



A Bureau Veritas Group Company

Regulatory Compliance Report

Augusta Warehouse Development
Augusta Street, Blacktown

Prepared for: The Trustee for Huntingwood Property Trust
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1. Executive Summary

Development Overview

The proposed SSDA seeks approval to redevelop the site to accommodate a warehouse and distribution centre use inclusive of the following:

Site establishment works, including tree removal, minor excavation / bulk earthworks.

Construction and operation of four (4) new warehouse buildings comprising a multi-level warehouse building on the eastern portion of the site and three single storey warehouse buildings on the western portion of the site. The warehouse buildings will include ancillary office space and indicative warehouse fit out works including warehouse racking.

Other associated works including landscaping, at-grade car parking and general site improvements.
Business and building identification signage including wayfinding signage.

Vehicle access provided via Augusta Street and a new proposed access from the Great Western Highway

Lot consolidation of properties.

Compliance Summary

Mckenzie Group has been commissioned by The Trustee for Huntingwood Property Trust to prepare this report in support of the State Significant Development Application (SSD-36138263) for the proposed Augusta Street warehouse and distribution centre at Augusta Street, Blacktown.

As Registered Certifiers relevant building surveyor we have reviewed the concept architectural design documents prepared by PACE Architects (refer appendix A) for compliance with the building assessment provisions currently outlined in BCA 2022, as current project timeframes indicate that BCA 2022 will be that which applies to the development.

It is noted that the full final version of BCA 2022 Volume 1 with state and territory variations has been released, however the Australian Building Codes Board have since advised that editorial corrections will need to be made. These corrections are scheduled to be released in early December 2023. This report has assessed the development against the provisions available at the time of this report.

This report has been prepared to assess the project against the Building Code of Australia to enable issuance of construction approvals. Further assessment of the design will be undertaken as the design develops to ensure compliance is achieved prior to approval being issued

Deviations from the Deemed-to-Satisfy Provisions

The assessment of the schematic design documentation has revealed that the following areas deviate from the deemed-to-satisfy provisions of the BCA. These items are to be addressed to ensure compliance is achieved, either through design amendment to achieve compliance with the deemed-to-satisfy provisions, or through a performance solution demonstrating compliance with the Performance Requirements of the BCA:

No.	Description	DTS Clause	Performance Requirements
Fire Safety Items			
1	<u>Travel Distance Non-Compliance</u> <u>Warehouse 1</u> Distance to an exit through a point of choice measured as 69.5m in lieu of the maximum 40m	BCA D2D5	D1P2, D1P4

No.	Description	DTS Clause	Performance Requirements
	<u>Warehouse 2</u> Distance to an exit through a point of choice measured as 74m in lieu of the maximum 40m <u>Warehouse 3A</u> Distance to an exit through a point of choice measured as 80.5m in lieu of the maximum 40m <u>Warehouse 3B</u> Distance to an exit through a point of choice measured as 91m in lieu of the maximum 40m <u>Warehouse 4A</u> Distance to an exit through a point of choice measured as 75.5m in lieu of the maximum 40m <u>Warehouse 4B</u> Distance to an exit through a point of choice measured as 75m in lieu of the maximum 40m <u>Warehouse 4C</u> Distance to an exit through a point of choice measured as 80m in lieu of the maximum 40m <u>Warehouse 5A</u> Distance to an exit through a point of choice measured as 78m in lieu of the maximum 40m <u>Warehouse 5B</u> Distance to an exit through a point of choice measured as 72m in lieu of the maximum 40m <u>Warehouse 5C</u> Distance to an exit through a point of choice measured as 73m in lieu of the maximum 40m <u>Warehouse 5D</u> Distance to an exit through a point of choice measured as 73m in lieu of the maximum 40m <u>Warehouse 5E</u> Distance to an exit through a point of choice measured as 81.5m in lieu of the maximum 40m <u>Warehouse 5F</u> Distance to an exit through a point of choice measured as 73.5m in lieu of the maximum 40m <u>Warehouse 5G</u> Distance to an exit through a point of choice measured as 71m in lieu of the maximum 40m <u>Warehouse 5H</u> Distance to an exit through a point of choice measured as 64.5m in lieu of the maximum 40m		
2	<u>Alternative Exit Non-Compliance</u> <u>Warehouse 1</u> Distance between alternative exit measured as 120m in lieu of the maximum 60m <u>Warehouse 2</u>	BCA D2D6	D1P2, D1P4

No.	Description	DTS Clause	Performance Requirements
	Distance between alternative exit measured as 135m in lieu of the maximum 60m <u>Warehouse 3A</u> Distance between alternative exit measured as 155.5m in lieu of the maximum 60m <u>Warehouse 3B</u> Distance between alternative exit measured as 180m in lieu of the maximum 60m <u>Warehouse 4A</u> Distance between alternative exit measured as 150m in lieu of the maximum 60m <u>Warehouse 4B</u> Distance between alternative exit measured as 150m in lieu of the maximum 60m <u>Warehouse 4C</u> Distance between alternative exit measured as 160m in lieu of the maximum 60m <u>Warehouse 5A</u> Distance between alternative exit measured as 155m in lieu of the maximum 60m <u>Warehouse 5B</u> Distance between alternative exit measured as 146m in lieu of the maximum 60m <u>Warehouse 5C</u> Distance between alternative exit measured as 145m in lieu of the maximum 60m <u>Warehouse 5D</u> Distance between alternative exit measured as 147m in lieu of the maximum 60m <u>Warehouse 5E</u> Distance between alternative exit measured as 161m in lieu of the maximum 60m <u>Warehouse 5F</u> Distance between alternative exit measured as 145m in lieu of the maximum 60m <u>Warehouse 5G</u> Distance between alternative exit measured as 137m in lieu of the maximum 60m <u>Warehouse 5H</u> Distance between alternative exit measured as 130m in lieu of the maximum 60m		
3	<u>Vehicular Perimeter Access Non-Compliance</u> The perimeter vehicle access of 6m wide and within 18m from the building is not achieved wholly within the allotment boundary around. <u>Warehouse 1</u> - No part of its furthest perimeter access boundary to exceed 18m currently measured as 25.4m at the waste storage area - Vehicular access measured as 4.5m in lieu of the minimum requirement of 6m at the car driveway next to office 1	BCA C3D5	C1P9

No.	Description	DTS Clause	Performance Requirements
	<u>Warehouse 2</u> - No part of its furthest perimeter access boundary to exceed 18m currently measured as 31m at the pump room area <u>Warehouse 3</u> - No part of its furthest perimeter access boundary to exceed 18m currently measured as 28.3m <u>Warehouse 4</u> - No part of its furthest perimeter access boundary to exceed 18m currently measured as 41m at the carpark area <u>Warehouse 5</u> - No part of its furthest perimeter access boundary to exceed 18m currently measured as 22m at the sprinkler tank area		
4	<u>Exit Signs</u> To allow directional exit signs to be installed approximately 4.5 above the finished floor level within the warehouse	BCA E4D5	E4P2
Miscellaneous Items			
5	Symphonic stormwater drainage	F1D3 (previously F1.1)	F1P2, F1P3 (previously FP1.2, FP1.3)
6	Weatherproofing of External Walls As the external walls are proposed to be constructed of a material not nominated in F3D5, a performance solution is to be provided by the façade engineer/registered architect demonstrating that the external walls comply with the requirements of Performance Requirement F3P1 (previously FP1.4).	F3D5	F3P1 (previously FP1.4).

