

Attachment 11





CDC DATA CENTRES HAZELMERE DEVELOPMENT

PRELIMINARY FIRE SAFETY STRATEGY AND DANGEROUS GOODS REVIEW

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27/02/2026	2	Revised to reflect updated architectural drawings and issued for incorporation within Development Application
05/03/2026	3	Revised to reflect updated architectural drawings and issued for incorporation within Development Application

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EXECUTIVE SUMMARY

This report has been prepared by Vector Alliance to communicate the Preliminary Fire Safety Strategy for the proposed CDC Hazelmere Data Centre Campus located at 178-196 Bushmead Road, Hazelmere WA 6055. The CDC Hazelmere Data Centre Campus is proposed to comprise 1 off 4-storey Data Centre Building (HA1) that is constructed in 2 off 'portions' to facilitate a staged handover. The development is proposed to include the following works:

- Data Centre Building (HA1 Building). It is assumed the building will be classified as a Class 7b / Class 8 Data Centre with ancillary Class 5 Office Areas.
- External diesel fuel generators in a triple stack arrangement.
- Security Gatehouse.
- Services infrastructure.
- Perimeter security fence / gates.
- Roads and carparking.
- Landscaping.

The Preliminary Fire Safety Strategy includes required Fire Safety Measures and proposed standards of construction, commissioning, management, use, and maintenance. The Preliminary Fire Safety Strategy will be subject to change as the design develops during future design phases.

Unless explicitly stated within this report, the design is assumed to comply with the Deemed to Satisfy (DtS) Provisions of the National Construction Code Volume 1 2022 Amendment 2 (BCA). The Fire Safety Strategy integrates performance-based design elements as per the Performance Solution Summary Table presented in Table 1.

Table 1 – Performance Solution Summary Table.

Performance Solution	BCA DtS Clause(s)	BCA Performance Requirement(s)
Rationalised Fire Resistance Levels (FRLs).	C2D2	C1P1, C1P2
Lightweight fire walls on security boundaries that are required to have a fire resistance level are permitted to comprise a non-tested system incorporating a steel plate for security compliance.	C2D2	C1P1, C1P2
Extended exit travel distances and distances between alternative exits – General.	D2D5, D2D6	D1P4, E2P2
Extended exit travel distances and distances between alternative exits – Chiller Deck.	D2D5, D2D6	D1P4, E2P2
More than half of exits serving a fire compartment are horizontal exits.	D2D16	D1P4
Fire hydrant system outside of scope of AS 2419.1:2021.	E1D2	E1P3
Omission of fire hose reels, with the exception of the Ground Floor Loading Dock.	E1D3	E1P1, E1P2
Sprinklers permitted in IT Switchrooms containing high voltage equipment.	E1D4	E1P4
Sprinkler Valve Rooms do not have direct egress to a road or open space.	E1D4	E1P4
Pre-action sprinkler systems serving Data Halls proposed to be activated by a smoke detection system complying with FM Global Property Loss Prevention Data Sheet 5-32 in lieu of AS 1670.1:2018.	E1D4	E1P4
Adoption of black mild steel pipework for pre-action sprinkler systems in lieu of galvanised steel.	E1D4	E1P4

The HA1 Building is proposed to contain lithium-ion battery energy storage systems within the building and have diesel fuel generators located on an external Generator Structure. This report describes elements of the design proposed to address the special hazards presented by these systems.

This report has been prepared in accordance with the Australian Fire Engineering Guidelines 2021 (AFEG) and precedes the Performance Based Design Brief (PBDB) for the HA1 Building.

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1 INTRODUCTION

1.1 SCOPE OF THE PROJECT

This report has been prepared by Vector Alliance to communicate the Preliminary Fire Safety Strategy for the proposed CDC Hazelmere Data Centre Campus located at 178-196 Bushmead Road, Hazelmere WA 6055. The CDC Hazelmere Data Centre Campus is proposed to comprise 1 off 4-storey Data Centre Building (HA1) that is constructed in 2 off 'portions' to facilitate a staged handover.

Refer to Figure 1 and Figure 2 for depictions of the proposed CDC Hazelmere site layout. The development is proposed to include the following works:

- Data Centre Building (HA1 Building). It is assumed the building will be classified as a Class 7b / Class 8 Data Centre with ancillary Class 5 Office Areas.
- External diesel fuel generators in a triple stack arrangement.
- Security Gatehouse.
- Services infrastructure.
- Perimeter security fence / gates.
- Roads and carparking.
- Landscaping.

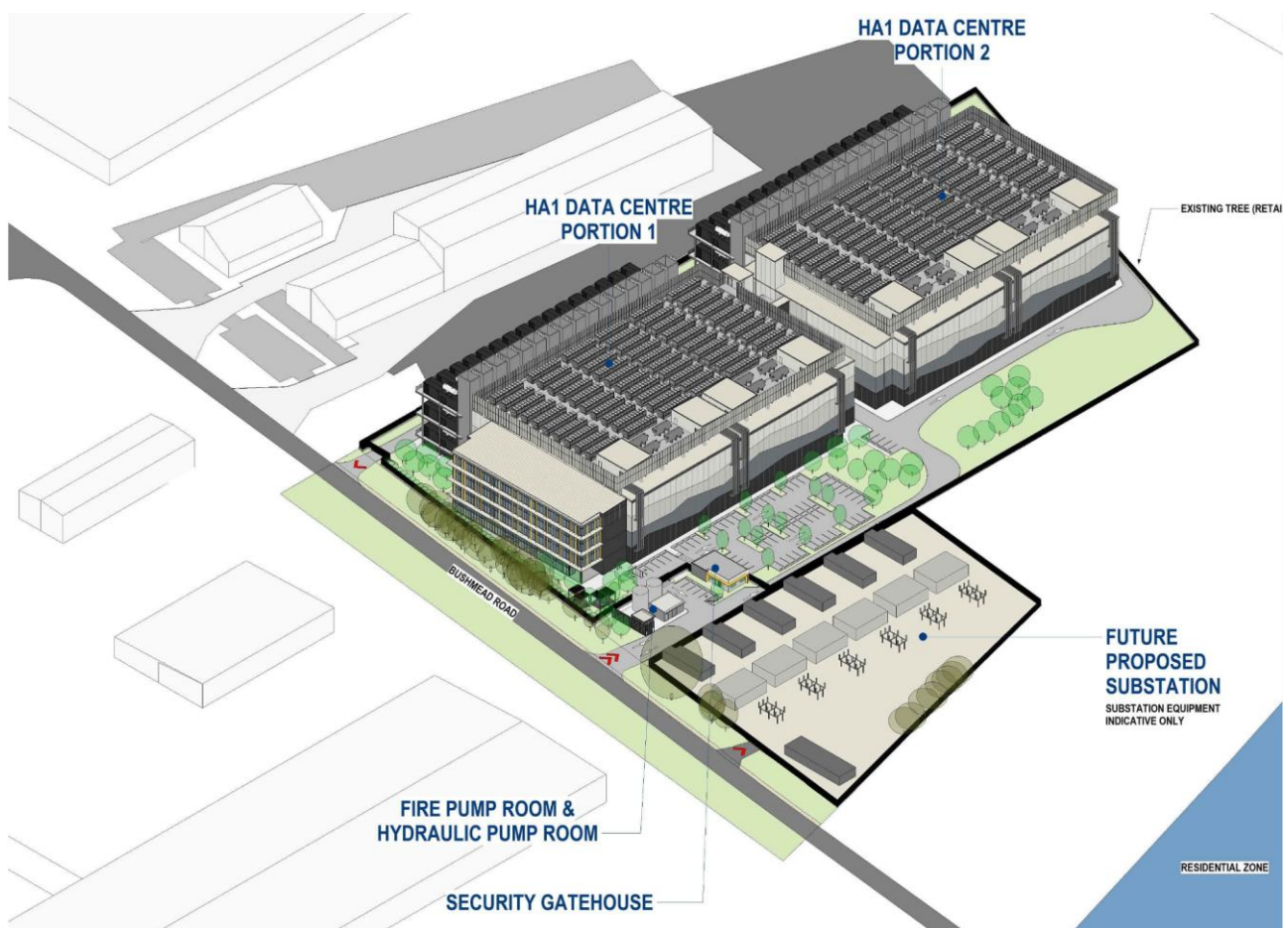


Figure 1 – Proposed CDC Hazelmere Site Layout – 3D Massing View.

