



A Bureau Veritas Group Company

BUILDING CODE OF AUSTRALIA REPORT

Revision: K

**Data Centre Development
1 Sirius Road, Lane Cove**

Prepared for: Airtrunk

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Table of Contents

Document Disclaimer	2
Table of Contents	3
Executive Summary	4
1.0 Introduction	5
2.0 PRELIMINARIES	6
3.0 FIRE PROTECTION	8
4.0 EGRESS PROVISIONS	11
5.0 ACCESS FOR PEOPLE WITH DISABILITIES	13
6.0 FIRE SERVICES AND EQUIPMENT	16
7.0 HEALTH AND AMENITY	19
8.0 ENERGY EFFICIENCY	19
Appendix A - Design Documentation	21
Appendix B - Draft Fire Safety Schedule	22
Appendix D- Fire Resistance Levels	23
Appendix E- Clause by Clause Assessment	25

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Executive Summary

Development Overview

The proposed development is the construction of a multi-storey Data Centre at 1 Sirius Road, Lane Cove

Compliance Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by Greenbox (refer appendix A) for compliance with the Building Code of Australia 2019.

In this regard the following areas in particular require further review as the project develops:

The assessment of the design documentation has revealed that the following areas are required to be assessed against the relevant performance requirements of the BCA. The submission for Construction certificate will need to include verification from a suitably accredited fire engineer: -

No.	Alternative Solution Description	DTS Clause	Performance Requirement
Fire Safety Items			
1.	It is proposed to permit rationalized Fire Resistance Level (FRL) for the following areas of the subject building: - L1 – Switch rooms and store rooms - L2, L3, L4 and L5 – MMR rooms, comms rooms, store rooms and data hall fire doors - Internal perimeter walls to be 2hrs in lieu of 4hrs - As the generator decks	C1.1, Spec C1.1, C2.7, C2.8, C2.9	CP1, CP2
2.	Extended travel distances and distances between alternative exits to be assessed under a performance solution;	D1.4, D1.5	DP4, EP2.2

Open Roof Plant:

- Travel distance to nearest exit is up to 64m in lieu of 40m; and
- Travel distance between alternative exits is up to 90m in lieu of 60m, measured to horizontal exit.

Generator decks

- Travel distance to a point of choice 21m in lieu of 20m
- Travel distance to nearest exit is up to 49m in lieu of 40m; and
- Travel distance between alternative exits is up to 65m in lieu of 60m

Crac Corridors:

- Travel distance between exit is up to 60m in lieu of 40m

- 127 m in lieu of 60m, measured to horizontal exit.

Data Halls

- Travel distance to nearest exit is up to 55m in lieu of 40m, measured to horizontal exit; and
- Travel distance between alternative exit is up to 100m in lieu of 60m, measured to horizontal exit.

L1 Fuel store

- Travel distance of 102m between alternative exits in lieu of 60m; and
- Travel distance of 52m to nearest exit in lieu of 40m.

3.	Horizontal exits are proposed which exit the maximum allowable of 50% in the crac corridors	D1.5 and D1.11	DP4, EP2.2
4.	It is proposed to permit the reduced unobstructed egress width in the hot aisle corridor in the data hall to be no less than 750mm in lieu of the required 1000mm	D1.6	DP6
5.	For the purpose of data hall operations, it is proposed to permit the door in the data hall compartments to swing against the direction of egress	D2.20	DP2
6.	Additional fire hydrant hose lengths to provide coverage are anticipated to be required	E1.3	EP1.3
7.	It is anticipated the hydrant booster location will not meet the prescriptive requirements of AS2419.1-2005 and will be required to be assessed as a fire engineered performance solution.	E1.3	EP1.3
8.	The hydrant pump room is not accessed via a door opening into a fire isolated passageways or directly via a door which opens to road or open space as require by AS2419.1-2005	E1.3 and AS2419.1-2005	EP1.3
9.	Removal of fire hose reels within the data halls and link corridor in lieu of providing fire hose reels as required (<i>it is noted: Current Fire Engineering Strategy permitted the omission of fire hose reel in store room less than 150m². Current set of drawings is showing store rooms > 150m². Need to either further fire compartmentalize the store room or provide fire hose reel coverage to the store room.</i>)	E1.4 and AS2441-2005	EP1.1

The fire engineered solution relating to EP1.3 and EP2.2 will be subject to consultation with the NSW Fire Brigade as part of the Construction Certificate process under Clause 144 of the Environmental Planning & Assessment Regulation 2000.

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 Regulation 2000.

1.0 Introduction

The proposed development comprises of the construction of multi-storey data halls and generator rooms

The site is located on 1 Sirius Road, Lane Cove.

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.

1.1 Current Legislation

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 Certifying authority for the Construction Certificate. For the purposes of this Report, BCA 2019 has been utilised as the version of the BCA applicable at the time of preparation this Report.

2.0 PRELIMINARIES

2.1 Building Assessment Data

Summary of Construction Determination: -

Part of Project	Data Hall Building
Classification	7b & 5
Number of Storeys	5
Rise In Storeys	5
Type of Construction	A
Effective Height (m)	23.4

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	7b	3,924m ²	TBC	TBC
Level 2	7b	7,721m ²	TBC	TBC
Level 3	7b	7,721m ²	TBC	TBC
Level 4	7b/5	7,477m ²	TBC	TBC
Level 5	7b/5	7,721m ²	TBC	TBC

2.2 Structural Provisions (BCA B1)

Any new structural works are to comply with the applicable requirements of AS/NZS 1170.1.

Glazing is to comply with AS1288, and AS2047.

Prior to the issue of the Construction Certificate structural certification is required to be provided, including determination of the importance level of the development.

2.3 Development Approval

A Development Approval will be required from the Local Authority for the development. A copy of the Development Permit conditions and approved drawings will be required prior to the issuing of the Building Approval for that component of works.

The proposed development must not be inconsistent with the endorsed drawings and all relevant conditions will need to be satisfied and accurately reflect the construction issue drawings.

2.4 Copy of Certificate of Title:

A copy of the current Certificate of Title and Registered Plan / Plan of Subdivision is required. Where it is proposed to construct any part of the building work within an easement, the consent of the relevant authority and /or Council is required prior to the issue of the Construction Certificate

3.0 FIRE PROTECTION

3.1 Fire Compartmentation (BCA 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 C2.2.

Based upon the rise in storeys and use of the Building, the building is required to be Type A Construction in accordance with Table 3 & 3.9 for Type A construction of Specification C1.1 of the Building Code of Australia 2019.

