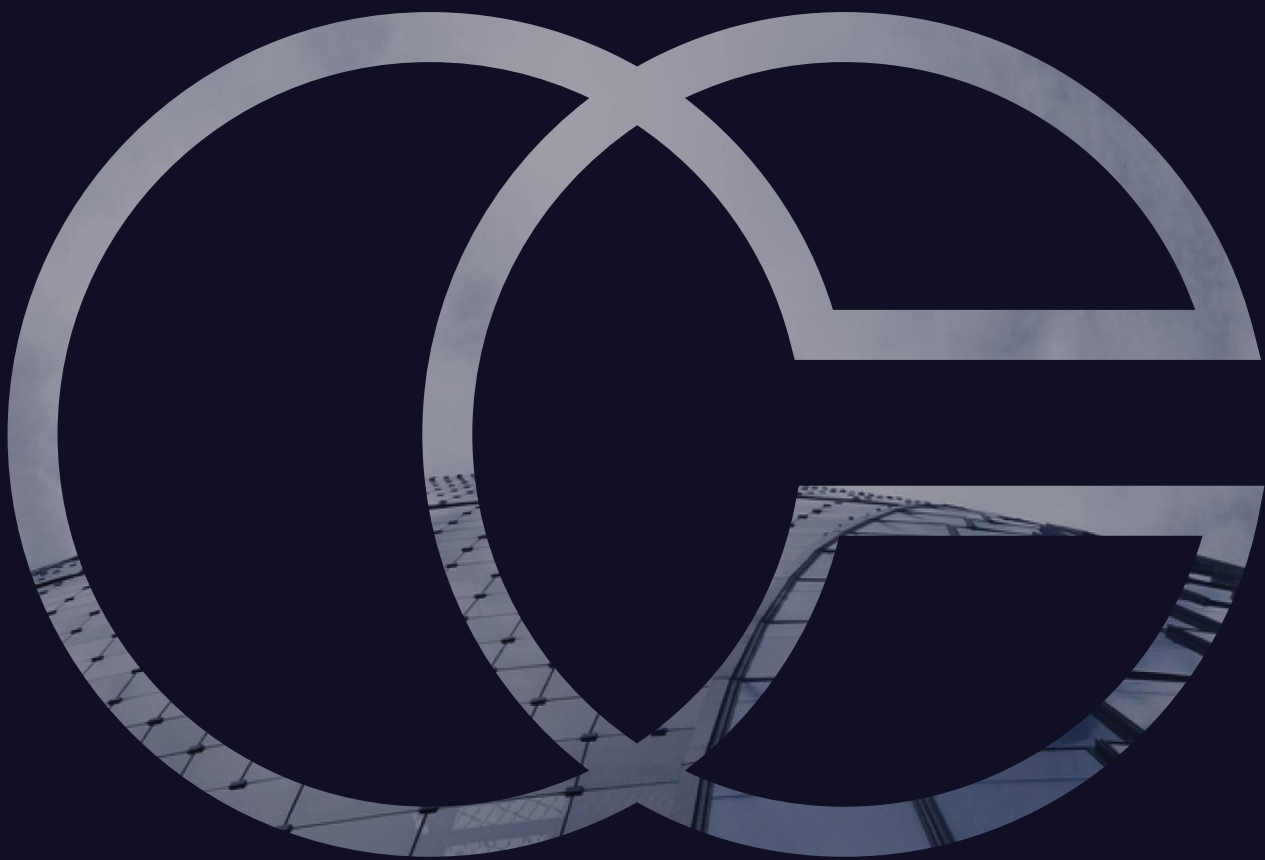




Leading the way with **fire safety**

Fire Safety Concept Strategy

Client: Mirvac

SEED Stage 1B
Warehouses 1,4,5,7,8 + Café

4 March 2026
Final Issue
Report No. F201608_1B_FSCS_03

1. Executive Summary

Elizabeth Drive Badgerys Creek. SEED Stage 1A includes site preparation works the bulk earthworks, road construction, construction and operation of two (2) warehouse buildings (Warehouses 2 and 6). Mirvac is seeking approval for a new DA for the construction and operation of Warehouses 1, 4, 5, 7 and 8, a café and regional stormwater basin at 1669-1723 and 1669A Elizabeth Drive Badgerys Creek. This forms the second stage of development works envisaged under the SEED Stage 1 Concept Proposal (SSD-19618251) and is referred to as the "SEED Stage 1B". A concurrent modification application to SEED Stage 1 Concept Proposal and SEED Stage 1A (SSD-19618251) is proposed to update civil design elements and to align with proposed design for SEED Stage 1B. The legal description of the site as it pertains to SEED Stage 1B is outlined below.

Property Address	Title Description
1669-1732 Elizabeth Drive, Badgerys Creek	Lot 100 in DP 1283398
1669A Elizabeth Drive, Badgerys Creek	Lot 741 in DP810111

This report has been prepared to address the Secretary’s Environmental Assessment Requirements (SEARs) issued (dated 8 December 2025) for the project (SSD-99079487).

The purpose of this report is to document the proposed holistic fire safety strategy for the building including the likely fire engineering trial design which has been established based on review of the proposed documentation, consultation with the client and relevant stakeholders and CORE Engineering Group’s previous experience.

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 identified departures from the DtS Provisions.

These are:

- C3D5 – Perimeter Vehicular Access (Warehouses 1/4/5/7/8)
- D2D5 – Office Travel Distance (Office 7B)
- D2D5, D2D6 – Extended Travel Distances (Warehouse 1)
- D2D5, D2D6, E2D10 – Extended Travel Distances and Rationalised Smoke Hazard Management (Warehouses 4/5/7/8)
- E1D2 – Fire Hydrant System Design (Warehouses 1/4/5/7/8)
- E1D3 – 50 m Fire Hose Reels (Warehouses 1/4/5/7/8)
- E1D4 – Location of Sprinkler Booster (Warehouses 1/4/5/7/8)
- E1D4 – Sprinkler Design to FM Guidelines (Warehouses 4/5/7/8)

The fire safety strategy presented herein is considered capable of meeting the Performance Requirements of the NCC, 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 Performance Based Design Brief, and ultimately for the Fire Engineering Report for Construction.

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2. Introduction

2.1 Overview

Mirvac is seeking approval for a new DA for the construction and operation of Warehouses 1, 4, 5, 7 and 8, a café and regional stormwater basin at 1669-1723 and 1669A Elizabeth Drive, Badgerys Creek. This forms the second stage of development works envisaged under the SEED Stage 1 Concept Proposal (SSD-19618251) and is referred to as the "SEED Stage 1B". The SEED Stage 1B Development seeks approval for the following:

- Construction of the following warehouse buildings for the purpose of warehouse and distribution centres (including warehouse building GFA, ancillary office GFA, hardstand areas for loading/unloading/vehicular manoeuvring and on-lot car parking):
 - Warehouse 1 (Lot 1) comprising 4,130sqm of GFA and 31 car parking spaces;
 - Warehouse 4 (Lot 4) comprising 8,990sqm of GFA and 55 car parking spaces;
 - Warehouse 5 (Lot 5) comprising 6,840sqm of GFA and 42 car parking spaces;
 - Warehouse 7 (Lot 7) comprising 40,410sqm of GFA and 183 car parking spaces;
 - Warehouse 8 (Lot 8) comprising 21,370sqm of GFA and 98 car parking spaces; and
 - Operating hours for Warehouse Buildings 1, 4, 5, 7 and 8 for 24 hours, 7 days a week.
- Estate café comprising 300sqm of GFA, 24 car supporting parking spaces as part of the Edge Amenity node. Operating hours for the Estate café from 5am to 5pm, 7 days a week;
 - Construction of Sydney Water Regional Stormwater Basin SC09 (through a Developer Works Agreement with Sydney Water Corporation (SWC) which will eventually be acquired by SWC);
 - Landscaping, including on-lot landscaping and amenity areas, street reserve landscaping and estate amenity nodes;
 - Construction of some new on-lot retaining walls to manage level differences between development lots; and
 - Estate wayfinding signage.

This proposal concerns the construction and operation of remaining warehouse buildings established under the SEED Stage 1 Concept Masterplan and further to the site preparation works approved under the Stage 1A Development approval.

Modifications to SEED Stage 1

- Re-distribution of warehouse and ancillary office GFA across Warehouse Buildings 1, 4, 5, 7 and 8 to align with the proposed SEED Stage 1B designs (net-zero change to the total GFA across these warehouse buildings);
- Minor increase to the café GFA by 150sqm for consistency with SEED Stage 1B requirements;
- Refinement to the approved levels and retaining walls for consistency with SEED Stage 1B requirements. This includes adjustment to Lot 8s FFL as well as refinements to the design of some approved retaining walls;
- Update to the cumulative stormwater management strategy for SEED to reflect changes to the intended development outcome at the Aspect Industrial Estate (AIE) site that is being progressed under a separate application; and
- An optional contingency to modify the interim evaporation basin within the SEED Stage 2 land.

The development sought as part of this proposal and the development under SSD-19618251 will deliver a unified, staged development of the overall Precinct.

2.2 Scope

The purpose of this report is to document the proposed holistic fire safety strategy for the building including the likely fire engineering trial design which has been established based on review of the proposed documentation, consultation with the client and relevant stakeholders and CORE Engineering Group's previous experience.

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 identified departures from the DtS Provisions.

2.3 Sources of Information

The following sources of information have been relied upon to develop this FSCS:

- National Construction Code, Volume 1 (2022 Amendment 2).
- Architectural package provided by Mirvac on behalf of SBA via email correspondence dated 18/02/26 and 04/03/26
- Pressure and flow enquiry provided by Mirvac via email dated 15/12/25
- Following BCA reports prepared by BM+G:
 - Warehouses 7/8, Report #250384, Rev 1 dated 18/11/25
 - Warehouses 1/4/5, Report #250384, Rev 0 dated 11/12/25.

2.4 Limitations, Assumptions and Exclusions

- 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 document has been prepared for guidance only, and any parties relying on this should be cognisant that the recommendations are preliminary and subject to detailed analysis and authority approvals.
- This report does not constitute a fire engineering report (FER) that addresses the Performance Requirements of the NCC.

3. Site Description

3.1 Site Context

The development site is located in Badgerys Creek, as shown in Figure 3-1. The site is located on Lot 100, DP1283398 and is bounded by Elizabeth Drive to the south. Note that the scope of the Stage 1B development is limited to Warehouses 1/4/5/7/8 and Café, as depicted in Figure 3-2. Note that all remaining warehouses as part of the masterplan development are not subject to this report.

