Warehouse and Distribution Centre 42 Boorea Street, Lidcombe

Regulatory Compliance Report

BCA Assessment

Prepared for: Hale Property Services Pty Ltd

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1. EXECUTIVE SUMMARY

The proposed development comprises of a multi-storey warehouse and distribution centre development, including ancillary offices, landscaping, bicycle and carparking at 42 Boorea Street, Lidcombe NSW 2141.

Summary of Compliance Matter to be Addressed

The assessment of the design documentation [referenced in Appendix A] has revealed that the following areas deviate from the deemed-to-satisfy provisions of the Building Code of Australia 2019 Amendment 1 (BCA). These following items are required to be addressed through design development to meet the deemed-to-satisfy provisions, or preparation of a performance solution demonstrating compliance with the nominated Performance Requirements:

No.	Description	Relevant DTS Clauses'	Performance Requirements
Fire Safety Items			
1	Rationalisation of FRLs in the main building structure from 240mins to 120mins	C1.1, Spec. C1.1	CP1
2	Omit FRLs to internal columns and roof within the Level 1 Office and Warehouse	C1.1, Spec. C1.1	CP1
3	To permit the use of skylights, deemed as combustible, as a covering to the roof structure.	C1.1, Spec. C1.1	CP1
4	The extended travel distances and distance between the exit stairs will need to addressed to comply with the requirements of the deemed to satisfy provisions noted above, or be assessed as performance solutions by the Fire Safety Engineer using BCA Performance Requirements DP4 & EP2.2. The fire engineer has confirmed that a performance-based solution can be provided to support the extended travel distances.	D1.4, D1.5	DP4, EP2.2
5	Fire-isolated exits 2 and 3 discharge internally in the building. Fire-isolated exits 5 to 7 discharge within the confines of the building and within 20m to a road or open space. However, the unimpeded path of travel to the road/open space is not shown on the floor plans to verify compliance with D1.7(b).	D1.7(b)	DP5, EP2.2
6	The path of travel from the point of discharge of fire-isolated exits 5 to 7 requires occupants to pass within 6m of the external wall of the same building (measured horizontally).	D1.7(c)	DP5, EP2.2
7	More than 2 access doorways open into fire-isolated exits 5 and 7. The BCA requires a pressurisation system complying with AS1668.1-2015 or a smoke lobby complying with clause D2.6 to be provided. Details demonstrating compliance with the requirements of the BCA is to be provided.	D1.7(d)	DP5, EP2.2
8	The non-fire isolated stairway leading from the sanitary compartments on level 5 departs in the following matters: 1. Discharges on Level 1 warehouse (storey no. 4) in lieu of a level at which egress is provided to road or open space 2. Proposes travelling to two alternative fire isolated exits within 40m in lieu of a door leading to a road or open space	D1.9	DP4 & EP2.2

No.	Description	Relevant DTS Clauses'	Performance Requirements
9	Stairs from recessed docks of warehouse 2 and 3 are not afforded the handrail extension in order to maintain the 1m un obstructed path of travel and must be addressed through a performance solution.	D2.17	DP2
10	The fire hydrant booster assembly is located remote from the proposed building and does not comply with the requirements of AS2419.1-2005 and must be addressed through a performance-based solution	E1.3	EP1.3
11	Fire Hose Reels exceeding 30m in length must be addressed through a performance-based solution. This is to be confirmed by the design team.	E1.4	EP1.1
12	Due to the nature of the proposed development, the following will need to be addressed in a performance solution: 1. The location of the FCC to serve a building containing 10 tenancies without common access within the building 2. The FCC located within a room, which does not strictly comply with the provisions of Spec E1.8 of the BCA. 3. Two indicative locations have been proposed as options at this stage pending FRNSW consultation. One location is nominated to be located within a room/building remote from the primary Warehouse Building.	E1.8 & Spec E1.8	EP1.6
13	The installation of the Direction Exit Signage must not be installed greater than 2.7m from FFL unless addressed through a performance-based solution. This is to be confirmed by the design team.	E4.6	EP4.2
14	The smoke hazard management system is to be rationalised on a performance-based solution as advised by the design team. The automatic smoke exhaust system (Spec E2.2b) with a rationalised extraction rates activated by a smoke detection complying with Clause 6 of E2.2a.	E2.2b	EP2.2
Miscellaneous Items			
15	**Weatherproofing of External Walls** As there are no deemed to satisfy provisions relating to the weatherproofing of external walls, a performance solution is required to prepared by the façade engineer/registered architect. [Note – Excluding Class 7 & 8 parts of the buildings]	-	FP1.4

Please refer to Section 3 of this report outlining the process required to be satisfied in preparation of a performance based solutions.

Further to the above, the subject development will be required to be submitted for consultation with the NSW Fire Brigade pursuant to Division 3 of the EP&A Regulations as part of the Construction Certificate process, as:

(a) a class 9a building that is proposed to have a total floor area of 2,000 square metres or more, where the plans and specifications for the work provide for a performance solution to meet the performance requirements contained in any one or more of the Category 2 fire safety provisions,
(b) a building (other than a class 9a building) that is proposed to have a fire compartment with a total floor area of more than 2,000 square metres, where the plans and specifications for the work provide for a performance

solution to meet the performance requirements contained in any one or more of the Category 2 fire safety provisions,

(c) a building (other than a class 9a building) that is proposed to have a total floor area of more than 6,000 square metres, where the plans and specifications for the work provide for a performance solution to meet the performance requirements contained in any one or more of the Category 2 fire safety provisions,

(d) a class 2, class 3 or class 9 building of 2 or more storeys, or the class 4 part of any class 9 building of 2 or more storeys, where—

(i) the plans and specifications for the work provide for a performance solution to meet performance requirement CP2 in Volume 1 of the Building Code of Australia, to the extent that it relates to external combustible cladding, and

(ii) the performance solution does not apply the verification method CV3 in Volume 1 of the Building Code of Australia in its entirety,

(e) a class 5, class 6, class 7 or class 8 building of 3 or more storeys, or the class 4 part of any class 5, class 6, class 7 or class 8 building of 3 or more storeys, where—

(i) the plans and specifications for the work provide for a performance solution to meet performance requirement CP2 in Volume 1 of the Building Code of Australia, to the extent that it relates to external combustible cladding, and

(ii) the performance solution does not apply the verification method CV3 in Volume 1 of the Building Code of Australia in its entirety,

(f) a class 2 or class 3 building of 4 or more storeys where the plans and specifications for the work provide for a performance solution to meet performance requirement EP1.4 in Volume 1 of the Building Code of Australia,

(g) a class 9b early childhood centre where the plans and specifications for the work do not meet requirement D1.18(a) in Volume 1 of the Building Code of Australia.

Request for Additional Information

The following additional information is required for further assessment prior to the relevant construction certificate:

No.	Elements/Documentation Required for Further Review	Status
1.	All consultants are to provide advise where/if their respective designs deviate from the DTS provisions of the BCA.	Open
2.	Verification of population number will be reassessed once the indicative layouts of the warehouse and office. The population proposed within the report has been determined in accordance with Table D1.13. Clause D1.13 permits assessing population through other suitable means. Please provide a written proposal for the population within the building or parts of the building.	Open
3.	Fire Compartmentation Plans prepared by the Registered Architect	Open
4.	Where the shaft of the fire isolated exits abuts against the structural steel columns, please confirm the proposed method to maintain the shaft FRL requirements	Open
5.	The roof covering of the building is non-combustible. Please provide details of the roof building up for further review.	Open
6.	Metal cladding is proposed to the office and enclosing external wall of the warehouse. Further details are to be provided of the proposed cladding system confirming the non-combustible criteria. Schedule of materials used in the construction of the external wall and associated test reports demonstrating compliance with non-combustibility requirements. (Please refer to our disclosure statement proforma)	Open
7.	Location of the following fire-fighting equipment – 1. Fire hydrants (including booster assembly) 2. Fire hose reels (including pumps and test valves)_ 3. Portable fire extinguishers 4. Sprinkler control valve As the design develops, services drawings are to be provided for our review. Please provide further information regarding the fire hydrant booster and pump set for further review. Due to the nature of the site, the hydrant booster assembly will need to form part of a performance based solution. Please confirm if double length (60m) fire hose reels are proposed or standard length (30m) Please confirm if the hydrants located below awnings are to be considered as external hydrants for the purpose of coverage. Detailed design to be provided demonstrating compliance and any performance solution required must be identified.	Open
8.	Location of fire control centre is to be nominated on the plans. Finished floor levels are to be shown to verify compliance with Spec E1.8, change in RL no greater than 300mm.	Open
9.	Door, window and wall type schedules identifying required FRLs and tested systems.	Open
10.	Stair details (plans, elevations and sections) including any enclosures beneath stairways	Open
11.	Design documentation must demonstrate compliance with the exit protection requirements of D1.10	Open
12.	Please indicate the locations of doorways to Fire stair 1 and 4 for accurate egress assessment.	Open
13.	Please confirm if jet fans will be proposed within the car park or will it be naturally ventilated as part of design development	Open

14.	Fire Stairs located outside the perimeter of the building must be fire isolated or designed to comply as external stairways in lieu of fire isolated stairs in accordance with D1.8. Any deviations from these provisions must be addressed in a performance solution.	Open
15.	Dry fire consultant to demonstrate the detection system coverage is appropriate to the smoke zone limitations of AS1670.1-2018. Deviations from this must be addressed in a performance solution.	Open
16.	External overhangs exceeding 1.5m in length must be afforded sprinkler coverage. Please confirm if the design deviates from this.	Open
17.	All external Occupiable areas are to be afforded adequate service coverage and evacuation provisions as required by Part G6. Further review will be undertaken as part of the detailed design phase.	Open
18.	The automatic smoke exhaust provisions for ground floor are to be identified on the proposed plans, and the service consultant must identify any specific departures to be addressed through a performance solution	Open
19.	Proposals for exemptions in accordance with Clause D3.4 must be submitted through an accredited access consultant demonstrating compliance with the requirements of this provision for further review.	Open
20.	Door swing of Fire stair 2 and 4 on level 1 are not in the direction of egress. This must be amended through design to comply or alternatively addressed in a performance solution.	Open

2. INTRODUCTION

The proposed development comprises of a multi-storey warehouse and distribution centre development, including ancillary offices, landscaping, bicycle and carparking at 42 Boorea Street, Lidcombe NSW 2141.

The EP&A Regulations (Cl. 98) outline the version of the BCA applicable to the development, specifically version that in place at the time of the application for Construction Certificate. BCA 2019 Amendment 1 was adopted in NSW on the first day of July 2020. Should a new version of the BCA be adopted prior to the issue of the construction certificate, the outcomes of the Report may not comply with updated versions of the BCA at the time of application for a construction certificate. Please note the nominated date for adoption of BCA 2022 is 1st September 2022. An additional assessment will be required to address the gap between BCA 2019 Amendment 1 and the subsequent BCA's upon application for a Construction Certificate.

The Report outlines the outcomes of the assessment against the DTS provisions of the BCA for the proposed design documentation referenced and further reviews may be required as the design development.

Please refer to Appendix A for a list of design documentation reviewed in the preparation of this report.

3. DOCUMENTATION OF PERFORMANCE SOLUTIONS

A Performance Solution must demonstrate compliance with all relevant Performance Requirements, or the solution must be at least equivalent to the Deemed-to-Satisfy provisions.

Compliance with the Performance Requirements is to be demonstrated through one or a combination of the following:

a) Evidence of suitability in accordance with Part A5 of the BCA that shows the use of a material, product, plumbing and drainage product, form of construction or design meets the relevant Performance Requirements.
b) A Verification Method including the following:
    i. The Verification Methods provided in the NCC.
    ii. Other Verification Methods, accepted by the appropriate authority that show compliance with the relevant Performance Requirements
c) Expert Judgement
d) Comparison with the Deemed-to-Satisfy Provisions

Where a Performance Solution is proposed as the method to achieve compliance, the following steps must be undertaken:

a) Prepare a performance-based design brief in consultation with relevant stakeholders
b) Carry out analysis, using one or more of the assessment methods nominated above, as proposed by the performance-based design brief.
c) Evaluate results from (b) against the acceptance criteria in the performance-based design brief
d) Prepare a final report that includes:
    i. All Performance Requirements and/or Deemed-to-Satisfy Provisions identified as applicable
    ii. Identification of all assessment methods used
    iii. Details of required steps above
    iv. Confirmation that the Performance Requirement has been met; and
    v. Details of conditions or limitations, if an exist, regarding the Performance Solution.

4. PROJECT DESCRIPTION

Brief Description

Construction of a two-storey warehouse and distribution centre comprising 38,959 m^2 GFA including ancillary office space, landscaping, bicycle and car parking.

Detailed Description

The proposal comprises the redevelopment of the site as summarised below:

- Construction, fit out and operation of a two-storey warehouse and distribution centre comprising approximately 39,249m^2 GFA including:
  - 35,111 m^2 of warehouse and distribution GFA; and
  - 4,138 m^2 GFA ancillary office space.
- Provision of 34 bicycle & 10 motorcycle parking spaces
- Provision 191 car parking spaces at ground.
- Approximately 4,579 m^2 of hard and soft landscaping at ground.
- Provision of internal vehicle access route and loading docks on ground and first floor.
- Upgrades to existing on-site infrastructure.
- Building identification signage.
- Operation 24 hours per day seven days per week.

The site is legally described as Lot 1 in Deposited Plan 740385

The stormwater channel to the west of the site is known as Haslam's Creek.

Site Description

The site is located at 42 Boorea Street, Lidcombe within the Cumberland Local Government Area (LGA). The site is legally described as Lot 1 in DP 740385. The site is approximately 4.1 hectares and 151m x 276m. The site has a fall of approximately 3.75m from north eastern corner to the south western corner. A 9.1m easement for sewer runs along the western side of the site in a north south direction, a further sewer easement runs along the northern side of the site in an east west direction.

The site is located at the rear of 44 Boorea Street, Lidcombe and is accessed via an access handle from Boorea Street. The site contains a warehouse building and associated loading docks and car park. Trees and vegetation are planted along the site boundary. Refer to Figure 1.

Figure 1: Site Location
Source: Nearmaps

Site Context
The site is located approximately 7.5 kilometres east from Parramatta. It is within a highly accessible location with connections to regional roads such as Olympic Drive, the M4 Motorway, and Great Western Highway and public transport including Auburn and Lidcombe railway station. The site is surrounded by a variety of industrial uses as summarised below:

- **North:** The Toohey's Brewery site at 29 Nyrang Street, Lidcombe which includes packaging and processing facilities, warehouses, tanks, silos and large car parking areas.
- **East:** Warehouses at 27 Nyrang Street, Lidcombe for the Regional Road Express, BM Sydney Building Materials and **ACACIA** Transport companies. At 25 Nyrang Street is a three-storey brick and glass warehouse building housing the company COS. On the opposite side of Nyrang Street are residential dwellings.
- **West:** Haslams Creek (which is a concrete lined drain) is adjacent to the western boundary of the site. Warehouse buildings which house Zico Imports and Amazing Flowers are located to the west of Haslams Creek. To the north west at 11-13 Percy Street is the Woolworths site, a former warehouse building has been demolished and the site is in the preparation stage for a new warehouse and distribution centre.
- **South:** To the south is number 44 Boorea Street, which is located at the front of the site and accommodates two double height warehouse building. On the opposite side of Boorea Street are residential dwellings.

