ACT Government
Chief Minister, Treasury and Economic Development

Freedom of Information Disclosure Log Publication Coversheet

The following information is provided pursuant to section 28 of the *Freedom of Information Act 2016*.

Application Details	
Ref. No.	CMTEDDFOI 2024-090
Date of Application	14 March 2024
Date of Decision	20 May 2024
Processing time (in working days)	44
Fees	Waived
Decision on Access	Partial Release
Information Requested (summary)	Planning approval documents applying to a development in Fyshwick.

Publication Details		
Original application	☑ Published	☐ N/A
Decision notice	☑ Published	☐ N/A
Documents and schedule	☑ Published	☐ N/A
Decision made by Ombudsman	N/A	
Additional information identified by Ombudsman	N/A	
Decision made by ACAT	N/A	
Additional information identified by ACAT	N/A	

From:	EPSDFOI
To:	CMTEDD FOI
Subject:	CMTEDDFOI 2024-090 - Application - Partial Transfer Request - 74 Mildura Street Fyshwick
Date:	Wednesday, 13 March 2024 3:44:26 PM
Attachments:	3793GKC2.pdf

OFFICIAL

Good afternoon again

Could you please advise if CMTEDD accepts partial transfer of the attached FOI request?

This request seeks information that is likely to be on the building file.

Thank you,

Charlotte Brougham-Pratt|Administrative Service Officer|Information Governance
Email: Charlotte.Brougham-Pratt@act.gov.au
Environment, Planning and Sustainable Development Directorate | ACT Government
Scarlet Robin or Powerful Owl, L5 480 Northbourne Avenue Dickson ACT 2602
www.act.gov.au | www.environment.act.gov.au | www.planning.act.gov.au

Freedom of Information - Access Application to Transport Canberra and City Services - Submission confirmation

Your submission has been successful. Please keep a copy of this receipt for your records.

Date and time	Reference code
12 Mar 2024 11:40:14 AM	3793GKC2

Transport Canberra and City Services (TCCS)
GPO Box 158
Canberra ACT 2601
Phone: 02 6207 2987
Email: TCCS.FOI@act.gov.au

Applicant details

Title | Given name | Family name

Preferred name

Preferred method of contact

(○) Phone (●) Email (○) Post

Contact phone number | Contact email address

Contact postal address

Address line 1

Address line 2

Suburb | State | Postcode

Preferred method to receive information *

(●) Email (○) Post

☑ Same as contact email address

Information request

Who are you making the request on behalf of?

Myself

What type of information are you requesting access to? *

Other information

What information are you requesting access to under the Act? *

Copies of any development consent (or similar planning approval), building certificate, occupation certificate and fire certification applying to 74 Mildura Street, Fyshwick 2609 (Certificate of Title Volume 972 Folio 45)

Attach a description or additional details about the information you are requesting access to (optional)

Do you have a similar or identical request currently under review by another ACT Government Directorate?

- ○ Yes
- ◉ No

Are you enquiring as

Other

Do you wish to apply for a waiver of fees associated with processing your application?

- ○ Yes
- ◉ No

Provide a statement about how the release of information is in the public interest (optional)

Would you like to provide any additional information? (optional)

Attach additional documents to support your application (optional)

ACT Government
Chief Minister, Treasury and Economic Development

Our ref: CMTEDDFOI 2024-090

[redacted]

FREEDOM OF INFORMATION REQUEST – NOTICE OF DECISION

I refer to your application under section 30 of the *Freedom of Information Act 2016* (the Act), received by the Chief Minister, Treasury and Economic Development Directorate (CMTEDD) on 14 March 2024.

Specifically, you have sought access to the following information:

- Copies of any development consent (or similar planning approval), building certificate, occupation certificate and fire certification applying to 74 Mildura Street, Fyshwick 2609 (Certificate of Title Volume 972 Folio 45).

Authority

I am an Information Officer appointed by the CMTEDD Director-General under section 18 of the Act to deal with access applications made under Part 5 of the Act.

Timeframes

In accordance with section 40 of the Act, CMTEDD is required to provide a decision on your access application within 30 days.

As this matter required third party consultation, the decision due date was extended by 15 working days, in accordance with section 40(2) of the Act.

Therefore, a decision is due by **21 May 2024.**

Decision on access

Searches of CMTEDD records have identified five documents within the scope of your request.

I have decided to grant **partial access** to five documents.

The records identified as relevant to your application are listed in the schedule enclosed at **Attachment A**. This provides a description of each document that falls within the scope of your request and the access decision for each of those documents.

Release of documents

The information being released to you is provided at **Attachment B**.

Statement of Reasons

In accordance with section 54(2) of the Act a statement of reasons outlining my decisions is below. In reaching my access decisions, I have taken the following into account:

- the Act
- the information that falls within the scope of your request
- third party views
- *Human Rights Act 2004*

As a decision maker, I am required to determine whether the information within scope is in the public interest to release. To make this decision, I am required to:

- assess whether the information would be contrary to public interest to disclose as per **Schedule 1** of the Act.
- perform the public interest test as set out in section 17 of the Act by balancing the factors favouring disclosure and factors favouring non-disclosure in **Schedule 2** of the Act.

Exemptions claimed

Public Interest Test

The Act has a presumption in favour of disclosure. As a decision maker I am required to decide where, on balance, public interests lies. As part of this process, I must consider factors favouring disclosure and non-disclosure.

In *Hogan v Hinch* (2011) 243 CLR 506, [31] French CJ stated that when 'used in a statute, the term [public interest] derives its content from "the subject matter and the scope and purpose" of the enactment in which it appears'. Section 17(1) of the Act sets out the test, to be applied to determine whether disclosure of information would be contrary to the public interest. These factors are found in subsection 17(2) and Schedule 2 of the Act.

Schedule 2: Factors to be considered when deciding the public interest.

Taking into consideration the information contained in the documents found to be within the scope of your request, I have identified that the following public interest factors are relevant to determine if release of the information contained within these documents is within the 'public interest'.

Factors favouring disclosure (Section 2.1)

- *Section 2.1(a)(xiii) - contribute to the administration of justice generally, including procedural fairness.*

Having considered the factors identified as relevant in this matter, I consider that release of the information contained in these documents may contribute to the administration of justice generally by allowing you to have a copy of the documents. I am satisfied that this factor favouring disclosure carries some weight. However, this factor is to be balanced against the factors favouring non-disclosure.

Factors favouring non-disclosure (Section 2.2)

- *Section 2.2(a)(ii) - prejudice the protection of an individual's right to privacy or any other right under the Human Rights Act 2004.*

- *Section 2.2(a)(xi) - prejudice trade secrets, business affairs or research of an agency or person.*

Having reviewed the documents, I consider that the protection of an individual's right to privacy, especially in the course of dealings with the ACT Government is a significant factor as the parties involved have provided their personal information for the purposes of working with the ACT Government. This, in my opinion, outweighs the benefit which may be derived from releasing the personal information of the individual's involved in this matter.

Individuals are entitled to expect that the personal information they have supplied as part of this process will be dealt with in a manner that protects their privacy. Considering the type of information to be withheld from release, I am satisfied that the factors in favour of release can still be met while protecting the personal information of the individuals involved. I therefore weigh the factor for nondisclosure more highly than the factor in favour of release in this instance. As a result, I have decided that release of this information (names, phone numbers, email addresses and signatures of individuals not employed by the ACT Public Service) could prejudice their right to privacy under the *Human Rights Act 2004*.

I have also considered the impact of disclosing information which relates to business affairs. In the case of Re Mangan and The Treasury [2005] AATA 898 the term 'business affairs' was interpreted as meaning 'the totality of the money-making affairs of an organisation or undertaking as distinct from its private or internal affairs'. Schedule 2 section 2.2(a)(xi) allows for government information to be withheld from release if disclosure of the information could reasonably be expected to prejudice the trade secrets, business affairs or research of an agency or person. The information withheld from release could reasonably be expected to unfairly prejudice the trade secrets of a third party, along with unwanted commercial implications.

Having applied the test outlined in section 17 of the Act and deciding that release of personal information contained in the documents is not in the public interest to release, I have chosen to redact this specific information in accordance with section 50(2). Noting the pro-disclosure intent of the Act, I am satisfied that redacting only the information that I believe is not in the public interest to release will ensure that the intent of the Act is met and will provide you with access to the majority of the information held by CMTEDD within the scope of your request.

Charges

Processing charges are applicable for this request because the total number of pages to be released to you exceeds the charging threshold of 50 pages. However, the charges have been waived.

Online publishing – Disclosure Log

Under section 28 of the Act, CMTEDD maintains an online record of access applications called a disclosure log.

Your original access application and my decision will be published on the CMTEDD disclosure log. Your personal contact details will not be published.

Ombudsman Review

My decision on your access request is a reviewable decision as identified in Schedule 3 of the Act. You have the right to seek Ombudsman review of this outcome under section 73 of the Act within 20 working days from the day that my decision is provided to you, or a longer period allowed by the Ombudsman.

We recommend using this form *Applying for an Ombudsman Review* to ensure you provide all of the required information. Alternatively, you may write to the Ombudsman at:

The ACT Ombudsman
GPO Box 442
CANBERRA ACT 2601

Via email: actfoi@ombudsman.gov.au

ACT Civil and Administrative Tribunal (ACAT) Review

Under section 84 of the Act, if a decision is made under section 82(1) on an Ombudsman review, you may apply to the ACAT for review of the Ombudsman decision. Further information may be obtained from the ACAT at:

ACT Civil and Administrative Tribunal
GPO Box 370
Canberra City ACT 2601
Telephone: (02) 6207 1740
http://www.acat.act.gov.au/

Should you have any queries in relation to your request please contact the Information Access Team by telephone on 6207 7754 or email CMTEDDFOI@act.gov.au.

Yours sincerely

Emma Hotham
Information Officer
Chief Minister, Treasury and Economic Development Directorate

20 May 2024

ACT Government
Chief Minister, Treasury and Economic Development

FREEDOM OF INFORMATION REQUEST SCHEDULE

WHAT ARE THE PARAMETERS OF THE REQUEST	Reference NO.
Copies of any development consent (or similar planning approval), building certificate, occupation certificate and fire certification applying to 74 Mildura Street, Fyshwick 2609 (Certificate of Title Volume 972 Folio 45)	CMTEDDFOI 2024-090

Ref No	Page number	Description	Date	Status	Reason for Exemption	Online Release Status
1	1-2	Certificate of Occupancy and Use	29 Aug 2022	Partial release	Sch 2 s2.2 (a)(ii)	Yes
2	4	Certificate of Occupancy and Use Certificate	29 Aug 2022	Partial release	Sch 2 s2.2 (a)(ii)	Yes
3	6-33	Performance Based Design Brief	10 Dec 2021	Partial release	Sch 2 s2.2 (a)(ii) Sch 2 s2.2 (a)(xi)	Yes
4	35-96	Fire Engineering Report	18 Jan 2022	Partial release	Sch 2 s2.2 (a)(ii) Sch 2 s2.2 (a)(xi)	Yes
5	98-101	ACTF&R Performance Based Design Brief Review	17 Dec 2021	Partial release	Sch 2 s2.2 (a)(ii)	Yes

Total No of Docs
5

ACT Government

Building Act 2004, S151

Building Approval

Project ID: B2022653

PART A - PROJECT DETAILS

Unit	Block	Section	Division (Suburb)	District	Jurisdiction
	9	39	FYSHWICK	CANBERRA CENTRAL	Australian Capital Territory

PART B - WORKS REQUIRING BUILDING APPROVAL

Item of building work to which this Building Approval relates:

Class of Occupancy	Nature of Work	Project Item Description	Other Description	Type Of Construction	Storeys	Area (m2)	Cost of Works ($)
5	New	OFFICE BUILDING	Office Refurbishment + New Front Entry	NA	1	582.15	Sch 2.2(a)(i)
5	New	OFFICE BUILDING	Divided Warehouse into 2 Units (Include Class 8)	NA	1	54.39	
5	New	OFFICE BUILDING	Fire Services (Include Class 8)	NA	1	40.00	

Work relates to the following Development Application(s):

Development Application ID	Description
202138744	Merit -

PART C - CERTIFIERS DECLARATION

I declare that in issuing this building approval under section 28 of the Building Act 2004:

- I am satisfied on reasonable grounds that the plans meet each applicable approval requirement under section 29 and is not prevented from being issued under section 30 or section 30A
- I have supplied all documents as required under 3.3 Building Act 2004
- I have prepared a notice (building approval certificate) certifying what approval requirements apply to the application and why the building approval is not prevented from being issued; and
- I have given the building approval certificate to the applicant.

In performing services as a certifier in relation to the work detailed in this application I am not in breach of my entitlement to act as a certifier in accordance with the Building Act 2004.

Full Name	Address	License Number	Expiry Date
ABSOLUTE APPROVALS PTY LTD	20 BRAINE STREET PAGE ACT 2614	2019816	30/08/2022

Date Issued : 18/02/2022

NOTES

Utilities

This application must also be accompanied by a Statement of Compliance from each relevant utility provider (for water, sewerage, electricity and stormwater) which confirms that the location and nature of earthworks, utility connections, proposed buildings, pavements and landscape features comply with utility standards, access provisions and asset clearance zones.

Note 1: If there is no stormwater easement or Territory owned stormwater pipes located within the property boundary, a "Statement of Compliance" for stormwater from TAMS (Asset Acceptance) is not required to be obtained.

Note 2: Where there is conflict between planning and utility requirements, the utility requirements take precedence over other codified or merit provisions.

Utilities – Demolition Only

This application must be accompanied by a Statement of Endorsement for utilities (including water, sewerage, electricity and stormwater) stating that:
- all network infrastructure on or immediately adjacent to the site has been identified on the plan
- all potentially hazardous substances and conditions (associated with or resulting from the demolition process) that may constitute a risk to utility services have been identified
- all required network disconnections have been identified and the disconnection works comply with utility requirements
- all works associated with the demolition comply with and are in accordance with utility asset access and protection requirements

Note: The documentation provided to the utility provider for endorsement must be consistent with the documentation that forms part of a development approval or the documentation verified as exempt from requiring development approval by a licensed certifier.

Asbestos Advice

If documents accompanying building approval do not include an asbestos assessment report as per the Building Act 2004, the building approval must have an Asbestos Advice attached as per the Act

Privacy Notice: The personal information on this form is being collected to enable processing of your application and to enable auditing and compliance of builders and certifiers by the Government appointed auditor. The information that you provide may be disclosed to the Australian Bureau of Statistics, ACT Revenue Office and the Taxation Office. The information may also be accessed by other government agencies and commercial organisations interested in building information.

Certificate of Occupancy and Use

Certificate No.: **B2022653C2**

Access Canberra Land, Planning and Building Services

ABN 16 479 763 216
8 Darling Street Mitchell
GPO Box 158 ACT 2601
www.act.gov.au/accesscbr

This Certificate is issued in accordance with Section 69 (2) of the Building Act 2004.

The building work listed on this certificate has been completed substantially in accordance with the prescribed requirements and is considered fit for occupation and use.

Unit	Block	Section	Division (Suburb)	District	Jurisdiction
	9	39	FYSHWICK	CANBERRA CENTRAL	Australian Capital Territory

Plans
B2022653/A

Building Works

Class of Occupancy	Nature of Work	Project Item Description	Other Description	Type Of Const.	Unit	BCN ID	Builder
5	New	OFFICE BUILDING	Office Refurbishment + New Front Entry	NA		B2022653N1	Sch 2.2(a)(ii)
5	New	OFFICE BUILDING	Divided Warehouse into 2 Units (Include Class 8)	NA		B2022653N1	
5	New	OFFICE BUILDING	Fire Services (Include Class 8)	NA		B2022653N1	

Comments **Important Note:**

This building work incorporates an alternative solution to the Building Code of Australia (BCA). Refer to the approval documentation for further information.

The issue, under this Part, of a certificate in respect of a building or portion of a building does not affect the liability of a person to comply with the provisions of a law of the territory (including this Act) relating to the building or portion of the building.

Issued by: Douglas Farr

Delegate of the ACT Construction Occupations Registrar.

Issued on: 29/08/2022

PROFESSIONAL FIRE SAFETY ENGINEERS
t: (02) 6100 3900 | ABN: 24 160 047 325
mail@ignissolutions.com.au | www.ignissolutions.com.au
Unit 13 / 14 Lonsdale Street Braddon ACT 2612
PO Box 5174 Braddon ACT 2612

HYPERION
B09 S39 Fyshwick ACT
PERFORMANCE BASED DESIGN BRIEF

IGNS-9138 Issue 01 Revision 01

Issued: 10 December 2021

DOCUMENT REVISION HISTORY

Issue	Revision	Date	Purpose of Issue	Prepared by	Reviewed by
01	00	25 October 2021	Issued for stakeholder review	CJ / NC	BHB
01	01	10 December 2021	Updated incorporating stakeholder comments	NC	BHB

Client
Hyperion Property Syndicates Ltd #16
Level 7, 9 George Street
Parramatta NSW 2150

Written by
Sch 2.2(a)(ii)

and
Sch 2.2(a)(ii)

Reviewed and Authorised by
Sch 2.2(a)(ii)

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CONDITIONS AND LIMITATIONS

The report does not provide guidance in respect of areas, which are used for bulk storage, processing of flammable liquids, explosive materials, multiple fire ignitions or sabotage of existing fire safety systems.

Apart from where noted in the specific sections of this report, we have not verified information provided by external parties and assume that the remainder of the building will comply with the DtS provisions of the NCC Volume 1 – BCA.

Any application of the content of this report should be made taking into full account the following items:

1. observations of the building fire safety systems and fire hazards listed in this report have been based on examination of documentation made available by the design team.
2. any change in the information referenced including building design as detailed in this report to suit future re-organisation or planning will require further evaluation to confirm compliance with the intent of the design objectives.
3. the data, methodologies, calculations and conclusions documented within this report specifically relate to the building and must not be used for any other purpose.
4. specifically, the report does not consider property damage; e.g. building and contents damage caused by fire, potential increased insurance liability and loss of business continuity.
5. this report considers a single point of fire as a source of ignition.
6. the design complies with the current DtS provisions of the BCA except for the specific performance solutions identified within this report.
7. figures provided within the report are indicative only. Full and appropriate detail is expected to be provided within discipline specific engineering specifications and associated detail design drawings by others.
8. all of the fire safety systems are assumed to be designed, installed and operate in accordance with the appropriate Australian Standards, other design codes, legislation and regulations relevant to the project unless specifically stated otherwise.
9. for a satisfactory level of fire safety to be achieved, regular testing and maintenance of all fire safety systems and measures, including management-in-use systems, is essential and is assumed in the conclusion of this evaluation.

Potential risks of incendiary are limited in the scope of engineering design. Conventional building design can only provide limited protection against malicious attack; for example, large scale incendiary and multiple ignition sources can potentially overwhelm some fire safety systems.

Strategies such as security, housekeeping and other management procedures may be more effective than additional fire protection in addressing arson events.

This report is applicable to the Project only. It does not consider property damage to the building as a result of the performance solutions addressed in the evaluations.

A number of issues within the NCC Volume 1 – BCA are interpretive in nature. Where these issues are encountered, interpretations are made that are consistent with standard industry practice.

This report is prepared in good faith and with due care for information purposes only, and should not be relied upon as providing any warranty or guarantee. In particular, attention is drawn to the nature of the inspection and investigations undertaken and the limitations these impose in determining with accuracy the state of the building, its services or equipment and life safety.

Ignis Solutions' involvement in the Project is limited to the role outlined in section 2 'Scope of Service' of the Letter. This report reflects that role. Any reliance on, or use of, this report for purposes outside the scope of service is at the user's own risk.

Ignis Solutions shall not be held liable for any loss or damage resulting from any defect of the building or its services or equipment or for any non compliance of the building or its services or equipment with any legislative or operational requirement, whether or not such defect or non-compliance is referred to or reported upon in this report, unless such defect or non-compliance should have been apparent to a competent engineer undertaking the evaluation of the type undertaken for the purpose of preparation of this report.

Ignis Solutions has carefully reviewed and applied to the best of our ability the requirements of local Legislation, the NCC and the International Fire Engineering Guidelines.

This report is provided to the client at their request to evaluate the building design under fire safety performance analysis. Ignis Solutions provides no warranty that this report will be approved by building authorities or future legislation or changes to the building code that would impact this evaluation where a deemed to satisfy solution may be required, further evaluation is needed or be subject to a fire order or new legislation for its design.

Ignis has relied upon the information provided by the client such as the architectural plans, building photos and construction detail. Ignis has not audited these documents or the building and assumes the information provided by the client on these documents is accurate. Ignis cannot provide any warranty that our report accuracy is maintained should the information provided have errors.

TABLE OF CONTENTS

Part

A

executive summary

1 EXECUTIVE SUMMARY

1.1 General

Ignis Solutions has been engaged by Hyperion Property Syndicates regarding the development at B09 S39 Fyshwick ACT.

The development is a warehouse building (Class 8) comprising of multiple warehouse tenancies and an office tenancy which is less than 10% of the total building area. A change to the internal configuration of the building is proposed, with no increase in building size.

Provision A2.0 details that a Building Solution will comply with the BCA if it satisfies the Governing Requirements of the NCC and the Performance Requirements. A building solution as defined by the BCA means a solution, which complies with the Performance Requirements and is an Alternative Solution or a solution, which complies with the Deemed-to Satisfy provisions or a combination of both.

1.2 Scope and Purpose

The purpose of this assessment is to evaluate the nominated performance requirements to demonstrate that the relevant performance requirements of the National Construction Code Volume One Amendment 1– Building Code of Australia 2019 are maintained.

TABLE 1:
PERFORMANCE SOLUTION SUMMARY

Assessment	Relevant BCA Provisions and Performance Requirements	Method for meeting performance requirements	IFEG Sub-system[s] Evaluated	BCA Assessment method
Large isolated building – Non-continuous perimeter vehicle access	C2.2 C2.3 C2.4 CP2 CP9	A2.1 (3)	C, F	A2.2 (2)(b)(ii)
Distance of travel – Warehouse	D1.4 D1.5 DP4	A2.1 (3)	E	A2.2(2) (b)(ii)
50 m Fire Hose Reels – Warehouse	E1.4 EP1.1	A2.1 (3)	D	A2.2(2) (b)(ii)
Fire hydrant system – Coverage (External)	E1.3 EP1.3	A2.1 (3)	F	A2.2(2) (b)(ii)

Source: Ignis Solutions

1.3 Relevant Stakeholders

Consultation with project stakeholders is undertaken based on the International Fire Engineering Guidelines Clause 1.2.2. The following stakeholders were involved in this fire engineering analysis.

The relevant stakeholders consulted in developing this fire strategy are outlined in the table below.

TABLE 2:

PROJECT STAKEHOLDERS

Name	Role	Organisation
Sch 2.2(a)(ii)	Client	Sch 2.2(a)(ii)
	Architect	
	Builder	
	Certifier	
	Referral Entity	
	Student Engineer	
	Fire Safety Engineer	
	Chartered Professional Fire Safety Engineer	

Source: Ignis Solutions

1.4 Sources of Information

The following information sources were used in the evaluation of the buildings:

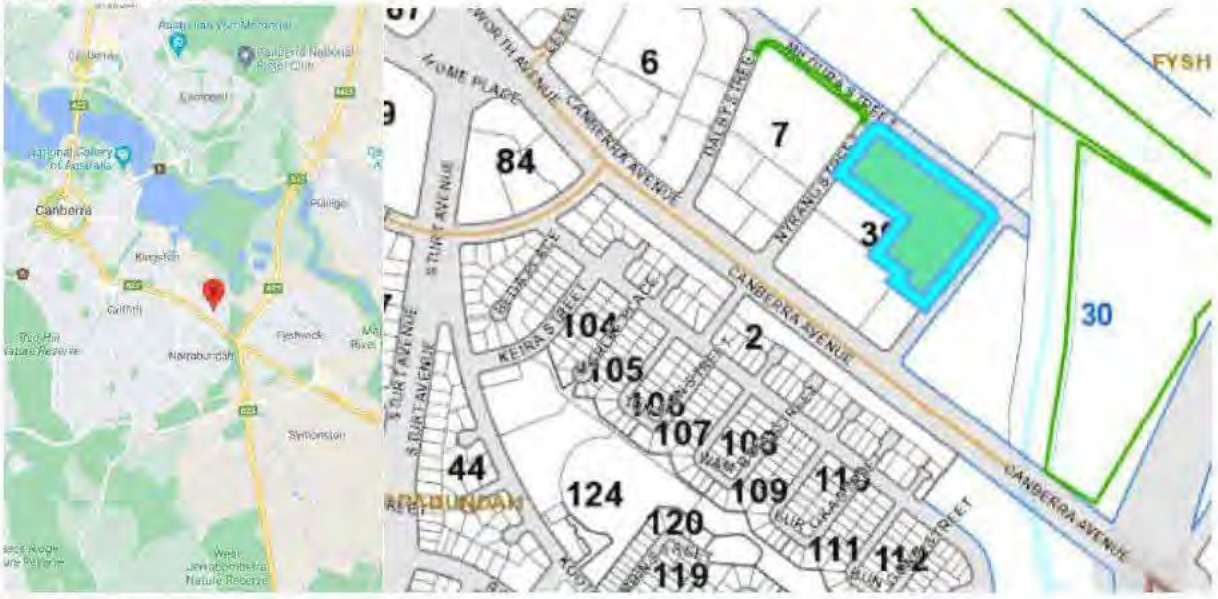
- National Construction Code 2019 – Volume One Amendment 1– Building Code of Australia, Class 2 to 9 buildings, Australian Building Codes Board, Canberra, 2020 (BCA).
- Guide to the Building Code of Australia 2019 – Volume One Amendment 1 – Building Code of Australia, Class 2 to 9 buildings, Australian Building Codes Board, Canberra, 2020 (the Guide).
- International Fire Engineering Guidelines, Australian Building Codes Board, Canberra, 2005.
- Drawings provided by DNA Architects, project number 2097 dated 14 May 2021.

1.5 Proposed Development

The location of the building is detailed below.

