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Fire Engineering Concept Design Report

Project Address:	William Carey Christian School, Bumbera Street, Prestons NSW 2170
Prepared for:	Marathon Modular
Report Ref:	390735-WCCS-LoteFECDR-RevB
Date:	23/10/2024

Commercial in Confidence

Conditions of Use

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1.0 Quality Information

Revision	Revision Date	Details	Document Details		
			Prepared	Reviewed	Authorised
A	3/09/2024	For Design Team Review	Joyce Van	Dr S A Magrabi	Dr S A Magrabi Director – Fire & Risk Engineering BDC No: 0240
B	23/10/2024	For submission	Joyce Van	Dr S A Magrabi	Dr S A Magrabi Director – Fire & Risk Engineering BDC No: 0240

Executive Summary

This Fire Engineering Concept Design Report relates to the additions and additions to the existing site known as at William Carey Christian School, Bumbera Street, Prestons NSW 2170.

Lote's Fire Safety Engineering role on this project is limited to the provision of the Performance Solutions identified and verified by the Bushfire Consultant.

Lote scope on this project excludes consideration of BCA Deemed-to-Satisfy (DtS) Provisions of the building. It is the responsibility of others (including the Design Team and Certifier) to ascertain that all elements of the building not subject to a Performance Solution/s comply with the BCA DtS Provisions.

Lote Consulting has been appointed by Tanglin Australia to undertake a Performance Requirement Assessment of the National Construction Code (NCC) Building Code of Australia (BCA) 2022 Volume 1 for the proposed Performance Solutions identified in Section 4.0 of this report and summarised below:

- Performance Solution #1 – Internal Tenability
- Performance Solution #2 – Emergency Power
- Performance Solution #3 – Vehicular Access

2.0 Introduction

2.1 The Project

This document relates to the additions and additions for a proposed new two (2) story school building to the existing site known as William Carey Christian School, Bumbera Street, Prestons NSW 2170.

2.2 Terms of Reference

Lote Consulting have been appointed by Marathon Modular to assess the proposed Performance Solutions identified in Section 3.0 of this report against the relevant National Construction Code (NCC) Building Code of Australia (BCA) 2022 Volume 1 Performance Requirements and prepare a Fire Engineering Concept Design Report (FECDR).

The Bushfire Regulatory Consultant, David Boverman has documented the Conceptual Bushfire Design & Compliance Strategy (Ref: Final_version_1_0_Bush_Fire_Design_Compliance_Approvals_Report) dated 22/10/2024.

The scope of the FECDR is to develop a concept design to support a performance-based fire engineered design strategy for the subject premises. It represents the first stage of the design process for the development of a fire safety strategy for this facility. The Performance Based Design Brief (PBDB) and Fire Engineering Report (FER) will be developed in the next phase of this project (i.e. Detailed Design). The PBDB represents the formal consultation and approval process with the relevant Approval Authorities.

2.3 Project Stakeholders

The relevant project stakeholders that have been nominated by the Client for purposes of participating in the fire engineering process are outlined below in Table 2-1.

Table 2-1 – Project Stakeholders

Name	Company	Role
Derek Faure	Marathon Modular	Client/ Architect
Anthony Protas	Anthony Protas Consulting	BCA Consultant
TBC	WalkerBai Consulting	Fire Services Designer
TBC	WalkerBai Consulting	Mechanical Engineer
TBC	WalkerBai Consulting	Hydraulic Engineer
Matthew Noone	Bushfire Planning and Design	Bush Fire Consultant
David Boverman	Helping Hands Planning and Design	Bush Fire Regulatory Consultant
Dr Amer Magrabi (BDC No: 0240) Joyce Van	Lote Consulting	C10 Fire Safety Engineer

2.4 Definitions

The following definitions apply to terminology used in this report:

Architect – refers to Marathon Modular

BCA – refers to the Building Code of Australia

BCA DtS – refers to the Building Code of Australia (BCA) 2022 Volume 1 Deemed-to-Satisfy Provision (DtS)

BLM – refers to Bonded Laminate Materials

CC - refers to Construction Certificate

Certifier – refers to TBC (BDC: TBC)

Client – refers to Marathon Modular

DA – refers to Development Application

ERP – refers to Emergency Response Plan as per AS 3745:2010

FDCIE – refer to the Fire Detection Control and Indicating Equipment

Fire Engineering Concept Design Report (FECDR) – refers to the Fire Engineering Concept Design Report (FECDR) (This document)

Fire Safety Engineer – refers to Lote Consulting Pty Ltd

Fire Wall – refers to a wall with an appropriate resistance to the spread of fire that divides a storey or a building into fire compartments.

FRL – refers to Fire Resistance Level as defined in the BCA

FRNSW – refers to Fire and Rescue NSW

FSS – refers to Fire Safety Schedule.