Refer to Figure 2.

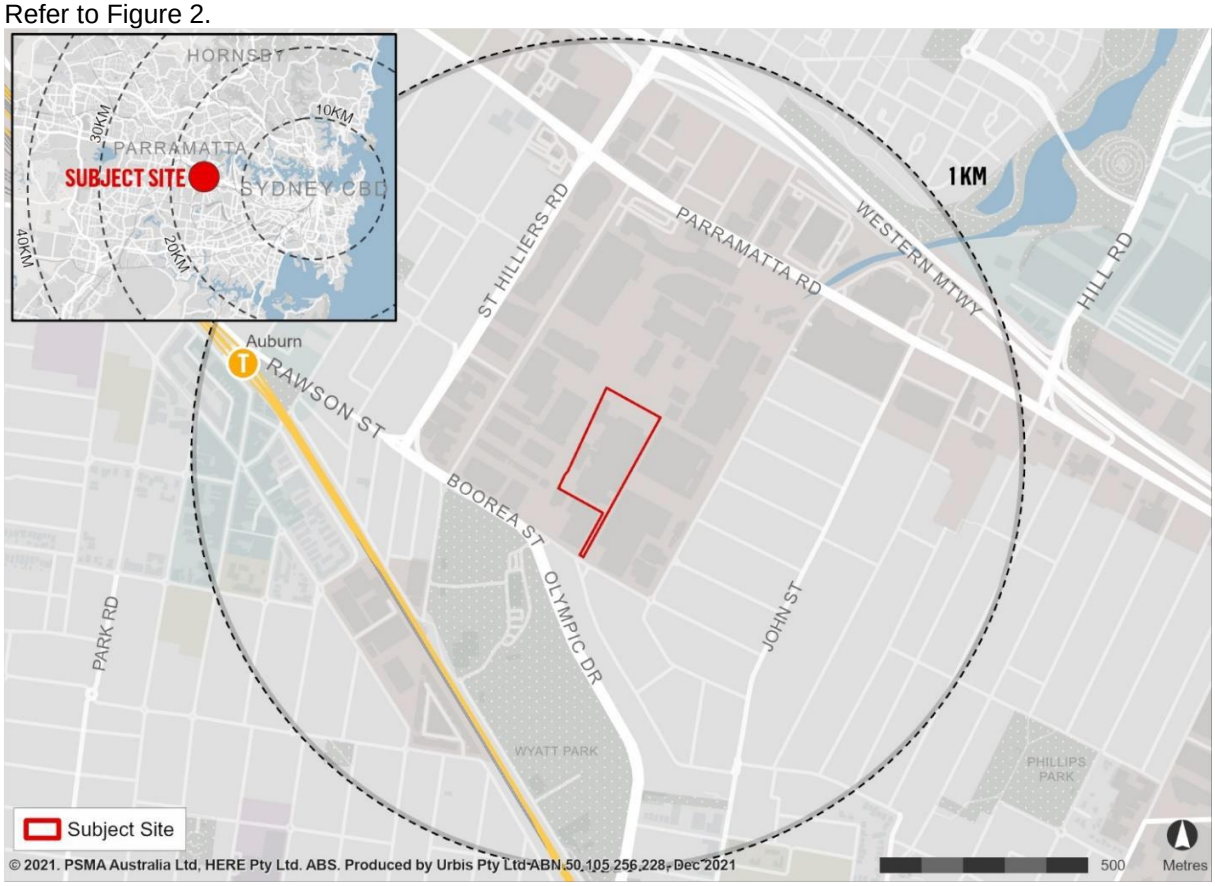

Figure 2 : Site Context
Source: Urbis

Stakeholder Engagement

All consultants must document the relevant authorities/agencies/etc consulted during the preparation of their reports, including:

- Meeting attendees or the relevant person in telephone/email correspondence
- Date/time of meetings or correspondences
- Issues discussed
- How the matters raised by the relevant stakeholder have been addressed within the proposal, including the key findings, recommendations, final plans, etc.

Assessment and Mitigation of Impacts

All technical reports need to address the following matters:

- **Existing environment** – describe the locality catchment relevant to the potential impact being addressed (eg air, noise, traffic, etc) including:
  - Local and regional community, including land ownership and/or land use activities.
  - Important natural or built features, including buildings, open spaces, infrastructure, etc.

- Key risks or hazards – eg site topography, flooding, contaminated land, climate change.

Note existing site area is 41,069 m^2.

- **Statutory requirements** – each of the specialist reports should list the relevant legislation, plans, policies, etc addressed within their assessment report. It is not necessary (or desirable) to copy-and-paste legislation into the report, although section references can be cited as appropriate. The relevant requirements will be addressed within the detailed impact assessment (refer below).

  Note the Cumberland Local Environmental Plan 2021 is the principal Environmental Planning Instrument for the site.

- **Scale and nature of impacts (including cumulative impacts)** – the potential impacts of the proposal will be assessed in accordance with the statutory requirements (as above) and the existing environment, including:

  - *Existing development*: consider potential impacts of the proposal on existing development/uses and the actual impacts of existing development/uses on the proposal.

  - *Approved development*: consider potential impacts of the proposal on approved development/uses and potential impacts of approved development/uses on the proposal, including (but not limited to):

    - Surrounding *properties on Percy Street, Nyrang Street, and Boorea Street; and*

    - The nearest residential properties at Nyrang Street /Yarram Street/ Boorea Street.

  - *Likely future development*: *consider* potential impacts of the proposal on likely future development/uses and potential impacts of likely future development/uses on the proposal, including (but not limited to):

    - Development applications currently being assessed.

    - Current planning controls (ie permitted uses, built form controls, etc).

  The impact assessment should identify any uncertainties associated with the assessment (eg lack of baseline data) and measures proposed to deal with these uncertainties (eg monitoring and review) – also refer mitigation measures below.

- **Mitigation measures** – identification of measures to avoid, mitigate and/or offset impacts of the project, including:

  - Measures which have been implemented into the current proposal (eg privacy screens).

  - Additional measures to be implemented in the future detailed design and/or operation of the development (eg operating hours).

5. DEVELOPMENT OVERVIEW

5.1. BUILDING ASSESSMENT DATA

Summary of Construction Determination:

Part of Project	Building 1
Classification	Class 5 – Office Class 7a – Carpark Class 7b/8 – Warehouse and Storage
Number of Storeys	Five (5)
Rise In Storeys	The building has a rise in storeys of five (5). *The warehouse on Level 1 has an average internal height of more than 6m and therefore counted as 2 storeys.*
Type of Construction	Type A Construction
Effective Height (m)	14.5m

Note: The effective height of the project includes all storeys included in the rise in storeys of the project.

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Approximate Volume (m^3)	Assumed Population
Ground Floor - Warehouse 01	7b / 8	3620 m^2	Building is assessed as a Large Isolated Building pursuant to C2.2, C2.3 and C2.4	123
Ground Floor - Warehouse 02	7b / 8	4515 m^2		151
Ground Floor - Warehouse 03	7b / 8	4554 m^2		152
Ground Floor - Warehouse 04	7b / 8	4589 m^2		154
Ground Floor Mezz. – Office 01	5	460 m^2		48
Ground Floor Mezz. – Office 02	5	508 m^2		53
Ground Floor Mezz. – Office 03	5	508 m^2		53
Ground Floor Mezz. – Office 04	5	459 m^2		48
Level 1 – Carpark	7a	3290.4 m^2		110
Level 1 – Office 05	5	348 m^2		35
Level 1 – Office 06	5	286 m^2		29
Level 1 – Office 07	5	304 m^2		31
Level 1 – Office 08	5	286 m^2		29
Level 1 – Office 09	5	287 m^2		29
Level 1 – Office 10	5	304 m^2		31
Level 1 - Warehouse 05	7b / 8	3040 m^2		103
Level 1 - Warehouse 06	7b / 8	2718 m^2		91
Level 1 - Warehouse 07	7b / 8	2760 m^2		92
Level 1 - Warehouse 08	7b / 8	2730 m^2		91

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Approximate Volume (m^3)	Assumed Population
Level 1 - Warehouse 09	7b / 8	2726 m^2		91
Level 1 - Warehouse 10	7b / 8	3706 m^2		125
Lobby	5	176 m^2		18
Ground Floor Dock Office	5	64 m^2		7
Level 1 Dock Office	5	89 m^2		9
Total				**1703**

Notes:

- *The above populations have been based on floor areas and calculations in accordance with Table D1.13 of the BCA.*
- *The floor areas nominated have been adjusted without ancillary areas such as sanitary facilities, corridors, shelving and or racking and storage areas.*
- *Areas and Volume assessments are to be confirmed by the architect.*

5.2. Copy of Certificate of Title:

A copy of the Certificate of Title and associated plan of subdivision is required. Where it is proposed to construct any part of the building over, under or within an easement, the consent of the relevant authority and Council is required prior to the issue of the Construction Certificate.

6. Structure

6.1. Structural Provisions (BCA B1):

New structural works are to comply with the applicable requirements of BCA Part B1, including AS/NZS 1170.0-2002, AS/NZS 1170-1-2002, AS/NZS 1170.2-2011 and AS 1170.4-2007.

The importance level of the building is to be determined by the registered/accredited structural engineer or a seismic consultant in accordance with AS/NZS 1170.0-2002. Accordingly, any non-structural elements of the building, including partitions (and non-structural fire walls), ceilings, services and racking/shelving may be required to comply with the seismic restraint requirements of AS 1170.4-2007. Certification will be required confirming that the design of the seismic restraints comply with AS 1170.4-2002.

Glazing is to comply with AS1288-2006, and AS2047-2014, and certification will be required prior to the issue of construction certificates.

Certification by a registered/accredited structural engineer will be required prior to the issue of the Construction Certificate.

7. Fire Protection

7.1. Fire Compartmentation (BCA C1.1)

The BCA stipulates three levels of fire-resistant construction based on the rise in storeys and classification of the building. Accordingly, the proposed design must comply with Table C2.2 of the BCA which outlines the maximum floor area and volume limitations.

Classification		Type of Construction		
		A	B	C
5	max floor area—	8 000 m^2	5 500 m^2	3 000 m^2
	max volume—	48 000 m^3	33 000 m^3	18 000 m^3
7a & 7b	max floor area—	5 000 m^2	3 500 m^2	2 000 m^2
	max volume—	30 000 m^3	21 000 m^3	12 000 m^3

Note – Extract of Table C2.2 of BCA 2019 Amendment 1

The proposed building will be constructed of Type A construction, therefore must satisfy the requirements of Table 3 & 3.9 of Specification C1.1 of the Building Code of Australia 2019 Amendment 1.

The following outlines the basis of our assessment:

- Table 3 of Spec. C1.1 requires an FRL of not less than 240mins be provided for beams, columns, floors etc. for Class 7b/8 parts. The client has advised that all loadbearing elements required to achieve an FRL of 240 minutes will be reduced to achieve an FRL to 120minutes by a performance-based solution prepared by a qualified fire safety engineer.

The building exceeds the floor area / volume limitations of the BCA provisions for Type A Construction, and therefore the building is considered a large, isolated building. The following provisions apply for large isolated buildings:

- Automatic sprinkler protection to AS2118.1 and BCA Specification E1.5 throughout the development / smoke detection and alarm system in accordance with AS1670.1-2018,
- Perimeter emergency vehicular access 6m wide located within 18m of the entire building perimeter in accordance with BCA Clause C2.4,
- Smoke exhaust or smoke and heat vents required throughout the development if the building exceeds 18,000m^2 or 108,000m^3 in volume
- Provision of a fire hydrant ring main pursuant to AS2419.1-2005.

7.2. FIRE RESISTANCE (BCA C1.1)

The building is required to be constructed in accordance with the relevant provisions of Specification C1.1 of the BCA applicable to Type A Construction.

The following concessions are afforded to the proposed development by Spec 1.1:

1. A roof need not comply with Table 3 if its covering is non-combustible and the building has a sprinkler system complying with Spec. E1.5 installed throughout.
2. ***If the roof is constructed without an FRL in accordance with the concession above:***
    a. ***in the storey immediately below that roof, internal columns and internal walls may have an FRL of 60/60/60. The structural columns in the storey immediately below the roof will not achieve the required FRL of 60/60/60 and will need to be addressed by a performance-based solution prepared by a suitably qualified fire engineer.***
    b. ***Skylights, which are deemed as combustible, will need to be addressed in a performance solution.***

The design development documentation must address the following items additional fire protection requirements to achieve an FRL not less than 120 minutes:

- Lift Motor Rooms;
- Electricity Supply;
- Boilers or Batteries (that has a total voltage of 12V or more and a storage capacity of 200 kWh or more);
- Hydrant Pump Rooms;
- Sprinkler Pump Rooms;

7.3. FIRE HAZARD PROPERTIES (BCA C1.10)

The fire hazard properties of fixed surface linings and mechanical ductwork pursuant to Specification C1.10 of the Building Code of Australia apply as follows:

Sprinkler Protected Areas

a) Floor Coverings – Critical radiant Flux not less than 1.2 kW/m^2
b) Wall and Ceiling Linings – Material Group No. 1,2 or 3 (with exception to fire-isolated exits requiring a Group 1 rating)
c) Other Materials – Spread of Flame Index not exceeding 9 and Smoke Developed Index not exceeding 8 if the Spread of Flame Index is more than 5.

Rigid and flexible air handling ductwork must comply with AS4254 Parts 1 & 2 2012.

Floor linings and floor coverings used in lift cars must have a critical radiant flux not less than 2.2, and wall and ceiling linings must be a Material Group No. 1 or 2.

Details demonstrating compliance are to be documented at the Construction Certificate stage.

7.4. NON-COMBUSTIBLE BUILDING ELEMENTS (BCA C1.9)

External Wall Cladding

Since the building is of Type A construction, the following components are required to be completely non-combustible:

- External walls, including façade coverings, framing, insulation;
- Flooring and framing of lift pits;
- Non-loadbearing internal walls required to have an FRL;
- All non-loadbearing shafts;
- All loadbearing internal walls and loadbearing fire walls, including those that are part of loadbearing shafts.

Please provide product specifications and test reports to AS 1530.1-1994 for all materials to demonstrate compliance

For materials and assemblies that are required to be non-combustible, the material or system must be not deemed combustible when tested in accordance with AS 1530.1-1994.

