Appendix O: Fire & Safety Management

Statement of Available Pressure and Flow

James Donegan
59 Kirby St
Rydalmere, 2112

Attention: James Donegan Date: 02/01/2018

Pressure & Flow Application Number: 347971
Your Pressure Inquiry Dated: 2017-11-09
Property Address: 16 Kerr Road, Ingleburn 2565

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

ASSUMED CONNECTION DETAILS

Street Name: Kerr Road	Side of Street: East
Distance & Direction from Nearest Cross Street	345 metres North-East from Aero Road
Approximate Ground Level (AHD):	26 metres
Nominal Size of Water Main (DN):	150 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	86 metre head
Minimum Pressure	74 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	74
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5 10 15 20 26 30 40 50	74 73 72 71 69 68 63 58
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main) Maximum Permissible Flow	5 10 15 20 26 30 40 50 67	74 73 72 71 69 67 63 57 45

(Please refer to reverse side for Notes)

For any further inquiries regarding this application please email :

swtapin@sydneywater.com.au

General Notes

This report is provided on the understanding that (i) the applicant has fully and correctly supplied the information necessary to produce and deliver the report and (ii) the following information is to be read and understood in conjunction with the results provided.

1. Under its Act and Operating Licence, Sydney Water is not required to design the water supply specifically for fire fighting. The applicant is therefore required to ensure that the actual performance of a fire fighting system, drawing water from the supply, satisfies the fire fighting requirements.

2. Due to short-term unavoidable operational incidents, such as main breaks, the regular supply and pressure may not be available all of the time.

3. To improve supply and/or water quality in the water supply system, limited areas are occasionally removed from the primary water supply zone and put onto another zone for short periods or even indefinitely. This could affect the supply pressures and flows given in this letter. This ongoing possibility of supply zone changes etc, means that the validity of this report is limited to one (1) year from the date of issue. It is the property owner's responsibility to periodically reassess the capability of the hydraulic systems of the building to determine whether they continue to meet their original design requirements.

4. Sydney Water will provide a pressure report to applicants regardless of whether there is or will be an approved connection. Apparent suitable pressures are not in any way an indication that a connection would be approved without developer funded improvements to the water supply system. These improvements are implemented under the Sydney Water 'Urban Development Process'.

5. Pumps that are to be directly connected to the water supply require approval of both the pump and the connection. Applications are to be lodged online via Sydney Water Tap in™ system -
Sydney Water Website – www.sydneywater.com.au/tapin/index.htm. Where possible, on-site recycling tanks are recommended for pump testing to reduce water waste and allow higher pump test rates.

6. Periodic testing of boosted fire fighting installations is a requirement of the Australian Standards. To avoid the risk of a possible 'breach' of the Operating Licence, flows generated during testing of fire fighting installations are to be limited so that the pressure in Sydney Water's System is not reduced below 15 metres. Pumps that can cause a breach of the Operating Licence anywhere in the supply zone during testing will not be approved. This requirement should be carefully considered for installed pumps that can be tested to 150% of rated flow.

Notes on Models

1. Calibrated computer models are used to simulate maximum demand conditions experienced in each supply zone. Results have not been determined by customised field measurement and testing at the particular location of the application.

2. Regular updates of the models are conducted to account for issues such a urban consolidation, demand management or zone change.

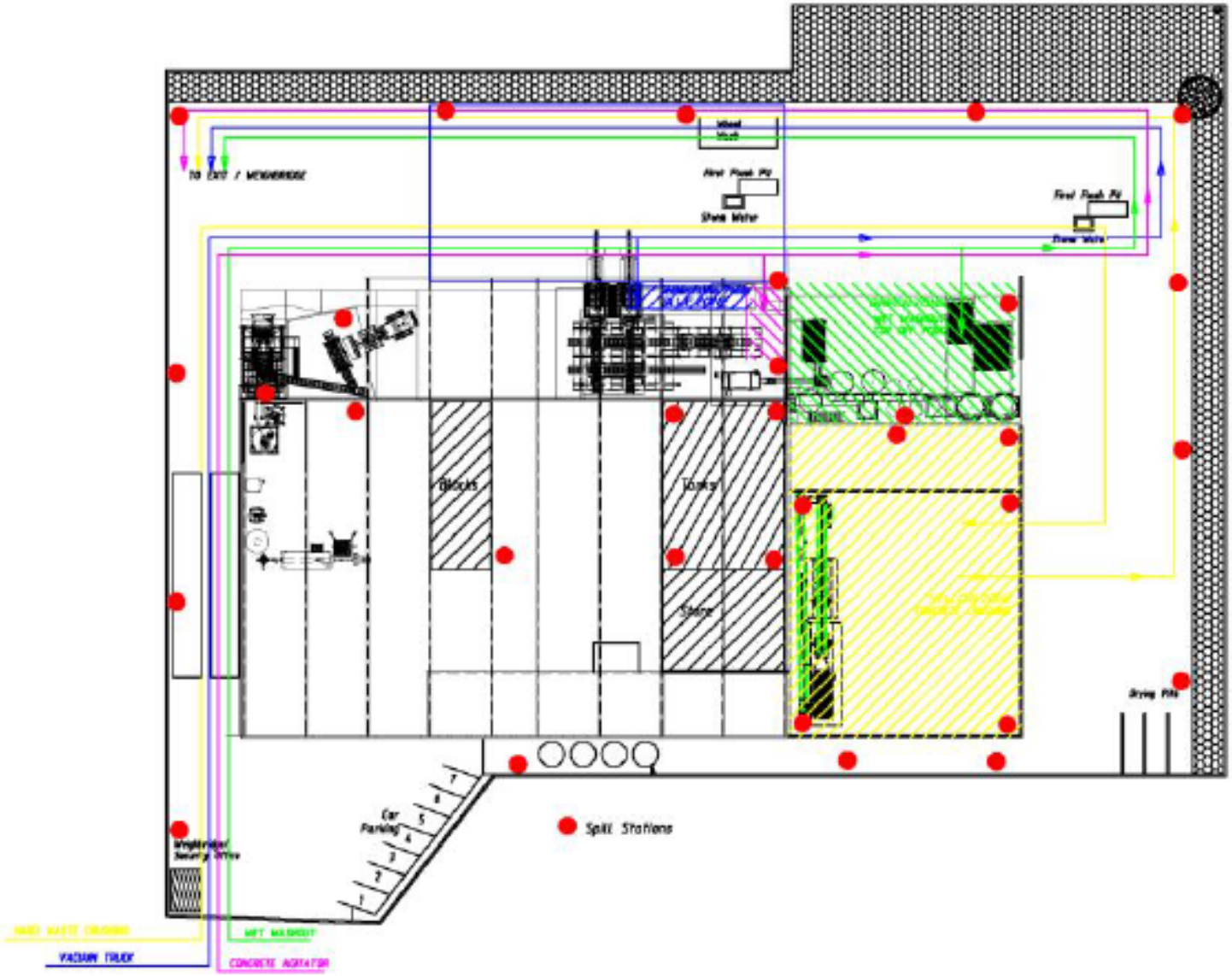
3. Demand factors are selected to suit the type of fire-fighting installation. Factor 1 indicates pressures due to system demands as required under Australian Standards for fire hydrant installations. Factor 2 indicates pressures due to peak system demands.