NCC – refers to National Construction Code

PPF – refers to Preformed Polymer Formwork (PPF) i.e. Dincel, AFS Logic wall, etc

3.0 Principal Building Characteristics

3.1 Building Description

This document relates to the additions and additions for a proposed new two (2) story school building to the existing site known as at William Carey Christian School.

3.1.1 Site Description

As noted in the Helping Hands Conceptual Bush Fire Safety Strategy Report, the proposed building is relatively small scale, having a ground floor footprint in the order of approximately 364 m^2, and is comprised of areas that include classrooms and storage as shown in Figure 3-1 and Figure 3-2. The proposed classroom building is located in a courtyard nestled in- between existing buildings.

Figure 3-1 - Proposed Ground Floor Plan

Figure 3-2 - Proposed Second Floor Plan

The development is located in a suburban/residential area as shown in Figure 3-3 and is exposed to a forest type Bush Fire Vegetation hazard on one side, that being to the west, noting it is classified lower risk Category 2. The proposed building is located in the buffer and is not directly exposed, as there is an existing building located to the hazard side.

Figure 3-3 - Aerial View of Site Showing Bushfire Risk Category

It is important to note that elevations that are not exposed to bush fire prone hazards can be considered a low-risk suburban/residential type setting, and that review indicates evacuation, rescue, and fire brigade intervention can be undertaken to/from areas that are not exposed to bush fire hazards/risk.

The proposed development would be considered to fall under section 100B, the provisions of PBP-2019, Addendum 2022, and NCC 2022, including Specification 43, within the context of submitting for development application and approval (DA submission).

3.2 Key DtS reference Criteria

Key BCA DtS reference criteria identified by the Lote Consulting and to be verified by the Certifier is shown in Table 3-1.

Table 3-1 – BCA Deemed to Satisfy (DtS) Reference Criteria

	BCA Clause	Description or requirement
Part A6	Classification	Class 9b - Assembly building
C2D2	Construction Type	Type B Construction applicable
C2D3	Rise in Storeys Storeys Contained	Two (2) Storeys Two (2) Storeys

	BCA Clause	Description or requirement
C2D3	Effective Height	N/A
C3D3	Floor Area	Ground Floor – 309 m^2 First Floor – 315 m^2 Total – 624 m^2
	Largest Fire Compartment	Floor Area ~ 624 m^2 Floor Volume ~ 1,685 m^3
C3D4	Large-Isolated Building	No
D2D18	Floor population as advised by Client	Ground Floor – 108 Persons (including 100 students) First Floor – 58 Persons (including 50 students)
E1D17 & E2D21	Special Hazard	No
	Unusual features Voids / Atriums	No

4.0 Fire Engineering Methodology

The methodology adopted for developing the Fire Engineering Concept Design Report is as follows. Further details in Appendix A.

a) Undertake a review of the current proposed design drawings and approach towards compliance with BCA 2022 Specification 43 based on a Performance Based Approach;

b) Provide advice from Certifier on approaches towards compliance and based on desired design consider ways forward;

c) Review previous assessments against the provisions in AS 3959:2018, and where appropriate, use said assessments as the basis for this concept report;

d) Undertake a review to consider feasibility of the proposed design being acceptable and appropriate having regard to the Bush Fire Safety Authority (BFSA) and General Terms of Approval (GTA's) from the NSW RFS under section 100B of the Rural Fires Act (and the relevant development consent from Council); and

e) Prepare a Conceptual Fire Engineering Report for submission to the Client.

5.0 Proposed Performance Solutions

TBC are the Certifier for purposes of assessing compliance with the BCA for this project and have identified the following BCA DtS Variations. Table 5-1 summarises the BCA DtS Variations, Proposed Performance Solutions, Relevant BCA Requirements and BCA Assessment Methods. All existing fire safety aspects are to comply with BCA DtS Provisions to the year of construction as approved. All new fire safety aspects are to comply with BCA DtS Provisions.

Table 5-1 – BCA DtS Variations, Proposed Performance Solutions, relevant BCA Performance Requirements and Assessment Methods