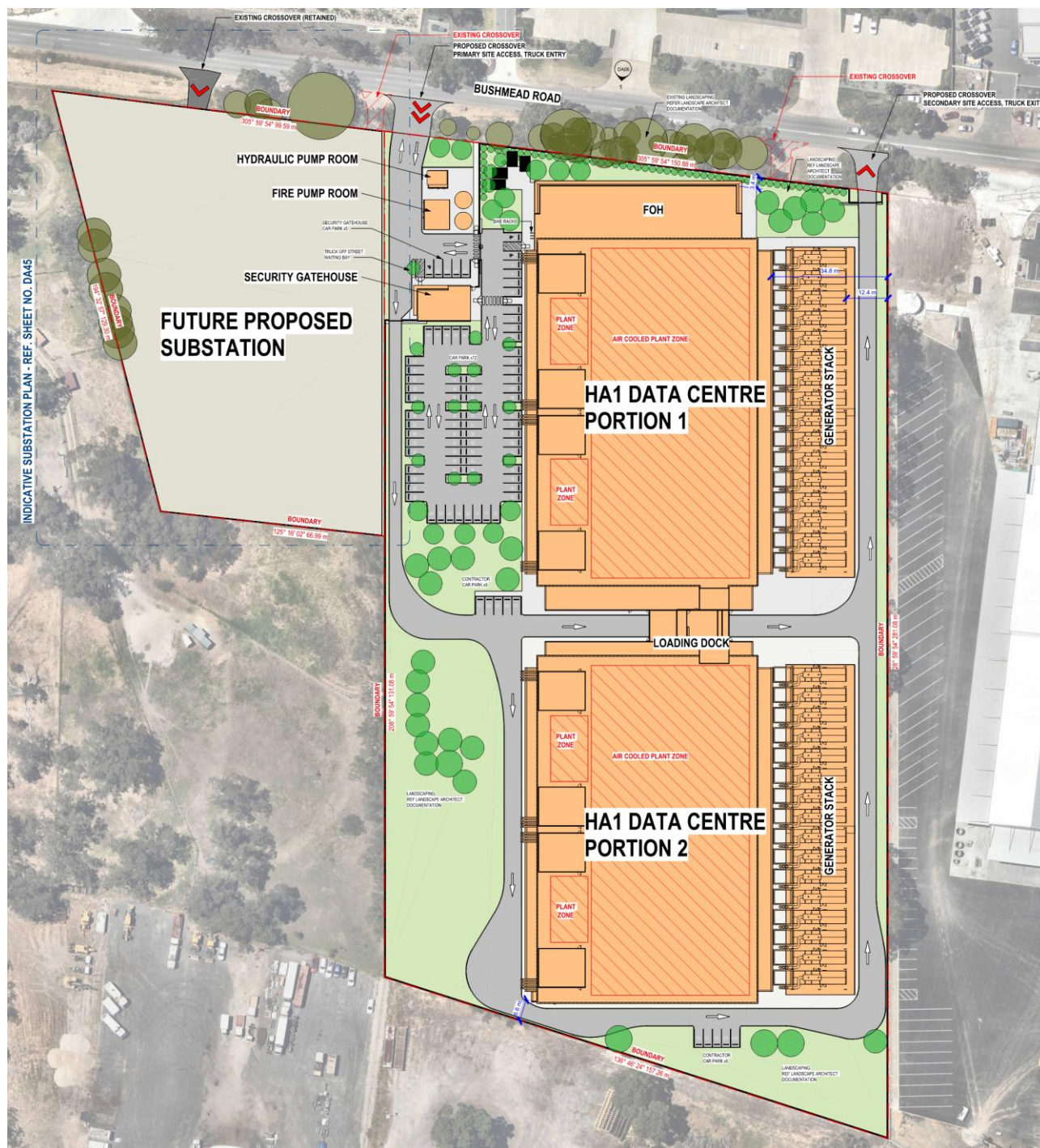


Figure 2 – Proposed CDC Hazelmere Site Layout – Site Plan.

All works shall be undertaken in accordance with the National Construction Code Volume 1 2022 Amendment 2 (BCA) and/or future edition(s) of the BCA depending on the date of approval for each stage of construction. The design of each building is proposed to incorporate a combination of Deemed-to-Satisfy (DtS) Solutions and Performance Solutions to comply with the Performance Requirements of the BCA.

This document comprises the Preliminary Fire Safety Strategy and has been prepared to communicate proposed Fire Safety Measures, standards of construction, commissioning, management, use, and maintenance. Whilst site-wide elements are considered within this report, the focus is on the HA1 Building. The Preliminary Fire Safety Strategy will be subject to change as the design develops further.

This report has been prepared in accordance with the Australian Fire Engineering Guidelines 2021 (AFEG) and proceeds the Performance Based Design Brief (PBDB).

1.2 REGULATORY FRAMEWORK

The project must meet the requirements of applicable Building Legislation, specifically the Western Australia Building Act 2011 and Building Regulations 2012. The BCA is adopted through this Legislation and provides technical building design requirements.

Building compliance is achieved through compliance with the BCA Performance Requirements. Compliance with the Performance Requirements can be demonstrated by satisfying the DtS Provisions, a Performance Solution, or a combination of both.

Fire Safety Engineering assessment and reporting is undertaken to demonstrate that Performance Solutions pertaining to fire safety comply with the Performance Requirements. A Performance Solution is an aspect of the building design that does not satisfy the DtS Provisions but has been demonstrated to:

- Comply with all relevant Performance Requirements; or
- Be at least equivalent to the DtS Provisions.

A Performance Solution must be demonstrated to comply with the Performance Requirements using one or a combination of the methods prescribed in Clause A2G2 of the BCA.

1.3 REFERENCE DOCUMENTATION

The Fire Safety Engineering scope and assessment has been based on drawings listed in Table 2.

Table 2 – Schedule of Referenced Drawings.

Discipline	Drawing Number	Drawing Name	Date	Revision
Architectural	PER-HA1-AR-DG-DA03	Site Plan	04.03.2026	E
Architectural	PER-HA1-AR-DG-DA04	Site Floor Plan	04.03.2026	E
Architectural	PER-HA1-AR-DG-DA05	Site 3D Massing	04.03.2026	E
Architectural	PER-HA1-AR-DG-DA10	GA Ground Floor Plan	04.03.2026	E
Architectural	PER-HA1-AR-DG-DA11	GA Level 1 Floor Plan	27.02.2026	D
Architectural	PER-HA1-AR-DG-DA12	GA Level 2 Floor Plan	27.02.2026	D
Architectural	PER-HA1-AR-DG-DA13	GA Level 3 Floor Plan	27.02.2026	D
Architectural	PER-HA1-AR-DG-DA14	GA Roof Plan	27.02.2026	D
Architectural	PER-HA1-AR-DG-DA15	GA Chiller Deck Plan	27.02.2026	D
Architectural	PER-HA1-AR-DG-DA20	Elevations	27.02.2026	E
Architectural	PER-HA1-AR-DG-DA30	Sections	27.02.2026	E

1.4 OBJECTIVES

The fire safety objectives have been developed in collaboration with project stakeholders. Objectives pertaining to Fire Safety Engineering are categorised as building regulatory objectives, other regulatory objectives, and non-regulatory objectives.

Building regulatory objectives applicable to the project are as identified in the BCA. The broad objectives pertaining to fire safety are prescribed in Objectives C1O1, D1O1, E1O1, E2O1, and E4O1. These objectives are summarised as follows:

- Safeguard people from illness or injury due to a fire in a building.
- Safeguard occupants from illness or by warning them of a fire so that they may safely evacuate.
- Safeguard occupants from illness or injury while evacuating a building during a fire or other emergency.
- In an emergency, safeguard occupants from injury by:
 - Having adequate visibility.
 - Having adequate identification of exits and paths of travel to exits.
 - Being made aware of the emergency.
- Facilitate the activities of emergency services personnel.
- Avoid the spread of fire between buildings.
- Protect other property from physical damage caused by structural failure of a building as a result of fire.
- Provide facilities for occupants and the fire brigade to undertake fire-fighting operations.
- Provide, as far as reasonable, people with safe, equitable and dignified access to:
 - A building.
 - The services and facilities within a building.

Other regulatory objectives are those presented in alternative Legislation and are generally broad in nature. Other regulatory objectives applicable to the project are summarised as follows:

- Environmental protection.
- Occupational health and safety.
- Accessibility.
- Fire brigade operational requirements.
- Land use and planning matters.

Non-regulatory objectives are additional objectives set by other stakeholders. The non-regulatory objectives pertaining to fire safety and applicable to the subject building are understood to comprise the following:

- Information security.
- Property and asset protection in accordance with CDC Data Centres client and insurer requirements.
- Access for large equipment installation and replacement.
- Minimise the extent of disruption and modification works required to achieve BCA compliance.
- Mitigate the likelihood and consequence of spurious fire alarms.

1.5 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations are applicable to the Fire Safety Engineering assessment and reporting:

- The contents of this report are only applicable to the subject building and the current design and shall not be utilised for other projects.
- Unless explicitly stated otherwise within this report, the building design is assumed to comply with the BCA DtS Provisions applicable to fire safety.
- This assessment is based on documentation explicitly referenced within this report. Changes to this documentation or the provision of additional documentation may affect the outcomes of this assessment.
- This assessment does not address compliance with regulatory requirements associated with dangerous goods, environmental, disability discrimination, and occupational health and safety.
- This assessment is limited to risks associated with accidental fire starts, considering a single fire occurring at any one time. Arson and other malicious acts that may result in a fire have not been identified as a considerable risk and therefore have not been assessed.
- This assessment is limited to addressing life safety and does not address property protection or business continuity following an incident. Client requirements exceeding BCA DtS Provisions have been adopted at the direction of the Client and included as part of the Fire Safety Strategy.
- This assessment is not based on achieving absolute safety, as there will always be a finite level of risk. The intent of the Fire Safety Engineering assessment is to demonstrate an adequate level of fire safety by demonstrating compliance with the BCA Performance Requirements.
- The diesel fuel generator assessment is limited to providing an overview of fire safety requirements applicable to the storage of diesel fuel and does not specify all ancillary compliance requirements or address the safe handling and use of the diesel fuel on site or general emergency management protocols.
- The diesel fuel generator assessment is based on the requirements of AS 1940:2017 and does not assess compliance with International Standards or Environmental Protection Authority requirements unless specifically noted within AS 1940:2017 or this report.
- The current edition of the BCA and referenced standards do not specifically address special risks associated with lithium-ion batteries. Therefore, Vector Alliance has relied on the material available at the time of writing this report. Risk mitigation strategies associated with lithium-ion battery energy storage systems are the subject of ongoing research. The analysis presented in this report represents the current understanding of the subject matter and is subject to limitations of the available data at the time of writing the report. While Vector Alliance has exercised judgment and due diligence in the use of such information, Vector Alliance assumes no responsibility for the consequences of any circumstances related to the development of the industry's understanding in strategies to mitigate risks associated with lithium-ion battery energy storage systems.
- This assessment is limited to compliance and regulatory requirements associated with the HA1 Building. Whilst future sitewide elements are considered within this report, Fire Safety Engineering assessments are generally limited to the HA1 Building and exclude assessments associated with the future Substation and/or other buildings proposed to be constructed.

2.2 BUILDING CHARACTERISTICS

The HA1 building is proposed to be used as a Data Centre building containing 4 storeys, with ancillary office areas provided on each storey. The building is also proposed to have a Roof Level Chiller Deck that is generally open to atmosphere but includes enclosed rooms for services equipment and has therefore been considered a storey (despite not being counted in the rise in storeys assessment). The proposed use and floor area of each storey is summarised in Table 3.