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,
- Fire compartmentation of the development 240mins it is noted that a fire engineered performance solution is proposed to reduce FRLs to 120mins

To negate the need for the building being assessed as a large isolated building, the building will need to be separated into fire compartments of not more than 5000m² and a volume of 30,000m³. The required fire walls between the separate compartments is required to achieve an FRL of 240/240/240. It is noted the fire wall FRL's are to be rationalised to 120/120/120 in lieu of 240/240/240 to the below areas:

- L1 – Switch rooms and store rooms
- L2, L3, L4 and L5 – MMR rooms, comms rooms, store rooms and data hall fire doors
- Internal perimeter walls to be 2hrs in lieu of 4hrs

It is noted that :

- The Current Fire Engineering Strategy permitted the omission of fire hose reel in store room less than 150m². Current set of drawings is showing store rooms > 150m². Need to either further fire compartmentalize the store room or provide fire hose reel coverage to the store room.
- L1fuel tanks will need to be enclosed in fire rated compartment to achieve the Fire Resistance Level advised by the DG consultant. This is to ensure that the egress path are segregated from the fuel loads, consistent with the approach taken in the FEBQ.

Recommendations in the Dangerous Good Report No 370082 Revision E dated 16 October 2019 are to be implemented

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	
7b	max floor area—	5 000 m ²
	max volume—	30 000 m ³

It is noted that the building is to be separated into fire compartments which do not exceed the maximum allowable for Type A Construction. The building can be compartmented to allow parts of the building be separated from the remainder of the building by fire walls. The fire walls are to be constructed in accordance with the appropriate Fire Resistance Level (FRL) of Spec C1.1 of BCA. Also, please note that any openings of the fire walls are not to reduce the level of FRL required.

3.5 Fire Resistance (BCA C1.1)

The building should be constructed generally in accordance with the relevant provisions of Specification C1.1 of the BCA applicable to Type A Construction, Please refer to Appendix D which outlines the required fire rating to be achieved by the development. These fire ratings are summarised below:-

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,

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

It is proposed to permit rationalized Fire Resistance Level (FRL) for the following areas of the subject building:

- L1 – Switch rooms and store rooms
- L2, L3, L4 and L5 – MMR rooms, comms rooms, store rooms and data hall fire doors
- Internal perimeter walls to be 2hrs in lieu of 4hrs
- Generator platforms

As the generator decks are connected to the main building they adopt the 7b classification and are ancillary to the main use, it is therefore anticipated that the steel structure FRLs will be rationalised through a fire engineered solution

3.6 Fire Hazard Properties (BCA C1.10 and BCA C1.12)

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 C1.10 Building Code of Australia. The following requirements apply:

Non-Sprinkler Protected Areas

- a) Floor Coverings – Critical radiant Flux not less than 2.2kWm^2 a maximum smoke development rate of 750 percent-minutes
- b) Wall and Ceiling Linings – Material Group No. 1, 2 & 3 and with a smoke growth rate index not more than 100, or an average specific extinction area less than $250\text{m}^2/\text{kg}$
- c) Other Materials – Spread of Flame Index not exceeding 9 and Smoke Developed Index not exceeding 8 (if Spread of Flame if >5)

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

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

External Wall Cladding

As the building is of Type A construction the external walls, including any external and internal claddings & linings must be non-combustible as determined by AS1530.1. 1994.

The following materials 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) Bonded laminated materials where—
 - i. each lamina, including any core, is non-combustible; and
 - ii. each adhesive layer does not exceed 1 mm in thickness and the total thickness of the adhesive layers does not exceed 2mm; and
 - iii. 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.

The BCA does nominate that ancillary elements may 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.

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

3.9 Protection of Openings in External Walls (BCA C3.2)

The prescriptive provisions of the BCA stipulate that any external opening within 3m of the fire source feature 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
More than 135° to 180°	2m
More than 180°	Nil

Fire source feature is defined as;

- a) *The far boundary of a road, river, lake or the like adjoining an allotment,*

- b) *The side or rear boundary of the allotment,*
- c) *The external wall of another building on the allotment which is not a class 10 building.*

3.10 Protection of Openings in fire rated building elements (BCA 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:

- a) Penetrations through fire rated floors to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a fire rated shaft achieving an FRL of 120min in lieu of 240mins through a fire engineered performance solution.
- b) Any penetration through a wall or room required to have an FRL (e.g. substation, boiler room, apartment separating wall etc) is to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a shaft achieving an FRL of 120mins (or 120/120/120 where it is a room such as a substation);
- c) Self-closing -/60/30 fire doors to the doors opening to the fire isolated stairs

Note that 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.

4.0 EGRESS PROVISIONS

4.1 Provisions for Escape (BCA D1)

The egress provisions from the proposed building are provided by:

- Fire isolated stairways
- External perimeter doorways
- Horizontal exits

Horizontal exits are proposed which exit the maximum allowable of 50% in the crack corridors this is to be assessed as a fire engineered performance solution

Other detailing issues that will need to be addressed include:

- Door Hardware
- Exit door operation
- Stair construction
- Handrail and balustrade construction
- Discharge from the Fire Isolated Exits
- Details of the egress provisions to the Road.

4.2 Travel via Fire Isolated Exits (BCA 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.

4.3 Exit Travel Distances (BCA D1.4)

This

The travel distances to exits should not exceed:

Class 5-9

- 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

Extended travel distances and distances between alternative exits to be assessed under a performance solution;

Open Roof Plant:

- Travel distance to nearest exit is up to 64m in lieu of 40m; and
- Travel distance between alternative exits is up to 90m in lieu of 60m, measured to horizontal exit.

Generator decks

- Travel distance to a point of choice 21m in lieu of 20m
- Travel distance to nearest exit is up to 49m in lieu of 40m; and
- Travel distance between alternative exits is up to 65m in lieu of 60m

Crac Corridors:

- Travel distance between exit is up to 60m in lieu of 40m
- 127 m in lieu of 60m, measured to horizontal exit.

Data Halls

- Travel distance to nearest exit is up to 55m in lieu of 40m, measured to horizontal exit; and
- Travel distance between alternative exit is up to 100m in lieu of 60m, measured to horizontal exit.

L1 Fuel store

- Travel distance of 102m between alternative exits in lieu of 60m; and
- Travel distance of 52m to nearest exit in lieu of 40m.

The above travel distances are to be assessed against DP4 and EP2.2 as part of a fire engineered performance solution

4.4 Dimensions of Exits (BCA 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 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).

Data Halls egress widths of up to 850mm in lieu of 1.0m are proposed to be assessed as a fire engineered performance solution.

4.5 Balustrading and Handrails (BCA D2.16 and BCA D2.17)

Generally

Balustrading to a height of 1000mm with a maximum opening of 125mm in any direction should be provided adjacent to balconies, landings, corridors etc where located adjacent to a change in level exceeding 1000mm.

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.

The roof balustrading will utilise a proprietary Monowills type dual rail system, to comply with AS1657.

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.

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.