4. When fire-fighting flows are included in the report, they are added to the applicable demand factor at the nominated location during a customised model run for a single fire. If adjacent properties become involved with a coincident fire, the pressures quoted may be substantially reduced.

5. Modelling of the requested fire fighting flows may indicate that local system capacity is exceeded and that negative pressures may occur in the supply system. Due to the risk of water contamination and the endangering of public health, Sydney Water reserves the right to refuse or limit the amount of flow requested in the report and, as a consequence, limit the size of connection and/or pump.

6. The pressures indicated by the modelling, at the specified location, are provided without consideration of pressure losses due to the connection method to Sydney Water's mains.

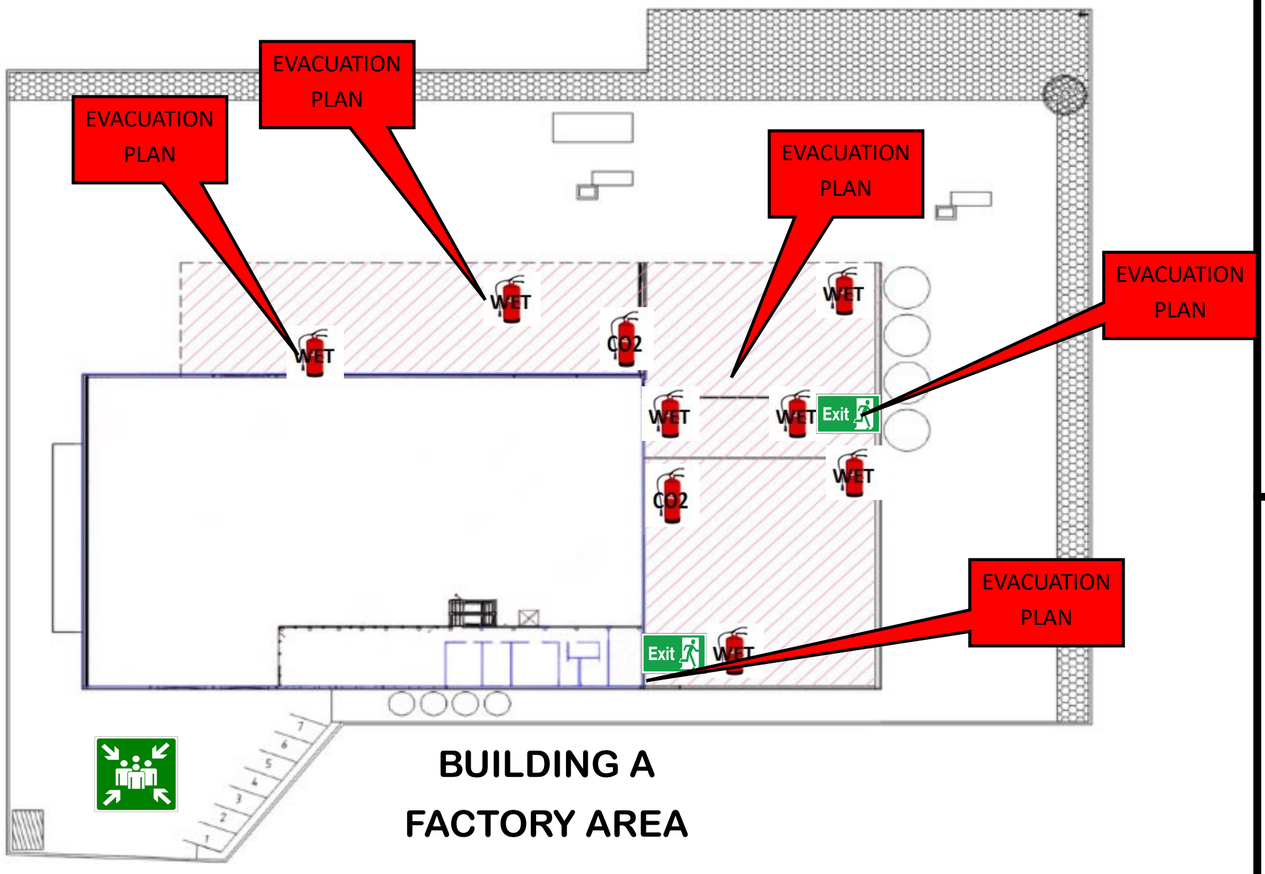
BRS – 16 Kerr Road, Ingleburn – Spill Kits Locations



EVACUATION DIAGRAM

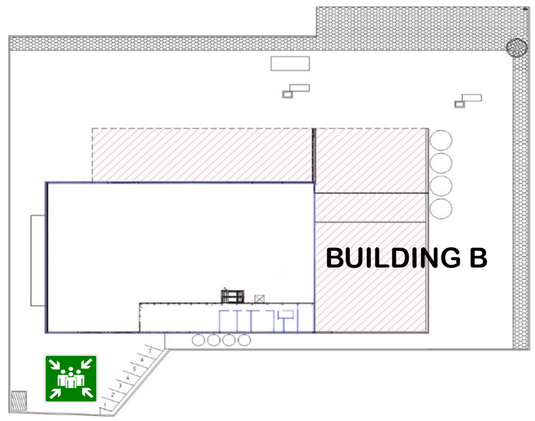
BUILDING B

16 KERR ROAD, INGLEBURN



BUILDING A

FACTORY AREA



LEGEND

- DON'T USE LIFT
- YOU ARE HERE
- FIRE EXIT
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- FIRE HOSE
- FIRE EXTINGUISHER (CO2)
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YOUR ASSEMBLY AREA IS:

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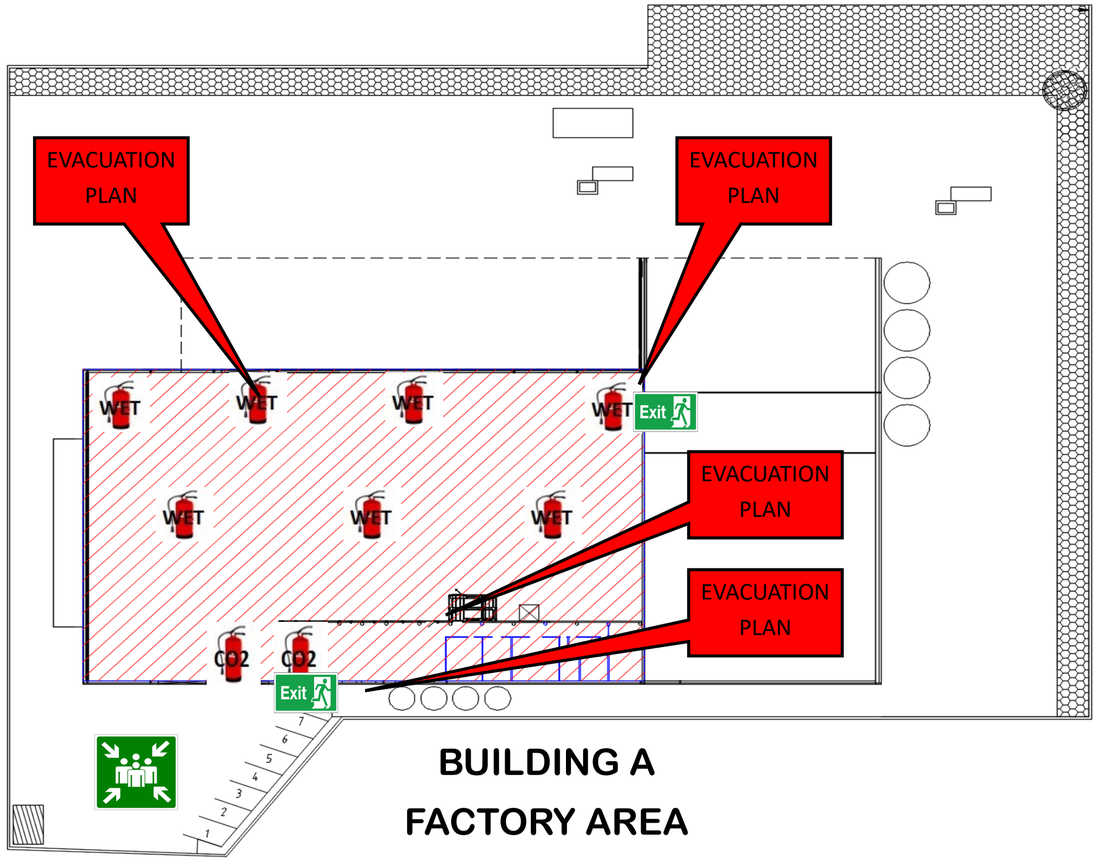