FIGURE 1:

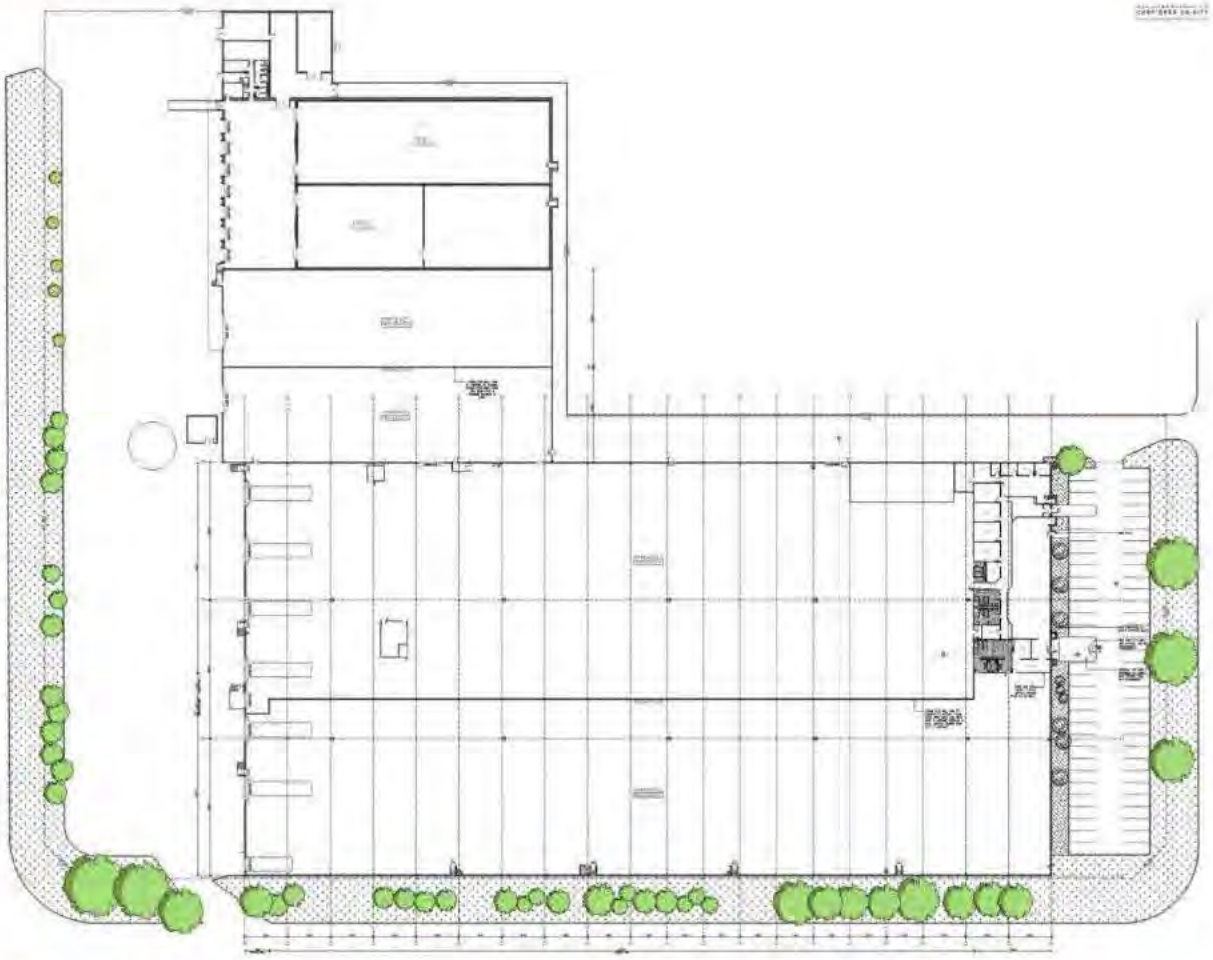
BUILDING LOCATION



Source: ACTmapi and Google Maps

FIGURE 2:

SITE PLAN



Source: Kasparek Architects

The minimum fire safety measures required within the building are determined in accordance with several specifics of the building including the various occupancy classifications, effective height, rise in storeys, compartment size and building floor area.

TABLE 3:

BUILDING CLASSIFICATION DETAILS

Project	B09 S39 Fyshwick ACT
Occupancy	Warehouse
Classification	8
Effective height	<12m
Rise In storeys	1
Number of storeys	1
Type of construction	Type C (large isolated building – built and proposed)

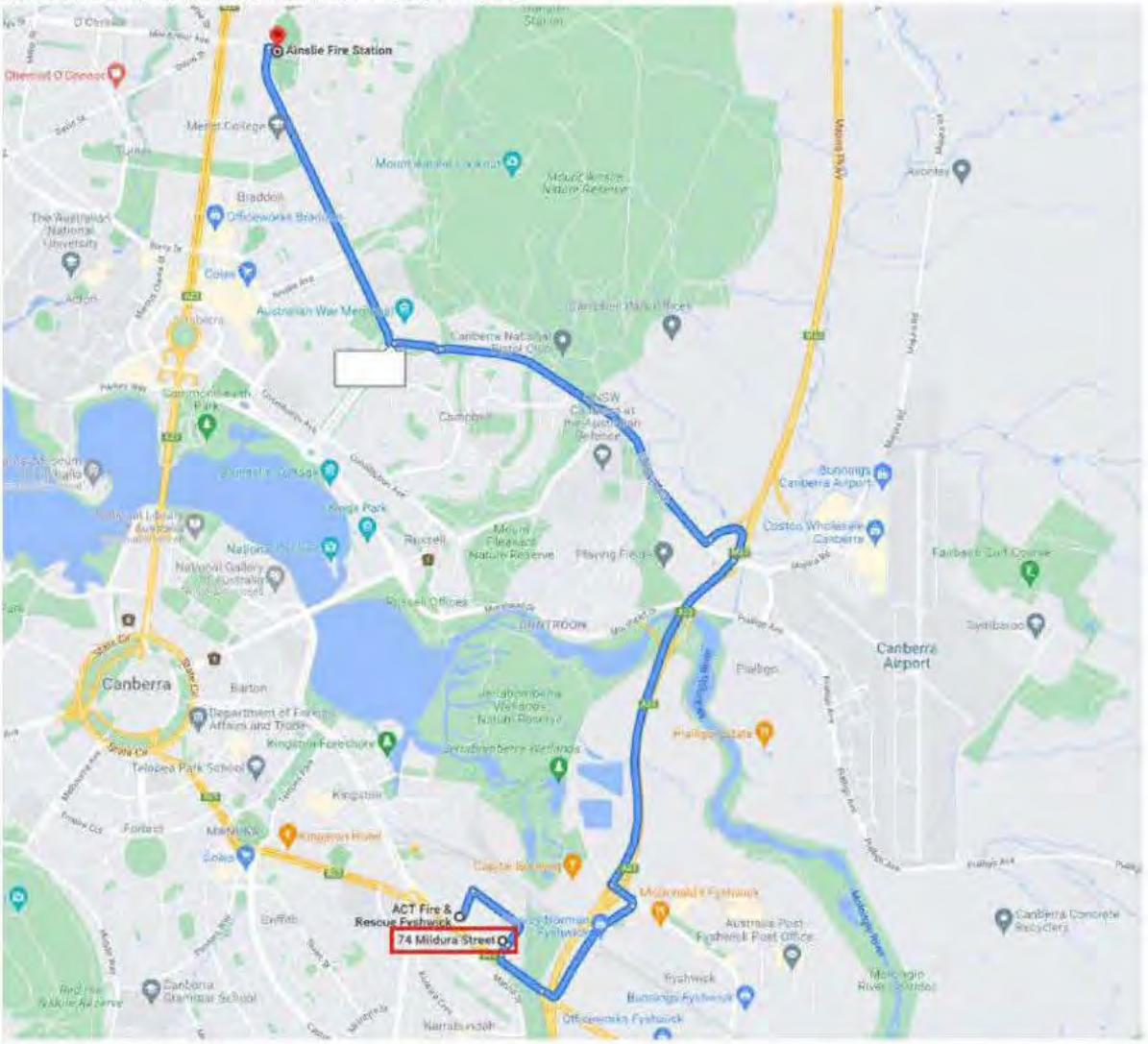
Source: NCC – Vol 1 – BCA

1.6 Fire Brigade Intervention

The site is served by a response from ACT Fire & Rescue. The nearest ACT Fire & Rescue station is Fyshwick Station being approximately 0.9 km by direct road from the site taking approximately 2 minutes. The second nearest ACT Fire & Rescue station is Ainslie Fire Station being approximately 9.5 km by direct road from the site taking approximately 13 minutes. The site location and the two fire stations are outlined below:

FIGURE 3:

BUILDING PROXIMITY TO NEAREST FIRE STATIONS



Source: Google map and Ignis Solutions

Part

B

fire safety measures

The fire safety measures listed in this section are essential measures forming part of the performance solution that must be designed, installed and identified on the essential services maintenance schedule for the building. These essential measures must be maintained and certified in accordance with the provisions of the National Construction Code, this report and ABCB Maintenance of Safety Measures, Equipment and Energy Efficiency Installations Handbook 2014 and any applicable Australian Standards. Other measures may be required by the National Construction Code. These measures are likely to be detailed by specific design disciplines or the BCA consultant. Ignis Solutions scope relates to performance based design as detailed in this report only.

Current legislation for the maintenance of buildings is managed initially through Section 92 of the Emergencies Act where the chief officer may, in writing, direct the occupier of the premises for the provision or installation of a fire appliance at the premises.

In accordance with Section 95(2) of the Emergencies Act, it is an offence if a fire appliance is provided or installed at the premises under a direction under Section 92 and the occupier fails to maintain the fire appliance to a reasonable standard.

It is expected that through the ACT F&R Plan Review and Performance Review process under the Building (General) Regulations that direction under Section 92 will be provided.

It is assumed that the following fire safety measures, limitations and assumptions of this report are read, understood and implemented. Ignis Solutions should be contacted if there are queries in regards to the content. Ignis Solutions takes no responsibility for the misinterpretation by others.

2 FIRE SAFETY MEASURES

2.1 General

a. The following fire safety measures relate to elements that are associated with the performance analysis. All other elements of the buildings fire safety measures not specifically documented in the following section is to comply with the requirements of the BCA and documented by others. No observation or allowance for any external wall element to be combustible has been identified and does not form part of our scope of works. Any proposal to use combustible external wall elements or modification to the BCA DtS provisions of fire safety must be brought to the attention of Ignis Solutions through written correspondence. Ignis Solutions takes no responsibility for compliance matters relating to fire safety that have not been discussed or brought to our attention.

2.2 Architectural Measures

2.2.1 Exits and Paths of Travel

a. It is proposed for the travel distance within the warehouse building to be up to approximately 75 m to the nearest exit in lieu of 40 m.

b. It is proposed for the travel distance between alternate exits through a point of choice to be 150 m in lieu of 60 m.

2.2.2 Vehicular perimeter access and clearance zone

a. It is proposed for the subject building to not be provided with full perimeter vehicular access in accordance with Provision C2.4(b).

2.3 Hydraulic System Measures

2.3.1 Fire Hydrant System

a. It is proposed for the coverage from the existing external attack hydrant system to the subject building to be via three lengths of fire hose.

b. It is proposed for the hydrant system serving the large isolated building to not be a dedicated ring main as required by Clause 8.6.1(b) of AS 2419.

c. A hydrant block plan is to be provided at the FIP and booster.

d. Signage indicating that three lengths of fire hose is required is to be installed adjacent to the hydrant block plan. The signage shall read "THREE LENGTHS OF FIRE FIGHTING HOSE IS REQUIRED TO REACH ALL AREAS FROM THE EXTERNAL HYDRANTS".

e. The signage is to be in capital lettering, not less than 20mm high in a colour contrasting the background. Signage must be permanent, fade resistant and weatherproof – i.e. must be screw fixed or other and not laminated paper.

2.3.2 Fire Hose Reels

a. It is proposed to have 50 m fire hose reels installed in the warehouse building.

b. Signage is required above the fire hose reel indicating the length.

2.4 Fire Safety Measures Maintenance

2.4.1 Maintenance Requirements

a. Current legislation for the maintenance of buildings is managed initially through Section 92 of the Emergencies Act where the chief officer may, in writing, direct the occupier of the premises for the provision or installation of a fire appliance at the premises.

In accordance with Section 95(2) of the Emergencies Act, it is an offence if a fire appliance is provided or installed at the premises under a direction under Section 92 and the occupier fails to maintain the fire appliance to a reasonable standard.

It is expected that through the ACT F&R Plan Review and Performance Review process under the Building (General) Regulations that direction under Section 92 will be provided.

A fire safety schedule of essential measures is to be generated and kept on the building file as well as provided at the Fire Indicator Panel.

2.5 Essential Fire Safety Measures

2.5.1 Essential Fire Safety Measures

a. All Fire safety systems listed in this performance report are considered to be essential measures and to be maintained in accordance with AS 1851:2012.

Part

C

performance solutions

To be completed as part of fire engineering report

Appendix

A

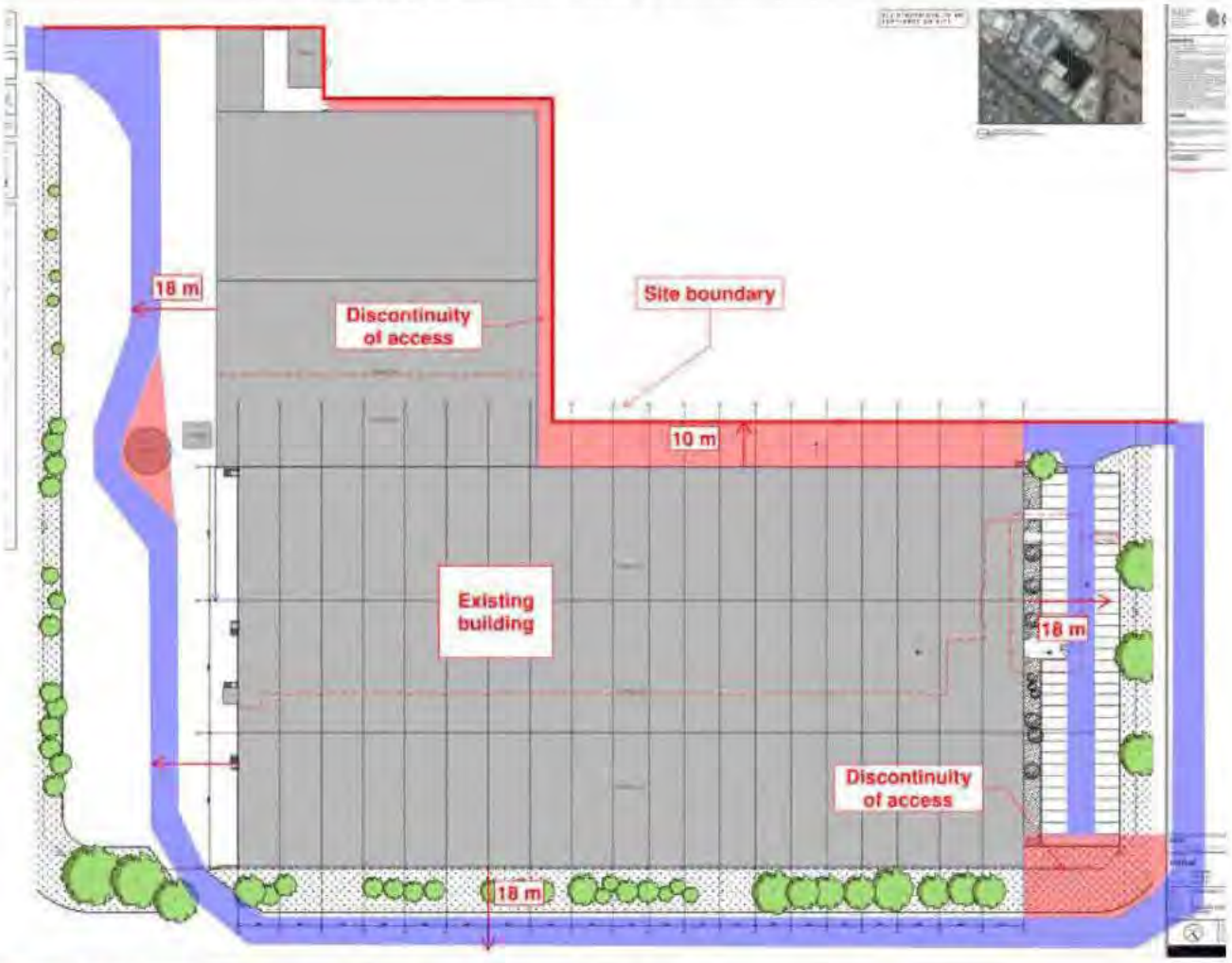
fire engineering brief detail

A FIRE ENGINEERING BRIEF

A.1 Large Isolated Building – Non-continuous Perimeter Vehicular Access

Brief

- Clause C2.2(a) details the size of any fire compartment in a Class 8 building must not exceed the relevant maximum floor area nor the relevant maximum volume set out in Table C2.2 and C2.5 except as permitted in C2.3.
- Clause C2.3(a)(ii)(B) of the BCA details that large-isolated buildings of Class 8 which exceed 18,000 m^2 in floor area or 108,000 m^3 in volume must be provided with a perimeter vehicular access complying with Clause C2.4(b).
- Clause C2.4(b) of the BCA details that the perimeter vehicular access must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building. Also, it must have an unobstructed width of 6m with no part of its furthest boundary more than 18 m form the building and no part of the 6 m width be built upon or used for any purpose other than vehicular or pedestrian movement.
- The building has an area of approximately 19,000 m^2.
- It is proposed for the subject building to not be provided with vehicular access in accordance with Clause C2.4(b). The sections of the building with non-compliant vehicular access are outlined in red in the figure below.
- It is proposed for the hydrant system serving the large isolated building to not be a dedicated ring main as required by Clause 8.6.1(b) of AS 2419.



BCA DtS Basis

C2.2 – General floor area and volume limitations

The size of any fire compartment in a Class 8 building must not exceed the relevant maximum floor area nor the maximum volume set out in Table C2.2 and C2.5 except as permitted in C2.3.

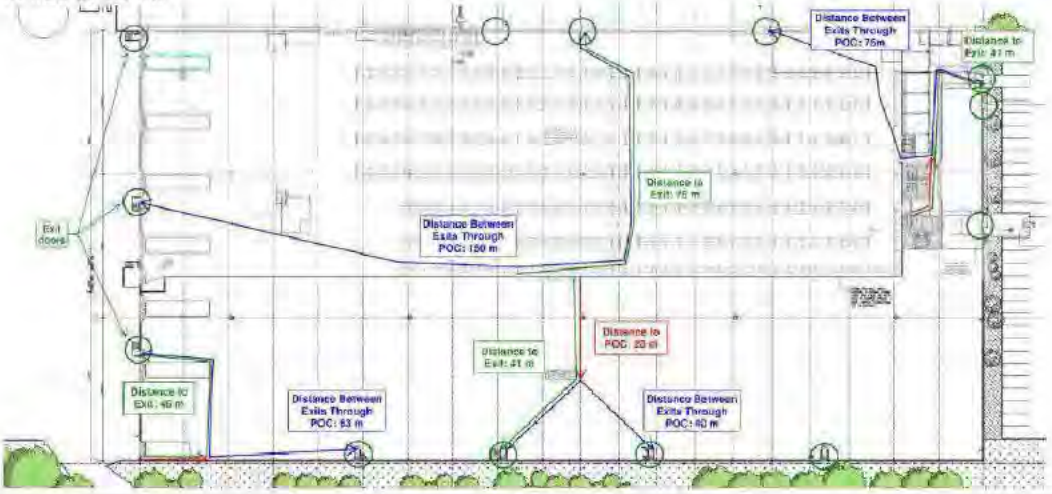
C2.3 – Large isolated buildings

	The Class 8 building may exceed 18,00 m^2 in floor area or 108,000 m^3 in volume if it is protected with a sprinkler system complying with Specification E1.5 and provided with perimeter vehicular access complying with C2.4(b). C2.4(b) – Requirements or open spaces and vehicular access Vehicular access must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building.
Intent	The intent of the related Deemed-to-Satisfy provision C2.4 is to set the minimum requirements for open space around a building and the provision of vehicular access for the fire brigade.
Performance Requirement	CP2 – Fire spread CP9– Fire brigade access
Meeting the Performance Requirement	BCA Provision A2.1 (3): a combination of (1) and (2) where (1) is a Performance Solution and (2) is a Deemed-to-Satisfy Solution.
Assessment Method	BCA Clause A2.2 (2)(b)(ii) Other Verification Methods accepted by appropriate authority that show compliance with the relevant Performance Requirements.
Methodology	Sch 2.2(a)(xi)
IFEG	C – Occupant Evacuation and Control
Acceptance Criteria	The acceptance criteria for this performance solution is that the proposed lack of vehicular access does not hinder brigade intervention.
Hazard	The potential hazard is that a fire incident may cause fire spread and the fire brigade cannot maintain continuous access in a forward direction around the entire building.
Strategy	• Description of building and current building use. • Building is existing, with extension in 1987. No change to external façade or size of the building proposed under current building works. • Layout of subject building and site access has not significantly changed for over 30 years. • Access on three sides of the building. • No change of use from current usage. • Existing hydrant system and street hydrants for hydrant coverage (see hydrant Performance Solution). • ESFR sprinkler system installed and maintained • Height of racking controls, wire mesh proposed to separate upper level tenancy wall to prevent sprinkler interference.
Calculation Tools	The evaluation is qualitative
Fire Safety Measures	Independent of the BCA DtS provisions, which remain required, no additional fire safety measures are required in relation to this performance solution.

A.2 Distance of Travel

Brief

- Clause D1.4 of the BCA requires that the travel distance in a Class 5, 6, 7, 8 or 9 building be no more than 20 m from an exit or to a point of choice of two exits, in which case the maximum distance to one of those exits must not exceed 40 m.
- Clause D1.5 of the BCA requires that the travel distance to an alternative exit through a point of choice for Class 5,6,7,8 or 9b building no more than 60 m.
- It is proposed for the travel distance within the warehouse building to be up to approximately 75 m to the nearest exit in lieu of 40 m.
- It is proposed for the travel distance between alternate exits through a point of choice to be 150 m in lieu of 60 m.



BCA DtS Basis

D1.4 – Exit travel distances
The requirements for exits are based on the Class of building. Within a Class 7a building the maximum distance to a single exit or point of choice must not be more than 20 m and the maximum distance to the nearest exit is 40 m.
D1.5 – Distance between alternative exits
The requirements for exits are based on the Class of building. Within a Class 8 building the maximum distance between alternative exits through a point of choice is to be no more than 60 m.

Intent

The intent of the related Deemed-to-Satisfy provision D1.4 is to maximise the safety of occupants by enabling them to be close enough to an exit to safely evacuate.

Performance Requirement

DP4 – Exits
EP2.2 – Evacuation routes

Meeting the Performance Requirement

BCA Provision A2.1 (3): a combination of (1) and (2) where (1) is a Performance Solution and (2) is a Deemed-to-Satisfy Solution.

Assessment Method

BCA Clause A2.2 (2)(b)(ii) Other Verification Methods accepted by appropriate authority that show compliance with the relevant Performance Requirements.

Methodology

Sch 2.2(a)(xi)

IFEG

E – Occupant Evacuation and Control

Acceptance Criteria

The acceptance criteria for this performance solution is that occupants are provided with sufficient warning and means to safely reach an exit such that the BCA Performance Requirement DP4(a) is satisfied to the degree necessary.

Hazard

The potential hazards include:

- the exit travel distance being too excessive,
- the risk of the fire safety systems not being sufficient for all the occupants who might be using the area to evacuate.

Strategy	• Description of building and travel distances. • Alternative egress routes not passing through the point of choice. • Low occupancy level of the warehouse. • High occupant familiarity. • Visibility along the open paths of the warehouse. • High hazard sprinkler system.
Calculation Tools	The evaluation is qualitative
Fire Safety Measures	Independent of the BCA DtS provisions, which remain required, no additional fire safety measures are required in relation to this performance solution.

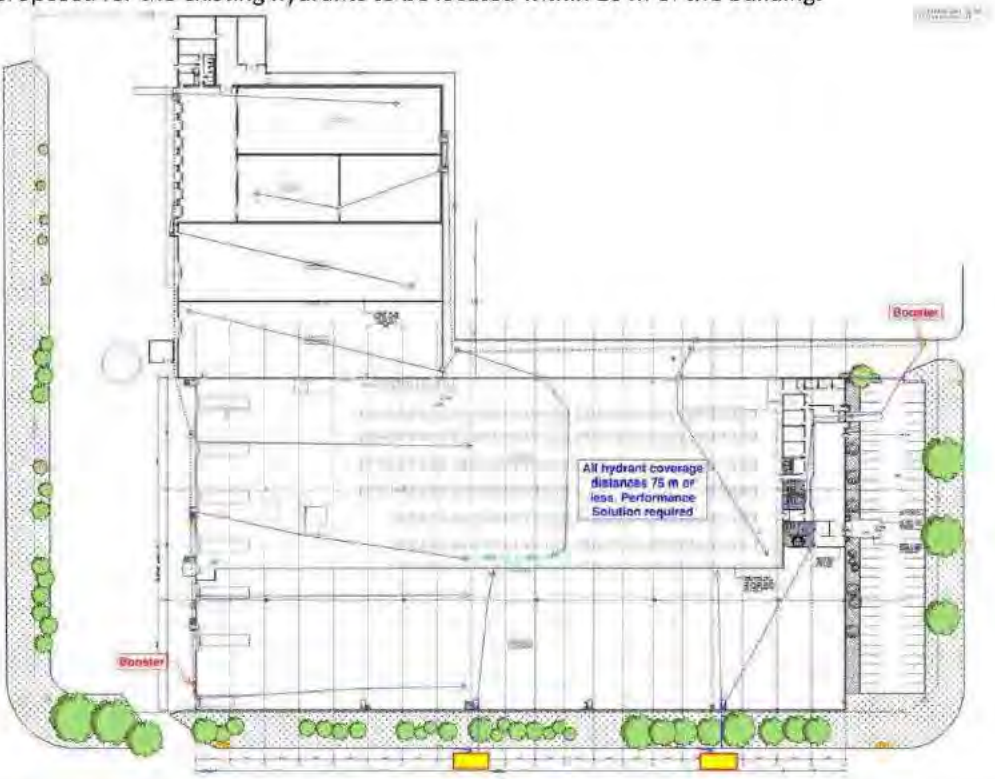
A.3 50 m Fire Hose Reels

Brief	• Clause E1.4 of the BCA requires that fire hose reels be provided throughout the warehouse building. • Clause 10.2(a) of AS 2441:2005 sets the maximum coverage of a hose length to be 36 m. • It is proposed for the fire hose reels within warehouse building to be 50 m in lieu of 36 m. Multiple 50 m fire hose reels provide coverage to the entire warehouse building.
BCA DtS Basis	E1.4 – Fire hose reels A fire hose reel system must be provided to serve the whole buildings where one or more internal hydrants are installed and to serve any fire compartments with a floor area greater than 500m^2.
Intent	The intent of the related Deemed-to-Satisfy provision is to require the installation of suitable fire hose reel systems to enable, where appropriate, a building's occupants to undertake initial attack on a fire.
Performance Requirement	EP1.1 – Fire Hose Reel System
Meeting the Performance Requirement	The Performance Requirement will be satisfied by A2.1 (3): a combination of (1) and (2) where (1) is a Performance Solution and (2) is a Deemed-to-Satisfy Solution.
Assessment Method	BCA Clause A2.2 (b)(ii) Other Verification Methods accepted by appropriate authority that show compliance with the relevant Performance Requirements.
Methodology	Sch 2.2(a)(xi)
IFEG	D – Fire Detection, Warning and Suppression
Acceptance Criteria	The acceptance criteria for this performance solution is that the proposed first attack provisions are appropriate to the occupants and do not reduce the capacity for the occupants to undertake first attack if required.
Hazard	The potential hazard is that a fire may occur in an area and occupants will not be able to suppress the fire.
Strategy	• The use of fire hose reels within the warehouse is based on a straight line run and open clear spaces.
Calculation Tools	The evaluation is qualitative
Fire Safety Measures	Independent of the BCA DtS provisions, which remain required, the following fire safety measures are required in relation to this performance solution: • 50 m fire hose reels within the warehouse building. • Signage above the fire hose reel indicating the length

A.4 Fire Hydrant System – Coverage (External)

Brief

- Provision E1.3 of the BCA requires the building hydrant system to comply with AS 2419.1.
- In accordance with Clause 3.2.3 of AS 2419.1:2005, all points on a floor shall be within reach of a 10 m hose steam issuing from a nozzle at the end of a 60 m length of hose laid on the floor connected to the external fire hydrant system.
- It is proposed for three lengths of fire hose to be used from the existing onsite attack hydrant system and the adjacent street hydrants to achieve coverage within all areas of the building. The maximum length of fire hose required from the existing external attack hydrant system is approximately 75 m for coverage into the warehouse.
- It is proposed for the existing hydrants to be located within 10 m of the building.



