as the building exceeds 108,000m³ in volume. A Fire Engineered Performance Solution will be required to justify the provision of fire hydrants remote from exits (i.e. >4m), pursuant to the requirements of AS 2419.1-2021. Consideration may be given to the rationalisation of the size of the hydrant & sprinkler block plans via a Fire Engineered Performance Solution, noting that the requirements of AS 2419.1-2021 specify the maximum scale of block plans at 1:250. It is noted that roofed areas are not permitted to be provided with external-style fire hydrants, based on the provisions of AS 2419.1-2021 – internal hydrants are required in such cases where the car parks are roofed. Use of external hydrants in such cases would require justification via a Fire Engineered Performance Solution. Consideration is also to be given to the requirement for Fire Hydrants to be situated no less than 10m from electric vehicle charging stations (including car parking spaces that are proposed to be provided with EV charging stations in future). Detailed plans showing the location of the hydrants (and booster assembly) providing coverage to all areas of the building and a design Performance Solution is to be provided with the CC Application. Any deviations from the requirements of AS 2419.1 proposed by the fire services designer are required to be itemised for BM+G & the Fire Engineer to review.
E1D3	**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. **Comment:** The Class 7a (Car Parking) & 7b (Warehouse) areas are required to be provided with fire hose reels in accordance with this clause. Plans shall be provided with the construction certificate documentation together with a design certificate to AS 2441-2005 that details the coverage provided by the fire hose reels. BM+G are to be advised where a Fire Engineered Performance Solution is proposed to justify omission of fire hose reels to these spaces. Where fire hose reels are proposed to be provided that incorporate a 50m hose length (in lieu of 36m), a Fire Engineered Performance Solution will be required. The Class 5 (Office) areas are subject to a concession under cl. E1D3(1) and thus are not required to be provided with fire hose reel coverage.

NSW E1D4, E1D12, & E1D13	**Sprinklers:** A sprinkler system must be installed in a building or part of a building when required by Clauses E1D5 to E1D13 and comply with Specification 17 or 18. Specification 17 sets out requirements for the design and installation of sprinkler systems in Class 2-9 Buildings, and details the required design standards, including AS 2118.1-2017 and AS 2118.6-2012. **Comment:** As the building is designated as a Large Isolated Building, it is required to be sprinkler protected throughout. Details demonstrating compliance are required to be submitted with the CC application. In accordance with Clause 4.14.1 of AS 2118.1-2017, sprinkler boosters are required to comply with the requirements of AS 2419.1-2021 for a hydrant booster. Details demonstrating compliance are to be provided with the CC application. It is understood that the sprinkler booster is proposed to be situated remote from the building, though will not be adjacent the site boundary, nor within sight of the main building entry. This is proposed to be addressed via a Fire Engineered Performance Solution.
E1D14	**Portable Fire Extinguishers:** To be provided and designed in accordance with Sections 1, 2 and 3 of AS 2444-2001. **Comment:** PFEs to be provided throughout the proposed development, as appropriate to the classes of fire risk.
E1D15	**Fire Control Centre:** A fire control centre is to be provided based on the total building floor area comprising more than 18,000m^2. A fire control centre must: + Be located in a building so that egress from any part of its floor to a public road or open space does not involve changes in level which in aggregate exceed 300mm. + Provide an area from which fire-fighting operations or other emergency procedures can be controlled. Must not be used for any other purpose. **Comment:** As the total floor area of the building exceeds 18,000m^2 it is required to be provided with a Fire Control Centre that complies with Spec 19 (Clauses S19C2 – S19C5). Further details which demonstrate compliance will be required to be included on the plans submitted with the CC Application.
E1D17	**Provisions for Special Hazards:** Suitable additional provisions must be made for fire-fighting if unique problems could arise due to; + The nature or quantity of materials stored, displayed or used in a building on the allotment; or + The location of the building in relation to a water supply for firefighting purposed. **Comment:** It is noted that if Hazardous/Dangerous Goods are proposed to be stored/utilised in significant quantities, details will be required from both the fire services designer and the Fire Engineer confirming that the proposed fire services achieve the required capability to address the additional hazard resulting from the Hazardous/Dangerous Goods storage in the buildings. The use of each tenancy remains unknown at the time of writing of this report. In this regard, no consideration has been given to additional fire services to account for special hazards.
E2D3	**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 E2D4, 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 20, 21, & 22.
E2D9, NSW E2D10 & E2D12	**Smoke Hazard Management:** The following smoke hazard management systems are to be installed to the building and will be required throughout: + An Automatic Fire Detection and Alarm System and Building Occupant Warning System complying with AS 1670.1 – 2018 and Specification 20.