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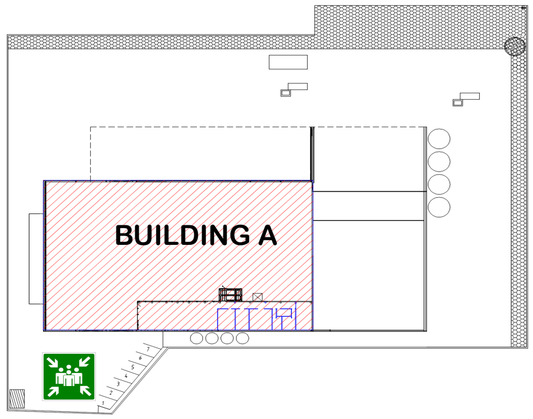

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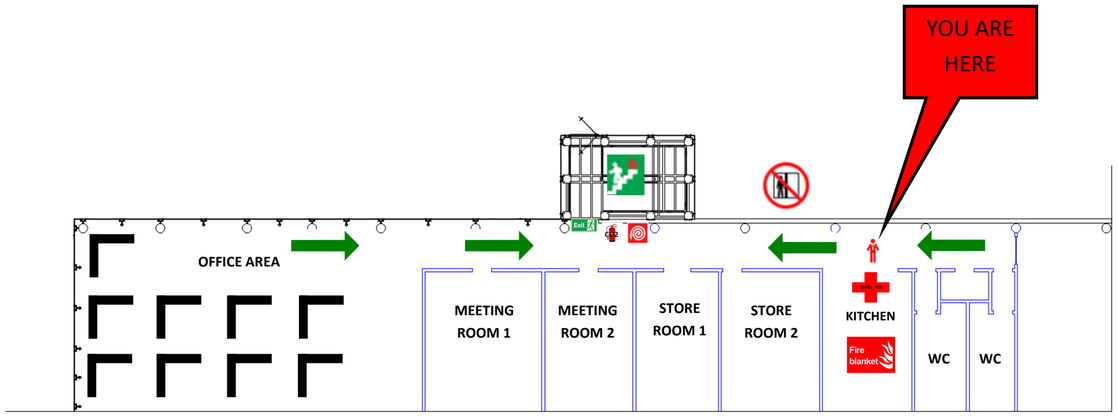
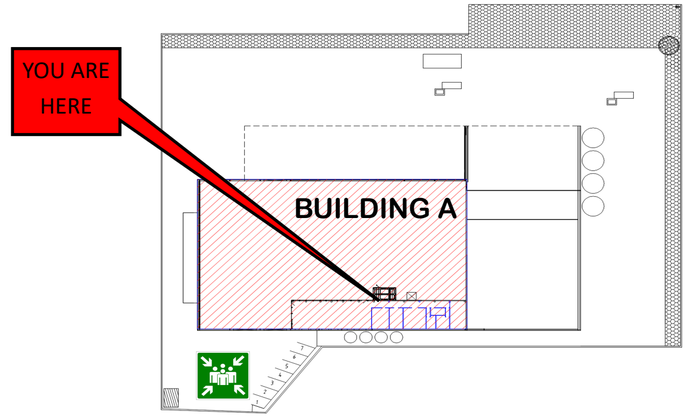


BUILDING A

FIRST FLOOR OFFICE PLAN



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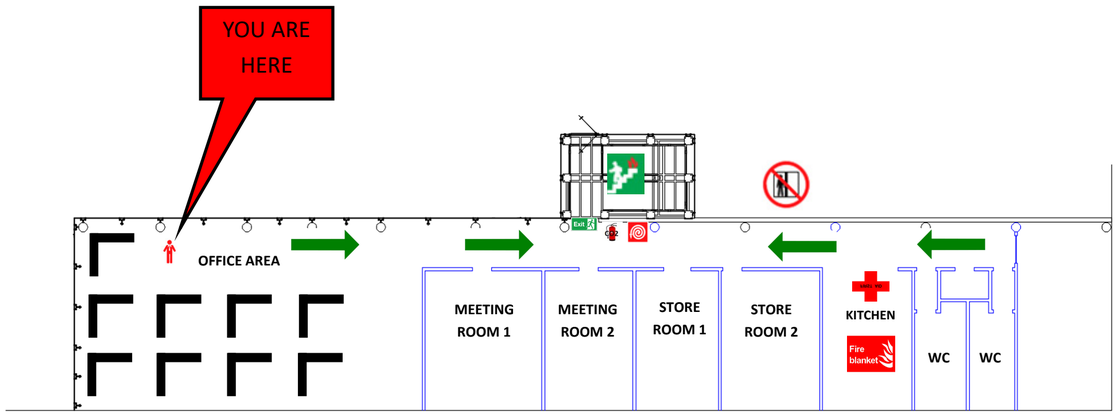

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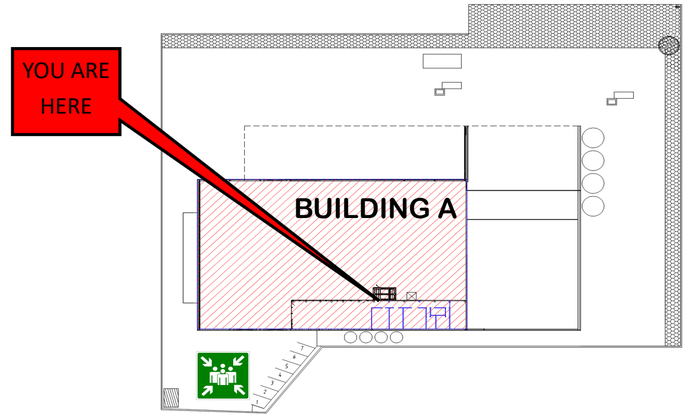