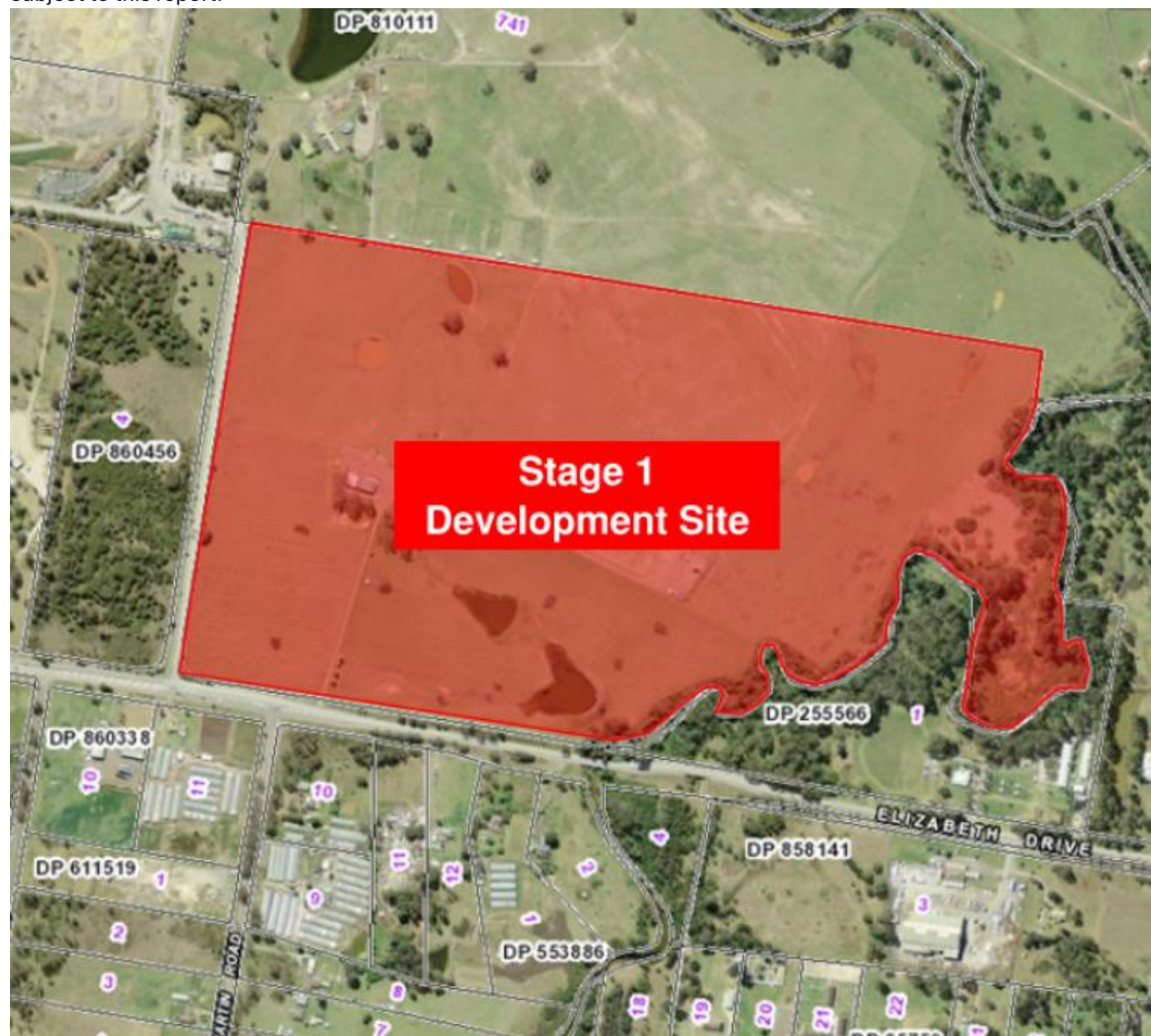


Figure 3-1: Development Site Context

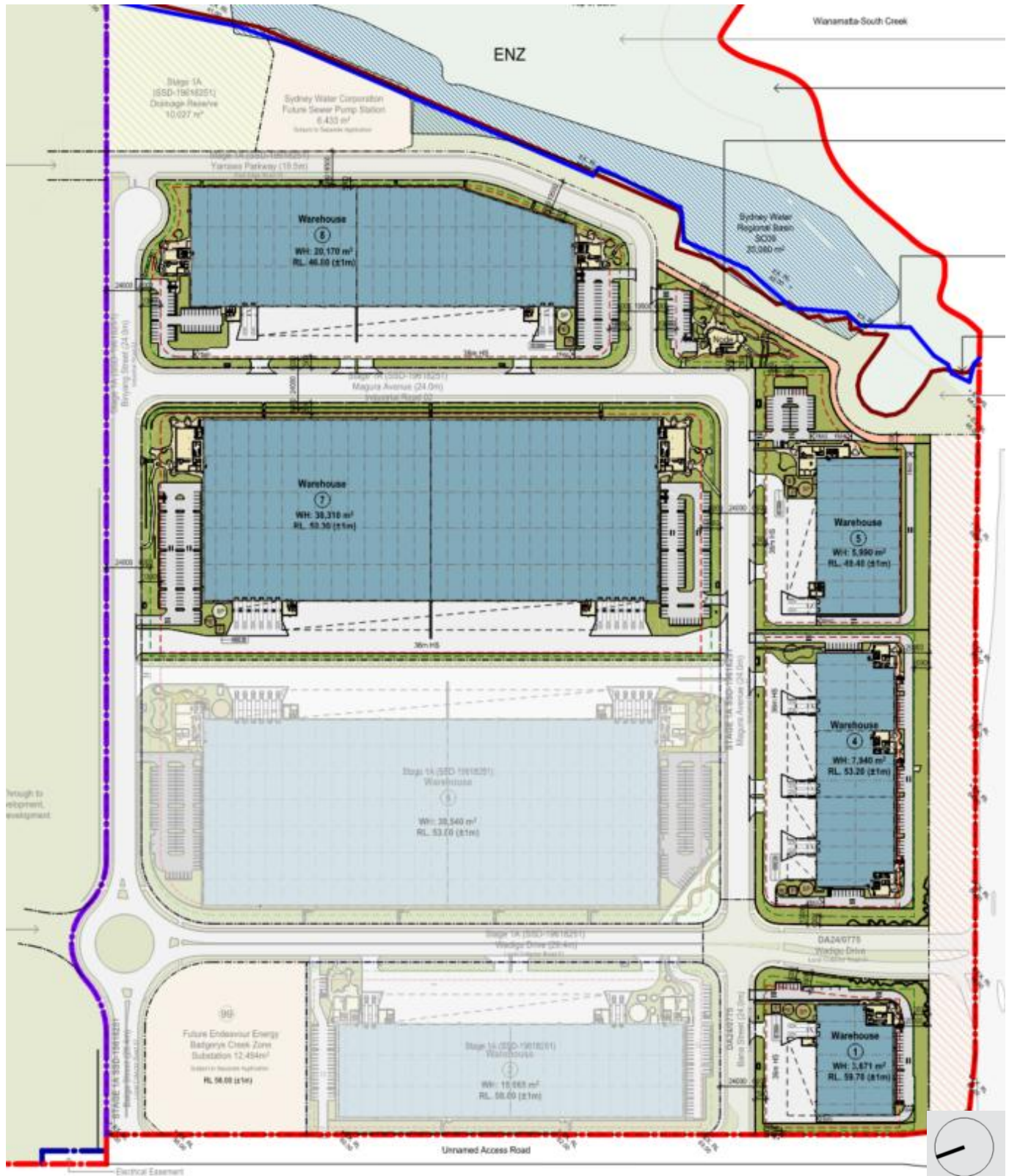


Figure 3-2: SEED Stage 1 Masterplan

- Warehouse 1 (Figure 3-3): Single tenanted 13.7 m ridge warehouse building served by ancillary two storey office to the south-east and loading docks, awnings and hardstands to the north.
- Warehouse 4 (Figure 3-4): Multi tenanted 13.7 m ridge warehouse containing Tenancy 4A to the west, Tenancy 4B centrally and Tenancy 7C to the east. All tenancies are served by two storey ancillary office to the south and loading docks, awnings and hardstands to the north.
- Warehouse 5 (Figure 3-5): Single tenanted 13.7 m ridge warehouse building served by ancillary two storey office to the north-east and loading docks, awnings and hardstands to the north-west.
- Warehouse 7 (Figure 3-6): Multi tenanted 14.6 m ridge warehouse containing Tenancy 7A to the north and Tenancy 7B to the south, with both tenancies served by two storey ancillary office to the north/south respectively and loading docks, awnings and hardstands to the west.
- Warehouse 8 (Figure 3-7): Multi tenanted 14.6 m ridge warehouse containing Tenancy 8A to the north and Tenancy 8B to the south, with both tenancies served by two storey ancillary office to the north/south respectively and loading docks, awnings and hardstands to the west.
- Café (Figure 3-8): Standalone single storey café. Note that as the Café is a single storey building provided in accordance with the DtS Provisions and shall therefore be excluded from the scope of this report.

The site plan illustrates the layout of Industrial Facility Warehouse 1, a large blue rectangular building measuring 3,671m². The building is oriented with its long side parallel to Wadigu Drive (26.4M) to the north and Bana Street (24.0M) to the west. The plan includes various setbacks: a 13m building setback to the north, a 7.5m building setback to the west, and a 5m building setback to the south. Landscaping setbacks of 6m and 2.5m are also indicated. The building features multiple exits, a dock office, a fire truck area, and a potential waste area. Surrounding the facility are roads including Wadigu Drive (26.4M), Bana Street (24.0M), and an unnamed access road. The plan also shows a potential future Elizabeth Drive widening and a truck entry point. Various utility features like pump rooms, potential booster tanks, and sprinkler tanks are marked. The site is bounded by a road boundary and a landscape boundary. The plan includes a north arrow and a scale bar.

Figure 3-3: Site Plan (Warehouse 1)

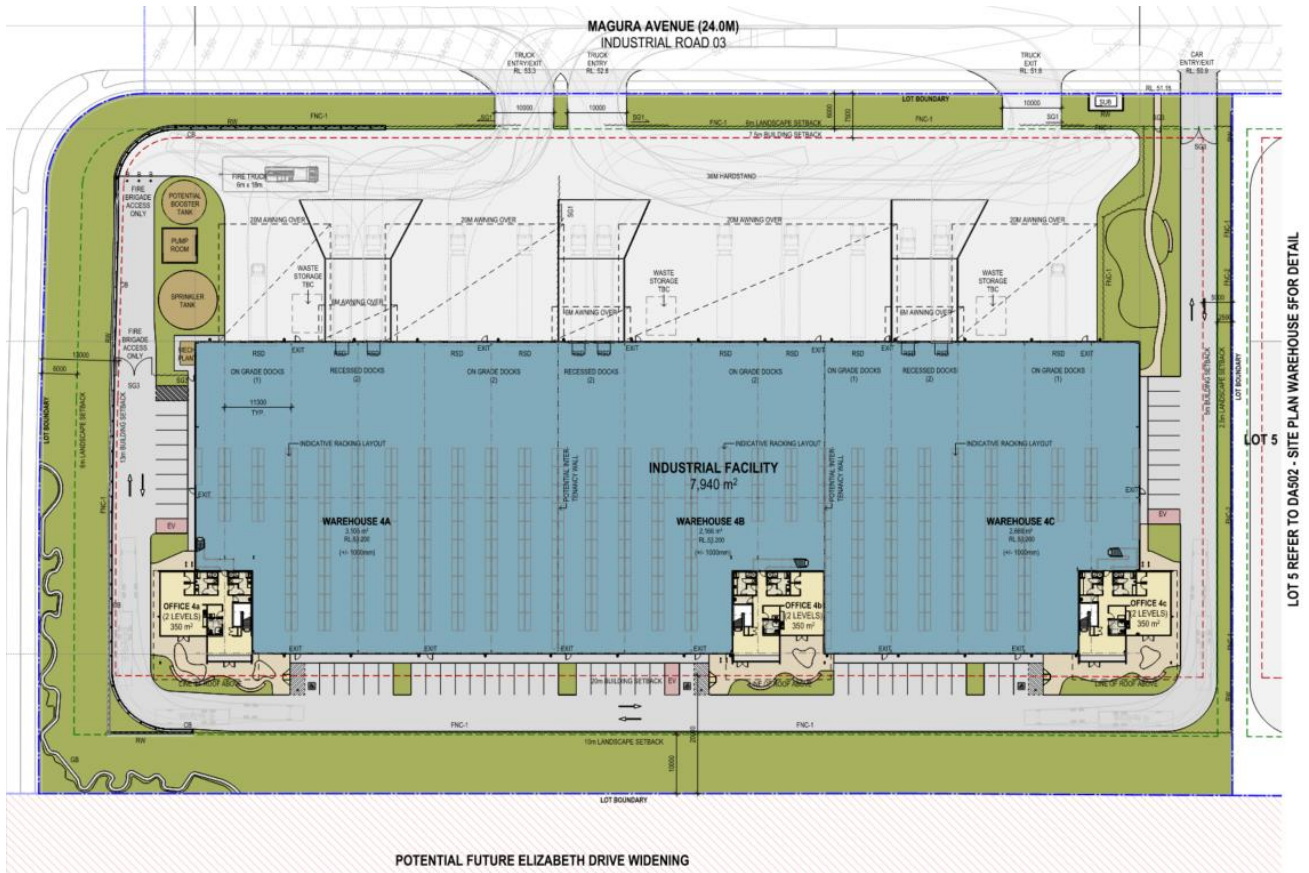


Figure 3-4: Site Plan (Warehouse 4)

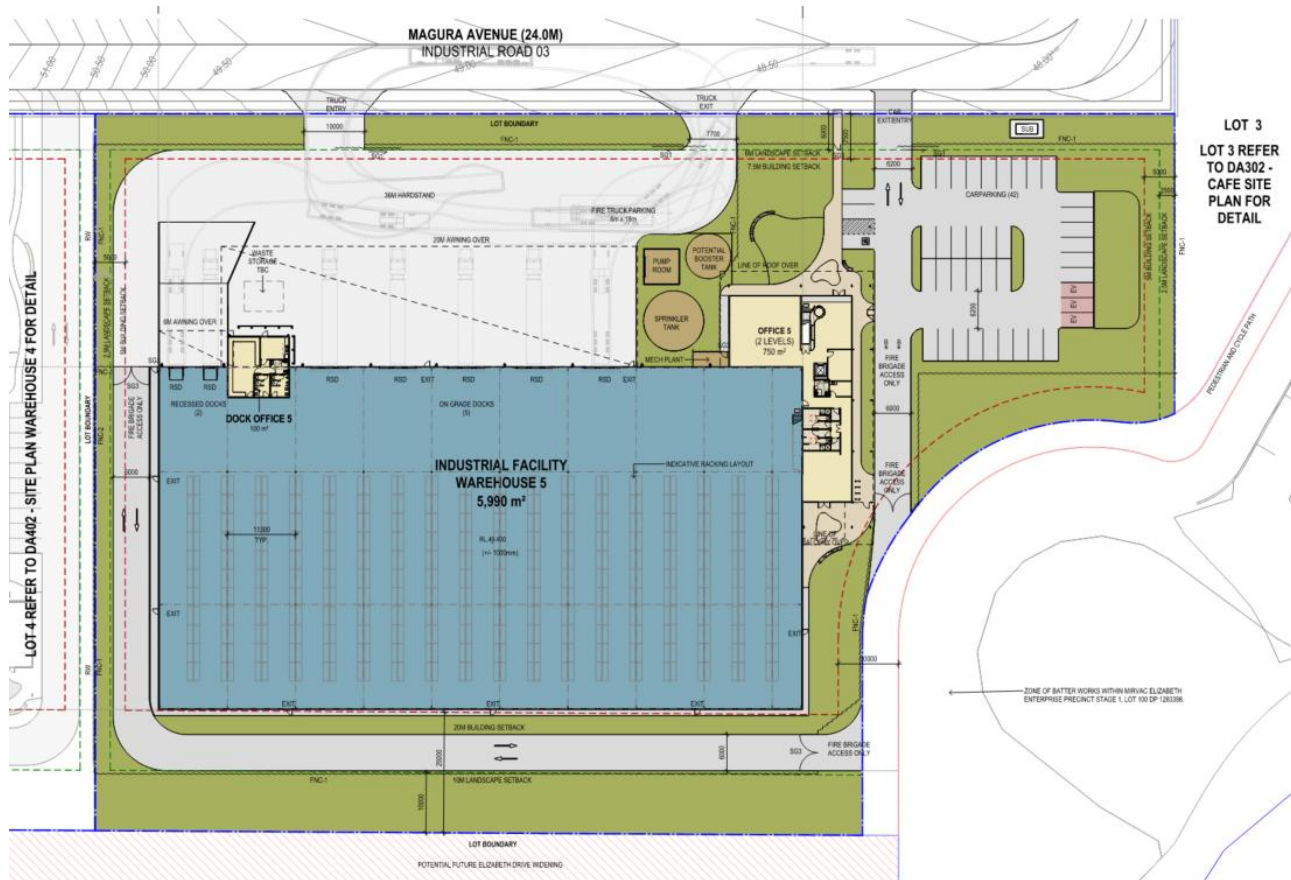


Figure 3-5: Site Plan (Warehouse 5)

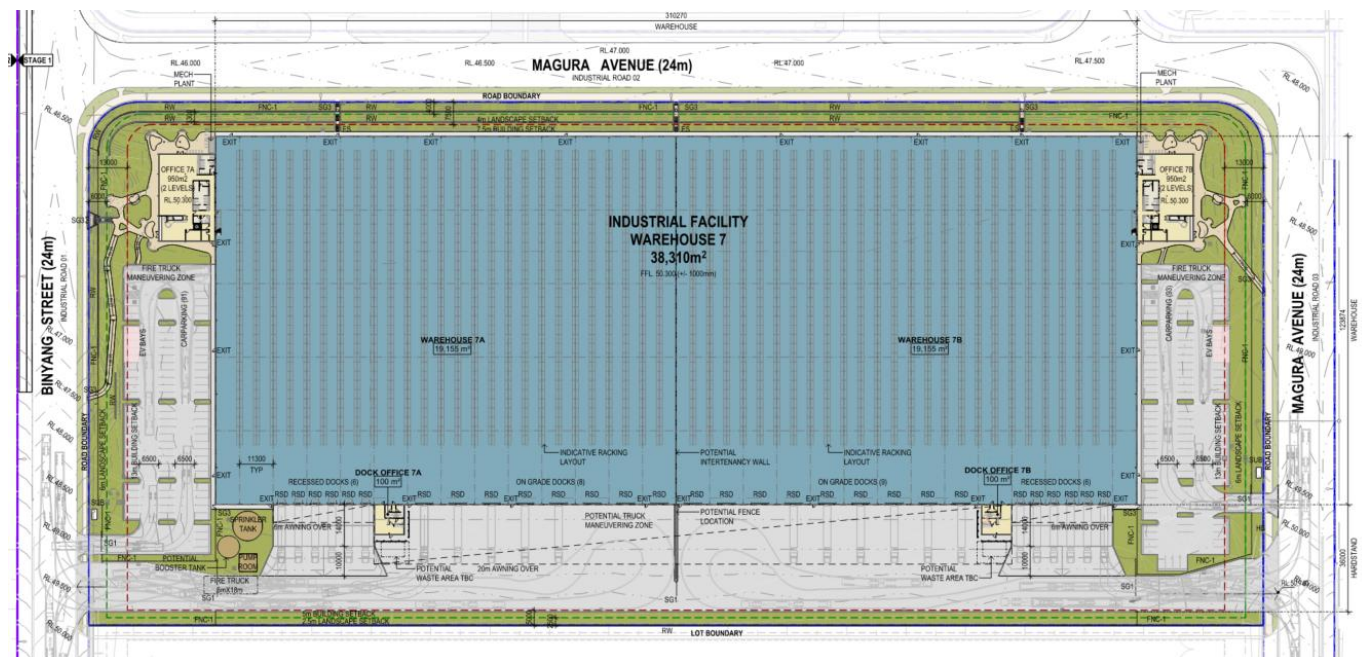


Figure 3-6: Site Plan (Warehouse 7)