The feasibility and any additional requirements that will apply as a result of the performance solution will need to be confirmed by the professional preparing the performance solution. Any performance solution will need to be prepared by a suitably qualified/accredited professional.

Fire Safety Services

The following key fire safety services are required to meet the minimum DTS requirements.

1.	Sprinklers system throughout the entire portions of the building
2.	Fire hydrant system throughout the entire portions of the building
3.	Fire hose reels throughout the entire portions of the building
4.	Fire precautions during construction
5.	Air-pressurization throughout the fire isolated stairs to Warehouse 5
6.	Automatic smoke detection and alarm system throughout the entire portions of the building
7.	Automatic smoke exhaust throughout the entire portions of the building

Refer to parts 9 and 10 of this report for further details regarding the required services.

(NSW) Any fire engineered solution relating to insert relevant category 2 items will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

Further Assessment

The assessment of the design documentation has also revealed that the following additional information is required in order to complete the assessment, and/or the following areas need to be further reviewed.

No.	Further Information / Review Required	Report Reference
1.	Stair details, including handrails and balustrades	8
2.	Fire hydrant and fire hose reel location to be provided	9
3.	Exit/Directional signs and emergency lighting layout plans to be provided	9
4.	Access report	12

Documentation to enable assessment and demonstrate compliance will be required to address the above items prior to the Construction Certificate approval, items is not required to be resolved at Development Application stage.

(NSW) The application for Construction Certificate shall be assessed under the relevant provisions of the Environmental Planning & Assessment Act 1979 (As Amended) and the Environmental Planning & Assessment (Development Certification and Fire Safety) Regulation 2021.

2. Introduction

Construction and operation of a warehouse and distribution centre development of approximately 134,565m² gross floor area, including four warehouse buildings, ancillary office space, office facilities, indicative warehouse fitout works inclusive of warehouse racking, on-site car parking, and associated works including excavation, landscaping, and signage.

The site is located on the Augusta Street Blacktown.

This report is based upon the review of the design documentation listed in Appendix A of this Report

The report is intended as an overview of the relevant provisions of the Building Code of Australia for assistance only. Detailed drawings and associated review will still be required as the final design is developed.

(NSW) The applicable legislation governing the design of buildings is the Environmental Planning and Assessment Act 1979. This Act requires that all new building works must be designed to comply with the BCA.

The version of the BCA applicable to the development, is version that in place at the time of the application to the Registered Certifier for the Construction Certificate. For the purposes of this Report, BCA 2022 has been utilised as it is anticipated that BCA 2022 will apply to the project based on project timeframes.

3. Compliance with the Building Code of Australia

The Building Code of Australia is a performance based document, whereby compliance is achieved by complying with the Governing Requirements and the Performance Requirements.

Performance Requirements are satisfied by one of the following:

- 1) A Performance Solution
- 2) A Deemed-to-Satisfy Solution

- 3) A combination of (1) and (2)

4. 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.

5. Preliminaries

5.1. Building Assessment Data

Summary of Construction Determination:

Part of Project	Warehouse 1	Warehouse 2	Warehouse 3	Warehouse 4	Warehouse 5
Classification	7/8	7/8	7/8	7/8	7/8
Number of Storeys	1	1	1	1	3
Rise In Storeys	1	1	1	1	3
Type of Construction	C	C	C	C	B
Effective Height (m)	3.7m	4m~	3.6m	3.6m	17.4m

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

Summary of the floor areas and relevant populations where applicable: -

Part of Project	BCA Classification	Approx. Floor Area (m ²)	Population as per BCA Clause D2D18
Warehouse 1	7/8	5,935	198
Warehouse 2	7/8	12,031	401
Warehouse 3A, 3B	7/8	22,400	747
Warehouse 4A, 4B, 4C	7/8	29,466	983
Warehouse 5A, 5B, 5C, 5D, 5E, 5F, 5G, 5H	5/7/8	64,733	2158

Notes:

- The above populations have been based on floor areas and calculations in accordance with Table D2D18 (prev. Table D1.13) of the BCA.
- The floor areas to retail portions have been adjusted without ancillary areas such as sanitary facilities, corridors, shelving and or racking layouts in storage areas.
- The carpark areas have been considered ancillary to the use for the purposes of population numbers

Occupiable Outdoor Areas

BCA 2019 introduced specific provisions regarding occupiable outdoor areas. These provisions outline requirements with regards to fire ratings, egress provisions and coverage from essential services and are contained in this report.

An occupiable outdoor area is defined in the BCA as follows:

‘a space on a roof, balcony or similar part of a building:

- a) That is open to the sky; and*
- b) To which access is provided, other than access only for maintenance; and*
- c) That is not open space or directly connected with open space’*

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 1170.2-2021 and AS 1170.4-2007.

Depending on the importance level of the building as determined by AS/NZS 1170.0-2002, the 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. Where this is required, certification will be required confirming that the design of the seismic restraints comply with AS 1170.4-2002. This may be provided by a specialist seismic consultant or by the architect and services design engineers.

It is noted that BCA 2019 introduced a new Verification Method, B1V2 (previously BV2), which is a pathway available to verify compliance with BCA Performance Requirement B1P1 (1)(c) (previously BP1.1(a)(iii)).

Glazing is to comply with AS1288-2021, and AS2047-2014.

Prior to the issue of the Construction Certificate structural certification is required to be provided by a Professional Engineer registered on the National Engineering Register.

7. Fire Protection

7.1. Fire Compartmentation (BCA C2D2 (previously C1.1))

The BCA stipulates three levels of fire resistant construction, which is based upon the rise in storeys and classification of the building. Each of these types of construction has maximum floor area and volume limitations as per BCA Table C3D3 (previously C2.2).

Based upon the rise in storeys and use of the building, it is required to be constructed in accordance with the requirements of Type C and B Construction, in accordance with Tables S5C21a-g/S5C24a-e of Specification 5 (previously Table 4 & 4.9/5 & 5.9 of Specification C1.1) of the Building Code of Australia 2022.