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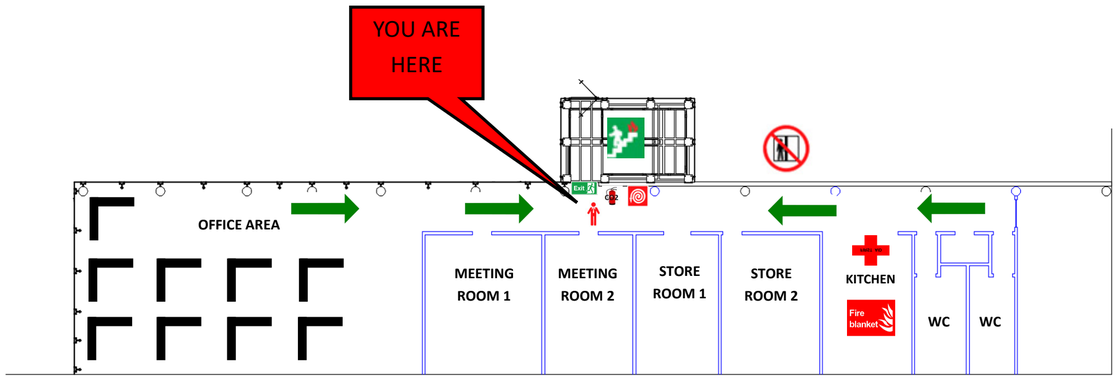

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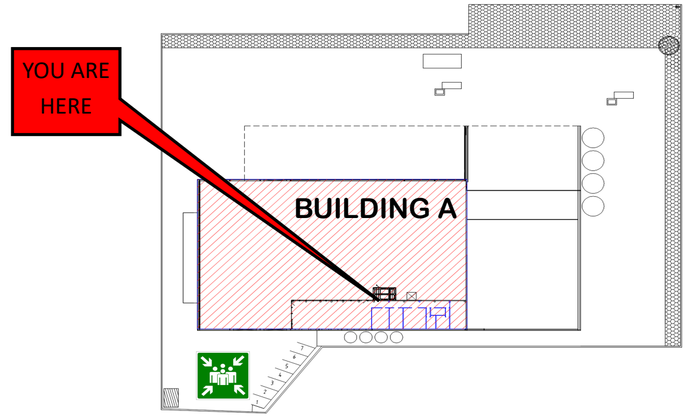

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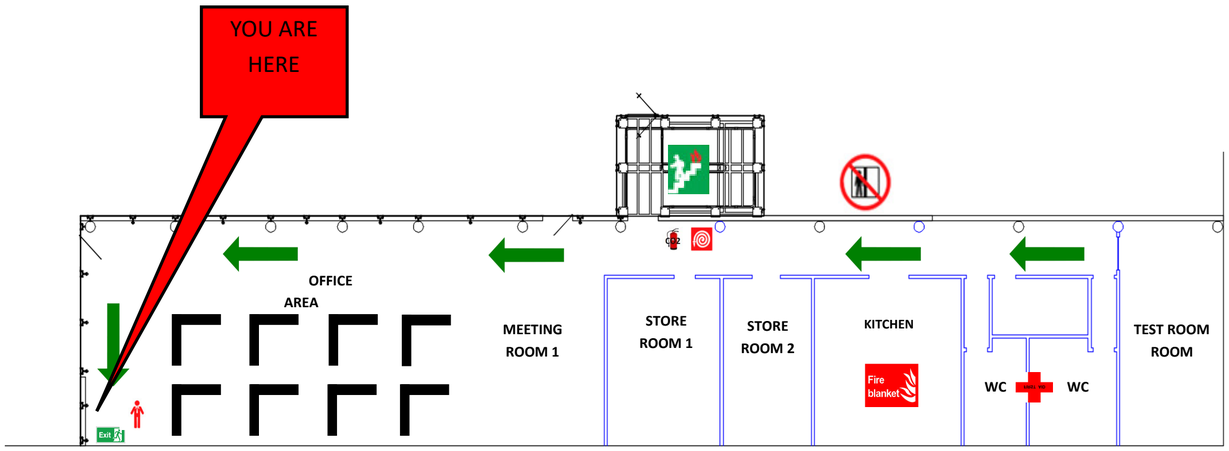

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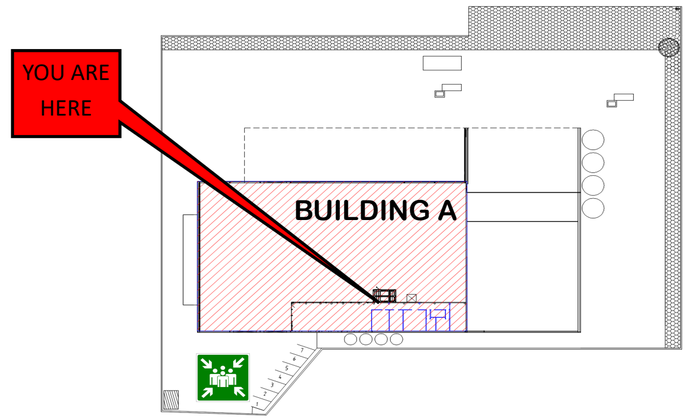
GROUND FLOOR OFFICE PLAN



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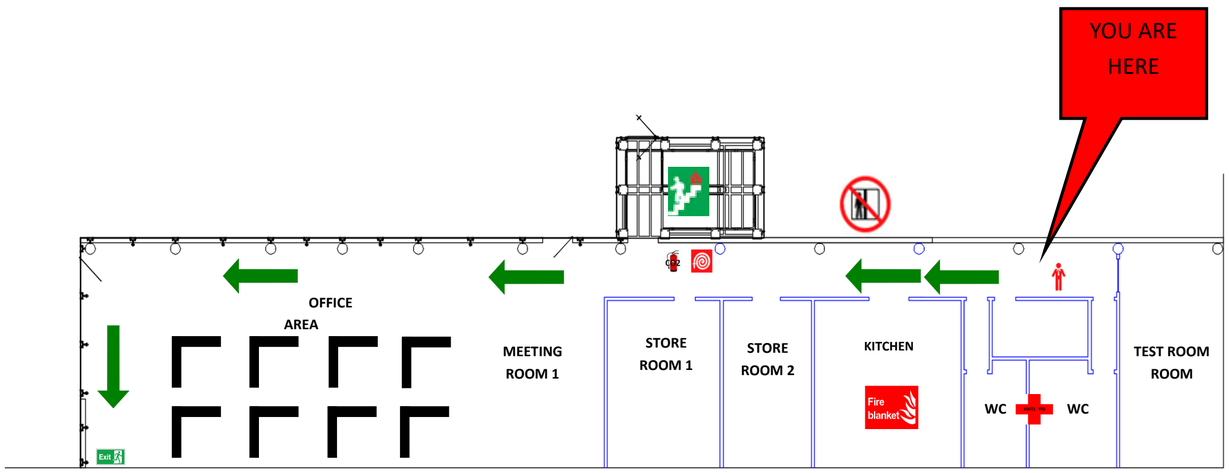