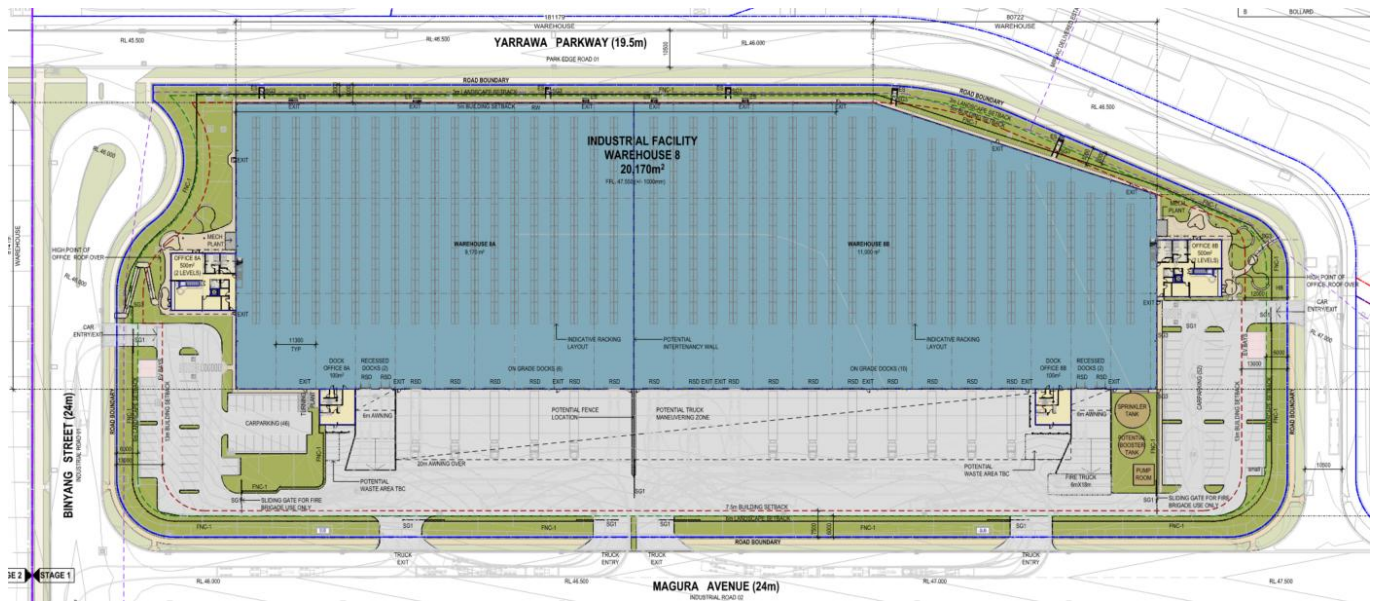


Figure 3-7: Site Plan (Warehouse 8)



Figure 3-8: Site Plan (Café) – DtS Compliance to be achieved

3.3 Fire Brigade Infrastructure

The following services shall be provided to facilitate brigade intervention for each of Warehouses 1, 4, 5, 7 and 8, as depicted in Figure 3-12 and Figure 3-13 below:

- Vehicular access around the perimeter of each facility, noting that this is also inclusive of additional external stairs/walkways along the eastern elevations of Warehouses 7/8 specifically.

- Dedicated hydrant booster assembly adjacent to main vehicular access point for each site.
- Sprinkler site infrastructure, inclusive of the following:
 - Pump room
 - Tank
 - Booster assembly and dedicated 6 m x 18 m brigade hardstand
- FDCIE at the Ground Floor entry to main pedestrian access point for each building.

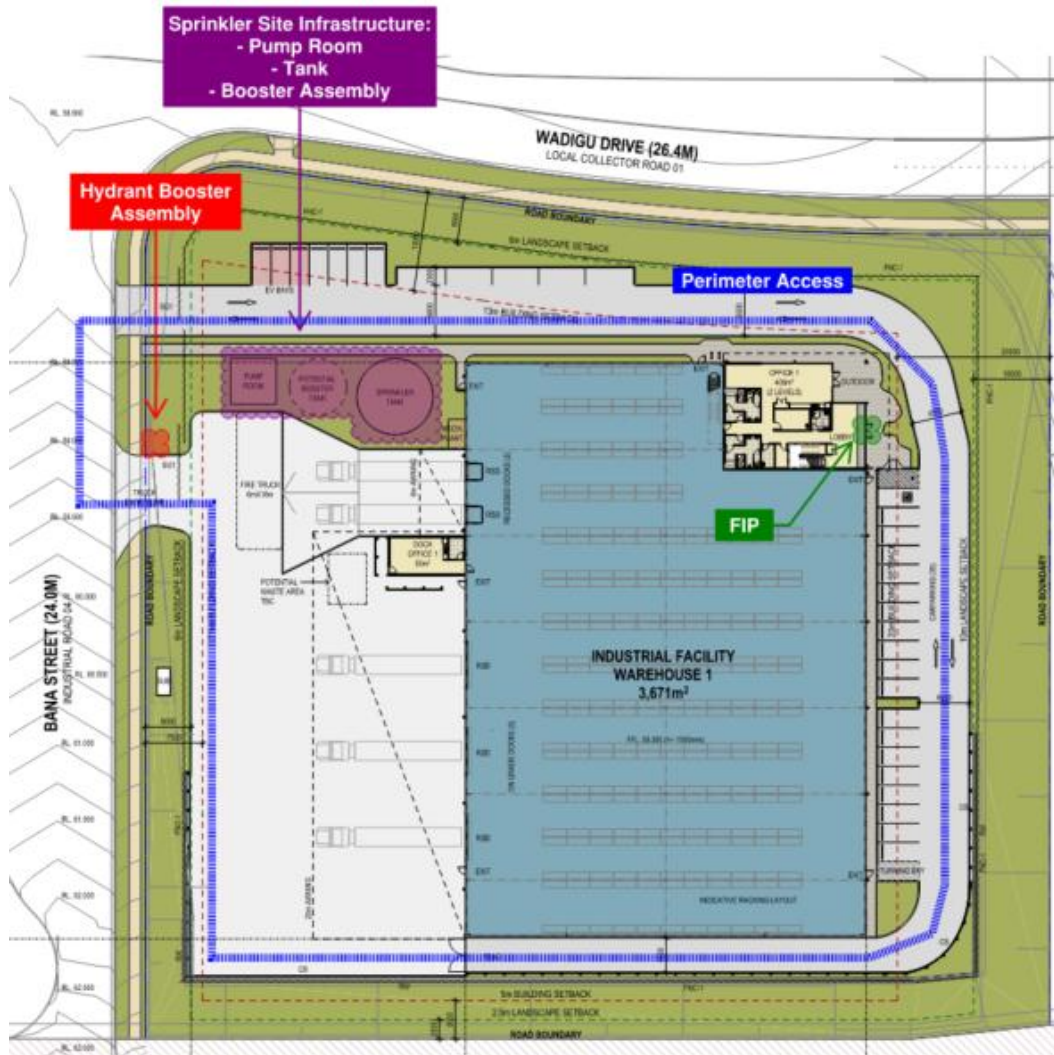


Figure 3-9: Fire Brigade Infrastructure (Warehouse 1)

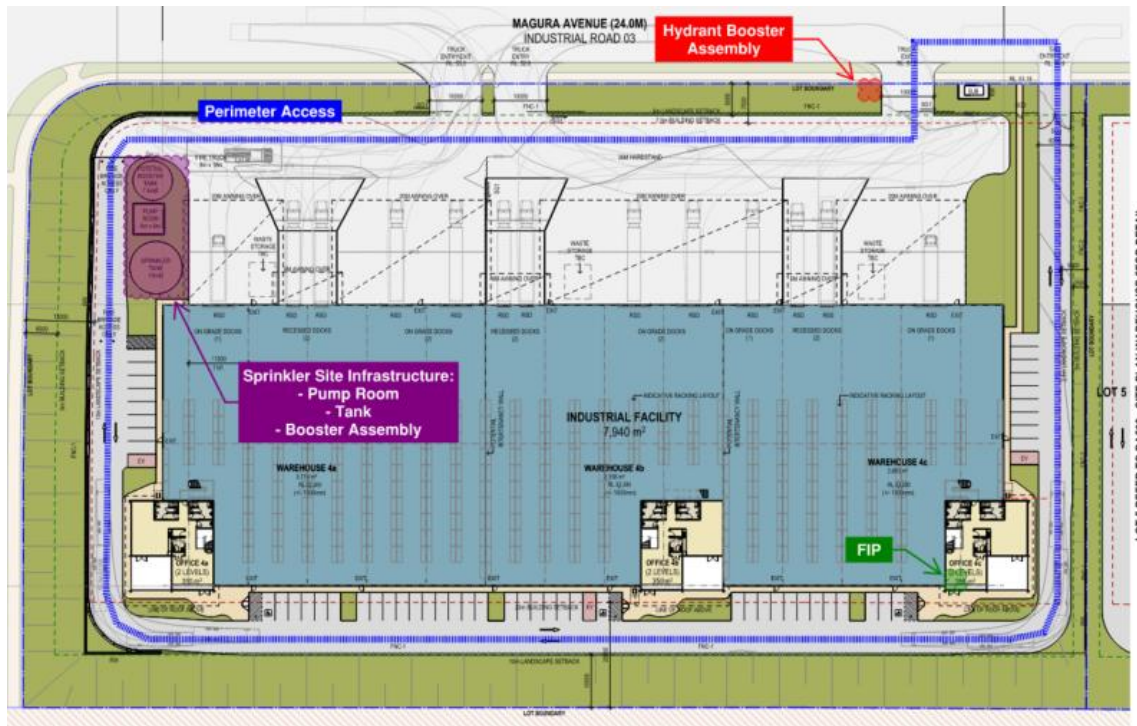


Figure 3-10: Fire Brigade Infrastructure (Warehouse 4)

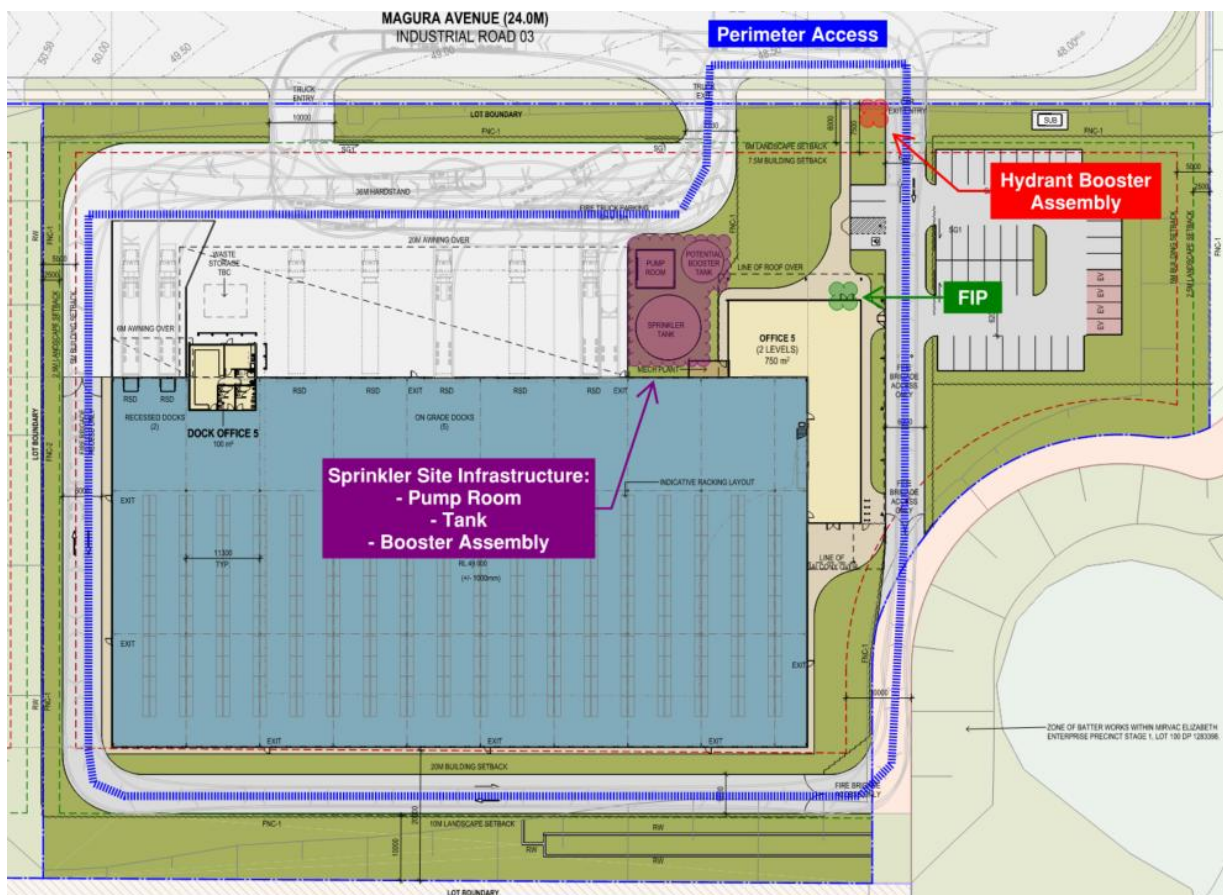


Figure 3-11: Fire Brigade Infrastructure (Warehouse 5)

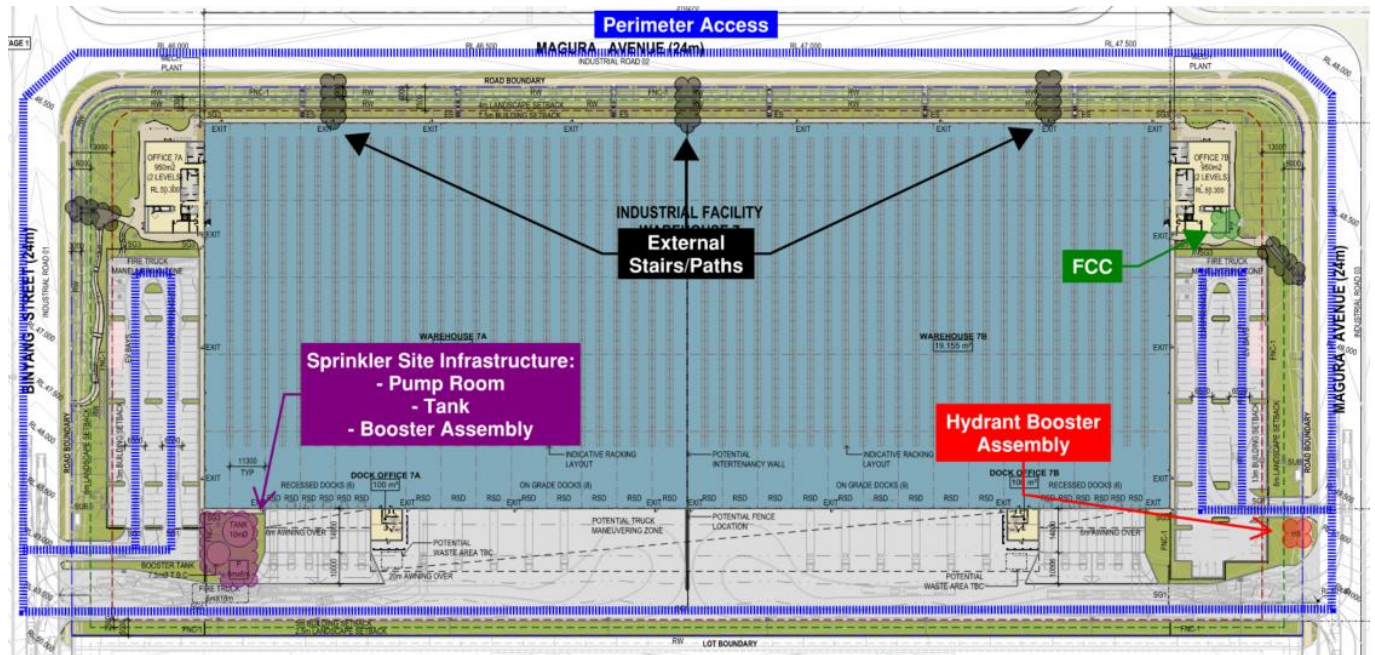


Figure 3-12: Fire Brigade Infrastructure (Warehouse 7)