- Fire compartmentation of the building at each floor level to be detailed for assessment

The maximum floor area and volume limitations of a fire compartment as nominated in the deemed to satisfy provisions are as follows:

Classification		Type of Construction		
		A	B	C
5, 9b or 9c aged care building	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
6, 7, 8 or 9a (except for patient care areas)	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

If the building exceeds the area / volume limitations of the BCA provisions, the building is then considered a large isolated building and the following provisions will apply:

- Automatic sprinkler protection to AS2118.1 and BCA Specification 17 (previously Specification E1.5) throughout the development / smoke detection and alarm system in accordance with AS1670,
- Perimeter emergency vehicular access 6m wide located within 18m of the entire building perimeter in accordance with BCA Clause C3D5 (previously C2.4),
- Smoke exhaust or smoke and heat vents required throughout the development if the building exceeds 18,000m² or 108,000m³ in volume
- Provision of a fire hydrant ring main

7.2. Fire Resistance (BCA C2D2 (previously C1.1))

The building should be constructed generally in accordance with the relevant provisions of Specification 5 (previously Specification C1.1) of the BCA applicable to Type (B and C) Construction, Please refer to Appendix D which outlines the required fire rating to be achieved by the development.

Where a fire wall is proposed, it is noted that the wall is to achieve a structural rating regardless of whether it is loadbearing or not. Refer to Appendix D for required FRLs.

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

- Emergency Power Supply;

- Emergency Generators;
- Electricity Supply;
- Hydrant Pump Rooms;
- Sprinkler Pump Rooms;

The above areas are to be separated from the remainder of the building by construction achieving a minimum fire resistance level of 120 minutes.

Please note that with regards to fire separation, the provisions and required FRL's that apply to the building also apply to an occupiable outdoor space associated with the building.

7.3. Fire Hazard Properties (BCA C2D10 and C2D11 (previously C1.10 and BCA C1.9))

External Wall Cladding

Since the building is of Type B 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 since the building is a Class 2 / Class 3 / Class 9a / Class 9b / Class 9c building;
- All non-loadbearing shafts connecting more than 2 storeys since the building is a Class 5 / Class 6 / Class 7a / Class 7b / Class 8 building.
- All loadbearing internal walls and loadbearing fire walls, including those that are part of loadbearing shafts.

Product specifications and test reports to AS 1530.1-1994 for all materials to demonstrate compliance to be provided by the Principle Contractor during Construction Certificate stage.

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.

Any Aluminium Composite Panels must be labelled in accordance with SA TS 5344.

The BCA 2022 has included additional items that are not required to comply with the above, including glazing, fixings, packers, paints, sealants to joints, adhesives and the like.

7.4. Separation of equipment (C3D13 (previously C2.12))

Equipment listed below must be separated from the remainder of the building providing a FRL as required by Specification 5 (previously Spec C1.1) but not less than 120/120/120 with a self-closing fire door with an FRL or not less than -/120/30. When separating a lift shaft and life motor room, an FRL of not less than 12/-/- is required.

- 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.

8. Access and Egress

8.1. Provision for Escape (BCA D2 (previously D1))

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

- Fire isolated stairways
- Required non-fire isolated stairways
- Non Fire isolated Stairs
- External Doors
- Horizontal Exits

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

Detailing issues that will need to be addressed as the design develops include:

- Door Hardware
- Exit Door Operation
- 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

8.2. Required Fire Isolation of Exits (BCA Clause D2D5 (previously D1.3))

Warehouse 5 (Only)

Class 5 to 9

Stairs utilised as required exits must be fire isolated where they connect, pass through or pass by more than 2 consecutive storeys and, an extra storey may be added if the building has a sprinkler system (other than a FPAA101D system) installed throughout.

Alternatively, where the stair does not provide access to or egress from the third storey, and is separated from that storey by construction achieving and FRL of 60 minutes.

The proposed exits are required to be fire isolated.

8.3. Travel via Fire Isolated Exits (BCA D2D12 (previously D1.7))

The BCA requires each fire isolated stairway to 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.

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.

8.4. Exit Travel Distances (BCA D2D5, D2D6 (previously 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

Refer to Section 1 for travel distance deviations from the Deemed-to-Satisfy Provisions. (To be addressed during Construction Certificate Stage)

The extended travel distances and distance between the exit stairs will need to be 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 D1P4 and E2P2 (previously DP4 & EP2.2)

8.5. Balustrades and Handrails (BCA D3D17, D3D18, D3D19, D3D20, D3D22, D3D29 (previously D2.16 / BCA D2.17 / D2.24))

Generally

Balustrading to a minimum height of 1000mm with a maximum opening of 124mm in any direction should be provided adjacent to balconies, landings, corridors etc where located adjacent to a change in level exceeding 1000mm, or where it is possible to fall through an openable window located more than 4m above the surface beneath.

Where it is possible to fall more than 4m to the surface below, the balustrade shall not contain any horizontal or near horizontal members that facilitate climbing between 150 – 760mm above the floor. It is noted that these provisions also apply to any building elements, including AC covers and the like, that are within 1m of the required balustrade.

Where a required barrier is fixed to the vertical face forming an edge of a landing, balcony, deck, stairway or the like, the opening formed between the barrier and the face must not exceed 40 mm.

Handrails should generally be provided at a minimum height of 865mm alongside of all ramps and stairs.

The public stairs and ramps located along an accessible path of travel should be designed in accordance with the requirements of AS1428.1 for persons with disabilities. This requires a handrail on each side of the stair and ramp and for the handrail to extend approximately 550mm – 600mm past the last tread / end of ramp.

In addition to the above, handrails are required to both sides of all stairs with a width of 2m or more.

Fire Isolated Stairways & Class 7b/8 Buildings

Balustrades in the fire isolated stairways (excluding those serving a Class 9b early childhood centre) and Class 7b or 8 parts of buildings are permitted to contain a 3 rail system, with a bottom rail situated at not more than 150mm above the nosings. The distance between the rails shall not exceed 460mm.

Handrails are required on both sides of all stairways except for fire isolated stairways used only for emergency egress purposes.

Note: in a required exit serving an area required to be accessible, handrails must be designed and constructed to comply with Clause 12 of AS1428.1-2009

8.6. Slip Resistance (BCA D3D15 (previously D2.14))

The adoption of BCA 2014 introduced a requirement for slip resistance of stairway treads and ramp surfaces. The requirements are as follows:

Table D3D15 (prev. 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

The following section of this report describes the essential fire safety measures and the minimum performance requirements of those measures. A draft essential fire safety schedule can be found in Appendix B.

It is noted that the provisions below also apply to occupiable outdoor areas.

9.1. Fire Hydrants (BCA E1D2 (previously E1.3))

A system of Fire Hydrants is required to be provided in accordance with BCA Clause E1D2 (prev. E1.3) and AS2419.1-2021.

The new version of the fire hydrant standard notes that the standard does not apply to the following:

- Class 7b or 8 buildings with a total volume of more than 108,000m³
- Buildings that include automatic racked storage systems
- Buildings with an effective height of more than 135m
- Buildings and associated areas that include special hazards.

Where the building falls into one of the above criteria, the hydrant system is required to be assessed on a performance basis with consultation with the relevant fire brigade as required by legislation. Performance solutions are required to be verified to BCA Performance Requirement E1P3 (previously EP1.3).