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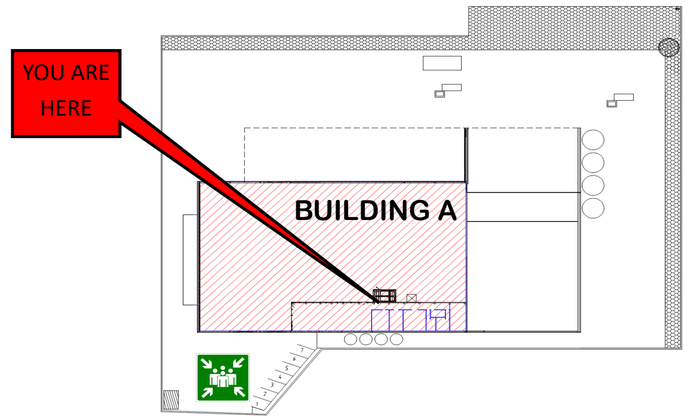

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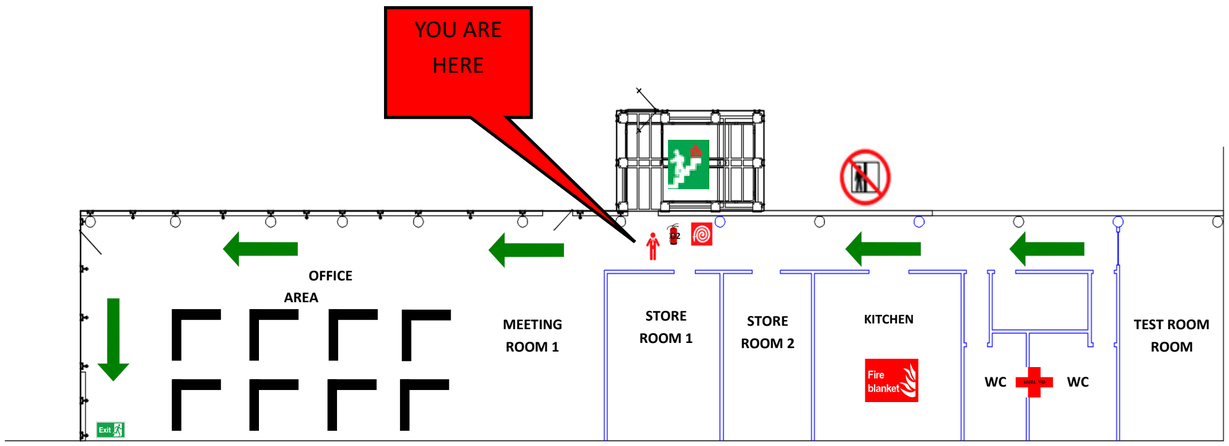

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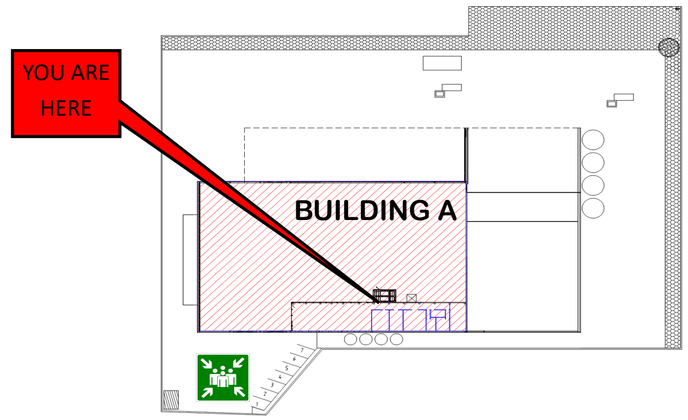

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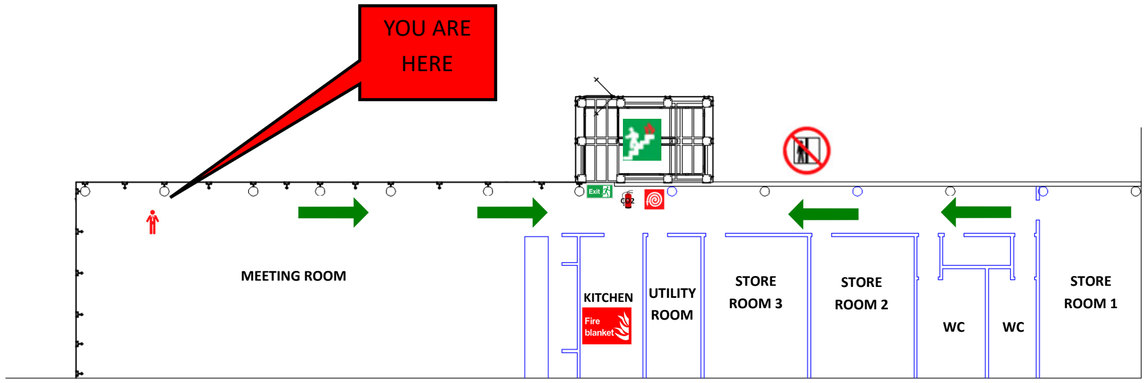
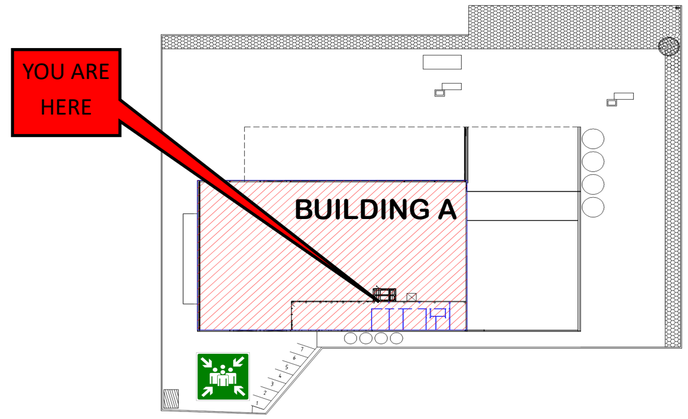


BUILDING A

SECOND FLOOR OFFICE PLAN



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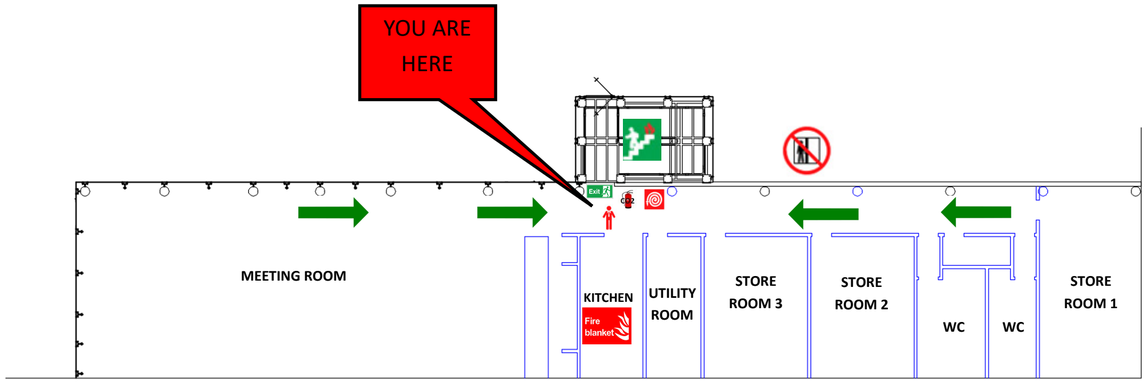