BCA Clause	BCA DtS Provisions	Performance Solution	Relevant Performance Requirement	Assessment Method / Acceptance Criteria
G5D4 / S43C9	G5D4 Protection – certain Class 9 Buildings states that In a designated Bushfire Prone Area, the following must comply with Specification 43: (b) a Class 9b – (ii) primary or secondary school. Specification 43 Clause 9 provides guidance for buildings to maintain internal tenability throughout the duration of occupancy during a bushfire event.	**Performance Solution #1** The subject new buildings are proposed to vary from BCA Clause S43C9 as follows: 1) The building will not be designed to maintain internal tenability.	G5P1 and G5P2	Qualitative analysis based on BCA A2G2 (1)(a) and A2G2 (2)(b)(ii) 'Other Verification Methods'. With reference to BCA Performance Requirements G5P1 and G5P2, the proposed Performance Solution will meet the criteria for early occupant evacuation before untenable conditions occur in the subject building due to bush fire.
G5D4 / S43C12	G5D4 Protection – certain Class 9 Buildings states that In a designated Bushfire Prone Area, the following must comply with Specification 43: (b) a Class 9b – (ii) primary or secondary school. Specification 43 Clause 12 states that: 1) Emergency power must be provided to support, for not less	**Performance Solution #2** The subject new buildings are proposed to vary from BCA Clause S43C12 as follows: 1) Emergency power is not provided.	G5P1 and G5P2	Qualitative analysis based on BCA A2G2 (1)(a) and A2G2 (2)(b)(ii) 'Other Verification Methods'. With reference to BCA Performance Requirements G5P1 and G5P2, the proposed Performance Solution shall meet the criteria for early occupant evacuation before untenable conditions occur in the subject building due to bush fire.

BCA Clause	BCA DtS Provisions	Performance Solution	Relevant Performance Requirement	Assessment Method / Acceptance Criteria
	than 4 hours before and 2 hours after the passing of the fire front during a bushfire event, the ongoing operation of a. Air handling systems to maintain internal tenability; and b. Any pumps for firefighting; and c. Any emergency lighting and exit; d. Any other emergency equipment listed in C3D14(6) and required to be provided. 2) Manual control for emergency back-up power supply must be provided to facilitate manual intervention where the power supply fails or runs out.			
G5D4 / S43C14	G5D4 Protection – certain Class 9 Buildings states that In a designated Bushfire Prone Area, the following must comply with Specification 43: (b) a Class 9b –	**Performance Solution #3** The site is not proposed to have vehicular access in line with Specification 43 Clause 14 requirements.	G5P1 and G5P2	Qualitative analysis based on BCA A2G2 (1)(a) and A2G2 (2)(b)(ii) 'Other Verification Methods'. With reference to BCA Performance Requirements G5P1 and G5P2 the acceptance criterion is a perimeter vehicle access design

BCA Clause	BCA DtS Provisions	Performance Solution	Relevant Performance Requirement	Assessment Method / Acceptance Criteria
	(ii) primary or secondary school. Specification 43 Clause 14 states 1) Vehicular access to the building must be provided in accordance C3D5(2), as if the building were large isolated building for the purposes of C3D4.			that facilitates fire brigade intervention for bushfires and emergency evacuation and rescue for bushfires.

6.0 Trial Concept Design

The trial fire safety for this building is based on a combination of fire safety measures arising from the compliance with the BCA 2022 Volume 1 G5D4, Specification 43 and other additional requirements resulting from assessing the BCA DtS variations as Performance Solutions. It is noted that the works proposed below are preliminary and subject to regulatory approval and completion of the Fire Engineering report (FER).

6.1 General

1) With the exception of the proposed Performance Solutions, all existing fire safety aspects are to comply with BCA DtS Provisions to the year of construction. All new fire safety aspects are to comply with BCA DtS Provisions.
2) The use and storage of Dangerous Goods in the facility shall be in accordance with the relevant dangerous goods legislation including AS 1940:2017.

6.2 Fire Resistance

1) The building will comply with Type B Construction under BCA Section C with the exception of Performance Solutions #1, #2 and #3.
2) The new building will also comply with provisions for BAL-19 in AS 3959:2018 as well as Section 7.5 of Planning for Bush Fire Protection 2019.
3) In line with Performance Solution #1, the construction of the new buildings is permitted to have an air handling system that shuts down on fire trip/ bush fire alarm.
4) The openings in the new buildings will be installed with minimum 6 mm toughened glass as per AS 3959:2018.
5) The screened portions of openings will be screened internally or externally with screens / mesh constructed of corrosion-resistant Steel, Bronze or Aluminium that have a maximum allowable aperture size of 2 mm as per AS 3959:2018.
6) The frame supporting the screen / mesh will be made from metal or bush fire timber as per AS 3959:2018.
7) External walls will achieve a 60/60/60 FRL from the outside, with the exception of the openings that are permitted to be minimum 6 mm thick toughened glass.
8) In line with Performance Solution #2, emergency power will not be provided.
9) In line with Performance Solution #3, the existing vehicular access to the site as shown in blue in Figure 6-1 is proposed to be retained.
10) It is also noted that emergency access is available into the site through Camden Valley Way as confirmed by the Client.

Figure 6-1 - Site Plan showing existing perimeter access in yellow

11) The Architect has confirmed that there is a minimum 4.5 m clear width throughout the existing available vehicle access path to allow for general appliance access in accordance with FRNSW Access for Fire Brigade Vehicles and Firefighters Guideline.

