



A Bureau Veritas Group Company

Regulatory Compliance Report

Air Trunk 1 SYD 3 Data Centre
51 Huntingwood Drive, Huntingwood
NSW 2148



Prepared for:	AirTrunk
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1. Executive Summary

Development Overview

The proposed development is a new data centre, including ancillary outbuildings (such as fire pump room, substation, GIS etc) located at 51 Huntingwood Drive, Huntingwood NSW.

Compliance Summary

As Registered Certifiers we have reviewed the SSDA Issue architectural design documents prepared by Greenbox (refer appendix A) for compliance with the building assessment provisions currently outlined in BCA 2022 (with the exception of Section J as BCA 2019), as the previously issued Construction Certificates has locked in the BCA year.

This report has been prepared to assess the project against the Building Code of Australia for the proposed modifications to the building as part of the modification submission. 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 SSDA 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	Fire Compartment Size [PS#1] Oversize fire compartment (up to 18100m ² within main building, and up to 5366m ² to external gantry)	C3D3	C1P1, C1P2
2	Door Hardware [PS#2] Security locking devices will be incorporated within path of travel doors (data hall fire doors) as part of the building security	D3D26	D1P2
3	Services Penetrations [PS#3, 4 & 5] - Services penetrations within 4 hour building element (wall and floor) are proposed to achieve 2 hour fire rating in lieu of 4 hours due to limitation of existing tested systems. - Services penetration within external gantry floor slab will not be fire sealed	C4D15	C1P2, C1P8
4	Extended Travel Distances Exit [PS# 6 & 7] - Level 1 (Shell A) – 24m to point of choice in lieu of 20m and 47m to exit in lieu of 40m - Level 1 (external gantry) – 69m to single exit in lieu of 20m - Level 2 (Shell A) – 46m to a point of choice in lieu of 20m and 89m to exit in lieu of 40m - Level 2 (Shell B to E) – 29m to a point of choice in lieu of 20m and 64m to exit in lieu of 40m - Level 3 to 6 (Shell A to E) – 31m to a point of choice in lieu of 20m and 57m to exit in lieu of 40m - Level 4 (Shell E) – 75m to single exit in lieu of 20m	D2D5	D1P4, E2P2

No.	Description	DTS Clause	Performance Requirements
	- Level 6 (Shell A) – 55m to exit in lieu of 40m - Level 6 Upper Plant (Shell A) – 41m to exit in lieu of 40m		
5	Distance Between Exits [PS#8 &9] - Level 1 (Shell A) – 102m between exits in lieu of 60m - Level 2 (Shell A) – 106m between exits in lieu of 60m - Level 2 (Shell B to E) – 122m between exits in lieu of 60m - Level 3 to 6 (Shell A to E) – 109m between exits in lieu of 60m - Level 6 (Shell A) – 107m between exits in lieu of 60m	D2D6	D1P4, E2P2
6	Egress Width [PS#10] Reduced egress width of less than 1m (minimum 850mm achieved) around plant and equipment	D2D8	D1P4, D1P6
7	Fire Hydrant [PS#11, 12, 13 & 14] - Adoption of AS2419.1-2021 (as the building exceeds 108000m³ and contains special hazards, which is outside of the limitation for the standard) - Fire hydrants to be located outside of fire stairs (additional internal fire hydrants within each storey to achieve coverage) - Hydrant coverage shortfall (use of two length of hose to achieve coverage) - Fire Hydrant and Sprinkler Booster assembly location (remote booster not within sight from principal pedestrian entrance and principal vehicle entrance)	E1D2, E1D5	E1P3, E1P4
8	Fire Hose Reel [PS#15] Omission of fire hose reel within data halls area, GIS Switch room and substation buildings and to be replaced with Fire Extinguishers	E1D3	E1P1
9	Sprinkler System [PS#16] Omission of sprinkler protection within the following areas: - within generator on the gantries - within low voltage switchrooms on the roof top (Shell A)	E1D4	E1P4
10	Fire Precaution During Construction [PS#17] Due to construction staging (2 stages proposed), existing building and fire hydrant will be retained at completion of Stage 1 works. There will be two separate fire hydrant system (including separate booster assembly) for the new and existing building on the same time.	E1D16	E1P3, E1P4
11	Zone Smoke Control System [PS#18] Omission of zone smoke control within the main building areas	E2D6	E2P2
12	Stair Pressurisation System [PS#19] Omission of stair pressurisation system to fire isolated exits	E2D4	E2P2
13	Sound System and Intercom Systems for Emergency Purpose [PS#20 & 21]	E4D9	E4P3

No.	Description	DTS Clause	Performance Requirements
	The following departures are to be made from the EWIS system: - Speech intelligibility is proposed to be removed - WIPs will only be provided at fire stair entries only - Increase EWIS zoning to 2300m² in lieu of 2000m² to match the sprinkler valve zoning		
14	Sprinkler System Concession [PS#22 & 25] The following concession (available for fully sprinklered building) will need to be addressed: - C3D7 vertical separation of openings – omission of 1 hour fire rated spandrel - Specification 7 fire hazard properties – allow use of reduced critical radiant flux requirements and additional material group permitted (in line with the sprinkler protected building)	E1D13 interalia C3D2, C3D7, Spec 7, E1D2	E1P4, C1P1, C1P2, C1P4, E1P3
15	Fire Isolated Exits Re-entry [PS#23] Variation to fire stair re-entry provisions	D3D27	D1P5
16	Special Hazard [PS#24] Special hazard provisions to be considered for - bulk diesel tanks - lithium-ion batteries	E1D17, E2D21	E1P3, E1P4, E2P2
17	Fire Isolated Exits [PS#28] - Fire isolated exits do not extend to upper plant of Level 6 (Shell A) - Fire isolated exits discharge into covered area (gantry) at Level 2, where the travel distance exceeds 20m (up to 25m) and perimeter is less than 1/3 open (details to be confirmed) - Openings within 6m from fire isolated exits discharge at Level 2, which is proposed to be unprotected	D2D12	D1P4, D1P5, E2P2
18	Travel via Non Fire Isolated Exits [PS#26 & 27] - Exits from Level 6 upper level plants are via non fire isolated exits, through the fire isolated exits at Level 6, and the total travel distance via the non fire isolated exit and fire isolated exit exceeds 80m - Exit from Shell E Level 4 plant area (above the offices) is via non fire isolated exit (external open stair), and the total distance via the non fire isolated exit exceeds 80m (up to 104m)	D2D14	D1P4, E2P2
19	GIS Switch Rooms Doors [PS#29] The GIS Switchroom located external of the building is currently proposed to be fitted with a fire activated bolt to maintain the required FRL and not be readily openable without a key.	D3D26	D1P2
20	Fire Control Room [PS#36] The following non compliances are applicable - The fire control room will be located 3.5m above the street level due to slope of land. - Single exit provided to the fire control room in lieu of two	E1D15, Spec 19	E1P6