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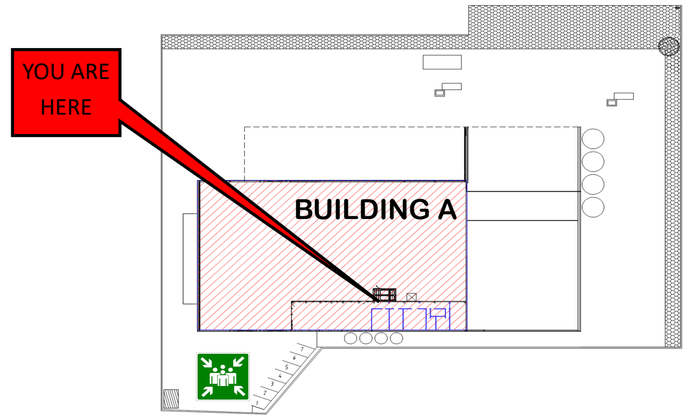

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Fire safety guideline

Technical information

D16/62522

Fire hydrant concessions for existing buildings

1 Purpose

This technical information sheet provides advice to consent authorities on concessions acceptable to Fire and Rescue NSW (FRNSW) regarding the provision of fire hydrant coverage to an existing building or premises that is subject to a fire safety order.

2 Scope

This technical information sheet details:

(a) the application of a concession acceptable to FRNSW, with conditions, on fire hydrant coverage for an existing building or premises

(b) requirements for the location of feed fire hydrants and attack fire hydrants providing extended fire hydrant coverage

(c) requirements for minimum performance and other ancillary items applicable to the fire hydrant system, and

(d) recommendations to the consent authority determining an existing building or premises to which this fire hydrant coverage concession may apply.

3 Application

This document applies to any existing building or premises which:

(a) is subject to a Development Control Order (DCO) issued pursuant to *Division 9.3* of the *Environmental Planning and Assessment Act 1979* by the relevant consent authority

(b) is required to have a fire hydrant system installed to satisfy the requirements of Clause E1.3 of the *National Construction Code* (*NCC*) and Australian Standard *AS 2419.1*[1], and

(c) does not contain fire isolated stairs.

This document does not apply to any existing building or premises which:

(a) proposes any building work by means of development consent (i.e. complying development certificate or construction certificate), and

(b) has, or is likely to have, manifest quantities of hazardous chemicals.

This document does not apply to any new building or premises.

This document is to be used by the relevant consent authority when issuing the DCO. Where appropriate, the consent authority should reference this document for any existing premises that the corresponding DCO applies to.

This document grants concession to a retrofitted fire hydrant system with reduced net benefit (e.g. performance) compared to a fire hydrant system that complies with all *NCC* and *AS 2419.1* requirements, which will typically incur much higher costs.

Note: FRNSW are mindful of the greater financial burden to retrofit a fully compliant fire hydrant system to an existing building.

[1] *AS 2419.1–2005 Fire hydrant installations, Part 1: System design, installation and commissioning*

When applying this document to any DCO, the resultant fire safety upgrade to the existing building or premises may not satisfy all performance requirements of the current *NCC*.

Note: FRNSW acknowledge fire safety upgrades may not fully comply with the NCC.

When this document does not apply, including when the existing building does not meet the requirements for the concession to apply, the consent authority may consult with FRNSW by applying for *comment on an occupied building*.

4 Background

Legislation applicable to building design have changed significantly over the last century. In 1912, the *Height of Building Act 1912* and *Ordinance 71* constituted the main building regulations in NSW. These regulations remained in place until repealed by *Ordinance 70*, with *Ordinance 71* being repealed in 1974 and the *Height of Building Act* repealed in 1986.

The *Building Code of Australia* (*BCA*) was first published in 1988. However, the *BCA* was not adopted in NSW in NSW until 1993 via the *Local Government Act 1993—Regulation (Local Government (Approvals) Regulation 1993)*. In 2011, the *BCA* was incorporated into a suite of building and plumbing codes, with the current *NCC* applying to buildings in NSW.

Changes were made by regulators to keep pace with the building industry, to standardise building rules, or respond to significant events. As a result, buildings are designed to differing requirements depending on the provisions applicable at the time of construction. By example, a Class 2 building having a rise in storeys of not more than four did not require a fire hydrant system under *Ordinance 70*, but under the current *NCC* the same building would require an *AS 2419.1* fire hydrant system be installed.

The concession provided in this document ensures applicable buildings and premises are still provided with fire hydrant coverage that enables firefighters to meet their statutory obligations and undertake firefighting intervention.

FRNSW expects an existing building issued with a DCO to install a fire hydrant system, be fitted with a hydrant system complying with *AS 2419.1* when this document does not apply.

Note: While the current *NCC* references *AS 2419.1–2005*, this document does make reference to specific provisions from *AS 2419.1–2017*[2].

5 General requirements

5.1 Minimum flow rate

5.1.1 The minimum flow rate from each feed fire hydrant outlet providing coverage is to be determined in accordance with the requirements of section 2.2.3 of *AS 2419.1–2017*.

5.1.2 The number of feed fire hydrant outlets required to discharge simultaneously is to be determined in accordance with the requirements of section 2.2.2 of *AS 2419.1–2017*.

5.2 Minimum residual pressure

5.2.1 The minimum residual pressure at the outlet of a standpipe connected to a street fire hydrant, or the on-site feed fire hydrant, is to be not less than Table 2.2.3.1(A) of *AS 2419.1–2017* when flowing at the minimum required flow rate for that feed fire hydrant.

Note: Greater head losses must be considered in the hydraulic calculations when two fire hydrants are required to flow simultaneously.

5.2.2 The on-site feed fire hydrant is to have a back-flow prevention device installed according to the requirements of the relevant water supply authority. The minimum residual pressure at the fire hydrant outlet is to include hydraulic losses associated with this device.

[2] *AS 2419.1–2017 Fire hydrant installations, Part 1: System design, installation and commissioning*

5.3 Method of measurement and limitations

5.3.1 The method of measuring fire hydrant coverage is to be made in accordance with the requirements of section 3.11 of *AS 2419.1–2017*, including consideration of all limitations which impact on the laid-on ground distance.

5.3.2 Fire hydrant coverage 'within a building' is the laid-on ground distance along paths of travel between the final exit (i.e. open space) and the furthermost point inside the building.

5.4 Hardstand areas

5.4.1 Hardstand areas required for the fire appliance (e.g. access to on-site feed fire hydrant) are to comply with the requirements of section 3.3 of *AS 2419.1–2017*.

Note: Refer to FRNSW guideline *Access for fire brigade vehicle and firefighters* for further information. A public road may serve as the hardstand area.

5.4.2 The hardstand area is to provide pedestrian access to the building entry point through which fire hydrant coverage is determined, as applicable to the portions of floor area being covered by that entry point.

6 Fire hydrant coverage

6.1 Supply from a street fire hydrant

6.1.1 A street fire hydrant being used as the feed fire hydrant is to be located within 30 m of the positioned fire appliance (see Figure 1).

6.1.2 A street fire hydrant may only be used as the feed fire hydrant if not likely to be obstructed by a parked vehicle nor present a safety hazard to firefighter (e.g. middle of roadway).

