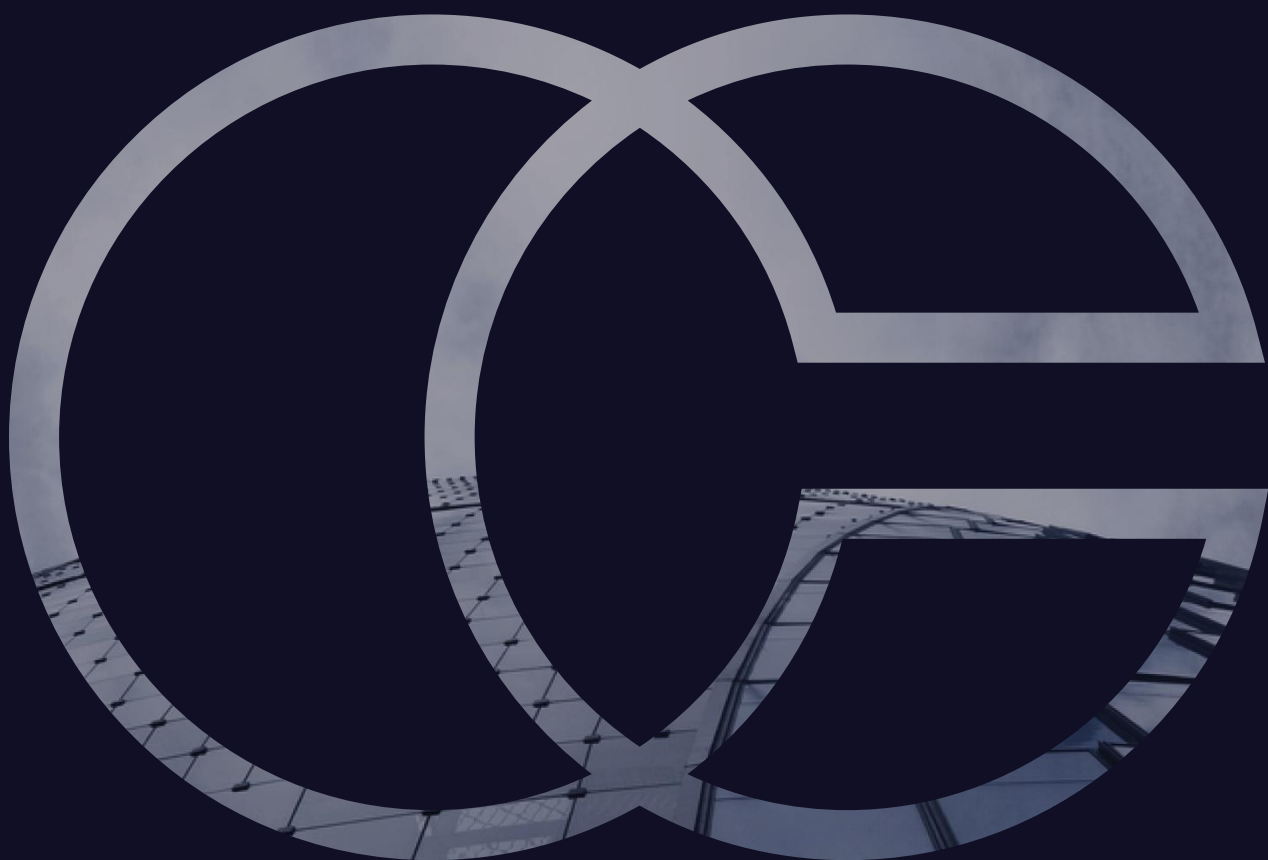




Leading the way with **fire safety**

Fire Safety Concept Strategy

Client: Goodman

Project Atlas Data Centre
10 Roberts Road, Eastern Creek, NSW

25 March 2026
SSDA Submission
Report No. F202837_FSCS_A

1. Report Revision Details

Report Revision History

Rev	Date issued	Reason for Issue	Prepared by	Reviewed by	Verified by
00	30/01/2026	Draft for Comment	Alex Chubb GradDip Fire Safety, BEng Mech MIEAust	Laurence Kwong BEng (Chemical) (Hons) MEng (Building Fire Safety and Risk Engineering) MIEAust, CPEng, NER	Sandro Razzi BE (Building), Grad. Dip. (Performance Based Building and Fire Codes), FIEAust, CPEng 2180287 BPB 501
A	25/03/2026	SSDA Submission		Alex Chubb GradDip Fire Safety, BEng Mech MIEAust	Sandro Razzi BE (Building) Grad Dip (Performance Based Building & Fire Codes) Registered Certifier (Fire Safety) - BDC0501 FIEAust CPEng 2180287 

Document Revision History

Rev	Date issued	Comment
00	30/01/2026	Draft issue for stakeholder comment
A	25/03/2026	Final issue including the following amendments: - Update of Section 3.3 - Sources of information - Update of Section 4.2- Building Description - Minor amendments throughout

2. Executive Summary

This Fire Safety Concept Strategy (FSCS) been prepared by CORE Engineering Group to accompany a State Significant Development Application (SSDA) for the construction and ongoing operation of a data centre facility and associated Offsite Enabling Infrastructure (OEI) at 10 Roberts Road, Eastern Creek within in the Blacktown Local Government Area ("LGA"). The site is legally described as Lot 553 in Deposited Plan 71110447.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the Project Atlas Data Centre (SSD - 101067971) dated 16th January 2026

Due to the complexity of the building design, a fully prescriptive approach of complying with the National Construction Code, Volume 1 2022 Amendment 2 (NCC) Deemed-to-Satisfy (DtS) Provisions for occupant egress, fire resisting construction, fire services, and fire brigade intervention would not satisfy the desired architectural, operational and client aspirations.

As such, Performance Solutions to satisfy the Performance Requirements of the NCC have been proposed to account for the following issues which have been identified in the NCC Compliance Report not to comply with the DtS Provisions:

- C2D14 – To permit illuminated sky signage on a façade that is combustible and/or not compliant with the NCC group rating.
- C3D3 & C3D8 – Fire compartment size & rationalization of separating elements.
- C4D4 – Separation of openings in external walls and associated openings in different fire compartments
- C4D6 – Lockable bolts fitted to inactive leaf of fire rated doorsets.
- D2D5 – Extended travel distances to a point of choice and nearest exit.
- D2D6 – Extended distances between alternative exits.
- D2D6, D3D26 – To permit security arrangements whereby re-entry into the data halls may restricted during a fire alarm.
- D2D14 – Travel by non-fire-isolated stairways or ramps
- E1D2 – To permit the design intent of AS2419.1:2021, which excludes Class 7b buildings over 108,000 m³.
- E1D2 – To permit hydrant coverage to be achieved by 2 hose lengths (60+10m).
- E1D3 – Omission of fire hose reels from data hall areas.
- E1D4, E1D17, AS2118.1 – Use of water mist system in lieu of sprinklers to the generator enclosures.
- E1D4, E1D17, AS2118.1 - To permit pre-action sprinkler control valves to be located at each floor level in lieu of position with direct access to a road or open space
- E1D2, E1D4 – Location of hydrant and sprinkler booster

This FSCS provides a holistic summary of the fire and life safety measures anticipated to be necessary in developing the above listed Performance Solutions. These measures include passive and active fire protection systems, egress provisions, occupant first aid firefighting, fire brigade intervention, and future building management provisions.

The complete fire engineering analysis will be included within the Fire Engineering Report (FER), undertaken in accordance with the Australian Fire Engineering Guidelines (AFEG), and as such is not documented herein.

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3. Introduction

3.1 Overview

This Fire Safety Concept Strategy (FSCS) been prepared by CORE Engineering Group to accompany a State Significant Development Application (SSDA) for the construction and ongoing operation of a data centre facility and associated Offsite Enabling Infrastructure (OEI) at 10 Roberts Road, Eastern Creek within in the Blacktown Local Government Area (“LGA”). The site is legally described as Lot 553 in Deposited Plan 71110447.

A State Significant Development Application (SSDA) has been prepared to support a data centre at 10 Roberts Road, Eastern Creek and associated offsite enabling infrastructure.

The proposal will include:

- Site preparation works including demolition, bulk excavation and removal of existing structures on the site, tree and vegetation clearing and bulk earthworks.
- Construction, fit-out and 24/7 operation of a Data Centre
- Offsite enabling infrastructure
- 2 Data Centre Buildings
 - Building 1 – 2 Level + rooftop plant
 - Building 2 – 3 Level + rooftop plant
- Ancillary office, EOT and amenity
- Provision of required utilities including:
 - diesel storage tanks
 - water tanks
 - substations on site
- Vehicle access for 20 m articulated vehicles (semi-trailers)
- Associated landscaping and site servicing
- Installation of site services and drainage infrastructure

This report has been prepared to address the Secretary’s Environmental Assessment Requirements (SEARs) and accompanying cover letter issued for the Project Atlas Data Centre (SSD- 101067971) dated 16th January 2026.

Specifically, this report has been prepared to respond to the SEARs requirement issued below:

Table 3-1: Relevant SEARs Requirement

ISSUE AND ASSESSMENT REQUIREMENTS	RESPONSE
Built Form and Urban Design	
• identifies design options considered during the iterative design process and demonstrates the proposed development has been optimised to provide an integrated landscape design and minimises amenity impacts by having regard to the relevant evaluation criteria in Better Placed (GANSW, 2017) • demonstrates how the building design will deliver a high-quality development, including consideration of façade design, articulation, materials, finishes, colours, any signage and integration of services • assesses how the development complies with relevant accessibility requirements	Refer to Section 5

3.2 Scope

The purpose of this report is to document the proposed fire safety strategy for the building, including guidance on the likely fire engineering trial design which has been established based on review of the proposed documentation, input from the BCA consultant and CORE Engineering Group's previous experience. This document is intended to be a guidance document for the design team to inform detailed design documentation and shall be further developed as necessary through ongoing consultation.

The specific details included are:

- The proposed Performance Solutions to address identified non-compliances.
- The proposed fire engineering requirements.

3.3 Sources of information

- Architectural Plans Rev A – SSDA Submission provided by Grimshaw dated 26/02/2026.
- Fire System Services drawings Issue P1 provided by LCI Consultants dated 24/10/25
- BCA Report prepared by BM+G, Report No. 250157 RevA
- Preliminary Risk Screening (F202837_Goodman, Project Atlas_PHA_A by CORE 10/02/26)

3.4 Limitations and Assumptions

- This document represents the opinions of CORE Engineering Group based on the information known at the time of preparation of this document. Opinions, findings, and recommendations detailed in this document are based on our understanding and interpretation of current statutory and regulatory obligations and standards and should not be construed as legal opinions.
- This report does not constitute a fire engineering report (FER) that addresses the Performance Requirements of the BCA. Any recommendations herein are subject to detailed fire engineering analysis, and the relevant approval process.
- This document has been prepared as a guidance document only, and any parties relying on this should be cognisant that the recommendations are preliminary and subject to detailed analysis and authority approvals.

4. Proposed Works

4.1 Site Context

The proposed Data Centre is located at 10 Roberts Road, Eastern Creek, legally referred to as Lot 553 DP1110447 with Offsite Enabling Infrastructure (OEI) proposed across Lot 21 DP1246626, Lot 20 DP1157491, and Lot 22 DP1246626 to connect to TransGrid’s Sydney West Substation & Switchyard (refer to Table 4-1 below). The site is located on Country of the Dharug people within the local government area of Blacktown.

The Data Centre site has a land area of approximately 168,574 m².

The site is identified as part of the Eastern Creek Precinct Stage 3 within the Western Sydney Employment Area. It is located approximately 35km of the Sydney Central Business District (CBD) and 5.1 km from Rooty Hill Train Station.

The site has a site area of approximately 17 hectares and is bounded by industrial development and has a primary frontage of 400m to Roberts Road. The existing site contains an industrial warehouse and surrounding hard-stand areas.

Surrounding land uses in the vicinity include:

- Northeast: A range of mixed-use industry & commercial buildings
- Southeast: Data Centre and substation
- South, southwest and west: land primarily owned and operated by TransGrid Sydney
- Northwest: Commercial industry and the Industrial Harvest cafe

The site is zoned IN1 General Industrial within Chapter 2 Western Sydney Employment Area of State Environmental Planning Policy (Industry and Employment) 2021 (IESEPP). The proposal is permissible with development consent in the IN1 zone as per the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP).

A summary of key features for the site and surrounding context are also summarised in Table 4-1 below.