No.	Description	DTS Clause	Performance Requirements
	Omission of fire separation to the adjoining fire pump room		
21	Fire Damper [PS#30 & 31] Fusible links to the following locations are to be removed from the damper within the Data Hall and battery rooms which will not meet the requirements of AS 1668.1-2015: - Supply air system to data hall - Exhaust from battery room	AS 1668.1 - 2015	E2P2
22	Mechanical Duct Fire Rating [PS#32] The makeup air duct and exhaust duct connecting the data halls within the vertical riser shaft to be constructed to FRL -/120/120 in lieu of FRL -/240/240	AS 1668.1 - 2015	E2P2
23	Smoke Detection System [PS#33] It is proposed to provide an additional line of detectors within the hot corridors of the data halls which are located more than 600mm below the ceiling.	AS 1670.1 – 2018	E2P2
24	Sprinkler System [PS#34] - A single tail end system is proposed to serve an area of up to 2200m² in lieu of 1,000m² - A single wet pipe installation will serve an area of up 9000m² in lieu of 2500m²	AS 2118.1 2017	E1P4
25	Rooftop Switchrooms [PS#35] It is proposed for the rooftop plant areas to be open to atmosphere in lieu of being fire separated by construction meeting FRL 120/120/120	C3D13	C1P1, C1P2
26	Emergency Generators [PS#37] Emergency generators serving the mechanical exhaust systems within the data hall to be open to gantries in lieu of being fire separated	C3D13	C1P1, C1P2
Accessibility Items			
27	No performance solutions proposed to date noting that the data centre (except for office spaces) shall be exempted under BCA Clause D4D5 from the requirements for accessibility.	D4D2	D1P1
Miscellaneous Items			
28	Weatherproofing of External Walls As there are no deemed to satisfy provisions relating to the weatherproofing of external walls, 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 Note: Applicable to the office part only	-	F3P1

Performance solution assessment report has been prepared based on the original development consent, incorporating the above design departures. Whilst the building layout and size is proposed to be amended as part of the proposed consent modification, the proposed update will be consistent with the existing performance solution assessment report. Prior to the issuance of construction certificate, the performance solution assessment report will be updated to suit, incorporating the changes from the consent modification.

Fire Safety Services

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

1.	Sprinklers system throughout.
2.	Fire hydrant system throughout.
3.	Fire hose reels throughout except for the Class 5 office portions of the building (subject to fire engineering assessment)
4.	Zone smoke control system throughout (subject to fire engineering assessment)
5.	Fire precautions during construction.
6.	Air-pressurization throughout the fire isolated stairs serving portions of the building above 25m in effective height. (subject to fire engineering assessment)
7.	Automatic smoke detection and alarm system throughout.
8.	Sound System and Intercom System for Emergency Purposes (subject to fire engineering assessment)

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

Any fire engineered solution will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

Documentation to enable assessment and demonstrate compliance will be required to address the above items prior to approval.

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

The proposed development comprises of a new seven storey data centre (Parts A and B) and associated office portions, with open air carparking area. There is other single storey outbuildings associated with this development, including guard kiosk, fire pump room, IW pump room (up to 2 separate buildings proposed), substation (up to 2 separate buildings proposed), and GIS switchroom,

The site is located at 51 Huntingwood Drive, Huntingwood, NSW.

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.

It is proposed to construct the building in 3 phases. Refer phasing diagram for the proposed construction phasing.

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 based on previously issued construction certificate.

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:

- a) A Performance Solution
- b) A Deemed-to-Satisfy Solution
- c) 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 any exist, regarding the Performance Solution.

5. Preliminaries

5.1. Building Assessment Data

Summary of Construction Determination:

Part of Project	Main Building	Guard Kiosk	Substation I & II	IW Pump Room I & II	Fire Pump Room	GIS Switchroom	HDC Farm Platforms
Classification	7b & 5	5	7b ancillary	7b ancillary	7b ancillary	7b ancillary	10b
Number of Storeys	7 (including Mezzanine, Level 7 & 8)	1	1	1	1	1	N/A
Rise In Storeys	14 (due to double height space between Levels 2 to 6)	1	1	1	1	1	N/A
Type of Construction	A	C	C	C	C	C	N/A
Effective Height (m)	50.21	N/A	N/A	N/A	N/A	N/A	N/A

Note:

1. The effective height of the project is measured between Level 1 (RL 72.50) and Level 6 (upper plant at Level 6, RL 122.71) for Shell A, and between Level 1 (RL 77.50) and Level 6 (RL 110.00) for Shells B to E.
2. BCA C2D3(3) notes that where the average internal height of a storey (where the storey is located above ground in a multiple storey building) exceeds 6m, the storey is counted as two (rise in) storey.
3. The roof top plant level (Level 6 Upper Plant for Shell A) has been considered as a storey due to the enclosed plant rooms
4. The HDC Farm Platform is considered as Class 10b non habitable structure.