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

4.6 Slip Resistance

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

Table D2.14 SLIP-RESISTANCE CLASSIFICATION

<u>Application</u>	<u>Surface conditions</u>	
	<i>Dry</i>	<i>Wet</i>
<i>Ramp steeper than 1:14</i>	<i>P4 or R11</i>	<i>P5 or R12</i>
<i>Ramp not steeper than 1:14</i>	<i>P3 or R10</i>	<i>P4 or R11</i>
<i>Tread or landing surface</i>	<i>P3 or R10</i>	<i>P4 or R11</i>
<i>Nosing or landing edge strip</i>	<i>P3</i>	<i>P4</i>

5.0 ACCESS FOR PEOPLE WITH DISABILITIES

5.1 General Building Access Requirements (BCA D3.1)

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

- AS1428.1-2009 General Requirements for Access – New Building Work;
- AS1428.4-2009 Tactile Ground Surface Indicators
- AS2890.6-2009 Car Parking for People with Disabilities

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

Warehouse and production/Manufacturing facilities

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

5.2 Provision for Access to Buildings

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

- Via the principle public entry and at least 50% of all other entrances
- 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 public.

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

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

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

5.3 Provisions for Access within Buildings (BCA D3.3)

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

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

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

Within the building the following are required;

- Door circulation space as per AS1428.1 Clause 13.3 and as attached in appendix 1;
- 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
- Any glazed 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.

5.4 Car parking (BCA D3.5)

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

The development proposes 57 car parking spaces with 2 AS 2890.6-2009 complaint spaces.

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

5.5 Tactile Indicators (BCA D3.8)

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

Exemptions apply in aged care facilities to include a down button to handrails in lieu of tactile indicators.

5.8 Stairs (BCA D3.3 inter Alia AS1428.1)

Stairs shall be constructed as follows:

- a) Where the intersection is at the property boundary, the stair shall be set back by a minimum of 900mm so that the handrail 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 in 300mm, 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.

5.9 Provisions for Accessible Sanitary Facilities (BCA F2.4)

Unisex Accessible Sanitary Facilities

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

Building Type	Minimum accessible unisex sanitary compartments to be provided
Office & industrial	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 AS1428.1-2009

5.10 Signage (BCA D3.6)

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

- Sanitary Facility Identification Signs (note that they are to comply with BCA Specification D3.6 and include the use of Braille, Tactile, etc and be placed on the wall on the latch side of the facility);
- Directional / Way Finding signs to the Lifts, Sanitary Facilities, etc;
- Hearing Augmentation System;
- Identify each door required by BCA Clause E4.5 to be provided with an exit sign, stating 'EXIT' and 'Level' number

5.12 Lifts (BCA E3.6)

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

6.0 FIRE SERVICES AND EQUIPMENT

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

6.1 Fire Hydrants (BCA E1.3)

A system of Fire Hydrants is required to be provided in accordance with BCA Clause E1.3 and AS2419.1-2005 required to be provided, please provide pressure and flow calculations for review.

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

It is anticipated that two fire hydrant hose lengths will be required to provide coverage, this is to be assessed as a fire engineered performance solution.

The hydrant pump room is not accessed via a door opening into a fire isolated passageways or directly via a door which opens to road or open space as require by AS2419.1-2005, this is to be assessed as a fire engineered performance solution

6.2 Fire Hose Reels (BCA E1.4)

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

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

It is proposed the fire hose reels are to be deleted from the data halls, this is to be assessed as a fire engineered performance solution. (it is noted: Current Fire Engineering Strategy permitted the omission of fire hose reel in store room less than 150m². Current set of drawings is showing store rooms > 150m². Need to either further fire compartmentalize the store room or provide fire hose reel coverage to the store room.)

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

6.3 Fire Extinguishers (BCA E1.6)

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

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

Occupancy Class	Risk Class (as defined in AS 2444)
General provisions – Class 2 to 9 buildings	(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.

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

6.4 Automatic Sprinkler Protection (BCA E1.5)

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

- Data halls
- MMR's
- LV switch rooms

It is noted that sprinkler protection is being provided as a means of asset protection and coverage will not be provided to all areas. Areas in which sprinklers are provided compliance with AS2118.1-2017 is to be achieved. The fire engineering report is to provide discussion on areas which are proposed to be non-sprinkler protected.

The sprinkler valve room does not have direct egress to road or open space as required by Specification E1.5, this required to be addressed as a fire engineered performance solution.

An occupant warning system should be provided in accordance with BCA Specification E1.5.

6.5 Exit Signs and Emergency Lighting (BCA E4.2 and BCA E4.5)

Emergency Lighting and Exit Signs indicating exit location paths of travel to exits to be provided in accordance with AS2293.1-2018

6.6 Sound Systems and Intercom Systems for Emergency Purposes (BCA E4.9)

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

6.7 Fire Control Centre (BCA E1.8)

As the building contains a floor area of greater than 18,000m², a fire control centre is required in accordance with BCA Specification E1.8.

6.8 Smoke Hazard Management (BCA E2.2)

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

- Automatic Smoke Detection and Alarm System in accordance with the requirements of BCA Spec E2.2a and AS 1670.1-2018

A fire indicator panel is required as part of the detection system. This panel is to be located within 4m of the main entry and must be incorporated within the fire control centre. Any variation to the prescriptive provisions will require the consent of the fire brigade and should form part of the fire safety engineering report to verify the performance requirements of the BCA.

6.9 Lift Services (BCA E3.42 and BCA E3.6)

The passenger lifts to be installed are to be: -

- fitted with warning signs, fire service controls in accordance with Clauses 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.
- Be provided with the following: -
 - A handrail in accordance with AS 1735.12;
 - Minimum internal floor dimensions as specified in Table E3.6b of the BCA i.e. 1,400mm x 1,600mm;
 - Minimum clear door opening complying with AS 1735.12;
 - Passenger protection system complying with AS 1735.12;
 - Have a set of buttons for operating the lift located at heights above level complying with AS 1735.12;
 - Lighting in accordance with AS 1735.12;
 - Automatic audible information within the lift car to identify the level each time the car stops; and
 - Audible and visual indication at each lift landing to indicate the arrival of the lift car.

6.10 Fire Precautions During Construction (BCA E1.9)

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

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

- Booster connections installed.

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

7.0 HEALTH AND AMENITY

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

Offices

The sanitary & other facilities within the development would generally consist of: -

Sanitary Facilities Required			
	WC	Urinals	Basins
Male	3	2	2
Female	4	0	2
Accessible	1		1

Note:

1. 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.

7.2 Floor Wastes (BCA F1.11)

Floor wastes to be provided within bathrooms and laundries where located above another sole occupancy unit. The floor shall be sloped towards these wastes.

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

7.3 Light and Ventilation (BCA Part F4)

Class 5, 6, 7, 8 & 9

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

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

8.0 ENERGY EFFICIENCY

The proposed development shall comply with Part J of the BCA. To achieve compliance, there are two options available:

1. The building can comply with the deemed-to-satisfy provisions of the BCA, relating to the following areas:

- Building Fabric
- Glazing
- Building Sealing
- Air Conditioning & Ventilation Systems
- Artificial Lighting & Power
- Hot Water Supply

2. The building can be verified against a reference building as per Verification Method JV3. This requires that the proposed building and its services be shown to have an annual energy consumption of equal or less than the reference building which has been modelled as per the requirements of Part J of the BCA.