Table 3 – Breakdown of HA1 Building by Storey and Use.

Storey	Classification	Use	Approx. Floor Area
Ground Floor	7b / 8	Data Halls, Mechanical Services Corridors, Circulation Corridors, Comms Rooms, Switchrooms, Battery Rooms, Plant Rooms, Sprinkler Valve Rooms, Store Rooms, Amenities, Waste Enclosure, and Loading Dock	16,000 m ²
Ground Floor	5	Offices, Security Rooms, Meeting Rooms, Store Rooms, and Amenities	660 m ²
Level 1	7b / 8	Circulation Corridors, Switchrooms, Battery Rooms, Plant Rooms, Sprinkler Valve Rooms, Store Rooms, and Loading Areas	15,840 m ²
Level 1	5	Offices, Meeting Rooms, Store Rooms, and Amenities	760 m ²
Level 2	7b / 8	Data Halls, Mechanical Services Corridors, Circulation Corridors, Comms Rooms, Switchrooms, Battery Rooms, Plant Rooms, Sprinkler Valve Rooms, Store Rooms, and Loading Areas	15,820 m ²
Level 2	5	Offices, Meeting Rooms, Store Rooms, and Amenities	760 m ²
Level 3	7b / 8	Circulation Corridors, Switchrooms, Battery Rooms, Plant Rooms, Sprinkler Valve Rooms, Store Rooms, and Loading Areas	15,800 m ²
Level 3	5	Offices, Meeting Rooms, Store Rooms, and Amenities	760 m ²
Chiller Deck*	8	Plant Rooms	1,280 m ²
Total**			67,680 m²

*Chiller Deck floor area calculated for the Plant Room only and excludes the external plant area.

Table 4 presents a summary of key building characteristics.

Table 4 – Summary of Key Building Characteristics.

Characteristic	Value
Number of Storeys Contained	5
Rise in Storeys	4*
Occupancy Classifications	5, 7b, and 8
Type of Fire-Resisting Construction	A
Effective Height (Approximate)	18.3 m

*Rise in storeys excludes Chiller Deck.

2.3 DIESEL FUEL GENERATORS

As illustrated in Figure 1, areas adjacent to the building are proposed to incorporate 3-storey structures to support 96 off diesel motor driven high voltage electrical generators. 2 off separate structures are proposed, with 16 off generators per storey of each structure as shown in Figure 5 and Figure 6. The occupancy classification for the Generator Structure is yet to be determined and shall be confirmed as part of the design development process.



Figure 5 – Elevation Drawing Excerpt Depicting Generator Structure – Sheet 1 of 2.

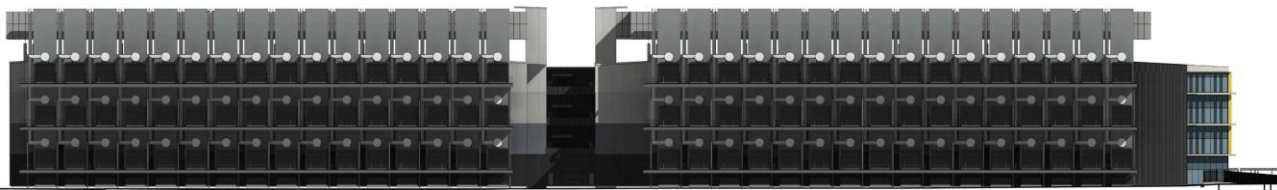


Figure 6 – Elevation Drawing Excerpt Depicting Generator Structure – Sheet 2 of 2.

A common chimney is proposed to be established to facilitate the discharge of hot air from the generators above the roof line. The chimney is not proposed to be utilised for generator flue exhaust. The chimney structure will be enclosed with non-combustible cladding, including any roof between chimney stacks but excluding the top of each chimney stack.

The Ground Floor diesel fuel generators are proposed to be provided with 76,000 L of dedicated diesel fuel storage in the form of a self-bunded 'belly tank' mounted to the base of the diesel generator engine skid. Each belly tank is proposed to be configured to serve the 3 off generators above the tank that comprise the triple stack arrangement. The Level 1 and Level 2 generators also incorporate a 250 L 'day tank'. Therefore, the total diesel fuel stored per group of 3 off generators is 76,500 L.

All fuel storage installations shall comply with the requirements of AS 1940:2017. Table 5 presents a summary of key characteristics of the backup generators and associated fuel storage area.

Table 5 – Generators and Associated Diesel Fuel Storage Characteristics.

Characteristic	Value
Quantity of generators	96
Total Diesel Fuel Stored in Generator Yard (Approximate)	2,448,000 L
Approximate distance from building	6.4 m
Approximate distance to closest allotment boundary	12 m
Approximate distance between diesel fuel tanks	2 m

2.4 DOMINANT OCCUPANT CHARACTERISTICS

Dominant occupant characteristics are based off of the design occupant groups and are summarised in Table 6. These characteristics will influence the response of occupants in a fire scenario.

Table 6 – Dominant Occupant Characteristics of Design Occupant Groups.

Characteristic	Description
Distribution	Building occupants are expected to comprise of staff and infrequent escorted visitors and maintenance personnel. Children are not expected to be present.
State / Activity	The building is a place of employment and staff are expected to be conscious, awake, and sober. Occupants are expected to be alert and aware of their surroundings. Occupants in Data Halls and Plant Rooms are expected to be in a noisy environment. Occupants in other areas are not expected to be in a noisy or otherwise significantly distracting environment.
Physical attributes and level of assistance required	A minority of occupants may not be fully mobile and may require assistance evacuating. The majority of occupants are expected to be fully mobile, not require assistance when evacuating, and be able to provide assistance to others in an evacuation event.
Mental attributes	A minority may have difficulty recognising visual or audible alarm cues, understand evacuation instructions, evacuate in an orderly manner, or have the ability to make and implement decisions independently. The minority may require assistance evacuating. The majority of occupants are expected to recognise fire alarm cues, take instructions, and evacuate in an orderly and independent manner. The majority of occupants are expected to provide assistance to occupants who may not be able to independently respond to a fire scenario.
Level of assistance required / available	The level of assistance required by the minority of occupants to evacuate is expected to be limited. The building is generally expected to be fully occupied during working hours, and therefore adequate evacuation assistance is expected to be available where required.
Emergency training	Occupants are not expected to be formally trained to act in an emergency event or use fire suppression equipment. However, CDC operations staff are trained in the use of portable fire extinguishers in response to an event where pre-alarm thresholds are detected by the aspirating smoke detection system. Additionally, a basic level of response is expected, including an understanding of and response to occupant warning system tones, evacuation instructions, and exit signage.
Familiarity with the building	The building is the place of employment for the majority of occupants, who are therefore expected to be familiar with the building and paths of travel to exits. The minority of occupants who may not be familiar with the building are expected to follow the majority and therefore be able to evacuate in a similar manner.

3 PRELIMINARY FIRE SAFETY STRATEGY

The preventative and protective measures identified to address potential fire hazards form part of the Fire Safety Strategy proposed to demonstrate compliance with the BCA Performance. Items not specifically addressed in the Fire Safety Strategy are expected to comply with the DtS Provisions of the BCA.

The Preliminary Fire Safety Strategy will be subject to change as the design develops during future design phases.

All elements of the strategy shall be considered Fire Safety Measures for the life of the building.

3.1 FIRE RESISTANCE LEVELS

Building elements are generally proposed to comply with the fire resistance level (FRL) requirements of the BCA DtS Provisions for Type A fire-resisting construction. However, it is proposed to rationalise FRL requirements to a minimum of 120/120/120 for load bearing elements and -/120/120 for non-loadbearing elements in lieu of 240/240/240 and -/240/240, respectively.

A 2 hour FRL has been adopted as a minimum benchmark for the building fire compartmentation and shall be utilised in the Fire Safety Engineering analysis. The Fire Safety Engineering analysis may identify a lower minimum FRL for a specific compartment as being capable of meeting the intent of the BCA Performance Requirements, however the 2 hour minimum FRL has been adopted for building structural integrity.

3.2 FIRE COMPARTMENTATION

The building is proposed to incorporate fire compartments with sizes within the limits of BCA DtS Provision C3D3. Fire compartmentation is generally configured as follows:

- Each storey shall be fire separated from other storeys in Class 7b / 8 areas.
- Class 7b / 8 portions of the building shall be fire compartmentalised from Class 5 portions of the building.
- The following rooms within Class 7b / 8 portions of the building shall be fire compartmentalised from the remainder:
 - Circulation Corridors, with the exception of the Loading Platforms on Level 1, Level 2, and Level 3, which shall not be used for storage and will be considered part of the Circulation Corridor (utilised to transport equipment). Signage shall be installed within each Loading Platform stating: “*STORAGE OF ITEMS IS PROHIBITED IN THIS AREA*”. The signage shall utilise capital lettering, not less than 50 mm, in a colour contrasting the background.
 - Combination of Mechanical Services Corridor(s) and Data Hall being served, grouped into a single fire compartment.
 - Sprinkler Valve Rooms.
 - Switchrooms.
 - Battery Rooms.

As the use of each room is currently under review, fire compartmentation plans have not been provided. Fire compartmentation plans shall be provided as part of the Performance Based Design Brief.

3.3 FIRE WALLS

All walls required to have a FRL shall generally comprise of tested systems, with the exception of non-structural fire walls also required to act as a security boundary which may either comprise a tested system or may incorporate a departure from a tested system as detailed in this section. Refer to Figure 7 for an excerpt from the CSR System Selector depicting the CSR1078 tested wall system comprising a steel stud frame with optional acoustic insulation (Acoustigard) between 2 groups of 2 x 13 mm fire rated plasterboard.