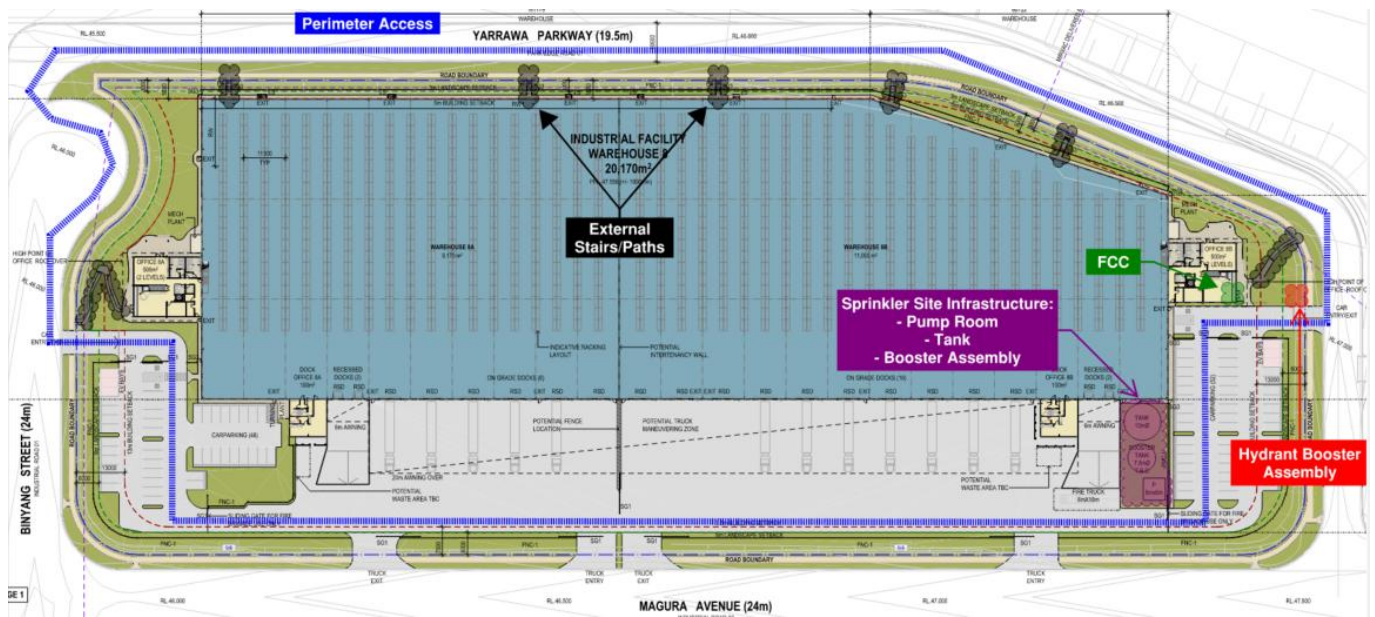


Figure 3-13: Fire Brigade Infrastructure (Warehouse 8)

3.4 Proposed Building NCC Characteristics

The NCC characteristics of the building influence the fire safety strategy and requirements. These characteristics are summarised in Table 3-1 based on the NCC report provided.

Table 3-1: NCC Building Characteristics (Warehouses 1,4, 5, 7 and 8)

NCC Characteristic	Subject Building
Classification(s)	Class 5 (Office) Class 7b (Warehouse) Class 10a (Pump room and tanks)
Number of storeys contained	Two (2)
Rise in storeys	Two (2)
Type of Construction	Type C (Large-isolated building)
Effective height	3.6 m
Maximum Fire Compartment Area	N/A – large isolated building provisions apply
Maximum Fire Compartment Volume	

3.5 Potential Fire Hazards Relevant to the Development

The development is likely to contain a number of fire hazards which will influence the fire safety strategy and measures required. These are documented below with the expected requirements to suitably mitigate the hazard. Addressing these hazards is not a Performance Solution however shall form part of the fire safety strategy to be agreed and accepted by the relevant stakeholders. At this preliminary stage the hazards on the following sections are expected, to be further developed through the following stages of the fire engineering approval process.

Note that the scope of the identified hazards is limited to base building only, with additional hazards (i.e. Dangerous Goods, ASRS, conveyors and the like) to be reviewed at fitout stage.

3.5.1 Substation

The substations serving each facility shall maintain a minimum separation distance of 10 m from all fire brigade infrastructure (e.g. fire hydrants, boosters).

The substations shall be constructed in accordance with the requirements of the relevant supply authority.

3.5.2 PV Cells

PV cells are proposed to the roof of each warehouse. 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 5033:2012.
- 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.

3.5.3 External Electric Vehicle Charging

A number of external electric vehicle chargers are anticipated to serve each 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 external 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.

3.5.4 Internal Material Handling Equipment (MHE) Charging

Forklifts within each facility may be powered by Li-Ion batteries, in which case, the guidance relevant to the external EV chargers is also generally applicable, with the following considering the internal location of these:

- Charging bays shall be positioned such that they are not located on any dead-end travel paths, and are greater than 3 m from building exit points.
- Charging bays should be located greater than 6 m from DG storage, BESS, solar panel inverters, gas pipework and the like.
- 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).
- The proposed charging bays should be located in an area served by an automatic smoke exhaust system (i.e. open to remainder of warehouse).
- Chargers shall be installed in accordance with AS3000, shall have RCM tick compliance, and where practical, smart charging shall be incorporated.
- If multiple chargers are proposed in close proximity to each other, a master isolation switch should be provided in an easily identifiable location, remote from the chargers.
- A block plan clearly identifying the location of each charger on site shall be provided adjacent to each fire panel as relevant. This plan should also show the location of master isolation switch and summarise shutdown procedures.

4. Proposed Fire Engineering Design Requirements

The below summarises the proposed fire engineering requirements likely to satisfy the Performance Requirements of the NCC. Where not specifically identified or noted, the remainder of the building elements is assumed to comply with the DtS Provisions of the NCC.

4.1 Fire Resistance

4.1.1 Structure and Compartmentation

Each building requires Type C construction and therefore no FRLs are required for structural elements. Furthermore, as a large-isolated building, each building is proposed to be a single fire compartment.

4.1.2 Perimeter Vehicular Access

A vehicle perimeter access pathway is required around each facility, constructed with an all-weather surface capable of supporting all FRNSW appliances in accordance with NCC Provision C3D4 and the FRNSW Fire Safety Guideline “Access for fire brigade vehicles and firefighters”.

The pathway must be at least 6 m wide and located within 18 m of the building on all sides, and provide continuous travel in a forwards direction around the building, with the following exceptions:

- Warehouse 1 (Figure 4-1): The perimeter access path is greater than 18 m from the building at the north-eastern corner. Furthermore, the perimeter access path has a reduced width no less than 4.5 m in lieu of 6 m along the western elevation.
- Warehouse 4 (Figure 4-2): The perimeter access path is greater than 18 m from the building at the north-eastern corner.
- Warehouse 5 (Figure 4-3): The perimeter access path is greater than 18 m from the building at the north-eastern corner. Furthermore, the perimeter access path requires travel across adjoining allotment along the south-eastern portion.
- Warehouse 7 (Figure 4-4): The perimeter access path is greater than 18 m from the building at the following locations:
 - Eastern elevation
 - North-western corner
 - South-western corner
- Warehouse 8 (Figure 4-5): The perimeter access path is greater than 18 m from the building at the following locations:
 - North-eastern corner
 - North-western corner
 - South-western corner
 - South-eastern corner

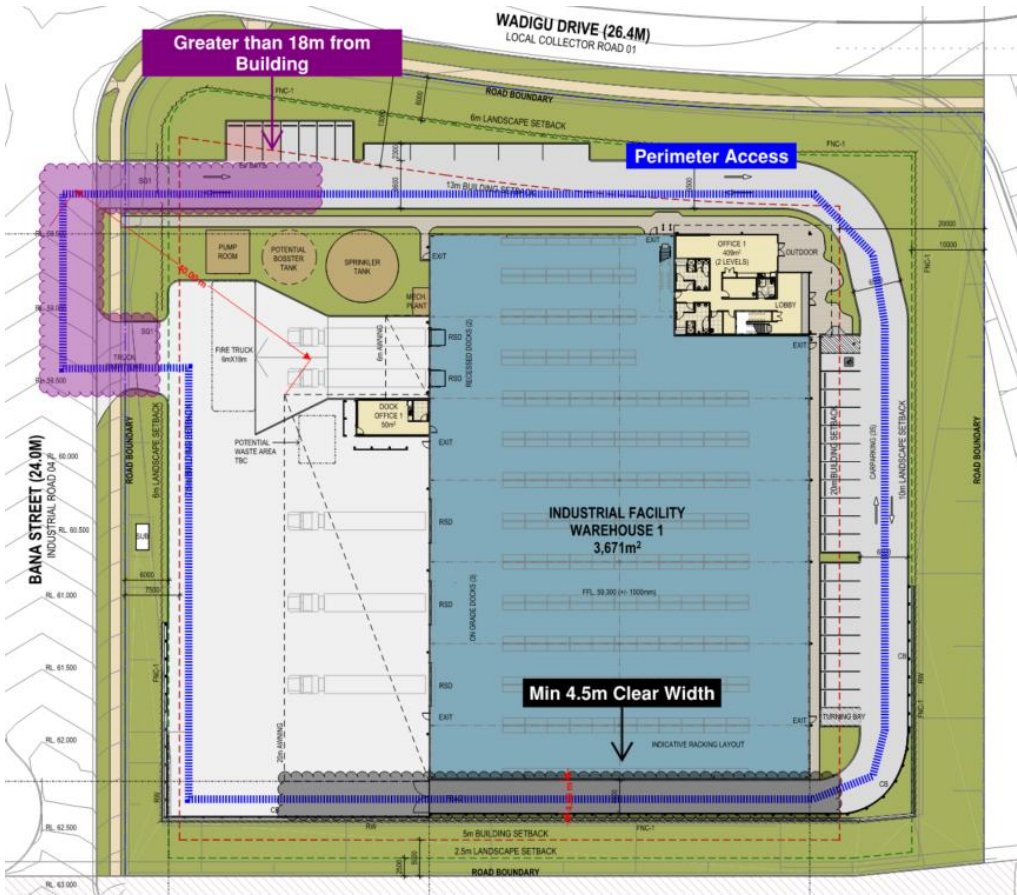


Figure 4-1: Perimeter Vehicular Access (Warehouse 1)

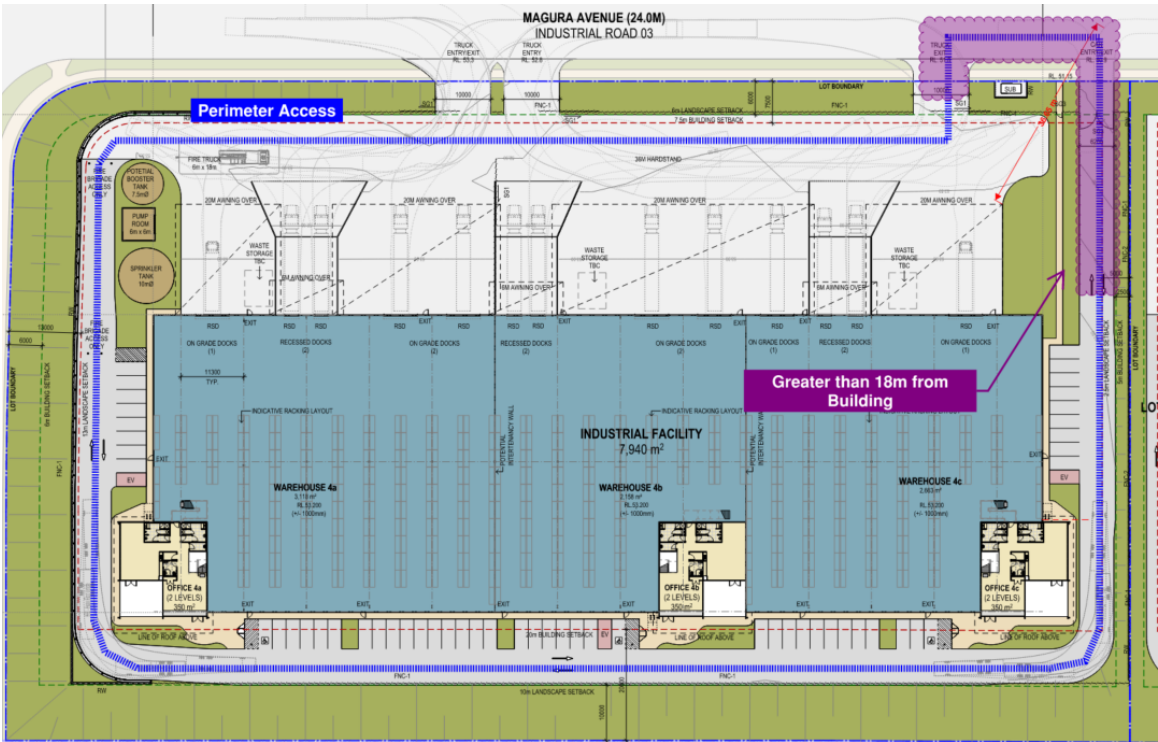


Figure 4-2: Perimeter Vehicular Access (Warehouse 4)