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

It is noted that Part J of BCA 2019 has a 12 month transitional period which allows BCA 2016 Amendment 1 to be utilised.

Access for maintenance is to be provided to the building in accordance with the requirements of BCA Part J8.

The proposed site will be located in a climate zone 5

Due to special nature of the building some energy provisions may not be appropriate.

Appendix A - Design Documentation

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

Drawing No.	Title	Date	Drawn By	Rev
ATSYD2_SSD_DRG_ARC_0100	LEVEL 1 FLOOR PLAN _ RL 8.4	15.1.20	GREENBOX	11
ATSYD2_SSD_DRG_ARC_0101	LEVEL 2 FLOOR PLAN _ RL14.4	15.1.20	GREENBOX	11
ATSYD2_SSD_DRG_ARC_0102	LEVEL 3 FLOOR PLAN _ RL20.2	15.1.20	GREENBOX	11
ATSYD2_SSD_DRG_ARC_0103	LEVEL 4 FLOOR PLAN _ RL26.0	15.1.20	GREENBOX	11
ATSYD2_SSD_DRG_ARC_0104	LEVEL 5 FLOOR PLAN_RL31.8	15.1.20	GREENBOX	11
ATSYD2_SSD_DRG_ARC_0105	ROOF PLAN	15.1.20	GREENBOX	11
ATSYD2_SSD_DRG_ARC_0300	ELEVATIONS 1	15.1.20	GREENBOX	11
ATSYD2_SSD_DRG_ARC_0301	ELEVATIONS 2	15.1.20	GREENBOX	11

Appendix B - Draft Fire Safety Schedule

Essential Fire Safety Measures		Standard of Performance
1.	Automatic Fail Safe Devices	BCA Clause D2.19 & D2.21
2.	Automatic Fire Detection and Alarm System	BCA Spec. E2.2a & AS 1670.1 – 2015, AS/NZS 1668.1 - 2015
3.	Automatic sprinkler protection	BCA Spec E1.5, clause E1.5 and AS2118.1-2017
4.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005 Amdt 1 & 2
5.	Emergency Evacuation Plan	AS 3745 – 2002
6.	Exit Signs	BCA Clauses E4.5, NSW E4.6 & E4.8 and AS/NZS 2293.1 – 2005 Amdt 1 & 2
7.	Fire Control Centres	BCA Spec. E1.8
8.	Fire Dampers	BCA Clause C3.15, AS/NZS 1668.1 – 2015 & AS 1682.1&2 - 1990
9.	Fire Doors	BCA Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8, Spec C3.4 and AS 1905.1 – 2015
10.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005 Amdt 1
11.	Fire Hydrant System	BCA Clause E1.3 & AS 2419.1 – 2005 Amdt 1
12.	Fire Seals, Collars	BCA Clause C3.15, C3.16 & AS 1530.4 – 2014
13.	Lightweight Construction	BCA Clause C1.8, C3.17 & AS 1530.3 – 1999
14.	Paths of Travel	EP&A Reg 2000 Clause 186
15.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
16.	Smoke Detectors and Heat Detectors	BCA Spec E2.2a & AS 1670.1-2015, AS/NZS 1668.1-2015
17.	Warning and Operational Signs	EP&A Reg 2000 Clause 183, BCA Clause C3.6, D2.23, E3.3 & H101.8

Appendix D- Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2019.

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

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

ROOFS	90/ 60/ 30	120/ 60/ 30	180/ 60/ 30	240/ 90/ 60
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Appendix E - BCA Clause by Clause Assessment

Clause	Description	Comment	Status
PART C – FIRE RESISTANCE			
C1.1	Type of construction required	Type A construction is required, i.e. fire ratings as follows;	Complies
C1.5	Two storey Class 2 or 3 buildings	<i>Two storey may be Type C depending on exits.</i>	Not Applicable
C1.7	Open spectator stands and indoor sports stadiums	May be Type C depending on design.	Not Applicable
C1.8	Lightweight construction	Lightweight construction must comply with Specification C1.8 and be a tested system	To be specified
C1.9	Non-combustible building elements	In a building required to be of Type A or B construction, the following building elements and their components must be non-combustible: (i) External walls and common walls, including all components incorporated in them including the facade covering, framing and insulation. (ii) The flooring and floor framing of lift pits. (iii) Non-loadbearing internal walls where they are required to be fire-resisting.	To be specified
C1.10	Fire Hazard Properties	Details to be provided or noted on drawings	To be specified
C1.11	Performance of external walls in fire	Concrete external walls that could collapse as complete panels (e.g. tilt-up and pre-cast concrete), in a building having a rise in storeys of not more than 2, must comply with Specification C1.11.	To be specified
C1.14	Ancillary elements	An ancillary element must not be fixed, installed or attached to the internal parts or external face of an external wall that is required to be non-combustible	To be specified
C2.2	General floor area and volume limitations	5000m2 compartmentation is provided as per Type A construction requirements	Complies

Clause	Description	Comment	Status
C2.3 & 2.4	Large isolated buildings (Perimeter Vehicular Access (Category 2))	Building is compartmentalised to Type A construction area and volume requirements	Not Applicable
C2.5	Class 9a buildings	<i>Fire/Smoke Separation</i>	Not Applicable
C2.6	Vertical separation of openings in external walls	<i>Spandrels or balconies to unsprinklered Type A buildings.</i>	Complies / Does Not Comply / To be specified / Not Applicable
C2.7	Separation by fire walls	Construction — A fire wall must be constructed in accordance with the following: (i) The fire wall has the relevant FRL prescribed by Specification C1.1 for each of the adjoining parts, and if these are different, the greater FRL, except where Tables 3.9, 4.2 and 5.2 of Specification C1.1 permit a lower FRL on the carpark side. (ii) Any openings in a fire wall must not reduce the FRL required by Specification C1.1 for the fire wall, except where permitted by the Deemed-to-Satisfy Provisions of Part C3. (iii) Building elements, other than roof battens with dimensions of 75 mm x 50 mm or less or sarking-type material, must not pass through or cross the fire wall unless the required fire-resisting performance of the fire wall is maintained.	To be specified
C2.8	Separation of classifications in the same storey		Not Applicable
C2.9	Separation of classifications in different storeys	Type A construction — The floor between the adjoining parts must have an FRL of not less than that prescribed in Specification C1.1 for the classification of the lower storey. 2 hour fire separation required between the admin office and data halls	Complies / Does Not Comply / To be specified / Not Applicable
C2.10	Separation of lift shafts	To achieve a 2 hour fire rating	To be specified
C2.11	Stairways and lifts in one shaft		Not Applicable