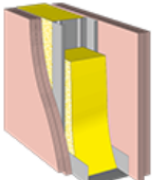
SYSTEM SPECIFICATION Refer to Book 3 Commercial & Multi-Residential Installation Guide			ACOUSTIC REPORT: PKA Predictor V16					
FRL	SYSTEM NUMBER	WALL LININGS	STUD DEPTH mm	51	64	76	92	150
			STUD BMT mm	0.50	0.50	0.55	0.55	0.75
☐ Non-Combustible ☒ -/120/120 ☐ 90/90/90 (from both sides) Report/Opinion FC-12946	CSR 1078 	BOTH SIDES • 2 x 13mm Gyprock Fyrchek Plasterboard	CAVITY INFILL		Rw (dB)/Rw+Ctr (dB)			
			(a) Nil	44/37	45/38	46/40	47/41	48/42
			(c) 75 Acoustigard 11kg	-	53/44	53/45	54/46	54/46
			(f) 50 Acoustigard 14kg	51/42	52/43	53/45	54/46	54/46
			(g) 70 Soundscreen 2.0	-	-	54/45	55/46	55/46
			(h) 50 MAB Polyester 11kg	48/40	49/41	50/43	51/44	51/44
			Wall Thickness mm	103	116	128	144	202

Figure 7 – CSR1078 – Steel Framed Single Stud Tested Wall System.

The subject walls not forming a tested system are proposed to comprise of a lightweight wall system incorporating 1off steel plate as shown in Figure 8. The proposed wall system is in accordance with a tested system (CSR1078 or equivalent), except for the steel plate (required for security compliance).

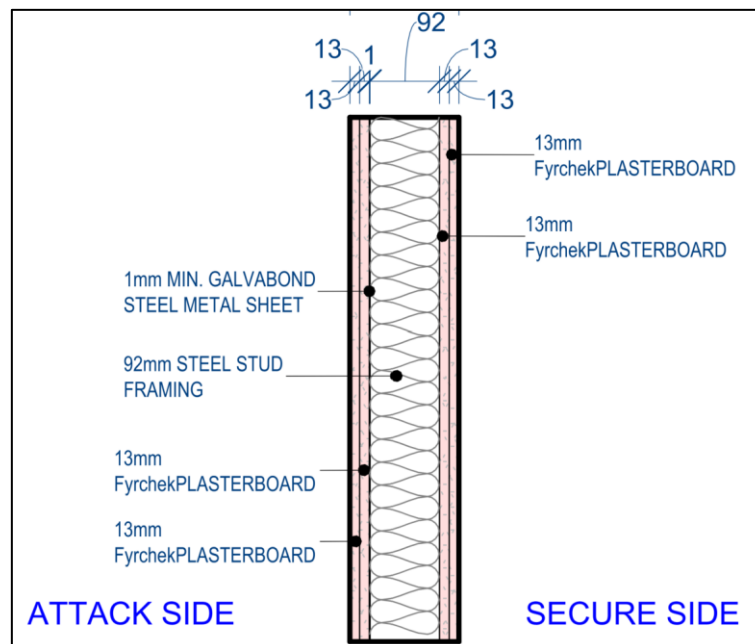


Figure 8 – Non-Structural Fire Wall Incorporating Steel Plate (Inconsistent with Tested System).

3.4 FIRE DOORS

Certain fire door types proposed for installation require firebolts to facilitate compliance with AS 1905.1:2015 and AS 1530.4:2014. The requirement for firebolts is determined based on door type, size, and fire rating. Firebolts will activate at 230°C to minimise deflection between the door leaf and door frame, fixing the door in the closed position and preventing the fire door from being used for egress or fire brigade intervention. Firebolts activating at a temperature less than 230°C shall not be permitted for use within the building.

Static signage shall be installed to each fire door incorporating firebolts, fixed to the door leaf (a single leaf) on the side of the door accessible by a Circulation Corridor. Signage shall state “DOOR CONTAINS FIREBOLTS PREVENTING OPERATION WHEN ACTIVATED – ACTIVATION TEMPERATURE = 230°C”. The signage shall be mounted at approximately 1.2 m above finished floor level and include capital lettering with a height not less than 50 mm and in a colour contrasting the background. Refer to Figure 9 for a typical example.



Figure 9 – Typical Example of Signage Proposed to Warn Firefighters of Doors Incorporating Firebolts.

The doors fitted with firebolts will generally not be relied on for egress or fire brigade access / intervention, including use for passage of fire hydrant hose. All rooms shall be served by at least one door that does not incorporate firebolts to facilitate occupant evacuation and fire brigade intervention.

As the use of each room and associated door sizes and locations are currently under review, plans depicting the locations of doors containing firebolts have not been provided. These plans shall be provided as part of the Performance Based Design Brief.

3.5 PROVISIONS FOR ESCAPE

Egress provisions for the building are summarised as follows:

- Multiple fire doors (horizontal exits) serving fire compartment boundaries are available to egressing occupants throughout the building. Most fire compartments are served by horizontal exits that comprise more than 50% of the exits from the fire compartment.
- Building discharge points are available around the perimeter of the building to occupants egressing from Ground Floor.
- The building is proposed to be served by internal fire-isolated stairways which serve all floors of the building. At least 2 off stairways shall also extend to the Roof Level Chiller Deck.

Exit travel distances shall be measured in accordance with the BCA DtS requirements and consideration of Security Zones.

Exit travel distances are proposed to exceed the limitations prescribed in the BCA DtS Provisions with respect to maximum distance to an exit, maximum distance to a point of choice where at least two different exits are available, and the maximum distance between alternative exits. As the use of each room, security zoning, and associated door locations are currently under review, plans depicting exit travel distances have not been provided. These plans shall be provided as part of the Performance Based Design Brief.

3.6 FIRE HYDRANT SYSTEM

The building and adjacent external generator structure shall be served by a fire hydrant system.

The building is proposed to have a volume exceeding 108,000 m³ and is therefore considered outside of the scope of AS 2419.1:2021 and must be the subject of a Performance Solution. The fire hydrant system is generally proposed to comply with the requirements of AS 2419.1:2021 (despite volume exceeding 108,000 m³), with the exception of the following:

- Coverage from internal fire hydrant outlets is proposed to be achieved through 2 hose lengths (60 m hose + 10 m spray) in lieu of 1 hose length (30 m hose + 10 m spray) required by Clause 3.6.1 of AS 2419.1:2021.
- Coverage from external fire hydrant outlets located less than 50 m from a hardstand and serving a sprinkler-protected building is proposed to be achieved through 3 hose lengths (100 m coverage) in lieu of 2 hose lengths (70 m coverage) required by Clause 3.5.3.3 of AS 2419.1:2021. Fire hydrant locations shall be configured such that only 2 off hose lengths are required internal to the building to provide complete coverage (maximum 70 m from building entrance point).
- Coverage from internal fire hydrants outside of fire-isolated stairs is permitted to cross fire compartment boundaries. This is a departure from Clause 3.7 of AS 2419.1:2021, which requires each fire compartment within a building to contain a fire hydrant, unless covered by external fire hydrants or hydrant within a fire-isolated exit.

Fire hydrant coverage is proposed to be provided with a combination of internal and external fire hydrant outlets, generally located within fire isolated stairways and adjacent external access points, respectively. Additional fire hydrants shall be provided within Circulation Corridors as required to facilitate coverage.

Signage shall be located at the site fire brigade booster assembly, Fire Control Centre (refer Section 3.10 for details), fire detection control and indicating equipment (FDCIE, i.e. fire panel), and at each fire hydrant to identify areas of the building requiring additional hose lengths. The signage shall be a permanent, fade resistant and weatherproof sign and utilise capital lettering with a height not less than 25 mm and in a colour contrasting the background. Signage shall state *"ADDITIONAL LENGTH OF FIREFIGHTING HOSE IS REQUIRED TO REACH ALL AREAS FROM INTERNAL AND EXTERNAL HYDRANTS"* or equivalent.

Internal site roads to facilitate access to fire hydrants and associated hardstands shall comply with DFES Built Environment Branch Guideline GL-11 dated February 2023, inclusive of but not limited to minimum dimensions and loadbearing capacities.

Fire Services water supply infrastructure (water storage tanks, pumpsets, booster assembly, etc) shall generally be located at the site entry point (refer to Figure 1 and Figure 2 in Section 1.1).

As the location of fire hydrants and the locations of room doors are currently under review, plans depicting fire hydrant coverage have not been provided. These plans shall be provided as part of the Performance Based Design Brief.

Fire hydrant system coverage to the Generator Structure is proposed to be provided to address hazards associated with the generators. Fire hydrant coverage is generally proposed to be achieved by external fire hydrants on Ground Floor, with additional internal fire hydrants located adjacent stairways.

3.7 FIRE HOSE REELS

A Performance Solution is proposed to omit fire hose reels from all areas of the building, with the exception of the Ground Floor Loading Dock. Fire hose reel coverage shall be provided to the Ground Floor Loading Dock in accordance with AS 2444:2001.

3.8 AUTOMATIC FIRE SUPPRESSION SYSTEMS

The building shall be served by an automatic fire sprinkler system complying with AS 2118.1:2017 and BCA Specification 17, with the exception of the following:

- Sprinklers are proposed to be provided in IT Switchrooms containing high voltage equipment in accordance with FM Global Property Loss Prevention Data Sheet 5-32 - Data Centres and Related Facilities (FMDS 5-32). High voltage equipment is generally limited to switchgear and dry type transformers. Signage shall be provided at the entrance to each IT Switchroom to warn occupants and firefighters of the presence of high voltage equipment. Signage shall be a permanent, fade resistant and weatherproof sign and utilise capital lettering with a height not less than 25 mm and in a colour contrasting the background. Signage shall state “*DANGER – RISK OF ELECTROCUTION - HIGH VOLTAGE EQUIPMENT WITHIN ROOM THAT IS SPRINKLER-PROTECTED*” or equivalent.
- Sprinkler control valves located in Sprinkler Valve Rooms that do not have direct egress to a road or open space.
- Pre-action sprinkler system serving operational Data Hall(s) is activated by a smoke detection system not compliant to the requirements of AS 1670.1:2018. The smoke detection system is designed in accordance with FM Global Data Sheet 5-32 and does not incorporate detection within concealed spaces and below the slab in Mechanical Services Corridors. Smoke detection is instead provided at louvres separating the Data Halls and Mechanical Services Corridors.
- Pre-action sprinkler system is proposed to utilise black mild steel pipework (as per AS 1074:1989) charged with nitrogen in lieu of galvanised steel pipework charged with compressed air. To ensure the appropriate measures pertaining to the use of black mild steel and corrosion prevention described in FM Global Property Loss Prevention Data Sheets (FMDS) are adopted, the pipework system design, installation, commissioning, testing, and maintenance program is proposed to comply with the following relevant aspects of the applicable FMDS:

FM Global Property Loss Prevention Data Sheet 2-0 Interim Revision January 2024 – *Installation Guidelines for Automatic sprinkler Systems* (FMDS 2-0)

- General Requirements – Clause 2.1.3.5, Clause 2.2.1.10, and Clause 2.2.1.11.
- Pre-action Sprinkler System – Clause 2.2.4.3.
- Sprinkler System Component – Clauses 2.3.4 and 2.3.7.
- Sprinkler System Piping – Clause 2.4.1.1.2, Clause 2.4.1.1.3.1, Clause 2.4.1.1.4, and Section 2.4.2.