	+ An automatic smoke exhaust system in accordance with Specification 21 + Automatic shut-down of mechanical air handling systems upon fire trip in accordance with Section 5 and 6 of AS 1668.1. **Comment:** As the floor area of the warehouses exceeds 18,000m^2/108,000m^3 an automatic smoke exhaust system (incorporating a smoke detection system) is required to be provided, complying with Spec. 21. Consideration to a Performance Solution addressing the required smoke hazard management systems may be given. Such a Performance Solution would need to be prepared by the Fire Engineer, to demonstrate compliance with Performance Requirement E2P2. Where the car park is provided with mechanical ventilation complying with AS 1668.2, compliance with cl. 5.5 of AS 1668.1 is required.
E2D21	**Provisions for Special Hazards:** Additional smoke hazard management measures may be necessary due to the— + Special characteristics of the building; or + Special function or use of the building; or + Special type or quantity of material stored, displayed or used in a building; or + Special mix of classifications within a building or fire compartment, which are not addressed in E2D4 to E2D20. **Comment:** It is noted that if Hazardous/Dangerous Goods are proposed to be stored/utilised in significant quantities, details will be required from both the mechanical system designer and the Fire Engineer confirming that the proposed smoke hazard management systems achieve the required capability to address the additional hazard resulting from the Hazardous/Dangerous Goods storage in the buildings. The use of each tenancy remains unknown at the time of writing of this report. In this regard, no consideration has been given to additional fire services to account for special hazards.
E3D3	**Stretcher Facilities in Lifts:** Stretcher facilities, complying with this clause, must be provided in lifts in at least one emergency lift as required by E3D5 or in building where lifts serve any 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. **Comment:** 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.
E3D4	**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 E3D4. **Comment:** Applies to the proposed lift in the building - Lift Contractor to note.
E3D6	**Landings:** Access and egress to and from lift well landings must comply with the Deemed-to-Satisfy Provisions of Parts D2 & D3. **Comment:** Design certification from the lift supplier shall be provided with the documentation submitted with the Construction Certificate application.
E3D7	**Passenger Lift Types and Their Limitations:** In an accessible building, every passenger lift must be one of the types identified in sub-clause (1) and not rely on a constant pressure device for its operation if the lift car is fully enclosed. **Comment:** Design certification from the lift supplier shall be provided with the documentation submitted with the Construction Certificate application.
E3D9, E3D11 & E3D12	**Fire Service Controls and Recall Switches:** These clauses set out requirements for fire service control and recall switches for lifts serving storeys above an effective height of 12m. **Comment:** To be noted by the lift designer/installer.

E4D2 – E4D8	**Emergency Lighting and Exits Signs:** Emergency lighting and exit signage to be provided in accordance with E4D2 - E4D5 complying with AS 2293.1 – 2018. **Comment:** Emergency Lighting is required throughout the building in accordance with E4D2, E4D4 and AS/NZS 2293.1-2018.
E4D4	**Design & Operation of Emergency Lighting:** Every required emergency lighting system must comply with AS 2293.1-2018. **Comment:** Electrical Consultant to note. It is noted that compliant emergency lighting is unlikely to be provided in the automated portions of the warehouse and as such the lack of emergency lighting to these areas are to be addressed as a Performance Solution by the Fire Engineer to demonstrate compliance with Performance Requirement E4P1.
E4D5	**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. **Comment:** Electrical Consultant to note. Details demonstrating compliance will be required to be included in the CC plans.
E4D6	**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. **Comment:** Electrical Consultant to note. Details demonstrating compliance will be required to be included in the CC plans.