Table 4-1: Site Summary

ITEM	DESCRIPTION
Site Area	Data Centre – 168,574 m ²
Ownership	Goodman
Legal Description	Data Centre - Lot 553 DP1110447 OEI - Lot 21 DP1246626, Lot 20 DP1157491, and Lot 22 DP1246626

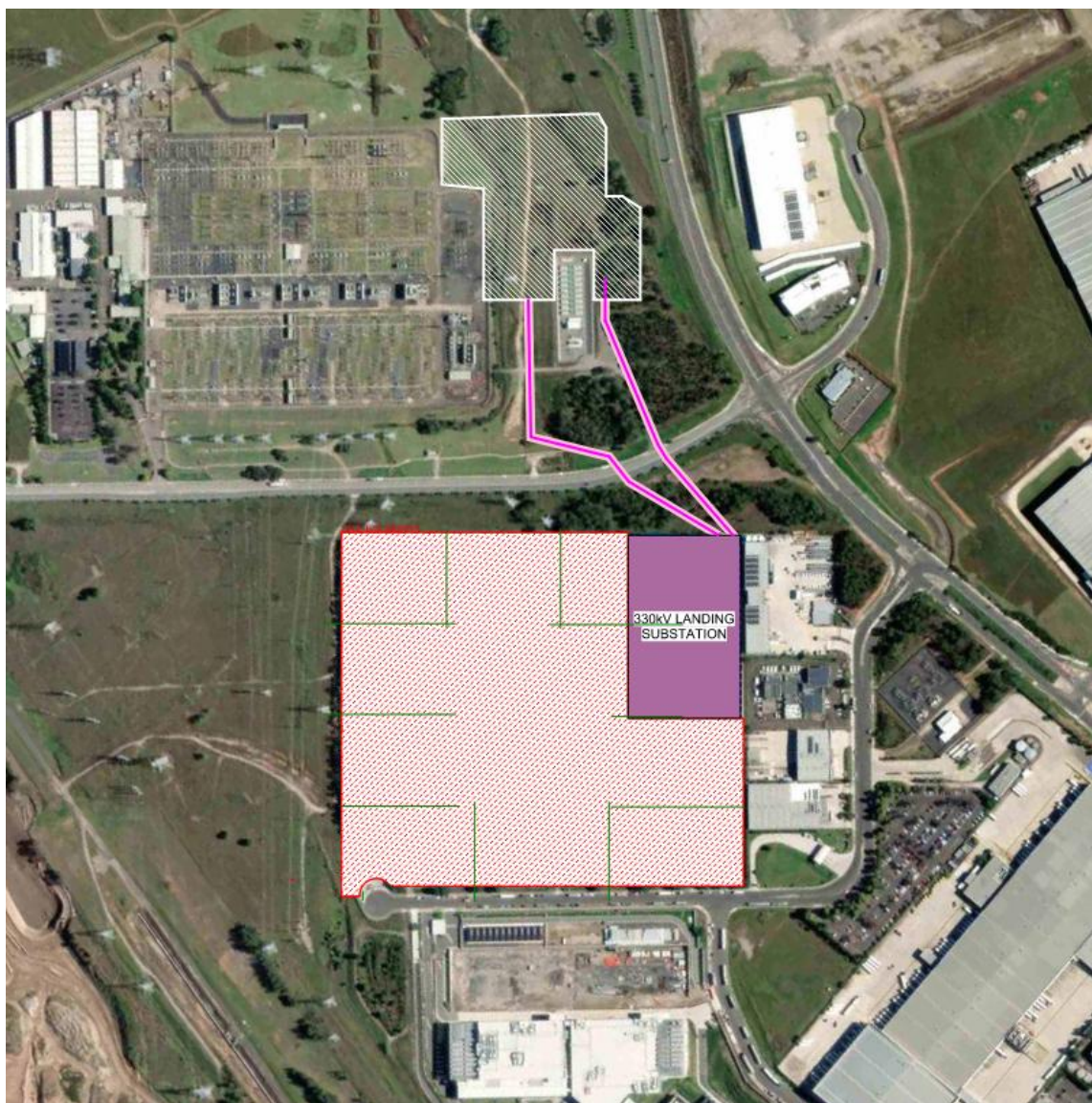


Figure 4-1: Site Location

4.2 Building Description

The proposed Data Centre Campus consist of the following buildings:

- Building 1 – 3 Storey data centre building
- Building 2 – 5 Storey data centre building
- High Voltage Substation

The location of the subject buildings is shown in Figure 4-2.

Each of the data centre building consists of the following level configuration:

- Ground Level - Data halls, loading dock, office/front of house areas, generator gantry
- Level 1 - Data halls, generator gantry
- Level 2 (Building 2 only) - Data halls, generator gantry
- Roof Level - Plant room, lift lobby.
- Upper Roof Level - Plant deck, lift lobby.