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

Part of Project	BCA Classification	Approx. Floor Area (m ²)	Approximate Volume (m ³)	Assumed Population
Level 1 (Office, Store, Plant)	7b & 5, Ancillary	5,753 3,590 (Office)	TBC	276 (office)
Mezzanine (Office)	5, Ancillary	1,366 1,228 (Office)	TBC	
Level 2 (Office, Data Centre, Store, Plant, Loading Dock)	7b, Ancillary	34,500 16,399 (gantry) 821 (office)	TBC	12 (office)
Level 3 (Office, Data Centre, Store, Plant)	7b, Ancillary	33,371 16,970 (gantry)	TBC	13 (office)
Level 4 (Office, Data Centre, Store, Plant)	7b, Ancillary	35,232 18,824 (gantry)	TBC	24 (office)
Level 5 (Office, Data Centre, Store, Plant)	7b, Ancillary	33,378 16,970 (gantry)	TBC	38 (office)
Level 6 (Office, Plant for Part B, Store, Plant, Roof for Part A)	Ancillary	33,306 15,765 (gantry)	TBC	24 (office)
Guard Kiosk	5	54	TBC	2
Substation I & II	7b	792 (each)	TBC	0*
IW Pump Room	10b	128	N/A	N/A
Fire Pump Room	10b	81	N/A	N/A
GIS Switchroom	7b	617	TBC	0*
HDC Farm Platform	10b	4782	N/A	N/A
Total		182,766	TBC	389

Notes:

1. A 1:10 ratio has been adopted for the office spaces.
2. The population for the data centre and storage parts are assumed as part of the office population, due to infrequent access to the building parts
3. The floor areas above include external gantry area and Level 6 roof top plant

The population is expected to be maximum 276 persons across 3 shifts, with maximum of 92 occupants per shift, as confirmed by AW Edwards (email from Dino DiPaolo dated 8 November 2023) within the office areas for Shell A. The additional offices areas at Levels 2 to 6 are located at Shell B, and at Level 2 Shell E. The population numbers have been nominated by the architect.

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)I (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.

As advised by AW Edwards (email correspondence from Nick Tohver dated 21 September 2023), building importance level 2 applies.

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 A Construction, in accordance with Tables S5C11a-g of Specification 5 (previously Table 3 & 3.9/4 of Specification C1.1) of the Building Code of Australia 2022.

The building has been assessed on the basis of the following fire separation / compartmentation within the development:

- Fire compartmentation of the building at each floor level,
- Additional fire compartmentation is proposed within each storey for each of the data hall shell (Parts A & B)
- Additional fire separation between the data hall shells and the external gantry

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

Below is a summary of the proposed fire compartments at each storey:

Level	Compartment	Area (m ²)
1 & Mezzanine	Shell A	4794
2	Shell A	9375
3	Shell A	9375

4	Shell A	9375
5	Shell A	9375
2	Shells B to E	TBC
3	Shells B to E	TBC
4	Shells B to E	TBC
5	Shells B to E	TBC
6	Shells B to E	TBC

While Levels 6 (Shell A & B) and Level 7 (Shell C to E) are considered as a rise in storey, they are open plantrooms, except for the switchrooms Level 6 & 7 (Shell A) which are fully enclosed with wall and roof. While fire compartmentation requirements do not apply to these parts of the building, Level 6 and 7 floor slabs are considered as floor and is to achieve the required fire rating.

The typical maximum fire compartment exceeds the DTS limit of 5000m², up to 18100m². Performance solution assessment by fire engineer is required for the oversized fire compartment within each storey (in lieu of being considered as large isolated building), and up to 5366m² for the external gantry area.

Detailed fire compartmentation drawings for Shells B to E are to be provided for further assessment.

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 A Construction, Please refer to Appendix C 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 C for required FRLs.

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

- Lift Motor Rooms;
- Emergency Power Supply;
- Emergency Generators;
- Electricity Supply;
- Boilers or Batteries;
- Hydrant Pump Rooms;
- Sprinkler Pump Rooms;
- Fire Control Room

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

The external gantry areas are considered as part of the building, as well the roof top plant area (including roof gantry), where the construction requirements of Specification 5 apply. Due to the large services penetrations to the floor slabs within the external gantry areas, the external wall separating the data centre areas and the external are fire separated, and the external gantry areas are considered as a single fire compartment.

The building structure, including external gantry and roof top low voltage switchrooms will generally be constructed from concrete structure, achieving FRL 4 hours construction.

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 A construction, the following components are required to be completely non-combustible:

- External walls and common walls, including façade coverings, framing, insulation;
- Flooring and floor 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.

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.

Furthermore, the BCA now considers the following items as non-combustible, therefore non-combustibility does not need to be demonstrated to achieve compliance. These items are concrete, steel, masonry, aluminium, autoclaved aerated concrete, iron, terracotta, porcelain, ceramic, natural stone, copper, zinc, lead, bronze, brass.

The BCA does nominate that ancillary elements may not be fixed to an external wall that is required to be non-combustible unless they comprise of the following:

- 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.
- i) An awning, sunshade, canopy, blind or shading hood other than one provided under (a) that—
 - i) meets the relevant requirements of Table S7C7 as for an internal element; and
 - ii) serves a storey—
 - A. at ground level; or
 - B. immediately above a storey at ground level; and
 - iii) does not serve an exit, where it would render the exit unusable in a fire.
- j) A part of a security, intercom or announcement system.
- k) Wiring.
- l) Waterproofing material installed in accordance with AS 4654.2 and applied to an adjacent floor surface, including vertical upturn, or a roof surface.
- m) Collars, sleeves and insulation associated with service installations.
- n) Screens applied to vents, weepholes and gaps complying with AS 3959.
- o) Wiper and brush seals associated with doors, windows or other openings.
- p) A gasket, caulking, sealant or adhesive directly associated with (a) to (o)

There is no building signage nominated. If building signage is proposed, the requirements of (h) above applies. Any variation to the prescribed requirements will require performance solution assessment by fire engineer.