3.5 Section F – Health and Amenity

F1D3	**Stormwater Drainage:** A roof balcony, podium or similar must have a system of stormwater drainage and the structural substrate must be graded with a minimum fall of 1:80 to a drainage outlet. **Comment:** Details of stormwater disposal are required to be prepared by a suitably qualified consultant and submitted with documentation for the CC.
F1D4	**Exposed Joints:** Exposed joints in the drainage surface on a roof, balcony, podium or similar horizontal surface part of a building must— + Be protected in accordance with Section 2.9 of AS 4654.2; and + Not be located beneath or run through a planter box, water feature or similar part of the building **Comment:** Details of compliance with the above are to be prepared by a suitably qualified consultant and submitted with documentation for the CC.
F1D5	**External Waterproofing Membranes:** External waterproofing membranes are required to comply with AS 4654.1 & 2. **Comment:** Waterproofing sub-contractor(s) to note. Certification will be required at OC stage.
F1D6	**Damp-Proofing:** + This sub-clause requires that moisture from the ground must be prevented from reaching certain parts of buildings as listed. + This sub-clause requires that all damp-proofing materials and termite shields used as damp-proofing must comply with AS/NZS 2904 and AS 3660.1. + This sub-clause lists the buildings and parts of a building that do not need to comply with (a). **Comment:** Waterproofing sub-contractor(s) to note. Certification will be required at OC stage.
F1D7	**Damp Proofing of Floors on the Ground:** If the floor of a room is laid on the ground or on fill,

	moisture from the ground must be prevented from reaching the upper surface of the floor and adjacent walls by the insertion of a vapour barrier in accordance with AS 2870. Damp-proofing need not be provided if weatherproofing is not required or the floor is the base of a stair, lift or similar shaft which is adequately drained by gravitation or mechanical means. **Comment:** Waterproofing sub-contractor(s) to note. Certification will be required at OC stage.
F2D3 & F2D4	**Wet Area Construction:** These clauses set out the construction requirements for wet areas in Class 2-9 Building, in relation to floor and wall materials, surface grading, floor wastes and drainage. **Comment:** Waterproofing sub-contractor(s) to note. Certification will be required at OC stage.
F2D4	**Floor Wastes:** Where a floor waste is provided, the fall of the floor plane to the floor waste is required to be between 1:80–1:50. **Comment:** Hydraulic Engineer to note. Design details & certification will be required with the CC application.
F3D2	**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) to (g) which identifies the types of materials that may be used and the adopted Australian Standards that apply to their quality and installation. **Comment:** Structural Engineer & roofing sub-contractor to note. Certification will be required at CC & OC stage.
F3D3	**Sarking:** Sarking-type materials used for weatherproofing of roofs must comply with AS/NZS 4200 parts 1 and 2 **Comment:** Façade installer to note. Certification will be required at OC stage.
F3D4	**Glazed Assemblies:** Glazed assemblies in an external wall must comply with AS2047 requirements for resistance to water penetration for windows, sliding doors with a frame, adjustable louvres, shop fronts and windows with one-piece framing **Comment:** Glazing sub-contractors to note. Certification will be required at OC stage.
F3D5	**Wall Cladding:** The following wall cladding materials are deemed to satisfy Performance Requirement F3P1: + Masonry, including masonry veneer, unreinforced and reinforced masonry, complying with AS 3700, + Autoclaved aerated concrete, complying with AS 5146.3, + Metal wall cladding, complying with AS 1562.1. **Comment:** Refer to comments under Performance Requirement F3P1, below.
F3P1 & F3D5	**Performance Requirement F3P1:** A roof and external wall (including openings around windows and doors) must prevent the penetration of water that could cause + Unhealthy or dangerous conditions, or loss of amenity for occupants; and + Undue dampness or deterioration of building elements. Note 1: There are limited Deemed-to-Satisfy provisions for this Performance Requirement in respect to External Walls. DtS wall types include; masonry; autoclaved aerated concrete; and metal wall cladding only. Note 2: Refer to Clause F3D2 for roof coverings. **Comment:** A Performance Solution Report will be required to address the above, noting that the proposed design does not comprise of wholly DtS materials.
F4D3	**Calculation of Number of Occupants and Facilities:** This clause sets out the requirements for the calculation of the number of occupants and the number of sanitary facilities required to be installed in Class 2 to 9 buildings. The parameters for the calculation are set out in sub-clauses (a) to (d). **Comment:** BM+G request that occupant numbers be provided that will be reflective of the

maximum occupancy envisaged in each building. Alternatively, BM+G can provide generic population calculations, based off the m^2 rates provided in the BCA.

F4D4

Facilities in Class 3 to 9 Buildings: This clause provides the requirements for sanitary facilities to be installed in Class 3-9 buildings in accordance with Tables F4D4a – F4D4l. The requirements and variations are set out in sub-clauses (1)-(11).

Comment: As indicated in D2D18, population numbers are to be given for an accurate assessment per Table D2D18 and will be used to assess the required toilet facilities within the building to achieve compliance with Table F4D4. However, based on the aggregate population numbers in accordance with the BCA, and allowing for 50% of warehouse use to be occupied by fit-out (i.e. racking), the proposed development have been calculated as per Tables F4D4a and F4D4b and are as follows.