6.1.3 If the street fire hydrant is not suitable (i.e. cannot be relied upon when fire occurs) then an external feed fire hydrant is to be installed.

6.1.4 All portions of floor area are to be within 90 m of the positioned fire appliance, except not more than 70 m is to be within the building (see Figure 1).

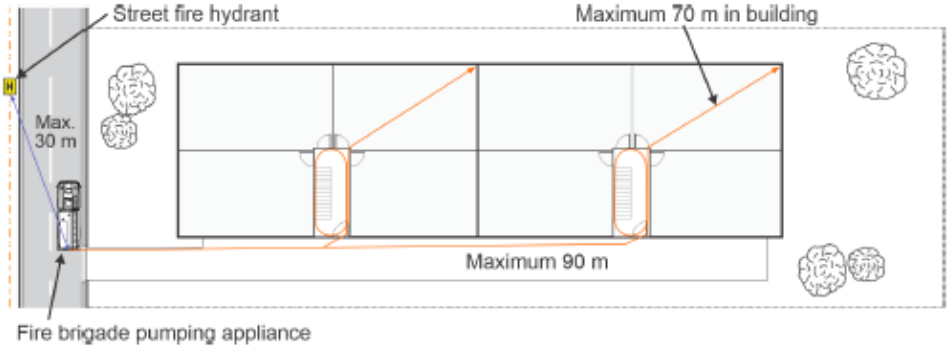

Figure 1 Example of fire hydrant coverage from a street fire hydrant

6.1.5 Where appropriate, an application may be made to the relevant water supply authority to request an additional street fire hydrant be installed on their town main water supply network so that street fire hydrant coverage can be achieved.

Note: The additional street fire hydrant should be installed equal distance between street fire hydrants located not more than 120 m apart, so the fire appliance is located within 30 m of the nearest street fire hydrant.

6.1.6 Not more than two street fire hydrants can be used to provide fire hydrant coverage to all portions of floor area of the residential premises.

6.1.7 Where fire hydrant coverage cannot be achieved in accordance with this section, an on-site feed fire hydrant complying with section 6.2, or a fire hydrant system complying with *AS 2419.1* is to be provided.

6.1.8 A fade and weather resistant sign, A3 in size, is to be permanently affixed at the front of the building or premises at the most likely access point, and have uppercase contrasting text which states (see Figure 2):

(a) 'STREET HYDRANT', not less than 30 mm high,

(b) 'HP' or 'HR' depending on whether the street fire hydrant is located on the Road or Path, along with arrows to each side and the respective distance to the nearest street fire hydrant in that direction, and

(c) 'ADDITIONAL HOSE LENGTHS MAY BE REQUIRED', not less than 20 mm high.

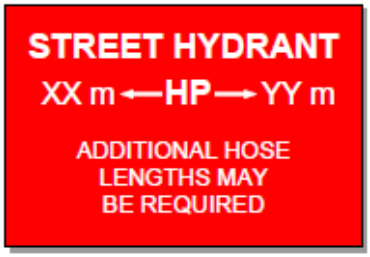

Figure 2 Example of signage required at the front of the building

Note: 'XX' and 'YY' is the distance from the sign to the street fire hydrant in each direction. In cases where multiple access points are likely, a sign should be provided at each access point.

6.2 Fire Supply from on-site feed fire hydrants

6.2.1 All portions of floor area are to be within 90 m of a fire appliance supplied from an on-site feed fire hydrant, except not more than 70 m is to be within the building (see Figure 3).

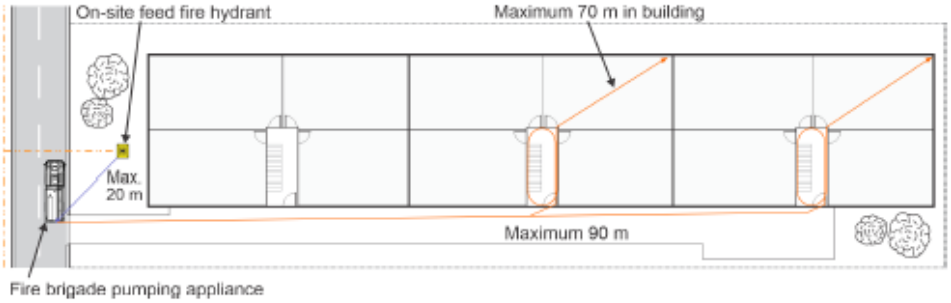

Figure 3 Example of fire hydrant coverage from an on-site feed fire hydrant

6.2.2 The on-site feed fire hydrant supplying the fire appliance is to be located within 20 m of the required hardstand area (e.g. driveway or public road adjacent to the site boundary).

6.2.3 Not more than two external on-site feed fire hydrants can be used to provide fire hydrant coverage to all portions of floor area of the premises.

6.2.4 External on-site feed fire hydrants are to comply with the requirements of section 3.2.2 of *AS 2419.1–2017*, except for numbered identification disc as per clause 3.2.2.1(e).

6.2.5 An external on-site feed fire hydrant combined with one street fire hydrant can be used to provide fire hydrant coverage to all portions of floor area of the premises (see Figure 4).

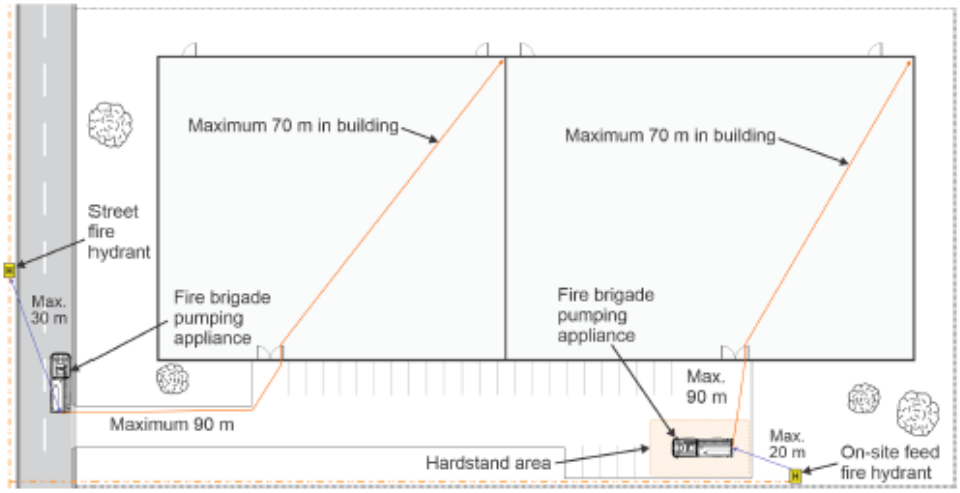

Figure 4 Example of fire hydrant coverage from street fire hydrant and on-site feed fire hydrant

6.2.6 An on-site feed fire hydrant is to be installed:

(a) externally in a location readily visible and accessible from the street where vehicular access is provided and any required hardstand area

(b) in an accessible position having pedestrian access to the building, and

(c) not less than 10 m from any electrical substation, distribution board, kiosk or the like, dangerous goods including LPG installations, or stored combustible goods.