Combustible Materials

The following materials, though combustible or containing combustible fibres, may be used wherever a non-combustible material is required:

a) Plasterboard.
b) Perforated gypsum lath with a normal paper finish.
c) Fibrous-plaster sheet.
d) Fibre-reinforced cement sheeting.
e) Pre-finished metal sheeting having a combustible surface finish not exceeding 1 mm thickness and where the Spread-of-Flame Index of the product is not greater than 0.
f) Sarking type materials that do not exceed 1mm in thickness and have a Flammability Index not greater than 5.
g) Bonded laminated materials where -
    (i) each laminate is non-combustible; and
    (ii) each adhesive layer does not exceed 1 mm in thickness; and
    (iii) the total thickness of the adhesive layers does not exceed 2 mm; and

(iv) the Spread-of-Flame Index and the Smoke-Developed Index of the bonded laminated material as a whole does not exceed 0 and 3 respectively.

It is recommended that once material selections are made, copies of the fire test certificates/reports be provided for review and approval.

Based on a review of the plans metal cladding is proposed to the office and enclosing external wall of the warehouse. Further details are to be provided of the proposed cladding system confirming the non-combustible criteria.

The following ancillary elements may be fixed to an external wall that is required to be non-combustible:

a) An ancillary element that is non-combustible.
b) A gutter, downpipe or other plumbing fixture or fitting.
c) A flashing.
d) A grate or grille not more than 2 m² in area associated with a building service.
e) An electrical switch, socket-outlet, cover plate or the like.
f) A light fitting.
g) A required sign.
h) A sign other than one provided under (a) or (g) that—
   i) achieves a group number of 1 or 2; and
   ii) does not extend beyond one storey; and
   iii) does not extend beyond one fire compartment; and
   iv) is separated vertically from other signs permitted under (h) by at least 2 storeys.

Please provide fire hazard properties reports for any proposed signs and confirm their extent i.e. not spanning more than one storey or fire compartment:

7.5. SEPARATION OF EQUIPMENT (C2.12)

Equipment listed below must be separated from the remainder of the building with construction achieving an FRL as required by Specification C1.1 but not less than 120/120/120 and a self-closing fire door with an FRL not less than -/120/30, including;

a) Lift motors and lift control panels; or
b) Emergency generators used to sustain emergency equipment operating in the emergency mode; or
c) Central smoke control plant; or
d) Boilers; or
e) A battery system installed in that building that has total voltage of 12 volts or more and a storage capacity of 200kWh or more.

Details demonstrating compliance with the requirements of this clause is to be provided.

7.6. PROTECTION OF OPENINGS IN EXTERNAL WALLS (BCA C3.2 / C3.3 / C3.4)

Openings in an external wall that is required to have an FRL must be protected in accordance with C3.4, if the distance between the opening and the fire-source feature to which it is exposed is less than—

a) 3 m from a side or rear boundary of the allotment; or
b) 6 m from the far boundary of a road, river, lake or the like adjoining the allotment, if not located in a storey at or near ground level; or

c) 6 m from another building on the allotment that is not Class 10, and

if wall-wetting sprinklers are used, they are located externally and the opening must not occupy more than 1/3 of the area of the external wall of the storey in which it is located.

Details demonstrating compliance with the requirements of this clause is to be provided.

7.7. PROTECTION OF OPENINGS FIRE RATED BUILDING ELEMENTS (BCA PART C3)

The prescriptive provisions of the BCA stipulate that openings within building elements required to have an FRL shall be protected as follows:

a) Penetrations through fire rated floors to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a fire rated shaft achieving an FRL the same as the FRL of the floor it is passing through;
b) Any penetration through a wall or room required to have an FRL (e.g. substation, boiler room, apartment separating wall etc) is to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a shaft achieving an FRL the same as the FRL of the floor it is passing through; (or 120/120/120 where it is a room such as a substation);
c) Self-closing -/60/30 fire doors to the doors opening to the fire isolated stairs (note that this also includes the access doors to the condenser units on the plant platforms).

Note that where fire dampers, fire collars, etc are utilised, allowance needs to be made for access hatches to be provided within the walls / ceilings to ensure that maintenance access is provided.

As the design develops, details will need to be included in relation to sealing of penetrations / construction of fire rated shafts.

8. ACCESS AND EGRESS

8.1. PROVISION FOR ESCAPE (BCA D1)

The egress provisions for the proposed building are provided by the following:

- Fire isolated stairways, ramps or passageways
- Perimeter external doorways
- Required non-fire isolated stairways, ramps or escalators
- External stairways or ramps in lieu of fire isolated exits

All egress provisions that apply to the building also apply to any occupiable outdoor areas.

Further design documentation is required detailing the following elements which will require further assessment upon submission:

- Door Hardware
- Operations of Required Exits
- Stair Construction
- Handrail and Balustrade construction
- Details of Separation of Rising and Descending Stairs
- Discharge from Fire Isolated Exits
- Details of the egress provisions to the Road.

- Door swings

The non-fire isolated stairway leading from the sanitary compartments on level 5 departs in the following matters:

1. ***Discharges on Level 1 warehouse (storey no. 4) in lieu of a level at which egress is provided to road or open space***
2. ***Proposes travelling to two alternative fire isolated exits within 40m in lieu of a door leading to a road or open space***

8.2. TRAVEL VIA FIRE ISOLATED EXITS (BCA D1.7)

Each fire-isolated stairway or fire-isolated ramp must provide independent egress from each storey served and discharge directly, or by way of its own fire isolated passageway to:

- A road or open space; or
- To a point in a storey 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 an unimpeded path of travel not more than 20m to a road or open space; or
- A covered area that adjoins a road or open space, is open for at least 1/3 of its perimeter, has an unobstructed clear height throughout of not less than 3m, and provides an unimpeded path of travel to a road or open space of not less than 6m.

Fire-isolated exits 2 and 3 discharge internally in the building. Fire-isolated exits 5 to 7 discharge within the confines of the building and within 20m to a road or open space. However, the unimpeded path of travel to the road/open space is not shown on the floor plans to verify compliance with D1.7(b).

Additionally, where the path of travel from the point of discharge requires occupants to pass within 6m of any part of the external wall of the same building (measured horizontally), that external wall must have a 60/60/60 FRL and have any openings protected internally for a distance of 3m above or below the path of travel.

The path of travel from the point of discharge of fire-isolated exits 5 to 7 requires occupants to pass within 6m of the external wall of the same building (measured horizontally).

In addition, where more than 2 access doorways, not from a sanitary compartment or the like, open to a required fire-isolated exit in the same storey, the required exit must be afforded; a smoke lobby in accordance with D2.6 must be provided; or the exit must be pressurised in accordance with AS 1668.1.

More than 2 access doorways open into fire-isolated exits 5 and 7. Details demonstrating compliance with the requirements of the BCA is to be provided.

8.3. EXIT TRAVEL DISTANCES AND DISTANCE BETWEEN EXITS (BCA D1.4 & D1.5)

The locations of the proposed exits would appear to indicate that the deemed to satisfy requirements in terms of travel distances, distances between alternative exits and egress widths would be satisfied.

The travel distances to exits should not exceed:

Class 5 to 9

- no point on the floor must be more than 20m to a single exit or point of choice and where two exits are provided, a maximum of 40m to one of those exits; and
- exits shall be located to not be more than 60m apart and not closer than 9m

The locations of the proposed exits indicate that the travel distances within the building exceed the DtS requirements of the BCA. The distance is expected to increase further in the majority of the warehouse and office areas once an indicative/future layout is shown.

For the purposes of measuring travel distances to and between alternative exits, the open space on ground floor is counted as the part reached beyond the extent of the awning.

The fire engineer has confirmed that a performance-based solution can be provided to support the extended travel distances.

The extended travel distances and distance between the exit stairs will need to addressed to comply with the requirements of the deemed to satisfy provisions noted above, or be assessed as performance solutions by the Fire Safety Engineer using BCA Performance Requirements DP4 & EP2.2.

8.4. DIMENSIONS OF EXITS (BCA D1.6)

Required exits and paths of travel to an exit must satisfy –

- Minimum dimensions of 1000mm and 2000mm height
- Doorways are permitted to contain a clear opening width of the required width of the exit minus 250mm with a height of 1980mm as part of egress requirements. Please note the access for persons with disabilities must be afforded a doorway with a clear width of 850mm (i.e. minimum 920 mm doors).

The following table summarises the aggregate exit widths required by Clause D1.6 of the BCA pursuant to the population determined by Clause D1.13 of the BCA:

Storey	Population pursuant to D1.13	Aggregate Exit Width Required	Aggregate Exit Width Provided
Ground Floor - Warehouse 01	123	1.25 m	✓
Ground Floor - Warehouse 02	151	1.75 m	✓
Ground Floor - Warehouse 03	152	1.75 m	✓
Ground Floor - Warehouse 04	154	1.75 m	✓
Ground Floor Mezz. – Office 01	48	1 m	✓
Ground Floor Mezz. – Office 02	53	1 m	✓
Ground Floor Mezz. – Office 03	53	1 m	✓
Ground Floor Mezz. – Office 04	48	1 m	✓
Level 1 – Carpark	110	1.25 m	✓
Level 1 – Office 05	35	1 m	✓
Level 1 – Office 06	29	1 m	✓
Level 1 – Office 07	31	1 m	✓
Level 1 – Office 08	29	1 m	✓
Level 1 – Office 09	29	1 m	✓
Level 1 – Office 10	31	1 m	✓
Level 1 - Warehouse 05	103	1.25 m	✓
Level 1 - Warehouse 06	91	1 m	✓
Level 1 - Warehouse 07	92	1 m	✓
Level 1 - Warehouse 08	91	1 m	✓
Level 1 - Warehouse 09	91	1 m	✓

Storey	Population pursuant to D1.13	Aggregate Exit Width Required	Aggregate Exit Width Provided
Level 1 - Warehouse 10	125	1.25 m	✓

Maintenance areas, including access between levels, walkways, etc., may be afforded a design compliant with AS1657-2018 in which case a 600mm clear width is permitted

8.5. BALUSTRADES AND HANDRAILS (BCA D2.16 / BCA D2.17)

A continuous barrier, compliant with *Table D2.16a & NSW Variation Table D2.16a.1*, must be provided along the side of—

(i) a roof to which general access is provided; and
(ii) a stairway or ramp; and
(iii) a floor, corridor, hallway, balcony, deck, verandah, mezzanine, access bridge or the like; and
(iv) any delineated path of access to a building,

if the trafficable surface is 1 m or more above the surface beneath.

Handrails must be design in accordance with the requirements of Clause D2.17 of the BCA.

Please provide detailed design documentation to enable further assessment.

Stairs from recessed docks of warehouse 2 and 3 are not afforded the handrail extension in order to maintain the 1m un obstructed path of travel and must be addressed through a performance solution.

8.6. PROTECTION OF OPENABLE WINDOWS (D2.24)

A barrier with a height not less than 865 mm above the floor is required to an openable window

- in addition to window protection by means of a child resistant release mechanism
- where the floor below the window is 4 m or more above the surface beneath if the window other than in bedrooms of Class 2 and 3 buildings or Class 9b early childhood centres

The barriers must –

(i) permit a 125 mm sphere to pass through it; and
(ii) have any horizontal or near horizontal elements between 150 mm and 760 mm above the floor that facilitate climbing

Further review will be undertaken to ensure compliance as the design develops.

8.7. SLIP RESISTANCE

The requirements for slip resistance of stairway treads, ramp & landing surfaces are as follows when tested in accordance with AS4586:

Table D2.14 SLIP-RESISTANCE CLASSIFICATION

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

Nosing or landing edge strip	P3	P4

9. SERVICES AND EQUIPMENT

Please refer to Appendix B for a draft essential fire safety schedule.

9.1. FIRE HYDRANTS (BCA E1.3)

A system of Fire Hydrants is required to be provided in accordance with BCA Clause E1.3 and AS2419.1-2005.

The building is required to be provided with a booster assembly as part of the fire hydrant requirements. Where the booster is installed, the design must satisfy the following requirements:

- If the booster is affixed to the external wall of the building, it is required to be within sight of the main entrance. Further to this, it must be protected from the remainder of the building by construction achieving an FRL not less than 90/90/90 unless the building is protected by a sprinkler system in accordance with the BCA.
- If it is remote from the building, the booster is to be located at the 4main vehicle entry or with sight of the main entry of the building within 20m of a hardstand area. at the boundary of the site and be within sight of the main entrance of the building; (ii) adjacent to the principal vehicular access to the site; and (iii) located not less than 10 m from the external wall of any building served.
- Booster assemblies may be located between 3.5m to 10m of the building if it is protected by construction achieving an FRL of not less than 90/90/90; and construction extends not less than 1 m each side of the outermost fire hydrant booster risers within the assembly and is not less than 3 m wide; and extends to a height of not less than 2 m above finished ground level.

As the building is a large isolated building, a fire ring main is required. The fire pump location is satisfactory.

The fire services/hydraulic engineer is to confirm the required flow rates for the development and certify the system has been designed in accordance with BCA Clause E1.3 and AS2419.1-2005.

The fire hydrant booster assembly is located remote from the proposed building and does not comply with the requirements of AS2419.1-2005 and must be addressed through a performance-based solution

9.2. FIRE HOSE REELS

A Fire Hose Reel System is required to BCA Clause E1.4 and AS2441-2005.

Fire hose reels must be located adjacent to internal fire hydrants other than those located with fire isolated exits. Where coverage cannot be achieve, further fire hose reels are to be located within 4m of exits. Where these are exhausted and coverage is not yet achieved, additional fire hose reels shall be located internally as required to provide coverage. Fire hose reel coverage within the building based on a 36m hose length and 4m of water spray.

Fire hose reel cupboards must not contain any other services such as water meters, etc., and doors to fire hose reel cupboards are not to impede the path of egress.

Fire Hose reel are not to extend through Fire Walls except as prescribed by the BCA being:

- Doorways opening into areas separated from the remainder of the building for the following purposes:
  - separating equipment or electrical supply systems (C2.12 & C2.13)
  - openings in shafts (C3.13)

Pumps and Water Storage facilities are only required where pressure and flows cannot be achieved in accordance with clause 6.1 of AS2441-2005.

The hose reels have not been indicated on the plans to verify if their locations are compliant and to assess hose reel coverage.

The fire services/hydraulic engineer is to confirm the required flow rates for the development and certify the system has been designed in accordance with BCA Clause E1.4 and AS2441-2001.

9.3. AUTOMATIC SPRINKLER PROTECTION (BCA E1.5)

Automatic sprinkler protection is required to Specification E1.5 and AS2118.1-2017 to the following areas:

- Throughout the entire building if it is classified as large isolated under BCA Clause C2.3;
- Throughout any Class 7a car park (other than open deck car parks) containing accommodation for more than 40 vehicles;
- Throughout any fire compartment that exceeds 2,000m^2 in floor area or 12,000m^3 in volume where occupancies of excessive hazard are proposed

The sprinkler system shall be connected to and activate an occupant warning system complying with BCA Specification E2.2a.

The fire services/hydraulic engineer is to confirm the required flow rates for the development and certify the system has been designed in accordance with BCA Clause E1.5, Spec. E1.5 and AS2118.1-2017.