FM Global Property Loss Prevention Data Sheet 2-1 Interim Revision July 2022 – *Corrosion in Automatic sprinkler Systems* (FMDS 2-1)

- Operation and Maintenance – Above Ground Pipework – Clause 2.2.1.1, Clause 2.2.1.2, Clause 2.2.1.5, Clause 2.2.1.6, Clause 2.2.1.7, Clause 2.2.1.8, Clause 2.2.1.10, and Clause 2.2.1.11.

FM Global Property Loss Prevention Data Sheet 2-81 Interim Revision January 2024 – *Fire Protection System Inspection, Testing and Maintenance* (FMDS 2-81)

- Inspection, Testing, and Maintenance Programs – Clause 2.2.3.
- Automatic Fire Sprinkler Systems – Clause 2.5.1.2.6 and Table 2c Items 1-17.
- Fire Services Mains – Clause 2.8.1 and Table 6.

Data Halls, Mechanical Services Corridors, Communication Rooms, Low Voltage Switchrooms, IT Switchrooms, Battery Rooms, and any other areas containing sensitive equipment (as determined by CDC) are proposed to be provided with pre-action automatic fire sprinkler suppression. This configuration is proposed due to the risk of water damage to equipment that might result from damaged automatic sprinklers or piping. Pre-action automatic fire sprinkler protection shall extend to both above and below ceiling areas. Pre-action sprinkler systems shall be configured such that the control valve shall open and charge the system with water only in the event of both sprinkler head and smoke detector activation. Conventional wet type automatic fire sprinkler protection is proposed to serve all other areas.

Fast response sprinkler heads with an activation temperature of 68°C shall be utilised throughout the building, except the activation temperature may be increased for areas of high ambient temperature in accordance with AS 2118.1:2017.

3.9 PORTABLE FIRE EXTINGUISHERS

Portable fire extinguishers are proposed to be provided throughout in accordance with AS 2444:2001. Additional portable fire extinguishers are proposed to be provided in lieu of the provision of a fire hose reel system.

All areas of the building shall be located within 15 m of a 4.5 kg dry chemical ABE type portable fire extinguisher, or a 5 kg carbon dioxide type portable fire extinguisher. A 4.5 kg dry chemical ABE type portable fire extinguisher or a 5 kg carbon dioxide type portable fire extinguisher shall be located within 4 m of each required exit.

Portable fire extinguishers shall be provided to serve the Generator Structure in accordance with AS 1940:2017 as per Section 3.15.4 of this report.

3.10 FIRE CONTROL CENTRE

The Security Gatehouse at the site entrance shall serve as the site Fire Control Centre and shall contain the main FDCIE. The Security Gatehouse shall contain building details and drawing documentation to support fire brigade operations for the site, inclusive of Tactical Fire Plans. Signage shall be installed at the Fire Control Centre to notify the fire brigade of the following:

- Presence of battery energy storage systems (BESS). Signage shall be installed stating: *"LITHIUM-ION BATTERY ENERGY STORAGE SYSTEMS PRESENT WITHIN DATA CENTRE BUILDINGS"*. The signage shall utilise capital lettering, not less than 50 mm, in a colour contrasting the background. Plans reflecting the location and capacity of the BESS shall be included in the Fire Control Centre.
- Requirement for the attending fire brigade to utilise additional hose lengths for adequate fire hydrant system coverage. Refer to Section 3.6 for details.
- Presence of firebolts that will activate at 230°C, preventing certain fire doors from being used for fire brigade intervention. Signage shall be installed stating: *"DOORS CONTAINING FIREBOLTS PREVENTING OPERATION WHEN ACTIVATED PRESENT WITHIN DATA CENTRE BUILDINGS – ACTIVATION TEMPERATURE = 230°C"*. The signage shall utilise capital lettering, not less than 50 mm, in a colour contrasting the background. Plans reflecting the location of doors containing firebolts shall be included in the Fire Control Centre.
- Requirement for firefighters to wait for power isolation prior to undertaking firefighting activities. Signage shall be installed stating: *"FIRE BRIGADE TO WAIT FOR LOCALISED POWER ISOLATION PRIOR TO UNDERTAKING FIREFIGHTING ACTIVITIES"*. The signage shall utilise capital lettering, not less than 50 mm, in a colour contrasting the background. Plans reflecting the location of doors containing firebolts shall be included in the Fire Control Centre.
- Presence of sprinkler-protection within IT Switchrooms containing high voltage equipment. Signage shall be installed stating: *"DANGER – RISK OF ELECTROCUTION - HIGH VOLTAGE EQUIPMENT WITHIN IT SWITCHROOMS THAT ARE SPRINKLER-PROTECTED"*. The signage shall utilise capital lettering, not less than 50 mm, in a colour contrasting the background. Plans reflecting the location of sprinkler-protected rooms containing high voltage equipment shall be included in the Fire Control Centre.

3.11 AUTOMATIC FIRE DETECTION AND ALARM SYSTEM

An addressable and monitored automatic fire detection and alarm system is proposed to be installed throughout the building in accordance with AS 1670.1:2018 except as detailed within this section of the report. All areas of the building required to be provided with fire detectors in accordance with AS 1670.1:2018 shall be served by multi-point aspirating smoke detection systems or point type smoke detection generally complying with AS 1670.1:2018, except for the following:

- Smoke detection is proposed to be omitted from lift shafts and concealed spaces above office areas (fire detection provided by sprinkler heads serving lift shafts and office area concealed ceiling spaces).
- Smoke detection in operational Data Halls is proposed to be limited to the underside of the ceiling throughout all cold aisle areas and in the ceiling space hot air return plenum at the louvre junction that separates the Data Hall ceiling space from the Mechanical Services Corridor in accordance with FMDS 5-32 as illustrated in Figure 10. Air sampling points installed at the junction that separates the Data Hall ceiling space from the Mechanical Services Corridor shall be located so that each sampling point covers a maximum louvre opening area of 0.4 m². Smoke detection will not be provided within the hot aisle areas, the above ceiling air plenum space (except at the louvre junction separating the Data Hall from the Mechanical Services Corridor) and below the slab within the Mechanical Services Corridor. The detection at louvres is considered to be more effective in early detection of smoke in high airflow environments when compared with detection at concealed spaces and below the slab within the Mechanical Services Corridor. This is understood to be due the louvre area being the only air pathway for circulation between the Mechanical Services Corridor and Data Hall, high volume of air circulating through the louvre area, and the high concentration of detectors present within the louvre area.

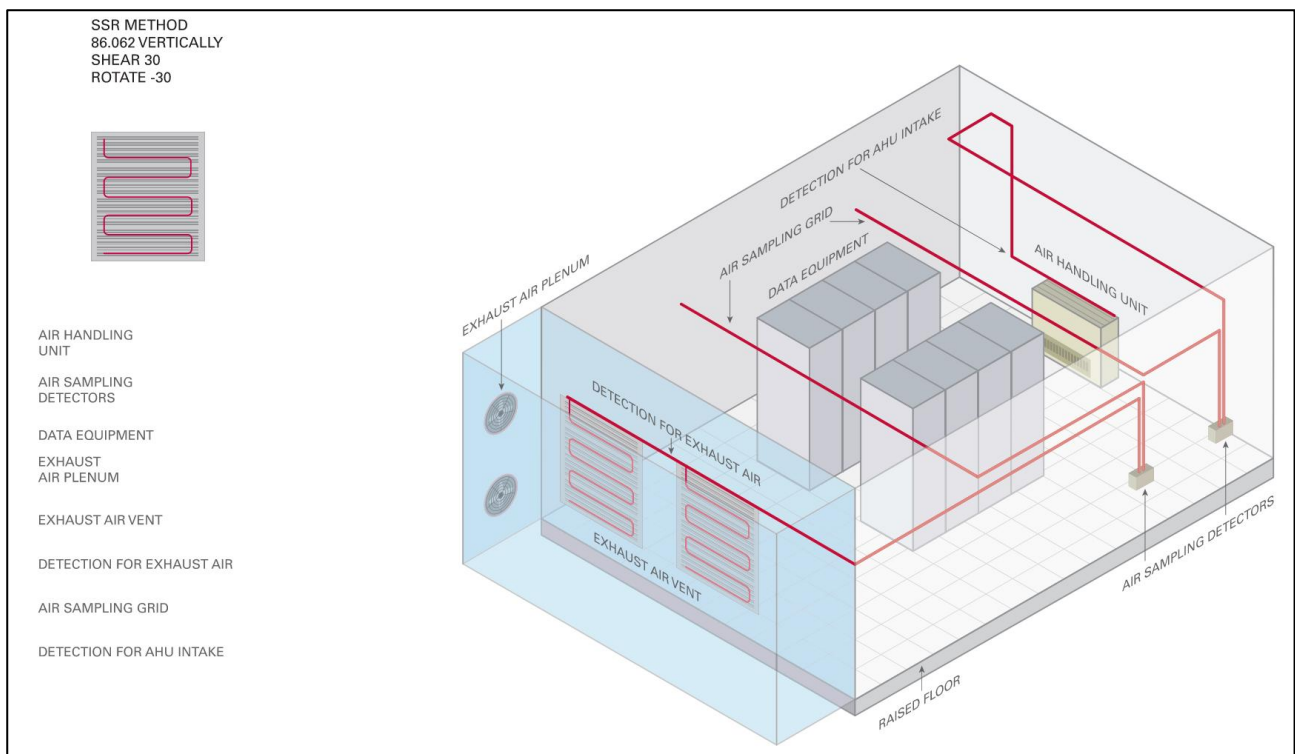


Figure 10 – Extract from FMDS 5-32 – Illustration of Data Hall Return Air Smoke Detection Arrangement.