Warehouse 1 (Including Offices)

Occupancy Class as per F4D4 (Employees)

Tenancy		Closet Pans		Urinals		Washbasins		Complies
		Required	Proposed	Required	Proposed	Required	Proposed	Yes/No
1A	Male	3	6	2	3	3	6	Yes
	Female	4	6	--	--	3	6	Yes
1B	Male	3	6	3	3	3	6	Yes
	Female	4	6	--	--	3	6	Yes
1C	Male	3	6	3	3	3	6	Yes
	Female	3	6	--	--	3	6	Yes
1D	Male	3	6	2	4	3	6	Yes
	Female	4	6	--	--	3	6	Yes
1E	Male	3	6	3	4	3	6	Yes
	Female	4	6	--	--	3	6	Yes
1F	Male	3	6	3	4	3	6	Yes
	Female	3	6	--	--	3	6	Yes

Warehouse 2 (Including Offices)

Occupancy Class as per F4D4 (Employees)

Tenancy		Closet Pans		Urinals		Washbasins		Complies
		Required	Proposed	Required	Proposed	Required	Proposed	Yes/No
2A	Male	3	6	3	3	3	6	Yes
	Female	4	6	--	--	3	6	Yes
2B	Male	3	6	2	3	3	6	Yes
	Female	4	6	--	--	3	6	Yes
2C	Male	3	6	2	3	3	6	Yes
	Female	4	6	--	--	3	6	Yes
2D	Male	3	6	2	3	3	6	Yes
	Female	4	6	--	--	3	6	Yes
2E	Male	3	6	3	4	3	6	Yes
	Female	4	6	--	--	3	6	Yes
2F	Male	3	6	2	4	3	6	Yes
	Female	4	6	--	--	3	6	Yes
2G	Male	3	6	2	4	3	6	Yes
	Female	4	6	--	--	3	6	Yes
2H	Male	3	6	3	4	3	6	Yes
	Female	4	6	--	--	3	6	Yes

Note 3: As mentioned under D2D18 above, these population numbers may be considered excessive for the development and hence more accurate population numbers may be provided by the tenant.

F4D5

Accessible Sanitary Facilities: Accessible unisex sanitary compartments must be provided, in accordance with F4D6 and unisex showers must be provided in accordance with Table F4D7, 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: Accessible unisex sanitary compartments are required at each bank of toilets where one or more toilets is provided. In addition to an accessible unisex sanitary compartment at that bank of toilets, an ambulant sanitary facility is required to be provided for use by male and female persons per AS 1428.1-2009. Where multiple banks of toilets are provided on a storey, at

	least 50% of the banks must comply with the above. Additionally, at least 1 accessible unisex sanitary compartment must be provided on every storey containing sanitary compartments, including Level 1 & 2. Design certification is to be provided at CC application stage demonstrating that the design of each facility complies with AS 1428.1-2009, however, it is considered compliance is readily achievable based on the current design.
F4D8	**Construction of Sanitary Compartments:** Other than in an early childhood centre, sanitary compartments must have doors and partitions that separate adjacent compartments and extend: + From floor level to the ceiling in the case of a unisex facility; or + A height of not less than 1.5m above the floor if primary school children are the principal users; or + 1.8m above the floor in all other cases. The door to a fully enclosed sanitary compartment must open outwards; or slide: or be readily removable from the outside of the sanitary compartment, unless there is a clear space of at least 1.2m, measured in accordance with Figure F4D8 between the closet pan within the sanitary compartment and the doorway. **Comment:** Details to be provided at CC application stage confirming compliance with the above requirements.
F5D2	**Height of Rooms and Other Spaces:** The ceiling heights in Class 2 to 9 buildings must not be less than required in sub-clauses (1) to (8) of this clause. The minimum ceiling heights for a Class 5, 6 & 7 building are as follows: + Corridor or Passage, Bathroom, Storeroom, etc. – 2.1m + Remainder – 2.4m. The minimum ceiling heights for a Class 9b building are as follows: + A part (including a corridor serving the part) that accommodates not more than 100 persons – 2.4m; A part (including a corridor serving the part) that accommodates more than 100 persons – 2.7m. **Comment:** Architect to ensure compliance. Ceiling heights are to be reviewed at the Construction Certificate state with the detailed section drawings.
F6D5	**Artificial Lighting:** Artificial lighting is required where it is necessary to minimise the hazard to occupants during an emergency evacuation. Sub-clauses (1) - (3) sets out the places where artificial lighting is always required in all classes of buildings and the standard to which it must be installed. **Comment:** Design certification to be submitted at CC Application.
F6D6	**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 F6D7 or a mechanical or air-conditioning system complying with AS1668.2 and AS/NZS 3666.1. **Comment:** Design certification to be submitted at CC Application.
F6D8	**Ventilation Borrowed from Adjoining Room:** Natural ventilation must consist of openings, windows, doors or other devices which can be opened— with a ventilating area not less than 5% of the floor area of the room required to be ventilated. Additionally, open to a suitably sized space open to the sky or an adjoining room in accordance with F6D8. **Comment:** Design certification to be submitted at CC Application.