Clause	Description	Comment	Status
C2.12	Separation of equipment	construction complying with (d), if that equipment comprises— (i) lift motors and lift control panels; or (ii) emergency generators used to sustain emergency equipment operating in the emergency mode; or (iii) central smoke control plant; or (iv) boilers; or (v) a battery system installed in the building that has a total voltage of 12 volts or more and a storage capacity of 200 kWh or more. 120/120/120 separation required	To be specified
C2.13	Electricity supply system	A main switchboard located within the building which sustains emergency equipment operating in the emergency mode must— (i) be separated from any other part of the building by construction having an FRL of not less than 120/120/120; and (ii) have any doorway in that construction protected with a self-closing fire door having an FRL of not less than – /120/30	To be specified
C2.14	Public corridors in Class 2 and 3 buildings	Corridors to be limited to 40 m compartments.	Not Applicable
C3.2	Protection of openings in external walls.	No openings within 3 m of fire source feature.	Complies
C3.3	Separation of external walls and openings in different fire compartments		Complies
C3.4	Acceptable methods of protection	(a) Where protection is required, doorways, windows and other openings must be protected as follows:	To be specified

Clause	Description	Comment	Status
		(i) Doorways—	
		(A) internal or external wall-wetting sprinklers as appropriate used with doors that are self-closing or automatic closing; or	
		(B) –/60/30 fire doors that are self-closing or automatic closing.	
C3.5	Doorways in fire walls	A single fire door or fire shutter which has an FRL of not less than that required by Specification C1.1 for the fire wall except that each door or shutter must have an insulation level of at least 30. A fire engineered performance solution will be applied to allow a 2 hour fire rated door in the 4hour fire rated fire walls	To be specified / performance solution
C3.6	Sliding fire doors		Not Applicable
C3.7	Protection of doorways in horizontal exits	a single fire door that has an FRL of not less than that required by Specification C1.1 for the fire wall except that the door must have an insulation level of at least 30; A fire engineered performance solution will be applied to allow a 2 hour fire rated door in the 4hour fire rated fire walls	To be specified / performance solution
C3.8	Openings in fire-isolated exits	Doorways that open to fire-isolated stairways, fire-isolated passageways or fire-isolated ramps, and are not doorways opening to a road or open space, must be protected by –/60/30 fire doors that are self-closing, or automatic-closing	To be specified
C3.9	Service penetrations in fire-isolated exits	Fire-isolated exits must not be penetrated by any services other than— (a) electrical wiring permitted by D2.7(e) to be installed within the exit; or (b) ducting associated with a pressurisation system if it—	To be

Clause	Description	Comment	Status
		(i) is constructed of material having an FRL of not less than –/120/60 where it passes through any other part of the building; and	
		(ii) does not open into any other part of the building; or	
		(c) Water supply pipes for fire services.	
		C3.10 Openings in fire-isolated lift	
C3.10	Openings in fire isolated lift shafts	(a) Doorways — If a lift shaft is required to be fire-isolated, an entrance doorway to that shaft must be protected by – /60/– fire doors that— (i) comply with AS 1735.11; and (ii) are set to remain closed except when discharging or receiving passengers, goods or vehicles. (b) Lift indicator panels — A lift call panel, indicator panel or other panel in the wall of a fire-isolated lift shaft must be backed by construction having an FRL of not less than –/60/60 if it exceeds 35 000 mm 2 in area.	To be specified
C3.11	Bounding construction: Class 2, 3 and 4 buildings		Not Applicable
C3.12	Openings in floors and ceilings for services	A service must be protected— (i) in a building of Type A construction, by a shaft complying with Specification C1.1; or (ii) in a building of Type B or C construction, by a shaft that will not reduce the fire performance of the building elements it penetrates; or (iii) in accordance with C3.15.	To be specified

Clause	Description	Comment	Status
		(c) Where a service passes through a floor which is required to be protected by a fire-protective covering, the penetration must not reduce the fire performance of the covering. Tested fire stopping systems to be used, test reports to be provided for review	
C3.13	Openings in shafts		Not Applicable
C3.15	Openings for service installations	Tested fire stopping systems to be used and installed as per the tested prototype	To be specified
C3.16	Construction joints	Construction joints, spaces and the like in and between building elements required to be fire-resisting with respect to integrity and insulation must be protected in a manner identical with a prototype tested in accordance with AS 1530.4 to achieve the required FRL.	To be specified

PART D - ACCESS AND EGRESS

D1.2	Number of exits required	Class 2 to 8 buildings — In addition to any horizontal exit, not less than 2 exits must be provided from the following: (i) Each storey if the building has an effective height of more than 25 m.	Complies
D1.3	When fire-isolated exits are required		Complies
D1.4	Exit travel distances	Extended travel distances and distances between alternative exits to be assessed under a performance solution; Open Roof Plant: - Travel distance to nearest exit is up to 55m in lieu of 40m; and - Travel distance between alternative exits is up to 90m in lieu of 60m, measured to horizontal exit. L4 Office Building: - Travel distance to point of choice of up to 25m in lieu of 20m; and - Travel distance to nearest exit of up to 50m in lieu of 40m; and	Performance solution

Clause	Description	Comment	Status
		- Travel distance between alternative exits of up to 65m in lieu of 60m Crac Corridors: - Travel distance between exit is up to 80m in lieu of 60m, measured to horizontal exit. Data Halls - Travel distance to nearest exit is up to 50m in lieu of 40m, measured to horizontal exit; and - Travel distance between alternative exit is up to 80m in lieu of 60m, measured to horizontal exit.	
D1.5	Distance between alternative exits	L1 Plant room - Travel distance of 120m between alternative exits in lieu of 60m; and - Travel distance of 80m to nearest exit in lieu of 40m.	Performance solution
D1.6	Dimensions of exits and paths of travel to exits	It is proposed to permit the reduced unobstructed egress width in the hot aisle corridor in the data hall to be no less than 750mm in lieu of the required 1000mm	Performance solution
D1.7	Travel via fire-isolated exits		Complies
D1.8	External stairways or ramps in lieu of fire-isolated exits		Not Applicable
D1.9	Travel by non-fire-isolated stairways or ramps		Complies
D1.10	Discharge from exits		Complies
D1.11	Horizontal exits	Horizontal exits are proposed which exit the maximum allowable of 50% in the crac corridors	Performance solution
D1.12	Non-required stairways, ramps or escalators		Not Applicable
D1.16	Plant rooms and lift motor rooms: Concession	(i) a plant room with a floor area of not more than 100 m ² ; or	To be specified

Clause	Description	Comment	Status
		(ii) all but one point of egress from a plant room, a lift machine room or a Class 8 electricity network substation with a floor area of not more than 200 m ² .	
		(b) A ladder permitted under (a)—	
		(i) may form part of an exit provided that in the case of a fire-isolated stairway it is contained within the shaft; or	
		(ii) may discharge within a storey in which case it must be considered as forming part of the path of travel; and	
		(iii) for a plant room or a Class 8 electricity network substation, must comply with AS 1657; and	
		(iv) for a lift machine room, where access is provided from within a machine room to a secondary floor, a fixed rung type ladder complying with AS 1657 may be used, provided that—	
		(A) the height between the floors is not more than 2800 mm; and	
		(B) the ladder is inclined at an angle to the horizontal not less than 65 degrees nor more than 75 degrees; and	
		(C) the distance between the front face of the ladder and any adjacent obstruction is not less than—	
		(aa) 960 mm, where the ladder is inclined 65 degrees to the horizontal; or	
		(bb) 760 mm, where the ladder is inclined 75 degrees to the horizontal; or	