Details of the proposed sprinkler system design will need to be reviewed as the design develops.

9.4. FIRE EXTINGUISHERS (BCA E1.6)

The provision of portable fire extinguishers is required to comply with BCA Clause E1.6 and AS2444 – 2001.

Table E.6 details when portable fire extinguishers are required:

Occupancy Class	Risk Class (as defined in AS 2444)
General provisions – Class 2 to 9 buildings (except within sole-occupancy units of a Class 9c building)	a) To cover Class AE or E fire risks associated with emergency services switchboards. (Note 1) b) To cover Class F fire risks involving cooking oils and fats in kitchens. c) To cover Class B fire risks in locations where flammable liquids in excess of 50 litres are stored or used (not excluding that held in fuel tanks of vehicles). d) To cover Class A fire risks in normally occupied fire compartments less than 500m^2 not provided with fire hose reels (excluding open deck carparks). e) To cover Class A fire risks in classrooms and associated schools not provided with fire hose reels. f) To cover Class A fire risks associated with Class 2 or 3 building or class 4 part of building.
Specific provisions (in addition to general provisions) – a) Class 9a health care building b) Class 3 parts of detention and correctional occupancies	To cover class A and E fire risks. (Note 2)

Occupancy Class	Risk Class (as defined in AS 2444)
c) Class 3 accommodation for children, aged persons and people with disabilities d) Class 9c building	

Fire extinguishers are to be located in accordance with AS 2444 - 2001, often collocated with fire hydrants and/or fire hose reels.

9.5. SMOKE HAZARD MANAGEMENT (BCA E2.2)

The following Smoke hazard management systems are to be provided:

- Automatic Smoke Exhaust System activated by Automatic Smoke Detection & Alarm System in accordance with the requirements of BCA Spec E2.2a and AS1670.1-2018
- Automatic Smoke Detection and Alarm System in accordance with the requirements of BCA Spec E2.2a and AS1670.1-2018;
- Automatic Pressurisation to Fire Isolated Exits in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1 (Refer to comments in Clause D1.7)

A fire indicator panel is required as part of the detection system. This panel is to be located within 4m of the main entry and should be incorporated within the fire control centre. Any variation to the prescriptive provisions will require a performance-based solution prepared by an accredited fire engineer to verify the performance requirements of the BCA.

The smoke hazard management system is to be rationalised on a performance-based solution as advised by the design team. The automatic smoke exhaust system (Spec E2.2b) with a rationalised extraction rates activated by a smoke detection complying with Clause 6 of E2.2a.

Please confirm if jet fans will be proposed within the car park or will it be naturally ventilated as part of design development.

9.6. LIFT SERVICES (BCA E3.4 AND BCA E3.6)

The passenger lifts to be installed are to be:-

- Fitted with warning signs in accordance with Clauses E3.3 & Figure E3.3 of the BCA
- Fitted with fire service controls in accordance E3.7, E3.9 and E3.10 of the BCA.
- Stretcher facilities are to be provided within the lifts with minimum dimensions of 600m wide, 2000mm long and 1400mm high;
- Be provided with the following in order to satisfy accessibility requirements:
  - A handrail in accordance with AS1735.12-1999,
  - Minimum internal floor dimensions of 1400 x 1600mm for lifts which travel more than 12m, or 1100 x 1400mm for lifts which travel not more than 12m,
  - Fitted with a series of door opening sensory devices which will detect a 75mm diameter or across the door opening between 50mm and 1550mm above floor level,
  - Have a set of buttons for operating the lift located at heights above level complying with AS1735.12 - 1999
  - For lifts serving more than 2 levels, automatic audible information within the lift car identifying the level each time the car stops, and audible and visual indication at each lift landing to indicate the arrival of a car

9.7. EXIT SIGNS AND EMERGENCY LIGHTING (BCA E4.2 AND BCA E4.5)

Emergency Lighting and Exit Signs indicating exit location paths of travel to exits to be provided in accordance with BCA Part E4 and AS/NZS 2293.1-2018.

A performance solution will be required to address the location of exit signs above 2.7m from the FFL.

Please provide detailed plans prepared by a qualified electrical engineer for review.

9.8. Fire Control Centre (BCA E1.8)

As the Class 6, 7, 8 or 9 building contains a floor area of greater than 18,000m^2, a fire control centre is required in accordance with BCA Specification E1.8.

The proposed Fire Control Room location is to be shown on the plans to verify compliance with clauses 1 to 6 of Specification E1.8.

Due to the nature of the proposed development, the following will need to be addressed in a performance solution:

1. The location of the FCC to serve a building containing 10 tenancies
2. The FCC located within a room, which does not strictly comply with the provisions of Spec E1.8 of the BCA.
3. Two indicative locations have been proposed as options at this stage pending FRNSW consultation. One location is nominated to be located within a room/building remote from the primary Warehouse Building.

9.9. Fire Precautions During Construction (BCA E1.9)

After the building has reached an effective height of 12m, the following fire services are required to be operational:

- Required fire hydrants and fire hose reels on every storey covered by the roof/floor structure (except the 2 uppermost storeys); and
- Booster connections installed.

Prior to the commencement of construction, the builder must nominate a date for inspection of these services in accordance with the construction programme. Once the inspection has been carried out, the licenced plumber will need to certify the installation of the systems to the appropriate standards.

10. Health and Amenity

10.1. Waterproofing of wet areas in buildings

In a Class 2 and 3 building and a Class 4 part of a building, building elements in wet areas must — be water resistant or waterproof in accordance with Table F1.7; and comply with AS 3740.

In a Class 5, 6, 7, 8 or 9 building, building elements in the bathroom or shower room, a slop hopper or sink compartment, a laundry or sanitary compartment must — be water resistant or waterproof in accordance with Table F1.7; and comply with AS 3740 as if they were in a Class 2 or 3 building or a Class 4 part of a building

Where urinals are proposed, the design and installation must comply with the provisions of F1.7.

Detailed design is to be submitted, highlighting the wet areas, for further review as part of the design development.

10.2. Sanitary Facilities (BCA F2.2 and BCA F2.3)

The following provisions are required:

Class 5 Offices and Class 7 and 8 parts.

Separate sanitary facilities are required to be provided for male & female employees at a rate tabulated in Table F2.3 of the BCA. An assessment of required vs provided number of sanitary facilities will be carried out once the population number of each part of the building is verified.

Note –

1. *Interpretation: Required unisex accessible facilities, construction in accordance with AS1428.1-2009, provided for people with disabilities may be counted once for each sex.*
2. *Interpretation: WC's may be used in place of Urinals.*

Bathroom Construction

Where bathrooms or rooms containing water closets have the WC within 1200mm of the doorway, the door shall be either sliding, open outwards, or be provided with removable hinges.

An accessible unisex sanitary compartment must contain a closet pan, washbasin, shelf or bench top, adequate means of disposal of sanitary products and comply with AS1428.1-2009

Detailed designs will need to be for review of the construction of the sanitary facilities.

10.3. LIGHT AND VENTILATION (BCA PART F4)

Class 5, 6, 7, 8 & 9

Natural Ventilation is required to be provided to rooms at a rate of 5% of the floor area in openings. Alternatively, mechanical ventilation is required in accordance with AS1668.2-2012

Artificial lighting complying with AS/NZS1680.0-2009 is to be incorporated with the final detailed design to be developed to confirm this.

These provisions also apply to areas considered as occupiable outdoor areas.

10.4. WEATHERPROOFING (BCA FP1.4)

Performance Requirement FP1.4 which relates to the prevention of the penetration of water through external walls, must be complied with. It is noted that there are no Deemed-to-Satisfy Provisions for this Performance Requirement in respect of external walls.

As such, a performance solution is to be prepared by a suitably qualified professional that demonstrates that the external walls of the proposed building complies with Performance Requirement FP1.4 which reads as follows:

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

a) unhealthy or dangerous conditions, or loss of amenity for occupants; and
b) undue dampness or deterioration of building elements.

10.5. INTERNAL AND EXTERNAL WET AREAS (BCA F1.4 & F1.7)

<u>External above Ground Membranes</u>

All external above ground areas (roof slabs, balconies etc.) shall be protected by a waterproofing system in accordance with AS4654 Parts 1 and 2 – 2012.

Pursuant to AS4654, vertical termination height of waterproofing membrane applied to external balconies must comply with the table below dependant in accordance with the wind class of the site:

Wind Class Regions A & B	Wind Class Regions C & D	Ultimate Limit State Wind Speed	Termination Height (mm)

N1	-	34	40
N2	-	40	50
N3	C1	50	70
N4	C2	61	100
N5	C3	74	150
N6	C4	86	180

Note – The wind class is determined by the registered structural engineer.

Wet Areas

Internal wet areas throughout the development (e.g. bathrooms, laundries) shall be waterproofed in accordance with AS3740 - 2010 requirements.

Further review will be undertaken as the design develops with respect to the specification of waterproofing membrane, provision of water-stops at doorways etc.

10.6. STORMWATER DRAINAGE

Stormwater drainage systems serving the building are to comply with AS3500.3 - 2018.

The use of a syphonic stormwater drainage system has been adopted by the latest version Australian Standards. Should any part of the proposed design not satisfy the requirements of AS3500.3-2018, this will need to be addressed in a performance solution documented by the accredited hydraulic engineer, addressing the system compliance against BCA Performance Requirements FP1.2 & FP1.3.

11. ENERGY EFFICIENCY

11.1. SECTION J (JP1 ENERGY USE)

Efficient energy use must be achieved appropriate to variables listed within this performance requirement. To achieve this JV1, JV2, JV3 and JV4 verification methods have been introduced as options available to achieve compliance.

It is noted that a deemed to satisfy pathway is still available.

The proposed site will be located in a climate zone 5.

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

Verification Methods

The Verification Methods available to demonstrate compliance with the BCA on a performance basis are as follows:

JV1 NABERS Energy for Offices

- To achieve compliance with JP1 a class 5 building must achieve a minimum of 5.5 NABERS Energy for Offices Base Building Commitment Agreement and comply with ANSI/ASHRAI Standard 140.
- To achieve the energy model for (JP1 (i)) solar radiation the base buildings greenhouse gas emissions are not more than 67% of the 5.5 star level when excluding:
  - Tenant supplementary heating; and
  - Cooling systems; and

- External lighting; and
- Car park services.
- A thermal comfort level between predicted mean vote of -1 to +1 is achieve across not less than 95% of the floor area of all occupied zones for not less than 98% f annual hours of operation.

- The building also need to comply with additional requirements of Spec JVa.

JV2 Green Star

- To achieve compliance with JP1 for Class 3,4,5,6, 7, 8, 9 and common area of Class 2 buildings Green Star can be used as a verification method when the calculation method complies with ANSI/ASHRAE Standard, Specification JVb and when:
  - The building complies with simulation requirements and is registers for a Green Star – Design & As-Built rating; and
  - The annual greenhouse gas emissions of the proposed building are less than 90% of the annual greenhouse gas emissions of the reference building; and
  - In the proposed building, a thermal comfort level of between predicted mean vote of -1 to +1 is achieve across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation of the building; and
  - The building complies with the additional requirements of Specification JVa.

JV3 Verification Using a Reference Building

- To achieve compliance with JP1 for Class 3,4,5,6, 7, 8, 9 and common area of Class 2 buildings verification using a reference building can be used when the calculation method complies with ANSI/ASHRAE Standard, Specification JVb and when:
  - It is determined that the annual greenhouse gas emissions of the proposed building are not more than the annual greenhouse gas emissions of a reference building when the proposed building is modeled with the proposed services and the proposed building is modelled with the same services as the reference building. The proposed building thermal comfort level is to be between predicted mean vote of -1 to +1 across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation; and
  - The building achieves the additional requirements in Specification JVa; and
  - The greenhouse gas emissions of the proposed building may be offset by renewable energy generated and use on site and another process such as reclaimed energy used on site.

JV4 Building Envelope Sealing – demonstrating compliance with JP1(e)

- Compliance with sealing of the building against air leakage is verified when the envelope is sealed at an air permeability rate tested in accordance with Method 1 of AS/NZS ISO 9972, of not more than –
  - For a class 2 building or a class 4 part of a building, 10m³hr.m² at 50 Pa reference pressure; or
  - For a class 5, 6, 8, 9a or 9b building other than a ward area in climate zones 1, 7 and 8, 5 m³/hr.m² at 50 Pa reference pressure; or
  - For class 3 or 9c building, or a class 9a ward area in climate zones 1, 3, 4, 6, 7 and 8 5m³/hr.m² at 50 Pa reference pressure.
- Compliance with JP1 (e) can also be achieved through DTS provisions of Part J3 or a performance solution that uses one of the other NCC assessment Methods.

11.2. BUILDING FABRIC (PART J1)

Roof and Ceiling Construction (Part J1.3)

For a deemed-to-satisfy solution roofs and or ceilings are to be constructed to provide a total R-Value greater than or equal to-

(iii) in climate zones 1, 2, 3, 4 and 5, R3.7 for a downward direction of heat flow; and
(iv) in climate zone 6, R3.2 for a downward direction of heat floor; and
(v) in climate zone 7, R3.7 for an upward direction of heat flow; and
(vi) in climate zone 8, R4.8 for an upward direction of heat flow;

In climate zones 1, 2, 3, 4, 5, 6 and 7, the solar absorptance of the upper surface of a roof must be not more than 0.45.

To achieve compliance with J0.2 (c) a roof that has a metal sheet roofing fixed to metal purlins, metal rafters or metal battens and does not have a celling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens must have a thermal break. The thermal break to be consisting of a material with a R-Value of not less than R0.2, installed at all points of contact between the metal sheet roofing and its supporting metal purlins, metal rafters or metal battens.

Roof lights (Part J1.4)

Where roof lights are installed they must have :-

(a) a total area of not more than 5% of the floor area of the room or space served; and
(b) transparent and translucent elements, including any imperforate ceiling diffuser, with a combined performance of:-
  (i) for Total system SHGC, in accordance with the below table; and
  (ii) for Total system U-value, not more than U3.9;

Roof light shaft index (see Note 1)	Total area of roof lights up to 3.5% of the floor area of the room or space	Total area of roof lights more than 3.5% and up to 5% of the floor area of the room or space
Less than 1.0	Not more than 0.45	Not more than 0.29
1.0 to less than 2.5	Not more or equal to than 0.51	Not more than 0.33
Greater than 2.5	Not more than or equal to 0.76	Not more than 0.49

External Walls and Glazing (Part 1.5)

For walls and glazing construction the total system U-value must not be greater than-

(i) for a Class 2 common area, a Class 5, 6, 7, 8 or 9b building other than a ward area, U2.0; and
(ii) for a Class 3 or 9c building or a Class 9a ward area –
  (a) in climate zones 1, 3, 4, 6 or 7, U1.1; or
  (b) in climate zones 2 or 5, U2.0; or
  (c) in climate zones 8, U0.9;

The total system U-value of wall-glazing construction should be calculated in accordance with Specification J1.5a.