BCA DtS Basis	E1.3 – Fire hydrants A fire hydrant system must be provided to serve a building having a total floor area greater than 500 m^2, the system must be installed in accordance with AS 2419.1 and all points on a floor shall be within reach of a 10 m hose steam issuing from a nozzle at the end of a 60 m length of hose laid on the floor connected to the external fire hydrant outlet.
Intent	The intent of the related Deemed-to-Satisfy provision is to require the installation of suitable fire hydrant systems to facilitate the fire brigades firefighting operations.
Performance Requirement	EP1.3 – Fire Hydrants
Meeting the performance requirement	The Performance Requirement will be satisfied by A2.1 (3): a combination of (1) and (2) where (1) is a Performance Solution and (2) is a Deemed-to-Satisfy Solution.
Assessment method	BCA Clause A2.2 (2) (b)(ii) Other Verification Methods accepted by appropriate authority that show compliance with the relevant Performance Requirements.
Methodology	Sch 2.2(a)(xi)
IFEG	F – Fire Service Intervention
Acceptance Criteria	The acceptance criteria for this performance solution is that the proposed fire hydrant design does not reduce the capacity for fire service intervention.

Hazard	The potential hazard is hindrance to firefighting operations by having to run out additional lengths of fire hose.
Strategy	• Proposed building works does not extend the construction of the building. Building footprint and hydrant placement are not changed from existing design. • Fire crews have the capacity and capability to deploy three lengths of hose from the hydrant point to reach all areas of the building. • The fire hose used by ACT Fire & Rescue is an advanced hose with minimal friction loss over multiple lengths. • The street hydrants located on Mildura Street be used for initial attack if required before utilising the onsite hydrants that are located within 10 m of the building.
Fire Safety measures	Independent of the BCA DtS provisions, which remain required, the following fire safety measures are required in relation to this performance solution: • It is proposed for the coverage from the existing external attack hydrant system and street hydrants to the subject building to be via three lengths of fire hose. • A hydrant block plan is to be provided at the FIP and both boosters. • Signage indicating that two lengths of fire hose is required is to be installed adjacent to the hydrant block plan. The signage shall read "THREE LENGTHS OF FIRE FIGHTING HOSE IS REQUIRED TO REACH ALL AREAS FROM THE EXTERNAL HYDRANTS". The signage is to be in capital lettering, not less than 20mm high in a colour contrasting the background. Signage must be permanent, fade resistant and weatherproof – i.e. must be screw fixed or other and not laminated paper.

A.5 Overview

This project proposes evaluation of the nominated Performance Requirements of the National Construction Code Volume One - Building Code of Australia (BCA) in accordance with the methodologies defined in the International Fire Engineering Guidelines (IFEG). The intent is to provide a workable and safe fire safety strategy through a trial design. In order to develop and assess the nominated non-compliances the following process is adopted as structured by chapter 1.2 of the IFEG.

Project Scope	• Provides details of the project scope • Provides details of the regulatory framework
⇓	
Relevant Stakeholders	• Provides details of the project team
⇓	
Principle Building Characteristics	• Provides details of the building including: – Occupancy – Location – Size and Shape – Structure
⇓	
Dominant Occupant Characteristics	• Provides details of the expected building occupants including: – Distribution - population – Physical and mental attributes – Familiarity with the building – Emergency training – Travel speed
⇓	
General Objectives	• Provides details of the general objectives including: – Building regulatory objectives – Other regulatory objectives – Non-regulatory objectives
⇓	
Fire Hazards and Protective Measures	• Provides details of the fire hazards and protective measures including: – Fire statistics – Fire load – Fire growth rate and intensity
⇓	
Fire Scenarios	• Provides details of the proposed fire scenarios

A.6 Scope of Project

The purpose of this evaluation is to satisfy the performance requirements of the National Construction Code Volume 1 - Building Code of Australia (BCA). This appendix sets down the basis on which the analysis will be undertaken (to be agreed by the stakeholders), necessary acceptance criteria, fire engineering evaluation and the recommended fire engineering requirements. The project is to evaluate the proposed building utilising both DtS and Performance Solutions across the development.

A.6.1 Contractual Content

The projects design team operate on a design and construct basis where a significant portion of the design will be undertaken by design and installation contractors. Appropriately qualified engineers will

provide oversight on general areas of design and specifically qualified engineers will provide detailed design and assessment reports including structural and fire safety provisions.

A.6.2 Regulatory Framework

The regulatory framework in Australia is spread over three levels of government. These levels are:

- Federal Government;
- State Government; and
- Local Government.

The Federal Government is responsible for the six states and two territories within the Commonwealth of Australia and coordinates the development of the BCA. The BCA contains the technical provisions for building design and is maintained by the Australian Building Codes Board.

The legislations and regulations required for the implementation of the BCA occurs at the State and Local Government level. Building approvals and occupancy permits are given by local council building surveyors and inspectors and in some cases by private building surveyors.

The administrative requirements still differ between each state and territories. In the ACT, the Building Act 2004 and Building Regulations 2008 detail the Territory legislative and regulatory requirements.

The technical requirements for building in respect to health, safety and amenity of people occupying or near buildings is contained with the National Construction Code - Volume 1 - Building Code of Australia (BCA). This document is applied nationally with various State and Territory variations.

The objectives and functional requirements are provided for guidance purposes only. The only part of the BCA that Building Solutions must comply are the Performance Requirements. A Building Solution may comply with the Deemed-to-Satisfy (DtS) provisions, which are deemed to comply with the Performance Requirements. In most Performance Solutions, the Building Solution is partly based on a DtS building design and partly a Performance Building Solution.

The BCA is not specifically referred to in the Building Act but is prescribed by the Building Regulation. The Building Regulation specifies that a proposed building must comply with the requirements of the BCA.

The IFEG document has been developed for use in the fire safety design and assessment of buildings and reflects world's best practice. The document is intended to provide guidance for fire safety engineers as they work to develop and access strategies that provide acceptable levels of safety.

The document is particularly useful in providing guidance in the design and assessment of Performance Solutions against the Performance Requirements of the BCA. The prescribed methodology set out in the IFEG is to be adopted in the fire engineering analysis.

The Building Regulations requires building planning to follow the following three step process:

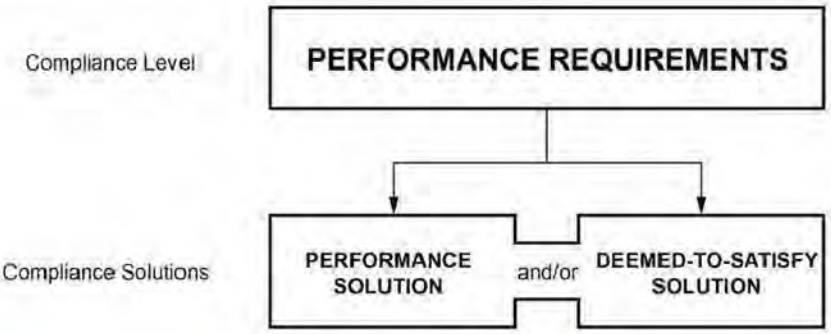
- Development Application
- Building Approval
- Occupancy

In order to obtain building approval, any proposed building or tenancy project with a floor area greater than 500 m^2 is required to be reviewed by ACT Fire & Rescue for both plan review as well as any performance solution review. Likewise, in order to obtain the Certificate of Occupancy for a building or tenancy project, occupancy clearance is required from ACT Fire & Rescue.

The role of ACT Fire & Rescue is governed by the Emergencies Act 1989. This Act sets out the Fire Brigade's structure, operations, responsibilities, etc.

FIGURE 4:

BCA STRUCTURE



Source: BCA 2019

A.6.3 Standards of Construction, Commissioning, Management, Use and Maintenance

The following base information sources were used in the evaluation of the building:

- National Construction Code 2019 – Volume One Amendment 1– Building Code of Australia, Class 2 to Class 9 Buildings', Australian Building Codes Board, 2020 (BCA).
- Guide to the Building Code of Australia 2019 – Volume One, Class 2 to Class 9 Buildings', Australian Building Codes Board, 2020 (the Guide).

A fire safety management-in-use plan is recommended to be developed and implemented by the buildings management incorporating as minimum the maintenance of the buildings fire safety measures in accordance with the ABCB Maintenance of Safety Measures, Equipment and Energy Efficiency Installations Handbook 2015 and any applicable Australian Standards.

Current legislation for the maintenance of buildings is managed initially through Section 92 of the Emergencies Act where the Chief Officer may, in writing, direct the occupier of the premises for the provision or installation of a fire appliance at the premises. In accordance with Section 95(2) of the Emergencies Act, it is an offence if a fire appliance is provided or installed at the premises under a direction via Section 92 and the occupier fails to maintain the fire appliance to a reasonable standard.

Prior to the Emergencies Act 2004 the Fire Brigades Ordinance of 1957 as amended until 2004 owners of a building are required to maintain to the satisfaction of the Chief Officer of a fire brigade a fire appliance provided or installed in the building in pursuance of a direction given under the regulations. Whilst no evidence has been identified that the ACT Fire Service Chief Officer has provided direction under Section 92 of the Emergencies Act 2004 or Section 13 of the Fire Brigades Ordinance 1957. ACT Building Regulations since 1972 have required the ACT Fire Service Chief Officer to review and comment on the installed fire appliances. Given the process of building approval, it is assumed that the ACT Fire Service Chief Officer has issued or will issue support for the installed fire safety appliances.

It is noted that the building maintenance process and documentation is not a legislated element within the ACT.

A.7 Dominant Occupant Characteristics

The characteristics of occupants in a building can have a significant impact on the evacuation behaviour and the total evacuation time for a building. The occupancy characteristics for the varying portions of the building are presented below.

The characteristics of various occupancies are listed below. Not all the following occupancies may be relevant to the subject project.

A.7.1 Distribution

The characteristics of occupants in a building can have a significant impact on the evacuation behaviour and the total evacuation time for a building.

Occupants within the building will be made up of staff members. In the event of fire, all occupants are assumed to perceive the fire alarm. There is however usually scepticism as to whether the alarm is genuine or not, and occupant behaviour following the alarm depends on many different factors such as social influence, experience, commitment and training.

The occupancy of the building is sufficiently large and uncensored to assume that there will be a mix of abilities amongst the individuals. People with disabilities may also be present to the same proportion as expected within the general population. It will however be assumed that nobody in the building needs to be transported in a bed or via a stretcher to evacuate the building in a fire incident.

A.7.2 Class 8 Warehouse

Occupants within the warehouse area will be made up of staff. Occupants can consist of people from a wide range of cultural, educational, demographic and religious backgrounds. The diversity in backgrounds can result in different behaviours and actions in the event of a fire.

If a fire occurs within the these areas, all occupants are assumed to perceive the fire alarm, but most staff are not likely to commence evacuation until encouraged by a voice alarm.

At the time of the fire occupants within these areas are assumed to be awake and either sitting or standing.

A.7.3 Familiarity and recognition

Occupants are expected to be familiar with the primary access and egress routes from the building. It is unlikely that occupants will be familiar with all the evacuation routes without the implementation of fire emergency training drills. The occupants are expected to have the ability to take and implement decisions independently and the potential emergency behaviour is to be rational and conducive to the emergency situation.

A.7.4 Physical attributes

Occupants are assumed to have the same level of mobility as the general population. This may include a limited proportion of mobility impaired occupants. These occupants may require crutches, a wheelchair or similar to evacuate on their own or need assistance from other occupants.

A.7.5 State

The building is a warehouse and office building, therefore occupants are likely to be awake and aware of the situation and able to respond in a timely manner.

A.7.6 Emergency training

Emergency training is unlikely to occur. The occupants are expected to have a level of understanding where they can recognise an emergency situation.

A.8 General Objectives

This fire engineering assessment has been undertaken to show the suitability of the proposed fire safety systems within the building and compliance with the nominated performance criteria of the Building Code of Australia (BCA).

The level of building fire safety has been determined by a systematic performance based evaluation generally complying with the Australian Building Codes Board, "International Fire Engineering Guidelines".

Where the results of the analysis indicate that the level of life safety does not meet the current prescriptive building regulations, alternative fire safety systems have been recommended.

The objectives of the performance assessment are to:

- Assess the compliance of nominated design aspects with the performance requirements of the BCA
- Consider alternate design solutions, to satisfy the relevant performance requirements.

The goals of the BCA are to enable the achievement and maintenance of acceptable minimum standards of structural sufficiency, safety (including safety from fire), health and amenity for the benefit of the community now and in the future. These goals are applied so that the BCA extends no further than is necessary in the public interest, is cost effective, easily understood, and is not needlessly onerous in its application.

The client must make themselves familiar and endorse the proposed performance solutions which complies with the Performance Requirements rather than complying with the Deemed-to-Satisfy Provisions of the BCA.

The fire safety objectives of the client are to:

- Enhance public image and satisfy moral obligations
- Protect assets
- Maintain services to the local community
- Continue operations
- The fire safety objectives of the fire and rescue service include:
- General authority to protect persons and property.
- Duty to deal with fires and hazardous material incidents.
- To take all practicable measures for preventing and extinguishing fires and protecting and saving life and property in case of fire.
- To have regard to the principles of ecologically sustainable development

A.9 Fire Hazards and Preventative and Protective Measures

The building will be provided with the major fire safety measures required by the DtS provisions of the BCA listed as follows. A comprehensive list of fire safety measures is to be provided by the certifier as part of the building approval process. Additional fire safety measures if required as part of the performance solution are listed within the fire safety measures within Part B.

TABLE 4:

HAZARDS AND PREVENTATIVE AND PROTECTIVE MEASURES

Area	Hazards Ignition Source	Fuel Loads	Preventative Measures	Protections Measures
Warehouse	Electrical faults Equipment faults Food stuffs Cooking Equipment Heating	Furniture Rubbish Bins Fixtures/Fittings Motor vehicles Merchandise	Presence of occupants Surveillance Alarm System	Portable fire extinguishers Sprinklers Fire Hose Reels

Source: Ignis Solutions

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HYPERION
B09 S39 Fyshwick, ACT
FIRE ENGINEERING REPORT

IGNS-9138 Issue 01 Revision 00

Issued: 18 January 2022

DOCUMENT REVISION HISTORY

Issue	Revision	Date	Purpose of Issue	Prepared by	Reviewed by
01	00	18 January 2022	Issued for stakeholder review	NC	BR

Client
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Level 7, 9 George Street
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Written by

Sch 2.2(a)(ii)

Reviewed by

Sch 2.2(a)(ii)

Authorised by

Sch 2.2(a)(ii)

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CONDITIONS AND LIMITATIONS

The report does not provide guidance in respect of areas, which are used for bulk storage, processing of flammable liquids, explosive materials, multiple fire ignitions or sabotage of existing fire safety systems.

Apart from where noted in the specific sections of this report, we have not verified information provided by external parties and assume that the remainder of the building will comply with the DtS provisions of the NCC Volume 1 – BCA.

Any application of the content of this report should be made taking into full account the following items:

1. observations of the building fire safety systems and fire hazards listed in this report have been based on examination of documentation made available by the design team.
2. any change in the information referenced including building design as detailed in this report to suit future re-organisation or planning will require further evaluation to confirm compliance with the intent of the design objectives.
3. the data, methodologies, calculations and conclusions documented within this report specifically relate to the building and must not be used for any other purpose.
4. specifically, the report does not consider property damage; e.g. building and contents damage caused by fire, potential increased insurance liability and loss of business continuity.
5. this report considers a single point of fire as a source of ignition.
6. the design complies with the current DtS provisions of the BCA except for the specific performance solutions identified within this report.
7. figures provided within the report are indicative only. Full and appropriate detail is expected to be provided within discipline specific engineering specifications and associated detail design drawings by others.
8. all of the fire safety systems are assumed to be designed, installed and operate in accordance with the appropriate Australian Standards, other design codes, legislation and regulations relevant to the project unless specifically stated otherwise.
9. for a satisfactory level of fire safety to be achieved, regular testing and maintenance of all fire safety systems and measures, including management-in-use systems, is essential and is assumed in the conclusion of this evaluation.

Potential risks of incendiary are limited in the scope of engineering design. Conventional building design can only provide limited protection against malicious attack; for example, large scale incendiary and multiple ignition sources can potentially overwhelm some fire safety systems.

Strategies such as security, housekeeping and other management procedures may be more effective than additional fire protection in addressing arson events.

This report is applicable to the Project only. It does not consider property damage to the building as a result of the performance solutions addressed in the evaluations.

A number of issues within the NCC Volume 1 – BCA are interpretive in nature. Where these issues are encountered, interpretations are made that are consistent with standard industry practice.

This report is prepared in good faith and with due care for information purposes only, and should not be relied upon as providing any warranty or guarantee. In particular, attention is drawn to the nature of the inspection and investigations undertaken and the limitations these impose in determining with accuracy the state of the building, its services or equipment and life safety.

Ignis Solutions' involvement in the Project is limited to the role outlined in section 2 'Scope of Service' of the Letter. This report reflects that role. Any reliance on, or use of, this report for purposes outside the scope of service is at the user's own risk.

Ignis Solutions shall not be held liable for any loss or damage resulting from any defect of the building or its services or equipment or for any non compliance of the building or its services or equipment with any legislative or operational requirement, whether or not such defect or non-compliance is referred to or reported upon in this report, unless such defect or non-compliance should have been apparent to a competent engineer undertaking the evaluation of the type undertaken for the purpose of preparation of this report.

Ignis Solutions has carefully reviewed and applied to the best of our ability the requirements of local Legislation, the NCC and the Australian Fire Engineering Guidelines.

TABLE OF CONTENTS

Part

A

executive summary

1 EXECUTIVE SUMMARY

1.1 General

Ignis Solutions has been engaged by Hyperion Property Syndicates regarding the development at B09 S39 Fyshwick ACT.

The development is a warehouse building (Class 8) comprising of multiple warehouse tenancies and an office tenancy which is less than 10% of the total building area. A change to the internal configuration of the building is proposed, with no increase in building size.

Provision A2.0 details that a Building Solution will comply with the BCA if it satisfies the Governing Requirements of the NCC and the Performance Requirements. A building solution as defined by the BCA means a solution, which complies with the Performance Requirements and is an Alternative Solution or a solution, which complies with the Deemed-to Satisfy provisions or a combination of both.

1.2 Scope and Purpose

The purpose of this assessment is to evaluate the nominated performance requirements to demonstrate that the relevant performance requirements of the National Construction Code Volume One – Building Code of Australia 2019 Amendment One are maintained.

TABLE 1:

PERFORMANCE SOLUTION SUMMARY

Assessment	Relevant BCA Provisions and Performance Requirements	Method for meeting performance requirements	AFEG Sub-system[s] Evaluated	BCA Assessment method
Large isolated building – Non-continuous perimeter vehicle access	C2.2 C2.3 C2.4 CP2 CP9	A2.1 (3)	C, F	A2.2 (2)(b)(ii)
Distance of travel – Warehouse	D1.4 D1.5 DP4	A2.1 (3)	E	A2.2(2) (b)(ii)
50 m Fire Hose Reels – Warehouse	E1.4 EP1.1	A2.1 (3)	D	A2.2(2) (b)(ii)
Fire hydrant system	E1.3 EP1.3	A2.1 (3)	F	A2.2(2) (b)(ii)

Source: Ignis Solutions

1.3 Relevant Stakeholders

Consultation with project stakeholders is undertaken based on the Australian Fire Engineering Guidelines Clause 1.2.2. The following stakeholders were involved in this fire engineering analysis.

The relevant stakeholders consulted in developing this fire strategy are outlined in the table below.

TABLE 2:

PROJECT STAKEHOLDERS

Name	Role	Organisation
Sch 2.2(a)(ii)	Client	Sch 2.2(a)(ii)
	Architect	
	Builder	
	Certifier	
	Referral Entity	
	Student Engineer	
	Fire Safety Engineer	
	Chartered Professional Fire Safety Engineer	

Source: Ignis Solutions

1.4 Sources of Information

The following information sources were used in the evaluation of the buildings:

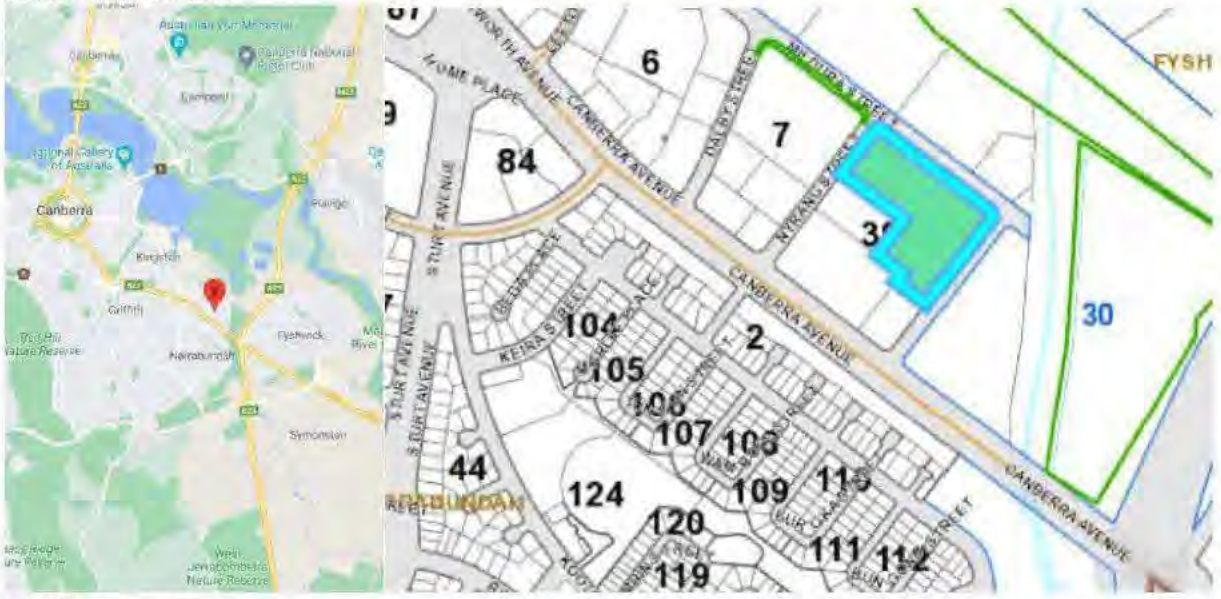
- National Construction Code 2019 – Volume One Amendment 1– Building Code of Australia, Class 2 to 9 buildings, Australian Building Codes Board, Canberra, 2020 (BCA).
- Guide to the Building Code of Australia 2019 – Volume One Amendment 1 – Building Code of Australia, Class 2 to 9 buildings, Australian Building Codes Board, Canberra, 2020 (the Guide).
- Australian Fire Engineering Guidelines, Australian Building Codes Board, Canberra, 2021.
- Drawings provided by DNA Architects, project number 2097 dated 14 May 2021.

1.5 Proposed Development

The location of the building is detailed below.