Pressure and flow information will be required to confirm the required pressures and flow to the system, depending on the type of hydrant to be utilized;

The fire services/hydraulic engineer is to confirm the required flow rates for the development.

The building is required to be provided with a booster assembly as part of the fire hydrant requirements. The booster is required to be located attached to the building at the main entry. If remote from the building, the booster is to be located at the main vehicle entry or with sight of the main entry of the building within 20m of a hardstand area.

A fire ring main is required.

The fire pump location to be provided

9.2. Fire Hose Reels (BCA E1D3 (previously E1.4))

A Fire Hose Reel System is required to BCA Clause E1D3 (previously E1.4) and AS2441-2005.

The system is required to provide coverage to the entire building.

Fire hose reels are to be located within 4m of exits and provide coverage within the building based on a 36m hose length and 4m of water spray. Where required, additional fire hose reels shall be located internally as required to provide coverage. These hose reels are to be located adjacent to internal hydrants.

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 unless a performance solution is developed under BCA Performance Requirement E1P1 (previously EP1.1).

Fire Hose reel are not to extend through Fire and Smoke Walls.

The hose reels locations to be indicated

9.3. Automatic Sprinkler Protection (BCA E1D4 – E1D13 (previously E1.5))

Automatic sprinkler protection is required to Specification 17 (previously Spec. 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 fire compartment that exceeds 2,000m² in floor area or 12,000m³ in volume where occupancies of excessive hazard are proposed

It is noted that a system complying with FPAA101D or FPAA101H does not afford concessions elsewhere in the BCA such as spandrel separation and fire hazard properties.

The sprinkler system shall be connected to and activate an occupant warning system complying with BCA Specification 20 (prev. Spec E2.2a).

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

9.4. Smoke Hazard Management (BCA E2D3 – E2D20 (previously E2.2))

Smoke hazard management shall be provided throughout the building by means of the following systems:

- Zone Pressurisation System/Smoke Control between vertically separated fire compartments in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1 ;
- Automatic Shutdown of Mechanical Systems in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1;
- Automatic Smoke Exhaust System to BCA Specification 21 (previously Spec E2.2b) activated by Automatic Smoke Detection & Alarm System in accordance with the requirements of BCA Spec 20 (previously E2.2a) and AS1670.1-2018
- Automatic Smoke and Heat Vents in accordance with the requirements of BCA Spec 22 (previously Spec E2.2c)
- Automatic Smoke Detection/Alarm System in accordance with the requirements of BCA Spec 20 Clause 3, 4 or a combination of Clause 3 and 4 (previously E2.2a) and AS 3786 and/or AS 1670.1-2018;
- Automatic Smoke Detection System complying with BCA Specification 20 Clause 4 (previously E2.2a) and AS 1670.1-2018
- Automatic Smoke Detection System to activate the smoke hazard management systems to BCA Spec 20 (previously E2.2b), AS 1670.1-2018 and AS/NZS1668.1-2015 Amendment 1;
- Building Occupant Warning System activated by the smoke alarm/detection in accordance with BCA Specification 20 Clause 7 (previously Spec E2.2a) and Clause 3.22 of AS 1670.1-2018
- Automatic Pressurisation to Fire Isolated Exits in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1. It is noted that this is to be provided to the entire exit.
- Natural smoke venting with ventilation openings distributed as evenly as practicable and comprising permanent openings at roof level with a free area comprising not less than 1.5% of the floor area, and low level openings which may be permanent or readily openable with a free area not less than 1.5% of floor area;

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 room. Any variation to the prescriptive provisions will require the consent of the fire brigade and should form part of the fire safety engineering report to verify the performance requirements of the BCA.

9.5. Exit Signs and Emergency Lighting (BCA E4D2, E4D4, E4D5, E4D6 and E4D8 (previously E4.2 E4.5, E4.6, E4.8))

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, including the potential use of photo luminescent exit signs.

Where exit signs are proposed to be above 2.7m to avoid potential damage by forklifts in the warehousing areas, this will need to be documented as a performance solution by an accredited fire safety engineer. This would need to be assessed to BCA Performance Requirement E4P2 (previously EP4.2).

Details are required to be provided for review.

9.6. Fire Control Centre (BCA E1D15 (previously E1.8))

Warehouse 3,4 and 5 (Only)

As the building is a Class 6, 7, 8 or 9 building that contains a floor area of greater than 18,000m², a fire control centre is required in accordance with BCA Specification 19 (previously Spec E1.8).

As the building has an effective height of greater than 25m, a fire control centre is required. Where the effective height of the building exceeds 50m, the fire control centre must be located within a dedicated, fire rated room in accordance with the requirements of BCA Specification 19 (previously Spec E1.8)

9.7. Fire Precautions During Construction (BCA E1D16 (previously 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.

Due to the height of the building this will need to be considered and implemented during construction.

10. Health and Amenity

10.1. Stormwater Drainage (BCA Clause F1D3 (previously Clause F1.1))

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

The use of a syphonic stormwater drainage system is not covered by Australian Standards and any design incorporating one would need an appropriate performance solution will need to be documented by the hydraulic consultant addressing the system compliance against BCA Performance Requirements F1P2 and F1P3 (prev. FP1.2 & FP1.3).

10.2. Surface Water Management (BCA Part F1)

Exposed Joints

Exposed joints in the drainage surface on a roof, balcony, podium or similar horizontal surface part of a building must not be located beneath or run through a planter box, water feature or similar part of the building.

Joints are to be protected in accordance with Section 2.9 of AS 4654.2.

External Waterproofing Membranes

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.

10.3. Roof & Wall Cladding (BCA Part F3 (previously Part F1))

BCA 2022 has introduced some deemed to satisfy provisions that relate to the waterproofing of external walls. These provisions apply as follows:

- Masonry, including masonry veneer, unreinforced and reinforced masonry is to comply with AS 3700
- Autoclaved aerated concrete is to comply with AS 5146.3
- Metal wall cladding is to comply with AS 1562.1

Where the installation is not proposed to comply with the above, or a different material is proposed to be used, a performance solution can be utilised to demonstrate compliance.

Performance Requirement F3P1 (previously FP1.4) which relates to the prevention of the penetration of water through external walls, must be complied with. Where a performance solution is proposed, it is to be prepared by a suitably qualified professional (façade engineer with NER for structural engineering) that demonstrates that the external walls of the proposed building comply with Performance Requirement F3P1 (previously 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.*

10.4. Wet Areas & Overflow Protection (BCA Part F2 (previously Part F1))

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.

10.5. Light and Ventilation (BCA Part F6 (previously Part F4))

Class 7, 8

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.

10.6. Condensation management (BCA Part F8 (previously Part F6))

External Wall Construction

Pliable building membranes installed to an external wall must:

- achieve compliance with AS 4200.1, and
- be installed in accordance with AS4200.2, and
- be located on the exterior side of the primary insulation layer or the wall assembly and except for the single skin mason and single skin concrete be separated from water sensitive materials.