All aspirating smoke detection systems installed within areas of high airflow shall be designed in accordance with technical design documents prepared by the system manufacturer associated with areas of high airflow.

An AVF is proposed to be implemented with a maximum cancellation time of 300 seconds to allow onsite security (present onsite 24/7) to investigate a fire event prior to fire mode activation. Activation of a local alarm at security shall occur to facilitate alarm investigation. A 'Type A Dependency' arrangement is proposed to be implemented in accordance with AS 1670.1:2018, except that the AVF is proposed to be permitted to be applied to fire detectors which are used to activate fire suppression systems. The AVF shall not result in the delay of activation of any fire suppression systems. Manual call points shall not be subject to AVF. Should a second fire detector register the detection of fire, the AVF shall be overridden and building fire mode activation shall occur.

An occupant warning system shall be provided throughout the building in accordance with AS 1670.1:2018. Visual alarm devices shall be provided where ambient sound pressure levels exceed the thresholds prescribed in Clause 3.22.4 of AS 1670.1:2018.

Activation of the fire detection system via manual activation, activation of 2 fire detection devices, or following the 300 second AVF delay after a single fire detector device activation shall result in the following:

- Notification to the fire brigade.
- Occupant warning system activation.
- Signal to the building management systems, access control system, security systems and the like.
- Automatic shutdown of air handling systems required to shutdown in accordance with the BCA DtS Provisions / AS 1668.1:2015.

3.12 AIR HANDLING SYSTEMS

All air handling systems shall comply with the requirements of the BCA DtS Provisions.

Data Halls, Switchrooms, and Battery Rooms are served by 100% outside air supply and return systems during normal conditions.

A Data Hall's 100% outside air supply and return system shall shutdown in the event of a fire detected within the fire compartment housing the Data Hall, or when outside air conditions are not considered favourable. In addition to the 100% outside air supply and return system, Data Halls are proposed to be served by self-contained air handling systems that are active at all times and continue to operate when 100% outside air supply and return system shut down.

Battery Rooms are provided with dedicated outside air make-up and local exhaust systems (i.e. off-gas ventilation system) that serve solely the Battery Room fire compartment. The exhaust systems serving the Battery Rooms continue to run in an event of a fire within the Battery Room.

Switchrooms are provided with outside air supply and return systems that shuts down in an event of a fire, and runs in reticulation mode when outside air conditions are considered unfavourable. In addition to the outside air supply and return systems, the Switchrooms are provided with cooling systems (CRAC units) that reticulate air only within the Switchroom fire compartment and continue to operate in an event of a fire.

The air handling systems do not promote the spread of smoke between compartments during a fire event, as in the event of a fire air is cycled only within the fire compartment to facilitates cooling of the server racks. Provisions for manual isolation shall be available for occupant or fire brigade use as required.

Smoke exhaust or other dedicated smoke management systems are not proposed to serve the building.

3.13 EXIT AND EMERGENCY LIGHTING

Exit and emergency lighting shall be provided throughout in accordance with BCA DtS Provisions E4D2 - E4D8 and AS/NZS 2293.1:2018. All exit signage shall be coordinated to ensure egressing occupants are not directed towards doors with firebolts (refer to Section 3.4 for further details).

3.14 EV AND EV CHARGING

All EVs and associated charging stations shall be external to buildings with a minimum 10 m separation distance from building exit / entry points.

The EV charging stations be protected by bollards, kerbs, or alternative measures to protect against vehicular damage.

The EV charging stations shall be interfaced with a remote emergency shutdown facility. The emergency shutdown facility to be located at the building entrance and/or adjacent the fire panel.

EVs with mechanical damage shall not be permitted within the site.

Block plans identifying the location of the EV charging station and the master isolation switch to be located at the Fire Control Centre.

3.15 DIESEL FUEL GENERATORS

The proposed development incorporates diesel fuel generators. Individual enclosures shall be provided for diesel-powered generator with independent diesel storage below. Generator enclosures shall comply with the requirements of AS 1940:2017.

3.15.1 TANK CONSTRUCTION AND VENTILATION

The diesel fuel tanks are in the form of self-bunded 'belly tanks' mounted to the base of the diesel generator engine skid. The tank shall be designed to comply with the construction and ventilation requirements of AS 1657:2018, AS 1692:2006, and AS 1940:2017. Therefore, this assessment does not focus on specific elements associated with the tank construction and provide the design requirements to facilitate installation on site.

3.15.2 TANK FILL POINT

Section 5.3 of AS 1940:2017 provides the requirements for fill connections on storage tanks that are filled from a tank vehicle. In accordance with Clause 5.3.2, the following provisions shall be satisfied for the proposed diesel fuel arrangement:

- The fill point shall be readily accessible.
- The fill point shall be protected from accidental damage.
- The fill point for a tank containing combustible liquid shall be located outside where possible.
- The fill point shall be located such that the tank vehicle is not required to enter the tank compound to make the fuel delivery.
- The fill point shall be clearly identified.
- The areas around the tank fill point and vehicle hose connection point shall be impervious to the product.

Clause 5.3.3 of AS 1940:2017 outlines the requirements for tank liquid level indication.

3.15.3 LOCATION AND SEPARATION REQUIREMENTS

Section 5.7 of AS 1940:2017 outlines the requirements for the separation of above-ground fuel storage tanks. Table 5.3 of AS 1940:2017 specifies the requirements for separation between fuel storage tanks, distances to security fence, and on-site protected places (buildings inside or outside the property boundary). Table 5.4 of AS 1940:2017 specifies the requirements for distances to off-site protected places based on the total volume of stored fuel.

Table 7 summarises the assessment results of location and separation of the proposed arrangement against the requirements of AS 1940:2017.

Table 7 – Assessment of AS 1940:2017 Location and Separation Requirements.

AS 1940:2017 Requirements	Proposed Arrangement	Assessment Results
Table 5.3 requires a separation distance of at least 6.2 m to on-site protected places that are considered 'office buildings, warehouses, manufacturing and processing areas, workshops or amenities blocks on the same premises'.	Diesel storage tanks are proposed to be located at approximately 6.4 m from the external wall.*	Proposed arrangement meets the separation requirements of AS 1940:2017.
Table 5.3 requires a separation distance to a security fence serving an on-site protected place of at least 7.5 m.	Approximately 12 m to security fence on allotment boundary.	Proposed arrangement meets the requirements of AS 1940:2017.
Table 5.3 requires a separation distance to platforms within an on-site protected place of at least 7.5 m.	No other platforms within vicinity of generator area.*	Proposed arrangement meets the requirements of AS 1940:2017.

AS 1940:2017 Requirements	Proposed Arrangement	Assessment Results
Considering the tanks as horizontal tanks, Clause 5.7.6 of AS 1940:2017 requires a minimum 0.6 m distance between tanks. Considering the tanks are double walled and have integral secondary containment, a spacing of 0.6 m between tanks is also required by Clause 5.9.2 (h) of AS 1940:2017.	Approximately 2 m distance between diesel storage tanks.	The distance between tanks meets the requirements of AS 1940:2017 based on the following: - The proposed fuel storage tanks most resemble the horizontal tank arrangement which requires a 0.6 m distance between tanks. - The proposed fuel storage tanks are considered to have integral secondary containment which requires a 0.6 m distance between tanks.
Table 5.4 requires the distance to off-site protected places to be at least 6.2 m.	Approximately 12 m to security fence on allotment boundary.	Proposed arrangement meets the requirements of AS 1940:2017.

**The Generator Structure and the common chimney are not considered on-site protected places under the definition of AS 1940:2017 and therefore are not considered as part of the separation distance assessment.*

3.15.4 FIRE SERVICES AND EQUIPMENT

Section 11.13 of AS 1940:2017 outlines the minimum fire protection requirements for the storage of C1 Combustible Liquids in above ground tanks with an aggregate capacity exceeding 2,000 m³. To satisfy this clause, the following measures shall be provided:

- Fire hydrants to facilitate coverage to all parts of the compound in accordance with AS 2419.1:2021.
- Accessories and foam concentrate, as applicable.
- One powder-type extinguisher per tank, with a minimum of three powder-type extinguishers for the storage area, strategically located around the storage. 9 kg powder type portable fire extinguishers having a rating of 2A 60B(E) are proposed to serve each generator enclosure in accordance with AS 2444:2001.
- Automatic fire detection and alarm system shall be provided in accordance with AS 1670.1:2018 and Section 11.5.2 of AS 1940:2017.

3.15.5 GENERATOR STRUCTURE

In order to comply with Clause 5.11.2 of AS 1940:2017, any supporting structure between the foundation and the tank shall comply with the following requirements:

- Any supporting structure, or ancillary structure used to provide rigidity, shall be made wholly of non-combustible material.
- Any metallic support that is more than 1 m high and supports a tank having a capacity greater than 10,000 L of combustible liquid, shall be protected by material having an FRL of at least 120/120/120.
- The structure shall be designed according to the requirements of the Australian Standard applicable to the particular construction (e.g. AS 4100:2020 for steel and AS 3600:2018 for concrete).
- The design shall take account of the total mass of the tank when full of either water or product, whichever is the greater, any wind loading, any possible uplift loading on restraining connections, and any likely seismic loading (refer to AS 1170.4:2007). Any such anchorage shall be designed to overcome the maximum anticipated buoyancy force.