Wall components of the wall-glazing construction must achieve a minimum total R-Value of R1.0 where the wall is less 80% if the area and reflect the value specified in Table J1.5a where the wall is *0% or more of the area.

There are further design parameters for display glazing and solar admittances for wall-glazing construction, both of which should comply with the relevant provisions of J1.5.

To achieve compliance with J0.2 (c) a wall that does not have a wall lining or has a wall lining that is fixed directly to the same metal frame and has a lightweight external cladding such as weatherboards, fibre-cement or metal sheeting fixed to a metal frame must have a thermal break. The thermal break is to consist of a material with an R-Value of not less than R.02, installed at all points of contact between the external cladding and metal frame.

Floors (Part J1.6)

Climate Zone 5 – Table J1.6 requires floors with out an in-slab heating or colling system to achieve a total R-value of 2.0, and for a floor with an in-slab heating or cooling system to achieve a total R-value of 3.25.

11.3. BUILDING SEALING (PART J3)

Application of Part (J3.1)

The Deemed-to-Satisfy Provisions of this Part J3 do not apply to a building or space where

- the mechanical ventilation required by Part F4 provides sufficient pressurisation to prevent infiltration; or
- parts of buildings that cannot be fully enclosed.

Windows and Doors (J3.4)

a) A door, openable window or the alike must be sealed –
   (i) When forming part of the envelope; or
   (ii) In climate zones 4,5,6,7 or 8
b) The requirements of (a) do not apply to –
   (i) A window complying with AS2047; or
   (ii) A fire door or smoke door; or
   (iii) A roller shutter door, roller shutter grille or other security door or device installed only for out of house security
c) A seal to restrict air infiltration –
   (i) For the bottom edge of a door, must be draft protection device; and
   (ii) For the other edged of a door or the edges of an openable window or other such opening, may be a foam or rubber compression strip, fibrous seal or the like.
d) An entrance to a building, if leading to a conditioned space must have an airlock, self-closing door, rapid roller door, revolving door or the like, other than –
   (i) When the conditioned space has a floor area of not more than 50m²; or
   (ii) Where a café, restaurant, open front shop or the like has –
      (A) A 3m deep un-conditioned zone between the main entrance, including an open front, and the conditioned space; and
      (B) At all other entrances to the café, restaurant, open front shop or the like, self-closing doors.
   (iii) A loading dock entrance, if leading to a conditioned space, must be fitted with a rapid roller door or the like

Exhaust fans (Part J3.5)

An exhaust fan must be fitted with a sealing device such as a self-closing damper or the like when serving a conditioned space or a habitable room in climate zones 4, 5, 6, 7, or 8.

Construction of ceilings, walls and floors (Part J3.6)

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

Ceilings, walls, floors and any openings such as a window frame, door frame, roof light frame or the like must be constructed to minimise air leakage in accordance with the below when forming part of –

(i) The envelope; or
(ii) In climate zones 4, 5, 6, 7 or 8

Construction required by above must be –

(iii) Enclosed by internal lining systems that are close fittings at ceiling, wall and floor junctions; or
(iv) Sealed at junctions and penetrations with –
  (A) Close fitting architrave, skirting or cornice; or
  (B) Expanding foam, rubber compressible strip, caulking or the like

The above does not apply to openings, grilles or the like required for smoke hazard management.

Evaporative coolers (Part J3.7)

An evaporative cooler must be fitted with a self-closing damper or the like –

(a) When serving a heated space; or
(b) In climate zones 4,5,6,7 or 8.

11.4. AIR CONDITIONING AND VENTILATION SYSTEMS (PART J5.0)

Air conditioning and ventilation systems must be designed to comply with the following provisions:

- Be capable of being deactivated when the building or part of a building being served by that system is not occupied;
- Where motorised dampers are in place, they should close when the system is deactivated
- Where serving a sole-occupancy unit in a Class 3 building, must not operate when any external door of the sole-occupancy unit that opens to a balcony or the like, is open for more than one minute;
- Time switches should be provided to control an air-conditioning system of more than 2kWr and a heater of more than 1kW $_{heating}$ used for air-conditioning, and be capable of switching electric power on and off at variable pre-programmed times on variable pre-programmed days.
- Ductwork and fittings in an air-conditioning system should have insulation complying with AS/NZS 4859.1 and have an insulation R-Value greater than or equal to:-
  - for flexible ductwork R1.0; or
  - for cushion boxes, that of the connecting ductwork; or
  - That specified in Table J5.5

Table J5.5

Location of ductwork and fittings	Climate zone 5
Within a conditioned space	1, 2
Where exposed to direct sunlight	3.0

All other locations	2.0

Mechanical:

- Be capable of being deactivated where the building or part of the building served by that system is not occupied
- Time switches must be provided to a mechanical ventilation system with an air flow rate of more than 1000 L/s, capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days;

Heaters

A heater used for air-conditioning or as part of an air-conditioning system must be a either a solar heater, gas heater, heat pump heaters, a heater using reclaimed heat or an electric heater.

A gas water heater, that is used as part of an air-conditioning system must:-

(i) if rated to consume 500 MJ/hour of gas or less, achieve a minimum gross thermal efficiency of 86% ; or
(ii) If rated to consume more than 500 MJ/hour of gas, achieve a minimum gross thermal efficiency of 90%

Refrigerant chillers

An air-conditioning system refrigerant chiller must comply with MEPS and the full load operation energy efficiency ratio and integrated part load energy efficiency ratio laid out under clause J5.10 of the BCA when determined in accordance with AHRI 551/591

Unitary air-conditioning equipment

Unitary air-conditioning equipment including packaged air-conditioners, split systems, and variable refrigerant flow systems must comply with MEPS and for a capacity greater than or equal to 65 kWr –

(a) Where water cooled, have a minimum energy efficiency ratio of 4.0 W_r/ $W_{input\ power}$ for cooling when tested in accordance with AS/NZS 3823.1.2 at test condition T1, where input power includes both compressor and fan input power; or
(b) Where air cooled, have a minimum energy efficiency ratio of 2.9 W_r / $W_{input\ power}$ for cooling when tested in accordance with AS/NZS 3823.1.2 at test condition T1, where input power includes both compressor and fan input power.

11.5. ARTIFICIAL LIGHTING AND POWER (PART J6)

Interior Artificial Lighting and Power Control (Part J6.2 & 6.3)

In a building other than a sole-occupancy unit of a Class 2 building or a Class 4 building for artificial lighting, the aggregate design illumination power load must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum illumination power density below:-

The maximum illumination power density;

Stairways, including fire-isolated stairways	2W/m^2
Toilet, locker room, staff room, rest room or the like	3W/m^2
Lift cars	3W/m^2
Service area, cleaner's room and the like	3W/m^2
Control room, switch room or the like	
(A) intermittent monitoring	3W/m^2
(B) Constant monitoring	4.5W/m^2

Plant room:	
(A) Where an average of 160 lx vertical illuminance is required on a vertical panel such as in switch rooms	4W/m^2
(B) With a horizontal illuminance target of 80 lx	2W/m^2
Library:	
(A) Stack & shelving area	2.5W/m^2
(B) Reading room & general areas	4.5W/m^2
Office:	
(A) Artificially lit to an ambient level of 200 lx or more	4.5W/m^2
(B) Artificially lit to an ambient level of less than 200 lx	2.5W/m^2
Corridors:	5W/m^2
Storage	1.5W/m^2
Kitchen and food preparation area:	4W/m^2
Car parks:	
(A) General	2W/m^2
(B) Entry zone (first 15m of travel during the daytime	11.5W/m^2
(C) Entry zone (next 4m of travel) during the day	2.5W/m^2
(D) Entry zone (first 20m of travel) during nighttime	2.5W/m^2

Artificial Lighting must be controlled by a time switch, other control device or a combination of both.

Each light control in a building must not operate lights within an area of more than;

- Not operate lighting for an area more than -
  a) 250m^2 for a space of not more than 2000m^2;
  b) 1000m^2 for a space of more than 2000m^2

  if in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building;
- 1000m^2 for a space of more than 2000m^2

<u>Interior decorative and display lighting</u>

Interior decorative and display lighting, such as for a foyer mural or art display, must be controlled -

- Separately from other artificial lighting; and
- By a manual switch for each area other than when operating times of the displays are the same in a number of areas (e.g. where in a museum) in which case they may be combined; and
- By a time switch in accordance with Specification J6 where the display lighting exceeds 1 kW

Window display must be controlled separately from other display lighting exceeds 1kW.

<u>Exterior artificial lighting</u>

Artificial lighting attached to or directed at the façade of the building if it exceeds a total of 100W must;

- Use LED luminaires for 90% of the total lighting load; or
- Be controlled by a motion detector in accordance with Specification J6 of the BCA;
- When used for decorative purposes, such as façade lighting or signage lighting, have a separate switch in accordance with Specification J6.

Lifts (Part 6.7)

Lifts must be configured to ensure artificial lighting and ventilation in the car are turned off when it is unused for 15 minutes and achieve the idle and standby energy performance level required, and the energy efficiency class under J6.7 of the BCA.

11.6. HEATED WATER SUPPLY AND SWIMMING POOL AND SPA POOL PLANT (PART 7)

Heated water supply (Part J7.2)

A heated water supply system for food preparation and sanitary purposes must be designed and installed in accordance with Part B2 of NCC Volume Three — Plumbing Code of Australia.

12. ACCESS FOR PEOPLE WITH DISABILITIES

The development is required to comply with the accessibility provisions contained within:

- The Building Code of Australia 2019 Amendment 1;
- Disability (Access to Premises – Buildings) Standards 2010;
- AS1428.1-2009 General Requirements for Access – New Building Work;
- AS1428.4.1 -2009 Tactile Ground Surface Indicators
- AS2890.6-2009 Car Parking for People with Disabilities

Note: With the introduction of the Commonwealth *Disability Discrimination Act (DDA)* in 1992 (enacted in 1993), all organisations have a responsibility to provide equitable and dignified access to goods, services and premises used by occupants. Organisations and individuals since its introduction, are required to work to the objects of the Act which are to eliminate, as far as possible, discrimination against persons on the ground of disability in the **areas of work, accommodation, education, access to premises, clubs and sports, and the provision of goods, facilities, services and land, existing laws and the administration of Commonwealth laws and programs.**

This report assesses against the requirements contained with the Building Code of Australia (and documents referred to therein) and is not considered to be a full assessment against the Disability Discrimination Act.

12.1. GENERAL BUILDING ACCESS REQUIREMENTS (BCA D3.1)

Access for people with disabilities shall be provided to and within the building in accordance with the requirements of Clause D3.2, D3.3 and D3.4 of the BCA 2019 Amdt 1 and AS 1428.1. Parts of the building required to be accessible shall comply with the requirements of:-

- AS1428.1-2009 General Requirements for Access – New Building Work;
- AS1428.4.1 -2009 Tactile Ground Surface Indicators
- AS2890.6-2009 Car Parking for People with Disabilities

Access for persons with a disability is to be provided as follows:

<u>Office/shops (Class 5/Class 6 buildings)</u>

To and within all areas normally used by the occupants

<u>Car parks (Class 7a buildings)</u>

To and within any level containing accessible car parking spaces.

<u>Warehouse and production/Manufacturing facilities</u>

To and within all areas normally used by the occupants, but as the uses of these areas could be deemed inappropriate, confirmation is required as the appropriateness of the areas in question by the owners or tenant.

Where a ramp or a lift complying withAS1428.1 is provided, to and within all areas of the level served by the lift or ramp.

12.2. EXEMPTIONS (D3.4)

Exemption provisions are provided, and requests may be submitted for the approval of the registered certifier for any areas associated with the following:

(a) An area where access would be inappropriate because of the particular purpose for which the area is used.
(b) An area that would pose a health or safety risk for people with a disability.
(c) Any path of travel providing access only to an area exempted by (a) or (b)

Proposals for exemptions must be submitted through an accredited access consultant demonstrating compliance with the requirements of this provision for further review.

12.3. PROVISION FOR ACCESS TO BUILDINGS

Clause D3.2 of the BCA prescribes access to be provided to and within the building as follows:

- From the main points of a pedestrian entry at the allotment boundary; and
- From any required accessible carparking space on the allotment; and
- From another accessible building connected by a pedestrian link; and
- Through the principle pedestrian entry and through not less than 50% of all pedestrian entrances; and
- in a building with a total floor area more than 500 m2, a pedestrian entrance which is not accessible must not be located more than 50 m from an accessible pedestrian entrance,

Where a pedestrian entry contains multiple doors, the following is required;

- Entrance containing not more than 3 doors, at least one of the doorways must be accessible.
- Where an entrance contains more than 3 doors, not less than 50% of the doorways must be accessible.

A door is considered to be accessible if it is automatic (open and closing) or is more than 850mm in clear opening width and contains the required door circulation space.

12.4. ACCESSIBILITY WITHIN BUILDING (BCA D3.3)

A building required to be accessible is required to be equipped with either a AS1428.1 compliant lift or AS1428.1 compliant ramp, (but the maximum vertical rise of a ramp must not exceed 3.6m).

Within the building the following are required;

- Door circulation space as per AS1428.1 Clause 13.3
- Doorways must have a clear opening of 850mm;
- Passing spaces (1.8m wide passages) must be provided at maximum of 20m intervals
- Within 2.0m of end access ways/corridors, turning areas spaces are required to be provided.
- Carpet pile height of not more than 11mm to an adjacent surface and backing <4mm
- Any glazing capable of being mistaken for a doorway or opening must be clearly marked (or contain chair rail, hand rail or transom as per AS 1288 requirements)

The design would generally comply with the prescriptive provisions of the BCA with additional ongoing review being undertaken as to door widths, circulation, etc. Further details are to be provided or access to these areas is to be assessed by an access consultant.

12.5. CAR PARKING (BCA D3.5)

Accessible car parking spaces are required to comply with AS 2890.6-2009 at the rate of 1 space for every 100 carparking spaces or part thereof.

- The ground floor carpark is proposed to contain 104 car parking spaces which requires a minimum of 2 accessible spaces.
- The ground mezzanine carpark is proposed to contain 12 car parking spaces which requires a minimum of 1 accessible spaces.
- The Level 1 office access is proposed to contain 74 car parking spaces which requires a minimum of 1 accessible spaces.

A 'shared zone' of minimum 5400mm x 2400mm is required adjacent to accessible car parking spaces, protected with a bollard.

12.6. TACTILE INDICATORS (BCA D3.8)

Tactile indicators are required to be provided to warn occupants of all stairs (except Fire Isolated stairs) and ramps regardless of public nature or private environment and where an overhead obstruction occurs less than 2.0m above the finished floor level.