FIGURE 1:

BUILDING LOCATION

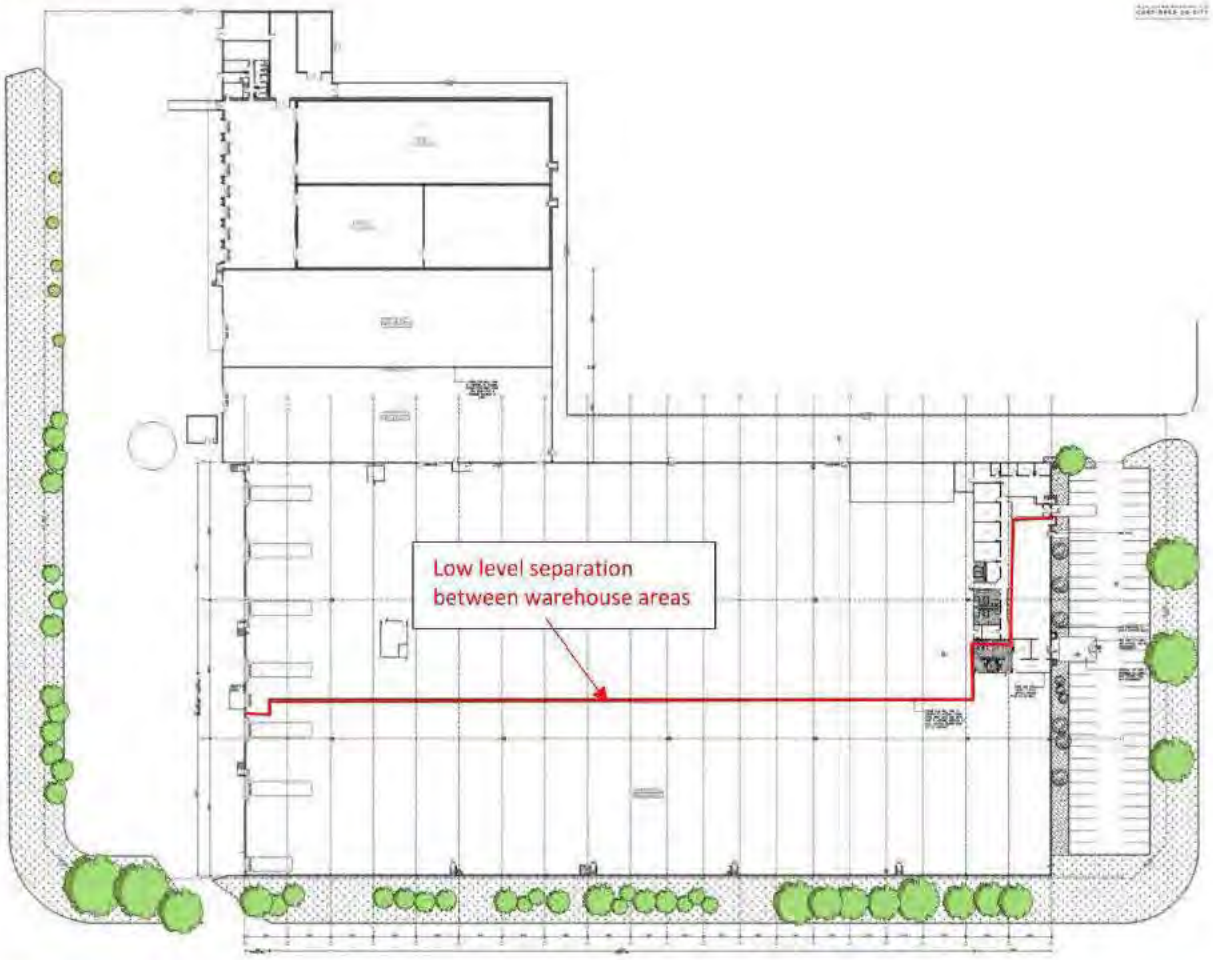


Source: Google Maps and ACTmaps

The warehouse is divided into tow separate areas by a low level wall. Wire mesh is provided for security separation between the two areas to maintain sprinkler coverage and operation. The separation line is highlighted in the figure below.

FIGURE 2:

SITE PLAN



Source: DNA Architects

The minimum fire safety measures required within the building are determined in accordance with several specifics of the building including the various occupancy classifications, effective height, rise in storeys, compartment size and building floor area.

TABLE 3:

BUILDING CLASSIFICATION DETAILS

Project	B09 S39 Fyshwick ACT
Occupancy	Warehouse
Classification	7b
Effective height	<12m
Rise In storeys	1
Number of storeys	1
Type of construction	Type C (large isolated building – built and proposed)

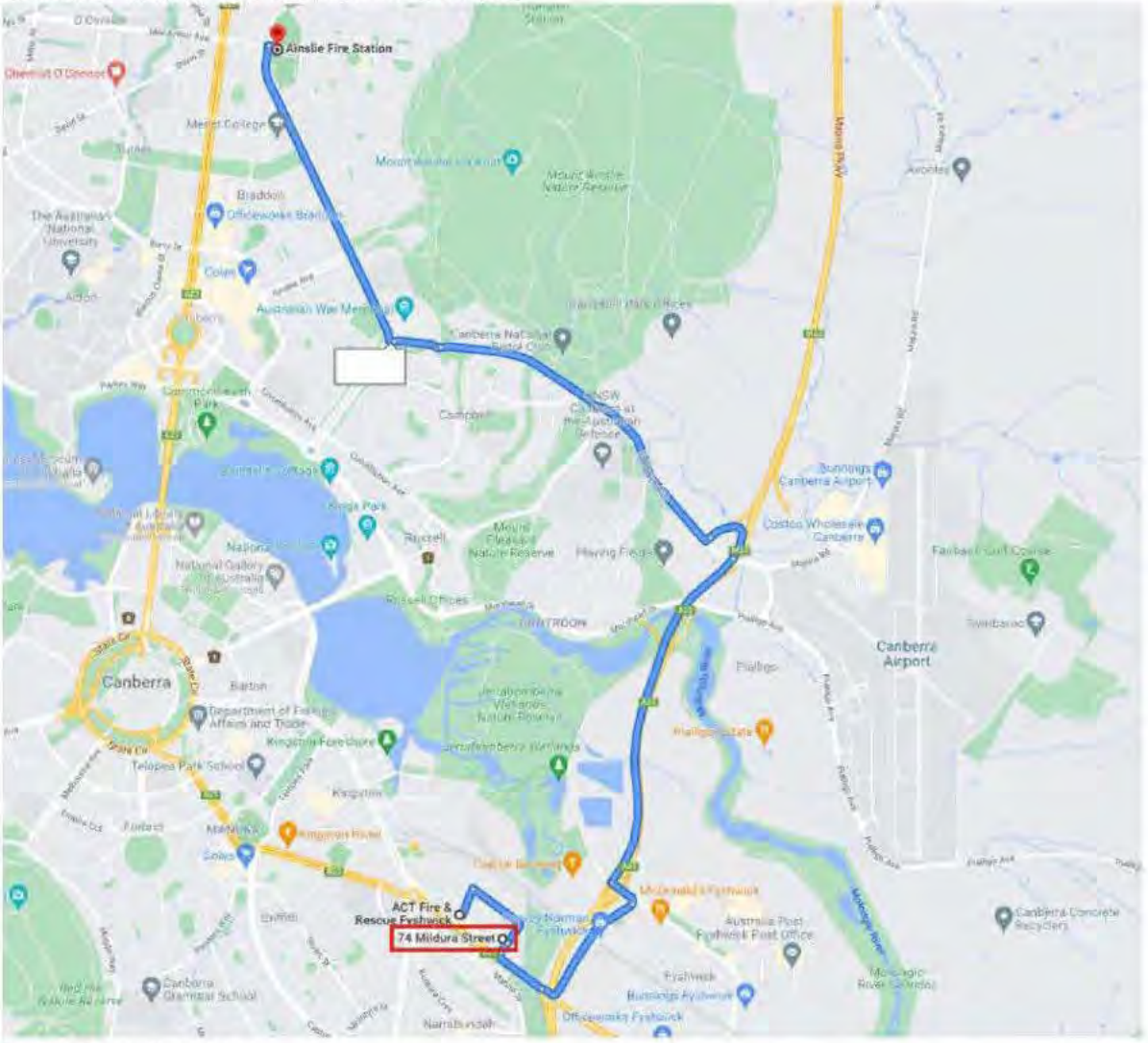
Source: NCC – Vol 1 – BCA

1.6 Fire Brigade Intervention

The site is served by a response from ACT Fire & Rescue. The nearest ACT Fire & Rescue station is Fyshwick Station being approximately 0.9 km by direct road from the site taking approximately 2 minutes. The second nearest ACT Fire & Rescue station is Ainslie Fire Station being approximately 9.5 km by direct road from the site taking approximately 13 minutes. The site location and the two fire stations are outlined below:

FIGURE 3:

BUILDING PROXIMITY TO NEAREST FIRE STATIONS



Source: Google map and Ignis Solutions

1.7 Fire Engineering Brief

IGNS-9138 PBDB I01R01 B09 S39 Fyshwick 10122021 was submitted to ACTF&R. It was reviewed under ACTF&R reference 2021-460 and 'in-principle' support was provided. For full details, please see appendix B.

Part

B

fire safety measures

The fire safety measures listed in this section are essential measures forming part of the performance solution that must be designed, installed and identified on the essential services maintenance schedule for the building. These essential measures must be maintained and certified in accordance with the provisions of the National Construction Code, this report and ABCB Maintenance of Safety Measures, Equipment and Energy Efficiency Installations Handbook 2014 and any applicable Australian Standards. Other measures may be required by the National Construction Code. These measures are likely to be detailed by specific design disciplines or the BCA consultant. Ignis Solutions scope relates to performance based design as detailed in this report only.

It is assumed that the following fire safety measures, limitations and assumptions of this report are read, understood and implemented. Ignis Solutions should be contacted if there are queries in regards to the content. Ignis Solutions takes no responsibility for the misinterpretation by others.

2 FIRE SAFETY MEASURES

2.1 General

a. The following fire safety measures relate to elements that are associated with the performance analysis. All other elements of the buildings fire safety measures not specifically documented in the following section is to comply with the requirements of the BCA and documented by others. No observation or allowance for any external wall element to be combustible has been identified and does not form part of our scope of works. Any proposal to use combustible external wall elements or modification to the BCA DtS provisions of fire safety must be brought to the attention of Ignis Solutions through written correspondence. Ignis Solutions takes no responsibility for compliance matters relating to fire safety that have not been discussed or brought to our attention.

2.2 Architectural Measures

2.2.1 Exits and Paths of Travel

a. It is proposed for the travel distance within the warehouse building to be up to approximately 75 m to the nearest exit in lieu of 40 m.

b. It is proposed for the travel distance between alternate exits through a point of choice to be 150 m in lieu of 60 m.

2.2.2 Vehicular perimeter access and clearance zone

a. It is proposed for the subject building to not be provided with full perimeter vehicular access in accordance with Provision C2.4(b).

2.3 Hydraulic System Measures

2.3.1 Fire Hydrant System

a. It is proposed for the coverage from the existing external attack hydrant system to the subject building to be via three lengths of fire hose.

b. It is proposed for the hydrant system serving the large isolated building to not be a dedicated ring main as required by Clause 8.6.1(b) of AS 2419.

c. A hydrant block plan is to be provided at the FIP and booster, and show internal layout, location of booster assembly, FIP, hydrants (attack and feed) and exits/entries.

d. 1 m clear working radius is to be maintained around all hydrants. All attack hydrants are to be identified with 'AH' plaque, street hydrants with 'FH' plaques and blue stimsonite marker, both securely fixed. If any plaques are located within landscaped area, the plaque is to be located on a 900 mm blue post.

e. Signage indicating that three lengths of fire hose is required is to be installed adjacent to the hydrant block plan. The signage shall read "THREE LENGTHS OF FIRE FIGHTING HOSE IS REQUIRED TO REACH ALL AREAS FROM THE EXTERNAL HYDRANTS".

f. The signage is to be in capital lettering, not less than 20mm high in a colour contrasting the background. Signage must be permanent, fade resistant and weatherproof – i.e. must be screw fixed or other and not laminated paper.

2.3.2 Fire Hose Reels

a. It is proposed to have 50 m fire hose reels installed in the warehouse building.

b. Signage is required above the fire hose reel indicating the length.

2.4 Fire Safety Measures Maintenance

2.4.1 Maintenance Requirements

a. Current legislation for the maintenance of buildings is managed initially through Section 92 of the Emergencies Act where the chief officer may, in writing, direct the occupier of the premises for the provision or installation of a fire appliance at the premises.

   In accordance with Section 95(2) of the Emergencies Act, it is an offence if a fire appliance is provided or installed at the premises under a direction under Section 92 and the occupier fails to maintain the fire appliance to a reasonable standard.

   It is expected that through the ACT F&R Plan Review and Performance Review process under the Building (General) Regulations that direction under Section 92 will be provided.

   A fire safety schedule of essential measures is to be generated and kept on the building file as well as provided at the Fire Indicator Panel.

2.5 Essential Fire Safety Measures

2.5.1 Essential Fire Safety Measures

a. All Fire safety systems listed in this performance report are considered to be essential measures and to be maintained in accordance with AS 1851:2012.

Part

C

performance solutions

3 LARGE ISOLATED BUILDING – NON-CONTINUOUS PERIMETER VEHICULAR ACCESS

3.1 Brief of Proposed Performance Solution

Clause C2.2(a) details the size of any fire compartment in a Class 8 building must not exceed the relevant maximum floor area nor the relevant maximum volume set out in Table C2.2 and C2.5 except as permitted in C2.3.

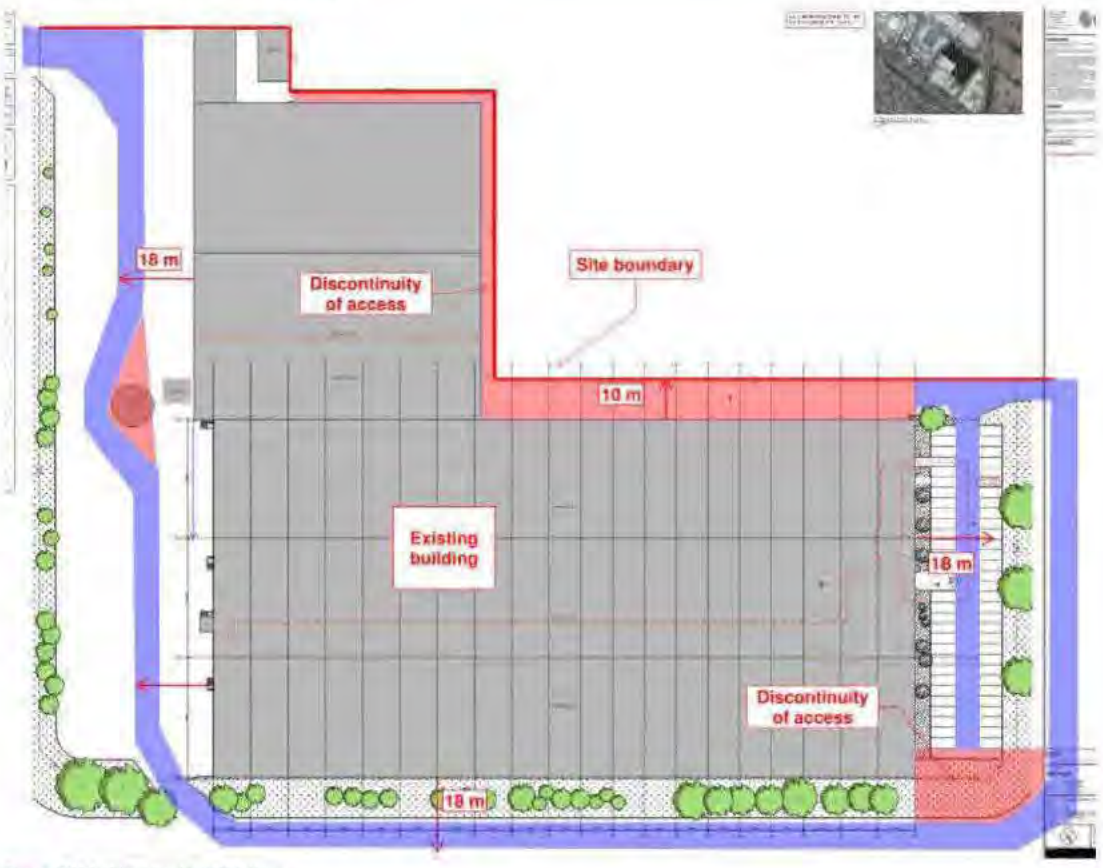
Clause C2.3(a)(ii)(B) of the BCA details that large isolated buildings of Class 8 which do not exceed 18,000 m^2 in floor area or 108,000 m^3 in volume must be provided with perimeter vehicular access complying with Provision C2.4(b).

Clause C2.4(b) of the BCA details that the perimeter vehicular access must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building. Also, it must have an unobstructed width of 6 m with no part of its furthest boundary more than 18 m from the building and in no part of the 6 m width be built upon or used for any purpose other than vehicular or pedestrian movement.

It is proposed for the subject building to not be provided with perimeter vehicular access in accordance with Clause C2.4(b).

It is proposed for the hydrant system serving the large isolated building to not be a dedicated ring main as required by Clause 8.6.1(b) of AS 2419.

FIGURE 4:
VEHICULAR PERIMETER ACCESS



Source: DNA Architects and Ignis Solutions

3.1.1 BCA Deemed-to-Satisfy Basis

BCA Clause C2.2, C2.3 and C2.4(b) detail the fire compartment size and type of construction required based on the class of building, the requirements for large isolated buildings, and specific requirements for perimeter vehicular access. See below:

FIGURE 5:

NCC – VOL 1 – CLAUSE C2.2

C2.2 General floor area and volume limitations

(a) The size of any *fire compartment* or *atrium* in a Class 5, 6, 7, 8 or 9 building must not exceed the relevant maximum *floor area* nor the relevant maximum volume set out in Table C2.2 and C2.5 except as permitted in C2.3.

(b) A part of a building which contains only heating, ventilating, or lift equipment, water tanks, or similar service units is not counted in the *floor area* or volume of a *fire compartment* or *atrium* if it is situated at the top of the building.

(c) In a building containing an *atrium*, the part of the *atrium well* bounded by the perimeter of the openings in the floors and extending from the level of the first floor above the *atrium* floor to the roof covering is not counted in the volume of the *atrium* for the purposes of this clause.

Source: ABCB NCC Volume One – Building Code of Australia 2019 Amendment One

FIGURE 6:

NCC – VOL 1 – CLAUSE C2.3

C2.3 Large isolated buildings

The size of a *fire compartment* in a building may exceed that specified in Table C2.2 where—

(a) the building does not exceed 18 000 m^2 in *floor area* nor exceed 108 000 m^3 in volume, if—

  (i) the building is Class 7 or 8 and—

    (A) contains not more than 2 *storeys*; and

    (B) is provided with open space complying with C2.4(a) not less than 18 m wide around the building; or

  (ii) the building is Class 5, 6, 7, 8 or 9 and is—

    (A) protected throughout with a sprinkler system complying with Specification E1.5; and

    (B) provided with a perimeter vehicular access complying with C2.4(b); or

(b) the building is Class 5, 6, 7, 8 or 9 and exceeds 18 000 m^2 in *floor area* or 108 000 m^3 in volume, if it is—

  (i) protected throughout with a sprinkler system complying with Specification E1.5; and

  (ii) provided with a perimeter vehicular access complying with C2.4(b); or

(c) there is more than one building on the allotment and—

  (i) each building complies with (a) or (b); or

  (ii) if the buildings are closer than 6 m to each other they are regarded as one building and collectively comply with (a) or (b).

Source: ABCB NCC Volume One – Building Code of Australia 2019 Amendment One

FIGURE 7:

NCC – VOL 1 – CLAUSE C2.4(b)

C2.4 Requirements for open spaces and vehicular access

(b) Vehicular access *required* by this Part—

  (i) must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building; and

  (ii) must have a minimum unobstructed width of 6 m with no part of its furthest boundary more than 18 m from the building and in no part of the 6 m width be built upon or used for any purpose other than vehicular or pedestrian movement; and

  (iii) must provide reasonable pedestrian access from the vehicular access to the building; and

  (iv) must have a load bearing capacity and unobstructed height to permit the operation and passage of *fire brigade* vehicles; and

  (v) must be wholly within the allotment except that a public road complying with (i), (ii), (iii) and (iv) may serve as the vehicular access or part thereof.

Source: ABCB NCC Volume One – Building Code of Australia 2019 Amendment One

3.1.2 Intent of BCA Deemed-to-Satisfy Clause

The Guide to the BCA is indented as a reference manual to provide clarification to the BCA and should be read in conjunction with the BCA. The Guide to the BCA describes the intent of Clauses C2.2, C2.3 and C2.4 as:

FIGURE 8:

NCC – GUIDE TO VOL 1 – CLAUSE C2.2

C2.2 General floor area and volume limitations

Intent
To limit the size of any fire in a building by limiting the size of the floor area and volume of a fire compartment.

Source: ABCB NCC Volume One, Guide – Building Code of Australia 2019 Amendment One

FIGURE 9:

NCC – GUIDE TO VOL 1 – CLAUSE C2.3

C2.3 Large isolated buildings

Intent
To grant concessions for large isolated buildings from the floor area and volume limitations.

Source: ABCB NCC Volume One, Guide – Building Code of Australia 2019 Amendment One

FIGURE 10:

NCC – GUIDE TO VOL 1 – CLAUSE C2.4

C2.4 Requirements for open spaces and vehicular access

Intent
To set the minimum requirements for open space around a building and the provision of vehicular access for the fire brigade.

Source: ABCB NCC Volume One, Guide – Building Code of Australia 2019 Amendment One

3.1.3 BCA Performance Requirement

The relevant BCA Performance Requirements are CP2 and CP9, as detailed below:

FIGURE 11:

NCC – VOL 1 – PERFORMANCE REQUIREMENT CP2

CP2 Spread of fire

(a) A building must have elements which will, to the degree necessary, avoid the spread of fire—

(i) to *exits*; and

(ii) to *sole-occupancy units* and *public corridors*; and

Application:
CP2(a)(ii) only applies to a Class 2 or 3 building or Class 4 part of a building.

(iii) between buildings; and

(iv) in a building.

(b) Avoidance of the spread of fire referred to in (a) must be appropriate to—

(i) the function or use of the building; and

(ii) the *fire load*; and

(iii) the potential *fire intensity*; and

(iv) the *fire hazard*; and

(v) the number of *storeys* in the building; and

(vi) its proximity to *other property*; and

(vii) any active *fire safety systems* installed in the building; and

(viii) the size of any *fire compartment*; and

(ix) *fire brigade* intervention; and

(x) other elements they support; and

(xi) the *evacuation time*.

Source: ABCB NCC Volume One – Building Code of Australia 2019 Amendment One

FIGURE 12:

NCC – VOL 1 – PERFORMANCE REQUIREMENT CP9

CP9 Fire brigade access

Access must be provided to and around a building, to the degree necessary, for *fire brigade* vehicles and personnel to facilitate *fire brigade* intervention appropriate to—

(a) the function or use of the building, and

(b) the *fire load*; and

(c) the potential *fire intensity*; and

(d) the *fire hazard*; and

(e) any active *fire safety systems* installed in the building; and

(f) the size of any *fire compartment*.

Source: ABCB NCC Volume One – Building Code of Australia 2019 Amendment One

3.1.4 Relevant Element of Performance Requirement

The entirety of Performance Requirements CP9 detailed above is relevant.

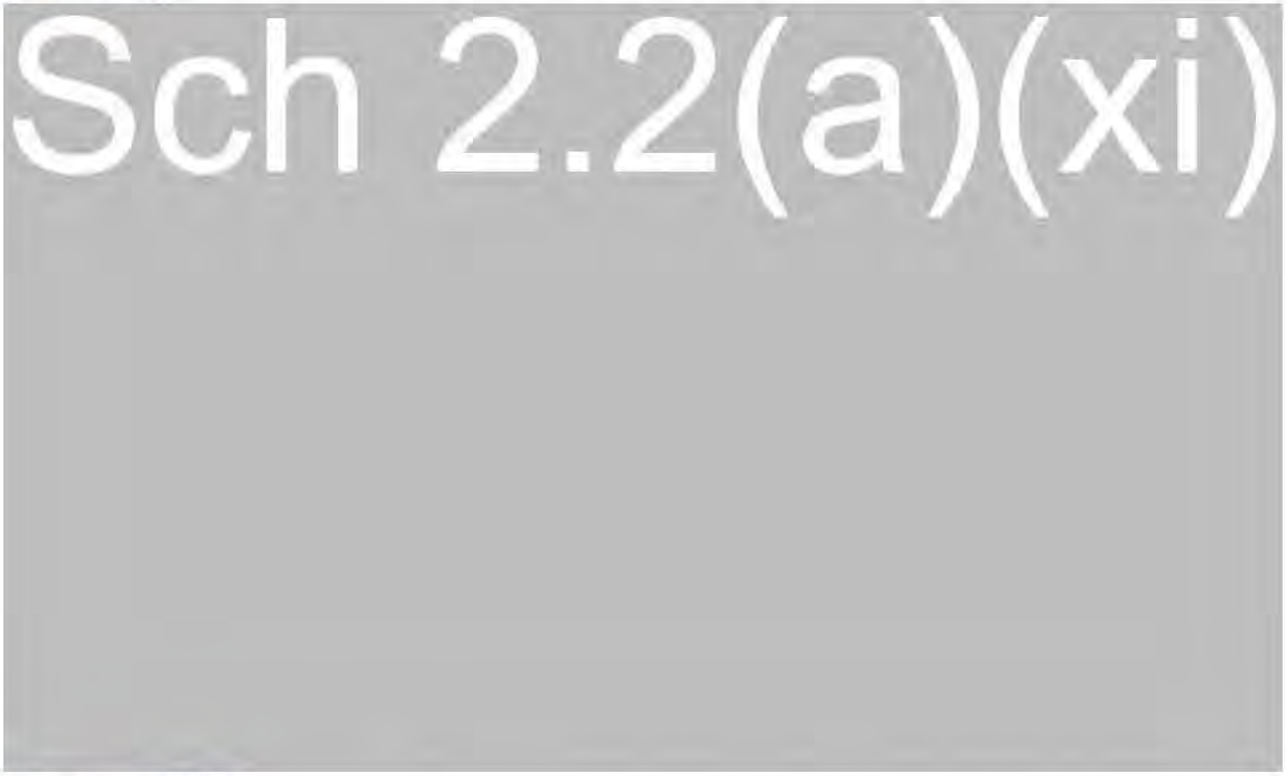
3.1.5 Meeting the Performance Requirement

The Performance Requirement will be satisfied by A2.1 (3): a combination of (1) and (2) where (1) is a Performance Solution and (2) is a Deemed-to-Satisfy Solution.

3.1.6 Assessment Method

BCA Clause A2.2 (2) (b)(ii) Other Verification Methods accepted by appropriate authority that show compliance with the relevant Performance Requirements.

3.1.7 Methodology



3.1.8 Acceptance Criteria

The acceptance criteria for this performance solution is that the proposed lack of vehicular access does not hinder brigade intervention.

3.1.9 Identified Hazard

The potential hazard is that a fire incident may cause fire spread and the fire brigade cannot maintain continuous access in a forward direction around the entire building.

3.2 Performance Evaluation

Clause C2.2(a) details the size of any fire compartment in a Class 8 building must not exceed the relevant maximum floor area nor the relevant maximum volume set out in Table C2.2 and C2.5 except as permitted in C2.3.

Clause C2.3(a)(ii)(B) of the BCA details that large isolated buildings of Class 8 which do not exceed 18,000 m^2 in floor area or 108,000 m^3 in volume must be provided with perimeter vehicular access complying with Provision C2.4(b).

Clause C2.4(b) of the BCA details that the perimeter vehicular access must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building. Also, it must have an unobstructed width of 6 m with no part of its furthest boundary more than 18 m from the building and in no part of the 6 m width be built upon or used for any purpose other than vehicular or pedestrian movement.

It is proposed for the subject building to not be provided with perimeter vehicular access in accordance with Clause C2.4(b).

Performance Requirement CP2 details that a building must have elements which will, to the degree necessary, avoid the spread of fire as appropriate to its proximity to other property, fire load and fire brigade intervention. Performance Requirement CP9 details that access must be provided to and around a building, to the degree necessary, for the fire brigade vehicles and personnel to facilitate fire brigade intervention appropriate for the function or use of the building, the fire load, the potential fire intensity, the fire hazard, any active fire safety systems installed in the building and the size of the fire compartment. Provision C2.2 details the maximum size for fire compartments and Provision C2.3 provides concessions to the fire compartment sizes for large isolated buildings subjected to compliance with Provision C2.4.