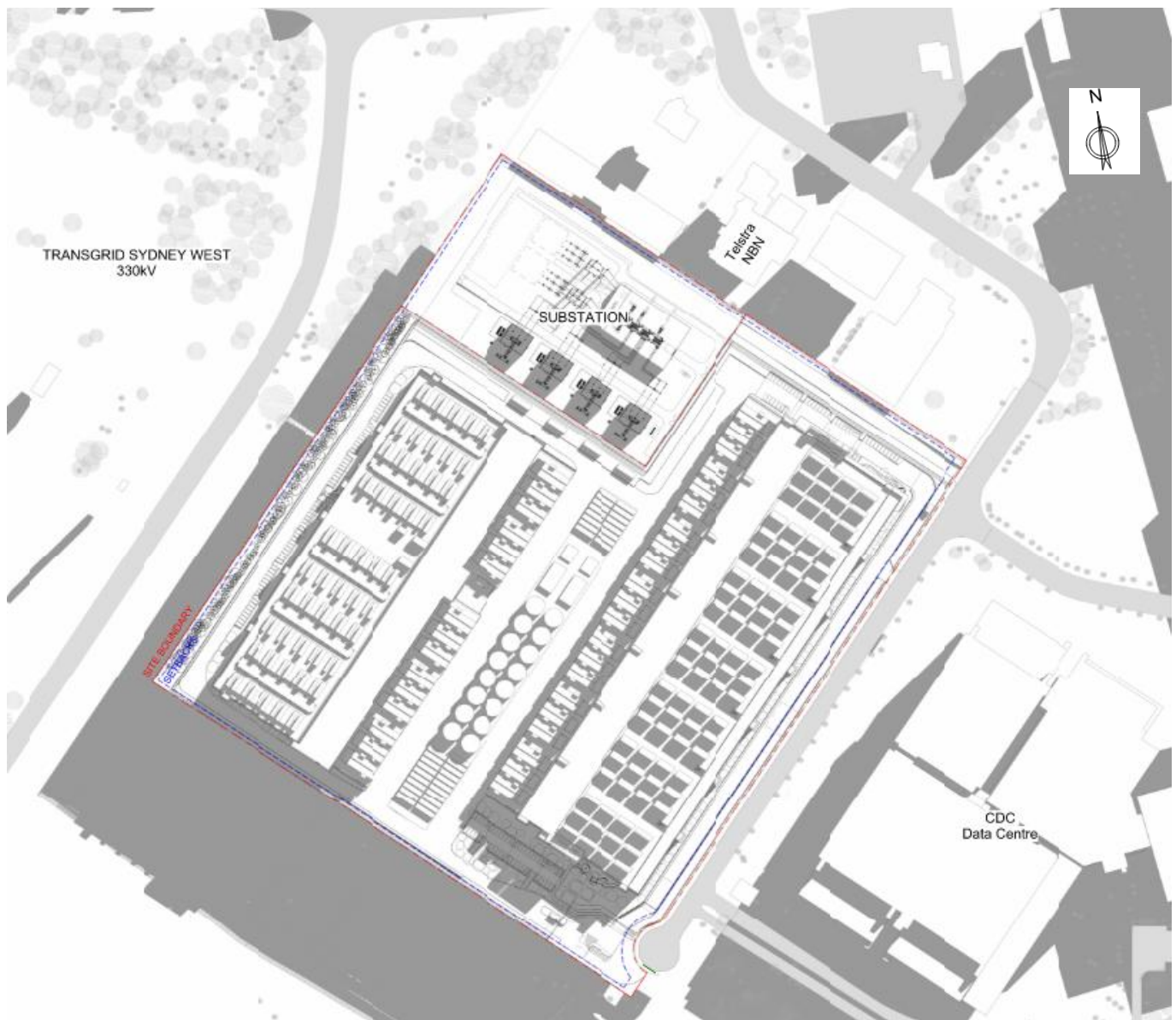


Figure 4-2: Site Plan

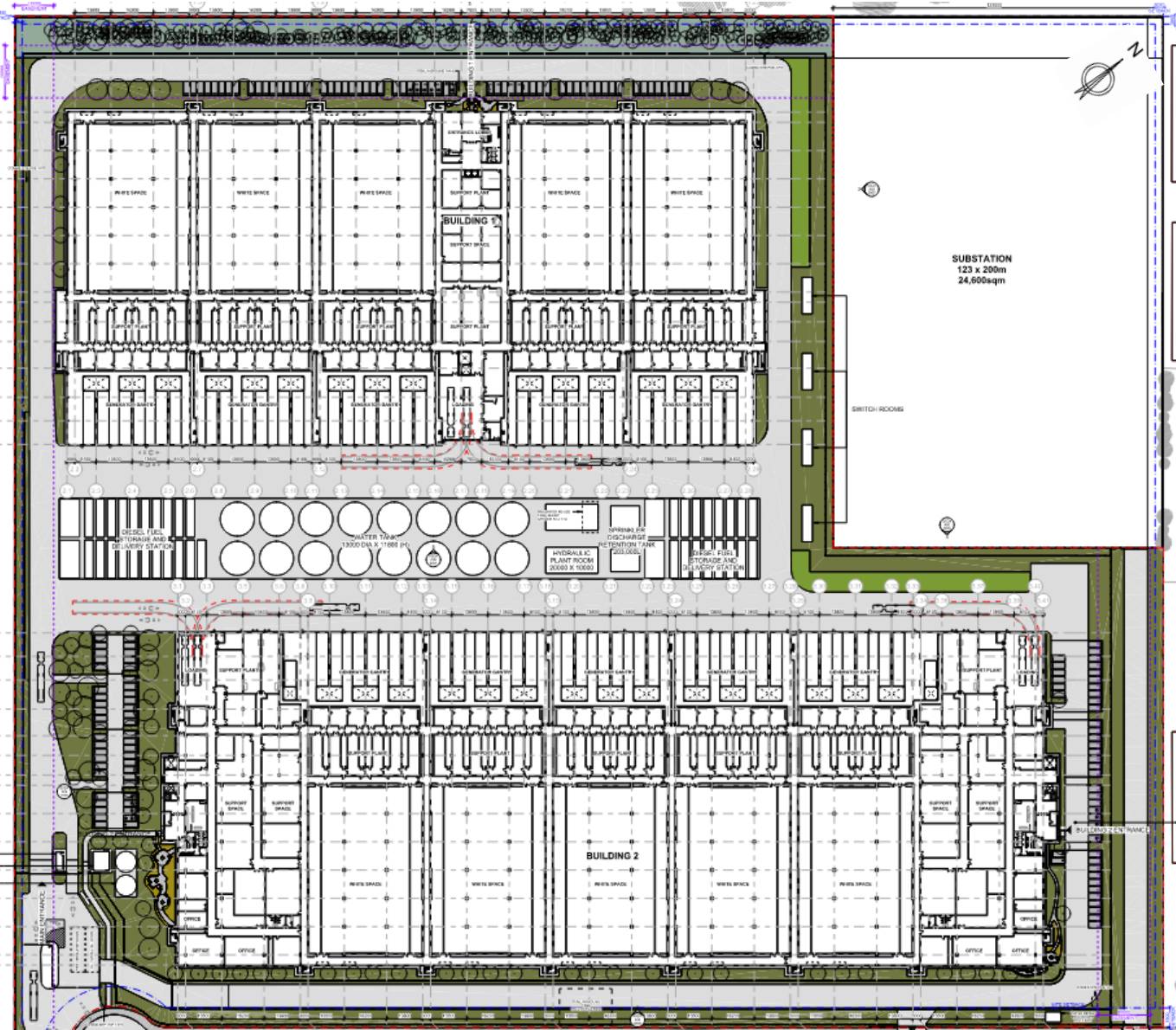


Figure 4-3: GA Floor Plan – Ground Floor

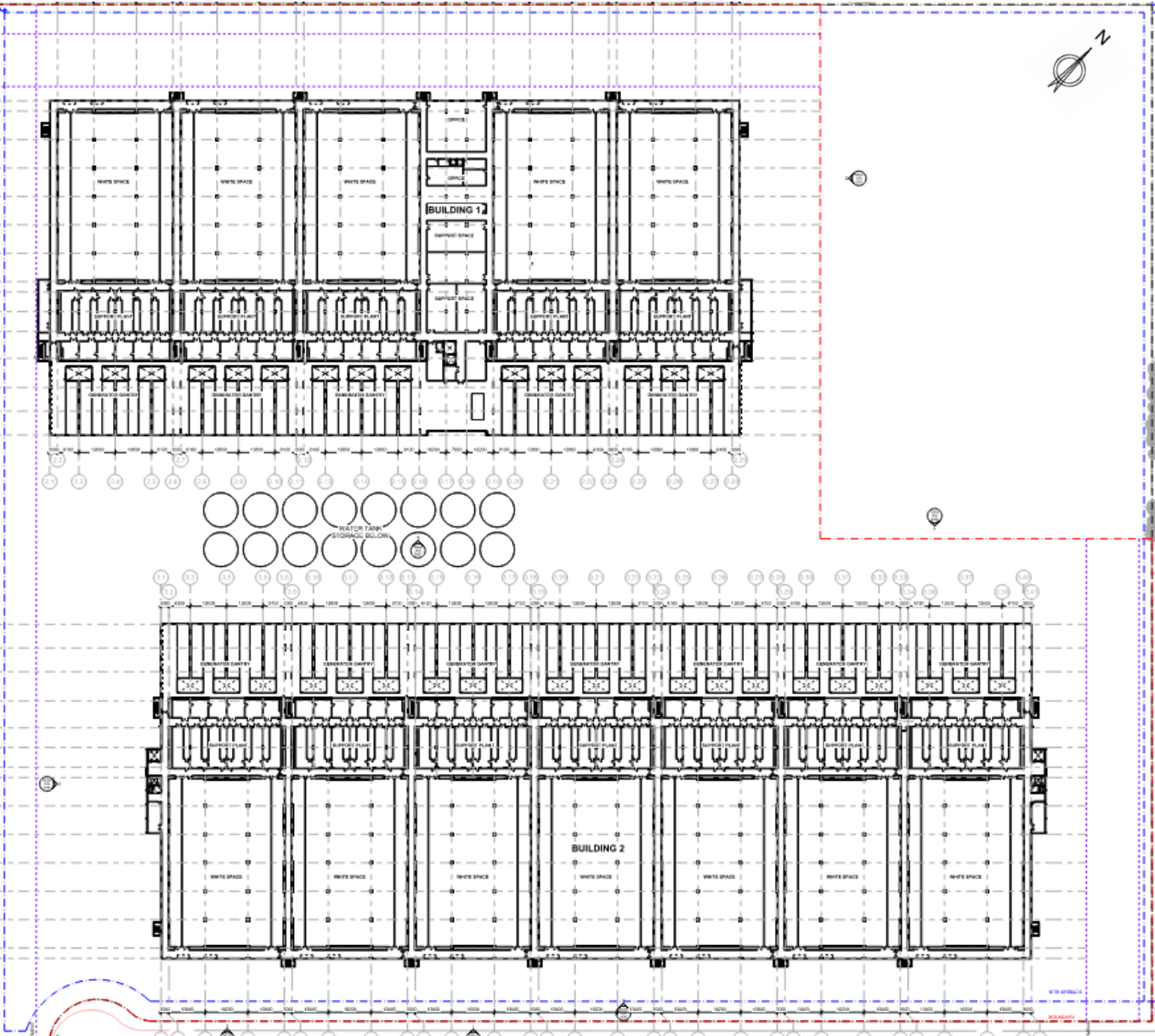


Figure 4-4: GA Floor Plan – Level 01

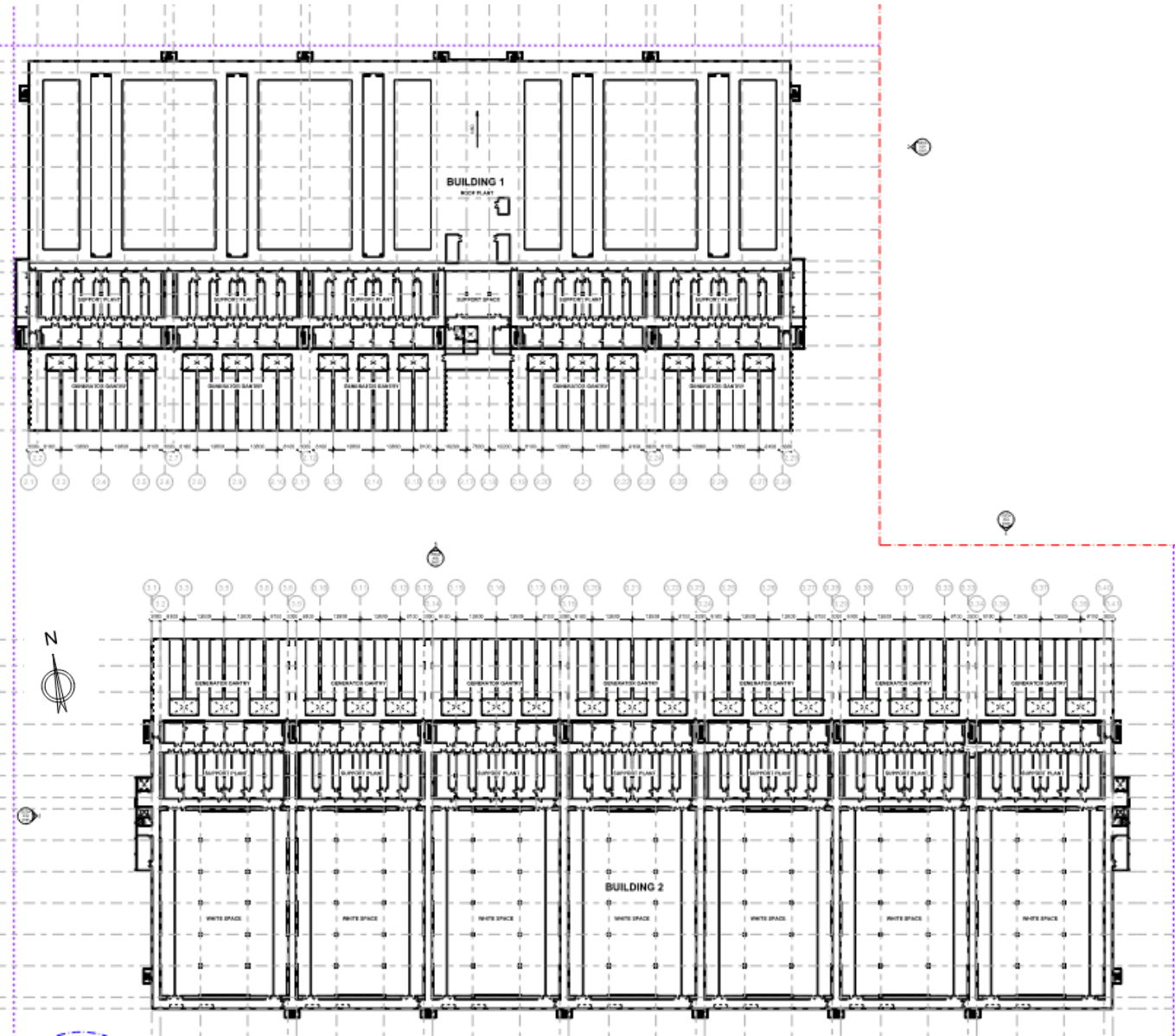


Figure 4-5: GA Floor Plan - Level 02

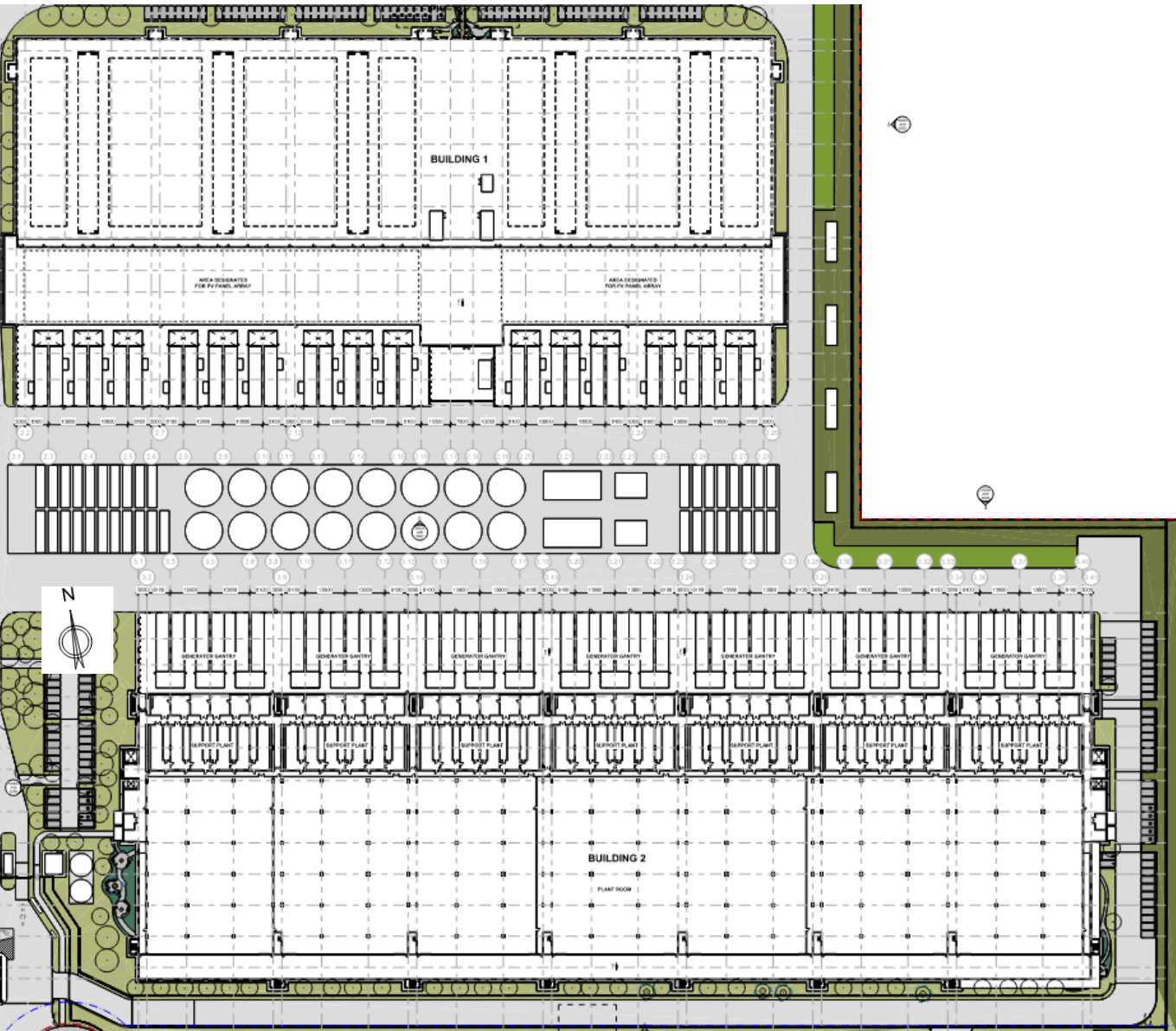


Figure 4-6: GA Floor Plan – Level 03

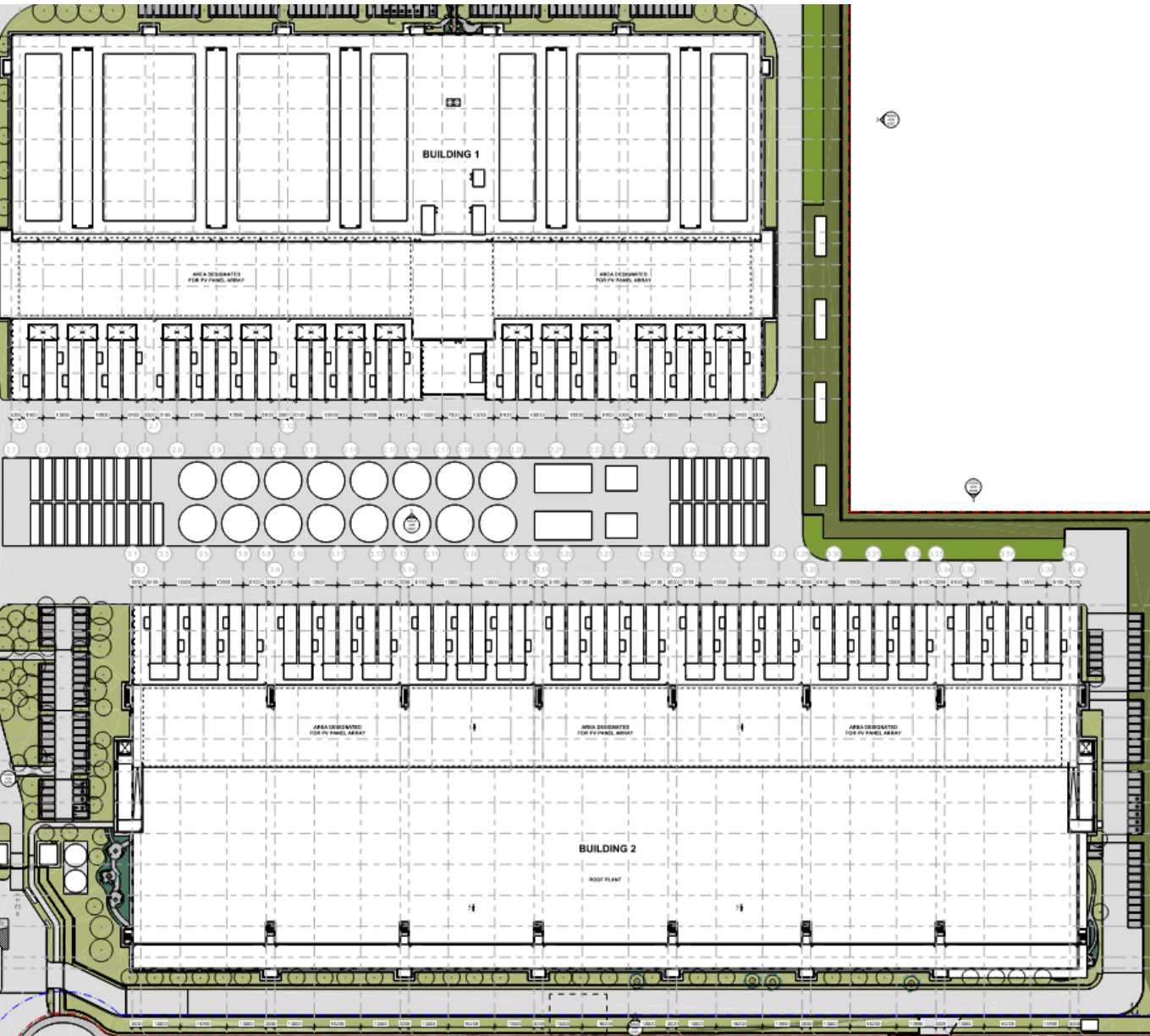


Figure 4-7: GA Floor Plan – Roof Level

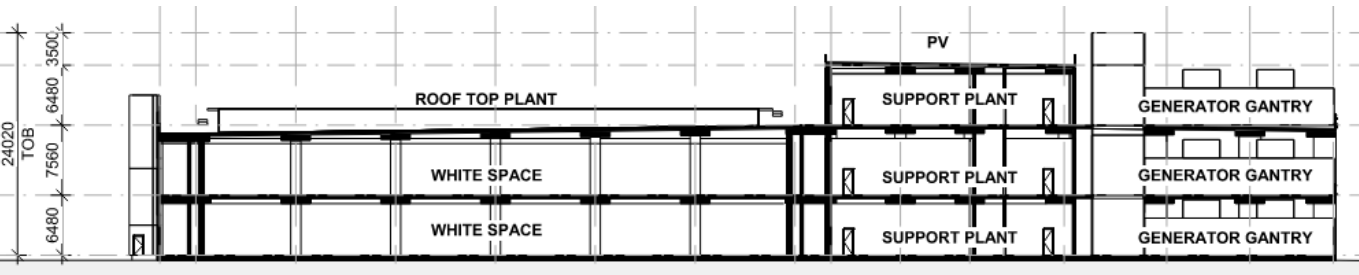


Figure 4-8: Section View - Building 1

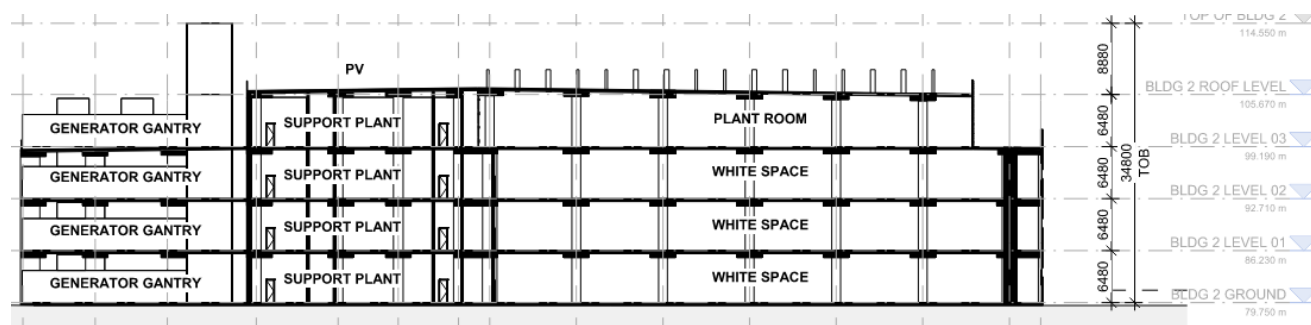


Figure 4-9: Section View - Building 2

4.3 Proposed Building BCA Characteristics

The following BCA characteristics apply to the subject building as documented in the NCC report.

Table 4-2 Building BCA Characteristics

NCC Characteristic	Building 1	Building 2
Classification(s) :	Class 5 (Office), Class 7b (Data Centre)	Class 5 (Office), Class 7b (Data Centre)
Number of Storeys	Three (3)	Four (4)
Rise in storeys:	Three (4)	Five (5)
Construction:	Type A	Type A
Effective height:	Less than 25m	Less than 25m

4.4 Potential Fire Hazards Within the Development

4.4.1 Dangerous Goods

At this stage of the project, a Preliminary Risk Screening (PRS) and Preliminary Hazard Assessment (PHA) Report has been produced by CORE Engineering Group with the following potentially Dangerous Goods identified by the design team as being present within the facility:

Table 4-3: Dangerous Goods information

Product	Quantity	Unit	Comments
Diesel	4,100,000	Litre	- Bulk storage tanks remote from buildings - Day tanks located within each generator enclosure in the DC building - Class C1 DG
Lithium-Ion Batteries (LIB)	2,994,390	Kg	- Centralised LIB in electrical rooms. - Depend on tenants, provision to allow for LIB in Data Halls. - Class 9 DG
HVSS Oil	~257,788	Litre	- Transformer Oil used for insulating and cooling the transformers. - Located within the HVSS to the northern side of the site. The remainder of the transformers in the building footprint are all dry type.

Product	Quantity	Unit	Comments
			Not classified as a DG under the SEPP33 assessment but presents a hazard regardless.

These Dangerous Goods (DGs) must be in accordance with the relevant Work Health and Safety Regulation which will apply governing storage allowances (quantity) and requirements, as well as complying with recommendations of the PHA report. The presence of DGs can also impact on the fire safety concept strategy and therefore must be reviewed in the context of fire spread, occupant evacuation and fire brigade intervention. As the LiB represent a special hazard which may impact the fire engineering strategy, these shall be considered as part of the fire safety strategy as discussed in Section 4.4.1.1

4.4.1.1. Lithium-ion Batteries

Lithium-ion batteries are proposed to be utilised within the facility. The primary hazard associated with lithium-ion batteries is the potential for thermal runaway of the battery cells, leading to ignition of a fire and emission of flammable lithium-ion fluid. This can also lead to emission of toxic and hazardous gases such as HF. Lithium-ion batteries, if subjected to adverse conditions such as excessive heat, over charging or mechanical damage, can suffer from thermal runaway and cell rupture.

It is understood that lithium-ion batteries are proposed in the data hall levels both within dedicated battery rooms, and within the data halls themselves as 'in-rack' battery UPS systems.

To address the hazards associated with the presence of li-ion batteries, the following measures as agreed with the design team are proposed to be implemented in the facility:

- Lithium-ion batteries stored within the facility shall be Lithium-iron-phosphate (LFP) chemistry which are UL9540A tested, with results showing no module-to-module fire propagation, no external flaming nor flying debris and no re-ignitions. Whilst alternative battery chemistries may be feasible subject to further analysis, they may impact strategy elements such as suppression and fire separation requirements. The batteries utilised shall comply with the following maximum capacities and configurations:
 - Battery Rooms – No more than 100kWh per rack.
 - Data halls – No more than 20kWh per rack, no more than 2 modules per rack.
- Rack configuration within the data halls shall comply with FM5-32 for Clauses 2.4.4.1 & 2.4.4.2, that being:
 - Maximum power capacity of 20 kWh per server rack as a distributed power configuration.
 - No more than 2 shelves containing BBU modules should be located together in the same area of the rack.
 - Aisle spacing between server rows is a minimum of 4 ft (1.2 m)
 - Maximum 30 ft (9 m) ceiling height
 - Provide vertical barriers in all server rack rows where Li-ion distributed power systems are used or expected to be used, irrespective of the power capacity. Provide vertical barriers as follow (See Figure 2.4.4.2 for FM5-32):
 - Spaced every third rack along the entire length of server rows,
 - Use a minimum 20-gauge (0.9 mm) solid steel sheet metal for the vertical barriers on the side of every 3rd rack to limit the fire spread.
 - Completely cover the side of the server rack and fit the rack profile.
 - Installed in a way that will not reduce the effectiveness of the hot/cold aisle arrangement (kept to the side profile of the server racks).

Note, the omission of the vertical barriers may be considered based on the final chemistry type, testing and further analysis.

- Fire separation requirements shall be as follows:
 - Battery Rooms – Minimum 4-hour fire compartments
 - Data halls – Minimum 4-hour fire separation

Note: Whilst the prescriptive NCC and engineering requirements demonstrate that 2 hours is adequate, based on FRNSW feedback 4 hour separation for rooms containing lithium ion batteries is their current policy. Noting where data halls are not proposed to contain batteries they may revert to 2 hours. Noting that in all instances horizontal separation (floors) shall still achieve the prescriptive 4 hours.

- An appropriate fire suppression system will be required to control the development of a fire involving lithium-ion batteries. The pre-action sprinkler system design shall be in accordance with AS2118.1 with the following increased performance:
 - Battery rooms - 12.2 mm/min over 230 m² and 60 min duration in accordance with FM5-33.
 - Data halls – 8 mm/min over 330 m² and 60 min duration in accordance with FM5-32.