Clause	Description	Comment	Status
		(cc) a distance that is determined by interpolating the values in (aa) and (bb), where the ladder is inclined at any angle between 65 degrees and 75 degrees to the horizontal; and	
		(D) a clear space not less than 600 mm exists between the foot of the ladder and any equipment.	
D1.17	Access to lift pits	Access to lift pits must—	To be specified
		(a) where the pit depth is not more than 3 m, be through the lowest landing doors; or	
		(b) where the pit depth is more than 3 m, be provided through an access doorway complying with the following:	
		(i) In lieu of D1.6, the doorway must be level with the pit floor and not be less than 600 mm wide by 1980 mm high clear opening, which may be reduced to 1500 mm where it is necessary to comply with (ii).	
		(ii) No part of the lift car or platform must encroach on the pit doorway entrance when the car is on a fully compressed buffer.	
		(iii) Access to the doorway must be by a stairway complying with AS 1657.	
		(iv) In lieu of D2.21, doors fitted to the doorway must be—	
		(A) of the horizontal sliding or outwards opening hinged type; and	
		(B) self-closing and self-locking from the outside; and	
		(C) marked on the landing side with the letters not less than 35 mm high: “DANGER LIFTWELL – ENTRY OF UNAUTHORIZED PERSONS PROHIBITED – KEEP CLEAR AT	

Clause	Description	Comment	Status
		ALL TIMES"	
D2.2	Fire-isolated stairways and ramps	A stairway or ramp (including any landings) that is required to be within a fire-resisting shaft must be constructed— (a) of non-combustible materials; and (b) so that if there is local failure it will not cause structural damage to, or impair the fire-resistance of, the shaft.	To be specified
D2.3	Non-fire-isolated stairways and ramps		Not Applicable
D2.4	Separation of rising and descending stair flights		Complies
D2.5	Open access ramps and balconies		Not Applicable
D2.6	Smoke lobbies		Not Applicable
D2.7	Installations in exits and paths of travel	Services or equipment comprising— (i) electricity meters, distribution boards or ducts; or (ii) central telecommunications distribution boards or equipment; or (iii) electrical motors or other motors serving equipment in the building, may be installed in— (iv) a required exit, except for fire-isolated exits specified in (a); or (v) in any corridor, hallway, lobby or the like leading to a required exit, if the services or equipment are enclosed by non-combustible construction or a fire-protective covering with doorways or openings suitably sealed against smoke spreading from the enclosure.	To be specified

Clause	Description	Comment	Status
		(e) Electrical wiring may be installed in a fire-isolated exit if the wiring is associated with—	
		(i) a lighting, detection, or pressurisation system serving the exit; or	
		(ii) a security, surveillance or management system serving the exit; or	
		(iii) an intercommunication system or an audible or visual alarm system in accordance with D2.22; or	
		(iv) the monitoring of hydrant or sprinkler isolating valves.	
D2.8	Enclosure of space under stairs and ramps	Fire-isolated stairways and ramps — If the space below a required fire-isolated stairway or fire-isolated ramp is within the fire-isolated shaft, it must not be enclosed to form a cupboard or similar enclosed space.	To be specified
D2.9	Width of stairways	Minimum 1m clear maintained	Complies
D2.10	Pedestrian ramps		Not Applicable
D2.11	Fire-isolated passageways	2 hour minimum fire rated corridors have been specified	Complies
D2.12	Roof as open space		Not Applicable
D2.13	Treads and risers	stairway must have—	To be specified
		(i) not more than 18 and not less than 2 risers in each flight; and	
		(ii) going (G), riser (R) and quantity (2R + G) in accordance with Table D2.13, except as permitted by (b) and (c); and	
		(iii) constant goings and risers throughout each flight, except as permitted by (b) and (c), and the dimensions of	

Clause	Description	Comment	Status
		goings (G) and risers (R) in accordance with (a)(ii) are considered constant if the variation between— (A) adjacent risers, or between adjacent goings, is no greater than 5 mm; and (B) the largest and smallest riser within a flight, or the largest and smallest going within a flight, does not exceed 10 mm; and (iv) risers which do not have any openings that would allow a 125 mm sphere to pass through between the treads; and (v) treads which have— (A) a surface with a slip-resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586; or (B) a nosing strip with a slip-resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586; and (vi) treads of solid construction (not mesh or other perforated material) if the stairway is more than 10 m high or connects more than 3 storeys; and (vii) in a Class 9b building, not more than 36 risers in consecutive flights without a change in direction of at least 30°; and (viii) in the case of a required stairway, no winders in lieu of a landing.	
D2.14	Landings	landings having a maximum gradient of 1:50 may be used in any building to limit the number of risers in each flight and each landing must—	Complies

Clause	Description	Comment	Status
		(i) be not less than 750 mm long, and where this involves a change in direction, the length is measured 500 mm from the inside edge of the landing; and (ii) have— (A) a surface with a slip-resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586; or (B) a strip at the edge of the landing with a slip-resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586, where the edge leads to a flight below; and	
D2.15	Thresholds	(i) the doorway opens to a road or open space, external stair landing or external balcony; and (ii) the door sill is not more than 190 mm above the finished surface of the ground, balcony, or the like, to which the doorway opens.	To be specified
D2.16	Balustrades or other barriers	A continuous barrier must be provided along the side of— (i) a roof to which general access is provided; and (ii) a stairway or ramp; and (iii) a floor, corridor, hallway, balcony, deck, verandah, mezzanine, access bridge or the like; and (iv) any delineated path of access to a building, if the trafficable surface is 1 m or more above the surface beneath.	To be specified

Clause	Description	Comment	Status
D2.17	Handrails	(a) Except for handrails referred to in D2.18, handrails must be— (i) located along at least one side of the ramp or flight; and (ii) located along each side if the total width of the stairway or ramp is 2 m or more; and (iii) in a Class 9b building used as a primary school— (A) have one handrail fixed at a height of not less than 865 mm; and (B) have a second handrail fixed at a height between 665 mm and 750 mm, measured above the nosings of stair treads and the floor surface of the ramp, landing or the like; and (iv) in any other case, fixed at a height of not less than 865 mm measured above the nosings of stair treads and the floor surface of the ramp, landing, or the like; and (v) continuous between stair flight landings and have no obstruction on or above them that will tend to break a hand-hold; and (vi) in a required exit serving an area required to be accessible, designed and constructed to comply with clause 12 of AS 1428.1, except that clause 12(d) does not apply to a handrail required by (a)(iii)(B).	To be specified
D2.18	Fixed platforms, walkways, stairways and ladders	A fixed platform, walkway, stairway, ladder and any going and riser, landing, handrail or barrier attached thereto may comply with AS 1657 in lieu of D2.13, D2.14, D2.16 and D2.17 if it only serves:	To be specified