12.7. STAIRS (BCA D3.3 INTER ALIA AS1428.1)

Stairs shall be constructed as follows:

a) Where the intersection is at the property boundary, the stair shall be set back by a minimum of 900mm so that the handrail and TGSIs do not protrude into the transverse path of travel.
b) Where the intersection is at an internal corridor, the stair shall be set back one tread width plus 300mm (nominally 700mm as per AS 1428.1-2009 Fig 26(b)), so the handrails do not protrude into transverse path of travel.
c) Stairs shall have opaque risers.
d) Stair nosing shall not project beyond the face of the riser and the riser may be vertical or have a splay backwards up to a maximum 25mm.
e) Stair nosing profiles shall;
    - Have a sharp intersection;
    - Be rounded up to 5mm radius; or
    - Be chamfered up to 5mm x 5mm
f) All stairs, including fire isolated stairs shall, at the nosing of each tread have a strip not less than 50mm and not more than 75mm deep across the full width of the path of travel. The strip may be set back a maximum of 15mm from the front of the nosing. The strip shall have a minimum luminance contrast of 30% to the background. Where the luminous contrasting strip is affixed to the surface of the tread, any change in level shall not exceed a difference of 5mm.

12.8. ACCESSIBLE SANITARY FACILITIES (BCA F2.4)

Unisex Accessible Sanitary Facilities

An accessible unisex sanitary facility must be located so that it can be entered without crossing an area reserved for one sex only and provided in accordance with AS 1428.1-2009 and must contain a closet pan, washbasin, shelf or bench top and adequate means of disposal of sanitary products and as per following.

Building Type	Minimum accessible unisex sanitary compartments to be provided
Office, industrial, assembly building, schools, health care except for within a ward area of a Class 9a health-care building	a) 1 on every storey containing sanitary compartments; and b) Where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments, at not less than 50% of those banks.

Ambulant Facilities

At each bank of toilets where there is one or more toilets in addition to an accessible unisex sanitary compartment, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS 1428.1-2009 must be provided for use by males and females.

Where male sanitary facilities are provided at a separate location to female sanitary facilities, accessible unisex sanitary facilities are only required at one of those locations.

An accessible unisex sanitary compartment or an accessible unisex shower need not be provided on a storey or level that is not provided with a passenger lift or ramp complying with AS 1428.1-2009

12.9. SIGNAGE (BCA D3.6)

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

- Sanitary Facility Identification Signs (note that they are to comply with BCA Specification D3.6 and include the use of Braille, Tactile, etc and be placed on the wall on the latch side of the facility);
- Directional / Way Finding signs to the Lifts, Sanitary Facilities, etc;
- Hearing Augmentation System;
- Identify each door required by BCA Clause E4.5 to be provided with an exit sign, stating ‘EXIT’ and ‘Level” number
- Braille and tactile signs must be illuminated to ensure *luminance contrast* requirements are met at all times during which the sign is required to be read.

12.10. LIFTS (BCA E3.6)

Lifts compliant to BCA E3.6 and BCA E3.7 must be provided, where required to be provided, with a minimum size of 1400 x 1600mm or 1100mm x 1400mm (whichever is appropriate) in size – with appropriate handrails and auditory commands.

13. Appendix A - Reference Documentation

The following documentation was used in the assessment and preparation of this report:

Drawing No.	Title	Issue	Date	Revision
DA000	Coverpage	DA	21.04.2022	H
DA010	3D – 1	DA	21.04.2022	H
DA011	3D – 2	DA	21.04.2022	H
DA012	3D – 3	DA	21.04.2022	H
DA013	3D – 4	DA	21.04.2022	H
DA050	Site Analysis Plan & Summary	DA	21.04.2022	G
DA100	Ground Floor	DA	21.04.2022	J
DA101	Ground Floor Mezz Plan	DA	21.04.2022	E
DA102	Level 1 Office Access	DA	21.04.2022	E
DA103	Level 1	DA	21.04.2022	I
DA104	Roof Plan	DA	21.04.2022	E
DA105	Services/Constraints Plan	DA	21.04.2022	H
DA106	Services/Constraints Plan	DA	21.04.2022	I
DA107	GFA Plans	DA	21.04.2022	F
DA120	Offices – Ground 01-02	DA	21.04.2022	E
DA121	Offices – Ground 03-04	DA	21.04.2022	D
DA125	Offices – Level 1 – 05-06	DA	21.04.2022	D
DA126	Offices – Level 1 – 07-08	DA	21.04.2022	D
DA127	Offices – Level 1 – 09-10	DA	21.04.2022	D
DA130	Dock Offices	DA	21.04.2022	B
DA200	Elevations	DA	21.04.2022	F
DA300	Sections	DA	21.04.2022	H
DA301	Sections	DA	21.04.2022	D
DA310	Signage Details	DA	21.04.2022	B
DA350	Shadow Diagrams	DA	21.04.2022	D

14. APPENDIX B - DRAFT FIRE SAFETY SCHEDULE

No.	Measure	Standard of Performance
STATUTORY FIRE SAFETY MEASURES		
1.	Access Panels, Doors and Hoppers	BCA 2019 Amdt 1 Clause C3.13
2.	Automatic Fail Safe Devices	BCA 2019 Amdt 1 Clause D2.19 & D2.21
3.	Automatic Fire Detection and Alarm System	BCA 2019 Amdt 1 Spec. E2.2a & AS 1670.1 – 2018
4.	Automatic Fire Suppression System (sprinklers)	BCA 2019 Amdt 1 Spec. E1.5 & AS 2118.1 – 2017, AS 2118.6 – 2017 (Combined sprinkler & hydrant)
5.	Emergency Lighting	BCA 2019 Amdt 1 Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005 Amdt 1 & 2
6.	Exit Signs	BCA 2019 Amdt 1 Clauses E4.5, NSW E4.6 & E4.8 and AS/NZS 2293.1 – 2005 Amdt 1 & 2
7.	Fire Control Centres	BCA 2019 Amdt 1 Spec. E1.8
8.	Fire Dampers	BCA 2019 Amdt 1 Clause C3.15, AS/NZS 1668.1 – 2015 & AS 1682.1&2 - 1990
9.	Fire Doors	BCA 2019 Amdt 1 Clause C3.2, C3.4, C3.5 & C3.8, Spec C3.4 and AS 1905.1 – 2015
10.	Fire Hose Reel Systems	BCA 2019 Amdt 1 Clause E1.4 & AS 2441 – 2005 Amdt 1
11.	Fire Hydrant Systems	BCA 2019 Amdt 1 Clause E1.3 & AS 2419.1 – 2005 Amdt 1
12.	Fire Seals protecting fire resisting components of the building	BCA 2019 Amdt 1 Clause C3.12, C3.15, C3.16 & AS 1530.4 – 2014
13.	Lightweight Construction	BCA 2019 Amdt 1 Clause C1.8, C3.17 & AS 1530.3 – 1999
14.	Mechanical Air Handling System (nominate installed systems here e.g. smoke exhaust system)	BCA 2019 Amdt 1 Clause E2.2, Spec. E2.2b, AS/NZS 1668.1 – 2015
15.	Perimeter Vehicular Access for emergency vehicles	BCA 2019 Amdt 1 Clause C2.4
16.	Portable Fire Extinguishers	BCA 2019 Amdt 1 Clause E1.6 & AS 2444 – 2001
17.	Warning and Operational Signs	EP&A Reg 2000 Clause 183, BCA 2019 Amdt 1 Clause C3.6, D2.23, E3.3
OTHER FIRE SAFETY MEASURES		
18.	Building Occupant Warning System	BCA 2019 Amdt 1 Spec. E1.5, BCA Spec. E2.2a & AS 1670.1 – 2015 – Clause 3.22
19.	Fire Collars protecting fire resisting components of the building	BCA 2019 Amdt 1 Clause C3.12, C3.15, C3.16 & AS 1530.4 – 2014
20.	Paths of Travel	EP&A (Development Certification and Fire Safety) Reg 2021 Clauses 108 & 109
21.	Required Exit Doors (power operated)	BCA 2019 Amdt 1 Clause D2.19
22.	Building Occupant Warning System	BCA 2019 Amdt 1 Spec. E1.5, BCA Spec. E2.2a & AS 1670.1 – 2015 – Clause 3.22

15. Appendix C – BCA Clause by Clause Assessment

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
Part B – Structural			
B1 – Structural Provisions			
B1.1	Resistance to Action	Further information required	Resistance of a building and structure must be designed to be greater than the most critical action effect resulting from different combinations of actions.
B1.2	Determination of individual Actions	Further information required	Structural engineers design plans to verify compliance with respect to design of buildings in cyclonic areas in addition to the requirements of AS1170.2.
B1.4	Determination of Structural resistance of materials and form of construction	Further information required	Structural resistance of materials and forms of construction must be determined in accordance with the requirements of this clause.
Specifications			
Spec B1.2	Design of buildings in Cyclonic Areas	Further information required	Structural engineers design plans to verify compliance with respect to design of buildings in cyclonic areas in addition to the requirements of AS1170.2.
Part C – Fire Resistance			
C1 - Fire Resistance			
C1.1	Type of Construction Required	Yes	Type A Construction to be adopted.
C1.2	Calculation of Rise in storeys	Yes	The warehouse on Level 1 has an average internal height of more than 6m and is therefore counted as 2 storeys.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
			The building has a rise in storeys of five (5).
C1.3	Buildings of Multiple classification	Yes	BCA Classification of: - Class 5 Office - Class 7a carpark Class 7b/8 storage/warehouse
C1.4	Mixed types of construction	Not Applicable	N/A
C1.5	Two storey Class 2, 3 or 9c buildings	Not Applicable	N/A
C1.6	Class 4 parts of buildings	Not Applicable	N/A
C1.7	Open Spectator stands and indoor sports stadiums	Not Applicable	N/A
C1.8	Lightweight Construction	Further information required	Compliance with Specification C1.8 is required if lightweight construction is used in a wall system that is required to have an FRL or for a lift shaft, stair shaft or service shaft or an external wall bounding a public corridor including a non-fire-isolated passageway or non-fire-isolated ramp. *Further information is required at the Construction Certificate stage where lightweight construction is used for the fire-resisting covering of a steel column or the like.*
C1.9	Non-combustible building elements	Further information required	In a building required to be of Type A construction, the following building elements and their components must be non-combustible: 1. External walls and common walls, including all components incorporated in them including the facade covering, framing and insulation. 2. The flooring and floor framing of lift pits. 3. Non-loadbearing internal walls where they are required to be fire-resisting.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
			4. A shaft, being a lift, ventilating, pipe, garbage, or similar shaft that is not for the discharge of hot products of combustion, that is non-loadbearing. *Further information is required at the Construction Certificate stage to verify the building elements and their components are non-combustible.*
C1.10 & *NSW Variation*	Fire Hazard Properties	Further information required	*The fire hazard properties of the following internal linings, materials and assemblies must comply with Specification C1.10 by way of test reports / certificates provided from a registered testing authority:* *1. Floor linings and floor coverings.* *2. Wall linings and ceiling linings.* *3. Air-handling ductwork.* *4. Lift cars.* *5. Sarking type materials.* *6. Attachments to floors, ceilings, internal walls and the internal linings of external walls.* *7. Other materials including insulation materials other than sarking type materials.* *Further information is required at the Construction Certificate stage to verify compliance with the requirements of this Clause and Specification C1.10.*
C1.11	Performance of external walls in fire	Not Applicable	The building will have a rise in storeys of more than two (2).
C1.13	Fire-Protected Timber: Concession	Not Applicable	Fire-protected timber is not proposed.
C1.14	Ancillary elements	Further information required	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 exempt from the requirements of
C2 - Compartmentation and Separation			
C2.1	Application of Part	Yes	Note.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
C2.2	General Floor area and volume limitations	No - Design Amendment or Performance Solution Required	Floor area and volume limitations of Table C2.2 are exceeded. The building is treated as a large-isolated building.
C2.3	Large isolated buildings	Further information required	The building is permitted to exceed 18000m^2 in floor area or 108000m^3 in volume if it is protected through with a sprinkler system complying with Spec. E1.5 and provided with a permitter vehicular access complying with C2.4(b).
C2.4	Requirements for open spaces and vehicular access	Further information required	Perimeter vehicular access required by this part – 1. Must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building. 2. Must have a minimum unobstructed width of 6 m with no part of its furthest boundary more than 18 m from the building and in no part of the 6 m width be built upon or used for any purpose other than vehicular or pedestrian movement; and 3. Must provide reasonable pedestrian access from the vehicular access to the building; and 4. Must have a load bearing capacity and unobstructed height to permit the operation and passage of fire brigade vehicles; and 5. Must be wholly with the allotment except that a public road complying with 1, 2, 3, and 5 may serve as the vehicular access or part thereof.
C2.5 & *NSW Variation*	Class 9a and 9c Buildings	Not Applicable	N/A
C2.6	Vertical Fire Separation of openings in external walls	Not Applicable	N/A

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
C2.7	Separation in fire walls	Further information required	Where fire walls are proposed to be provided to separate fire compartments, compliance with the requirements of this clause are to be incorporated into the plans.
C2.8	Separation of classifications in the same storey	Further information required	Each building element in that storey must have the higher FRL prescribed in Specification C1.1 for that element for the classifications concerned.
C2.9	Separation of classifications in different storeys	No - Design Amendment or Performance Solution Required	The floor between the adjoining parts must have an FRL of not less than that prescribed in Specification C1.1 for the classification of the lower storey. ***A performance solution will be provided by the fire safety engineer to rationalise the FRL of building elements from 240 to 120 mins.***
C2.10	Separation of Lift Shafts	Further information required	The enclosure walls of the lift shaft must achieve the relevant FRL prescribed by Spec. C1.1.
C2.11	Stairways and Lifts in one shaft	Not Applicable	N/A
C2.12	Separation of equipment	Further information required	Separation construction must have an FRL as required by Spec. C1.1 but not less than 120/120/120; and any doorway protected with a self-closing fire door having an FRL of not less than --/120/30.
C2.13	Electricity supply system	Further information required	The main switchboard located within the building which sustains emergency equipment operating in the emergency mode must be separated from any other part of the building by construction having an FRL of not less than 120/120/120 and have any doorway in the construction protected with a self-closing fire door having an FRL of not less than --/120/30. Provide confirmation if electrical conductors that supply a main switch board will be located within the building.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
C2.14	Public Corridors in Class 2 and 3 Buildings	Not Applicable	N/A
C3 – Protection of Openings			
C3.1	Application of Part	Yes	Note
C3.2	Protection of openings in external walls	Yes	Complies.
C3.3	Separation of openings in external walls and associated openings in difference fire compartments	Further information required	Based on a review, compliance appears to be achieved. Further review will be required as the design progresses.
C3.4	Acceptable methods of protection	Yes	Note. Method of protecting openings as called upon by other requirements in the BCA notably C3.2, C3.3, D1.7(c) etc.
C3.5	Doorways in fire walls	Not Applicable	N/A
C3.6	Sliding Fire doors	Not Applicable	N/A
C3.7	Protection of doorways in horizontal exits	Not Applicable	N/A
C3.8	Openings in fire-isolated exits	Further information required	Doorways that open to fire-isolated exits must be protected by --/60/30 except doorways opening to a road or open space.
C3.9	Service penetrations in fire isolated exits	Further information required	Services must not penetrate fire-isolated exits other than services permitted by this clause.
C3.10	Openings in fire-isolated lift shafts	Further information required	Doorways to a lift shaft must be protected by --/60/-- fire doors that comply with AS1735.11 and are set to remain closed except when discharging or receiving passengers, goods or vehicles.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
C3.11 & *NSW Variation*	Bounding construction: Class 2, 3 and 4 buildings	Not Applicable	N/A
C3.12	Openings in floors and ceilings for services	Further information required	Services massing through the fire-resisting floor must be protected by a shaft complying with Spec. C1.1 or in accordance with C3.15.
C3.13	Openings in shafts	Further information required	Openings in shaft must be protected in accordance with the requirements of this clause.
C3.14	*********	Not Applicable	-
C3.15	Openings for service installations	Further information required	Where an electrical, electronic, plumbing, mechanical ventilation, air-conditioning or other service penetrates a building element (other than an external wall or roof) that is required to have an FRL with respect to integrity or insulation or a resistance to the incipient spread of fire, that installation must comply with the requirements of this clause.
C3.16	Construction joints	Yes	Compliance required.
C3.17	Columns protected with lightweight construction to achieve an FRL	Further information required	Compliance required.
Specifications			
Spec C1.1	Fire-Resisting Construction	No - Design Amendment or Performance Solution Required	The building is required to be constructed in accordance with the relevant provisions of Specification C1.1 of the BCA applicable to Type A Construction. The following concessions are afforded to the proposed development by Spec 1.1:

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
			1. A roof need not comply with Table 3 if its covering is non-combustible and the building has a sprinkler system complying with Spec. E1.5 installed throughout. 2. If the roof is constructed without an FRL in accordance with the concession above: a. in the storey immediately below that roof, internal columns and internal walls may have an FRL of 60/60/60. The structural columns in the storey immediately below the roof will not achieve the required FRL of 60/60/60 and will need to be addressed by a performance-based solution prepared by a suitably qualified fire engineer. b. Skylights, which are deemed as combustible, will need to be addressed in a performance solution.
Spec C1.8	Structural Tests for Lightweight Construction	Further information required	Where lightweight construction is used compliance with Spec. C1.8 is required.
Spec C1.10 *& NSW Variation*	Fire Hazard Properties	Further information required	*Further information is required at the Construction Certificate stage to verify compliance with the requirements of this Clause and Specification C1.10.*
Spec C1.11	Performance of External Walls in Fire	Not Applicable	N/A
Spec C1.13	Cavity barriers for fire-protected timber	Not Applicable	N/A
Spec C1.13a	Fire-protected timber	Not Applicable	N/A
Spec C2.5	Smoke-Proof Walls in Health-Care and Aged Care Buildings	Not Applicable	N/A
Spec C3.4	Fire Doors, Smoke Doors, Fire Windows and Shutters	Further information required	*Further information is required at the Construction Certificate stage to verify compliance with the requirements of Spec. C3.4 for protection of openings.*

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
Spec C3.15	Penetration of Walls, Floors and Ceilings by Services	Further information required	*Further information is required at the Construction Certificate stage to verify compliance with the protection of openings for service installations.*
Part D			
D1 Provision for Escape			
D1.0	Deemed-to-Satisfy Provisions	Yes	Informational clause.
D1.1	Application of Part	Not Applicable	Not applicable.
D1.2 & *NSW Variation*	Number of exits required	Yes	Complies
D1.3	When fire-isolated stairways and ramps are required	No - Design Amendment or Performance Solution Required	The BCA requires fire-stairs 1 to 7 to be fire-isolated. Details demonstrating compliance are to be incorporated into the plans submitted for CC. ***The non-fire-isolated stairways 01 (grid A/3) and 04 (grids A/22) connects the L1 hardstand to GF. The stairways pass through/connect more than 3 storeys in a sprinkler protected building, up to 4 consecutive storeys. The BCA requires the stairways to be fire isolated.*** ***A performance solution prepared by a fire safety engineer is required to address the non-compliance.***
D1.4	Exit travel distances	No - Design Amendment or Performance Solution Required	***The locations of the proposed exits indicate that the travel distances within the building exceed the DtS requirements of the BCA. The distance is expected to increase further in the majority of the warehouse and office areas once an indicative/future layout is shown.*** ***For the purposes of measuring travel distances to and between alternative exits, the open space on ground floor is counted as the part reached beyond the extent of the awning.***
D1.5	Distance between alternative exits	No - Design Amendment or	

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
		Performance Solution Required	***The fire engineer has confirmed that a performance-based solution can be provided to support the extended travel distances.*** ***The extended travel distances and distance between the exit stairs will need to addressed to comply with the requirements of the deemed to satisfy provisions noted above, or be assessed as performance solutions by the Fire Safety Engineer using BCA Performance Requirements DP4 & EP2.2.***
D1.6 & *NSW Variation*	Dimensions of exits and paths of travel to exits	Further information required	Paths of travel, clear egress widths and the unobstructed height throughout paths of travel must comply with the requirements of this clause. *Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D1.7	Travel via fire-isolated exits	No - Design Amendment or Performance Solution Required	***Fire-isolated exits 2 and 3 discharge internally in the building. Fire-isolated exits 5 to 7 discharge within the confines of the building and within 20m to a road or open space. However, the unimpeded path of travel to the road/open space is not shown on the floor plans to verify compliance with D1.7(b).*** ***The path of travel from the point of discharge of fire-isolated exits 5 to 7 requires occupants to pass within 6m of the external wall of the same building (measured horizontally).*** ***More than 2 access doorways open into fire-isolated exits 5 and 7. Details demonstrating compliance with the requirements of the BCA is to be provided.***
D1.8	External stairways or ramps in lieu of fire-isolated exits	Not Applicable	N/A

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
D1.9	Travel by non-fire-isolated stairways or ramps	No - Design Amendment or Performance Solution Required	The distance from any point on a floor to a point of egress to a road or open space by way of a required non-fire-isolated stairway exceeds 80m. The non-fire isolated stairway leading from the sanitary compartments on level 5 departs in the following matters: 1. Discharges on Level 1 warehouse (storey no. 4) in lieu of a level at which egress is provided to road or open space 2. Proposes travelling to two alternative fire isolated exits within 40m in lieu of a door leading to a road or open space ***A performance solution prepared by a fire safety engineer is required to address the non-compliance.***
D1.10 & *NSW Variation*	Discharge from exits	Further information required	An exit must not be blocked at the point of discharge and where necessary, suitable barriers must be provided to prevent vehicles from blocking the exit, or access to it. The path of travel to the exit must be not less than 1m and the path of travel to the road must comply with the requirements of this clause.
D1.11	Horizontal exits	Not Applicable	N/A
D1.12	Non-required stairways, ramps or escalators	Not Applicable	N/A
D1.13 & *NSW Variation*	Number of persons accommodated	Further information required	Refer to table in Section 4.1.
D1.14	Measurement of distances	Yes	Informational clause.
D1.15	Method of measurement	Yes	Informational clause.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
D1.16	Plant rooms, lift machine rooms and electricity network substations: Concession	Further information required	Compliance required to be achieved.
D1.17	Access to lift pits	Further information required	Compliance required to be achieved.
D1.18	Egress from early childhood centres	Not Applicable	N/A
D2 – Construction of Exits			
D2.0	Deemed-to-Satisfy Provisions	Yes	Informational clause.
D2.1 & *NSW Variation*	Application of Part	Not Applicable	N/A
D2.2	Fire-isolated stairways and ramps	Further information required	Fire-isolated stairways must be constructed in accordance with the requirements of this clause.
D2.3	Non-fire-isolated stairways and ramps	Further information required	Non-fire-isolated stairways must be constructed in accordance with the requirements of this clause.
D2.4	Separation of rising and descending stair flights	Not Applicable	N/A
D2.5	Open access ramps and balconies	Not Applicable	N/A
D2.6	Smoke lobbies	Not Applicable	N/A
D2.7	Installations in exits and paths of travel	Further information required	Installations in exits and paths of travel must comply with the requirements of this clause, particular: 1. Access to service shafts and services other than to fire-fighting or detection equipment as permitted in the Deemed-to-Satisfy

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
			Provisions of Section E, must not be provided from a fire-isolated stairway, 2. Gas or other fuel services must not be installed in a required exit. Electrical wiring may be installed in a fire-isolated exit if the wiring is associated with— (i) a lighting, detection, or pressurisation system serving the exit; or (ii) a security, surveillance or management system serving the exit; or (iii) an intercommunication system or an audible or visual alarm system in accordance with D2.22; or (iv) the monitoring of hydrant or sprinkler isolating valves. Specific services or equipment may be installed in a required exit, except a fire-isolated exit, or in any corridor, hallway or the like leading to a required exit if the services or equipment are enclosed by non-combustible construction or a fire-protective covering with doorways or openings suitably sealed against smoke spreading from the enclosure.
D2.8	Enclosure of space under stairs and ramps	Further information required	If the space below a required fire-isolated stairway or fire-isolated ramp is within the fire-isolated shaft, it must not be enclosed to form a cupboard or similar enclosed space. The space below a required non fire-isolated stairway (including an external stairway) must not be enclosed to form a cupboard or other enclosed space unless— (i) the enclosing walls and ceilings have an FRL of not less than 60/60/60; and (ii) any access doorway to the enclosed space is fitted with a self-closing –/60/30 fire door.
D2.9	Width of required stairways and ramps	Not Applicable	N/A

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
D2.10	Pedestrian ramps	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D2.11	Fire-isolated passageways	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D2.12	Roof as open space	Not Applicable	N/A
D2.13 & *NSW Variation*	Goings and risers	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D2.14	Landings	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D2.15 & *NSW Variation*	Thresholds	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D2.16 & *NSW Variation*	Balustrades or other barriers	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D2.17	Handrails	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.* ***Stairs from recessed docks of warehouse 2 and 3 are not afforded the handrail extension in order to maintain the 1m un obstructed path of travel and must be addressed through a performance solution.***

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
D2.18	Fixed platforms, walkways, stairways and ladders	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D2.19 & *NSW Variation*	Doorways and doors	Further information required	*Details of the doorways, including operation of latches, must be incorporated as the design develops for review.*
D2.20.	Swinging doors	Further information required	Doorways are to swing in the direction of egress. Swinging doors must not encroach more than 500mm on the required width and more than 100mm of the required width when fully open. *Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.* Door swing of Fire stair 2 and 4 on level 1 are not in the direction of egress. This must be amended through design to comply or alternatively addressed in a performance solution.
D2.21 & *NSW Variation*	Operation of latch	Further information required	*Details of the doorways, including operation of latches and door hardware, must be incorporated as the design develops for review.*
D2.22	Re-entry from fire-isolated exits	Not Applicable	N/A
D2.23	Signs on doors	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D2.24	Protection of openable windows	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D2.25	Timber Stairways Concession	Not Applicable	N/A

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
NSW Variation D2.101	Doors in the path of travel in an entertainment venue	Not Applicable	N/A
D3 – Access for People with a Disability			
D3.0	Deemed-to-Satisfy Provisions	Yes	Informational clause.
D3.1	General building access requirements	Further information required	Access for persons with a disability is to be provided as follows: <u>Office/shops (Class 5/Class 6 buildings)</u> To and within all areas normally used by the occupants <u>Car parks (Class 7a buildings)</u> To and within any level containing accessible car parking spaces. <u>Warehouse and production/Manufacturing facilities</u> To and within all areas normally used by the occupants, but as the uses of these areas could be deemed inappropriate, confirmation is required as the appropriateness of the areas in question by the owners or tenant. *Details of the doorways, including operation of latches, must be incorporated as the design develops for review.*
D3.2	Access to buildings	Yes	An accessway must be provided to a building required to be accessible— i. from the main points of a pedestrian entry at the allotment boundary; and ii. from another accessible building connected by a pedestrian link; and iii. from any required accessible carparking space on the allotment.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
D3.3	Parts of buildings to be accessible	Further information required	In a building required to be accessible— a) every ramp and stairway, except for ramps and stairways in areas exempted by D3.4, must comply with— i. for a ramp, except a fire-isolated ramp, clause 10 of AS 1428.1; and ii. for a stairway, except a fire-isolated stairway, clause 11 of AS 1428.1; and iii. for a fire-isolated stairway, clause 11.1(f) and (g) of AS 1428.1; and b) every passenger lift must comply with E3.6; and c) accessways must have— i. passing spaces complying with AS 1428.1 at maximum 20 m intervals on those parts of an accessway where a direct line of sight is not available; and ii. turning spaces complying with AS 1428.1— within 2 m of the end of accessways where it is not possible to continue travelling along the accessway; and at maximum 20 m intervals along the accessway. Further assessment will be required as the design develops.
D3.4	Exemptions	Further information required	Further information required as the design progresses.
D3.5	Accessible carparking	Further information required	Accessible car parking spaces are required to comply with AS 2890.6-2009 at the rate of 1 space for every 100 carparking spaces or part thereof. - The ground floor carpark is proposed to contain 104 car parking spaces which requires a minimum of 2 accessible spaces. - The ground mezzanine carpark is proposed to contain 12 car parking spaces which requires a minimum of 1 accessible spaces. - The Level 1 office access is proposed to contain 74 car parking spaces which requires a minimum of 1 accessible spaces.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
			A 'shared zone' of minimum 5400mm x 2400mm is required adjacent to accessible car parking spaces, protected with a bollard.
D3.6	Signage	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D3.7	Hearing augmentation	Not Applicable	N/A
D3.8	Tactile indicators	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D3.9	Wheelchair seating spaces in Class 9b assembly buildings	Not Applicable	N/A
D3.10	Swimming pools	Not Applicable	N/A
D3.11	Ramps	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
D3.12	Glazing on an accessway	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
Specifications			
Spec D1.12	Non-Required Stairways, Ramps and Escalators	Not Applicable	N/A
Spec D3.6	Braille and Tactile Signs	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
Spec D3.10	Accessible Water Entry/Exit for Swimming Pools	Not Applicable	N/A