- To enable early detection and recognition of the thermal runaway process, off-gas detection sensors (e.g., Li-ion Tamer® by Xtralis or other suitable system) shall be provided to serve each dedicated battery room containing lithium-ion batteries. Li-ion Tamer® sensors are designed to be sensitive to gaseous compounds released by lithium-ion batteries during the initial cell venting stage of battery abuse and failure. It is understood to be the intent for the battery management system to interlock with Li-ion Tamer® system to control the battery system on off-gas detection. The Li-ion Tamer® will output a signal to the battery management system once battery failure is detected which will then trip off the battery units in the corresponding sector. Noting that off gas detection is not proposed to the data halls, due to the impracticality of installing this type of detection to the number of racks and the decreased battery energy density within the data halls.
- An automatic mechanical ventilation system shall be provided to the data hall enclosures and battery rooms containing li-ion batteries for ventilation of smoke and noxious gases. The system capacity and design shall be determined as part of the detailed design development, but at this point is proposed to be as follows:
 - Battery room ventilation in accordance with FM5-33:
 - Under normal operation battery room will ventilate based on Australian Standard battery room ventilation requirements, typically 100 L/s for a typical 2MW string but discharge rate will need to be confirmed based on installed configuration.
 - In the event of a fire or activation of the of gas-detection system within the battery room, ventilation system will increase to accommodate peak ventilation volume based on venting data from likely battery vendors and to align with the FM5-33 standard of 0.75 m³/min/m² (typically 750L/s depending on the room size) to ensure LEL for relevant off gases are not exceeded.
 - Data hall ventilation:
 - Noting that FM5-32 does not require mechanical ventilation to data halls where in rack batteries are provided. Regardless, dedicated automatic ventilation is proposed to be provided to the data halls to assist with brigade intervention. Exact rates and function to be determined during design development, but broadly the minimum requirements shall be as follows:
 - The system is to activate upon activation of the sprinkler system in the respective area.
 - System capacity must be capable of exhausting at a rate of at least 1 enclosure air change per hour.
 - All fans, motors and cabling must comply with AS1668.1 for a smoke exhaust system
 - AUTO/ON/OFF switches must be located at the FFCP.
 - System shall be considered an essential service and be listed on the fire safety schedule
- Dedicated smoke detection in the form of MASD shall be provided both within the data halls and within the battery rooms.
- The water run-off from sprinkler activation and brigade hydrant operation shall be considered for containment within the facility due to potential contaminants. Water runoff from the data halls, the dedicated battery rooms and battery storage rooms, shall be retained within a dedicated 700,000 L fire water containment tank. Appropriate drainage shall be provided to other areas to facilitate this. The tank capacity has been determined by the fire services designer based on the prescriptive requirements for the full sprinkler design density (12.2 mm/min/m² over 230 m²) and area of operation for 60 minutes, plus 3 hydrants (10L/s each) for a 4-hour duration as per the proposed design. Access shall be provided to the tank, with a plan provided at the main FDCIE to alert attending emergency service personnel of its presence should they elect to test the runoff water for contaminants.
 - In addition to statutory signage, the following must be provided to support fire brigade intervention:
 - Battery warning signs & block plans at the FDCIE and pump room, stating:

“LITHIUM-ION BATTERY ENERGY STORAGE SYSTEMS ON SITE. CHECK BATTERY MANAGEMENT SYSTEM FOR FAULTS. POSSIBILITY OF TOXIC GASES – SCBA RECOMMENDED.”

 Site plans showing the location of battery rooms shall be positioned adjacent to the signs.
 - Visual warning device at the entrance of the compartment containing lithium-ion batteries, activated by off-gas detection, with clear signage indicating a triggered fire safety measure and potential hazardous atmosphere.
 - Hazard signage at facility entrances, main control room, and other suitable locations per AS/NZS 5139:2019, warning of electrical and chemical hazards. A copy of Safety Data Sheet (SDS) for the installed batteries must be available at the Fire Control Centre.

4.4.2 Substation

The location of the substation shall maintain a minimum separation distance of 10 m from all fire brigade infrastructure (e.g. fire hydrants, boosters). The substation shall be constructed in accordance with the requirements of the relevant supply authority.

4.4.3 Combustible External Elements

As the building is required to be of Type A construction, external walls of the building are required to be of non-combustible construction. This includes any ancillary elements affixed, installed or attached to the external wall. Combustible external signage is proposed for installation on the northern façade, see Figure 5-5 & Figure 5-6. The proposed signage does not comply with DtS Provisions of NCC 2022. However, a Performance Solution is proposed, subject to detailed review and engineering assessment, refer to Section 5.1.3.

4.4.4 PV Cells

As indicated in Figure 5-12 PV cells are proposed on the roof level of both buildings. The following general design guidance is provided in order to limit electrical exposure to evacuating occupants or attending fire fighters:

- The panels shall be installed in compliance with AS/NZS 5033:2021
- Solar panel / inverter isolation switches should be accessible from Ground Floor.
- A diagram of the solar installation shall be provided at the FDCIE showing the locations and key infrastructure and confirming whether they do or do not isolate on fire trip.
- Where insulation is proposed below the solar panels, it is recommended to be non-combustible.
- Recommended that panels are located no closer than 1 m from a roof light or other combustible portion of the roof .

4.4.5 External Electric Vehicle Charging

Although not currently shown on the plans, it is expected that a number of external electric vehicle chargers are anticipated to serve the facility. EVs can pose unique challenges to firefighting and evacuation. Mitigating measures are recommended for these installations, with consideration of industry guidance including ABCB's Advisory Note on EV charging, FRNSW position statement, and AFAC's Position Statement Document entitled "Electric Vehicles and EV Charging Equipment in the Built Environment".