Interior Linings

The fire hazard properties of fixed surface linings and mechanical ductwork will also need to be addressed within the detailed documentation phase pursuant to Specification 7 (previously Specification C1.10) of the Building Code of Australia. The following requirements apply:

Sprinkler Protected Areas

- a) Floor Coverings – Critical radiant Flux not less than 1.2 kW/m²
- b) Wall and Ceiling Linings – Material Group No. 1, 2, 3.
- c) Other Materials – Spread of Flame Index not exceeding 5 and Smoke Developed Index not exceeding 9.

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 kW/m², and wall and ceiling linings must be a Material Group No. 1 or 2.

The following concession (available for fully sprinklered building) will need to be addressed:

- Specification 7 fire hazard properties – allow use of reduced critical radiant flux requirements and additional material group permitted (in line with the sprinkler protected building)

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 120/-/- 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.

The following design departures are subject to performance solution assessment by fire engineer:

- Emergency generators serving the mechanical exhaust systems within the data hall to be open to gantries in lieu of being fire separated.
- It is proposed for the rooftop plant areas to be open to atmosphere in lieu of being fire separated by construction meeting FRL 120/120/120

7.5. Vertical Separation of openings in external walls (BCA C3D7 (previously C2.6))

A building of Type A construction must be provided with spandrel separation between openings on different storeys unless the building is protected with a sprinkler system throughout in accordance with Specification 17 (previously Specification E1.5).

For the purposes of C3D7 (previously C2.6), window or other opening means that part of the external wall of a building that does not have an FRL of 60/60/60 or greater.

Spandrels are required in accordance with BCA Clause C3D7 (previously C2.6), which stipulates a 900mm high spandrel; with 600mm of this spandrel being above the finished floor level. Alternatively, an 1100mm horizontal slab may be utilized. The spandrel material is required to be non-combustible and to achieve an FRL of 60/60/60.

It is noted that any penetrations in the spandrel construction e.g. for drainage, overflow etc. are to be protected.

While sprinkler protection is proposed for the building, as there is proposed variation to the proposed sprinkler system, the building is not considered as provided with sprinkler system throughout. Performance solution assessment by the fire engineer is required to consider the building is provided with sprinkler system throughout to utilise this concession.

7.6. Protection of Openings in External Walls (BCA C4D3, C4D4, C4D5 (previously C3.2 / C3.3 / C3.4))

The prescriptive provisions of the BCA stipulate that any external opening within 3m of the boundary, within 6m of the far boundary of a road, river, lake or the like that adjoins the allotment, or within 6m of another building on the allotment requires protection by -/60/- fire rated construction, or externally located wall wetting sprinklers.

Where a building is separated into fire compartments, the distance between parts of external walls and openings within them must be not less than the table below unless those parts of each external wall has an FRL not less than 60/60/60 and openings are protected.

Angle Between Walls	Minimum Distance
0° (walls opposite)	6m
More than 0° to 45°	5m
More than 45° to 90°	4m
More than 90° to 135°	3m

Angle Between Walls	Minimum Distance
More than 135° to 180°	2m
More than 180°	Nil

Openings in external walls in the current design do not require protection as they are setback more than 6m from the boundaries. However, the adjoining walls located within proximity from the adjacent fire compartment that will require fire rated construction. It has been assumed that a similar fire compartment strategy will be undertaken which will have of external walls within 4m from adjoining fire compartment such as the below.

- Level 1 – between Shell B and existing Shell A
- Level 2 – between Shell B and C, Shell E data hall and office (TBC)
- Between any gantry compartments to data halls/ main building

Openings and walls are required to be adequately fire protected or alternatively performance solution assessment by fire engineer is required.

Fire source feature is defined as;

- The far boundary of a road, river, lake or the like adjoining an allotment,*
- The side or rear boundary of the allotment,*
- The external wall of another building on the allotment which is not a class 10 building.*

7.7. Protection of Openings fire rated building elements (BCA C4D6, C4D11 (previously C3.5 and BCA C3.10))

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

- 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;
- 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);
- 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.

It is proposed for services penetrations (wall and floor) will be fire sealed with products achieving 2 hour fire rating in lieu of 4 hour fire rating, due to limitation of existing tested systems. Performance solution assessment by fire engineer will be required.

In addition, as the external gantry is considered as part of the building construction, where the floor slab requires fire rating. Large services penetrations are proposed to the external gantry floor slab for building services/ equipment to pass through. Due to the size of these services penetrations, it is not feasible for the services penetration to be fire sealed, as well as lack of tested system for the fire seal products. Performance solution assessment is required for omission of fire seal to floor slab services penetration.

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
- External Doors

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

- Door Hardware
- Exit Door Operation
- Stair Construction
- Handrail and Balustrade construction
- Discharge from Fire Isolated Exits
- Details of the egress provisions to the Road.
- Door swings

The following design departures are proposed, and performance solution assessment by fire engineer is required:

- Security locking devices will be incorporated within path of travel doors (data hall fire doors) as part of the building security
- Reduced egress width of less than 1m (minimum 850mm achieved) around plant and equipment
- Single exit serving Shell E Level 4 external gantry
- The GIS Switchroom located external of the building is currently proposed to be fitted with a fire activated bolt to maintain the required FRL and not be readily openable without a key.

Further assessment is required as the design develops.

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

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 or, in a Type A building where the construction is loadbearing, 90 minutes, the exit is also not required to be fire isolated.

The proposed exits are required to be fire isolated, and have generally been nominated, with the exception of the stair connecting Level 1 and mezzanine at Shell A, and the stair to external gantry area at Shell E. The Shell A stair is open stair connecting 2 storeys only. As for Shell E stair, it connects 2 storeys (up to 3 storeys, if the internal height at Level 2 exceeds 6m).

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.

As the Level 6 roof top plant level for Shell A are considered as a storey, fire isolated stair is required to serve these storeys as well. Performance solution assessment from fire engineer to allow use of non fire isolated stair serving the top storey that connects to the fire isolated stair, in lieu of fire isolated stair serving all storeys.