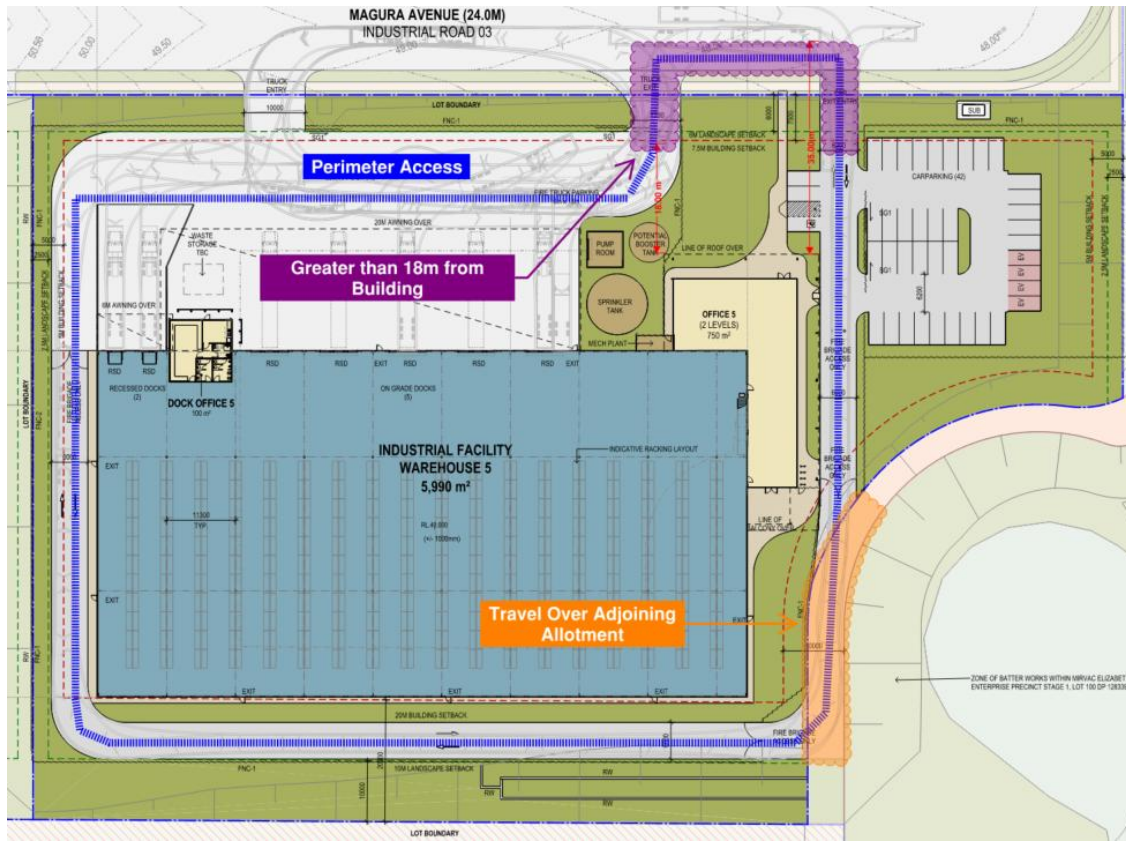


Figure 4-3: Perimeter Vehicular Access (Warehouse 5)

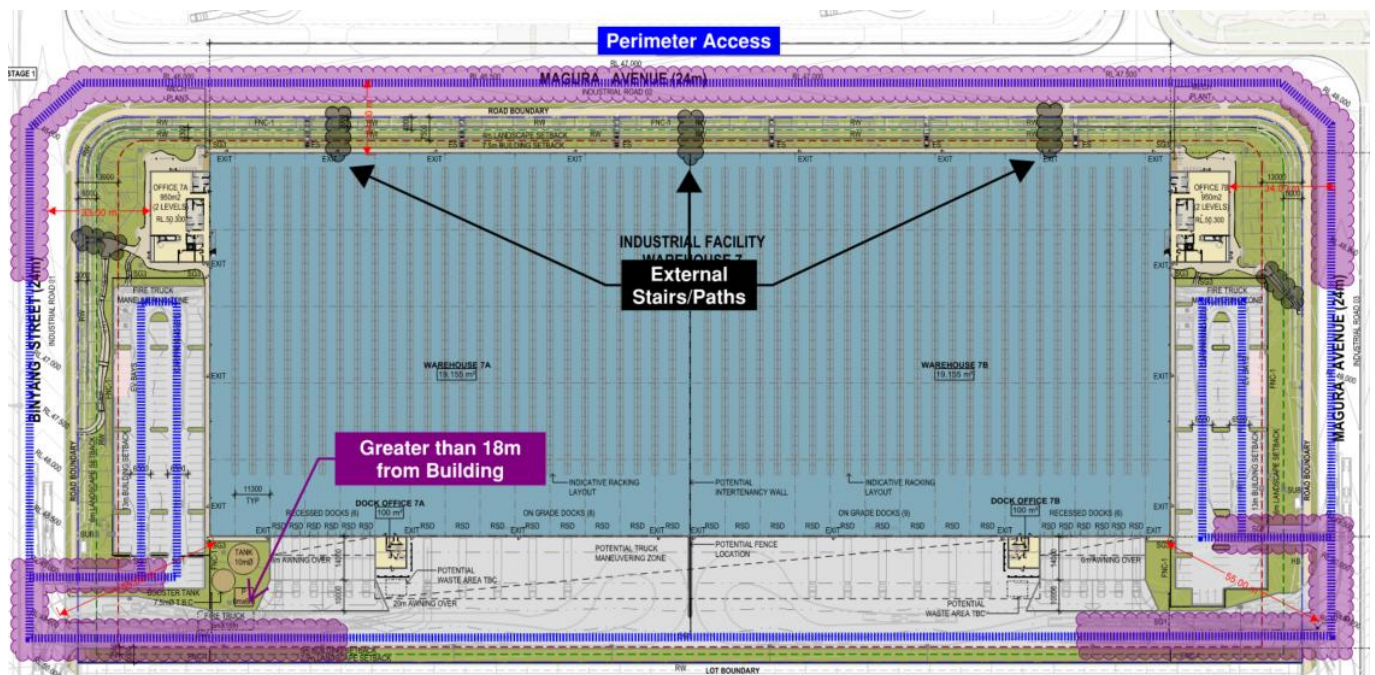


Figure 4-4: Perimeter Vehicular Access (Warehouse 7)

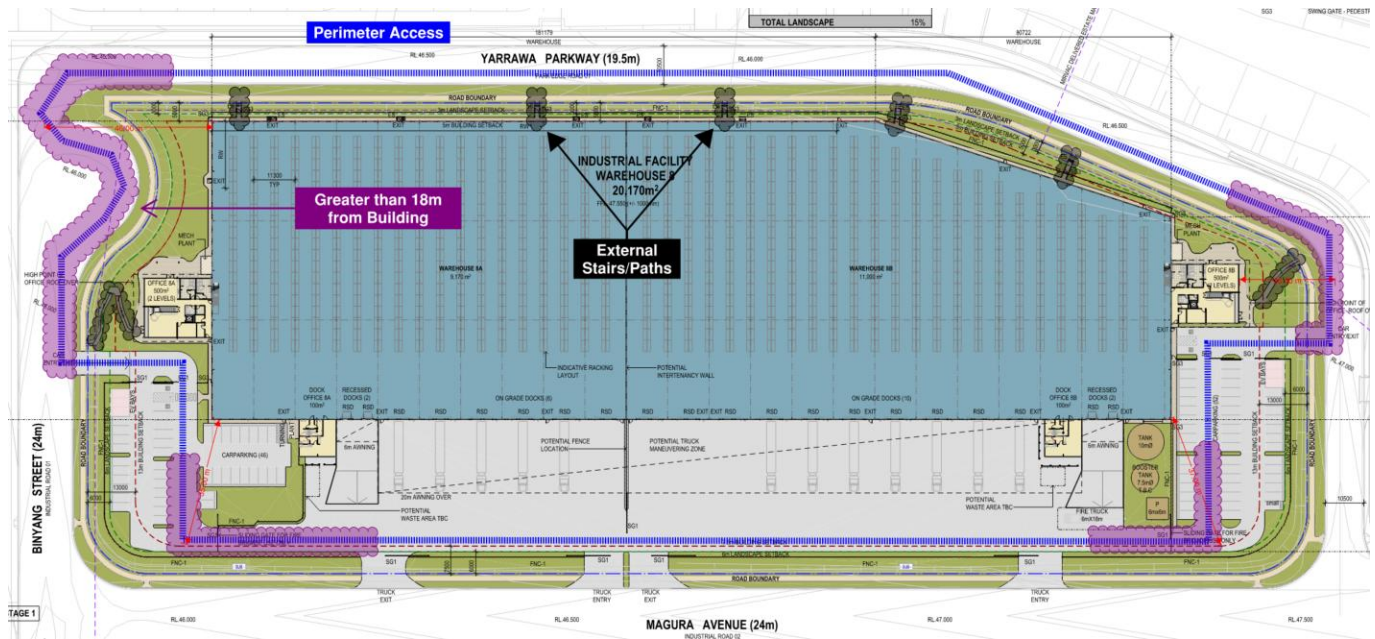


Figure 4-5: Perimeter Vehicular Access (Warehouse 8)

The following measures should be provided as part of the design and layout of each perimeter access pathway:

- The pathway shall have sufficient width, swept paths and loadbearing capacity to support the specialist brigade appliances to appropriately stage, as per FRNSW’s Guideline Clause 7 “Vehicle access requirements” and 9 “Weight and loads”.
 - This is inclusive of the carpark areas, as depicted in Figure 4-4 and Figure 4-5 above.
- Areas where the pathway is greater than 18 m from the building is generally along the main road with limited obstructions, barring landscaping, affecting visibility of the building.
 - Specifically for Warehouses 7/8, external stairs/pathways shall be provided to ensure adequate access to the building from the perimeter access path (Section 4.3.1).
- Brigade appliances are provided with a dedicated bay to connect to the available sprinkler tank suction connections and otherwise set up their appliances, such that the circulation of other emergency vehicles is not hindered by the connected appliance. Line marking areas shall be provided for these designated spaces to ensure that they are not otherwise occupied.
- Gates in the perimeter access path to be on loose chain openable by 003 key, auto unlatch on fire trip, or copies of keys and swipes provided to the two local fire brigade stations.
- Staging opportunities generally provided in proximity to all four corners of each building.
- Specifically for Warehouse 1, minimum 4.5 m clear width shall be provided from warehouse external wall (including downpipes) to armco barrier.
- Specifically for Warehouse 5, south-eastern portion shall be of clear and obvious hardstand material (i.e. asphalt or concrete).
 - Should this area be privately owned, appropriate legal instruments shall be implemented to ensure adequate access provided for lifetime of subject building.

4.2 Egress

4.2.1 Travel Distances (Warehouse)

Due to the size of the warehouse, travel distances exceed the DtS limitations of 40 m to the nearest exit and 60 m between alternative exits, being approximately:

- Warehouse 1 (Figure 4-6): Up 80 m between alternative exits

- Warehouse 4 (Figure 4-7): Up to 45 m to nearest exit and 90 m between alternative exits
- Warehouse 5 (Figure 4-8): Up to 45 m to nearest exit and 90 m between alternative exits
- Warehouse 7 (Figure 4-9): Up to 90 m to nearest exit and 180 m between alternative exits
- Warehouse 8 (Figure 4-10): Up to 70 m to nearest exit and 140 m between alternative exits

Note that the above travel distances consider travel beneath warehouse awnings.

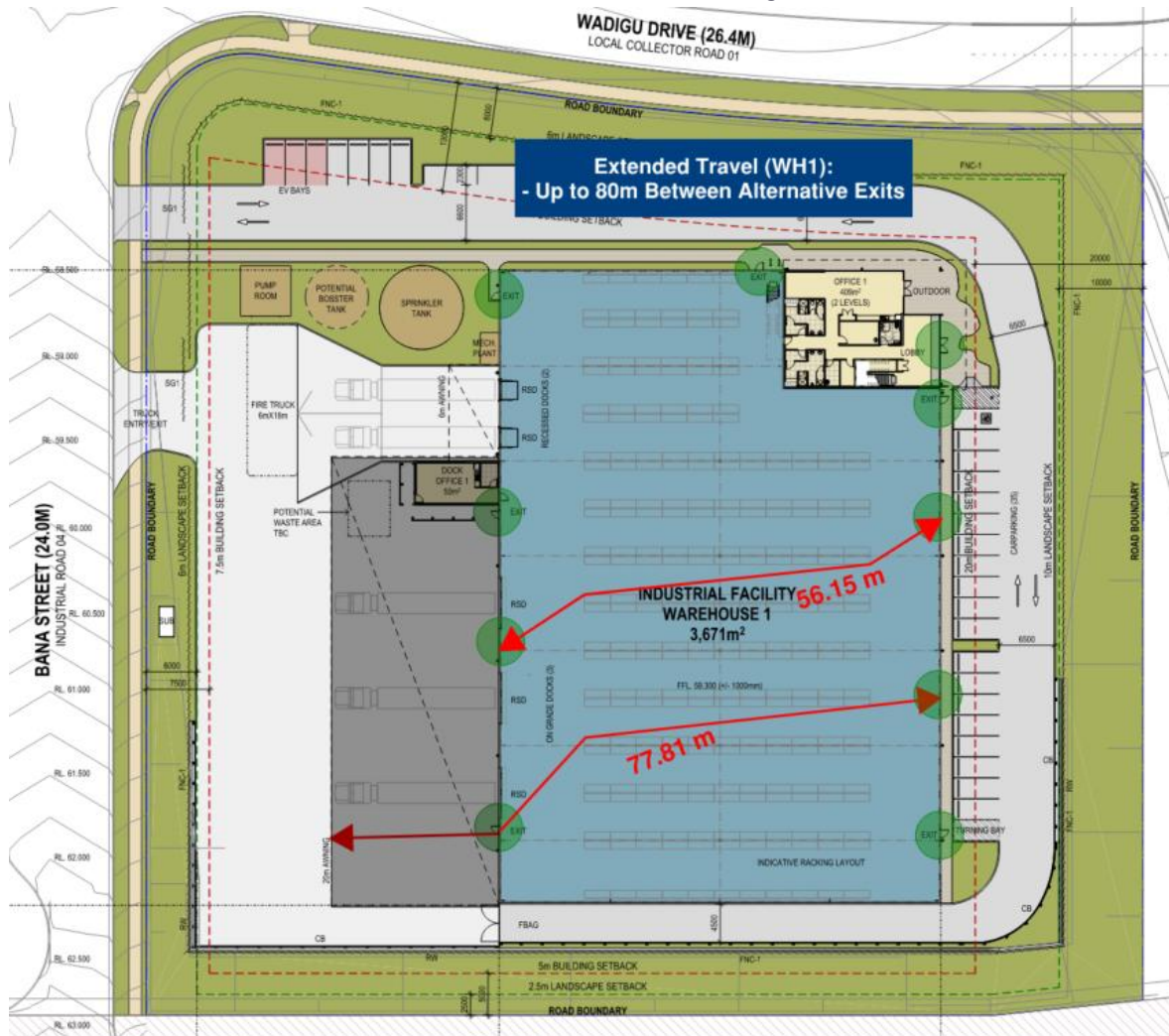


Figure 4-6: Warehouse Travel Distances (Warehouse 1)