It is proposed for the subject building to have non-continuous perimeter vehicular access.

The subject development has a floor area of approximately 19,000 m^2, without separation into fire compartments and therefore is considered a large isolated building. Provision C2.3(a)(ii) allows for concessions for buildings with a floor area of less than 18,000 m^2 or volume being less than 108,000 m^3 provided that the is protected throughout with a sprinkler system and provided with perimeter vehicular access complying with Provision C2.4(b).

It is proposed for the building to have non-continuous perimeter vehicular access, where the non-accessibility is limited to the area as shown in the figure below. The building has an ESFR (Early Suppression, Fast Response) sprinkler system installed throughout.

FIGURE 13:

VEHICULAR PERIMETER ACCESS

Source: DNA Architects and Ignis Solutions

While not a compliant access path, access is provided to three of the four sides of the building.

The subject building is an existing warehouse building that is undergoing renovations, with no extension to the building footprint. This building and all neighbouring structures and block boundaries are existing and are not impacted by the proposed works

The subject building has four warehouse compartments, three cool rooms, and associated office space and other ancillary rooms. The building has a total of 17 designated emergency exits on all sides of the building.

The entire building is provided with an ESFR (Early Suppression, Fast Response) sprinkler system throughout which is expected to at least control a fire and stop it from spreading beyond the area of origin.

Fire Brigade Intervention

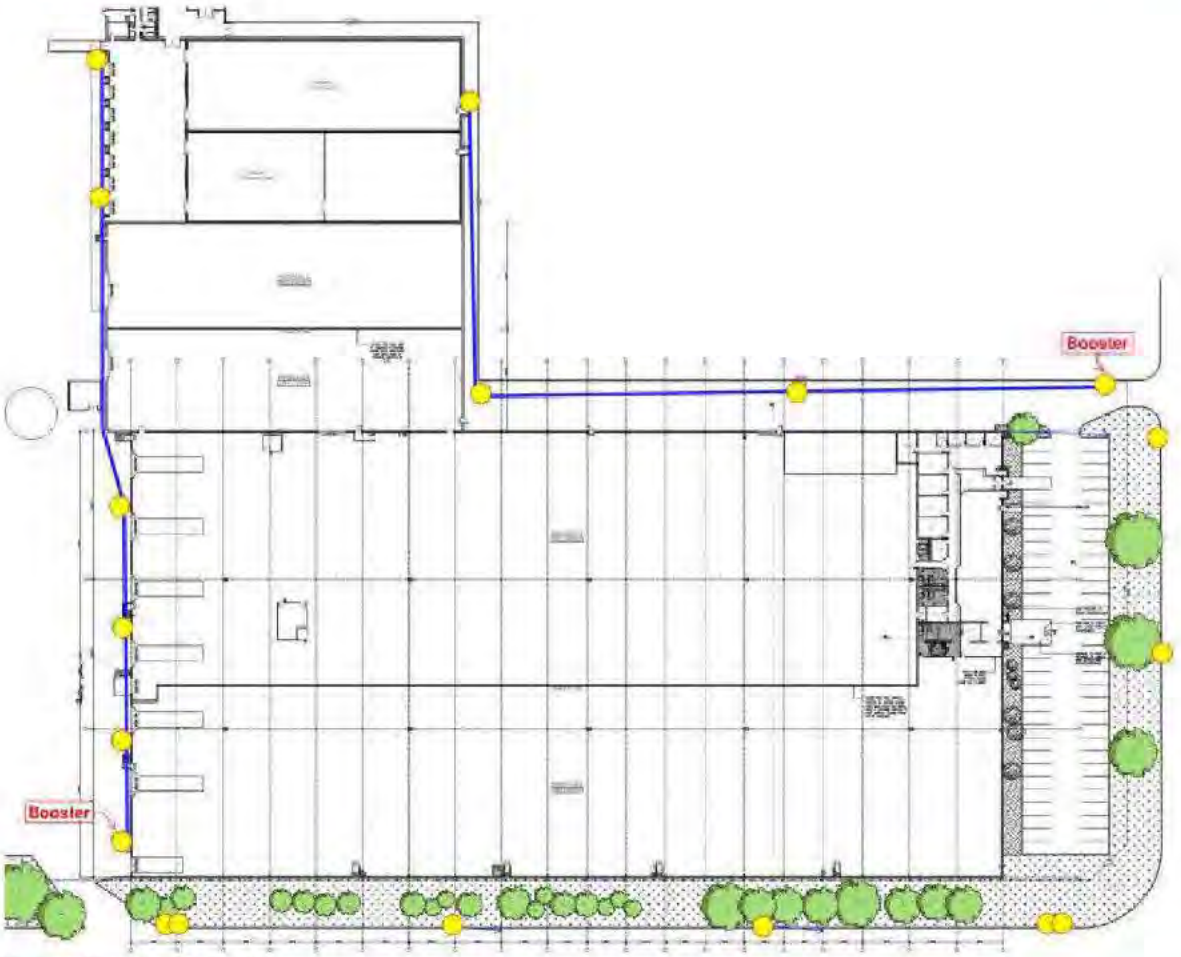
It is proposed for the hydrant system serving the large isolated building to not be a dedicated ring main as required by Clause 8.6.1(b) of AS 2419.

The building is served by two separate hydrant lines, each which serve one side of the building. The other two facades are served by the street hydrants on Mildura Street and Nyrang Street. As the building does not have a continuous path of travel around, a hydrant ring main is not a valid option for this building.

The hydrants provide coverage to the entire building, as detailed in the hydrant Performance Solution.

FIGURE 14:

LOCATION OF HYDRANTS



Source: DNA Architects and Ignis Solutions

Taking in to account the sprinkler protection provided throughout the building and the existing nature of the building footprint, it is deemed that a non-continuous perimeter access will not adversely affect fire brigade intervention more than the current building layout.

3.3 Required Fire Safety Measures

Independent of the BCA DtS provisions, which remain required, no additional fire safety measures are required in relation to this performance solution.

3.4 Evaluation Summary

In the opinion of Ignis Solutions, the evaluation has demonstrated that the proposed Performance Solution for the perimeter vehicle access to the subject building satisfies BCA Performance Requirement CP2 and CP9 to the degree necessary.

4 DISTANCE OF TRAVEL – WAREHOUSE

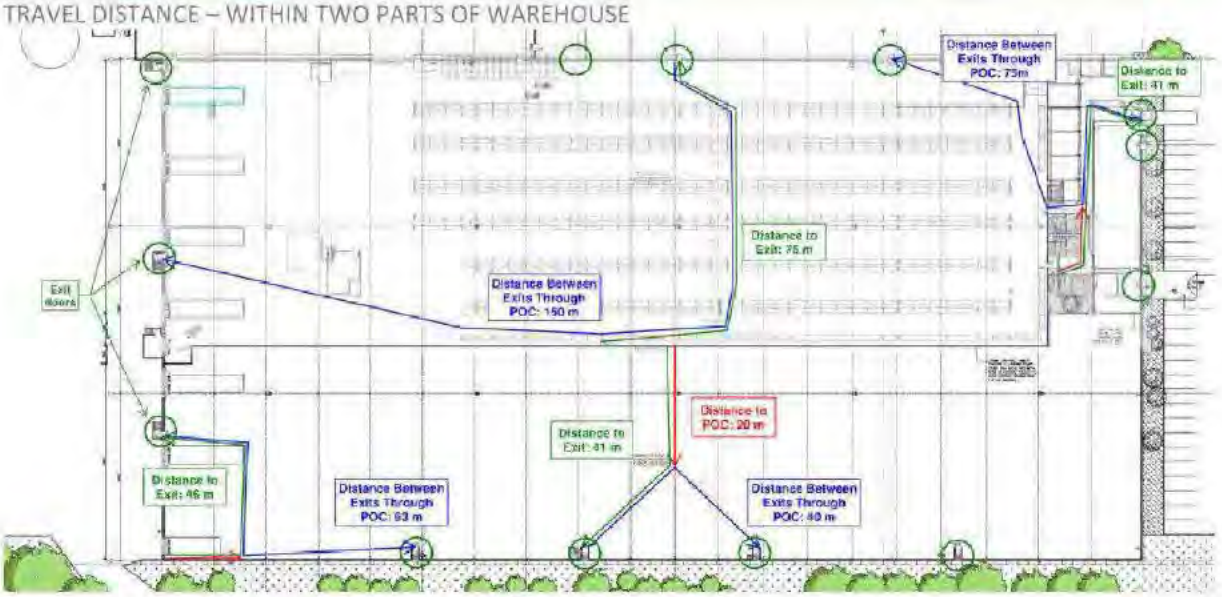
4.1 Brief of Proposed Performance Solution

Clause D1.4 of the BCA requires that the travel distance in a Class 5, 6, 7, 8 or 9 building be no more than 20 m from an exit or to a point of choice of two exits, in which case the maximum distance to one of those exits must not exceed 40 m. BCA Clause D1.5(c)(iii) requires that the distance between alternate exits in a Class 5, 6, 7, 8 or 9 building be no more than 60 m apart.

It is proposed for the travel distance within the warehouse building to be up to approximately 75 m to the nearest exit in lieu of 40 m. It is also proposed for the travel distance between alternate exits through a point of choice to be 150 m in lieu of 60 m.

FIGURE 15:

TRAVEL DISTANCE – WITHIN TWO PARTS OF WAREHOUSE



Source: DNA Architects and Ignis Solutions

4.1.1 BCA Deemed-to-Satisfy Basis

BCA Clause D1.4(c)(i) requires that the travel distance in a Class 5, 6, 7, 8 or 9 building be no more than 20 m from an exit or a point from which travel in different directions to two exits is available, in which case the maximum distance to one of those exits must not exceed 40 m.

FIGURE 16:

NCC – VOL 1 – CLAUSE D1.4 (PART)

D1.4 Exit travel distances

(c) **Class 5, 6, 7, 8 or 9 buildings** — Subject to (d), (e) and (f)—

(i) no point on a floor must be more than 20 m from an *exit*, or a point from which travel in different directions to 2 *exits* is available, in which case the maximum distance to one of those *exits* must not exceed 40 m; and

(ii) in a Class 5 or 6 building, the distance to a single *exit* serving a *storey* at the level of access to a road or *open space* may be increased to 30 m.

Vic D1.4(d)

Source: ABCB NCC Volume One – Building Code of Australia 2019 Amendment One

BCA Clause D1.5(c)(iii) requires that the distance between alternate exits in a Class 5, 6, 7, 8 or 9 building be no more than 60 m apart. See below:

FIGURE 17:

NCC – VOL 1 – CLAUSE D1.5

D1.5 Distance between alternative exits

Exits that are *required* as alternative means of egress must be—

(a) distributed as uniformly as practicable within or around the *storey* served and in positions where unobstructed access to at least 2 *exits* is readily available from all points on the floor including lift lobby areas; and

(b) not less than 9 m apart; and

(c) not more than—

(i) in a Class 2 or 3 building — 45 m apart; or

(ii) in a Class 9a *health-care building*, if such *required exit* serves a *patient care area* — 45 m apart; or

(iii) in all other cases — 60 m apart; and

(d) located so that alternative paths of travel do not converge such that they become less than 6 m apart.

SA D1.5(e)

Source: ABCB NCC Volume One – Building Code of Australia 2019 Amendment One

4.1.2 Intent of BCA Deemed-to-Satisfy Clause

The Guide to the BCA is indented as a reference manual to provide clarification to the BCA and should be read in conjunction with the BCA. The Guide to the BCA describes the intent of Clause D1.4 as:

FIGURE 18:

NCC – GUIDE TO VOL 1 – CLAUSE D1.4

Intent
To maximise the safety of occupants by enabling them to be close enough to an exit to safely evacuate.

Source: ABCB NCC Volume One, Guide – Building Code of Australia 2019 Amendment One

The Guide to the BCA describes the intent of Clause D1.5 as:

FIGURE 19:

NCC – GUIDE TO VOL 1 – CLAUSE D1.5

Intent
To require that if an exit is inaccessible, access to any required alternative exit must be available within a reasonable distance.

Source: ABCB NCC Volume One, Guide – Building Code of Australia 2019 Amendment One

4.1.3 BCA Performance Requirement

The relevant BCA Performance Requirement is DP4 as detailed below.

FIGURE 20:

NCC – VOL 1 – PERFORMANCE REQUIREMENT DP4

DP4 Exits

Exits must be provided from a building to allow occupants to evacuate safely, with their number, location and dimensions being appropriate to—

(a) the travel distance; and

(b) the number, mobility and other characteristics of occupants; and

(c) the function or use of the building; and

(d) the height of the building; and

(e) whether the *exit* is from above or below ground level.

Source: ABCB NCC Volume One – Building Code of Australia 2019

4.1.4 Relevant Element of Performance Requirement

The relevant element of performance requirement DP4 is (a):

Exits must be provided from a building to allow occupants to evacuate safely, with their number, location and dimensions being appropriate to (a) the travel distance.

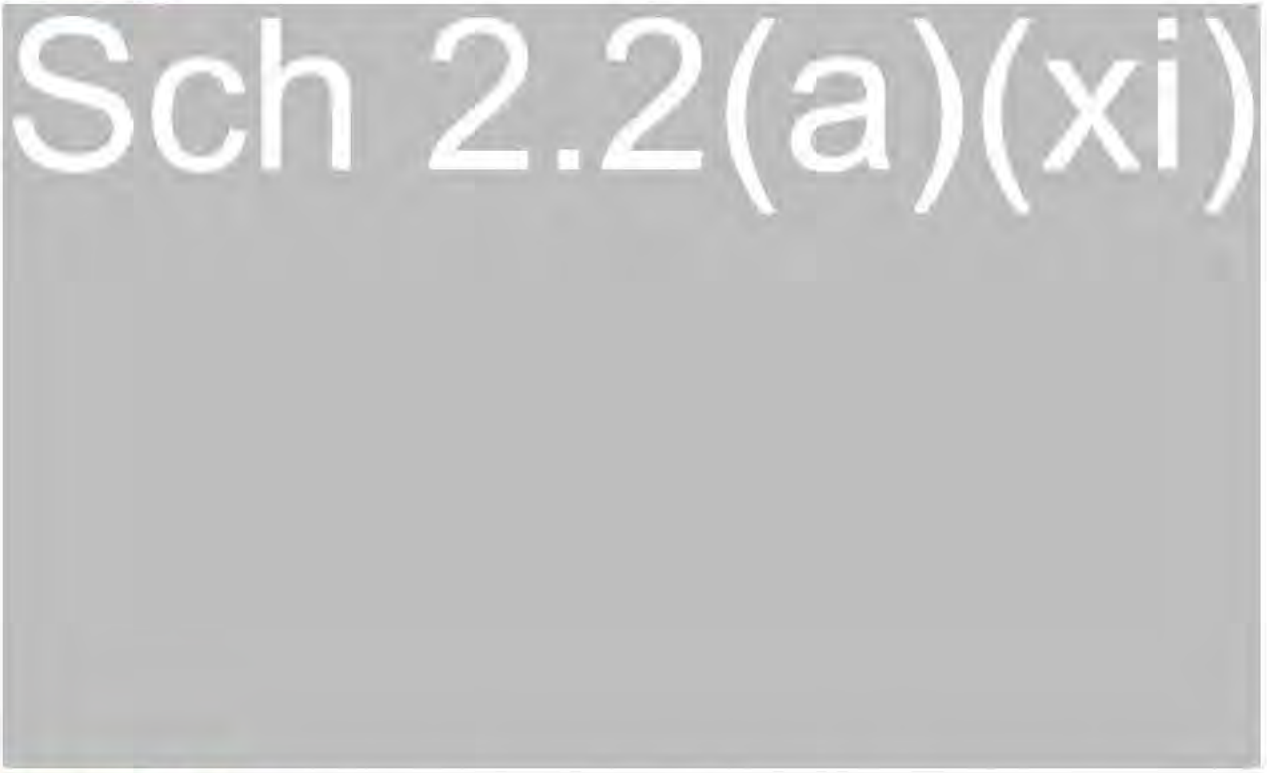
4.1.5 Meeting the Performance Requirement

The Performance Requirement will be satisfied by A2.1 (3): a combination of (1) and (2) where (1) is a Performance Solution and (2) is a Deemed-to-Satisfy Solution.

4.1.6 Assessment Method

BCA Clause A2.2 (b)(ii) Other Verification Methods accepted by appropriate authority that show compliance with the relevant Performance Requirements.

4.1.7 Methodology



4.1.8 Acceptance Criteria

The acceptance criteria for this performance solution is that the occupants are provided with sufficient warning and means to safely reach an exit such that the BCA Performance Requirement DP4 is satisfied to the degree necessary.

4.1.9 Identified Hazard

The potential hazards include the travel distance being too excessive and the risk of the fire safety systems not being sufficient for all the occupants to evacuate.

4.2 Performance Evaluation

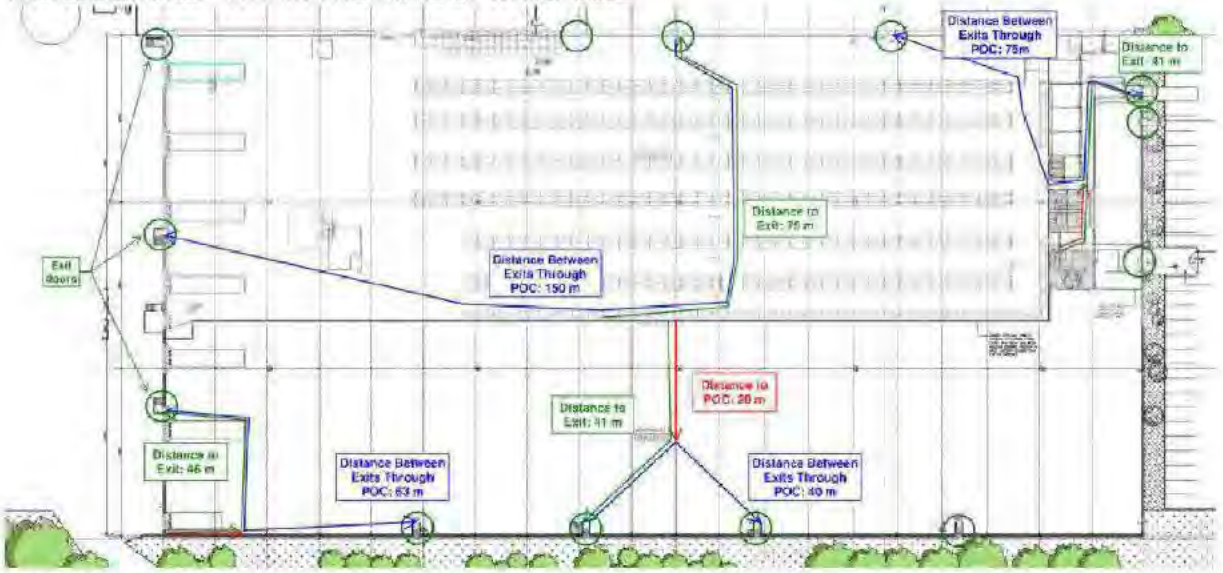
Clause D1.4 of the BCA requires that the travel distance in a Class 5, 6, 7, 8 or 9 building be no more than 20 m from an exit or to a point of choice of two exits, in which case the maximum distance to one

of those exits must not exceed 40 m. BCA Clause D1.5(c)(iii) requires that the distance between alternate exits in a Class 5, 6, 7, 8 or 9 building be no more than 60 m apart.

It is proposed for the travel distance within the warehouse building to be up to approximately 75 m to the nearest exit in lieu of 40 m. It is also proposed for the travel distance between alternate exits through a point of choice to be 150 m in lieu of 60 m.

FIGURE 21:

TRAVEL DISTANCE – WITHIN TWO PARTS OF WAREHOUSE



Source: DNA Architects and Ignis Solutions

Description of Building

The subject building has four warehouse compartments, three cool rooms, an office space and several other ancillary rooms. The building contains 17 designated emergency exits on all sides of the building. The greatest travel distances are within the main warehouse which has 5 exit doors leading directly outside the building and a further egress through the front office.

Occupant familiarity and fire safety measures

Occupants of the building will be staff members who are awake and aware of their surroundings. They are expected to be familiar with the location of the exits and the paths of travel to reach the exits. Corridors provide clear lines of sight through the length of the building allowing occupants to clearly identify the emergency exits present throughout the length of the building. Visitors of the building will be accompanied by staff members.

Travel to nearest exit

It is proposed for the travel distance within the subject development to the nearest exit to be up to approximately 75 m in lieu of 40 m. In addition, it is also proposed for the travel distance between alternate exits through a point of choice to be 150 m in lieu of 60 m.

The Guide to the BCA is intended as a reference manual to provide clarification to the BCA and should be read in conjunction with the BCA. The Guide describes the intent of D1.4 as 'to maximise the safety of occupants by enabling them to be close enough to an exit to safely evacuate'.

The Guide further details that 'D1.4(c)(i) sets out the maximum travel distance in Class 5-9 buildings. The distances specified allow people to evacuate in a reasonable time, assuming that they are not asleep.'

The maximum travel distances stipulated in the BCA are notional figures. These provisions are conservative in nature as they attempt to take into account all possible design scenarios. The layout or fire safety measures within the building are not taken into account in the distance of travel nominated within the BCA as they are static for all scenarios of size, number of storeys and effective height.

The movement period may be assessed with a performance-based approach to occupant travel times using occupancy characteristics including travel speeds and occupant densities, which are reflective of the particular occupancy being modelled. This approach avoids the need for further time adjustments.

The comparison analysis for travel time is based on equivalence for the floor area, volume and ventilation. The variable characteristic considered is the travel distance, occupancy numbers and hence the movement time. For the purpose of this assessment, an occupant travel speed of 0.8m/s has been adopted. The total DtS travel distance to the nearest exit is 40 m whereas the proposed design has a travel distance of up to 75 m to the exit.

The occupancy numbers have been based on the effective width of the exits in the main warehouse for the DtS scenario (6 exits, with each providing sufficient exit width for 100 persons) while the occupancy numbers for the Performance Solution are based on advice from the client and the intended use of the area. It is expected that up to 10-20 occupants will be present within the subject development main warehouse according to its intended usage. The upper occupancy of 100 has been used in the evaluation to allow for a factor of safety. The flow rate through the exit is calculated as 1 person/second, per meter of exit width.

TABLE 4:

MOVEMENT PERIOD – WAREHOUSE FLOOR

Variable	Deemed to Satisfy	Performance Solution
Distance to the nearest exit	40 m	75 m
Travel Speed	0.8 m/s	0.8 m/s
Travel Time to Exit	**50 seconds**	**94 seconds**
Occupancy	600	100
Effective Width of Exits	6 m	6 m
Flow Rate Through Exit	6 persons/s	6 persons/s
Queue Time	**600/6 = 100 seconds**	**100/6 = 17 seconds**
Which is Greater?	Queue Time	Travel Time
Total Movement Period	**100 seconds**	**94 seconds**
Decrease in Movement Period compared to DtS	**6 seconds**	

Source: Ignis Solutions

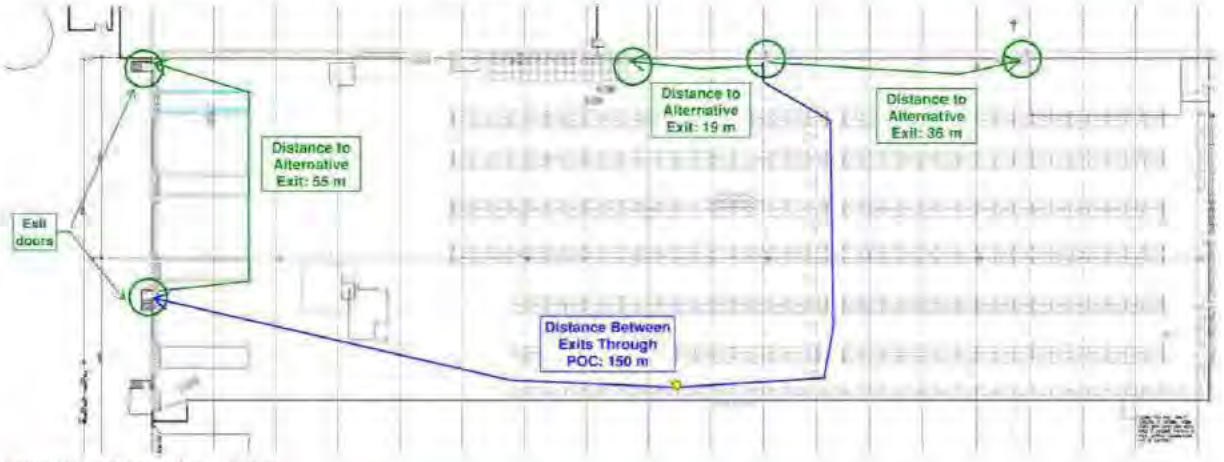
The movement period for the DtS scenario is queue driven whereas Performance Solution is travel time driven. The lower occupancy numbers of the performance solution from the subject area provides an improvement over that of the BCA Deemed-to-Satisfy scenario and is considered to offset the extended travel distance to the nearest exit. In addition, considering the occupant familiarity, the increase in the travel distance does not impact upon the safe evacuation of the occupants.

Travel to an alternative exit

The distance of travel to the alternative exit is measured through the point of choice as 150 m, in lieu of the 60 m permitted by the DtS provisions. The warehouse is provided with five exit doors that egress directly outside in addition to an egress path through the office tenancy. If an occupant travels to the nearest exit and finds it blocked, their travel distance to the nearest alternative exit is less than 60 m, when not travelling through the point of choice. This exit will be visible before occupants have to travel back to their original point of choice. Additionally, as the primary occupants are staff, they are likely to be familiar with the building and would be familiar with the egress options from the building. Non-staff members such as visitors to the building or those who require assistance in locating the exits will still be able to locate the alternate exit through emergency exit signs. In addition, these occupants are likely to be accompanied by staff. As such, occupants are unlikely to need to travel back through the point of choice to reach an alternative exit point.

FIGURE 22:

TRAVEL DISTANCES BETWEEN ALTERNATE EXITS



Source: DNA Architects and Ignis Solutions

4.3 Required Fire Safety Measures

Independent of the BCA DtS provisions, which remain required, no additional fire safety measures are required in relation to this performance solution.

4.4 Evaluation Summary

In the opinion of Ignis Solutions, the assessment has demonstrated that the proposed Performance Solution for travel distance to the nearest exit and between alternate exits within the warehouse is suitable and does not limit the capacity for occupant evacuation and as such satisfies BCA Performance Requirement DP4.