8.4. Travel via Non Fire Isolated Exits (BCA D2D14 (previously D1.7))

Non fire isolated stairway serving as required exit must provide a continuous means of travel by its own flight and landings from every storey served to the level at which egress to road or open space is provided.

The travel distance from any point on the floor to road or open space via non fire isolated stair must not exceed 80m. In a Class 5, 6, 7, 8 or 9 building, the non fire isolated stair discharge must be located no more than 20m from a doorway providing egress to road or open space, or 40m if there is more than 2 doorways provided.

The overall travel distance at Mezzanine via the central open stair to the Level 1 external doorway does not exceed 80m, and the discharge distance is less than 40m (based on 2 exits available at Level 1).

The overall travel distance from the roof top plant levels via the non fire isolated stair and fire isolated stair exceeds 80m. Performance solution assessment from fire engineer is required.

Additionally, egress from the external gantry at Shell E Level 4 require travel via external stair that exceeds 80m (up to 104m). Performance solution assessment from fire engineer is required.

8.5. Fire Stair Re-Entry (BCA D3D27 (previously D2.22))

The doors of a fire isolated exit must not be locked from the inside so as to allow provision for fire stair re-entry within fire isolated exits serving any storey above any effective height of 25m.

The requirement for doors to remain unlocked do not apply to a door fitted with a fail-safe device that automatically unlocks the door upon activation of a fire alarm and –

- a) On at least every fourth storey the doors are not able to be locked and a sign is fixed on such doors stating that re-entry is available; or
- b) An intercommunication system, or an audible or visual alarm system operated from within the enclosure is provided, and a sign is fixed adjacent to such doors explaining its purpose and method of operation.

The doors in fire stairs are to be locked from the inside on all levels and do not permit re-entry into the building on any level during normal operation. On fire trip the doors on all levels will unlock. The door on every fourth level will be provided with manual call point that will unlock the door and activate the fire alarm in lieu of it always being unlocked. This is a variation from the DTS provisions and will require performance solution assessment.

8.6. Horizontal Exits (BCA D2D16 (previously D1.11))

Horizontal exits are not to comprise of more than half of the required exits from any part of a storey divided by a fire wall.

Horizontal exits are to have a clear area on the side of the wall that the persons are evacuating to that accommodates the total number of persons served by the horizontal exit. Space allowances are to be based on areas of not less than:

- 0.5m² per person in any other case

Where a compartment is provided with two exits only, and one is a horizontal exit, the clear area provided above is to accommodate all occupants evacuating from the compartment.

The current assessment does not include consider fire walls between different Shell areas as horizontal exits.

8.7. Exit Travel Distances (BCA D2D5, D2D6 (previously D1.4, D1.5))

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 are as follows:

Area	BCA Provisions (Distance to Point of Choice/ Travel Distance/Distance Between)	Assessed Distances			Comments
		To a Point of Choice	Overall Travel Distance	Between Alternate Exits	
Level 1 (Shell A)	20m/40m/60m	24m	47m	102m	
Level 1 (External gantry)	20m/-/-	-	69m	-	69m to single exit (shared with the fire stair discharge path)
Mezzanine	20m/40m/60m	<20m	<40m	<60m	
2 (Shell A)	20m/40m/60m	46m	89m	106m	
2 (Shell B to E)	20m/40m/60m	29m	64m	122m	
3 to 6 (Shells A to E)	20m/40m/60m	31m	57m	109m	
3 (Shell E)	20m/-/-	-	75m	-	75m to single exit via external stair
6 (Shell A)	20m/40m/60m	<20m	55m	107m	
6 Upper Plant (Shell A)	20m/40m/60m	<20m	41m	<60m	

The above indicates that the deemed to satisfy requirements in terms of travel distances would be satisfied, with the exception of the following areas:

- Level 1 (Shell A) – 24m to point of choice in lieu of 20m and 47m to exit in lieu of 40m
- Level 1 (external gantry) – 69m to single exit in lieu of 20m
- Level 2 (Shell A) – 46m to a point of choice in lieu of 20m and 89m to exit in lieu of 40m
- Level 2 (Shell B to E) – 29m to a point of choice in lieu of 20m and 64m to exit in lieu of 40m
- Level 3 to 6 (Shell A to E) – 31m to a point of choice in lieu of 20m and 57m to exit in lieu of 40m
- Level 4 (Shell E) – 75m to single exit in lieu of 20m
- Level 6 (Shell A) – 55m to exit in lieu of 40m
- Level 6 Upper Plant (Shell A) – 41m to exit in lieu of 40m

Distances between alternative exits do not comply in the following areas:

- Level 1 (Shell A) – 102m between exits in lieu of 60m
- Level 2 (Shell A) – 106m between exits in lieu of 60m
- Level 2 (Shell B to E) – 122m between exits in lieu of 60m
- Level 3 to 6 (Shell A to E) – 109m between exits in lieu of 60m
- Level 6 (Shell A) – 107m between exits in lieu of 60m

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)

8.8. Dimensions of Exits (BCA D2D7, D2D8, D2D9, D2D10, D2D11 (previously D1.6))

Minimum dimensions of 1000mm and 2000mm height to be provided within exits, with the paths of travel should provide a minimum width of 1000mm (note that all maintenance access, cat walks, etc may comply with AS1657-2018 in which case a 600mm clear width is required).

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. Access for persons with disabilities however requires a clear doorway opening width of 850mm (i.e. minimum 920 mm doors).

The maximum population per storey does not exceed 200 persons. Minimum 2 exits are required for each storey and has been provided.

8.9. 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 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

8.10. 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

Details to be provided for review as design develops.

9. Services and Equipment

The following section of this report describes the essential fire safety measures and the minimum performance requirements of those measures.

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.

The building total volume exceeds 108,000m³, where 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).

A fire ring main is required.