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
Part E – Services and Equipment			
E1 – Fire Fighting Equipment			
E1.0	Deemed-to-Satisfy Provisions	Yes	Informational clause.
E1.3	Fire hydrants	Further information required	A system of Fire Hydrants is required to be provided in accordance with BCA Clause E1.3 and AS2419.1-2005. The building is required to be provided with a booster assembly as part of the fire hydrant requirements. Where the booster is installed, the design must satisfy the following requirements: ▪ If the booster is affixed to the external wall of the building, it is required to be within sight of the main entrance. Further to this, it must be protected from the remainder of the building by construction achieving an FRL not less than 90/90/90 unless the building is protected by a sprinkler system in accordance with the BCA. ▪ If it is remote from the building, the booster is to be located at the 4main vehicle entry or with sight of the main entry of the building within 20m of a hardstand area. at the boundary of the site and be within sight of the main entrance of the building; (ii) adjacent to the principal vehicular access to the site; and (iii) located not less than 10 m from the external wall of any building served. ▪ Booster assemblies may be located between 3.5m to 10m of the building if it is protected by construction achieving an FRL of not less than 90/90/90; and construction extends not less than 1 m each side of the outermost fire hydrant booster risers within the assembly and is not less than 3 m wide; and extends to a height of not less than 2 m above finished ground level. As the building is a large isolated building, a fire ring main is required. The fire pump location is satisfactory.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
			The fire services/hydraulic engineer is to confirm the required flow rates for the development and certify the system has been designed in accordance with BCA Clause E1.3 and AS2419.1-2005. ***The fire hydrant booster assembly is located remote from the proposed building and does not comply with the requirements of AS2419.1-2005 and must be addressed through a performance-based solution***
E1.4	Fire hose reels	Further information required	A Fire Hose Reel System is required to BCA Clause E1.4 and AS2441-2005. Fire hose reels must be located adjacent to internal fire hydrants other than those located with fire isolated exits. Where coverage cannot be achieve, further fire hose reels are to be located within 4m of exits. Where these are exhausted and coverage is not yet achieved, additional fire hose reels shall be located internally as required to provide coverage. Fire hose reel coverage within the building based on a 36m hose length and 4m of water spray. Fire hose reel cupboards must not contain any other services such as water meters, etc., and doors to fire hose reel cupboards are not to impede the path of egress. Fire Hose reel are not to extend through Fire Walls except as prescribed by the BCA being: ▪ Doorways opening into areas separated from the remainder of the building for the following purposes: - separating equipment or electrical supply systems (C2.12 & C2.13) - openings in shafts (C3.13) Pumps and Water Storage facilities are only required where pressure and flows cannot be achieved in accordance with clause 6.1 of AS2441-2005.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
			The hose reels have not been indicated on the plans to verify if their locations are compliant and to assess hose reel coverage. ***The fire services/hydraulic engineer is to confirm the required flow rates for the development and certify the system has been designed in accordance with BCA Clause E1.4 and AS2441-2001.***
E1.5 & *NSW Variation*	Sprinklers	Further information required	Automatic sprinkler protection is required to Specification E1.5 and AS2118.1-2017 to the following areas: ▪ Throughout the entire building if it is classified as large isolated under BCA Clause C2.3; ▪ Throughout any Class 7a car park (other than open deck car parks) containing accommodation for more than 40 vehicles; ▪ Throughout any fire compartment that exceeds 2,000m^2 in floor area or 12,000m^3 in volume where occupancies of excessive hazard are proposed The sprinkler system shall be connected to and activate an occupant warning system complying with BCA Specification E2.2a. ***The fire services/hydraulic engineer is to confirm the required flow rates for the development and certify the system has been designed in accordance with BCA Clause E1.5, Spec. E1.5 and AS2118.1-2017.***
E1.6	Portable fire extinguishers	Further information required	The provision of portable fire extinguishers is required to comply with BCA Clause E1.6 and AS2444 – 2001. Fire extinguishers are to be located in accordance with AS 2444 - 2001, often collocated with fire hydrants and/or fire hose reels.
E1.8	Fire control centres	No - Design Amendment or	Location and aggregate change of level to open space of the fire control centre must be incorporated into the documentation as the design progresses.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
		Performance Solution Required	Due to the nature of the proposed development, the following will need to be addressed in a performance solution: 1. The location of the FCC to serve a building containing 10 tenancies 2. The FCC located within a room, which does not strictly comply with the provisions of Spec E1.8 of the BCA. 3. Two indicative locations have been proposed as options at this stage pending FRNSW consultation. One location is nominated to be located within a room/building remote from the primary Warehouse Building.
E1.9	Fire precautions during construction	Further information required	Compliance to be achieved.
E1.10	Provision for special hazards	Further information required	Performance solutions must also address the nature, type and quantity of materials stored and the impact on the smoke hazard management systems and will need to be assessed by the fire safety engineer.
Specifications			
E1.5	Fire Sprinkler Systems	Further information required	Automatic sprinkler protection is required to Specification E1.5 and AS2118.1-2017 to the following areas: ▪ Throughout the entire building if it is classified as large isolated under BCA Clause C2.3; ▪ Throughout any Class 7a car park (other than open deck car parks) containing accommodation for more than 40 vehicles; ▪ Throughout any fire compartment that exceeds 2,000m^2 in floor area or 12,000m^3 in volume where occupancies of excessive hazard are proposed The sprinkler system shall be connected to and activate an occupant warning system complying with BCA Specification E2.2a.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
			The fire services/hydraulic engineer is to confirm the required flow rates for the development and certify the system has been designed in accordance with BCA Clause E1.5, Spec. E1.5 and AS2118.1-2017.
E1.8	Fire Control Centres	Further information required	Location and aggregate change of level to open space of the fire control centre must be incorporated into the documentation as the design progresses.
E2 – Smoke Hazard Management			
E2.0	Deemed-to-Satisfy Provisions	Yes	Information Clause.
E2.1	Application of Part	Yes	Information Clause.
E2.2 & *NSW Variation*	General requirements	No - Design Amendment or Performance Solution Required	The following smoke hazard management systems are required to be installed: 1. An automatic air pressurisation system for fire-isolated exits in accordance with AS1668.1-2015 where more than 2 doorways open into the exit. 2. Automatic smoke detection and alarm system complying with Spec. E2.2a 3. Automatic smoke exhaust system in accordance with Spec. E2.2b
E2.3	Provision for special hazards	No - Design Amendment or Performance Solution Required	Performance solutions must also address the nature, type and quantity of materials stored and the impact on the smoke hazard management systems and will need to be assessed by the fire safety engineer.
Specifications			
Spec E2.2a & *NSW Variation*	Smoke Detection and Alarm Systems	Further information required	Type of automatic smoke detection and alarm system required: 1. Smoke detection system complying with Clause 4 complying with AS1670.1-2018 and activate a building occupant warning system in accordance with Clause 7

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
			2. Smoke detection system required to activate a smoke exhaust system in accordance with Spec. E2.2b complying with Clause 6 Smoke detection system must be connected to a fire alarm monitoring system connected to a fire station or fire station dispatch centre in accordance with AS1670.3-2018.
Spec E2.2b	Smoke Exhaust Systems	No - Design Amendment or Performance Solution Required	The smoke hazard management system is to be rationalised on a performance-based solution as advised by the design team. The automatic smoke exhaust system (Spec E2.2b) with a rationalised extraction rates activated by a smoke detection complying with Clause 6 of E2.2a.
Spec E2.2c	Smoke-and-Heat Vents	Not Applicable	-
Spec E2.2d	Residential Fire safety systems	Not Applicable	N/A
E3 – Lift Installations			
E3.0	Deemed-to-Satisfy Provisions	Yes	Information clause.
E3.1	Lift installations	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E3.2	Stretcher facility in lifts	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E3.3	Warning against use of lifts in fire	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E3.4	Emergency lifts	Not Applicable	N/A

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
E3.5	Landings	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E3.6	Passenger lifts	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E3.7	Fire service controls	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E3.8	Residential care buildings	Not Applicable	N/A
E3.9	Fire service recall operation switch	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E3.10	Lift car fire service drive control switch	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
Specifications			
Spec E3.1	Lift Installations	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E4 – Emergency Lighting, Exit Signs and Warning Systems			
E4.0	Deemed-to-Satisfy Provisions	Yes	Informational clause.
E4.1	********	Not Applicable	-

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
E4.2	Emergency lighting requirements	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E4.3	Measurement of distance	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E4.4	Design and operation of emergency lighting	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E4.5	Exit signs	No - Design Amendment or Performance Solution Required	***A performance solution will be required to address the location of exit signs above 2.7m from the FFL.*** *Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E4.6 *& NSW Variation*	Direction signs	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E4.7	Class 2 and 3 buildings and Class 4 parts: Exemptions	Not Applicable	N/A
E4.8	Design and operation of exit signs	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
E4.9	Sound systems and intercom systems for emergency purposes	Not Applicable	N/A
Specifications			
Spec E4.8	Photoluminescent exit signs	Not Applicable	N/A

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
Part F – Health and Safety			
F1 – Damp and Weatherproofing			
F1.0	Deemed-to-Satisfy Provisions	No - Design Amendment or Performance Solution Required	Performance solution required to demonstrate compliance with Performance Requirement FP1.4 with respect to weatherproofing of external walls.
F1.1	Stormwater drainage	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F1.4	External above ground membranes	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F1.5	Roof coverings	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F1.6	Sarking	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F1.7	Waterproofing of wet areas in buildings	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F1.9	Damp-proofing	Not Applicable	N/A
F1.10	Damp-proofing of floors on the ground	Not Applicable	N/A
F1.11	Provision of floor wastes	Not Applicable	N/A

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
F1.12	Sub-floor ventilation	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F1.13	Glazed assemblies	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F2 – Sanitary and Other Facilities			
F2.0	Deemed-to-Satisfy Provisions	Yes	Informational clause.
F2.1	Facilities in residential buildings	Not Applicable	N/A
F2.2	Calculation of number of occupants and facilities	Further information required	Separate sanitary facilities are required to be provided for male & female employees at a rate tabulated in Table F2.3 of the BCA. An assessment of required vs provided number of sanitary facilities will be carried out once the population number of each part of the building is verified. *Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F2.3	Facilities in Class 3 to 9 buildings	Further information required	
F2.4	Accessible sanitary facilities *Refer to Appendix A for sanitary facility tables*	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F2.5	Construction of sanitary compartments	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F2.6	Interpretation: Urinals and washbasins	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
F2.7 & *NSW Variation*	Microbial (legionella) control	Not Applicable	--
F2.8	Waste management	Not Applicable	N/A
F3 – Room Heights			
F3.0	Deemed-to-Satisfy Provisions	Yes	Informational clause.
F3.1	Height of rooms and other spaces	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F4 – Light and Ventilation			
F4.0	Deemed-to-Satisfy Provisions	Yes	Informational clause.
F4.1	Provision of natural light	Not Applicable	N/A
F4.2	Methods and extent of natural lighting	Not Applicable	N/A
F4.3	Natural light borrowed from adjoining room	Not Applicable	N/A
F4.4	Artificial lighting	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F4.5 & *NSW Variation*	Ventilation of rooms	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F4.6	Natural ventilation	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
F4.7	Ventilation borrowed from adjoining room	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F4.8	Restriction on position of water closets and urinals	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F4.9	Airlocks	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
F4.11	Carparks	Further information required	*Based on a review of the plans it appears that the carpark is naturally ventilated. Details demonstrating compliance with the requirements of this clause and AS1668.4 must be incorporated as the design develops.*
F4.12	Kitchen local exhaust ventilation	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
Part G – Ancillary Provisions			
G1 – Minor Structures and Components			
G1.0	Deemed-to-Satisfy Provisions	Yes	Informational clause.
G1.2	Refrigerated chambers, strong-rooms and vaults	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
NSW Variation G1.101	Provision for window cleaning	Further information required	*Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.*
G6 – Occupiable Outdoor Areas			

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
G6.1	Application of Part	Yes	Informational clause. *Note the occupiable outdoor areas are the outdoor areas to the office spaces of Ground mezzanine level and Level 1.*
G6.2	Fire hazard properties	Further information required	A lining, material or assembly in an occupiable outdoor area must comply with C1.10 as for an internal element. The following fire hazard properties of a lining, material or assembly in an occupiable outdoor area are not required to comply with C1.10: (i) Average specific extinction area. (ii) Smoke-Developed Index. (iii) Smoke development rate. (iv) Smoke growth rate index (SMOGRARC).
G6.3	Fire separation	Further information required	All building elements required to have an FRL within the storey (occupiable outdoor area) must comply with the requirements of Clause C2.8 and C2.9.
G6.4	Provision for escape	Further information required	Provisions for escape, location of exits and travel distances have been assessed from the occupiable outdoor area as per the prescriptive requirements of Part D1. Refer to Part D1 of this report and mark-ups.
G6.5	Construction of exits	Further information required	Construction of exits have been assessed from the occupiable outdoor area as per the prescriptive requirements of Part D2. Refer to Part D2 of this report.
G6.6	Fire fighting equipment	Further information required	The provisions of Part E with exception to Clause 7(b)(i) of Spec. E1.5 apply to the occupiable outdoor area. Fire services engineer to ensure design plans and specifications extend to all outdoor areas on Ground Mezzanine and Level 1.

BCA Clause	Compliance Provisions	Compliance Status	Assessment Outcomes
G6.7	Lift installations	Yes	A lift is provided to serve all occupiable outdoor areas. Refer to Part E3 of the BCA for design requirements.
G6.8	Visibility in an emergency, exit signs and warning systems	Further information required	Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.
G6.9	Light and ventilation	Further information required	Details demonstrating compliance with the requirements of this clause must be incorporated as the design develops.
G6.10	Fire orders	Not Applicable	N/A
Part J – Energy Efficiency			
J0 – Energy efficiency			
J0.0	Deemed-to-Satisfy Provisions	Further information required	ESD Consultant to provide a report demonstrating compliance with the DTS or Performance Requirements for the proposed development.

16. APPENDIX D - FIRE RESISTANCE LEVELS

The table below represents the Fire resistance levels required in accordance with BCA 2019 Amendment 1:

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

Table 3.9 REQUIREMENTS FOR CARPARKS			**FRL (not less than) Structural adequacy/Integrity/Insulation** **ESA/M (not greater than)**
Wall			
(a)	*external wall*		
	(i)	less than 3 m from a *fire-source feature* to which it is exposed:	
		Loadbearing	60/60/60
		Non-*loadbearing*	–/60/60
	(ii)	3 m or more from a *fire-source feature* to which it is exposed	–/–/–
(b)	*internal wall*		
	(i)	*loadbearing*, other than one supporting only the roof (not used for carparking)	60/–/–
	(ii)	supporting only the roof (not used for carparking)	–/–/–
	(iii)	non-*loadbearing*	–/–/–
(c)	*fire wall*		
	(i)	from the direction used as a *carpark*	60/60/60
	(ii)	from the direction not used as a *carpark*	as *required* by Table 3
Column			
(a)	supporting only the roof (not used for carparking) and 3 m or more from a *fire-source feature* to which it is exposed		–/–/–
(b)	steel column, other than one covered by (a) and one that does not support a part of a building that is not used as a *carpark*		60/–/– or 26 m^2/tonne
(c)	any other column not covered by (a) or (b)		60/–/–
Beam			
(a)	steel floor beam in continuous contact with a concrete floor slab		60/–/– or 30 m^2/tonne
(b)	any other beam		60/–/–
Fire-resisting lift and stair shaft (within the *carpark* only)			60/60/60
Floor slab and vehicle ramp			60/60/60
Roof (not used for carparking)			–/–/–
Notes:	1.	ESA/M means the ratio of exposed surface area to mass per unit length.	
	2.	Refer to Specification E1.5 for special requirements for a sprinkler system in a *carpark* complying with Table 3.9 and located within a multi-classified building.	