5 50 M FIRE HOSE REEL – WAREHOUSE

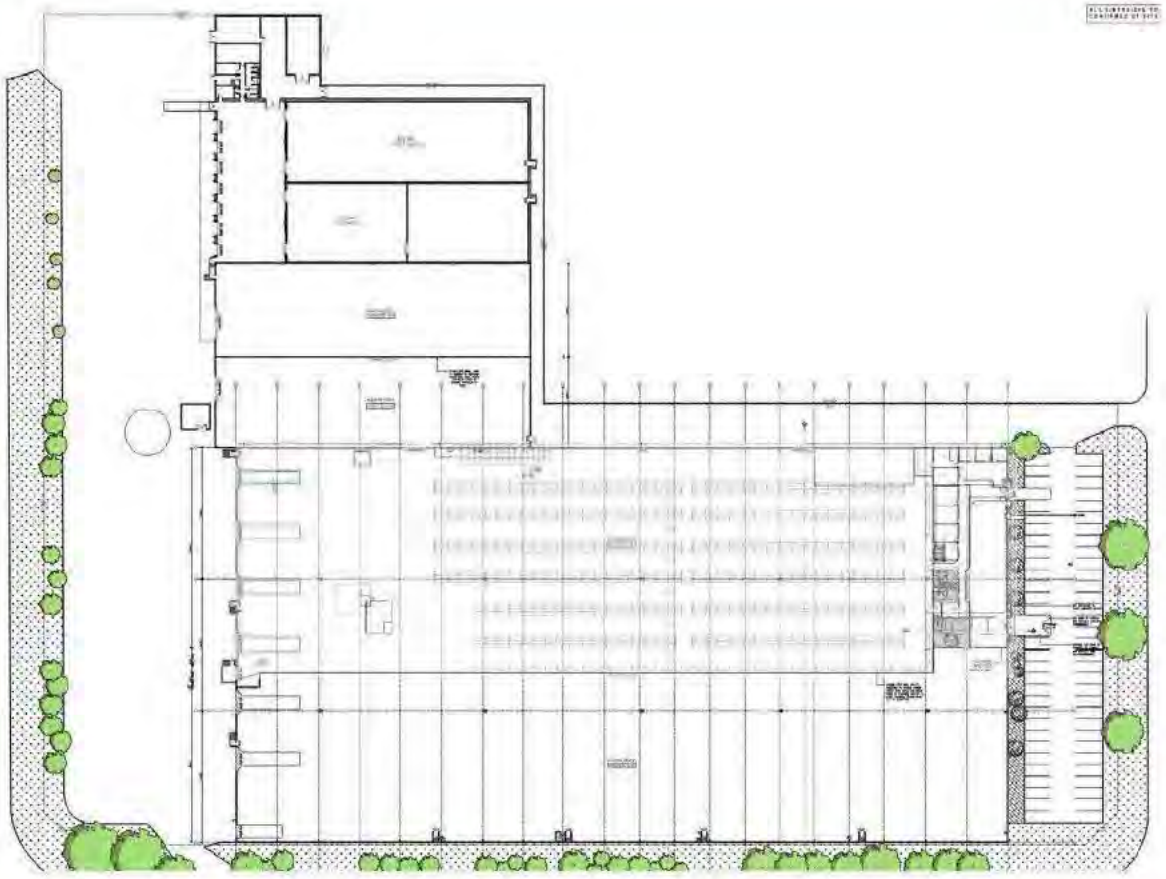
5.1 Brief of Proposed Performance Solution

Clause E1.4 of the BCA requires that fire hose reels be provided throughout the building and to be installed in accordance with AS 2441:2005. Clause 10.2(a) of AS 2441:2005 sets the maximum coverage of a hose length to be 36 m.

It is proposed for the fire hose reels within the warehouse to be 50 m in length in lieu of 36 m. Multiple 50 m fire hose reels are required to provide full coverage to the warehouse.

FIGURE 23:

WAREHOUSE



Source: DNA Architects and Ignis Solutions

5.1.1 BCA Deemed-to-Satisfy Basis

BCA Clause E1.4(b)(i) requires a fire hose reel system to be installed where one or more internal fire hydrants are installed and to serve any fire compartment with a floor area greater than 500 m^2. Class 2 occupants are excluded from this requirement. See below:

FIGURE 24:

NCC – VOL 1 – CLAUSE E1.4

E1.4 Fire hose reels

(a) E1.4 does not apply to—

(i) a Class 2, 3 or 5 building or Class 4 part of a building; or

(ii) a Class 8 *electricity network substation*; or

(iii) a Class 9c building; or

(iv) classrooms and associated corridors in a primary or secondary *school*.

SA E1.4(a)(v) and *(vi)*

(b) A fire hose reel system must be provided—

(i) to serve the whole building where one or more internal fire hydrants are installed; or

(ii) where internal fire hydrants are not installed, to serve any *fire compartment* with a *floor area* greater than 500 m^2.

(c) The fire hose reel system must—

(i) have fire hose reels installed in accordance with AS 2441; and

(ii) provide fire hose reels to serve only the *storey* at which they are located, except a *sole-occupancy unit* of not more than 2 *storeys* in a Class 6, 7, 8 or 9 building may be served by a single fire hose reel located at the level of egress from that *sole-occupancy unit* provided the fire hose reel can provide coverage to the whole of the *sole-occupancy unit*.

(d) Fire hose reels must be located internally, externally or in combination, to achieve the system coverage specified in AS 2441.

(e) In achieving system coverage, one or a combination of the following criteria for individual internally located fire hose reels must be met in determining the layout of any fire hose reel system:

(i) Fire hose reels must be located adjacent to an internal fire hydrant (other than one within a fire-isolated *exit*), except that a fire hose reel need not be located adjacent to every fire hydrant, provided system coverage can be achieved.

(ii) Fire hose reels must be located within 4 m of an *exit*, except that a fire hose reel need not be located adjacent to every *exit*, provided system coverage can be achieved.

(iii) Where system coverage is not achieved by compliance with (i) and (ii), additional fire hose reels may be located in paths of travel to an *exit* to achieve the *required* coverage.

(f) Fire hose reels must be located so that the fire hose will not need to pass through doorways fitted with fire or smoke doors, except—

(i) doorways in walls referred to in C2.5(a)(v) in a Class 9a building and C2.5(b)(iv) in a Class 9c building, separating ancillary use areas of high potential *fire hazard*; and

(ii) doorways in walls referred to in C2.12 or C2.13 separating equipment or electrical supply systems; and

(iii) doorway openings to *shafts* referred to in C3.13.

(g) Where the normal water supply cannot achieve the flow and pressures required by AS 2441, or is unreliable—

(i) a pump; or

(ii) water storage facility; or

(iii) both a pump and water storage facility,

must be installed to provide the minimum flow and pressures required by clause 6.1 of AS 2441.

Source: ABCB NCC Volume One – Building Code of Australia 2019 Amendment One

5.1.2 Intent of BCA Deemed-to-Satisfy Clause

The Guide to the BCA is indented as a reference manual to provide clarification to the BCA and should be read in conjunction with the BCA. The Guide to the BCA describes the intent of Clause E1.4 as:

FIGURE 25:

NCC – GUIDE TO VOL 1 – CLAUSE E1.4

Intent

To require the installation of suitable fire hose reel systems to enable, where appropriate, a building's occupants to undertake initial attack on a fire.

Source: ABCB NCC Volume One, Guide – Building Code of Australia 2019 Amendment One

5.1.3 BCA Performance Requirement

The relevant BCA Performance Requirement is EP1.1 as detailed below:

FIGURE 26:

NCC – VOL 1 – PERFORMANCE REQUIREMENT EP1.1

EP1.1 Fire hose reels

A fire hose reel system must be installed to the degree necessary to allow occupants to safely undertake initial attack on a fire appropriate to—

(a) the size of the *fire compartment*; and

(b) the function or use of the building; and

(c) any other *fire safety systems* installed in the building; and

(d) the *fire hazard*.

Source: ABCB NCC Volume One – Building Code of Australia 2019 Amendment One

5.1.4 Relevant Element of Performance Requirement

The relevant element of the performance requirement is (a): A fire hose reel system must be installed to the degree necessary to allow occupants to safely undertake initial attack on a fire appropriate to (a) the size of the fire compartment.

5.1.5 Meeting the Performance Requirement

The Performance Requirement will be satisfied by A2.1 (3): a combination of (1) and (2) where (1) is a Performance Solution and (2) is a Deemed-to-Satisfy Solution.

5.1.6 Assessment Method

BCA Clause A2.2 (b)(ii) Other Verification Methods accepted by appropriate authority that show compliance with the relevant Performance Requirements.

5.1.7 Methodology

Sch 2.2(a)(xi)

5.1.8 Acceptance Criteria

The acceptance criteria for this performance solution is that the proposed first attack provisions are appropriate to the occupants and do not reduce the capacity for the occupants to undertake first attack if required.

5.1.9 Identified Hazard

The potential hazard is that a fire may occur in an area and occupants will not be able to suppress the fire.

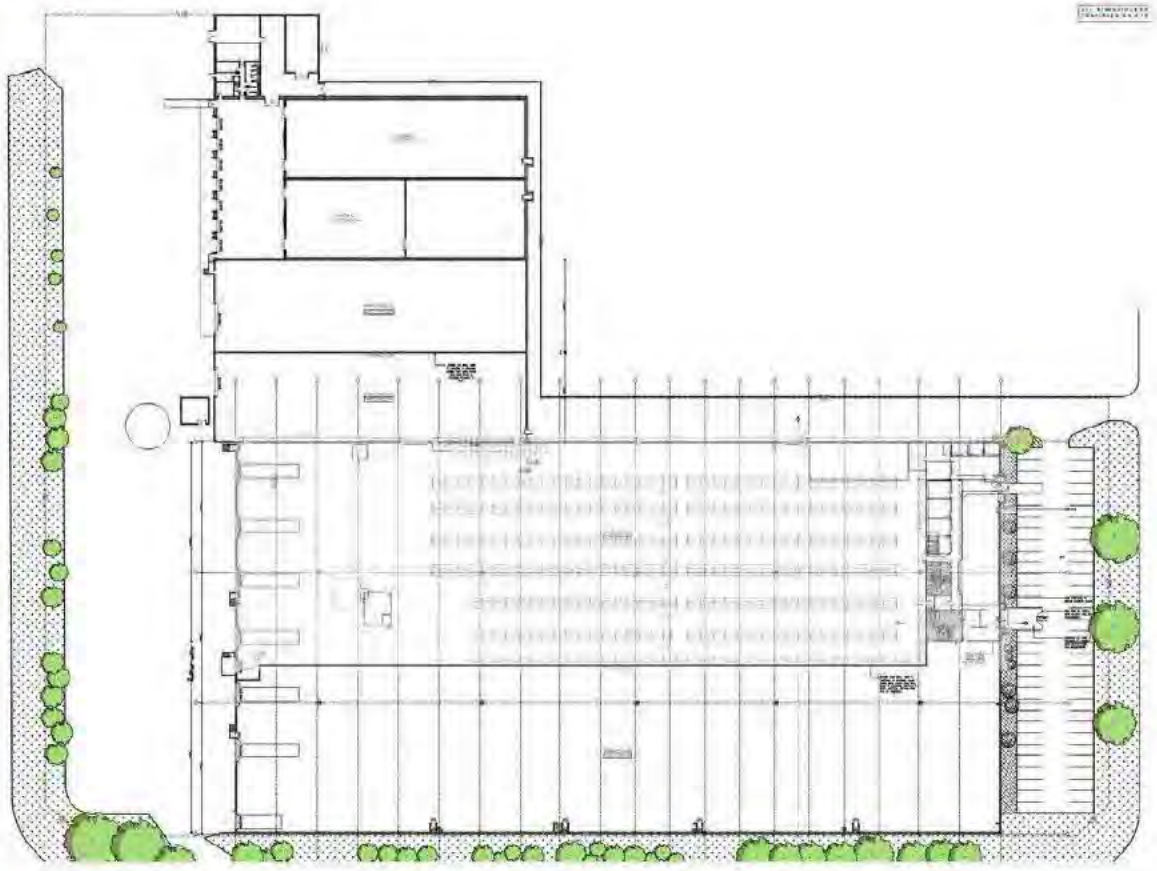
5.2 Performance Evaluation

Clause E1.4 of the BCA requires that fire hose reels be provided throughout the building and be installed in accordance with AS 2441:2005. Clause 10.2(a) of AS 2441:2005 sets the maximum coverage of a hose length to be 36 m.

It is proposed for the fire hose reels within the warehouse to be 50 m in length in lieu of 36 m. Multiple 50 m fire hose reels are required to provide full coverage to the warehouse.

FIGURE 27:

WAREHOUSE FLOOR PLAN



Source: BNA Architects and Ignis Solutions

The 36m hose length detailed within AS 2441:2005 is a notional figure that does not take the active fire safety systems of the building or make-up of the compartment into account. The warehouse is approximately 20,000 m^2 in floor area. The design of the building is such that if an occupant was not able to extinguish the fire during initial attack, they would be able to evacuate via one of the

alternatives exits instead of retreating to the location where the fire hose reel is installed. 50 m fire hose reels located within the warehouse located will provide full and compliant coverage.

In addition, occupants of the building who may undertake initial attack on a fire are likely to be staff members who can be assumed to be awake and capable of responding to the activation of a fire alarm. Staff are likely to be familiar with the layout and location of fire hose reels. This familiarity will enable occupants to evaluate the location of a fire and determine whether it is small enough to attempt initial firefighting. Should occupants choose to attack the fire, they can be expected to be familiar with the location of exits and fire fighting equipment. This familiarity with the building will significantly reduce the likelihood of occupants placing themselves in a life-threatening situation.

With the exception of the non-complying length, the fire hose reel will be designed and installed in accordance with the requirements of AS 2441:2005 including signage, operation and placement.

5.3 Required Fire Safety Measures

Independent of the BCA DtS provisions, which remain required, the following fire safety measures are required in relation to this performance solution:

- 50 m fire hose reels within the buildings.
- Signage above the fire hose reel indicating the length. This signage shall read "50 m FHR"

5.4 Evaluation Summary

In the opinion of Ignis Solutions, the evaluation has demonstrated that the proposed Performance Solution for fire reels is suitable and the provision of a first attack medium is maintained and as such satisfies BCA Performance Requirement EP1.1(a).

6 FIRE HYDRANT SYSTEM – COVERAGE (EXTERNAL)

6.1 Brief of Proposed Performance Solution

In accordance with Clause 3.2.2 of AS 2419.1:2005, all points on a floor shall be within reach of a 10 m hose stream issuing from a nozzle at the end of a 60 m length of hose laid from the fire appliance via a 20 m hose to the fire hydrant outlet.

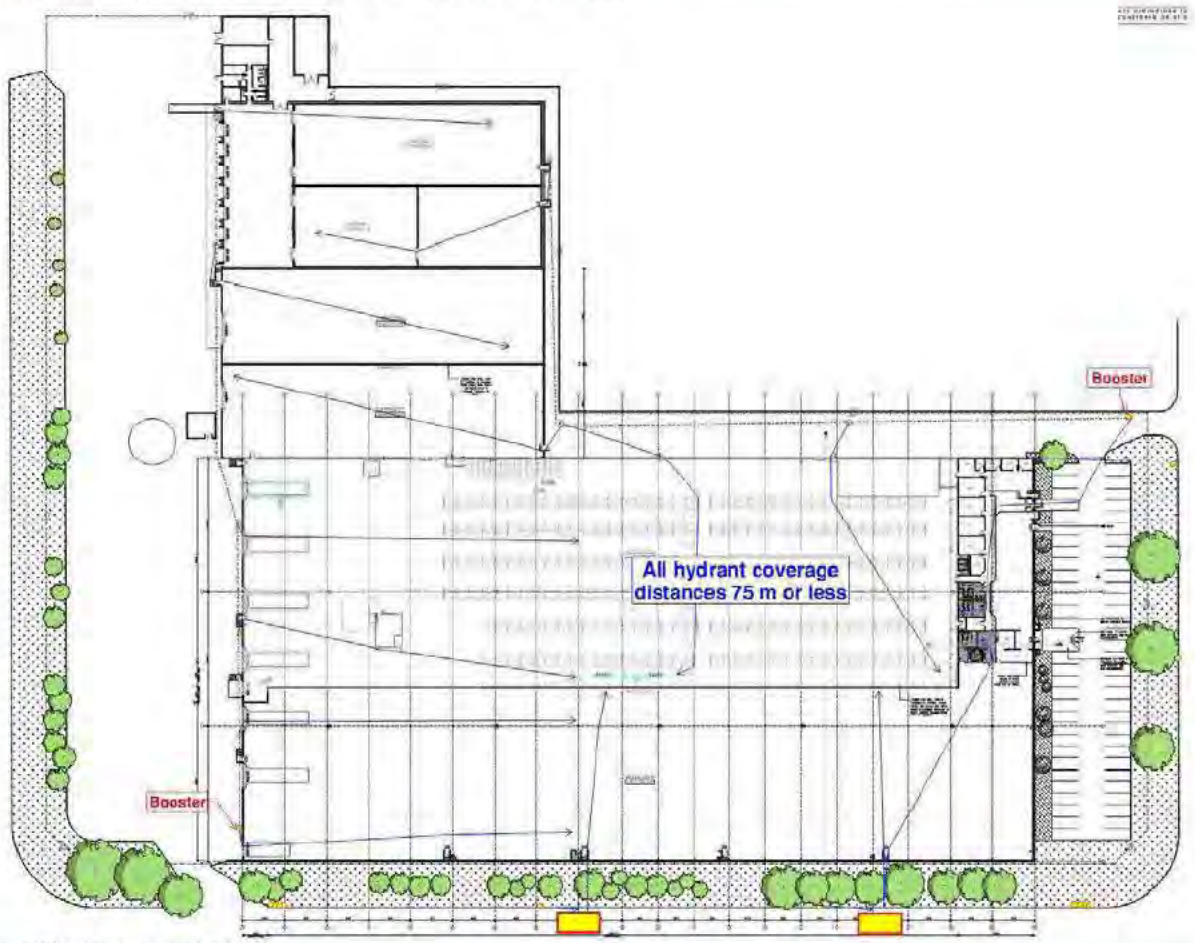
Clause 3.2.2.2(e) details external fire hydrants shall be located in a position not less than 10 m from the building it is protecting unless safe guarded by construction having an FRL of not less than 90/90/90, extending 2 m each side of the hydrant outlet and extending not less than 3 m above the ground adjacent to the fire hydrant or the height of the building, whichever is lesser.

It is proposed for three lengths of fire hose to be used from the existing onsite attack hydrant system and the adjacent street hydrants to achieve coverage within all areas of the building. The maximum length of fire hose required from the existing external attack hydrant system is approximately 75 m for coverage into the warehouse.

It is proposed for the existing hydrants to be located within 10 m of the building.

FIGURE 28:

WAREHOUSE COVERAGE OVER BOTH PARTS OF WAREHOUSE



Source: DNA Architecture and Ignis Solutions

6.1.1 BCA Deemed-to-Satisfy Basis

BCA Clause E1.3 requires a fire hose reel system to be provided to serve a building greater than 500 m^2 and for it to be installed in accordance with AS 2419.1. See below:

FIGURE 29:

NCC – VOL 1 – CLAUSE E1.3

E1.3 Fire hydrants

(a) A fire hydrant system must be provided to serve a building—

(i) having a total *floor area* greater than 500 m^2; and

(ii) where a *fire brigade station* is—

(A) no more than 50 km from the building as measured along roads; and

(B) equipped with equipment capable of utilising a fire hydrant.

(b) The fire hydrant system—

(i) must be installed in accordance with AS 2419.1, except—

(A) a Class 8 *electricity network substation* need not comply with clause 4.2 of AS 2419.1 if—

(aa) it cannot be connected to a town main supply; and

(bb) one hour water storage is provided for fire-fighting; and

(B) where a sprinkler system is installed throughout a building in accordance with AS 2118.1, AS 2118.4, AS 2118.6, FPAA101H or FPAA101D the fire hydrant booster protection requirements of clauses 7.3(c)(ii) and 7.3(d)(iii) of AS 2419.1 do not apply; and

(C) a fire hydrant booster assembly may be located between 3.5 m and 10 m of the building, and need not comply with clause 7.3(d)(iii) of AS 2419.1 where the assembly is protected by an adjacent fire-rated freestanding wall that—

(aa) achieves an FRL of not less than 90/90/90; and

(bb) extends not less than 1 m each side of the outermost fire hydrant booster risers within the assembly and is not less than 3 m wide; and

(cc) extends to a height of not less than 2 m above finished ground level; and

(ii) where internal fire hydrants are provided, they must serve only the *storey* on which they are located except that a *sole-occupancy unit*—

(A) in a Class 2 or 3 building or Class 4 part of a building may be served by a single fire hydrant located at the level of egress from that *sole-occupancy unit*; or

(B) of not more than 2 *storeys* in a Class 5, 6, 7, 8 or 9 building may be served by a single fire hydrant located at the level of egress from that *sole-occupancy unit* provided the fire hydrant can provide coverage to the whole of the *sole-occupancy unit*.

SA E1.3(c), (d), (e) and *(f)*

Source: ABCB NCC Volume One – Building Code of Australia 2019 Amendment One

6.1.2 Intent of BCA Deemed-to-Satisfy Clause

The Guide to the BCA is indented as a reference manual to provide clarification to the BCA and should be read in conjunction with the BCA. The Guide to the BCA describes the intent of Clause E1.3 as:

FIGURE 30:

NCC – GUIDE TO VOL 1 – CLAUSE E1.3

E1.3 Fire hydrants

Intent
To require the installation of suitable fire hydrant systems to facilitate the fire brigade's firefighting operations.

Source: ABCB NCC Volume One, Guide – Building Code of Australia 2019 Amendment One

6.1.3 BCA Performance Requirement

The relevant BCA Performance Requirement is EP1.3 as detailed below:

FIGURE 31:

NCC – VOL 1 – PERFORMANCE REQUIREMENT EP1.3

EP1.3 Fire hydrants

A fire hydrant system must be provided to the degree necessary to facilitate the needs of the *fire brigade* appropriate to—

(a) fire-fighting operations; and

(b) the *floor area* of the building; and

(c) the *fire hazard*.

Application:

EP1.3 only applies to a building where a *fire brigade* is available to attend.

Source: ABCB NCC Volume One – Building Code of Australia 2013 Amendment One

6.1.4 Relevant Element of Performance Requirement

The entirety of the Performance Requirement EP1.3 detailed above is relevant.

6.1.5 Meeting the Performance Requirement

The Performance Requirement will be satisfied by A2.1 (3): a combination of (1) and (2) where (1) is a Performance Solution and (2) is a Deemed-to-Satisfy Solution.

6.1.6 Assessment Method

BCA Clause A2.2 (b)(ii) Other Verification Methods accepted by appropriate authority that show compliance with the relevant Performance Requirements.

6.1.7 Methodology

Sch 2.2(a)(xi)

6.1.8 Acceptance Criteria

The acceptance criteria for this performance solution is that the proposed fire hydrant design does not reduce the capacity for fire service intervention.

6.1.9 Identified Hazard

The potential hazard is hindrance to fire-fighting operations by having to run three lengths of fire hose.

6.2 Performance Evaluation

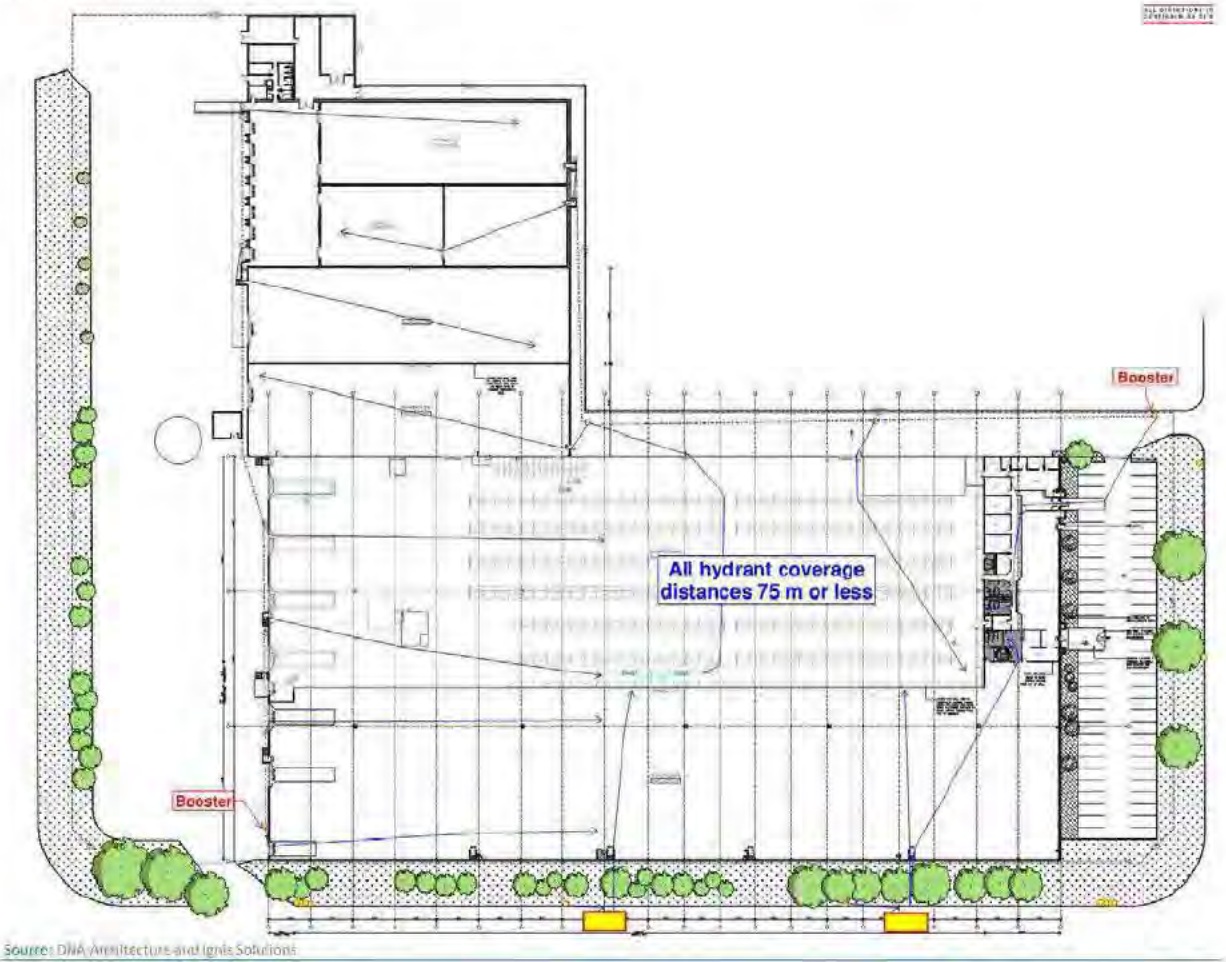
In accordance with Clause 3.2.2 of AS 2419.1:2005, all points on a floor shall be within reach of a 10 m hose stream issuing from a nozzle at the end of a 60 m length of hose laid from the fire appliance via a 20 m hose to the fire hydrant outlet.