The building is required to be provided with a booster assembly as part of the fire hydrant requirements. The booster where located remote from the building, is to be located at the main vehicle entry or within 20m from the main entry of the building. The booster assembly is located along Huntingwood Drive and within sight from the vehicular entrance, however it is located more than 20m from the building main entrance (Shell A office).

Provide fire hydrant coverage mark up as part of the construction certificate submission.

Fire hydrant coverage is also required to the outbuildings where the floor area exceeds 500m², including the substations and GIS switchroom.

Performance solution assessment by fire engineer is required for the following design departures:

- Adoption of AS2419.1-2021 (as the building exceeds 108000m³ and contains special hazards, which is outside of the limitation for the standard)
- Fire hydrants to be located outside of fire stairs (additional internal fire hydrants within each storey to achieve coverage)
- Hydrant coverage shortfall (use of two length of hose to achieve coverage)
- Booster assembly location (remote booster not within sight from principal pedestrian entrance and principal vehicle entrance)

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 all parts except the office areas.

Fire hose reel is generally required to buildings exceeding 500m², including substation and GIS switchroom. Omission of fire hose reel coverage to these rooms (if proposed) will require performance solution assessment by fire engineer.

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 reels are not to extend through Fire and Smoke Walls.

Performance solution assessment by fire engineer is required for omission of fire hose reel to the data halls, which are fire separated (FRL 120 mins construction) as well as GIS switchroom and substation buildings.

9.3. Fire Extinguishers (BCA E1D14 (previously E1.6))

The provision of portable fire extinguishers is required to BCA Clause E1D14 (previously E1.6) and AS24-4 – 2001 to provide coverage to the building.

Table below 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.

Fire extinguishers are to be located in accordance with AS 24-4 – 2001, often collocated with fire hydrants and/or fire hose reels.

9.4. 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 where the effective height exceeds 25m;
- Throughout the entire building if it is classified as large isolated under BCA Clause C3D4;
- Throughout any fire compartment that exceeds 2,000m² in floor area or 12,000m³ 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 20 (prev. Spec E2.2a).

Details of the proposed sprinkler system design to be included as part of the construction certificate submission.

The following performance solutions are proposed to be addressed by fire engineer:

- Omission of sprinklers within the following areas:
 - within generator on the gantries
 - within low voltage switchrooms on the roof top (Shell A)
- A single tail end system is proposed to serve an area of up to 2200m² in lieu of 1,000m²
- A single wet pipe installation will serve an area of up to 9000m² in lieu of 2500m²

The following concession (available for fully sprinklered building) will need to be addressed for the proposed variation to the sprinkler system:

- C3D7 vertical separation of openings – provision of 1 hour fire rated spandrel
- Specification 7 fire hazard properties – critical radiant flux requirements and material group permitted

9.5. 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; It is noted a performance solution may be sought.

- Automatic Shutdown of Mechanical Systems in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1;
- 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/NZS 1668.1-2015 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.
- Provisions for special hazards may need to be considered under the requirements of Clause E2D21.

A fire indicator panel is required as part of the detection system. This panel is to be located within the fire control room/ centre.

Stair pressurisation system does not apply to the open stair serving Level 1 and mezzanine; and zone smoke control system does not apply to the external gantry areas, and roof top plant.

The following design departure proposed will require performance solution assessment by fire engineer, as well as concurrence from fire brigade:

- Omission of stair pressurisation system to fire isolated stairs
- Omission of zone smoke control system within main building areas
- Fusible links to the following locations are to be removed from the damper within the Data Hall and battery rooms which will not meet the requirements of AS 1668.1-2015:
 - Supply air system to data hall
 - Exhaust from battery room
- The makeup air duct and exhaust duct connecting the data halls within the vertical riser shaft to be constructed to FRL -/120/120 in lieu of FRL -/240/240
- It is proposed to provide an additional line of detectors within the hot corridors of the data halls which are located more than 600mm below the ceiling

The fire engineering report is to include assessment of any special hazard within the building, including bulk diesel tanks and lithium-ion batteries.

9.6. Lift Services (BCA E3D3, E3D4, E3D5, E3D9, E3D10, E3D11E3.4 and BCA E3.6)

The passenger lifts to be installed are to be:-

- Fitted with warning signs, fire service controls in accordance with Clauses E3D4, Figure E3D4, E3D9, E3D11, and E3D12 (previously E3.3, Figure E3.3, E3.7, E3.9 and E3.10) of the BCA.
- Stretcher facilities are to be provided within the lifts with minimum dimensions of 600mm wide, 2000mm long and 1400mm high;
- At least two emergency lifts with stretcher facilities in accordance with Clause E3D5 (previously Part E3.4) of the BCA. The two emergency lifts shall be located in separate shafts. These lifts are to serve all storeys that are served by passenger lifts.
- 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

Minimum 2 emergency lifts are required to serve all levels provided with lift access. Details including location of each emergency lifts are to be nominated on the documentation as part of the construction certificate submission.

9.7. 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 (such as the double height space within the data hall levels), 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 as part of the construction certificate submission.

9.8. Sound Systems and Intercom Systems for Emergency Purposes (BCA E4D9 (previously E4.9))

A Sound System and Intercom System is required in accordance with AS1670.4-2018 and BCA Clause E4D9 (previously E4.9).

The following proposed rationalisation of emergency warning and intercom system within the building will require performance solution assessment by fire engineer:

- Speech intelligibility is proposed to be removed
- WIPs will only be provided at fire stair entries only
- Increase EWIS zoning to 2300m² in lieu of 2000m² to match the sprinkler valve zoning

Details are required to be provided as part of the construction certificate submission.

9.9. Fire Control Room (BCA E1D15 (previously E1.8))

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 50m, a fire control room is required.

The fire control room is located within a dedicated building, connected to the fire pump room (north west of the site). The fire control room is located more than 300mm above the street level (up to 3.5m), provided with single access door and not fire separated from the fire pump room. Performance solution assessment by fire engineer is required.