Where a pliable building membrane, sarking-type material or insulation layer is installed on the exterior side of the primary insulation layer, it must have a vapour permeance of not less than: 0.143µg/N.s in climate zones 4 and 5, and not less than 1.14µg/N.s in climate zones 6, 7 and 8.

Exhaust Systems

Exhaust systems must achieve a minimum flow rate of 25L/s for bathrooms and sanitary compartments and 40L/s for kitchens and laundries. These exhaust systems must all discharge directly or via a shaft/duct to outdoor air.

An exhaust system that is not run continuously and is serving a bathroom or sanitary compartment that is not ventilated in accordance with F6D7 is to be:

- Interlocked with the room's light switch; and
- Include a run on timer so that the exhaust system continues to operate for 10 minutes after the light switch is turned off.

Ventilation of Roof Spaces

A roof in climate zones 6, 7 and 8 must have a roof space that:

- a) Is located
 - i. Immediately above the primary insulation layer; or
 - ii. Immediately above sarking with a vapour permeance of not less than 1.14µg/N.s, which is immediately above the primary insulation layer; or
 - iii. Immediately above ceiling insulation which meets the requirements of J3D7 (3) and (4)
- h) Has a height of not less than 20mm; and
- i) Is either
 - i. Ventilated to outdoor air through evenly distributed openings in accordance with Table F8D5; or
 - ii. Located immediately underneath roof tiles of an unsarked tiled roof

11. Energy Efficiency

11.1. SECTION J (JP1 Energy Efficiency)

Efficient energy use must be achieved appropriate to the function and use of the building, level of human comfort, solar radiation, energy source of the services and sealing of the building envelope. To achieve this JV1, JV2, JV3, JV4 and JV5 verification methods have been introduced as options available to achieve compliance.

Verification Methods

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

J1V1 (previously JV1) NABERS Energy for Offices

- To achieve compliance with J1P1 (previously JP1) a class 5 building must achieve a minimum of 5.5 NABERS Energy for Offices Base Building Commitment Agreement.
- The energy model demonstrates the base building's greenhouse gas emissions are not more than 67% of the 5.5 star level when excluding:
 - Tenant supplementary heating and cooling systems
 - External lighting; and
 - Car park services.
 - A thermal comfort level between predicted mean vote of -1 to +1 is achieved across not less than 95% of the floor area of all occupied zones for not less than 98% of annual hours of operation.
- The building also needs to comply with additional requirements of Spec 33 (previously JV4).

The calculation method must comply with ANSI/ASHRAE Standard 140

J1V2 (previously JV3) Green Star

To achieve compliance with J1P1 (previously 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 140, Specification 34 (previously Spec JVb) and when:

- The building complies with simulation requirements and is registered 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 achieved 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.

J1V3 (previously 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 34 (previously Spec 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 modelled 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 33 (previously Spec JVb); 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.

J1V4 (previously JV4) Building Envelope Sealing

Compliance with J1P1(e) (previously JP1) and J1P2 (previously JP2) is verified for building envelope sealing 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, 10m³/hr.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.

Part J3 and performance solution that uses one of the other NCC assessment Methods which verifies that compliance with JP1 (e) will be achieved can also be used as verification methods.

11.2. Building Fabric (Part J4 (previously Part J1))

Roof and Ceiling Construction (Part J4D4 (previously 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-

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

Where the layer of insulation is penetrated by the percentages as tabled below, additional upgrading of the remainder of the insulation level is required.

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 ceiling 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.

External Walls and Glazing (Part J4D6 (previously J1.5))

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

The total system U-value of wall-glazing construction should be calculated in accordance with Specification 37 (previously 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 J4D6a (previously 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 J4D6 (previously J1.5).

11.3. Building sealing (Part J5 (previously J3))

Windows and Doors (Part J5D5 (previously 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 J5D6 (previously 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 J5D7 (previously 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 J5D8 (previously 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 J6 (previously J5))

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 2kW_r 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 J6D6 (previously J5.5)

Table J6D6 (previously Table J5.5)

Location of ductwork and fittings	Climate zone 1, 2, 3, 4, 5, 6 or 7	Climate zone 8
Within a conditioned space	1, 2	2.0
Where exposed to direct sunlight	3.0	3.0
All other locations	2.0	3.0

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 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 kW_r –

- (a) Where water cooled, have a minimum energy efficiency ratio of $4.0 W_r / W_{\text{input power}}$ 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 $2.9 W_r / W_{\text{input power}}$ 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 sole-occupancy unit of a Class 2 building or Class 4 part the lamp power density/illumination power density of artificial lighting must not exceed the allowance of 5 W/m² within a sole-occupancy unit and 4 W/m² on a verandah, balcony or the like attached to a sole-occupancy unit.

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;

Common rooms, spaces and corridors in a Class 2 building	4.5W/m ²
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
Museum & gallery	2.5W/m ²
Retail:	14W/m ²
Corridors:	5W/m ²
Common rooms, spaces & corridors in a Class 2 building	4.5W/m ²
Lounge area for communal use in a Class 3 or 9c building	4.5W/m ²
Dormitory of Class 3 building:	
(A) Used for sleeping only	3W/m ²
(B) Used for sleeping & study	4W/m ²
Storage	1.5W/m ²
School:	4.5W/m ²
Health Care:	
(A) Infants & children's wards & ED	4W/m ²
(B) Exam room	4.5W/m ²
(C) Exam room in intensive care & high dependency ward	6W/m ²
(D) All other patient care areas inc wards & corridors	2.5W/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
Auditoriums, church and public hall :	8W/m ²
Restaurant, café, bar:	14W/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;

- 250m² if in a Class 6 building or Class 8 laboratory
- Not operate lighting for an area more than -
 - a) 250m² for a space of not more than 2000m²;
 - b) 1000m² for a space of more than 2000m²
 if in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building;
- 1000m² for a space of more than 2000m²

Interior decorative and display lighting

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 40 (previously J6) where the display lighting exceeds 1 kW

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

Exterior artificial lighting

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.

11.6. Energy Monitoring and On-Site Distributed Energy Resources (Part J9 (previously Part J8))

Facilities for Energy Monitoring (J9D3 (previously J8.3))

A building or sole-occupancy unit with a floor area of more than 500 m² must have energy meters configured to record the time-of-use consumption of gas and electricity.

A building with a floor area of more than 2 500 m² must have energy meters configured to enable individual time-of-use energy data recording, in accordance with the below, of—

- a) artificial lighting; and
- b) appliance power; and
- c) central hot water supply; and
- d) internal transport devices including lifts, escalators and moving walkways where there is more than one serving the building; and
- e) on-site renewable energy equipment; and
- f) on-site electric vehicle charging equipment; and
- g) on-site battery systems; and
- h) other ancillary plant.