Clause 3.2.2.2(e) details external fire hydrants shall be located in a position not less than 10 m from the building it is protecting unless safe guarded by construction having an FRL of not less than 90/90/90, extending 2 m each side of the hydrant outlet and extending not less than 3 m above the ground adjacent to the fire hydrant or the height of the building, whichever is lesser.

It is proposed for three lengths of fire hose to be used from the existing onsite attack hydrant system and the adjacent street hydrants to achieve coverage within all areas of the building. The maximum length of fire hose required from the existing external attack hydrant system is approximately 75 m for coverage into the warehouse.

It is proposed for the existing hydrants to be located within 10 m of the building.

FIGURE 32:
WAREHOUSE COVERAGE



Source: DNA Architecture and Ignis Solutions

The hydrant valves that provide coverage will be featured on the hydrant block plan which will be located at the building's driveway entrance. In addition, signage will be provided detailing that three lengths of fire hose is required for full coverage of the building. This signage is to be located adjacent to the hydrant block plan.

The use of three lengths of fire hose to achieve coverage has been detailed by ACT Fire & Rescue to be suitable under performance based designs. As the proposed building requires up to 75m coverage, the proposed fire hose distance remains within the acceptable limit of ACT Fire & Rescue precedent.

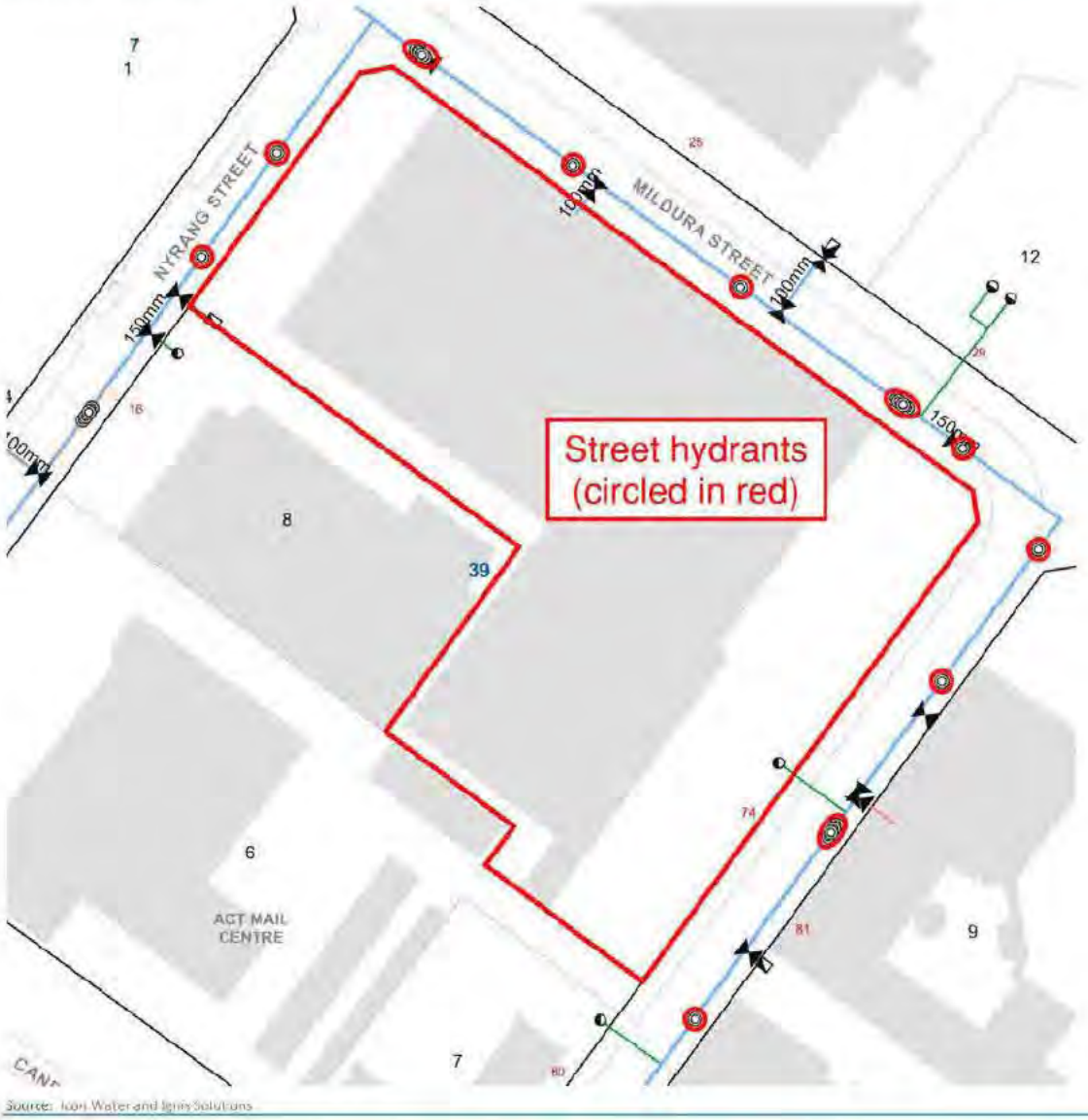
Hydrants within 10 m of the subject building

Whilst the hydrants as part of the attack system are located within 10 m of the building they serve, there are street hydrants located greater than 10 m from the building which can be used for initial attack.

There are multiple street hydrants, on Mildura Street and Nyrang Street which serve the subject development. Compliant coverage is not however achievable from the street hydrants alone.

FIGURE 33:

STREET HYDRANTS



Source: Icon Water and Ignis Solutions

Fire Safety Measures

A hydrant block plan will be provided at both hydrant boosters and the Fire Indicator Panel. The hydrant block plans will show the internal layout, location of the booster assemblies, FIP, hydrants (attack and feed) and exit/entry points into the building. These elements will assist with reducing the time taken for ACTF&R to intervene in a fire.

Signage indicating that three lengths of fire hose is required is to be installed adjacent to the hydrant block plan. The signage shall read "THREE LENGTHS OF FIRE FIGHTING HOSE IS REQUIRED TO REACH ALL AREAS FROM THE EXTERNAL HYDRANTS". The signage is to be in capital lettering, not less than 20 mm high in a colour contrasting the background. Signage must be permanent, fade resistant and weatherproof – i.e. must be screw fixed or other and not laminated paper.

To ensure the hydrants will not be covered by landscaping, a 1 m clear working radius is to be maintained around all hydrants. All attack hydrants are to be identified with 'AH' plaques, street hydrants with 'FH' plaques, and all hydrants with blue stimsonite marker, both securely fixed. If any hydrants or 'AH' plaques are located within landscaped area, the plaque is to be located on a 900 mm blue post.

Fire Service Equipment

Australian Standard 2419.1:2005 appendix D provides details of fire appliances and strategies. Section D2 details the following regarding types of appliances.

Fire brigade pumping appliances are equipped with an on board pump which is used to increase the pressure of the water supplied to it. The flow performance of the pump is determined by the water supply characteristics. Layflat hose is connected between a feed fire hydrant and the pump suction and it is the pressure available at the feed fire hydrant to overcome the frictional loss in the hose, which determines the available flow at the pump suction. The characteristics of the appliance pump will then determine the pressure increase available. Typically, 1000 kPa or more can be achieved at 20 L/s with zero pressure at the pump suction.

Fire brigade pumping appliances can be used for the direct connection of fire hoses to attack a fire, to boost the performance of an installed fire hydrant system or to supply water to an aerial appliance or other appliance for relay activity.

Fire hose is considered to be a key piece of equipment carried on a fire appliance. ACT Fire & Rescue uses Duraline fire hose manufactured by Angus Fire in lieu of soft canvas fire hose. Duraline is considered to be the benchmark in fire hose technology. Duraline fire hose is a specially formulated high grade synthetic rubber extruded through a polyamide woven jacket to give a non-kinking construction and excellent rubber to textile adhesion.

Modern extruded fire hose, as used by ACT Fire & Rescue, has improved the performance and function of the fire hose including friction loss. A 2012 study by the National Fire Protection Association (NFPA) stated that "Baseline friction loss coefficients used by today's fire fighters for calculating fire hose pressure loss were derived using hose design technology from upwards of 50 Years ago." Further to this the NFPA stated "Friction loss characteristics of fire hose have changed as a result of evolving hose manufacturing technology, the published friction loss characteristics used, may be overly conservative." They then concluded that "The friction loss coefficient used in calculations, the C factor, in all tests was less than the published C factor in NFPA documentation." This improved performance

and reduced friction loss enables the Fire Appliance to pump water at the required pressure and flow over greater distances than previously assumed within standard calculations on which the one hose limit was applied in Australian Standard 2419.1-2005. These statements by the NFPA are characteristic of the Australian Standard, which has not changed the limitation of one length of hose (based on common canvas fire hose) since 1988 over 25 years ago.

It is understood that the pump operator with support from the second arriving fire crew would establish the pump and hydrant feed system. The residual pressure is required to limit the risk of hydraulic collapse of the feed fire hose. Australian Standard 2419.1:2005 details that at least 150kPa is required to limit hydraulic collapse of the fire hose. This value accounts for soft canvas fire hose. It is understood that the site achieves the residual pressure of at least 350kPa. This residual pressure is considered sufficient to charge the line of fire hose from the feed point to the appliance. The set up of the supply line to the pumper is completed in a place of safety remote of the fire risk.

Part D3 of AS 2419.1:2005 provides generic detail relating to action on arrival by fire crew. Part D details that if the fire is of limited heat output it may only be necessary to use the onboard high-pressure hose reel or a small bore (38 mm) layflat hose with water supplied from an on board tank or a street fire hydrant.

Fires of greater intensity and size will of necessity require the use of an increased amount of equipment such as multiple hose streams, larger diameter hoses (up to 64 mm) and the use of high discharge monitors on pumpers and aerial appliances, requiring an even larger amount of water to be available.

As supported by appendix D of AS2419.1:2005, the first crew are likely to run out their hose reel to support occupant evacuation and rescue or to intervene in the fire event. The hose reel is 90 m in length. Majority of the site would achieve coverage from the fire appliance first aid reel.

6.3 Required Fire Safety Measures

Independent of the BCA DtS provisions, which remain required, the following fire safety measures are required in relation to this performance solution:

- It is proposed for the coverage from the existing external attack hydrant system to the subject building to be via three lengths of fire hose.
- It is proposed for the hydrant system serving the large isolated building to not be a dedicated ring main as required by Clause 8.6.1(b) of AS 2419.
- A hydrant block plan is to be provided at the FIP and booster, and show internal layout, location of booster assembly, FIP, hydrants (attack and feed) and exits/entries.
- 1 m clear working radius is to be maintained around all hydrants. All attack hydrants are to be identified with 'AH' plaque, street hydrants with 'FH' plaque and all with blue stimsonite marker, both securely fixed. If any plaques are located within landscaped area, the plaque is to be located on a 900 mm blue post.
- Signage indicating that three lengths of fire hose is required is to be installed adjacent to the hydrant block plan. The signage shall read "THREE LENGTHS OF FIRE FIGHTING HOSE IS REQUIRED TO REACH ALL AREAS FROM THE EXTERNAL HYDRANTS".
- The signage is to be in capital lettering, not less than 20mm high in a colour contrasting the background. Signage must be permanent, fade resistant and weatherproof – i.e. must be screw fixed or other and not laminated paper.

6.4 Evaluation Summary

In the opinion of Ignis Solutions, the evaluation has demonstrated that the proposed Performance Solution for the fire hydrant system is suitable and does not reduce the capacity for fire service intervention and as such satisfies BCA Performance Requirement EP1.3.

Appendix

A

fire engineering brief detail

A FIRE ENGINEERING BRIEF

A.1 Large Isolated Building – Non-continuous Perimeter Vehicular Access

Brief

- Clause C2.2(a) details the size of any fire compartment in a Class 8 building must not exceed the relevant maximum floor area nor the relevant maximum volume set out in Table C2.2 and C2.5 except as permitted in C2.3.
- Clause C2.3(a)(ii)(B) of the BCA details that large-isolated buildings of Class 8 which exceed 18,000 m^2 in floor area or 108,000 m^3 in volume must be provided with a perimeter vehicular access complying with Clause C2.4(b).
- Clause C2.4(b) of the BCA details that the perimeter vehicular access must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building. Also, it must have an unobstructed width of 6m with no part of its furthest boundary more than 18 m form the building and no part of the 6 m width be built upon or used for any purpose other than vehicular or pedestrian movement.
- The building has an area of approximately 19,000 m^2.
- It is proposed for the subject building to not be provided with vehicular access in accordance with Clause C2.4(b). The sections of the building with non-compliant vehicular access are outlined in red in the figure below.
- It is proposed for the hydrant system serving the large isolated building to not be a dedicated ring main as required by Clause 8.6.1(b) of AS 2419.

BCA DtS Basis

C2.2 – General floor area and volume limitations
The size of any fire compartment in a Class 8 building must not exceed the relevant maximum floor area nor the maximum volume set out in Table C2.2 and C2.5 except as permitted in C2.3.
C2.3 – Large isolated buildings
The Class 8 building may exceed 18,00 m^2 in floor area or 108,000 m^3 in volume if it is protected with a sprinkler system complying with Specification E1.5 and provided with perimeter vehicular access complying with C2.4(b).
C2.4(b) – Requirements or open spaces and vehicular access
Vehicular access must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building.

Intent

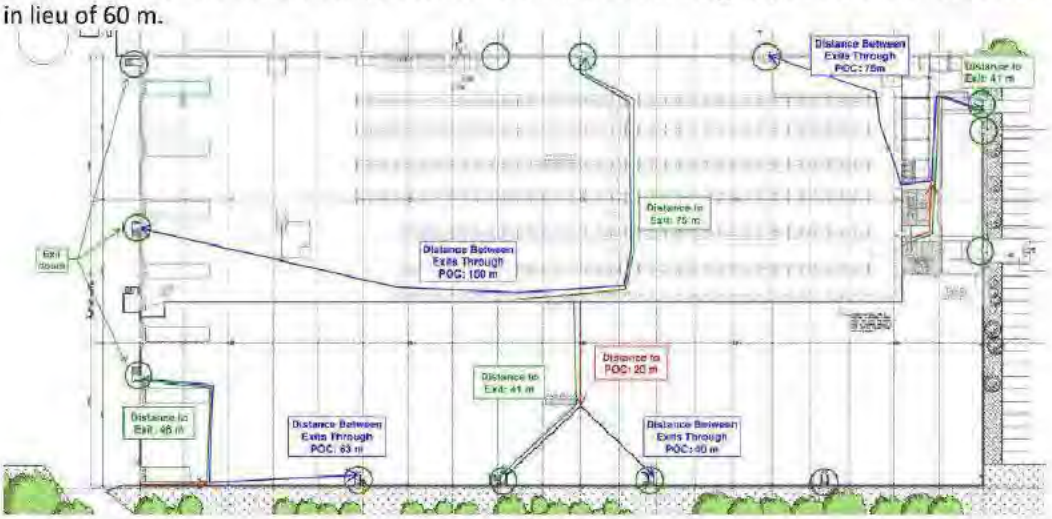
The intent of the related Deemed-to-Satisfy provision C2.4 is to set the minimum requirements for open space around a building and the provision of vehicular access for the fire brigade.

Performance Requirement	CP2 – Fire spread CP9– Fire brigade access
Meeting the Performance Requirement	BCA Provision A2.1 (3): a combination of (1) and (2) where (1) is a Performance Solution and (2) is a Deemed-to-Satisfy Solution.
Assessment Method	BCA Clause A2.2 (2)(b)(ii) Other Verification Methods accepted by appropriate authority that show compliance with the relevant Performance Requirements.
Methodology	Sch 2.2(a)(xi)
AFEG	C – Occupant Evacuation and Control
Acceptance Criteria	The acceptance criteria for this performance solution is that the proposed lack of vehicular access does not hinder brigade intervention.
Hazard	The potential hazard is that a fire incident may cause fire spread and the fire brigade cannot maintain continuous access in a forward direction around the entire building.
Strategy	• Description of building and current building use. • Building is existing, with extension in 1987. No change to external façade or size of the building proposed under current building works. • Layout of subject building and site access has not significantly changed for over 30 years. • Access on three sides of the building. • No change of use from current usage. • Existing hydrant system and street hydrants for hydrant coverage (see hydrant Performance Solution). • ESFR sprinkler system installed and maintained • Height of racking controls, wire mesh proposed to separate upper level tenancy wall to prevent sprinkler interference.
Calculation Tools	The evaluation is qualitative
Fire Safety Measures	• Independent of the BCA DtS provisions, which remain required, no additional fire safety measures are required in relation to this performance solution.

A.2 Distance of Travel

Brief

- Clause D1.4 of the BCA requires that the travel distance in a Class 5, 6, 7, 8 or 9 building be no more than 20 m from an exit or to a point of choice of two exits, in which case the maximum distance to one of those exits must not exceed 40 m.
- Clause D1.5 of the BCA requires that the travel distance to an alternative exit through a point of choice for Class 5,6,7,8 or 9b building no more than 60 m.
- It is proposed for the travel distance within the warehouse building to be up to approximately 75 m to the nearest exit in lieu of 40 m.
- It is proposed for the travel distance between alternate exits through a point of choice to be 150 m in lieu of 60 m.



BCA DtS Basis

D1.4 – Exit travel distances
The requirements for exits are based on the Class of building. Within a Class 7a building the maximum distance to a single exit or point of choice must not be more than 20 m and the maximum distance to the nearest exit is 40 m.
D1.5 – Distance between alternative exits
The requirements for exits are based on the Class of building. Within a Class 8 building the maximum distance between alternative exits through a point of choice is to be no more than 60 m.

Intent

The intent of the related Deemed-to-Satisfy provision D1.4 is to maximise the safety of occupants by enabling them to be close enough to an exit to safely evacuate.

Performance Requirement

DP4 – Exits
EP2.2 – Evacuation routes

Meeting the Performance Requirement

BCA Provision A2.1 (3): a combination of (1) and (2) where (1) is a Performance Solution and (2) is a Deemed-to-Satisfy Solution.

Assessment Method

BCA Clause A2.2 (2)(b)(ii) Other Verification Methods accepted by appropriate authority that show compliance with the relevant Performance Requirements.

Methodology

Sch 2.2(a)(xi)

AFEG

E – Occupant Evacuation and Control

Acceptance Criteria

The acceptance criteria for this performance solution is that occupants are provided with sufficient warning and means to safely reach an exit such that the BCA Performance Requirement DP4(a) is satisfied to the degree necessary.

Hazard

The potential hazards include:

- the exit travel distance being too excessive,
- the risk of the fire safety systems not being sufficient for all the occupants who might be using the area to evacuate.

Strategy	• Description of building and travel distances. • Alternative egress routes not passing through the point of choice. • Low occupancy level of the warehouse. • High occupant familiarity. • Visibility along the open paths of the warehouse. • High hazard sprinkler system.
Calculation Tools	The evaluation is qualitative
Fire Safety Measures	Independent of the BCA DtS provisions, which remain required, no additional fire safety measures are required in relation to this performance solution.

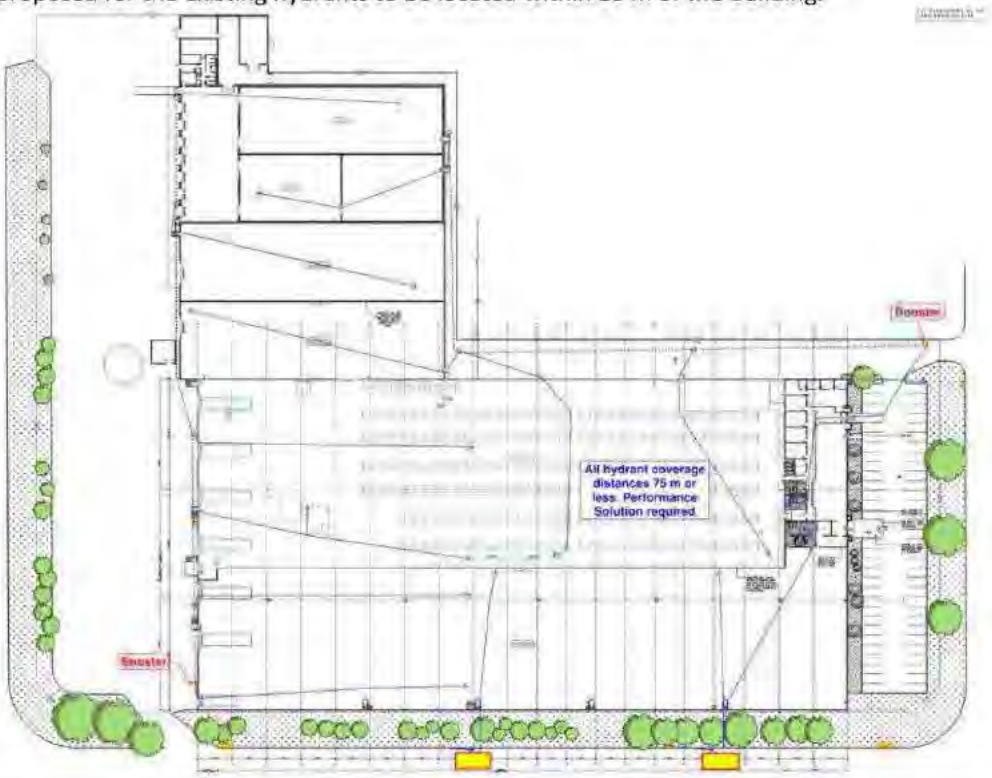
A.3 50 m Fire Hose Reels

Brief	• Clause E1.4 of the BCA requires that fire hose reels be provided throughout the warehouse building. • Clause 10.2(a) of AS 2441:2005 sets the maximum coverage of a hose length to be 36 m. • It is proposed for the fire hose reels within warehouse building to be 50 m in lieu of 36 m. Multiple 50 m fire hose reels provide coverage to the entire warehouse building.
BCA DtS Basis	E1.4 – Fire hose reels A fire hose reel system must be provided to serve the whole buildings where one or more internal hydrants are installed and to serve any fire compartments with a floor area greater than 500m^2.
Intent	The intent of the related Deemed-to-Satisfy provision is to require the installation of suitable fire hose reel systems to enable, where appropriate, a building's occupants to undertake initial attack on a fire.
Performance Requirement	EP1.1 – Fire Hose Reel System
Meeting the Performance Requirement	The Performance Requirement will be satisfied by A2.1 (3): a combination of (1) and (2) where (1) is a Performance Solution and (2) is a Deemed-to-Satisfy Solution.
Assessment Method	BCA Clause A2.2 (b)(ii) Other Verification Methods accepted by appropriate authority that show compliance with the relevant Performance Requirements.
Methodology	Sch 2.2(a)(xi)
AFEG	D – Fire Detection, Warning and Suppression
Acceptance Criteria	The acceptance criteria for this performance solution is that the proposed first attack provisions are appropriate to the occupants and do not reduce the capacity for the occupants to undertake first attack if required.
Hazard	The potential hazard is that a fire may occur in an area and occupants will not be able to suppress the fire.
Strategy	• The use of fire hose reels within the warehouse is based on a straight line run and open clear spaces.
Calculation Tools	The evaluation is qualitative
Fire Safety Measures	Independent of the BCA DtS provisions, which remain required, the following fire safety measures are required in relation to this performance solution: • 50 m fire hose reels within the warehouse building. • Signage above the fire hose reel indicating the length

A.4 Fire Hydrant System – Coverage (External)

Brief

- Provision E1.3 of the BCA requires the building hydrant system to comply with AS 2419.1.
- In accordance with Clause 3.2.3 of AS 2419.1:2005, all points on a floor shall be within reach of a 10 m hose steam issuing from a nozzle at the end of a 60 m length of hose laid on the floor connected to the external fire hydrant system.
- Clause 3.2.2.2(e) details external fire hydrants shall be located in a position not less than 10 m from the building it is protecting unless safe guarded by construction having an FRL of not less than 90/90/90, extending 2 m each side of the hydrant outlet and extending not less than 3 m above the ground adjacent to the fire hydrant or the height of the building, whichever is lesser.
- It is proposed for three lengths of fire hose to be used from the existing onsite attack hydrant system and the adjacent street hydrants to achieve coverage within all areas of the building. The maximum length of fire hose required from the existing external attack hydrant system is approximately 75 m for coverage into the warehouse.
- It is proposed for the existing hydrants to be located within 10 m of the building.



BCA DtS Basis	E1.3 – Fire hydrants A fire hydrant system must be provided to serve a building having a total floor area greater than 500 m^2, the system must be installed in accordance with AS 2419.1 and all points on a floor shall be within reach of a 10 m hose steam issuing from a nozzle at the end of a 60 m length of hose laid on the floor connected to the external fire hydrant outlet.
Intent	The intent of the related Deemed-to-Satisfy provision is to require the installation of suitable fire hydrant systems to facilitate the fire brigades firefighting operations.
Performance Requirement	EP1.3 – Fire Hydrants
Meeting the performance requirement	The Performance Requirement will be satisfied by A2.1 (3): a combination of (1) and (2) where (1) is a Performance Solution and (2) is a Deemed-to-Satisfy Solution.
Assessment method	BCA Clause A2.2 (2) (b)(ii) Other Verification Methods accepted by appropriate authority that show compliance with the relevant Performance Requirements.