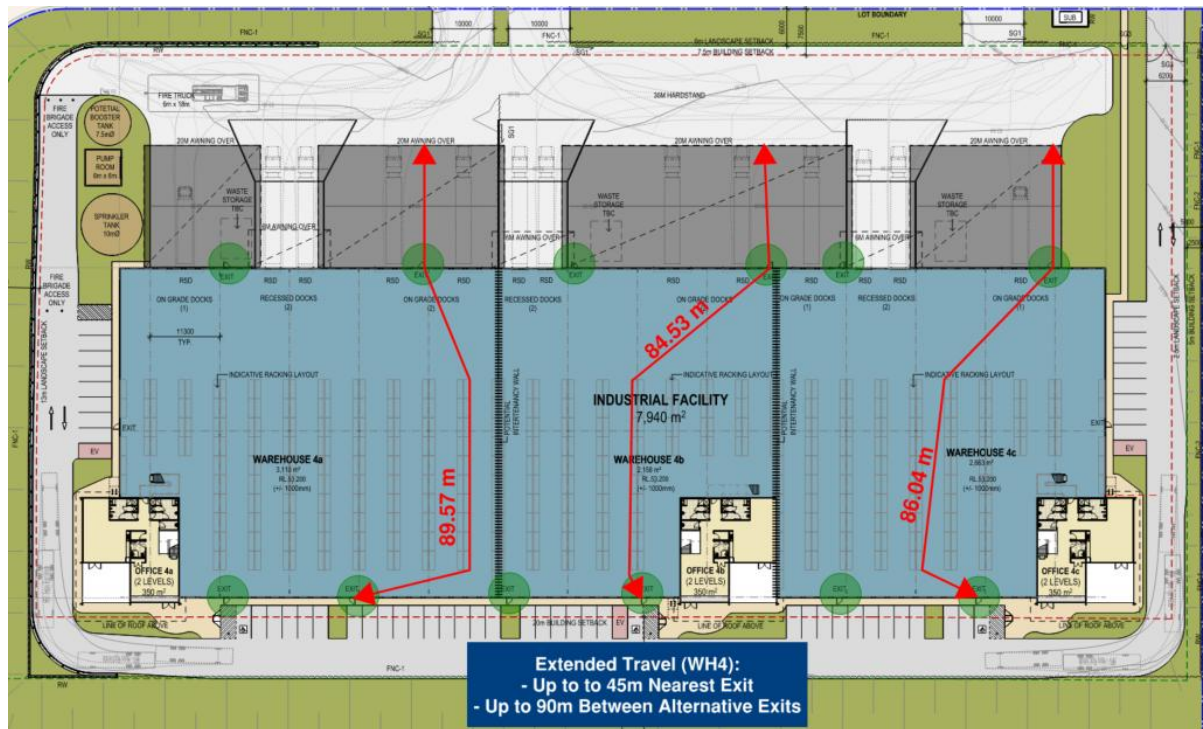


Figure 4-7: Warehouse Travel Distances (Warehouse 4)

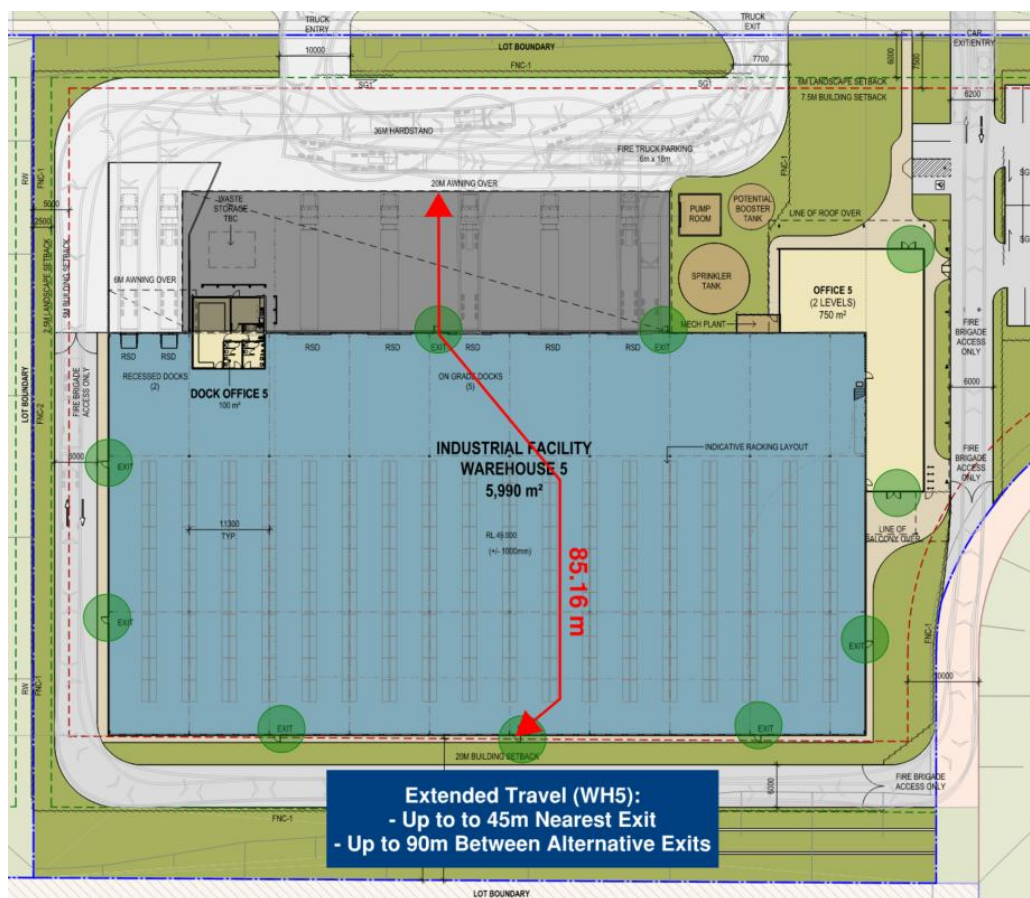


Figure 4-8: Warehouse Travel Distances (Warehouse 5)

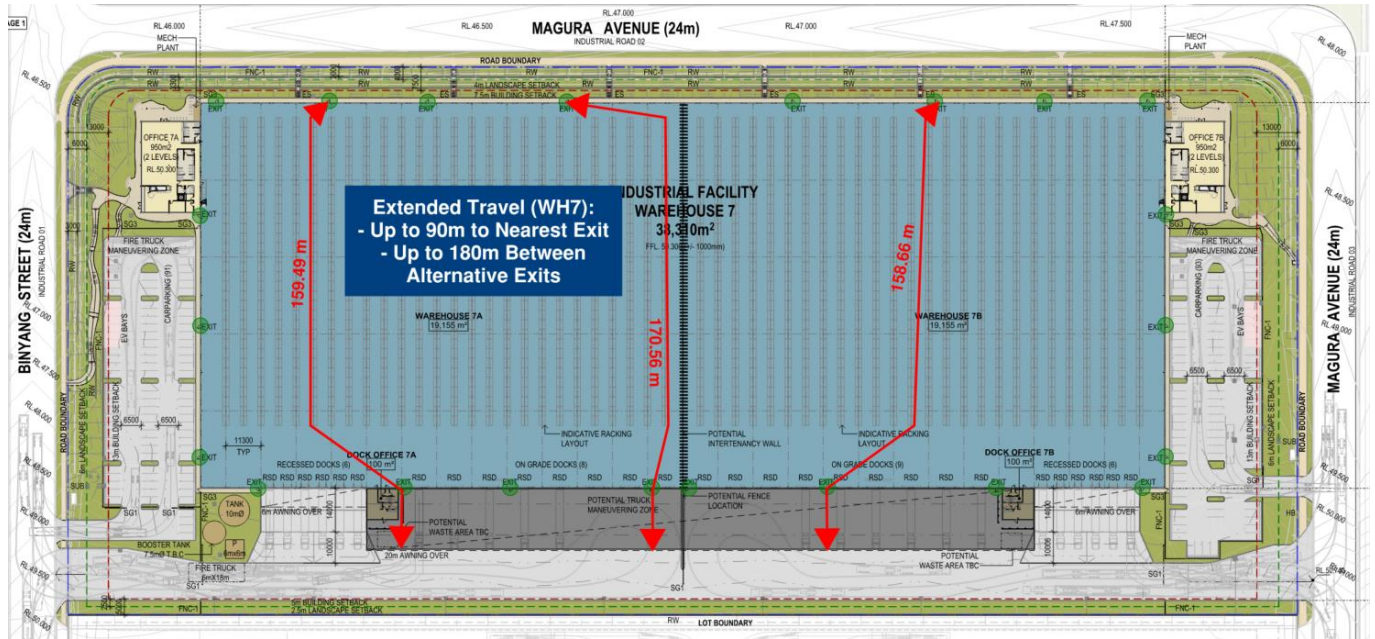


Figure 4-9: Warehouse Travel Distances (Warehouse 7)

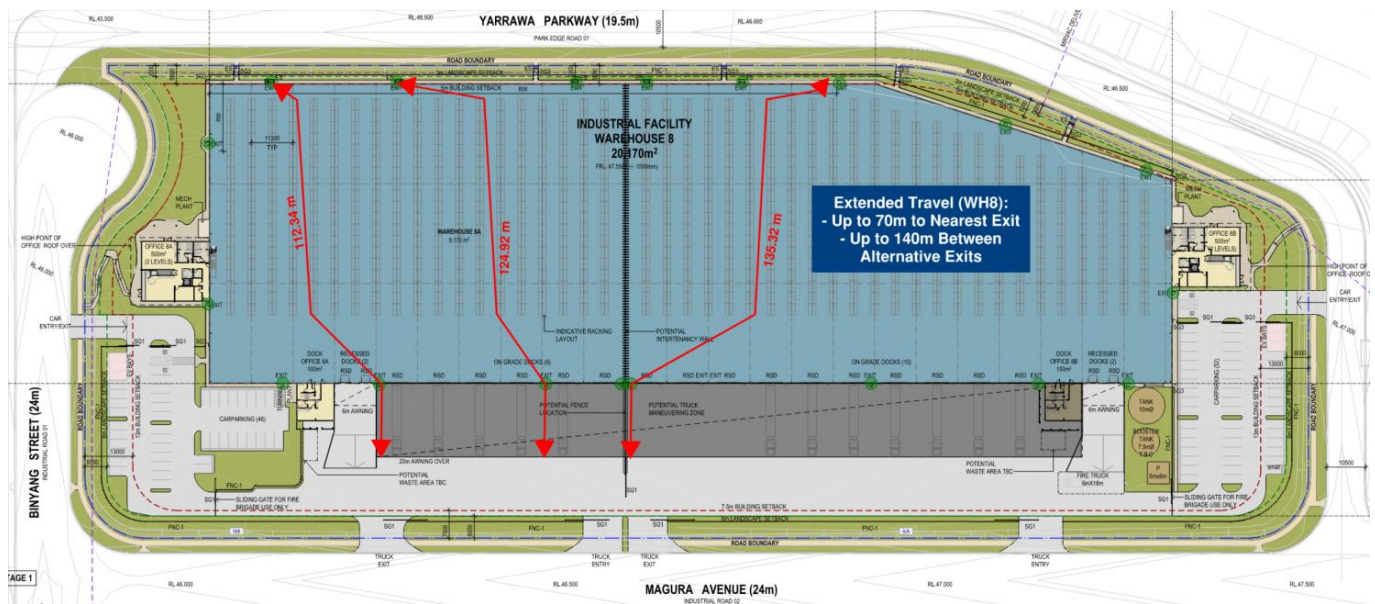


Figure 4-10: Warehouse Travel Distances (Warehouse 8)

A Performance Solution is proposed for Warehouse 1, reliant on internal travel distances in accordance with DtS Provisions of the NCC. For all remaining enclosures the Performance Solution shall rely on the large enclosure volume and sprinkler system present to demonstrate that despite the extended distances, occupants are provided with tenable conditions for evacuation.

Specifically for Warehouse 4, smoke detection may be required at warehouse roof level in accordance with Section 7 of AS1670.1:2018 (max 15 m grid) however, is subject to detailed CFD analysis.

4.2.2 Travel Distances (Office)

Travel distances in all offices appear capable of compliance with the DtS Provisions based on minimum two exit stairs provided.

This is with the exception of Office 7B (Level 1), where there is up to 27 m to a point of choice (Figure 4-11). This can be supported via Performance Solution, reliant on smoke detection provided throughout Office 7B, in accordance with Section 5 of AS1670.1:2018 (max 10 m grid).

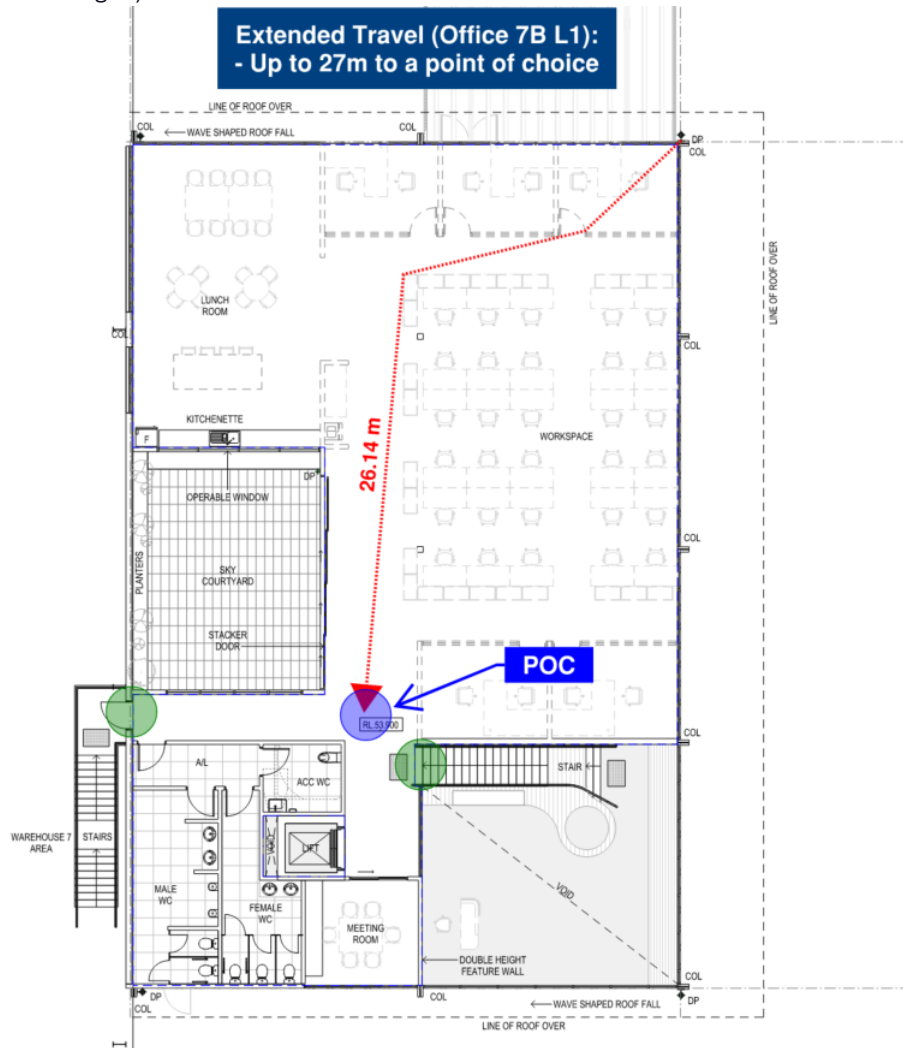


Figure 4-11: Office Travel Distances (Office 7B – Level 1)

4.3 Fire Fighting Equipment

4.3.1 Fire Hydrant System

A fire hydrant system must be provided for the subject warehouses in accordance with NCC Provision E1D2 and AS2419.1:2021. On the basis that all buildings with the exception of Warehouse 1 exceed 108,000 m³, they are not prescriptively within the scope of AS2419.1:2021 and are therefore subject to a Performance Solution.