Energy meters required by the above must be interlinked by a communication system that collates the time-of-use energy data to a single interface monitoring system where it can be stored, analysed and reviewed.

Facilities for Solar Photovoltaic and Battery Systems

The main electrical switchboard of a building must—

- a) contain at least two empty three-phase circuit breaker slots and four DIN rail spaces labelled to indicate the use of each space for—
 - i. a solar photovoltaic system; and
 - ii. a battery system; and
- b) be sized to accommodate the installation of solar photovoltaic panels producing their maximum electrical output on at least 20% of the building roof area.

At least 20% of the roof area of a building must be left clear for the installation of solar photovoltaic panels, except for buildings—

- a) with installed solar photovoltaic panels on—
 - i. at least 20% of the roof area; or
 - ii. an equivalent generation capacity elsewhere on-site; or
- b) where 100% of the roof area is shaded for more than 70% of daylight hours; or
- c) with a roof area of not more than 55 m²; or
- d) where more than 50% of the roof area is used as a terrace, carpark, roof garden, roof light or the like.

The requirements do not apply to a building with solar photovoltaic panels installed on at least 20% of the roof area or to a building with battery systems installed.

12. Access for People with Disabilities

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

- The Building Code of Australia 2022;
- 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 D4D2 (previously D3.1))

Access for people with disabilities shall be provided to and within the building in accordance with the requirements of Clause D4D3, D4D4 and D4D5 (previously D3.2, D3.3 and D3.4) of the BCA 2022 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:

Warehouse and production/Manufacturing facilities

To and within all areas normally used by the occupants,

Where 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 an exemption is sought from providing access under clause D4D5 (previously D3.4), this is to be applied for as part of the application for building work approval.

12.2. Provision for Access to Buildings (BCA Clause D4D3 (previously D3.2))

The BCA prescribes access to be provided to and within the building as follows:

- Via the principle pedestrian entry and at least 50% of all other entrances from the allotment boundary
- From designated car parking spaces for the use of occupants with a disability.
- From another accessible building connected by a pedestrian link.
- All areas used by the occupants.

In buildings over 500m² in floor area, a non-accessible entrance must not be located more than 50m from an accessible 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.

12.3. Accessibility within Building (BCA Clause D4D4 (previously D3.3))

A building required to be accessible is required to be equipped with either a AS 1428.1 compliant lift or AS 1428.1 compliant ramp, (but the maximum vertical rise of a ramp must not exceed 3.6m).

An exemption to not provide either a lift or ramp exists for class 5, 6, 7b, or 8 buildings, where a building contains;

- a) Less than 3 storeys; and
- b) Floor area of each storey (excluding the entrance level) is not more than 200m².

Within the building the following are required;

- Door circulation space as per AS1428.1 Clause 13.3 and as attached in Appendix B;
- 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.

12.4. Car Parking (BCA Clause D4D6 (previously D3.5))

Accessible car parking spaces are required to comply with AS 2890.6-2009 at the rate of 1/100

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

12.5. Tactile Indicators (BCA Clause D4D9 (previously 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.

12.6. Stairs (BCA Clause D4D4 (previously clause 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.

12.7. Accessible Sanitary Facilities (BCA Clause F4D5, F4D6, F4D7 (previously 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

13. Conclusion

The proposed works are capable of complying with the Building Code of Australia 2022 subject to final assessment of detailed documentation at Construction Certificate stage.

14. Appendix A - Reference Documentation

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

Drawing No.	Title	Revision	Date	Prepared By
220207-DA-0	COVER PAGE AND TITLE SHEET	A	23.6.23	PACE ARCHITECTS
220207-DA-100	BUILDING 1 SITE & WAREHOUSE PLAN	A	23.6.23	PACE ARCHITECTS
220207-DA-110	BUILDING 1 OFFICE PLAN	A	23.6.23	PACE ARCHITECTS
220207-DA-115	BUILDING 1 ROOF PLAN	A	23.6.23	PACE ARCHITECTS
220207-DA-120	BUILDING 1 ELEVATION	A	23.6.23	PACE ARCHITECTS
220207-DA-121	BUILDING 1 OFFICE ELEVATION	A	23.6.23	PACE ARCHITECTS
220207-DA-130	BUILDING 1 SECTIONS	A	23.6.23	PACE ARCHITECTS
220207-DA-00	COVER PAGE AND TITLE SHEET-BLDG2	C	18.8.23	PACE ARCHITECTS
220207-DA-200	BUILDING 2 SITE & WAREHOUSE PLANS	C	18.8.23	PACE ARCHITECTS
220207-DA-210	BUILDING 2 OFFICE PLAN	C	18.8.23	PACE ARCHITECTS
220207-DA-215	BUILDING 2 ROOF PLAN	C	18.8.23	PACE ARCHITECTS
220207-DA-220	BUILDING 2 ELEVATIONS	C	18.8.23	PACE ARCHITECTS
220207-DA-221	BUILDING 2 OFFICE ELEVATION	C	18.8.23	PACE ARCHITECTS
220207-DA-230	BUILDING 2 SECTIONS	C	18.8.23	PACE ARCHITECTS
220207-DA-000	COVER PAGE AND TITLE SHEET-BLDG3	C	18.8.23	PACE ARCHITECTS
220207-DA-300	BUILDING 3 SITE & WAREHOUSE PLANS	C	18.8.23	PACE ARCHITECTS
220207-DA-310	BUILDING 3 OFFICE PLAN	C	18.8.23	PACE ARCHITECTS
220207-DA-315	BUILDING 3 ROOF PLAN	C	18.8.23	PACE ARCHITECTS
220207-DA-320	BUILDING 3 ELEVATIONS	C	18.8.23	PACE ARCHITECTS
220207-DA-321	BUILDING 3 OFFICE ELEVATION	C	18.8.23	PACE ARCHITECTS
220207-DA-330	BUILDING 3 SECTIONS	C	18.8.23	PACE ARCHITECTS
220207-DA-0000	COVER PAGE AND TITLE SHEET-BLDG4	C	18.8.23	PACE ARCHITECTS
220207-DA-400	BUILDING 4 SITE & WAREHOUSE PLANS	C	18.8.23	PACE ARCHITECTS
220207-DA-410	BUILDING 4 OFFICE 4A & 4B PLANS	C	18.8.23	PACE ARCHITECTS
220207-DA-411	BUILDING 4 OFFICE 4C PLANS	B	18.8.23	PACE ARCHITECTS
220207-DA-415	BUILDING 4 ROOF PLAN	C	18.8.23	PACE ARCHITECTS