3.6 Section J – Energy Efficiency

Part J4	**Building Fabric:** The provision of insulation of the building envelope will be required in the proposed Building, in accordance with Clauses J4D3 to J4D7, 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. **Comment:** This section applies to the building envelope of 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 J5	**Building Sealing:** The provision of a compliant building sealing is required to all chimneys & flues, roof lights, windows & doors, Exhaust Fans, Ceilings Walls, & floors in accordance with Clauses J5D3 to J5D7. **Comment:** This section applies to any air-conditioned spaces proposed within the Warehouses buildings. Design details and/or certification of building envelope design will be required to be submitted with the application for a Construction Certificate.
Part J6	**Airconditioning and 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 J6 will be required to be provided from the mechanical engineer. **Comment:** Details or certification demonstrating compliance will need to be submitted with the application for a Construction Certificate.
Part J7	**Artificial Light and 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 J7 will be required to be provided from the electrical engineer **Comment:** Section J Consultant certification required at CC Application Stage.
Part J8	**Hot Water Supply, and Swimming Pool and 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 J8 (Section 8 of AS 3500.4) will be required to be provided from the hydraulic engineer. **Comment:** Details and certification demonstrating compliance will need to be submitted with the application for a Construction Certificate.
Part J9	**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 and being connected to a single interface monitoring system. **Comment:** Details or certification demonstrating compliance with J9D3 for energy monitoring, J9D4 for provision for EV charging stations, and J9D5 for solar, will need to be submitted with the application for a Construction Certificate. Specifically, it is noted that provision for EV charging is required to the following ratios: + 10% of car parking spaces associated with a Class 5 building, + 20% of car parking spaces associated with a Class 7b building.

4.0 Conclusion

This report contains an assessment of the referenced architectural documentation for the proposed Multi-Level Warehouse Development at 61 Milperra Road, Revesby against the Deemed-to-Satisfy provisions of the Building Code of Australia 2022.

Arising from the assessment, key compliance issues have been identified that require further resolution, either by way of fire engineered Performance Solutions or plan amendments prior to the Construction Certificate stage.

Notwithstanding the above, it is considered that the proposed development can readily achieve compliance with the BCA subject to resolution of the matters identified in this report.

Appendices

+ Appendix 1 – References Tables

Table 1: Non-Combustibility Requirements

+ Building Element	+ Type A 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 C2D10)

Table 2: Fire Hazard Properties Requirements – Floor Linings

+ Table S7C3 of Specification 7 Critical Radiant Flux or Floor Linings and Floor Coverings			
+ Class of Building	Building Not Fitted with a Sprinkler System	Building Fitted with a Sprinkler System (other than a FPAA101D or FPAA10H System)	Fire-isolated Exits and Fire Control Rooms
Class 5 & 7	2.2 kW/m2	1.2 kW/m2	2.2 kW/m2

Table 3: Fire Hazard Properties Requirements – Wall and Ceiling Linings

+ Table S7C4 of Specification 7 – Wall and Ceiling Lining Materials (Materials Groups Permitted)				
Class of Building	Fire-isolated Exits and Fire Control Rooms	Public Corridors	Special Areas	Other Areas
Class 5 & 7 (Sprinkler Protected)	Walls: 1 Ceilings: 1	Walls: 1, 2, 3 Ceilings: 1, 2, 3	Walls: 1, 2, 3 Ceilings: 1, 2, 3	Walls: 1, 2, 3 Ceilings: 1, 2, 3

Note 1: "Sprinkler protected" relates to buildings provided with a sprinkler system, other than an FPAA101D or FPAA101H system.