6.2.7 A fade and weather resistant sign, A4 in size, is to be permanently affixed adjacent to each on-site feed fire hydrant, and have uppercase contrasting text which states (see Figure 5):

(a) 'FEED FIRE HYDRANT', not less than 25 mm high, and

(b) 'ADDITIONAL HOSE LENGTHS MAY BE REQUIRED', not less than 15 mm high.

Figure 5 Example of signage required adjacent to each feed fire hydrant

6.2.8 Fire hydrant outlets are to be fitted with a 65 mm 'Storz' hose connection in accordance with FRNSW technical information sheet *FRNSW compatible Storz hose connections.*

6.2.9 Where fire hydrant coverage cannot be achieved in accordance with this section, a fire hydrant system complying with *AS 2419.1* is to be provided.

6.3 External attack fire hydrants

6.3.1 When a fire hydrant system otherwise complying with *AS 2419.1* is being installed, all portions of floor area are to be within 90 m of an external attack fire hydrant, except not more than 70 m is to be within the building (see Figure 6).

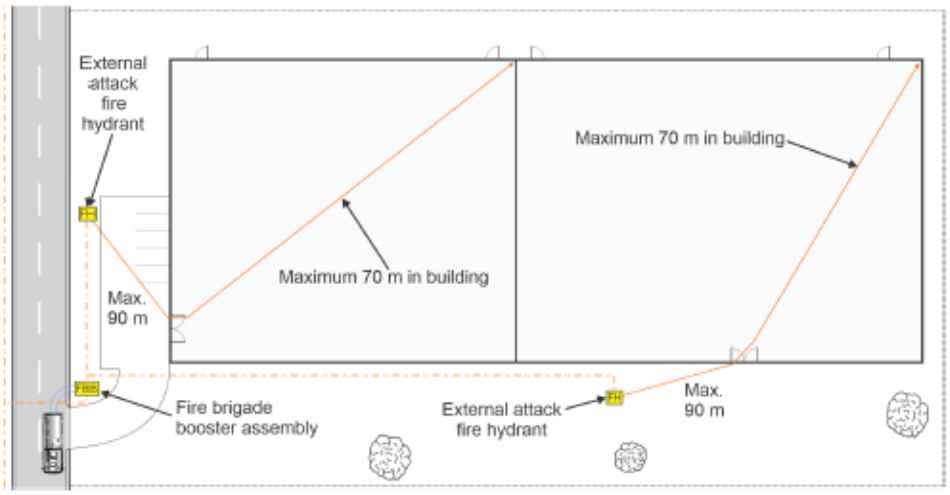

Figure 6 Example of fire hydrant coverage from external attack fire hydrant

6.3.2 A fade and weather resistant sign, A4 in size, is to be permanently affixed adjacent to each external attack fire hydrant, and have uppercase contrasting text which states (see Figure 7):

(a) 'ATTACK FIRE HYDRANT', not less than 25 mm high, and

(b) 'ADDITIONAL HOSE LENGTHS MAY BE REQUIRED', not less than 15 mm high.

Figure 7 Example of signage required adjacent to external attack fire hydrant

7 Fire sprinkler system

7.1 If the DCO applies to a Class 2 or 3 building that requires a fire sprinkler system under Table E1.5 of the *NCC,* the fire hydrant system concessions applicable under Specification E1.5a of the *NCC* may be applied if a fire sprinkler system is installed, including:

(a) the fire hydrant system being a dry fire hydrant system

(b) feed fire hydrants being located within 60 m of the fire appliance

(c) an on-site fire pumpset not being required

(d) the minimum fire hydrant outlet flow being 6 L/s; and

(e) the minimum pipe sizes specified in *AS 2419.1* not applying.

Note: The DCO should consider adequate provision for fire safety in respect to all fire safety systems, including a fire sprinkler system under Clause E1.5 of the *NCC*.

7.2 If a fire sprinkler system is installed and a dry fire hydrant system is being considered, Council should consult with FRNSW on the additional requirements of a dry fire hydrant system to facilitate the needs of the fire brigade.

8 Ancillary provisions

8.1 A fade and weather resistant fire hydrant system block plan (see Figure 8) is to be permanently affixed in a readily visible position at:

(a) each on-site feed fire hydrant (when installed), and

(b) the front of the building at the likely access point (when feed fire hydrants are installed).

Note: When multiple access points exist, a block plan should be provided at each access.

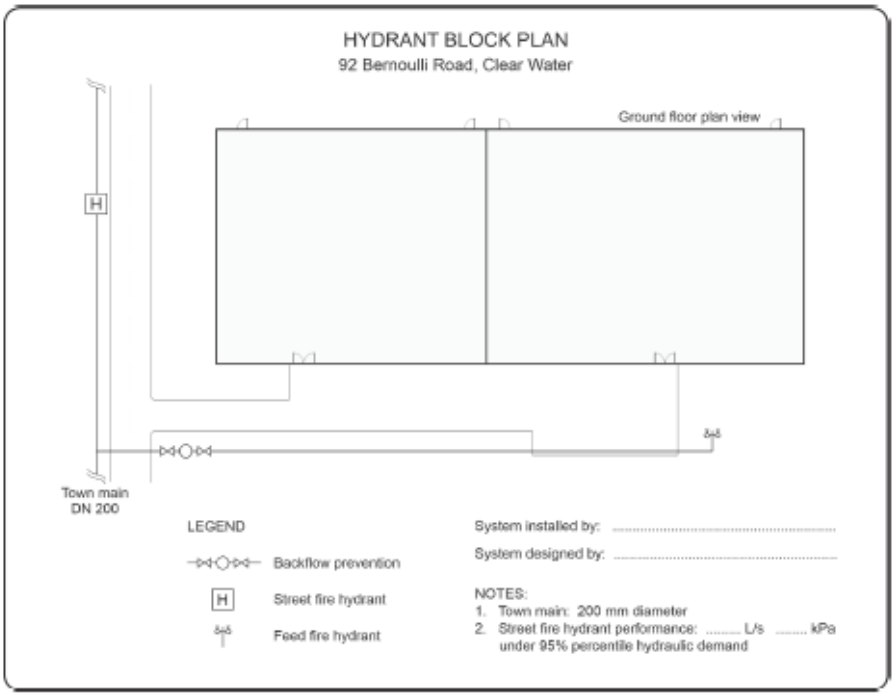

Figure 8 Example of fire hydrant system block plan

8.2 The fire hydrant block plan is to be a fade and weather resistant sign, minimum size of A4, and have uppercase contrasting text which indicate the following:

(a) a plan of the building and its entry points

(b) the location of street fire hydrants and size and location of the town main/s

(c) the pressure and flow available under 95th percentile demand condition

(d) the location of attack fire hydrants and on-site feed fire hydrants (where installed)

(e) the location of back-flow prevention device and all valves (e.g. isolation)

(f) the location of any significant hazard (e.g. electrical substation/kiosk, LPG installation or dangerous goods storage), and

(g) the name of the installer and the designer of the fire hydrant system.

8.3 The fire hydrant block plan is to be oriented in the manner that reflects the aspect of the fire hydrant system as it is presented to the reader.

9 Contact us

For further information contact the Fire Safety Branch on (02) 9742 7434 or email *firesafety@fire.nsw.gov.au*.