Clause	Description	Comment	Status
		(a) machinery rooms, boiler houses, lift-machine rooms, plant-rooms, and the like;	
D2.19	Doorways and doors		Complies
D2.20	Swinging doors	For the purpose of data hall operations, it is proposed to permit the door in the data hall compartments to swing against the direction of egress	Performance solution
D2.21	Operation of latch	A door in a required exit, forming part of a required exit or in the path of travel to a required exit must be readily openable without a key from the side that faces a person seeking egress, by— (i) a single hand downward action on a single device which is located between 900 mm and 1.1 m from the floor and if serving an area required to be accessible by Part D3— (A) be such that the hand of a person who cannot grip will not slip from the handle during the operation of the latch; and (B) have a clearance between the handle and the back plate or door face at the centre grip section of the handle of not less than 35 mm and not more than 45 mm; or (ii) a single hand pushing action on a single device which is located between 900 mm and 1.2 m from the floor; and	To be specified
D2.22	Re-entry from fire-isolated exits		Not Applicable
NSW D2.101	Doors in path of travel in a place of public entertainment		Not Applicable
D2.23	Signs on doors	a) A sign, to alert persons that the operation of certain doors must not be impaired, must be installed where it can readily be seen on, or adjacent to—	To be specified

Clause	Description	Comment	Status
		(i) a required—	
		(A) fire door providing direct access to a fire-isolated exit, except a door providing direct egress from a sole-occupancy unit in a Class 2 or 3 building or Class 4 part of a building; and	
		(B) smoke door, on the side of the door that faces a person seeking egress and, if the door is fitted with a device for holding it in the open position, on either the wall adjacent to the doorway or both sides of the door; and	
		(ii) a—	
		(A) fire door forming part of a horizontal exit; and	
		(B) smoke door that swings in both directions; and	
		(C) door leading from a fire isolated exit to a road or open space, on each side of the door.	
		(b) A sign referred to in (a) must be in capital letters not less than 20 mm high in a colour contrasting with the background and state—	
		(i) for an automatic door held open by an automatic hold-open device— “FIRE SAFETY DOOR—DO NOT OBSTRUCT”; or	
		(ii) for a self-closing door— “FIRE SAFETY DOOR DO NOT OBSTRUCT DO NOT KEEP OPEN”; or	

Clause	Description	Comment	Status
		(iii) for a door discharging from a fire-isolated exit— “FIRE SAFETY DOOR—DO NOT OBSTRUCT”.	
D2.24	Protection of openable windows		Not Applicable
D3.1	General building access requirements		Complies
D3.2	Access to the buildings		Complies
D3.3	Parts of buildings to be accessible	Applies to office portions only	Complies
D3.4	Exemptions	Exemption can be applied to areas other than the office portions	Complies / Does Not Comply / To be specified / Not Applicable
D3.5	Accessible Carparking	1 spot provided as required	Complies
D3.6	Signage	Signage to comply with AS1428.1-2009	To be specified
D3.7	Hearing augmentation	Confirmation required if any meeting rooms will be provided with in built amplification system	To be Specified
D3.8	Tactile indicators	Tactile ground surface indicators required must comply with sections 1 and 2 of AS/NZS 1428.4.1.	To be specified
D3.9	Wheelchair seating spaces in Class 9b assembly buildings		Not Applicable
D3.10	Swimming Pools		Not Applicable
PART E - SERVICES AND EQUIPMENT			
E1.3	Fire hydrants (Category 2)	Additional fire hydrant hose lengths to provide coverage are anticipated to be required It is anticipated the hydrant booster location will not meet the prescriptive requirements of AS2419.1-2005 and will be required to be assessed as a fire engineered performance solution.	Performance solution

Clause	Description	Comment	Status
E1.4	Fire hose reels	Removal of fire hose reels within the data halls and link corridor in lieu of providing fire hose reels as required	Performance Solution
E1.5	Sprinklers (Category 2)	Automatic sprinkler protection is required to Specification E1.5 and AS2118.1-2017 to the following areas: - Data halls - Tenant storage areas It is noted that sprinkler protection is being provided as a means of asset protection and coverage will not be provided to all areas. Areas in which sprinklers are provided compliance with AS2118.1-2017 is to be achieved. The fire engineering report is to provide discussion on areas which are proposed to be non-sprinkler protected. The sprinkler valve room does not have direct egress to road or open space as required by Specification E1.5, this required to be addressed as a fire engineered performance solution.	Performance solution
E1.6	Portable fire extinguishers	a) To cover Class AE or E fire risks associated with emergency services switchboards. (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 including that held in fuel tanks of vehicles).	To be specified
E1.8	Fire control centres/rooms (Category 2)		Complies
E1.9	Fire precautions during construction	In a building under construction— (a) not less than one fire extinguisher to suit Class A, B and C fires and electrical fires must be provided at all times on	To be specified

Clause	Description	Comment	Status
		each storey adjacent to each required exit or temporary stairway or exit; and (b) after the building has reached an effective height of 12 m— (i) the required fire hydrants and fire hose reels must be operational in at least every storey that is covered by the roof or the floor structure above, except the 2 uppermost storeys; and (ii) any required booster connections must be installed.	
E1.10	Provision for special hazards	Fuel store to be constructed as per the Dangerous Goods report	Complies / Does Not Comply / To be specified / Not Applicable
E2.2	Smoke hazard management (Category 2)	the building must be provided with— (d) in each required fire-isolated stairway, including any associated fire-isolated passageway or fire-isolated ramp, an automatic air pressurisation system for fire-isolated exits in accordance with AS 1668.1; or (e) a zone pressurisation system between vertically separated fire compartments in accordance with AS 1668.1, if the building has more than one fire compartment; or (f) an automatic smoke detection and alarm system complying with Specification E2.2a; or (g) a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification E1.5.	To be specified
E3.2 to E3.7	Lifts (Category 2)	(a) A stretcher facility in accordance with (b) must be provided— (i) in at least one emergency lift required by E3.4; or (ii) where an emergency lift is not required, if passenger lifts are installed to serve any storey above an effective	Sizes Comply and to be specified

Clause	Description	Comment	Status
		height of 12 m, in at least one of those lifts to serve each floor served by the lifts.	
		(b) A stretcher facility must accommodate a raised stretcher with a patient lying on it horizontally by providing a clear space not less than 600 mm wide x 2000 mm long x 1400 mm high above the floor level.	
		Warning against use of lifts in fire A warning sign must—	
		(a) be displayed where it can be readily seen—	
		(i) near every call button for a passenger lift or group of lifts throughout a building; except	
		(ii) a small lift such as a dumb-waiter or the like that is for the transport of goods only; and	
		(b) comply with the details and dimensions of Figure E3.3 and consist of—	
		(i) incised, inlaid or embossed letters on a metal, wood, plastic or similar plate securely and permanently attached to the wall; or	
		(ii) letters incised or inlaid directly into the surface of the material forming the wall.	
		Lift car buttons and controls to comply with AS1735.12	
		Where lifts serve any storey above an effective height of 12 m, the following must be provided:	