9.10. 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.

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. Floor Wastes (BCA Clause F2D4 (previously F1.11))

Floor wastes are required to be provided where wall hung urinals are provided and the floor shall be sloped towards these wastes.

Details to be included as part of the construction certificate submission.

10.4. 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:

This requirement does not apply for Class 7 and 8 buildings, where there is no necessity for compliance.

For the main building (except for the Level 1, Mezzanine and Level 2 office part) and the outbuildings (except for guard kiosk), there is concession to allow for these buildings/ part to not be provided with weatherproofing. However, where weatherproofing is provided, they are to comply with the prescribed requirements. The external wall materials proposed includes precast concrete, glazing, blockwork, aluminium cladding and fibre cement cladding. Performance solution assessment is required for all the proposed building materials.

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.*

Performance solution assessment report is required as part of the construction certificate submission.

10.5. 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.

Details of the waterproofing membrane, provision of water-stops at doorways etc to be included in the construction certificate submission.

10.6. Sanitary Facilities (BCA F4D2, F4D3, F4D4, F4D5, F4D6 (previously F2.2 and F2.3))

Offices

Separate sanitary facilities are required to be provided for male & female employees at a rate at the following.

	Male			Female		Accessible
	WC	U	B	WC	B	
Level 1 & Mezzanine (276 staff)	7	4	5	10	5	1
Level 2 (12 Staff)	1	0	1	1	1	1
Level 3 (13 Staff)	1	0	1	1	1	1
Level 4 (24 Staff)	1	1	1	1	1	1
Level 5 (38 Staff)	1	1	1	2	1	1
Level 6 (24 Staff)	1	1	1	1	1	1

Detailed designs including layout, dimensions, etc of the sanitary facilities to be included in the construction certificate submission.

Note: The Unisex facilities provided for people with disabilities may be counted once for each sex. These facilities are to be provided in accordance with AS1428.1-2009.

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.

10.7. Light and Ventilation (BCA Part F6 (previously 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.

Details of the proposed artificial lighting and mechanical ventilation to be included in the construction certificate submission.

11. Energy Efficiency

11.1. SECTION J (JP1 Energy Efficiency)

NOTE: BCA 2019 Section J provisions apply for this project.

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.

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

The proposed site will be located in a climate zone 6.

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:

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 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.

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-

- (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 flow; 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.

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)

Floors are to achieve an R rating of 2.0.

11.3. Building sealing (Part J3)

Windows and Doors (Part 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 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 J5.5

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 $4.0 W_r / W_{input\ power}$ 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
- (c) 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;

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 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.

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

Facilities for Energy Monitoring (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) Air conditioning plant; and
- b) artificial lighting; and
- c) appliance power; and
- d) central hot water supply; and
- e) internal transport devices including lifts, escalators and moving walkways where there is more than one serving the building; and
- f) 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.

These provisions do not apply to energy meters serving—

- a) a Class 2 building where the total floor area of the common areas is less than 500 m²; or
- b) individual sole-occupancy units with a floor area of less than 2 500 m²

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:

Office/shops (Class 5/Class 6 buildings)

To and within all areas normally used by the occupants

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.

There is new pedestrian entries proposed at Level 2 of Shell B and E. As each of the pedestrian entries are located more than 50m apart, each entry must be provided with accessible entry as well. Provide details, including floor levels for review.

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.
- 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 in 100. Accessible car spaces have not been designated in the current documentation.

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

Accessible carparking space is only nominated to Shell A and B entry. There is currently none nominated to Shell E entry.

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. Details to be included as part of the construction certificate submission.

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.

Details to be included as part of the construction certificate submission.

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 buildings	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

12.8. Signage (BCA Clause D4D7 (previously 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 15 (previously Spe. 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 E4D5 (previously 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.

12.9. Hearing Augmentation (BCA Clause D4D8 (previously D3.7))

A hearing augmentation system shall be installed throughout the building in accordance with the requirements of Clause D4D8 (previously D3.7) of the BCA, where ever in a 9b building, auditorium conference room, meeting room etc. contain a PA system not used for emergency purposed or any ticket office or teller's booth or reception where the public is screened from the service provider.

12.10. Lifts (BCA Clause E3D7, E3D8 (previously E3.6))

Lifts compliant to BCA E3D7, E3D8, and E3D9 (previously E3.6, 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	Revision	Prepared By
DA001	LOCALITY & CONTEXT PLAN	M	Greenbox
DA010	OVERALL SITE PLAN	P	Greenbox
DA011	OVERALL LEVEL 1 PLAN (LOWER GROUND)	M	Greenbox
DA012	OVERALL LEVEL 2 PLAN (UPPER GROUND)	M	Greenbox
DA013	OVERALL LEVEL 3 PLAN	L	Greenbox
DA014	OVERALL LEVEL 4 PLAN	K	Greenbox
DA015	OVERALL LEVEL 5 PLAN	K	Greenbox
DA016	OVERALL LEVEL 6 PLAN (LOWER ROOF)	K	Greenbox
DA017	OVERALL LEVEL 7 PLAN (UPPER ROOF)	K	Greenbox
DA020	SITE ELEVATION	M	Greenbox
DA030	SITE SECTION	L	Greenbox
DA031	SITE SECTION	L	Greenbox
DA101	PART A – L1 + MEZZANINE	F	Greenbox
DA102	PART A – L2	F	Greenbox
DA103	PART A- L3	F	Greenbox
DA104	PART A – L4	A	Greenbox
DA105	PART A – L5	A	Greenbox
DA106	PART A – L6 ROOF	A	Greenbox
DA107	PART A – L7 ROOF	A	Greenbox
DA111	PART B – L2	G	Greenbox
DA112	PART B- L3	H	Greenbox
DA113	PART B – L4-L6 (TYPICAL)	A	Greenbox
DA114	PART B – L7 (ROOF)	A	Greenbox
DA201	PART A – BUILDING ELEVATION	K	Greenbox
DA202	PART A – BUILDING ELEVATION	I	Greenbox
DA203	PART A – BUILDING SECTION	E	Greenbox
DA211	PART B – BUILDING ELEVATION	J	Greenbox
DA212	PART B – BUILDING ELEVATION	J	Greenbox