Note 2: "Special areas" are as follows:

+ *Class 5: Open plan offices with a minimum floor dimension/floor to ceiling height ratio > 5.*

Table 4: Fire-Resisting Construction – Type A Construction

+ 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 1.5m	90/90/90	120/120/120	180/180/180	240/240/240
1.5 to less than 3m	90/60/60	120/90/90	180/180/120	240/240/180
3m or more	90/60/30	120/60/30	180/120/90	240/180/90
For non-loadbearing parts:				
less than 1.5m	–/90/90	–/120/120	–/180/180	–/240/240
1.5 to less than 3m	–/60/60	–/90/90	–/180/120	–/240/180
3m 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	240/120/120s
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 the 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. Any lightweight construction in a fire wall or an internal wall required to have an FRL is to comply with Specification 11.
2. 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.
3. Where a part of a building required to have an FRL depends upon direct vertical or lateral support from another part to maintain its FRL, that supporting part must typically achieve the same FRL. Where that part is also required to be non-combustible, the supporting part must also be non-combustible.
4. 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.
5. 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)
6. The concession granted under S5C15 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 5.
7. Lift shafts are required to be enclosed at the top of the shaft with fire rated construction having an FRL of 120/120/120.
8. Fire isolated exits are to be provided with a fire rated "lid" that achieves an FRL of 120/120/120.
9. 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.
10. Any loadbearing internal walls or loadbearing fire walls are to be masonry or concrete.
11. 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.
12. 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

+ Appendix 2 – Fire Safety Schedule

The following table is a list of the required fire safety measures within the building. These measures may be subject to further change pending the outcomes of the final Fire Safety Engineering Review to confirm the works are permissible and do not contradict the base building Performance Solutions.

Table 7: Fire Safety Schedule

+ Statutory Fire Safety Measure	+ Design/Installation Standard	+ Proposed
Access Panels, Doors & Hoppers	BCA 2022 Clause C4D14 AS 1530.4 – 2014 Manufacturer's Specifications	✓
Alarm Signalling Equipment	AS 1670.3 – 2018	✓
Automatic Fail Safe Devices	BCA 2022 Clause D3D26	✓
Automatic Fire Detection & Alarm System	BCA 2022 Spec. 20 AS 1670.1 – 2018	✓
Automatic Fire Suppression Systems	BCA 2022 Spec. 17 & BCA Spec 18 AS 2118.1 – 2017	✓
Building Occupant Warning System activated by the Sprinkler System	BCA 2022 Spec. 17 Clause 8 AS 1670.1 – 2018 Clause 3.22	✓
Emergency Lighting	BCA 2022 Clause E4D2 & E4D4 AS 2293.1 – 2018	✓
Emergency Evacuation Plan	AS 3745 - 2010	✓
Exit Signs	BCA 2022 Clauses E4D5, NSW E4D6 & E4D8 AS 2293.1 – 2018	✓
Fire Control Centres	BCA 2022 Spec. 19	✓
Fire Doors	BCA 2022 Clauses C3D13, C3D14, C4D3, C4D5, C4D6, C4D7, C4D8 & C4D12 AS 1905.1 – 2015 Manufacturer's Specification	✓
Fire Hose Reels	BCA 2022 Clause E1D3 AS 2441 – 2005	✓
Fire Hydrant Systems (External Hydrants)	BCA 2022 Clause E1D2 AS 2419.1 – 2021	✓
Fire Seals	BCA 2022 Clause C4D15, AS 1530.4 – 2014 & AS 4072.1 – 2014 Manufacturer's Specification	✓
Lightweight Construction	BCA 2022 Clause C2D9 AS 1530.4 – 2014 Manufacturer's Specification	✓
Mechanical Air Handling Systems	BCA 2022 Clause E2D3	✓

+ Statutory Fire Safety Measure	+ Design/Installation Standard	+ Proposed
(Automatic Shutdown)	AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012	
Perimeter Vehicular Access	BCA 2022 Clause C3D5	✓
Portable Fire Extinguishers	BCA 2022 Clause E1D14 AS 2444 – 2001	✓
Required Exit Doors (Power Operated)	BCA 2022 Clause D3D24(2)	✓
Smoke Hazard Management Systems + Smoke Exhaust	BCA 2022 Part E2 AS/NZS 1668.1 –2015	✓
Warning & Operational Signs	BCA 2022 Clause D3D28, D4D7 & E4D4. AS 1905.1 – 2015 EP&A (DCFS) Regulations 2021 Section 108	✓
Fire Engineered Performance Solutions relating to: 1. TBC	BCA 2022 Performance Requirements … Fire Safety Engineering Report prepared by … Report No. … Revision … dated …	✓