Clause	Description	Comment	Status
		(a) A fire service recall control switch complying with E3.9 for— (i) a group of lifts; or (ii) a single lift not in a group that serves the storey. (b) A lift car fire service drive control switch complying with E3.10 for every lift	
E4.2 to 4.4	Emergency lighting requirements	An emergency lighting system must be installed— (a) in every fire-isolated stairway, fire-isolated passageway or fire-isolated ramp; and (b) in every storey of a Class 5, 6, 7, 8 or 9 building where the storey has a floor area more than 300 m2 (i) in every passageway, corridor, hallway, or the like, that is part of the path of travel to an exit; and (ii) in any room having a floor area more than 100 m2 that does not open to a corridor or space that has emergency lighting or to a road or open space; and (iii) in any room having a floor area more than 300 m2;	To be specified
E4.5 to 4.8	Exit signs	An exit sign must be clearly visible to persons approaching the exit, and must be installed on, above or adjacent to each— (a) door providing direct egress from a storey to— (i) an enclosed stairway, passageway or ramp serving as a required exit; and	To be specified

Clause	Description	Comment	Status
		(ii) an external stairway, passageway or ramp serving as a required exit; and	
		(iii) an external access balcony leading to a required exit; and	
		(b) door from an enclosed stairway, passageway or ramp at every level of discharge to a road or open space; and	
		(c) horizontal exit; and	
		(d) door serving as, or forming part of, a required exit in a storey required to be provided with emergency lighting	
		To be installed and design in accordance with AS2293.1-2018	

E4.9	Emergency warning and intercommunication systems		Not Applicable
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PART F - HEALTH AND AMENITY

FP1.4	Weatherproofing of External Walls	Performance Requirement FP1.4 which relates to the prevention of the penetration of water through external walls, must be complied with. It is noted that there are no Deemed-to-Satisfy Provisions for this Performance Requirement in respect of external walls. As such, a performance solution is to be prepared by a suitably qualified professional that demonstrates that the external walls of the proposed building complies with Performance Requirement FP1.4 which reads as follows: <i>A roof and external wall (including openings around windows and doors) must prevent the penetration of water that could cause—</i> a) <i>unhealthy or dangerous conditions, or loss of amenity for occupants; and</i> b) <i>undue dampness or deterioration of building elements.</i>	To be specified
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Clause	Description	Comment	Status
F1.5	Roof coverings	A roof must be covered with— (a) concrete roofing tiles complying with AS 2049 and fixed, except in cyclonic areas, in accordance with AS 2050, as appropriate; or (b) terracotta roofing tiles complying with AS 2049 and fixed, except in cyclonic areas, in accordance with AS 2050; or (c) cellulose cement corrugated sheeting complying with AS/NZS 2908.1 and installed in accordance with AS/NZS 1562.2; or (d) metal sheet roofing complying with AS 1562.1; or (e) plastic sheet roofing designed and installed in accordance with AS/NZS 4256.1, AS/NZS 4256.2, AS/NZS 4256.3, AS/NZS 4256.5 and AS/NZS 1562.3; or (f) Terracotta, fibre-cement and timber slates and shingles designed and installed in accordance with AS 4597, except in cyclonic areas.	To be specified
F1.6	Sarking	Sarking-type material used for weatherproofing of roofs and walls must comply with AS/NZS 4200.1 and AS 4200.2.	To be specified
F1.7	Water proofing of wet areas in buildings	building elements in the bathroom or shower room, a slop hopper or sink compartment, a laundry or sanitary compartment must— (i) be water resistant or waterproof in accordance with Table F1.7; and (ii) comply with AS 3740,	To be specified
F1.9	Damp-proofing		Not Applicable

Clause	Description	Comment	Status
F1.10	Damp-proofing of floors on the ground	If a floor of a room is laid on the ground or on fill, moisture from the ground must be prevented from reaching the upper surface of the floor and adjacent walls by the insertion of a vapour barrier in accordance with AS 2870	To be specified
F1.11	Provision of floor wastes		Not Applicable
F1.12	Sub-floor ventilation		Not Applicable
F1.13	Glazed assemblies		Not applicable
F2.1	Facilities in residential buildings		Not Applicable
F2.3	Facilities in Class 3 to 9 buildings		Complies
F2.4	Facilities for people with disabilities	(AS 1428.1- 2009)	Complies
F2.5	Construction of sanitary compartments	Each toilet to have separated cubical or enclosure, cubicle doors need to be lift off type	Complies
F2.8	Waste management		Not Applicable
F3.1	Height or rooms and other spaces		Complies
F4.1 to 4.3	Provision of natural light		Not Applicable
F4.4	Artificial lighting (AS 1680)	The artificial lighting system must comply with AS/NZS 1680.0.	To be specified
F4.5 to 4.7	Ventilation of rooms	A habitable room, office, shop, factory, workroom, sanitary compartment, bathroom, shower room, laundry and any other room occupied by a person for any purpose must have— (a) natural ventilation complying with F4.6; or (b) a mechanical ventilation or air-conditioning system complying with AS 1668.2 and AS/NZS 3666.1.	To be specified

Clause	Description	Comment	Status
F4.8 & 9	Restriction of position of water closets and urinals / Airlocks		Complies
F4.11	Car park ventilation		Not Applicable
F4.12	Kitchen local exhaust ventilation		Not Applicable
F5.2 to F5.7	Sound transmission and insulation		Not Applicable
Part F6			Not Applicable
PART G - ANCILLARY PROVISIONS			
G1.1	Swimming pools		Not Applicable
G1.2	Refrigerated chambers, strong-rooms and vaults		Not Applicable
NSW G1.101	Provision for window cleaning		To be specified
G2.2	Installation of domestic oil-fired or solid-fuel appliances and pressure equipment		Not Applicable
G2.3	Open fireplaces		Not Applicable
G2.4	Incinerator rooms		Not Applicable
G3.2 to G3.8	Atrium construction		Not Applicable
G4.2 to G4.9	Construction in alpine areas		Not Applicable
G5.1 & 2	Construction in bush fire zones		To be specified
PART H - SPECIAL USE BUILDINGS			
H1.2 to H1.7	Theatres, stages and public halls		Not Applicable
NSW Part H101	Places of public entertainment		Not Applicable

Clause	Description	Comment	Status
NSW Part H102	Temporary structures		Not Applicable
NSW Part H103	Drive-in theatres		Not Applicable
SECTION J – ENERGY EFFICIENCY			
J11.1 and 1.2	Insulation	ESD consultant to confirm requirements	To be specified
J2	Building Sealing	ESD consultant to confirm requirements	To be specified
J3	Building Services	ESD consultant to confirm requirements	To be specified
J5	Air Conditioning & Ventilation Systems	ESD consultant to confirm requirements	To be specified
J6	Artificial Lighting & Power	ESD consultant to confirm requirements	To be specified
J7	Hot Water Supply		Not applicable
J8	Access for Maintenance		To be specified