Drawing No.	Title	Revision	Prepared By
DA213	PART B – BUILDING SECTION	F	Greenbox
DA311	SUBSTATION 1 DETAILS	E	Greenbox
DA321	PUMP ROOM II DETAILS	E	Greenbox
DA400	MATERIAL FINISHES SCHEDULE	F	Greenbox
DA920	PHASING DIAGRAM	E	Greenbox

14. Appendix B - Draft Fire Safety Schedule

	Essential Fire Safety Measures	Standard of Performance
1.	Access Panels, Doors and Hoppers	BCA 2022 Clause C4D14, AS1530.4-2015
2.	Automatic Fail Safe Devices	BCA 2022 Clause D3D24 & D3D26
3.	Automatic Smoke Detection and Alarm System	BCA 2022 Clause E2D3, E2D6, Spec 20 Clause S20C4, AS 1670.1 – 2018, AS/NZS 1668.1 – 2015, Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
4.	Automatic Fire Suppression System	BCA 2022 Clause E1D5, E1D13, Spec 17 & AS 2118.1 – 2017 Amdt 1 & 2, AS 2118.6 – 2012 (Combined sprinkler & hydrant); Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
5.	Building Occupant Warning System activated by the Sprinkler System	BCA 2022 Spec 17 & Spec 20 Clause S20C7 & AS 1670.1 – 2018 – Clause 3.22
6.	Emergency Lifts	BCA 2022 Clause E3D5, AS 1735.1-2016
7.	Emergency Lighting	BCA 2022 Clause E4D2, E4D4 & AS/NZS 2293.1 – 2018, Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
8.	EWIS	BCA 2022 Clause E4D9 & AS 1670.4 – 2018, Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
9.	Emergency Evacuation Plan	Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025 and AS 3745 – 2010
10.	Exit Signs	BCA 2022 Clauses E4D5, E4D6 & E4D8 and AS/NZS 2293.1 – 2018; Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
11.	Fire Control Rooms	BCA 2022 Spec. 19, Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
12.	Fire Dampers	BCA 2022 Clause C3D13, C4D15, D2D12, E2D3, E2D21 & AS 1668.1 – 2015; Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
13.	Fire Doors	BCA 2022 Clause C4D6, C4D8 & C4D9 and AS 1905.1 – 2015; Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
14.	Fire Hose Reels	BCA 2022 Clause E1D3 & AS 2441 – 2005 Amdt 1, , Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025

	Essential Fire Safety Measures	Standard of Performance
15.	Fire Hydrant System	BCA 2022 Clause C3D13, E1D2, Spec 18, & AS 2419.1 – 2021, , Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
16.	Fire Seals	BCA 2022 Clause C4D13, C4D15, C4D16, Spec 13, Spec 14, & AS 1530.4 –2014, Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
17.	Lightweight Construction	BCA 2022 Clause C2D9, Spec 6
18.	Mechanical Air Handling System	BCA 2022 Clause E2D3, E2D4, E2D6, AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012, Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
19.	Path of Travel	EP&A (Development Certification & Fire Safety) Reg 2021 Section 108, 109, Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
20.	Portable Fire Extinguishers	BCA 2022 Clause E1D14 & I3D11, AS 2444 – 2001, Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
21.	Pressurising Systems	BCA 2022 Clause E2D3, E2D4, E2D6, E2D7, E2D9, E2D11, E2D12 & AS/NZS 1668.1 – 2015
22.	Required Exit Doors (power operated)	BCA 2022 Clause D3D24 (3), Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
23.	Smoke Doors	Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
24.	Warning and Operational Signs	EP&A (Development Certification and Fire Safety) Regulation 2021 Clause 108, BCA 2022 Clause D3D28, E3D4 & AS 1905.1 –2015, Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
25.	Water Mist System	AS4587-2020, Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025
26.	Standby Power System	Fire Engineering Report No. 380926-AirtrunkSYD3-LoteFER-RevB Revision B prepared by Lote Consulting dated 24 March 2025

15. Appendix C - Fire Resistance Levels

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

Type A Construction

Table S5C11a: Type A 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	120/90/90	180/180/120	240/240/180
3m or more	90/60/30	120/60/30	180/120/90	240/180/90

Table S5C11b: Type A 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	-/60/60	-/90/90	-/180/120	-/240/180
3m or more	-/-/-	-/-/-	-/-/-	-/-/-

Table S5C11c: Type A Construction: FRL of external columns non 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 S5C11d: Type A 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 S5C11e: Type A Construction: FRL of 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	90/90/90	120/120/120	180/120/120	240/120/120

Bounding public corridors, public lobbies and the like	90/90/90	120/-/-	180/-/-	240/-/-
Between or bounding sole-occupancy units	90/90/90	120/-/-	180/-/-	240/-/-
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion	90/90/90	120/90/90	180/120/120	240/120/120

Table S5C11f: Type A 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	-/-/-	-/-/-	-/-/-
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion	-/90/90	-/90/90	-/120/120	-/120/120

Table S5C11g: Type A Construction: FRL of other building elements not covered by Tables S5C11a to S5C11f

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	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

(3) Carparks

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

a) External wall:

- 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 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 Tables S5C11a to S5C11g.
 - 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 26m²/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 30m²/tonne.
 - ii. Any other beam: 60/–/–.
 - f) Fire-resisting lift and stair shaft (within the carpark only): 60/60/60.
 - g) Floor slab and vehicle ramp: 60/60/60.
 - h) Roof (not used for carparking): –/–/–.
- (4) For the purposes of subclause (3):
- a) ESA/M means the ratio of exposed surface area to mass per unit length.
 - b) Refer to Specification 17 for special requirements for a sprinkler system in a carpark complying with (3) and (b) located within a multi-classified building.