- Where practical, charging bays shall be located greater than 6 m from the building, including any awnings.
- At a minimum, charging bays must be positioned greater than 3 m from building exit points.
- Charging bays must be positioned no closer than 10 m to fire brigade or electrical infrastructure including fire hydrants and substations.
- Charging bays should be within 70 m of the nearest fire hydrant(s) to enable fire brigade intervention
- Where charging bays are proposed within 6 m of the building, the chargers shall be configured to automatically shut down upon fire detection within the building (e.g. activation of sprinklers or smoke detection system as applicable)
- Chargers shall be installed in accordance with AS3000, shall have RCM tick compliance, and where practical, smart charging shall be incorporated
- The EV charger(s) should have a manual isolation switch, and the distribution board serving them should also have a shutdown switch, to be indicated on a block plan.
- A block plan clearly identifying the location of each charger on site shall be provided adjacent to the FDCIE.

5. Proposed Fire Engineering Design Requirements

The below summarises the proposed fire engineering requirements to satisfy the Performance Requirements of the NCC. Note as the building layouts are generally consistent across the two data centre buildings on site, the following summaries apply across both buildings unless noted otherwise.

5.1 Structure and Compartmentation

5.1.1 Type of Construction Required

The buildings shall be built in accordance with the NCC DtS provisions for Type A fire-resisting construction and comply with the relevant requirements of Specification 5. These principally being 4 hours for Class 7b parts and 2 hours for Class 5 parts.

5.1.2 Fire Compartmentation

For a building required to be of Type A construction, the following maximum fire compartment sizes as per the DtS provisions of the NCC apply:

- Class 7b parts – 5,000 m² in floor area and 30,000 m³ in volume.
- Class 5 parts – 8,000 m² in floor area and 48,000 m³ in volume.

The office portion (Class 5) of Building 2 is proposed to be fire separated from the Class 7b area with DtS 4 hour fire separation and is therefore compliant with the maximum compartment sizes.

Due to the nature of its use and client requirements for the data halls, their surrounding corridors and many of the ancillary rooms shall be further divided into separate fire zones with --/120/120 separation and --/120/30 door sets. This separation being 2 hours in lieu of the prescriptive 4 hours does not satisfy the requirements of C3D8 and Specification 5, and therefore results in an effective compartment size which exceeds 5,000 m² and 30,000 m³. This shall be addressed as part of a Performance Solution, reliant on the heavily compartmentalised nature of the building. Refer Figure 5-1 & Figure 5-2 for a typical proposed compartmentation plan. Note, these markup do not include standard NCC Spec 5 related FRL items (fire stairs, risers, etc), client required separation or C3D14/AS2067 requirements.

The battery rooms within the building shall be fire-separated in accordance with NCC 2022 Provision C3D13 irrespective of the capacity of the battery system. Note, due to FRNSW's recent unpublished position on rooms containing batteries, the minimum FRL of the subject separation shall be 4 hours with doors into these subject rooms remaining as -/120/30. Additionally, any rooms used for the temporary storage of batteries (i.e. as spare or used parts) shall also be fire separated to the same rating. Should data halls be intended to be fitted out with in-rack batteries these shall also be a minimum of 4 hour separation in lieu of 2 hours.

The requirements for fire separation of any transformers or electrical supply equipment within the building as shall be determined by the electrical design and as accepted by the PCA.

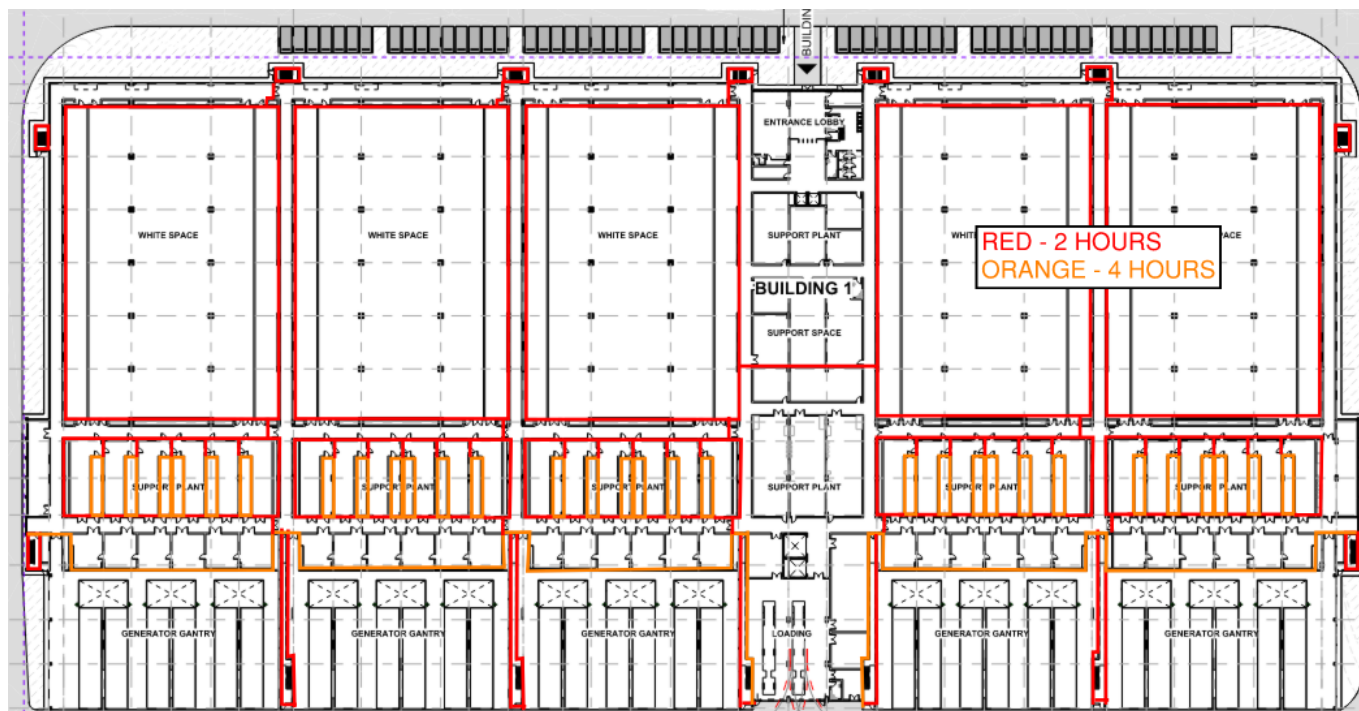


Figure 5-1: Typical fire compartmentation plan on ground floor – Building 1

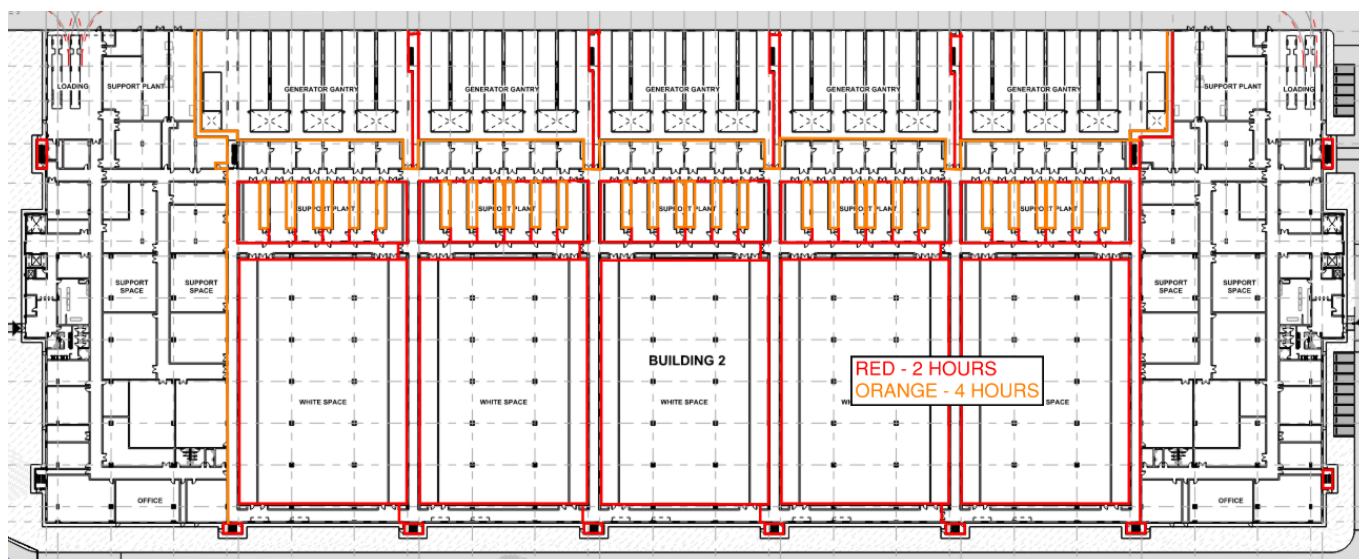


Figure 5-2: Typical fire compartmentation plan on ground floor – Building 2



Figure 5-3: Fire compartmentation Plan on upper levels – Building 1

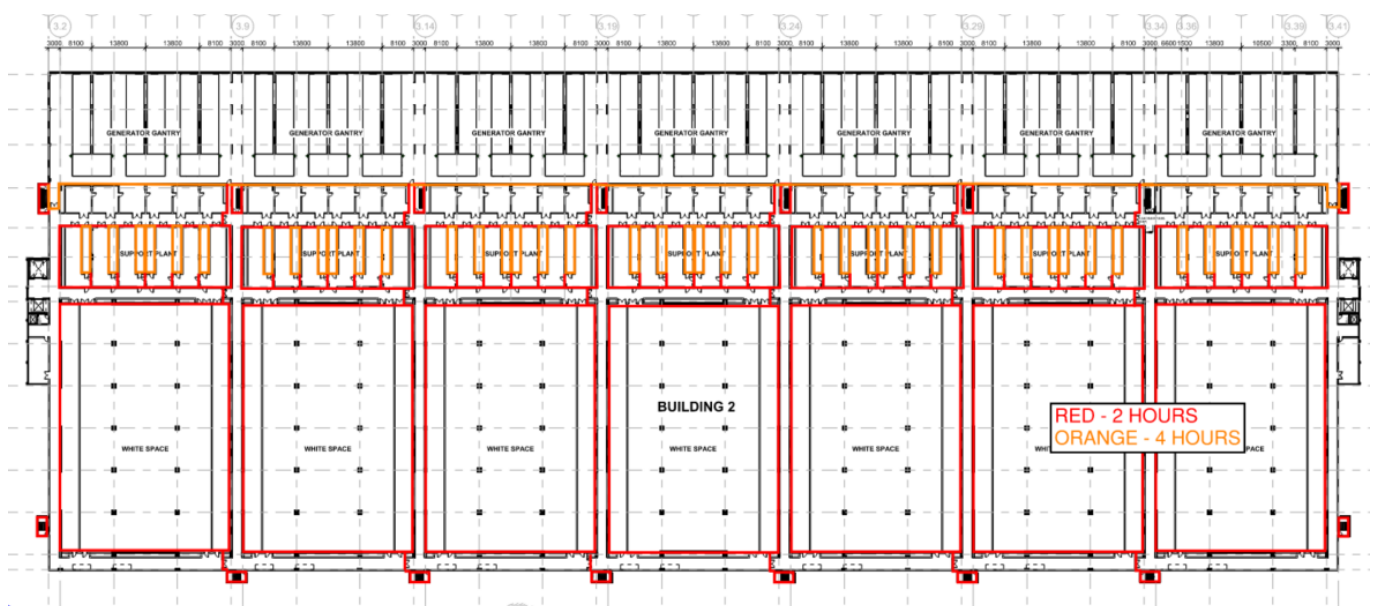


Figure 5-4: Fire compartmentation Plan on upper levels – Building 2

5.1.3 External Walls

All components of the external wall are to be non-combustible and shall comply with DtS Provisions C2D10 and C2D14 with the exception of the combustible signage proposed to be fixed to the external northern and southern façade of both buildings. This shall be addressed through a Performance Solution, taking into account that the following:

- Substrate to which the signage is installed is non-combustible
- Multiple stairs available from the building
- Signage is located on the roof/plant level screening and is therefore located above the highest compartment in the building, eliminating the risk of upwards fire spread.

- Signage is adjacent to perimeter road and located <25m above the road level, allowing for efficient brigade intervention in the event the signage becomes involved in a fire.
 - Multiple paths to the road available around the building, whereby occupants aren't required to pass by the signage.
- Separately, details surrounding the curtain wall and slab edge construction details should be presented to the BCA consultant/PCA for review and consideration against the fire separation requirements.