The Generator Structure is not required to achieve an FRL under AS 1940:2017 as the bulk diesel fuel storage tanks are located at Ground Level and the Level 1 and Level 2 day tanks each have a capacity of 250 L. However, the Generator Structure shall comply with the other requirements of Clause 5.11.2 of AS 1940:2017.

3.16 LITHIUM-ION BATTERY ENERGY STORAGE SYSTEMS

The proposed development incorporates lithium-ion BESS, with the majority of batteries being confined to battery racks in Battery Rooms. However, decentralised systems are also proposed to be implemented within Data Halls.

The special hazards presented by lithium-ion BESS are proposed to be addressed through fire compartmentation, use of tested and certified battery systems, active fire protection, off gas detection, and ventilation.

3.16.1 BATTERY ROOMS

All battery racks proposed to be installed within Battery Rooms shall be UL 9540A certified, with UL 9540A test reporting that demonstrates a forced thermal runaway event will self-extinguish without propagation, and with no external flaming or flying debris. Test reporting shall demonstrate that no battery module adjacent to a battery module undergoing a thermal runaway event will be subject to temperatures exceeding the lowest cell vent temperature.

Battery management systems shall be configured to alert onsite CDC staff or CDC customer staff of battery voltage, temperature, or current fluctuations outside of normal operating conditions.

Battery Rooms containing lithium-ion batteries forming part of a BESS shall be protected by gas monitoring systems to monitor for the build up toxic and flammable gasses. The system shall include gas monitoring detection sensors capable of detecting battery off-gases (e.g. hydrogen gas) located within each room containing lithium-ion batteries.

The proposed gas monitoring system shall incorporate visual display panels located outside the room being monitored, allowing for occupants or the fire brigade to be provided with information associated with the environment within the room without needing to enter the room. Each visual display panel shall incorporate visual status LED indicators to advise whether the gas concentration is within normal range, exceeding normal range (25% of the lower flammability limit of hydrogen), or the equipment is in fault state.

The off-gas detection system shall be interfaced with the Building Management System to notify security personnel and facilitate activation of off-gas ventilation system in an event of off-gases detection.

Battery Rooms containing lithium-ion batteries forming part of a BESS are proposed to be provided with a mechanical exhaust system to prevent the build-up of off gasses. Each Battery Room shall be served by an exhaust system with a minimum exhaust rate of 12.5 L/s per m² floor area of the room in accordance with FMDS 5-33. The off-gas ventilation system shall either be continuous or be activated in the event of one of the following scenarios:

- Activation of the off-gas detection system. The off-gas detection system shall be designed to activate when the level of off-gas within the Battery Room exceeds 10% of the lower flammability limit of hydrogen.
- In an event of fire detected within the Battery Room (i.e. an event of general alarm initiated from the Battery Room).

All essential components of the ventilation system shall be fire rated. The off-gas exhaust system shall be provided with fire-rated ductwork (without any fire dampers) reticulating to outside of the building and activate in an event of a fire detected within the Battery Room or activation of the off-gas detection system. The exhaust system is proposed to continue running until manual de-activation occurs. The fans are proposed to be designed in accordance with the sections of AS 1668.1:2015 applicable to fan design, but the system is not required to comply with all requirements of AS 1668.1:2015. Off-gas exhaust system and any make-up air system ductwork shall achieve a 2 hour FRL or be protected by construction achieving an equivalent FRL.

The locations of Battery Rooms, quantity of battery racks per room, and battery rack design are yet to be confirmed. This information shall be provided as part of the Performance Based Design Brief.

3.16.2 DATA HALLS

Data Hall tenants (CDC's client) may require the provision of lithium-ion battery backup units within server racks. These battery backup units are installed to provide a localised uninterruptible power supply in the event of mains power failure. Lithium-ion battery backup units within server racks shall strictly be installed in accordance with the requirements of FMDS 5-32 unless documented in the Performance Based Design Report and accepted by relevant stakeholders, complete with justification for any departures.

Battery management systems shall be configured to alert onsite CDC staff or CDC customer staff of battery voltage, temperature, or current fluctuations outside of normal operating conditions.

Lithium-ion battery backup units within server racks installed in accordance with the requirements of FMDS 5-32 shall be provided with the following in addition to the requirements of other sections of the Fire Safety Strategy:

- Lithium-ion batteries comply with requirements of UL 1642.
- Lithium-ion batteries comply with requirements of UL 1973.
- Lithium-ion batteries comply with requirements of AS/IEC 62619.
- Maximum power capacity of 20 kWh per server rack as a distributed power configuration.
- No more than two shelves containing battery backup unit modules shall be located together in the same area of the rack as illustrated in Figure 11.
- Aisle spacing between server rows shall be at least 1.2 m.
- Vertical barriers comprising minimum 20-gauge (0.9 mm) solid sheet metal shall be provided on the side of every third server rack to limit the fire spread as illustrated in Figure 12. Vertical barriers shall be provided throughout any server rack row where lithium-ion battery backup units are installed or expected to be installed in the future.
- Enhanced fire sprinkler protection design criteria as per FMDS 5-32.

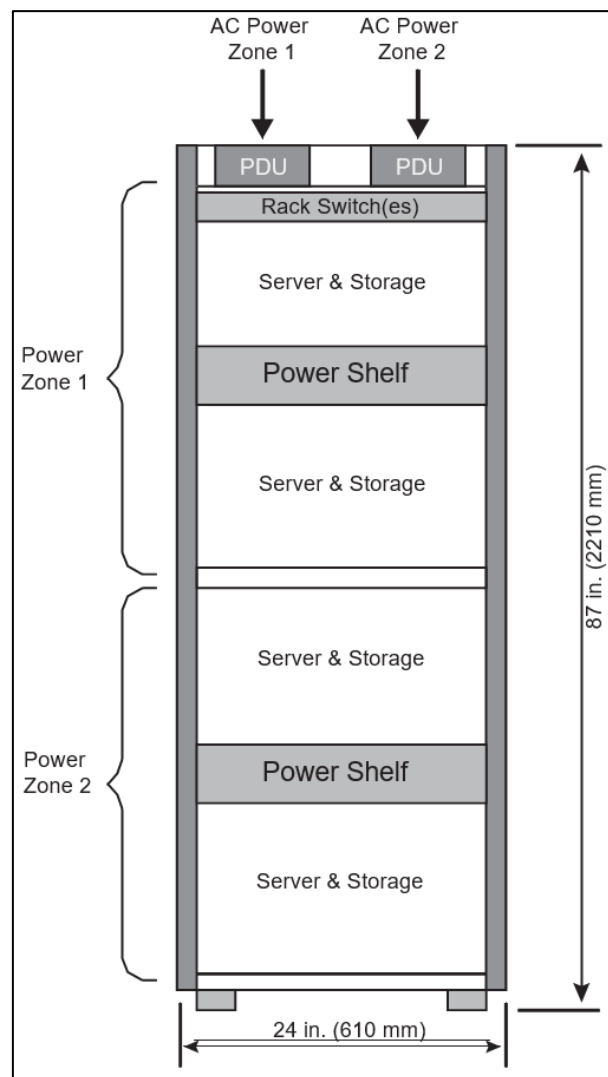


Figure 11 – Extract from FMDS 5-32 – Illustration of Lithium-ion Battery Backup Units in a Server Rack.

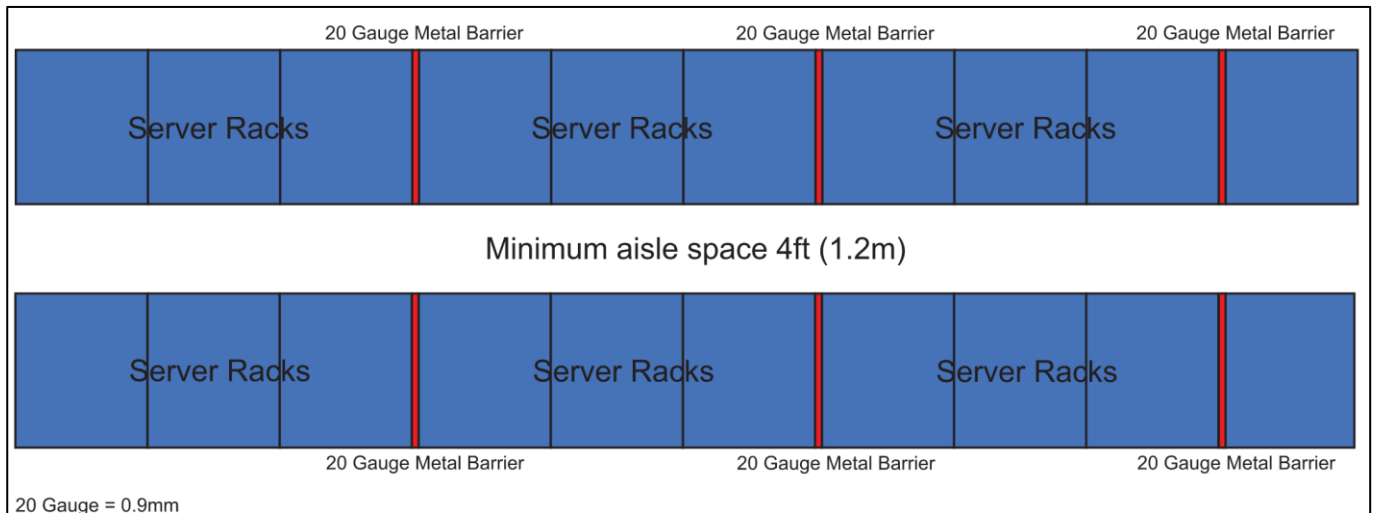


Figure 12 – Extract from FMDS 5-32 – Illustration of Server Rack Vertical Barriers.