Methodology	Sch 2.2(a)(xi)
AFEG	F – Fire Service Intervention
Acceptance Criteria	The acceptance criteria for this performance solution is that the proposed fire hydrant design does not reduce the capacity for fire service intervention.
Hazard	The potential hazard is hindrance to firefighting operations by having to run out additional lengths of fire hose.
Strategy	• Proposed building works does not extend the construction of the building. Building footprint and hydrant placement are not changed from existing design. • Fire crews have the capacity and capability to deploy three lengths of hose from the hydrant point to reach all areas of the building. • The fire hose used by ACT Fire & Rescue is an advanced hose with minimal friction loss over multiple lengths. • The street hydrants located on Mildura Street be used for initial attack if required before utilising the onsite hydrants that are located within 10 m of the building.
Fire Safety measures	Independent of the BCA DtS provisions, which remain required, the following fire safety measures are required in relation to this performance solution: • It is proposed for the coverage from the existing external attack hydrant system and street hydrants to the subject building to be via three lengths of fire hose. • A hydrant block plan is to be provided at the FIP and boosters, and show internal layout, location of booster assembly, FIP, hydrants and exits/entries. • 1 m clear working radius is to be maintained around all hydrants. All hydrants are to be identified with 'AH' plaque and blue stimsonite marker, both securely fixed. If any 'AH' plaques are located within landscaped area, the plaque is to be located on a 900 mm blue post. • Signage indicating that two lengths of fire hose is required is to be installed adjacent to the hydrant block plan. The signage shall read "THREE LENGTHS OF FIRE FIGHTING HOSE IS REQUIRED TO REACH ALL AREAS FROM THE EXTERNAL HYDRANTS". The signage is to be in capital lettering, not less than 20mm high in a colour contrasting the background. Signage must be permanent, fade resistant and weatherproof – i.e. must be screw fixed or other and not laminated paper.

A.5 Overview

This project proposes evaluation of the nominated Performance Requirements of the National Construction Code Volume One - Building Code of Australia (BCA) in accordance with the methodologies defined in the Australian Fire Engineering Guidelines (AFEG). The intent is to provide a workable and safe fire safety strategy through a trial design. In order to develop and assess the nominated non-compliances the following process is adopted as structured by chapter 1.2 of the AFEG.

Project Scope	• Provides details of the project scope • Provides details of the regulatory framework
⇓	
Relevant Stakeholders	• Provides details of the project team
⇓	
Principle Building Characteristics	• Provides details of the building including: – Occupancy – Location – Size and Shape – Structure
⇓	
Dominant Occupant Characteristics	• Provides details of the expected building occupants including: – Distribution - population – Physical and mental attributes – Familiarity with the building – Emergency training – Travel speed
⇓	
General Objectives	• Provides details of the general objectives including: – Building regulatory objectives – Other regulatory objectives – Non-regulatory objectives
⇓	
Fire Hazards and Protective Measures	• Provides details of the fire hazards and protective measures including: – Fire statistics – Fire load – Fire growth rate and intensity
⇓	
Fire Scenarios	• Provides details of the proposed fire scenarios

A.6 Scope of Project

The purpose of this evaluation is to satisfy the performance requirements of the National Construction Code Volume 1 - Building Code of Australia (BCA). This appendix sets down the basis on which the analysis will be undertaken (to be agreed by the stakeholders), necessary acceptance criteria, fire engineering evaluation and the recommended fire engineering requirements. The project is to evaluate the proposed building utilising both DtS and Performance Solutions across the development.

A.6.1 Contractual Content

The projects design team operate on a design and construct basis where a significant portion of the design will be undertaken by design and installation contractors. Appropriately qualified engineers will

provide oversight on general areas of design and specifically qualified engineers will provide detailed design and assessment reports including structural and fire safety provisions.

A.6.2 Regulatory Framework

The regulatory framework in Australia is spread over three levels of government. These levels are:

- Federal Government;
- State Government; and
- Local Government.

The Federal Government is responsible for the six states and two territories within the Commonwealth of Australia and coordinates the development of the BCA. The BCA contains the technical provisions for building design and is maintained by the Australian Building Codes Board.

The legislations and regulations required for the implementation of the BCA occurs at the State and Local Government level. Building approvals and occupancy permits are given by local council building surveyors and inspectors and in some cases by private building surveyors.

The administrative requirements still differ between each state and territories. In the ACT, the Building Act 2004 and Building Regulations 2008 detail the Territory legislative and regulatory requirements.

The technical requirements for building in respect to health, safety and amenity of people occupying or near buildings is contained with the National Construction Code - Volume 1 - Building Code of Australia (BCA). This document is applied nationally with various State and Territory variations.

The objectives and functional requirements are provided for guidance purposes only. The only part of the BCA that Building Solutions must comply are the Performance Requirements. A Building Solution may comply with the Deemed-to-Satisfy (DtS) provisions, which are deemed to comply with the Performance Requirements. In most Performance Solutions, the Building Solution is partly based on a DtS building design and partly a Performance Building Solution.

The BCA is not specifically referred to in the Building Act but is prescribed by the Building Regulation. The Building Regulation specifies that a proposed building must comply with the requirements of the BCA.

The AFEG document has been developed for use in the fire safety design and assessment of buildings and reflects world's best practice. The document is intended to provide guidance for fire safety engineers as they work to develop and access strategies that provide acceptable levels of safety.

The document is particularly useful in providing guidance in the design and assessment of Performance Solutions against the Performance Requirements of the BCA. The prescribed methodology set out in the AFEG is to be adopted in the fire engineering analysis.

The Building Regulations requires building planning to follow the following three step process:

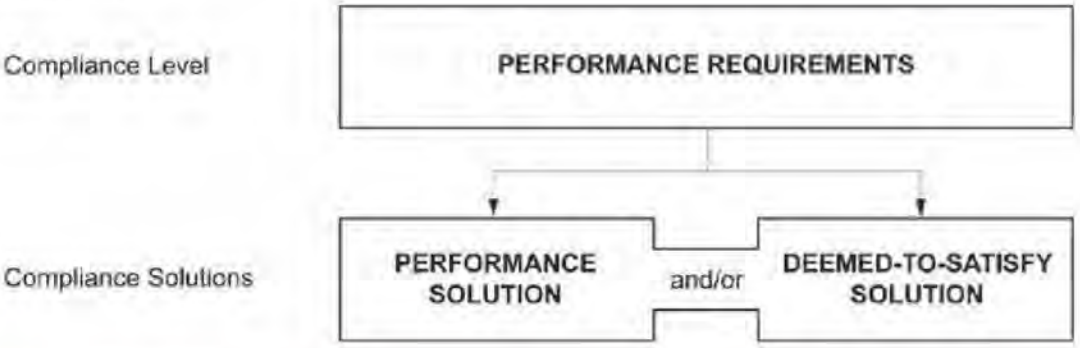
- Development Application
- Building Approval
- Occupancy

In order to obtain building approval, any proposed building or tenancy project with a floor area greater than 500 m^2 is required to be reviewed by ACT Fire & Rescue for both plan review as well as any performance solution review. Likewise, in order to obtain the Certificate of Occupancy for a building or tenancy project, occupancy clearance is required from ACT Fire & Rescue.

The role of ACT Fire & Rescue is governed by the Emergencies Act 1989. This Act sets out the Fire Brigade's structure, operations, responsibilities, etc.

FIGURE 34:

BCA STRUCTURE



Source: BCA 2019 Amendment One

A.6.3 Standards of Construction, Commissioning, Management, Use and Maintenance

The following base information sources were used in the evaluation of the building:

- National Construction Code – Volume One – Building Code of Australia 2019, Amendment One, Class 2 to 9 buildings, Australian Building Codes Board, Canberra, 2020 (BCA).
- National Construction Code – Volume Two – Building Code of Australia2019, Amendment One, Class 1 and Class 10 Buildings', Australian Building Codes Board, Canberra, 2020 (BCA).
- Guide to the Building Code of Australia – Volume One – Building Code of Australia 2019, Amendment One, Class 2 to 9 buildings, Australian Building Codes Board, Canberra, 2020 (the Guide).

A fire safety management-in-use plan is recommended to be developed and implemented by the buildings management incorporating as minimum the maintenance of the buildings fire safety measures in accordance with the ABCB Maintenance of Safety Measures, Equipment and Energy Efficiency Installations Handbook 2015 and any applicable Australian Standards.

Current legislation for the maintenance of buildings is managed initially through Section 92 of the Emergencies Act where the Chief Officer may, in writing, direct the occupier of the premises for the provision or installation of a fire appliance at the premises. In accordance with Section 95(2) of the Emergencies Act, it is an offence if a fire appliance is provided or installed at the premises under a direction via Section 92 and the occupier fails to maintain the fire appliance to a reasonable standard.

Prior to the Emergencies Act 2004 the Fire Brigades Ordinance of 1957 as amended until 2004 owners of a building are required to maintain to the satisfaction of the Chief Officer of a fire brigade a fire appliance provided or installed in the building in pursuance of a direction given under the regulations. Whilst no evidence has been identified that the ACT Fire Service Chief Officer has provided direction under Section 92 of the Emergencies Act 2004 or Section 13 of the Fire Brigades Ordinance 1957. ACT Building Regulations since 1972 have required the ACT Fire Service Chief Officer to review and comment on the installed fire appliances. Given the process of building approval, it is assumed that the ACT Fire Service Chief Officer has issued or will issue support for the installed fire safety appliances.

It is noted that the building maintenance process and documentation is not a legislated element within the ACT.

A.7 Dominant Occupant Characteristics

The characteristics of occupants in a building can have a significant impact on the evacuation behaviour and the total evacuation time for a building. The occupancy characteristics for the varying portions of the building are presented below.

The characteristics of various occupancies are listed below. Not all the following occupancies may be relevant to the subject project.

A.7.1 Distribution

The characteristics of occupants in a building can have a significant impact on the evacuation behaviour and the total evacuation time for a building.

Occupants within the building will be made up of staff members. In the event of fire, all occupants are assumed to perceive the fire alarm. There is however usually scepticism as to whether the alarm is genuine or not, and occupant behaviour following the alarm depends on many different factors such as social influence, experience, commitment and training.

The occupancy of the building is sufficiently large and uncensored to assume that there will be a mix of abilities amongst the individuals. People with disabilities may also be present to the same proportion as expected within the general population. It will however be assumed that nobody in the building needs to be transported in a bed or via a stretcher to evacuate the building in a fire incident.

A.7.2 Class 8 Warehouse

Occupants within the warehouse area will be made up of staff. Occupants can consist of people from a wide range of cultural, educational, demographic and religious backgrounds. The diversity in backgrounds can result in different behaviours and actions in the event of a fire.

If a fire occurs within the these areas, all occupants are assumed to perceive the fire alarm, but most staff are not likely to commence evacuation until encouraged by a voice alarm.

At the time of the fire occupants within these areas are assumed to be awake and either sitting or standing.

A.7.3 Familiarity and recognition

Occupants are expected to be familiar with the primary access and egress routes from the building. It is unlikely that occupants will be familiar with all the evacuation routes without the implementation of fire emergency training drills. The occupants are expected to have the ability to take and implement decisions independently and the potential emergency behaviour is to be rational and conducive to the emergency situation.

A.7.4 Physical attributes

Occupants are assumed to have the same level of mobility as the general population. This may include a limited proportion of mobility impaired occupants. These occupants may require crutches, a wheelchair or similar to evacuate on their own or need assistance from other occupants.

A.7.5 State

The building is a warehouse and office building, therefore occupants are likely to be awake and aware of the situation and able to respond in a timely manner.

A.7.6 Emergency training

Emergency training is unlikely to occur. The occupants are expected to have a level of understanding where they can recognise an emergency situation.

A.8 General Objectives

This fire engineering assessment has been undertaken to show the suitability of the proposed fire safety systems within the building and compliance with the nominated performance criteria of the Building Code of Australia (BCA).

The level of building fire safety has been determined by a systematic performance based evaluation generally complying with the Australian Building Codes Board, "Australian Fire Engineering Guidelines".

Where the results of the analysis indicate that the level of life safety does not meet the current prescriptive building regulations, alternative fire safety systems have been recommended.

The objectives of the performance assessment are to:

- Assess the compliance of nominated design aspects with the performance requirements of the BCA
- Consider alternate design solutions, to satisfy the relevant performance requirements.

The goals of the BCA are to enable the achievement and maintenance of acceptable minimum standards of structural sufficiency, safety (including safety from fire), health and amenity for the benefit of the community now and in the future. These goals are applied so that the BCA extends no further than is necessary in the public interest, is cost effective, easily understood, and is not needlessly onerous in its application.

The client must make themselves familiar and endorse the proposed performance solutions which complies with the Performance Requirements rather than complying with the Deemed-to-Satisfy Provisions of the BCA.

The fire safety objectives of the client are to:

- Enhance public image and satisfy moral obligations
- Protect assets
- Maintain services to the local community
- Continue operations
- The fire safety objectives of the fire and rescue service include:
- General authority to protect persons and property.
- Duty to deal with fires and hazardous material incidents.
- To take all practicable measures for preventing and extinguishing fires and protecting and saving life and property in case of fire.
- To have regard to the principles of ecologically sustainable development

A.9 Fire Hazards and Preventative and Protective Measures

The building will be provided with the major fire safety measures required by the DtS provisions of the BCA listed as follows. A comprehensive list of fire safety measures is to be provided by the certifier as part of the building approval process. Additional fire safety measures if required as part of the performance solution are listed within the fire safety measures within Part B.

TABLE 5:

HAZARDS AND PREVENTATIVE AND PROTECTIVE MEASURES

Area	Hazards Ignition Source	Fuel Loads	Preventative Measures	Protections Measures
Warehouse	Electrical faults Equipment faults Food stuffs Cooking Equipment Heating	Furniture Rubbish Bins Fixtures/Fittings Motor vehicles Merchandise	Presence of occupants Surveillance Alarm System	Portable fire extinguishers Sprinklers Fire Hose Reels

Source: Ignis Solutions

Appendix

B

ACTF&R support of PBDB

A ACTF&R SUPPORT OF PBDB

ACTF&R PERFORMANCE BASED DESIGN BRIEF REVIEW

Fire Safety Section | 9 Amberley Avenue | Fairbairn Business Park | Majura ACT 2609

ACT Fire & Rescue (ACTF&R) has reviewed the Performance-Based Design submitted in the form of a Performance-Based Design Brief (PBDB) for the building detailed below. The ACTF&R undertakes this review in accordance with Section 5.4 of the Emergencies ACT 2004 and as a "referred entity" in accordance with Item 6 of Part 2.2, Schedule 2 of the ACT Building (General) Regulations 2008 made under the Building ACT 2004.

The evaluation of the Performance-Based Design Brief has been undertaken with consideration given to the National Construction Code Series Volume 1 and 2 Building Code of Australia (NCC), the operational requirements of ACTF&R and the International Fire Engineering Guidelines.

Project details	
Date:	17 December 2021
ACTF&R reference:	2021-460
Performance-Based Design Brief reference:	IGNS-9138 Issue 01 Revision 01
Block, Section & Division:	B09 S39 FYSHWICK
Building Name and Street Address:	HYPERION. Mildura St FYSHWICK
Building Certifier:	Sch 2.2(a)(ii) – Absolute Approvals
Fire Safety Engineer:	Sch 2.2(a)(ii) – IGNIS Solutions
ACTF&R advice of Performance-Based Design Brief:	'In Principle' support provided. See additional comments at the end of this document

Building Information	
BCA Classification:	8
Rise in Storeys C1.2:	1
Type of Construction (C1.1)	C
Effective height:	<12m
Scope of Building Works:	Existing Building - Internal configuration of the building is proposed, with no increase in building size

No	Description	Strategy and protective measures *	DTS Provision	Performance Requirement	Method of meeting PR	Assessment method	IFEG sub-system
1	It is proposed for the subject building to not be provided with vehicular access in accordance with Clause C2.4(b). The sections of the building with non-compliant vehicular access are outlined in red in the figure below. It is proposed for the hydrant system serving the large isolated building to not be a dedicated ring main as required by Clause 8.6.1(b) of AS2419.1.	Description of building and current building use. Building is existing, with extension in 1987. No change to external façade or size of the building proposed under current building works. Layout of subject building and site access has not significantly changed for over 30 years. Access on three sides of the building. No change of use from current usage. Existing hydrant system and street hydrants for hydrant coverage (see hydrant Performance Solution). ESFR sprinkler system installed and maintained. Height of racking controls, wire mesh proposed to separate upper level tenancy wall to prevent sprinkler interference.	C2.2 C2.3	CP2 CP9	A2.1(3)	A2.2(2)(b)(ii)	C F
2	It is proposed for the travel distance within the warehouse building to be up to approximately 75m to the nearest exit in lieu of 40m. It is proposed for the travel distance between alternate exits through a point of choice to be 150m in lieu of 60m.	Alternative egress routes not passing through the point of choice. Low occupancy level of the warehouse. High occupant familiarity. Visibility along the open paths of the warehouse. High hazard sprinkler system.	D1.4 D1.5	DP4 EP2.2	A2.1(3)	A2.2(2)(b)(ii)	E
3	It is proposed for the fire hose reels within warehouse building to be 50m in lieu of 36m. Multiple 50m fire hose reels provide coverage to the entire warehouse building.	50 m fire hose reels within the warehouse building. Signage above the fire hose reel indicating the length.	E1.4	EP1.1	A2.1(3)	A2.2(2)(b)(ii)	D

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4	It is proposed for three lengths of fire hose to be used from the existing onsite attack hydrant system and the adjacent street hydrants to achieve coverage within all areas of the building. The maximum length of fire hose required from the existing external attack hydrant system is approximately 75m for coverage into the warehouse. It is proposed for the existing hydrants to be located within 10 m of the building.	The street hydrants located on Mildura Street be used for initial attack if required before utilising the onsite hydrants that are located within 10m of the building. A hydrant block plan is to be provided at the FIP and both boosters. Signage indicating that two lengths of fire hose is required is to be installed adjacent to the hydrant block plan. The signage shall read "THREE LENGTHS OF FIRE FIGHTING HOSE IS REQUIRED TO REACH ALL AREAS FROM THE EXTERNAL HYDRANTS". The signage is to be in capital lettering, not less than 20mm high in a colour contrasting the background. Signage must be permanent, fade resistant and weatherproof – i.e. must be screw fixed or other and not laminated paper.	E1.3	EP1.3	A2.1(3)	A2.2(2)(b)(ii)	F

Sub-system A – Fire Initiation and Development
Sub-system B – Smoke Development and Spread & Control
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Sub-system D – Fire Detection, Warning and Suppression
Sub-system E – Occupant Evacuation and Control
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*The information provided is not exhaustive and may not cover all aspects of the submitted Performance-Based Design Brief.

ACTF&R advice

ACTF&R can provide support for the proposed performance solution concepts, associated methodologies, format, and trial designs as outlined in the Performance-Based Design Brief IGNS-9138 Issue 01 Revision 01 submitted by IGNIS Solutions. Based on this support the ACT Fire & Rescue will accept the submission of a Performance Based Design Report (PBDR) for full review.

In principle support for the Performance-Based Design Brief is given on the assumption that all other aspects of the building comply with the NCC. If other aspects of the building do not meet the Deemed-to-Satisfy provisions of the NCC, a review of the Performance-Based Design Brief maybe required.

ACTF&R Comments:

- All Block Plans to include:
  - Internal layout
  - Location of Booster Assembly/s, FIP, hydrants and Exits/Entries.
- All hydrants:
  - Identified with 'AH' plaque and Blue stimsonite marker.
    - Securely fixed.
  - Clear working area of 1m radius.
  - Where 'AH' is located within landscaped area, 900mm blue marker post.

Report Prepared By:	Fire Safety and Engineered Solutions Station Officer Brendan Cross 02 6207 8372 actfbfireengineer@act.gov.au	Sch 2.2(a)(ii)	17/12/2021
Report Verified By:	Manager Fire Safety & Engineered Solutions Commander Scott Mackenzie 02 6205 0986 Scott.Mackenzie@act.gov.au		17/12/2021

For the Chief Officer ACT Fire & Rescue.

Appendix

C

fire engineering notices

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Braddon, ACT 2612
PO Box 5174
Braddon ACT 2612
t: (02) 6100 3900
mail@ignissolutions.com.au
www.ignissolutions.com.au

A member of LIVE Group International

18-Jan-2022
Date of Issue

IGNIS FIRE SAFETY COMPLIANCE SCHEDULE

B09 S39 Fyshwick, ACT

Evaluation No.9138
Issue 01 Revision 00 [2021]

Fire Safety Measure	Reference Standard
Access and Egress	• Ignis Solutions Performance Report 9138 I01R00 dated 18-Jan-2022 • Travel distance - warehouse
Automatic fire detection and alarm systems	• BCA 2019 Amendment One Part E AS 1670.1:2018 Fire detection, warning, control and intercom systems
Emergency lighting	• BCA 2019 Amendment One Clause E4.2, E4.4 • AS/NZS 2293.1:2005 Emergency evacuation lighting in buildings
Exit signs	• BCA 2019 Amendment One Clause E4.5 and E4.6 • AS/NZS 2293.1:2005 Emergency evacuation lighting in buildings
Fire hydrant systems	• BCA 2019 Amendment One Clause E1.3 • Attack hydrant system • Ignis Solutions Performance Report 9138 I01R00 18-Jan-2022 • Block plans to include location of attack and feed hydrants, entry points, FIP • All hydrants to have blue cats eyes and 'FH' plaque
Hose reel system	• BCA 2019 Amendment One Clause E1.1 • AS 2441:2005 amdt 1 installation of fire hose reels • Ignis Solutions Performance Report 9138 I01R00 18-Jan-2022 • 50 m Fire Hose Reels
Portable fire extinguishers	• BCA 2019 Amendment One Clause E1.6 • AS 2444:2001 Portable fire extinguishers and fire blankets
Fire Sprinkler System	• BCA 2019 Amendment One Clause E1.5
Performance Solutions	• Ignis Solutions Performance Report 9138 I01R00 18-Jan-2022 • Large isolated buildings - non-continuous perimeter vehicle access • Travel distance – warehouse • Fire hydrant system – coverage • Fire Hose Reels – 50m in warehouse

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18-Jan-2022
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IGNIS PERFORMANCE SOLUTION NOTICE

B09 S39 Fyshwick, ACT

Evaluation No.9138
Issue 01 Revision 00 [2021]

PERFORMANCE SOLUTIONS HAVE BEEN APPLIED TO THIS BUILDING.

These relate to:

- Large isolated building – Non-continuous perimeter vehicle access
- Travel distance – Warehouse
- Fire hydrant system– Coverage
- Fire Hose Reels – 50m in Carpark

Refer to Fire Engineering Report, 9138.I01R00, dated 18-Jan-2022, by Ignis Solutions.

This report specifies building works and services which are required to be inspected as part of the Annual Fire Safety Certification process.

Where building alterations or a change of occupancy occurs, the validity of this fire safety analysis may be compromised.

Please contact Ignis Solutions prior to undertaking any alterations and to assist with the annual certification process.

ACTF&R PERFORMANCE BASED DESIGN BRIEF REVIEW

Fire Safety Section | 9 Amberley Avenue | Fairbairn Business Park | Majura ACT 2609

ACT Fire & Rescue (ACTF&R) has reviewed the Performance-Based Design submitted in the form of a Performance-Based Design Brief (PBDB) for the building detailed below. The ACTF&R undertakes this review in accordance with Section 5.4 of the Emergencies ACT 2004 and as a "referred entity" in accordance with Item 6 of Part 2.2, Schedule 2 of the ACT Building (General) Regulations 2008 made under the Building ACT 2004.

The evaluation of the Performance-Based Design Brief has been undertaken with consideration given to the National Construction Code Series Volume 1 and 2 Building Code of Australia (NCC), the operational requirements of ACTF&R and the International Fire Engineering Guidelines.

Project details	
Date:	17 December 2021
ACTF&R reference:	2021-460
Performance-Based Design Brief reference:	IGNS-9138 Issue 01 Revision 01
Block, Section & Division:	B09 S39 FYSHWICK
Building Name and Street Address:	HYPERION. Mildura St FYSHWICK
Building Certifier:	Sch 2 2(a)(ii) – Absolute Approvals
Fire Safety Engineer:	Sch 2 2(a)(ii) – IGNIS Solutions
ACTF&R advice of Performance-Based Design Brief:	'In Principle' support provided. See additional comments at the end of this document

Building Information	
BCA Classification:	8
Rise in Storeys C1.2:	1
Type of Construction (C1.1)	C
Effective height:	<12m
Scope of Building Works:	Existing Building - Internal configuration of the building is proposed, with no increase in building size

Performance Solutions

No	Description	Strategy and protective measures *	DTS Provision	Performance Requirement	Method of meeting PR	Assessment method	IFEG sub-system
1	It is proposed for the subject building to not be provided with vehicular access in accordance with Clause C2.4(b). The sections of the building with non-compliant vehicular access are outlined in red in the figure below. It is proposed for the hydrant system serving the large isolated building to not be a dedicated ring main as required by Clause 8.6.1(b) of AS2419.1.	Description of building and current building use. Building is existing, with extension in 1987. No change to external façade or size of the building proposed under current building works. Layout of subject building and site access has not significantly changed for over 30 years. Access on three sides of the building. No change of use from current usage. Existing hydrant system and street hydrants for hydrant coverage (see hydrant Performance Solution). ESFR sprinkler system installed and maintained. Height of racking controls, wire mesh proposed to separate upper level tenancy wall to prevent sprinkler interference.	C2.2 C2.3	CP2 CP9	A2.1(3)	A2.2(2)(b)(ii)	C F
2	It is proposed for the travel distance within the warehouse building to be up to approximately 75m to the nearest exit in lieu of 40m. It is proposed for the travel distance between alternate exits through a point of choice to be 150m in lieu of 60m.	Alternative egress routes not passing through the point of choice. Low occupancy level of the warehouse. High occupant familiarity. Visibility along the open paths of the warehouse. High hazard sprinkler system.	D1.4 D1.5	DP4 EP2.2	A2.1(3)	A2.2(2)(b)(ii)	E
3	It is proposed for the fire hose reels within warehouse building to be 50m in lieu of 36m. Multiple 50m fire hose reels provide coverage to the entire warehouse building.	50 m fire hose reels within the warehouse building. Signage above the fire hose reel indicating the length.	E1.4	EP1.1	A2.1(3)	A2.2(2)(b)(ii)	D

4	It is proposed for three lengths of fire hose to be used from the existing onsite attack hydrant system and the adjacent street hydrants to achieve coverage within all areas of the building. The maximum length of fire hose required from the existing external attack hydrant system is approximately 75m for coverage into the warehouse. It is proposed for the existing hydrants to be located within 10 m of the building.	The street hydrants located on Mildura Street be used for initial attack if required before utilising the onsite hydrants that are located within 10m of the building. A hydrant block plan is to be provided at the FIP and both boosters. Signage indicating that two lengths of fire hose is required is to be installed adjacent to the hydrant block plan. The signage shall read "THREE LENGTHS OF FIRE FIGHTING HOSE IS REQUIRED TO REACH ALL AREAS FROM THE EXTERNAL HYDRANTS". The signage is to be in capital lettering, not less than 20mm high in a colour contrasting the background. Signage must be permanent, fade resistant and weatherproof – i.e. must be screw fixed or other and not laminated paper.	E1.3	EP1.3	A2.1(3)	A2.2(2)(b)(ii)	F

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