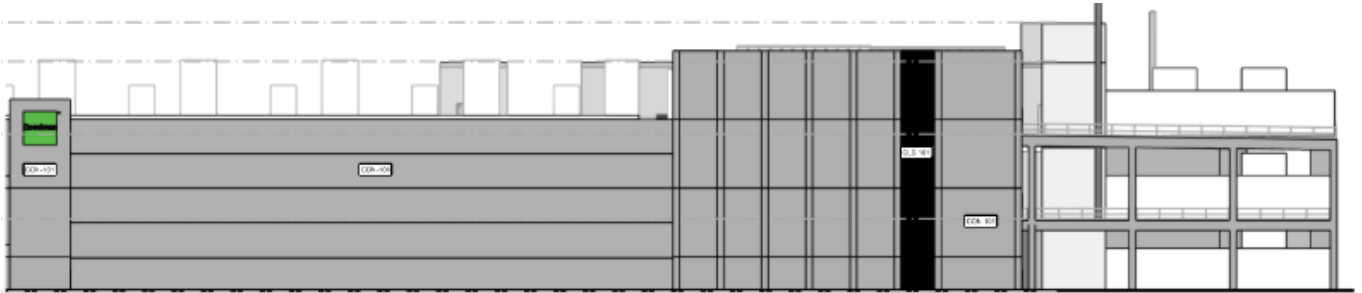


Figure 5-5: Proposed location of combustible signage at southern external façade – Building 1

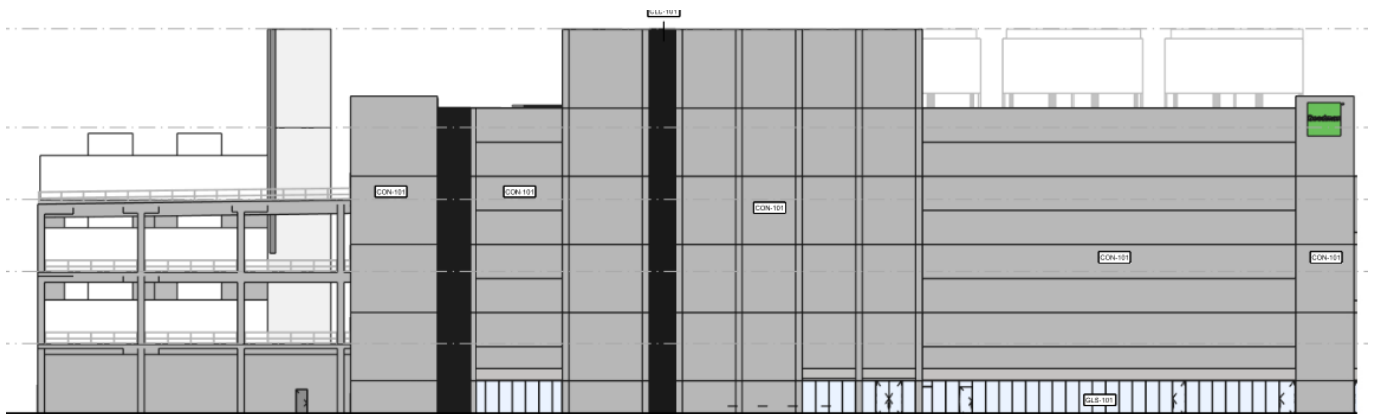


Figure 5-6: Proposed location of combustible signage at southern external façade – Building 2

5.1.4 Spandrels

No spandrels are required in the building as a sprinkler system in accordance with AS2118.1:2017 throughout the building is proposed, the exception being within the generator enclosures where it is understood watermist protection shall be provided in lieu of sprinklers. The use of watermist in lieu of sprinklers in these areas shall be considered as part of a Performance Solution, to address the building not being prescriptively sprinkler protected throughout. Noting that the broader gantry outside of the enclosures is prescriptively afforded sprinkler protection.

5.1.5 Separation of external walls and associated openings from different fire compartments

External walls between compartments and any associated openings shall comply with DtS Provision C4D4.

5.1.6 Roof as open space

To assist with addressing extended travel distances on the primary building roof, the roof shall achieve an FRL no less than 240/120/120 to satisfy the requirements of DtS Provision D3D13. Where there are penetrations in this slab, these penetrations are to be suitably fire-stopped in accordance with C3D15. Note, the metal structure supporting the upper roof plant deck has been confirmed by the BCA consultant as being a roof plant area only (i.e not a storey) and it doesn't not prescriptively require an FRL.

5.1.7 Fire Rated Doorsets

Where protection is required within the building, fire doors must comply with the DtS Provisions of the NCC and AS1905.1:2015. This is with the exception of fire-rated double door sets which provide access to areas such as the data halls and electrical rooms, where a Performance Solution is proposed (if desired by the design team) to address the DtS non-compliant lockable bolts installed on the inactive leaf which may possibly inhibit the self-closure of the door leaf. Note, the

proposed Performance Solution does not pertain to 'fire bolts', which are not supported by FRNSW as detailed in their relevant published position statement. The compliance of any proposed 'fire bolts' are a responsibility of the PCA.

5.2 Egress

5.2.1 Evacuation Strategy

Activation of any suppression or detection system in the building should initiate the building alarm. Noting that due to the SCEC ratings, re-entry into the data halls may not be permitted on fire alarm. As such an occupant may not be afforded the opportunity to pass back through their original point of choice whilst navigating to an alternative exit. This shall be addressed as part of a Performance Solution considered holistically within the extended travel distance solution.

5.2.2 Travel Distances

In the buildings, travel distances to the nearest exit and between alternative exits must be compliant with the NCC DtS requirements (maximum travel distance of 20 m to the point of choice, 40 m to the nearest exit, 60 m between alternative exits and discharge points must be located as far apart as practical) with the exceptions noted on the following markups:

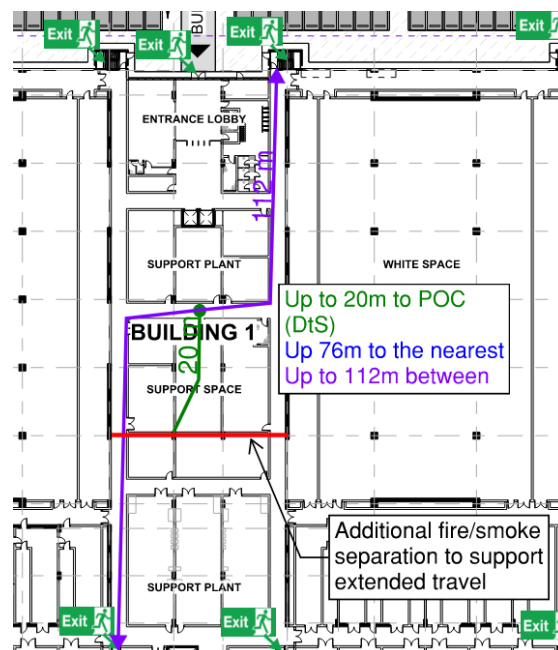


Figure 5-7: Building 1 - Ground Floor – Office Area – Travel Distances

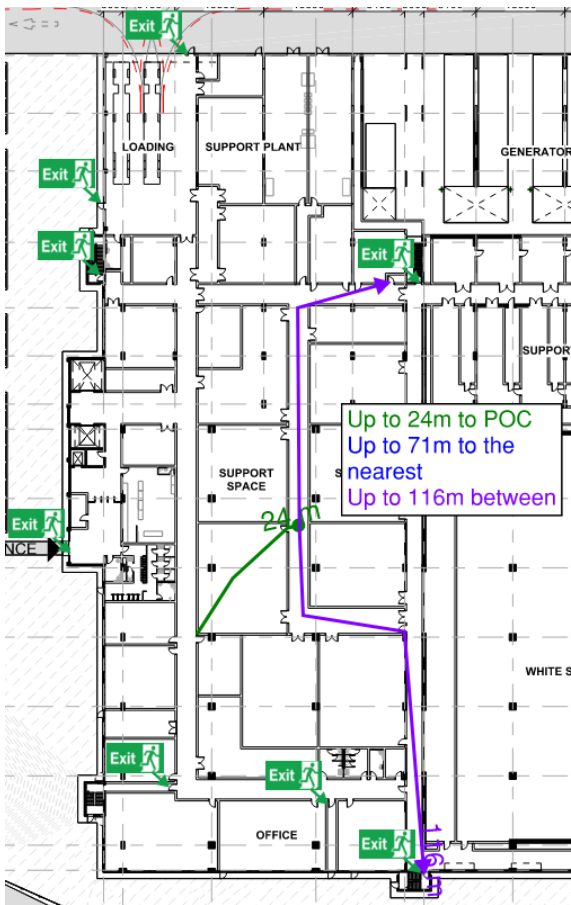


Figure 5-8: Building 2 - Ground Floor – Office Area – Travel Distances

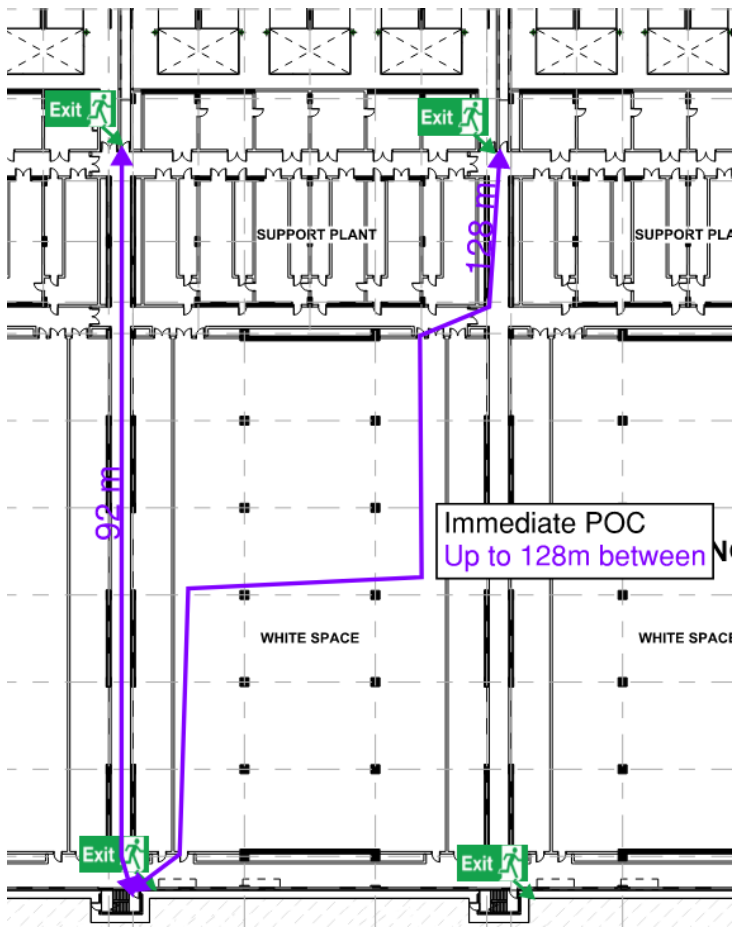


Figure 5-9: Building 1 & 2 - Ground to Level 02 – Data Hall - Travel Distances

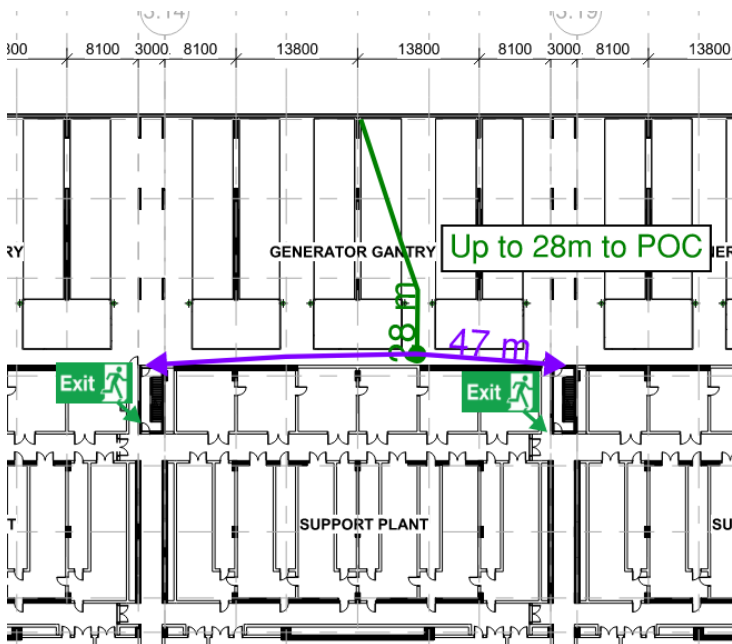


Figure 5-10: Building 1 & 2 – All levels - Generator Gantries –Travel Distances

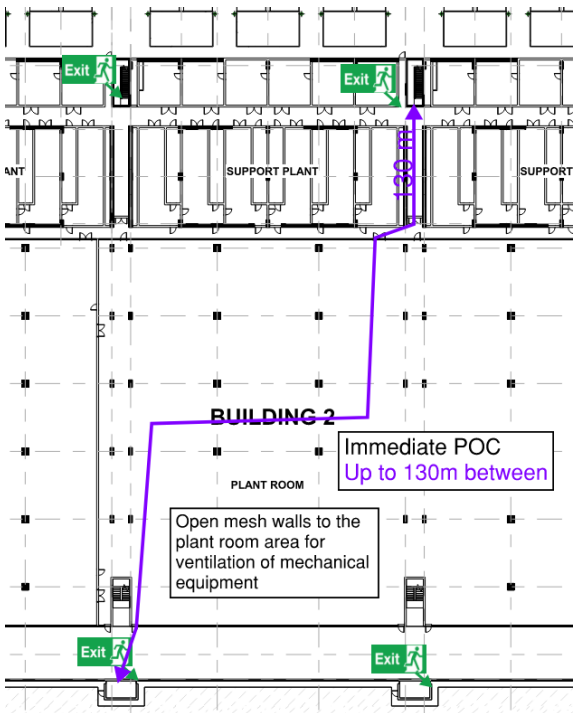


Figure 5-11: Buildings 1 & 2 – Plant room level – Travel distances

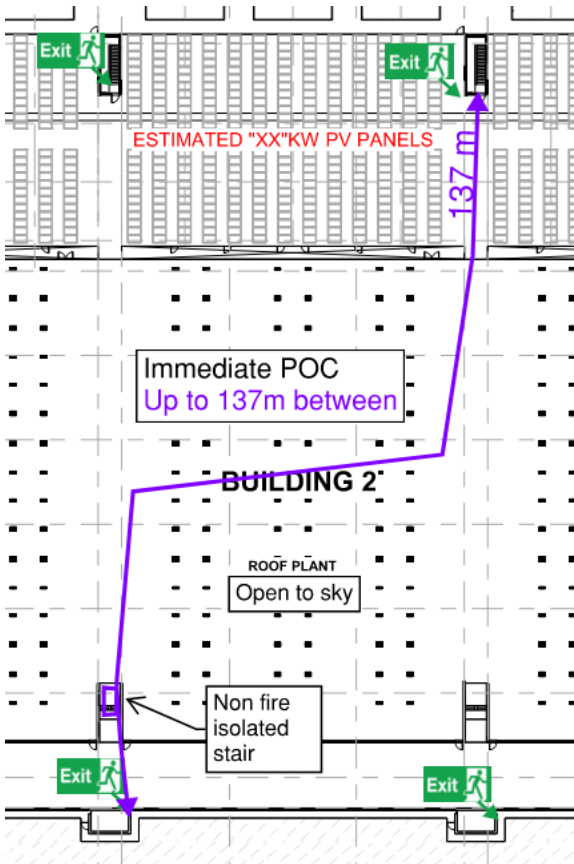


Figure 5-12: Building 1 & 2 – Plant deck level (roof) – Travel distances

These non-conformances are proposed to be addressed through the following Performance Solutions:

- Office areas on all levels and Class 7b area (storage rooms, mech rooms, loading dock, corridor etc):
 - A smoke detection system shall also be provided throughout, with spacing requirements in accordance with Section 5 of AS1670.1:2018. The smoke detection will assist in offsetting the extended travel time in these areas in lieu of the sprinkler protection only which is required to satisfy the smoke hazard management requirements of the NCC.
 - Multiple exits available
 - The majority of occupants are staff members and clients who are familiar with the building layout and exit locations.
- Generator Gantries:
 - Low occupant numbers, as occupants are restricted to trained maintenance staff only. Workers are inducted and are present only to conduct maintenance related activities such as inspections.
 - The generator gantries shall be separated from the rest of the building by fire-resisting construction achieving minimum --/240/240 or 240/240/240 FRL.
- Data Halls and surrounding corridors
 - Increased compartmentation is proposed to the data halls and surrounding corridors. This combined with the sterile nature of the proposed corridors (no storage or the like), plus the additional fire/smoke compartmentation proposed through the central corridors as depicted in Figure 5-2, provide occupants an alternative safe path in the event the central exits are unavailable.
 - Due to the security restrictions in data halls, occupants may not be able to re-enter the data halls after exiting and therefore are not able to return to the point of choice as required in the DtS Provisions for travel to an alternative exit. The proposed increased compartmentation provided through central corridors shall allow occupants to safely navigate to an alternative exit should the first exit be unavailable.
 - In addition to the above, a smoke detection system shall also be provided throughout, with spacing requirements in accordance with Section 5 of AS1670.1:2018. The smoke detection will assist in offsetting the extended travel time in these areas in lieu of the sprinkler protection only which is required to satisfy the smoke hazard management requirements of the NCC. Note, an ASD system is proposed in the data halls.
- Plant area on roof plant room area and the plant deck level
 - Low occupant numbers, as occupants are restricted to trained maintenance staff only. Workers are inducted and are present only to conduct maintenance related activities.
 - Slab below roof plantroom achieves a minimum FRL of 240/120/120
 - Roof plant rooms have mesh side and are freely vented as a function of their usage.
 - Roof plant deck is open to the sky on a fire rated roof.
 - Multiple exits available
- In all cases, the building shall be provided with an automatic sprinkler protection throughout except, where varied by this report, in accordance with AS2118.1 with the expectation that the suppression system will control the spread and development of an internal fire within the building.

5.2.3 Fire-Isolated Stairs

Due to the size of the floor and plate to facilitate occupant evacuation and brigade intervention, the building shall be provided with multiple exits from all levels. Stairs within the building are proposed to be fire isolated, complying with D2D12. (refer Figure 5-14).

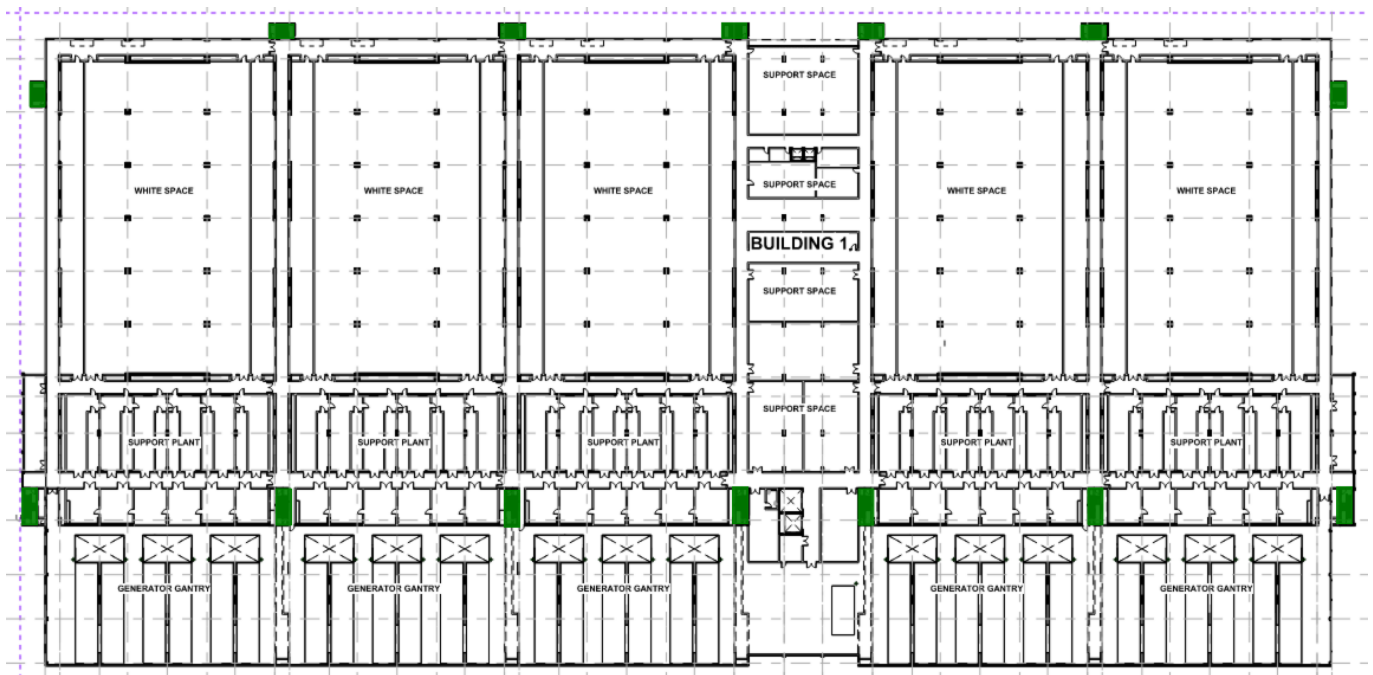


Figure 5-13: Building 1 - Location of Fire-Isolated Stairs (GREEN)

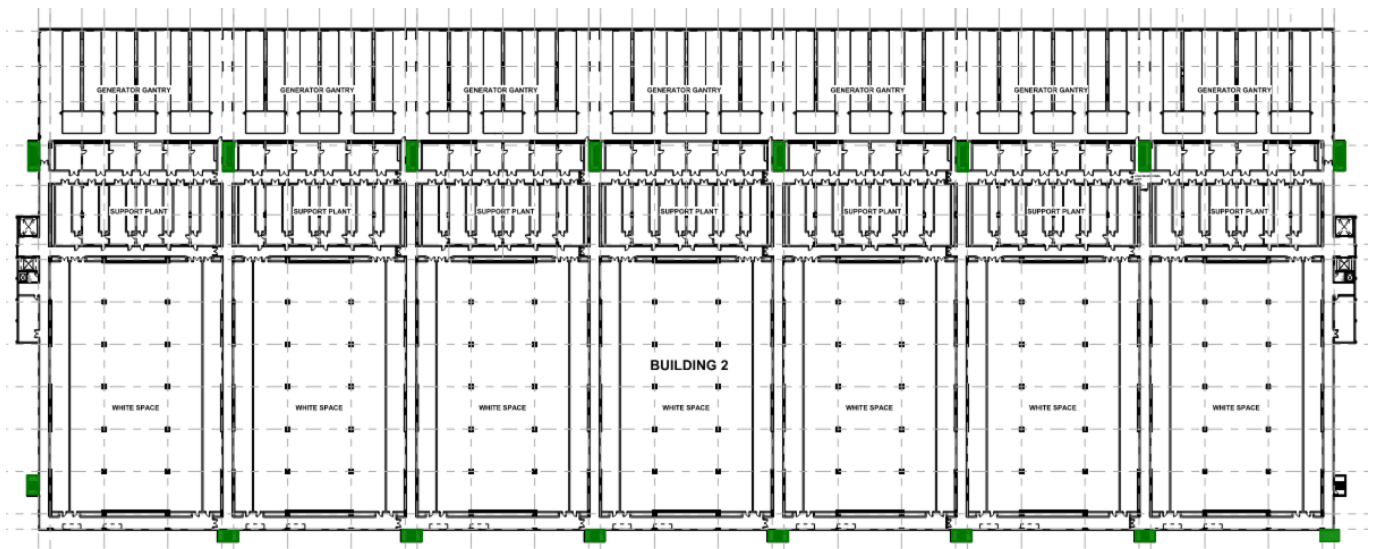


Figure 5-14: Building 2 - Location of Fire-Isolated Stairs (GREEN)

5.2.4 Required Non-fire isolated stairs

The second exit from the Building 2 roof plant gantry level is provided by non-fire isolated stairs ways (refer Figure 5-15) which discharge onto lower roof level. This does not comply with the requirements of D2D14(1),(3) & (5), in that the stairs do not:

- Provide a continuous means of travel by its own flights and landings from every storey served to the level at which egress to a road or open space is provided.
- The distance from any point on a floor to a point of egress to a road or open space by way of stairways exceeds 80 m

These non-conformances are proposed to be addressed through the following Performance Solutions:

- Low occupancy numbers (maintenance only)
- Travel is across the fire rated roof which is open to the sky
- Multiple fire isolated exits available off the roof.

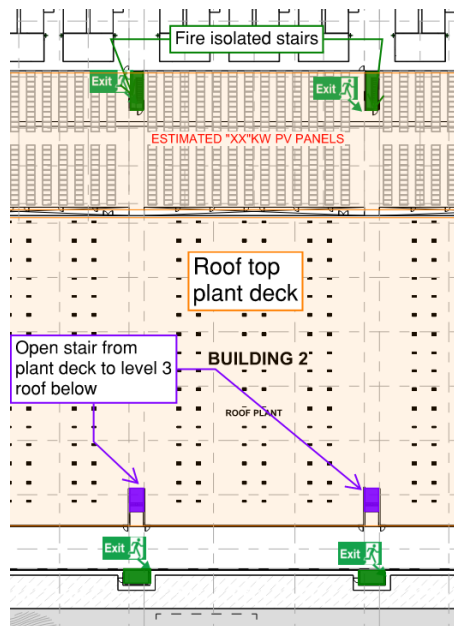


Figure 5-15: Roof top plant deck – Stair configuration

5.3 Fire Fighting Equipment

5.3.1 Fire Hydrants

A dedicated hydrant system shall be provided to serve the building in accordance with NCC Provision E1D2 and AS2419.1:2021 with the following specifications:

- Internal fire hydrants shall be provided within fire-isolated stairways to serve all levels above ground. A Performance Solution is proposed to permit hydrant coverage to these levels to be achieved by 2 hose lengths (60 + 10 m) from an internal hydrant (within a fire isolated stair) in lieu of the DtS prescriptive maximum of 40 m.
- Where additional on floor hydrants are required to achieve coverage, these shall be permitted to provide coverage up to 40 m.
- All hose connections in the system are to be fitted in accordance with FRNSW Technical information sheet – FRNSW compatible hose connections (available at firesafety.fire.nsw.gov.au). These couplings should be tested as part of the system when the commissioning tests are undertaken.
- The booster assemblies are proposed to be located on the southern side of the building, adjacent to the public road but not within sight of the main pedestrian entrance or within the façade of the building. The non-compliant location of the booster assemblies shall be addressed by a Performance Solution, reliant on a strobe light at the booster assembly and block plans at the main FIP of both buildings.
- Hydrant system shall be designed and demonstrated as suitable for the specific building and application in accordance with the guidance in Appendix C of AS2419.1:2021 which pertains to hydrant system design for buildings exceeding 108,000 m³ in volume. It is noted that the extensive compartmentation both horizontally and vertically across the floor plate limit the compartment size compared with a typical Class 7b building exceeding the compartment volume limitations of AS2419.1. As confirmed by the fire services design, the current proposed hydrants design allows for up to 3 hydrants operating simultaneously (3 x 10 L/s).