Drawing No.	Title	Revision	Date	Prepared By
220207-DA-420	BUILDING 4 ELEVATIONS	C	18.8.23	PACE ARCHITECTS
220207-DA-421	BUILDING 4 OFFICE ELEVATION	C	18.8.23	PACE ARCHITECTS
220207-DA-422	BUILDING 4 OFFICE ELEVATION	B	18.8.23	PACE ARCHITECTS
220207-DA-430	BUILDING 4 SECTIONS	C	18.8.23	PACE ARCHITECTS
220207-DA-00000	COVER PAGE AND TITLE SHEET-BLDG5	A	23.6.23	PACE ARCHITECTS
220207-DA-500	BUILDING 5 PARKING LEVEL	D	25.8.23	PACE ARCHITECTS
220207-DA-501	BUILDING 5 FIRST LEVEL	D	25.8.23	PACE ARCHITECTS
220207-DA-502	BUILDING 5 SECOND LEVEL	D	25.8.23	PACE ARCHITECTS
220207-DA-510	BUILDING 5 OFFICE A & B	D	25.8.23	PACE ARCHITECTS
220207-DA-510-1	BUILDING 5 UNIT A & B – AMENITIES	D	25.8.23	PACE ARCHITECTS
220207-DA-510-2	BUILDING 5 OFFICE C & D	D	25.8.23	PACE ARCHITECTS
220207-DA-510-3	BUILDING 5 UNIT C & D – AMENITIES	D	25.8.23	PACE ARCHITECTS
220207-DA-510-4	BUILDING 5 OFFICE E & F	D	25.8.23	PACE ARCHITECTS
220207-DA-510-5	BUILDING 5 UNIT E & F – AMENITIES	D	25.8.23	PACE ARCHITECTS
220207-DA-510-6	BUILDING 5 OFFICE G & H	D	25.8.23	PACE ARCHITECTS
220207-DA-510-7	BUILDING 5 UNIT G & H – AMENITIES	D	25.8.23	PACE ARCHITECTS
220207-DA-515	BUILDING 5 ROOF PLAN	D	25.8.23	PACE ARCHITECTS
220207-DA-520	BUILDING 5 ELEVATIONS – SHEET 1	C	25.8.23	PACE ARCHITECTS
220207-DA-521	BUILDING 5 ELEVATIONS – SHEET 2	C	25.8.23	PACE ARCHITECTS
220207-DA-550	BUILDING 5 SECTIONS – SHEET 1	D	25.8.23	PACE ARCHITECTS
220207-DA-551	BUILDING 5 SECTIONS – SHEET 2	A	23.6.23	PACE ARCHITECTS
220207-DA-552	BUILDING 5 SECTIONS – SHEET 3	A	23.6.23	PACE ARCHITECTS

15. Appendix B - Draft Fire Safety Schedule

	Essential Fire Safety Measures	Standard of Performance
1.	Access Panels, Doors and Hoppers	BCA 2022 Clause C4D14
2.	Automatic Smoke Detection and Alarm System	BCA 2022 Clause E2D3, E2D5, E2D7, E2D8, E2D9, E2D10, E2D11, E2D13, E2D14, E2D15, E2D16, E2D17, E2D19, E2D20, Spec 20 Clause S20C3/S20C4/S20C5, AS 1670.1 – 2018, AS/NZS 1668.1 – 2015, AS 3786-2014
3.	Automatic Fire Suppression System	BCA 2022 Clause C3D4, E1D5, E1D6, E1D7, E1D8, E1D9, E1D10, E1D11, E1D13, E2D8, E2D9, E2D10, E2D11, E2D13, E2D14, E2D15, E2D16, E2D17, E2D19, E2D20, G3D8, Spec 17, Spec 31 & AS 2118.1 – 2017 Amdt 1 & 2, AS 2118.6 – 2012 (Combined sprinkler & hydrant)
4.	Emergency Lighting	BCA 2022 Clause E4D2, E4D4 & AS/NZS 2293.1 – 2018
5.	Exit Signs	BCA 2022 Clauses E4D5, E4D6 & E4D8 and AS/NZS 2293.1 – 2018
6.	Fire Control Centres and Rooms	BCA 2022 Spec. 19
7.	Fire Blankets	BCA 2022 Clause E1D14, I3D11 and AS 2444 – 2001
8.	Fire Doors	BCA 2022 Clause C4D3, C4D5, C4D6, C4D7, C4D8 & C4D9 and AS 1905.1 – 2015
9.	Fire Hose Reels	BCA 2022 Clause E1D3 & AS 2441 – 2005 Amdt 1
10.	Fire Hydrant System	BCA 2022 Clause C3D13, E1D2, Spec 18, I3D9 & AS 2419.1 – 2021
11.	Fire Seals	BCA 2022 Clause C4D15, C4D16, Spec 13, Spec 14, & AS 1530.4 –2014
12.	Lightweight Construction	BCA 2022 Clause C2D9, Spec 6
13.	Mechanical Air Handling System	BCA 2022 Clause E2D3, E2D4, E2D6, E2D7, E2D8, E2D9, E2D10, E2D11, E2D12, E2D13, E2D14, E2D15, E2D16, E2D17, E2D18, E2D19, E2D20, G3D8, Spec 21, AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012
14.	Perimeter Vehicular Access	BCA 2022 Clause C3D5
15.	Portable Fire Extinguishers	BCA 2022 Clause E1D14 & I3D11, AS 2444 – 2001
16.	Smoke Alarms	BCA 2022 Spec 20 & AS 3786 - 2014
17.	Smoke Doors	BCA 2022 Spec 11
18.	Stand-by Power System	BCA 2022 Clause G3D8, Spec 31
19.	Warning and Operational Signs	BCA 2022 Clause C4D7, D2.23, E3D4, AS 1905.1 –2015

16. Appendix D - Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2022:

Type B Construction

Table S5C21a: Type B Construction: FRL of loadbearing parts of external walls

Distance from a fire source feature	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Less than 1.5m	90/90/90	120/120/120	180/180/180	240/240/240
1.5 to less than 3m	90/60/30	120/90/60	180/120/90	240/180/120
3m to less than 9m	90/30/30	120/30/30	180/90/60	240/90/60
9m to less than 18m	90/30/-	120/30/-	180/60/-	240/60/-
18m or more	-/-/-	-/-/-	-/-/-	-/-/-

Table S5C21b: Type B Construction: FRL of non-loadbearing parts of external walls

Distance from a fire source feature	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Less than 1.5m	-/90/90	-/120/120	-/180/180	-/240/240
1.5 to less than 3m	-/60/30	-/90/60	-/120/90	-/180/120
3m or more	-/-/-	-/-/-	-/-/-	-/-/-

Table S5C21c: Type B Construction: FRL of external columns not incorporated in an external wall

Column type	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Loadbearing	90/-/-	120/-/-	180/-/-	240/-/-
Non-loadbearing	-/-/-	-/-/-	-/-/-	-/-/-

Table S5C21d: Type B Construction: FRL of common walls and fire walls

Wall type	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Loadbearing or non-loadbearing	90/90/90	120/120/120	180/180/180	240/240/240