3.17 STANDARDS OF CONSTRUCTION AND COMMISSIONING

Fire Safety Measures shall be installed, tested, and commissioned in accordance with the Australian Standards applicable to the installed Fire Safety Measures and this Fire Safety Strategy. Commissioning tests required to be undertaken include but are not limited to:

- Confirmation of operation of all installed fire detectors and subsequent activation of the occupant warning system and other systems required to operate / shutdown in fire mode.
- Testing of all fire dampers, air conditioning shutdowns or controls required in order to achieve the building fire mode operational requirements.
- Testing of signals to building management system, access control system, security systems and the like.
- Testing of fire alarm transmission signal to the local fire authority or monitoring facility.
- Sound pressure level testing of the occupant warning system.
- Flow and pressure testing of the fire hydrant and fire sprinkler systems.
- Hydrostatic pressure testing of the fire hydrant and fire sprinkler systems.
- Exit and emergency lighting discharge testing.
- Testing of gas monitoring and ventilation systems serving rooms containing lithium-ion batteries.

Testing and commissioning of the automatic fire sprinkler systems shall be undertaken in accordance with relevant FMDS as per Section 3.8.

Records of testing and commissioning activities shall be included in Operation and Maintenance Manuals, forming part of the baseline documentation package for the building.

Fire Services shall be provided during construction in accordance with BCA DtS Provision E1D16.

3.18 FIRE SAFETY ENGINEER COMPLETION LETTER

Following the completion of works, the following documentation relevant to this Fire Safety Strategy shall be provided by the Head Contractor to facilitate a Fire Safety Engineer review for consistency with the Performance Based Design Report (PBDR) and provision of a Fire Safety Engineer Completion Letter:

- Installation certificate confirming fire compartmentation works have been completed in accordance with the BCA, reference Australian Standards, and Sections 3.1, 3.2, and 3.3 of the PBDR.
- Installation certificate confirming penetrations through fire resisting building elements have been fire sealed in accordance with the BCA, reference Australian Standards, and Sections 3.1, 3.2, and 3.3 of the PBDR.
- Penetration register associated with fire sealing of penetrations through fire resisting building elements in accordance with the BCA, reference Australian Standards, and Sections 3.1, 3.2, and 3.3 of the PBDR.

- Installation certificate confirming fire doors have been installed in accordance with the BCA, reference Australian Standards, and Section 3.4 of the PBDR.
- Installation certificate confirming the fire hydrant system has been installed in accordance with the BCA, reference Australian Standards, and Section 3.6 of the PBDR.
- Hydrostatic pressure test results associated with the fire hydrant system in accordance with AS 2419.1:2021.
- Flow test results associated with the fire hydrant system in accordance with AS 2419.1:2021.
- As-installed drawings associated with the completed fire hydrant system works.
- Installation certificate confirming fire hose reels have been installed in accordance with the BCA, reference Australian Standards, and Section 3.7 of the PBDR.
- Installation certificate confirming the fire sprinkler system has been installed in accordance with the BCA, reference Australian Standards, and Section 3.8 of the PBDR.
- Hydrostatic pressure test results associated with the fire sprinkler system in accordance with AS 2118.1:2017.
- Flow test results associated with the fire sprinkler system in accordance with AS 2118.1:2017.
- As-installed drawings associated with the completed fire sprinkler system works.
- Installation certificate confirming portable fire extinguishers have been installed in accordance with the BCA, reference Australian Standards, and Section 3.9 of the PBDR.
- Installation certificate confirming the fire detection and alarm system has been installed in accordance with the BCA, reference Australian Standards, and Section 3.11 of the PBDR.
- Commissioning results associated with the fire detection and alarm system in accordance with AS 1670.1:2018.
- As-installed drawings associated with the completed fire detection and alarm system works.
- Installation certificate confirming air handling systems have been installed in accordance with the BCA, reference Australian Standards, and Section 3.12 of the PBDR.
- Installation certificate confirming the exit and emergency lighting system has been installed in accordance with the BCA, reference Australian Standards, and Section 3.13 of the PBDR.
- Exit and emergency lighting discharge testing results in accordance with AS/NZS 2293.1:2018.
- As-installed drawings associated with the completed exit and emergency lighting system works.
- Installation certificate confirming any EV charging stations have been installed in accordance with 3.14 of the PBDR.
- Installation certificate confirming diesel fuel storage has been installed in accordance with AS 1940:2017 and Section 3.15 of the PBDR.
- Installation certificate confirming lithium-ion BESS have been installed in accordance with Section 3.16 of the PBDR.
- Installation certificate confirming gas detection and alarm systems have been installed in accordance with Section 3.16 of the PBDR.
- Installation certificate confirming gas ventilation systems have been installed in accordance with Section 3.16 of the PBDR.
- Results of full function fire testing confirming all fire mode requirements are achieved following activation of the automatic fire detection and alarm system.

The Fire Safety Engineer Completion Letter shall be prepared by a Fire Safety Engineer that is registered to provide Fire Safety Engineering Services in Western Australia.

3.19 STANDARDS OF MANAGEMENT, USE AND MAINTENANCE

The Fire Safety Strategy extends for the life of the building, and it is the responsibility of the building owner to ensure fire safety management and maintenance tasks are being undertaken in accordance with this Fire Safety Strategy.

The following fire safety management and emergency response strategies shall be implemented:

- All occupants shall undertake an induction process which identifies all relevant exit locations and advises on emergency response procedures.
- A hazardous goods register shall be established and maintained by building management.
- A register of doorsets required to comprise of fire resisting elements shall be kept onsite and verified during annual maintenance activities.
- The building owner shall prepare and follow management procedures to conduct reviews of the storage of goods and general housekeeping to maintain a reasonable fire load within the building and ensure egress paths and access to Fire Services equipment are maintained.
- Work permits and safe work method statements are required for any works conducted onsite. A management system shall be developed and implemented for the management of hot work (e.g. welding).
- Electrical systems, equipment and plant shall be regularly inspected and maintained in accordance with regulatory requirements, in intervals not exceeding 1 year.

Emergency response procedures shall be developed to facilitate the following general fire emergency response strategy for the building:

- On duty site security shall investigate a fire alarm subject to AVF and initiate fire mode if determined to be a confirmed fire incident.
- In the event of a confirmed fire incident, early occupant fire suppression via the use of portable fire extinguishers shall be undertaken if deemed appropriate.
- The local fire brigade shall be notified automatically through the automatic fire detection and alarm system to facilitate prompt intervention.
- Fire brigade intervention shall only occur if a threat to life safety is introduced as a result of a fire event and shall commence only after an emergency shutdown procedure of electrical plant has occurred. If the fire risk is life-threatening (as deemed by attending firefighters), the building occupants are expected to undertake an emergency shutdown procedure prior to fire brigade search and rescue commencement. The shutdown procedure shall include shutdown to all electrical supply to the room required to be electrically isolated to facilitate fire brigade intervention.
- On duty site security personnel shall open all security access gates when appropriate to facilitate fire brigade perimeter access to the building.
- Doors that provide access to secure areas within the Data Centre facility are provided with a combination of electronic and mechanical locking provisions. Onsite Security shall ensure keys to mechanical locking are made available to the attending fire brigade.

Maintenance of all Fire Safety Measures shall be undertaken in accordance with relevant Legislation. All systems that fall within the scope of AS 1851:2012 shall be tested and maintained in accordance with the requirements of AS 1851:2012, future updated revisions of AS 1851, or other Fire Safety Maintenance regime required by Western Australian Building Legislation and DFES Guidelines. Testing and maintenance of the automatic fire sprinkler systems shall also be undertaken in accordance with relevant FMDS as per Section 3.8 of the PBDR. Exit and emergency lighting systems shall be tested and maintained in accordance with AS/NZS 2293.2:2019, future updated revisions of AS/NZS 2293.2, or other Fire Safety Maintenance regime required by Western Australian Building Legislation and DFES Guidelines. Maintenance records shall be kept up to date and located onsite.

Any change to the Fire Safety Strategy will result in the outcomes presented in this report being invalid and the Fire Safety Strategy will require reassessment to confirm compliance with the BCA. Compliance with the Fire Safety Strategy presented in the PBDR shall be validated as part of ongoing maintenance activities.

DFES shall be notified of all planned activities requiring isolation of active Fire Safety Measures.

3.20 STAGED WORKS

The building is proposed to be constructed in a staged manner, where areas may not be fitout as part of the initial handover. Occupation Certificates are expected to be issued for each stage of works that is completed. Therefore, it is anticipated the building will be occupied when the building arrangement deviates from the final layout arrangements presented in the Fire Safety Strategy detailed within this Section of the report, e.g. non-operational Data Halls may be provided with temporary point-type smoke detection in lieu of aspirating smoke detection.

The staged delivery will result in server racks and other equipment not being installed within all Data Halls. Data Halls, associated Mechanical Services Corridors, and rooms including equipment serving the subject Data Halls (e.g. IT Switchrooms and Battery Rooms) may not be fitout, omitting the installation of partition walls between Mechanical Services Corridors and the Data Halls they serve, ceilings, and services equipment.

The building shall not be occupied unless the building achieves the requirements of the proposed Fire Safety Strategy. Where the Fire Safety Strategy is proposed to be deviated to facilitate a staged delivery as explicitly described above, the following requirements shall be satisfied:

- Proposed arrangement and fitout shall be explicitly approved by a Building Certifier.
- Proposed arrangement and fitout shall be explicitly approved by an appropriately qualified Fire Safety Engineer.
- Any rooms that are proposed to be subject to a staged delivery and fitout at a later date, shall not be used for general storage (excludes equipment proposed to be installed within the subject rooms as part of a future stage of works, e.g. Mechanical Services plant within a Mechanical Services Corridor). The building owner shall be responsible for the regular review of these spaces to ensure they are not used for storage. Signage shall be provided at each entrance to these spaces stating: *"STORAGE OF ITEMS IS PROHIBITED IN THIS AREA"*. The signage shall include capital lettering, not less than 50 mm, in a colour contrasting the background. Review to the occupancy and storage limit to these rooms shall be undertaken as part of routine fire safety maintenance.

If the building is proposed to be handed over in stages such that portion(s) of the building are proposed to be occupied whilst other parts remain a construction zone, a Partial Occupation Management Plan shall be prepared and approved by the Building Certifier and an appropriately qualified Fire Safety Engineer. This is to ensure the requirements of the Fire Safety Strategy are adequately maintained (not affected by the construction zone) within the handed over areas.