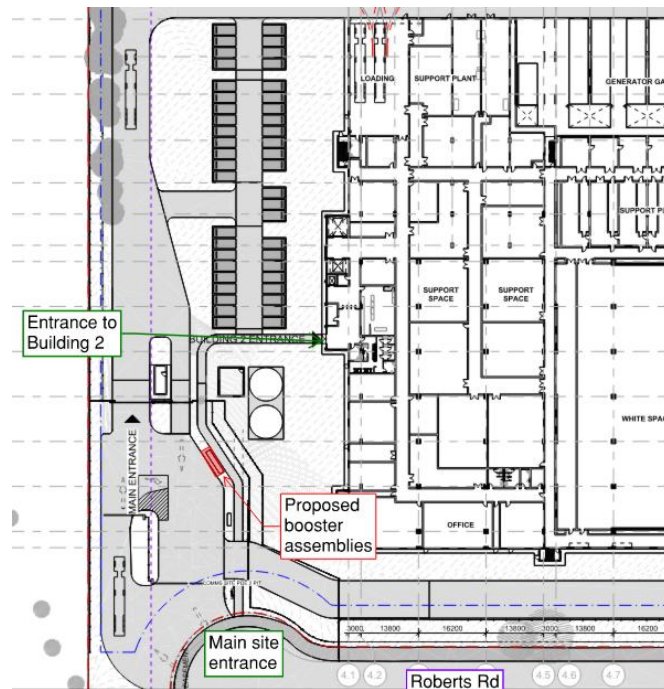


Figure 5-16: Proposed booster location adjacent to main driveway.

5.3.2 Fire Hose Reels

Fire hose reels shall be provided throughout the ground floor loading dock and BOH areas in accordance with Provision E1D3 of the NCC and AS2441:2005.

A Performance Solution shall be presented to omit the provision of FHRs in data hall areas due to presence of electrical equipment susceptible to water damage and instead reliant on the provision of PFE to facilitate first line fire attack. Note, FHRs are not prescriptively required in Class 5 office spaces.

5.3.3 Fire Sprinkler System

A fire sprinkler system shall be provided throughout the building in accordance with the DtS Provisions and AS2118.1:2017. It has been advised by the fire services engineer for the project that the proposed system shall be a pre-action system fully compliant with the requirement of AS2118.1:2017, except with the design density and area of operation satisfying the requirements of FM5-33/NFPA855 where lithium-ion batteries are utilised in battery rooms/storage rooms and FM5-32 in data halls. Noting that these exceed the DtS requirements. Additionally:

- The generator enclosures shall be provided with a water mist system in lieu of a DtS compliant sprinkler system, to be addressed via a Performance Solution.
- The pre-action valve rooms shall be located on each level they serve and are therefore the ones on Level 1&2 are not directly accessible to road or open space. This location shall also be considered as part of a Performance Solution, based on
 - Wet valves are located in DtS rooms on ground floor, readily accessible from open space. With only the dry valves located on the floors served.
 - Dry valves are located in fire isolated enclosure accessed from the fire/smoke isolated corridors surrounding the data halls and are outside of the compartment served.
- The sprinkler booster location being next to the hydrant booster located adjacent to the main driveway, shall be considered holistically as part of the hydrant booster solution.

5.3.4 Portable Fire Extinguishers

Portable fire extinguishers are to be provided throughout the building in accordance with Provision E1D14 of the NCC and selected, located, and distributed in accordance with AS2444:2001.

The data halls areas shall be provided with additional PFEs in appropriate locations to afford personal fire suppression opportunities in lieu of FHRs.

5.3.5 Control and Indicating Equipment

Each building shall be provided with a Main Fire Indicator Panel (FIP/FDCIE) within a compliant Fire Control Centre (FCC), located at the main entrance to the building. The fire panel must be installed in accordance with NCC Specification 20 and AS1670.1:2018. The Fire Control Centre shall comply with the requirements of Specification 19.

5.4 Smoke Hazard Management

5.4.1 Smoke Detection System

A smoke detection system shall be provided throughout each building in accordance with AS1670.1:2018.

- Smoke detection shall be provided throughout the Class 7b portion of the building with spacing in accordance with Section 5 of AS1670.1 (i.e. 10 m x 10 m). Noting that the data halls themselves are understood to be provided with Aspirated Smoke Detection (ASD) systems.
- The smoke detection system through the office area (Class 5) shall be provided on spacing in accordance with Section 5 of AS1670.1 (i.e. 10 m x 10 m) to offset extended travel distances.

Activation of detectors in any part of the building must initiate the BOWS system. Noting that client may wish to have the two buildings panels networked but there is no prescriptive requirement to evacuate both building simultaneously.

5.4.2 Building Occupant Warning System

As the building has an effective height of less than 25 m. A building occupant warning system (BOWs) shall be provided throughout all parts of the building. The system should be in accordance with the prescriptive requirements of S20C7 of NCC 2022 and AS1670.1.

5.4.3 System Monitoring

Automatic signalling equipment should be provided that sends notification to fire brigade on alarm.

5.5 Visibility in an Emergency

Emergency lighting is to be provided throughout the building in accordance with DtS Provisions E4D2 and E4D4 of the NCC 2022 and AS2293.1:2018.

Exit signage is to be provided throughout the building in accordance with the DtS Provisions E4D5, E4D6, E4D8 of the NCC 2022 and AS2293.1:2018.

5.6 Building and Construction Management Procedures

The ongoing management of the building is as important in maintaining a high level of life safety as the provisions recommended during the design phase of the building. As such the following shall be implemented:

- A management in use document shall be developed and contain at a minimum the following:
 - Fire/smoke corridors within the Class 7b areas shall not be used for the storage of goods other items.
 - Building management procedures and security measures to ensure the inactive leaf of double leaf fire doors which include non-automatic door hardware remains in the closed position when not in use.
 - Roof access shall be restricted to trained and inducted personnel only.
- The fire safety systems should be tested and maintained in accordance with Australian Standard AS1851.
- An emergency management plan should be developed for the site in accordance with AS3745:2010.

6. Proposed Performance Solutions

6.1 Summary

DtS non-conformances have been identified as part of these works. In particular, the fire safety assessment and fire engineering analysis shall be focused on the following identified Performance Solutions (Table 6-1).

Table 6-1: Summary of potential Performance Solutions

#	DTS Provision	Title	Non-Compliance(s)	Proposed Performance Solution
1	C3D3, C3D4 & Spec 5	<i>Fire compartment size & rationalization of separating elements – Data hall areas</i>	The building is proposed to be separated into multiple fire compartments each less than 5000 m², the fire walls separating these compartments are proposed to achieve 120/120/120 (or -/120/120 for non-load bearing elements), in lieu of the perspective 240/240/240 (-/240/240).	- Floors shall achieve the prescriptive 240 FRL. - Building is sprinkler protected throughout. - Each data hall is separated from surrounding corridors by fire rated construction achieving 120/120/120 (-/120/120 for non load bearing elements). - Each battery room is 4 hour fire separated from surrounding corridors. - Generator gantries shall be separated from the data hall portion of the building with 240/240/240 (--/240/240 non load bearing) construction. - Corridors fire/smoke separated from the surrounding floor plate and sterile (i.e not used for storage/display or the like).
2	C2D14	<i>Ancillary elements</i>	The signage is expected to be fixed to the external façade which is combustible and/or does not achieve the required group rating permitted by the NCC.	- The mounting substrate comprises of non-combustible construction. - The level above the proposed signage is an open plant level, thereby reducing the risk of upwards fire spread - The proposed location of the sky signage will not impact occupant evacuation from fire isolated stairs or the main entrance to open space.
3	C4D6 & Spec 12	<i>Lockable Bolts Fitted to Inactive Leaf of Fire Rated Doorsets</i>	Lockable bolts are fitted to the top and bottom of the inactive leaf of fire rated double doorsets. If these lockable bolts are engaged when the inactive leaf is not in the closed position, then it is possible for this hardware to inhibit the self-closure of this door leaf.	24/7 security staffed facility. - Door position monitoring through the site security system. - Building management procedures and security measures to ensure the inactive leaf remains in the closed position when not in use.
4	D2D5 & D2D6	<i>Extended Travel – ground floor office and back of house areas</i>	- Office areas - Up to 24 m to POC	Fire suppression system provided throughout the building.

#	DTS Provision	Title	Non-Compliance(s)	Proposed Performance Solution
			- Up to 71 m to the nearest exit - Up to 116 m between exits	AS1670.1 fire detection system provided in accordance with spacing requirements in Section 5 of AS1670.1 in lieu of the DtS required sprinkler system only to satisfy the requirements of E2D9.
5	D2D5 & D2D6	<i>Extended travel – data halls and surrounding corridors, UPS battery rooms</i>	- Data halls - Immediate POC - Up to 64 m to the nearest exit - Up to 128 m between exits - Additionally, security measures prevent any re-entry into data halls such that travel back through the point of choice may not be available for occupants that have exited these rooms. - Corridors - Up to 92 m between exits	- Fire suppression system provided throughout the building. - AS1670.1 fire detection system provided throughout the subject data halls. - Where point-type detection is utilised, it shall be in accordance with spacing requirements in Section 5 of AS1670.1 in lieu of the DtS required sprinkler system only to satisfy the requirements of E2D9. - Noting that MASD is proposed to be utilised within the data halls in lieu of point type detection. - Increased compartmentation and additional fire/smoke compartmentation provided to alternative exits.
6	D2D5 & D2D6	<i>Extended travel – Generator gantries</i>	Generator gantries Up to 28 m to POC	- Low occupant numbers, as occupants are restricted to trained maintenance staff only. Workers are inducted and are present only to conduct maintenance related activities such as inspections. - The generator gantries shall be separated from the rest of the building by fire-resisting construction achieving minimum --/240/240 or 240/240/240 FRL.
7	D2D5 & D2D6	<i>Extended travel – Roof Plan Room & Roof Plant Deck</i>	- Roof Plan Room - Immediate POC - Up to 65 m to the nearest exit - Up to 130 m between alternative exits - Roof plant deck - Immediate POC - Up to 69 m to the nearest exit - Up to 137 m between alternative exits	- Sprinkler protected throughout - Low occupancy numbers (maintenance only) - Slab below roof plantroom achieves a minimum FRL of 240/120/120 - Roof plant rooms have mesh side and are freely vented as a function of their usage. - Roof plant deck is open to the sky on a fire rated roof. - Multiple exits available

#	DTS Provision	Title	Non-Compliance(s)	Proposed Performance Solution
8	D2D14	<i>Travel by non-fire-isolated stairways or ramps</i>	Travel via non-fire isolated exits from the Building 2 rooftop plant gantry floors to Level 3 below – exits do not provide a continuous path of egress to the level of road or open space.	- Low occupancy numbers (maintenance only) - Travel is across the fire rated roof which is open to the sky - Multiple fire isolated exits available off the roof.
9	E1D2	<i>Hydrant Coverage</i>	2 hose lengths from internal hydrant within a fire isolated stairs (60+10 m).	- Automatic fire suppression systems provided throughout. - Additional signage and floor specific block plans located at all internal hydrants and at the fire brigade booster assembly. - Increased fire and smoke compartmentation, providing flexibility in brigade operations when attacking a fire from a hydrant within a stair.
10	E1D2	<i>Hydrant System Design including coverage</i>	The AS2419.1:2021 standard is not directly applicable to Class 7b buildings greater than 108,000 m³ in volume.	- Hydrant system shall be designed and demonstrated as suitable for the specific building and application in accordance with the guidance in Appendix C of AS2419.1:2021 which pertains to hydrant system design for buildings exceeding 108,000 m³ in volume. - Extensive compartmentation both horizontally and vertically across the floor plate, thereby limiting compartment size.
11	E1D3	<i>Omission of FHRs</i>	Fire hose reels are proposed to be omitted from data halls and associated corridors area.	- Low occupant numbers in data halls, and associated corridors areas, and the provision of appropriate means of fire suppression for occupants (i.e. fire extinguishers). - Electrical equipment is present throughout the building and therefore presents a significant life safety risk if an occupant attempts to suppress a fire with water. - It is noted that fire hose reels are not required in Class 5 office spaces prescriptive - FHR to be provided to ground floor loading dock and BOH as prescriptively required.
12	E1D4	<i>Use of Water Mist System In lieu of Sprinklers to the Generator Enclosures</i>	The generator enclosures are proposed to be provided with alternative fire suppression by a high-pressure water mist system.	Reliant on the fire suppression capabilities of the water mist system to be equivalent to or no less effective than a DtS sprinkler design.

#	DTS Provision	Title	Non-Compliance(s)	Proposed Performance Solution
13	E1D4, E1D17, Spec 17	<i>Pre-action valve room location</i>	The pre-action valve rooms located on data hall levels above ground are not directly accessible to road or open space.	- Wet valves are located in DtS rooms on ground floor, readily accessible from open space. With only the dry valves located on the floors served - Dry valves are located in fire isolated enclosure access from the fire/smoke isolated corridors surrounding the data halls and are outside of the compartment served.
14	E1D2,E1D4	<i>Location of hydrant and sprinkler boosters</i>	Hydrant and sprinkler boosters are proposed to be located at the main vehicle entry to the site which is not insight of the main building entrance.	- A strobe light at the booster assembly. - Block plans at the main FIP of each building. - Proposed location is the main entrance to the site and as such the likely turnout location for FRNSW.

7. Conclusion

The fire safety strategy presented herein is considered capable of meeting the Performance Requirements of the BCA, subject to validation and verification of any assumptions made through detailed fire engineering analysis.

Through ongoing design development, the strategy proposed herein shall be amended and adapted based on consultation with the design team to develop the scope for the Fire Engineering Brief (Performance Based Design Brief), and ultimately for the Fire Engineering Report for Construction.

Contact



Sydney Office
Suite 401, Grafton Bond Building,
201 Kent Street, Sydney NSW 2000

Melbourne Office
Level 8, 805/ 220 Collins Street,
Melbourne VIC 3000

Email
sydney@coreengineering.om.au
ABN: 40 760 911 311