Table S5C21e: Type B Construction: FRL of loadbearing internal walls

Location	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation
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	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Fire-resisting lift and stair shafts	90/90/90	120/120/120	180/180/180	240/240/240
Bounding public corridors, public lobbies and the like	60/60/60	120/-/-	180/-/-	240/-/-
Between or bounding sole-occupancy units	60/60/60	120/-/-	180/-/-	240/-/-

Table S5C21f: Type B Construction: FRL of non-loadbearing internal walls

Location	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Fire-resisting lift and stair shafts	-/90/90	-/120/120	-/120/120	-/120/120
Bounding public corridors, public lobbies and the like	-/60/60	-/-/-	-/-/-	-/-/-
Between or bounding sole-occupancy units	-/60/60	-/-/-	-/-/-	-/-/-

Table S5C21g: Type B Construction: FRL of other building elements not covered by Tables S5C21a to S5C21e

Location	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Other loadbearing internal walls, internal beams, trusses and columns	60/-/-	120/-/-	180/-/-	240/-/-
Roofs	-/-/-	-/-/-	-/-/-	-/-/-

Carparks

- 1) Notwithstanding S5C21, a carpark may comply with this clause if it is an open-deck carpark or is protected with a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification 17 and is—
 - a) a separate building; or
 - b) a part of a building, and if occupying only part of a storey, is separated from the remaining part by a fire wall.
- 2) For the purposes of this clause, a carpark—
 - a) includes—
 - i. an administration area associated with the functioning of the carpark; and
 - ii. where the carpark is sprinklered, is associated with a Class 2 or 3 building and provides carparking for separate sole-occupancy units each carparking area with an area not greater than 10% of its floor area for purposes ancillary to the sole-occupancy units; but
 - b) excludes—
 - c)

- i. except for (a), any area of another classification, or other part of a Class 7 building not used for carparking; and
- ii. a building or part of a building specifically intended for the parking of trucks, buses, vans and the like.

3) For building elements in a carpark as described in (1) and (2), the following minimum FRLs are applicable:

a) External walls:

- i. Less than 3 m from a fire-source feature to which it is exposed:
 - A. Loadbearing: 60/60/60.
 - B. Non-loadbearing: -/60/60.
- ii. 3 m or more from a fire-source feature to which it is exposed: -/-/-.

b) Internal walls:

- 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 walls:

- i. From the direction used as a carpark: 60/60/60.
- ii. From the direction not used as a carpark: as required by Tables S5C21a to S5C21f as appropriate.

d) Columns:

- i. Supporting only the roof (not used for carparking) and 3 m or more from a fire-source feature to which it is exposed: -/-/-.
- ii. Steel column, other than one covered by (i) and one that does not support a part of a building that is not used as a carpark—
 - A. 60/-/-; or
 - B. an ESA/M of not greater than 26 m²/tonne.
- iii. Any other column not covered by (i) or (ii): 60/-/-.

e) Beams:

- i. Steel floor beam in continuous contact with a concrete floor slab—
 - A. 60/-/-; or
 - B. an ESA/M of not greater than 30 m²/tonne.
- ii. Any other beam: 60/-/-.

f) Lift shaft: -/-/-.

g) Fire-resisting stair shaft (within the carpark only): 60/60/60.

h) Roof, floor slab and vehicle ramp: -/-/-.

4) For the purposes of (3), ESA/M means the ratio of exposed surface area to mass per unit length

Type C Construction

Table S5C24a: Type C Construction: FRL of parts of external walls

Distance from a fire source feature	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Less than 1.5m	90/90/90	90/90/90	90/90/90	90/90/90
1.5 to less than 3m	-/-/-	60/60/60	60/60/60	60/60/60
3m or more	-/-/-	-/-/-	-/-/-	-/-/-

Table S5C24b: Type C Construction: FRL of external columns not incorporated in an external wall

Column type	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Less than 1.5m	90/-/-	90/-/-	90/-/-	90/-/-
1.5 to less than 3m	-/-/-	60/-/-	60/-/-	60/-/-
3m or more	-/-/-	-/-/-	-/-/-	-/-/-

Table S5C24c: Type C Construction: FRL of common walls and fire walls

Wall type	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Loadbearing or non-loadbearing	90/90/90	90/90/90	90/90/90	90/90/90

Table S5C24d: Type C Construction: FRL of internal walls

Location	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Bounding public corridors, public lobbies and the like	60/60/60	-/-/-	-/-/-	-/-/-
Between or bounding sole-occupancy units	60/60/60	-/-/-	-/-/-	-/-/-
Bounding a stair if required to be fire rated	60/60/60	60/60/60	60/60/60	60/60/60

Table S5C24e: Type C Construction: FRL of roof

Location	FRL (in minutes): Structural Adequacy/ Integrity/ Insulation			
	Class 2,3 or 4 part	Class 5, 7a or 9	Class 6	Class 7b or 8
Roofs	-/-/-	-/-/-	-/-/-	-/-/-

Carparks

- 5) Notwithstanding S5C21, a carpark may comply with this clause if it is an open-deck carpark or is protected with a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification 17 and is—
 - c) a separate building; or
 - d) a part of a building, and if occupying only part of a storey, is separated from the remaining part by a fire wall.
- 6) For the purposes of this clause, a carpark—
 - d) includes—
 - iii. an administration area associated with the functioning of the carpark; and
 - iv. where the carpark is sprinklered, is associated with a Class 2 or 3 building and provides carparking for separate sole-occupancy units each carparking area with an area not greater than 10% of its floor area for purposes ancillary to the sole-occupancy units; but
 - e) excludes—
 - f)
 - iii. except for (a), any area of another classification, or other part of a Class 7 building not used for carparking; and
 - iv. a building or part of a building specifically intended for the parking of trucks, buses, vans and the like.
- 7) For building elements in a carpark as described in (1) and (2), the following minimum FRLs are applicable:
 - i) External walls:
 - iii. Less than 1.5 m from a fire-source feature to which it is exposed:
 - C. Loadbearing: 60/60/60.
 - D. Non-loadbearing: -/60/60.
 - iv. 1.5 m or more from a fire-source feature to which it is exposed: -/-/-.
 - j) Internal walls: -/-/-
 - k) Fire walls:
 - iii. From the direction used as a carpark: 60/60/60.
 - iv. From the direction not used as a carpark: 90/90/90.
 - l) Columns:
 - iv. Steel column less than 1.5m from a fire source feature—
 - C. 60/-/-; or
 - D. an ESA/M of not greater than 26 m²/tonne.
 - v. Any other columns not less than 1.5m from a fire source feature: 60/-/-
 - vi. Any other column not covered by (i) or (ii): -/-/-.
 - m) Beams:
 - iii. Steel floor beam, less than 1.5m from a fire source feature, in continuous contact with a concrete floor slab—
 - C. 60/-/-; or
 - D. an ESA/M of not greater than 30 m²/tonne.
 - iv. Any other beam: 60/-/-.
 - v. More than 1.5m from a fire source feature: -/-/-
 - n) Roof, floor slab and vehicle ramp: -/-/-.