Wherever possible, the hydrant system should comprise external hydrant points. However, due to the size of Warehouse 7, internal fire hydrants are also required. These internal hydrants shall be located more than 4 m from an exit and therefore do not prescriptively comply with Clause 3.6.2 of AS2419.1:2021. Notwithstanding this, this hydrant layout shall facilitate the progressive movement of firefighters towards the central parts of the building.

- The travel distance from an external hydrant to the first internal hydrant in the building shall not exceed 50 m

- The travel distance from each internal hydrant to the next internal hydrant required for coverage shall not exceed 25 m.
- An external hydrant should be provided adjacent to or within close proximity of each external entry/exit point around the building as required for coverage.

Additional requirements for the design of the fire hydrant system include the following:

- Specifically for Warehouses 7/8, external hydrants must have a travel path to the road, hardstand, or carriageway of less than 50 m.
- Hydrants located beneath the warehouse awnings, although considered internal hydrants in accordance with AS2419.1:2021, shall be designed and treated as external hydrants for coverage of the internal warehouse parts.
 - Hydrant coverage of the area below the awnings should be provided by additional, or alternative hydrants which are not located beneath the awnings.
- The system should incorporate a ring main with isolation valves that are external to each building and numbered with the corresponding numbers indicated on the block plan at the booster assembly.
- 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.
- Dedicated hydrant booster assembly adjacent to the primary vehicular access point and within the sight of the main building entry, and shall be located at least 10 m away from substations or other electrical hazards.
- Appendix C of AS2419.1:2021 shall be considered and implemented in the hydrant design. This shall include full duty pumps.
- With the exception of Warehouse 1 which is permitted to be served by minimum 2 hydrants to operate simultaneously (i.e. 20 L/s), the design capacity of all remaining systems shall be capable of allowing minimum 3 hydrants to operate simultaneously (i.e. 30 L/s) as per Appendix C of AS2419.1:2021.

Conservatively, spatial provision has also been made for a hydrant tank adjacent to the sprinkler infrastructure serving each site, should this be required (Figure 3-12, Figure 3-13:). Based on the pressure/flow enquiry provided for Lot 7 dated 12/12/25 (Application #2236400), sufficient flow/pressure is expected to serve all sites on the estate without the implementation of additional hydrant tanks.

However, at the time of construction, an additional pressure/flow enquiry is required to be lodged with Sydney Water to verify the available pressure and flow, noting that this updated application may be subject to change.

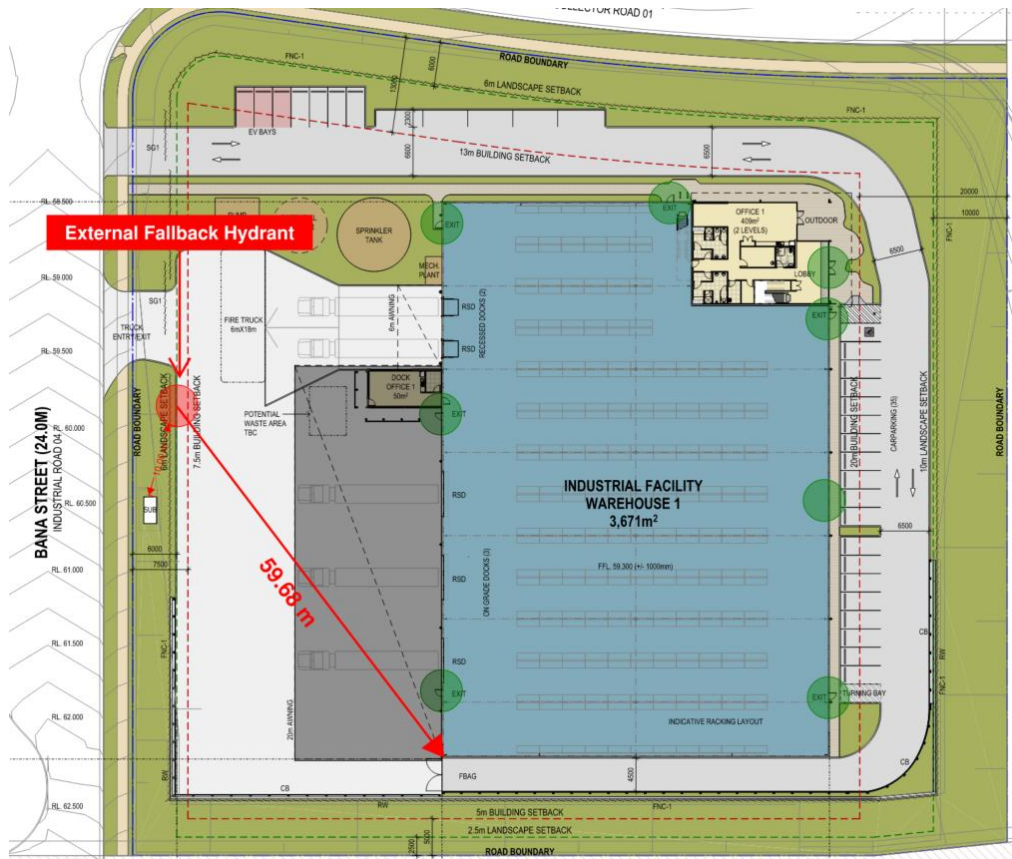


Figure 4-12: Hydrant Strategy (Warehouse 1)

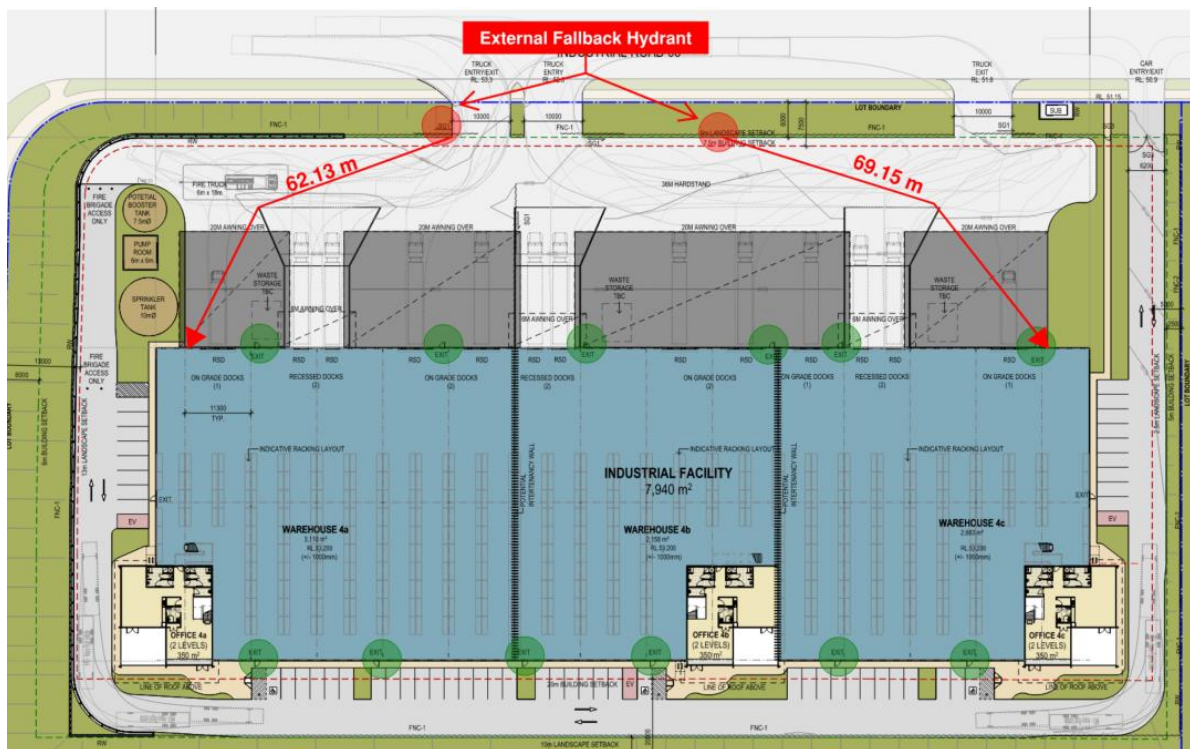


Figure 4-13: Hydrant Strategy (Warehouse 4)

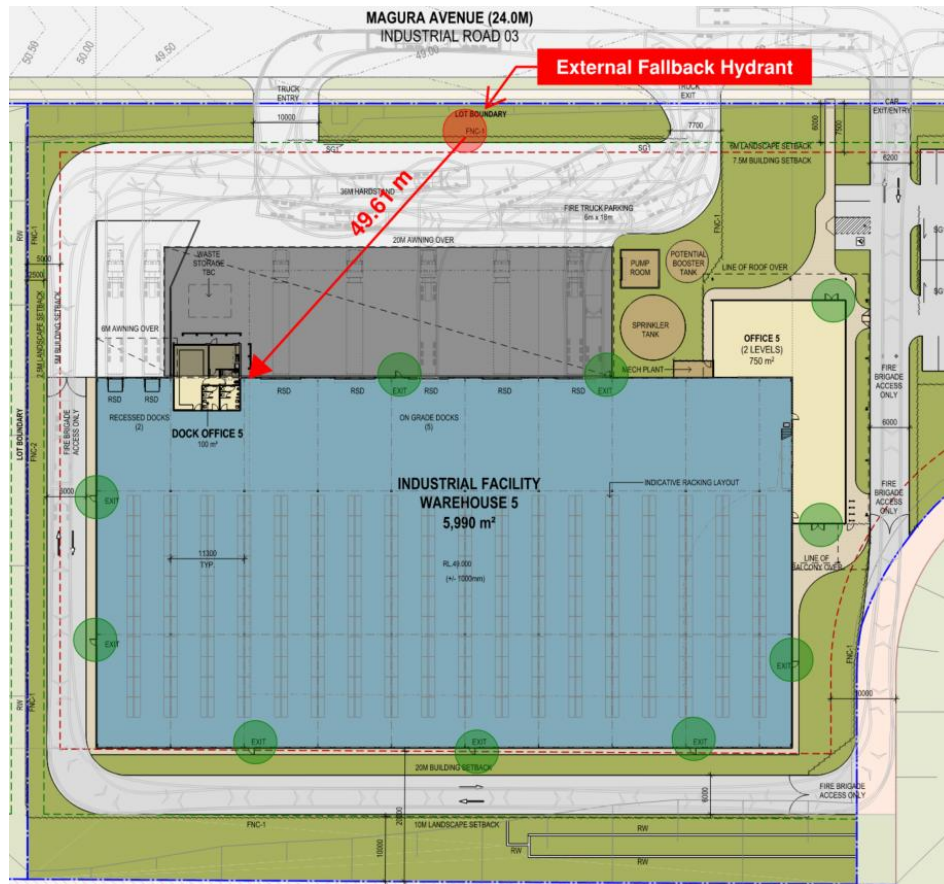


Figure 4-14: Hydrant Strategy (Warehouse 5)

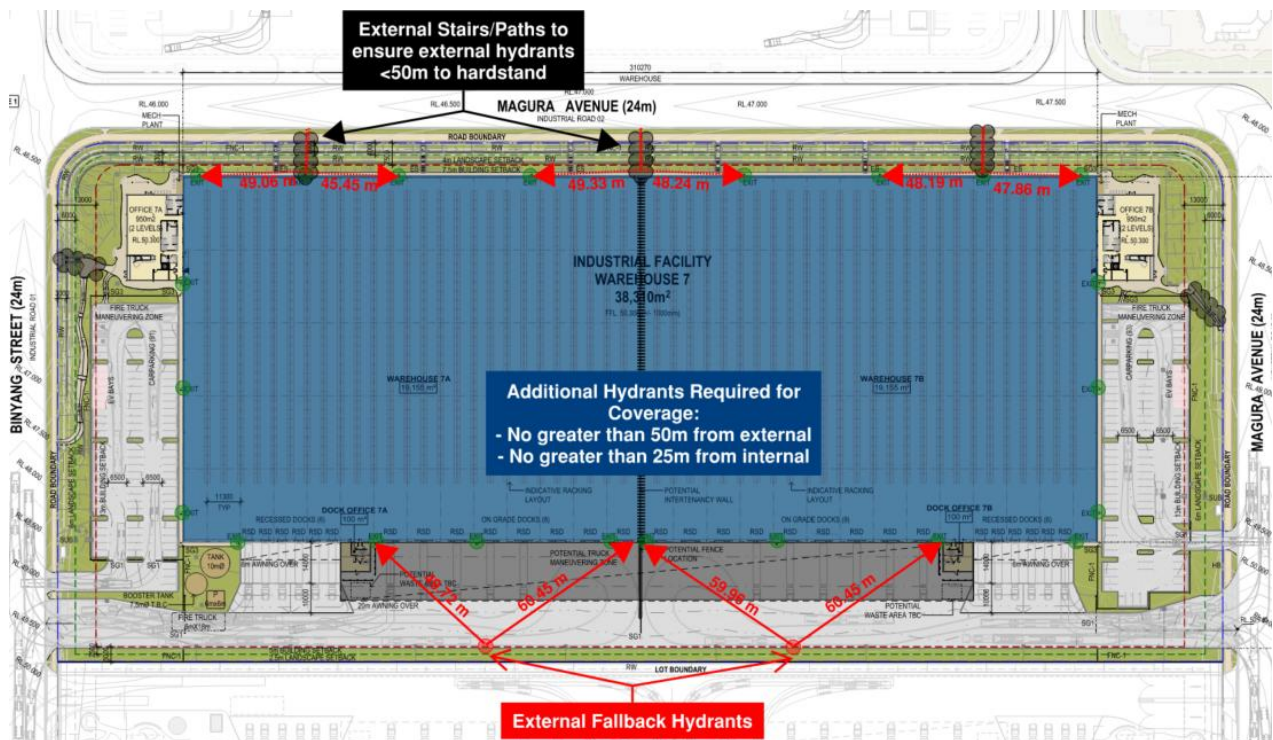


Figure 4-15: Hydrant Strategy (Warehouse 7)

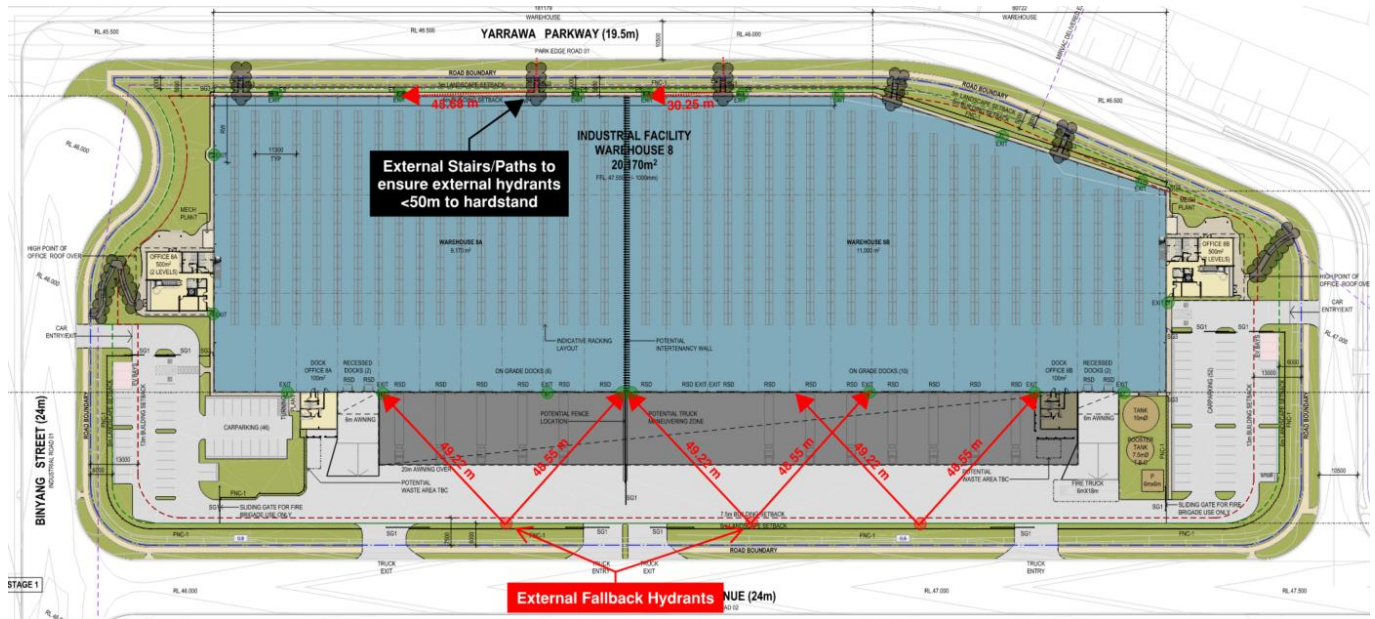


Figure 4-16: Hydrant Strategy (Warehouse 8)

4.3.2 Fire Hose Reels

Fire hose reel shall be provided throughout all buildings in accordance with DtS Provision E1D3 of the NCC and AS2441:2005.

If desired, a Performance Solution may be feasible to permit the use of 50 m long fire hose reels, in lieu of 36 m to provide greater flexibility in the design. This would rely on:

- Only the FHRs located within 4 m of an exit shall be 50 m. Where additional on floor FHRs required for coverage, they shall be standard 36 m lengths.
- 50 m fire hose reels must be tested and certified according to AS2441:2005 and Provision E1D3 of the NCC.
- The pressure and flow at the nozzle of the 50 m hose reel are to be achieved based on the requirement of AS2441:2005.
- Coverage using 50 m hose reels is to be achieved with no more than two bends in the hose to reduce friction and snagging.
- Occupant training in the use of the 50 m length fire hose reels is to occur at least every 12 months to maintain occupant familiarity with the increased weight and length of the extended hose reels.

4.3.3 Fire Sprinkler System

A fire sprinkler system shall be provided throughout each building in accordance with the DtS Provisions and AS2118.1:2017 with the following considerations:

- Sprinkler activation temperature in the warehouse must be no greater than 101°C and have a Response Time Index (RTI) of less than $50 \text{ m}^{1/2} \text{ s}^{1/2}$ (i.e. fast response type).
- Upon sprinkler activation the building occupant warning alarm shall be initiated throughout the building and the direct brigade notification activated.
- With the exception of Warehouse 1 which shall be provided with a 13.7 m ridge height, all buildings shall be provided with a 16.8 m ridge height and therefore, sprinkler system at the warehouse roof level shall comply with the design criteria nominated in Table 17b of FM Global Datasheet 8-9 (Figure 4-18).
- Note: Site infrastructure (pumps, tanks, etc) shall comply with AS2118.1:2017 and shall be appropriately sized to facilitate the design criteria nominated in Table 17b of FM Global Datasheet 8-9.

A Performance Solution is expected to be feasible to support the location of the sprinkler boosters, reliant on:

- The fixed suction criteria being met, as set out in Clause 4.4 of AS2419.1:2021.

- The fire sprinkler booster and the dedicated hardstand for fire brigade appliances being located as depicted in Figure 4-17. As per FRNSW's Guideline "Access for fire brigade vehicles and firefighters", the hardstand should be designed to be 18 m long by 6 m wide, whilst allowing other fire brigade appliances to pass. The hardstand area serving a suction-connection outlet is to be positioned at an angle not greater than 45 degrees from the outlet's longitudinal direction.
- The location of sprinkler booster and FDCIE, shall be indicated on all fire hydrant and fire sprinkler block plans.

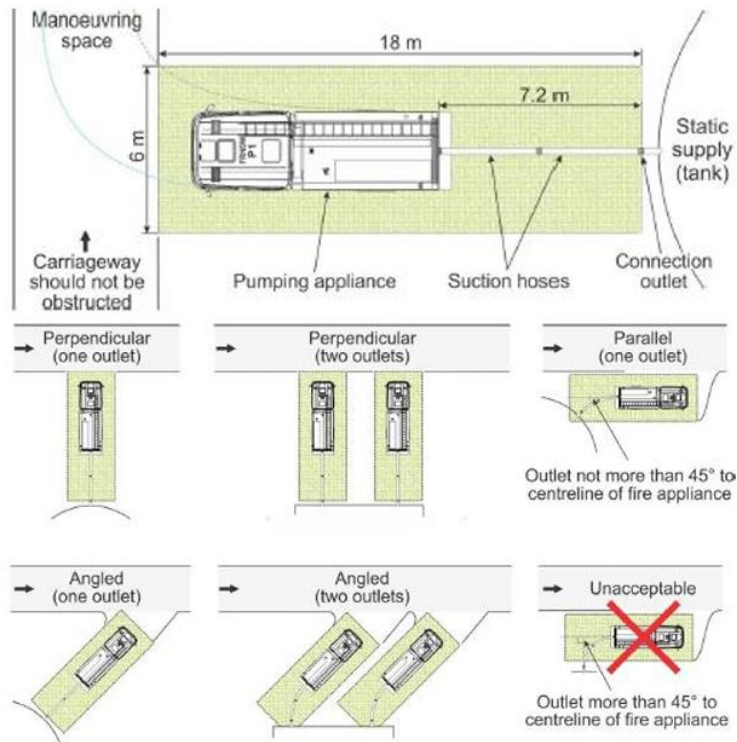


Figure 4-17: Extract from FRNSW Guideline – Rigid Suction Connection Hardstand

Table 17b. Quick-Response, 160°F (70°C) Nominally Rated, Standard-Coverage Pendent Storage Sprinkler Ceiling-Only Designs for Ceiling Heights Over 40 ft (12.0 m)

Storage Arrangement	Commodity	Max. Storage Height, ft (m)	Max. Ceiling Height, ft (m)	Ceiling Sprinkler K-Factor	Max. Vertical Distance from Ceiling to Sprinkler's Thermal Element, in. (mm)	Min. Aisle Width, ft (m)	Sprinkler System Design		
							Ceiling Sprinkler System, No. of AS @ psi (bar)	Hose Demand, gpm (L/min)	System Duration, min
Solid-Piled, Palletized, Bin-Box, Shelf, and Open-Frame Racks*	Class 1, 2, 3, 4 and Cartonized Unexpanded Plastics	45 (13.7)	50 (15.2)	22.4 (320)	13 (325)	6 (1.8)	10 @ 63 (4.3)	250 (950)	60
				25.2 (360)	13 (325)	6 (1.8)	10 @ 50 (3.5)		
					17 (425)	6 (1.8)	10 @ 75 (5.2)		
				28.0** (400**)	13 (325)	6 (1.8)	10 @ 40 (2.8)		
				33.6 (480)	17 (425)	6 (1.8)	9 @ 55 (3.8)		
		50 (15.2)	55 (16.8)	28.0 (400)	13 (325)	8 (2.4)	9 @ 80 (5.5)		
				33.6 (480)	17 (425)	6 (1.8)	9 @ 55 (3.8)		

* See the guidelines in Section 2.2.3.2 to confirm that any multiple-row racks being protected in accordance with this table meet the requirements to be considered open-frame.

** The design of 10 AS @ 40 psi (2.8 bar) can be reduced to 9 AS @ 40 psi (2.8 bar) when the water supply can also provide a minimum pressure of 80 psi (5.5 bar) from the most remote 4 sprinklers (2 sprinklers on 2 lines).

Figure 4-18: Extract Table 17b of FM Global Datasheet 8-9

4.3.4 Portable Fire Extinguishers

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

4.3.5 Fire Detection Control and Indicating Equipment

All buildings shall be provided with FDCIE within the main pedestrian entry for each respective office. Specifically for Warehouses 7/8 which exceed 18,000 m², an FCC is required and shall contain the FDCIE with sufficient clearances and spatial provision for mounting of block plans.

Where multiple tenancies are proposed in the same building, additional FDCIE facilities may be desired by the building owner to facilitate specific functional requirements of tenants (i.e. should an alarm occur during operational hours of one tenancy and not the other).

4.4 Smoke Hazard Management

4.4.1 Smoke Detection System

A smoke detection system for occupant warning is unlikely to be required throughout the warehouses due to its large volume. However, if the warehouse is subdivided into smaller separate tenancy enclosures, or if complex fit-outs such as automated racking or mezzanine platforms are introduced, smoke detection may be required to support occupant evacuation and fire brigade intervention.

As a result of the extended travel distances within Office 7B (Figure 4-11), a smoke detection system shall be provided throughout Office 7B, in accordance with Section 5 of AS1670.1:2018 (max 10 m grid). The requirement for smoke detection to concealed spaces within offices shall be reviewed through detailed design.

Furthermore, for Warehouse 4 a smoke detection system may be required at warehouse roof level in accordance with Section 7 of AS1670.1:2018 (max 15 m grid) however, is subject to detailed CFD analysis.

4.4.2 Smoke Exhaust System

An automatic smoke exhaust system shall be provided to the warehouse portions of all buildings, with the exception of Warehouse 1 due to the building not exceeding 108,000 m³. The smoke exhaust systems must comply with Specification 21 and AS1668.1:2015, with the following requirements:

- System capacity must be capable of an exhaust rate of at least one enclosure air change per hour for each tenancy.
- Any mechanical boards or switching boards serving the smoke exhaust system are to be protected by construction achieving an FRL of 120/120/120 if within the building.
- Adequate make-up air should be provided at a low level to facilitate the smoke exhaust system's designed operational capacity. The make-up air should be provided at a low level by:
 - Permanently open natural ventilation louvers; and/or
 - Perforated roller shutters; and/or
 - Mechanically operated louvers that open upon activation of the fans.

Note: smoke exhaust is not required to the offices or other ancillary areas.

4.4.3 Building Occupant Warning System

A building occupant warning system is to be provided throughout all parts of each building. The system should be in accordance with the prescriptive requirements of Specification 17 and Clause 7 of Specification 20 of the NCC 2022, and AS1670.1:2018.

The occupant warning alarm should be sounded throughout all areas of the relevant building upon general fire alarm.

4.5 Visibility in an Emergency, Exit Signs & Warning Systems

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

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

4.6 Building Management Requirements

- 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.
- Ongoing training in 50 m hose reels as required by the Performance Solution (if required)
- Prior to the occupation or commissioning an Emergency Plan will be developed in accordance with WH&S Regulations and where relevant, HIPAP No.1.
- Prior to the occupation or commissioning an Emergency Services Information Package will be prepared in accordance with FRNSW fire safety guidelines – Emergency services information package and tactical fire plans.

5. Proposed Performance Solutions

As a result of the concept design review, the Performance Solutions listed in Table 5-1 have been proposed.

Table 5-1: Proposed Performance Solutions

#	DtS Provision	Description	Non-Compliance(s)	Proposed Measures
1	C3D5	Perimeter Vehicular Access (Warehouses 1/4/5/7/8)	- Vehicular access is greater than 18 m from the building in parts - Specifically for Warehouse 1, a portion of the perimeter path is provided with reduced clear width. - Specifically for Warehouse 5, a portion of the perimeter path may require travel over an adjoining allotment.	- Continuous perimeter access path - Multiple staging opportunities - Car park designed as loadbearing - Specifically for Warehouses 7/8 external pathways/stairs to provided sufficient pedestrian access - Specifically for Warehouse 1, reduced clear width along western perimeter shall be no less than 4.5 m - If shared cycleway is privately owned, appropriate legal instruments shall be provided to ensure emergency access is provided for the lifetime of the subject building.
2	D2D5	Office Travel Distance (Office 7B)	Up to 27 m to a point of choice in lieu of 20 m	- Sprinkler system - Smoke detection to office, beneath ceilings
3	D2D5 D2D6	Extended Travel Distances (Warehouse 1)	Up to 80 m between alternative exits.	- Sprinkler protection - DtS internal travel distances (excluding awning)
4	D2D5 D2D6 E2D10	Extended Travel Distances and Rationalised Smoke Hazard Management (Warehouses 4/5/7/8)	- Warehouses 4/5: Up to 45 m to nearest exit and 90 m between alternative exits. - Warehouse 7: Up to 90 m to nearest exit and 180 m between alternative exits. - Warehouse 8: Up to 70 m to nearest exit and 140 m between alternative exits. - Rationalised smoke exhaust system.	- Large smoke reservoir volume. - Sprinkler protection - Smoke detection for Warehouse 4 specifically (TBC – pending detailed CFD analysis) - Automatic smoke exhaust system, achieving a minimum exhaust rate of one enclosure air change per hour.

#	DtS Provision	Description	Non-Compliance(s)	Proposed Measures
5	E1D2	Fire Hydrant System Design (Warehouses 1/4/5/7/8)	- For all buildings except Warehouse 1, AS2419.1:2021 used despite the building exceeding 108,000 m³. Also: - Internal on-floor hydrants (Warehouse 7 only) - Block plan size - Hydrants under awnings are proposed to be treated as externals	- Hydrants beneath awnings designed as external hydrants - Fall-back hydrants - Sprinkler system beneath awnings - Specifically for Warehouse 7, internal hydrant coverage using progressive movement (50/25 rule) - Conformance to Appendix C of AS2419.1:2021
6	E1D3	50 m Fire Hose Reels (Warehouses 1/4/5/7/8)	50 m fire hose reels are provided within the warehouse, exceeding the maximum 36 m.	- Sprinkler system - Occupant training in the use of 50 m fire hose reels - Coverage from 50 m FHRs designed with no more than 2 bends
7	E1D4	Location of Sprinkler Booster (Warehouses 1/4/5/7/8)	The location of the sprinkler booster serving the building is not within sight of main pedestrian entrance	- Sprinkler boosters accessed directly accessible from perimeter vehicular access path. - Location of sprinkler booster and FDCIE to be indicated on fire hydrant block plans.
8	E1D4	Sprinkler Design to FM Guidelines (Warehouses 4/5/7/8)	A ridge height of 16.8 m is proposed, for which there is no guidance under AS2118.1:2017 for roof level protection	- Sprinkler design criteria for roof level sprinklers provided in accordance with FM Global Datasheet 8-9. - All remaining portions of system (tanks, pumps, etc) to comply with AS2118.1:2017.

6. Conclusion

This Fire Safety Concept Strategy 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 fire safety strategy presented herein is considered capable of meeting the Performance Requirements of the NCC, 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 Performance Based Design Brief, and ultimately for the Fire Engineering Report for Construction.

Author:	Reviewer:
Julien Christopher <i>BEng (Mechanical) (Hons)</i> <i>MEngSc (Fire Safety)</i>	Dean Watt <i>B Eng (Chemical) (Hons)</i> <i>M Eng (Fire Safety)</i>

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