12) With the exception of the above, perimeter vehicular access will comply with FRNSW Policy #4 and Guide Sheet #5 and RFS Vehicle Requirements (1). This will be verified by the Traffic Engineer.

13) A 1 m wide all weather trafficable pedestrian pathway will be provided around the perimeter of the new building. This will provide access to all the doors to the building.

14) The 1 m wide all weather pedestrian access path will be extended to provide access to any external fire hydrants serving the site.

15) All gates that obstruct the perimeter vehicular access will be openable by the fire brigade in the event of a fire.

16) FRNSW and RFS will be provided with the passcode/ key to unlock the gates to allow for fire brigade vehicle access.

17) All roads forming part of the vehicle access will be shown on the block plan at the FDCIE and fire hydrant booster and main entry to the site.

18) The Traffic Engineer is to undertake a swept path analysis to confirm compliance with the FRNSW Policies.

6.3 Egress

1) The building will comply with egress provisions under BCA Section D.

2) Occupant and minimum staffing numbers in the building will comply with BCA 2022 Volume 1 Type B Construction.

6.4 Fire Services

This section summarises the fire safety services that are proposed within the building critical to the proposed Performance Solutions within this report based on the Essential Fire Safety Measures Schedule prepared by the Certifier. Further detailed information on the fire services can be found in the relevant services engineer's specifications and drawings.

6.4.1 Fire Hydrants

1) The existing fire hydrants will be maintained in accordance with BCA E1.3 and AS 2419.1 at the time of construction.

2) The Fire Services Designer has confirmed that the pipework will be extended to install a new two-outlet hydrant to provide coverage for the new building.

6.4.2 Portable Fire Extinguishers

1) Portable fire extinguishers will be provided in the new building in accordance with BCA E1D14 and AS 2444:2001.

2) Fire extinguisher location and sizing will be undertaken by the Fire Services Designer.

6.4.3 Emergency Lighting & Exit Signage

1) Emergency lighting and exit signs are to be installed throughout the new building in accordance with BCA E4D2, E4D3 and E4D4 and the relevant provisions of AS 2293.1:2018. All exit and directional exit signs are to be of the illuminated type.

6.5 Minimum Commissioning and Maintenance Requirements

1) The maintenance of fire and other safety systems is a mandatory requirement for building owners under the provisions of the Clause 43 of the NSW Work Health & Safety Regulation (2017) . All systems provided should be designed, detailed, commissioned and maintained in accordance with the relevant legislation and standards including AS 1851:2012.

2) Bush Fire protection measures will also be considered as essential fire safety measures.

6.6 Bushfire Management Plan

1) An Enhanced Bush Fire Protection Management, Operations, & Maintenance Plan will be developed taking into consideration the Performance Solutions #1 to #3.

2) The Enhanced Bush Fire Protection Management, Operations, & Maintenance will include an Operations & Evacuation Plan.

6.7 Emergency Control Procedures

1) Emergency Control Organisation and Procedures in accordance with Clause 43 of the Work Health & Safety Regulation (2017) and AS 3745:2010 will be developed and implemented.

7.0 Occupant Characteristics

7.1 Population

Table 7-1 summarises the maximum population on each floor as advised by the Client and verified by the BCA Consultant and Certifier.

Table 7-1 – Maximum Floor Population

Level	Use	Population Density	Gross Floor Area (m^2)	Population
Ground	School	2 m^2 per person in accordance with D2D18	N/A	Ground Floor – 108 Persons (including 100 students) First Floor – 58 Persons (including 50 students)

7.2 Occupant Group

The three (3) occupant groups in the building are as follows:

1) Occupant Group 1 – Teachers/Staff
2) Occupant Group 2 – Students
3) Occupant Group 3 – Visitors

7.2.1 Occupant Group 1 – Teachers/Staff

Characteristics	Description
Distribution – Age, Gender, Location	Teachers / Staff are considered to be representative of the general population with no specific or unusual distributions applicable in gender, age and physical or mental attributes
State of Awareness	Occupants are expected to be awake and conscious of their surroundings.
Familiarity – egress routes, group roles, training	This occupant group is generally expected to be familiar with egress routes, have particular group roles and have some emergency response training.
Mobility	This occupant group is considered to have a similar level of mobility as the general population and do not require special assistance for evacuation. Some occupants may have mobility impairments that require wheel chairs, crutches or the like to evacuate on their own or with assistance from other people. Persons with disabilities and/or aged persons are not expected to require special assistance other than from carers or staff members who may already be present.

7.2.2 Occupant Group 2 – Students

Characteristics	Description
Distribution – Age, Gender, Location	Students are considered to be representative of the general population with no specific or unusual distributions applicable in gender, age and physical or mental attributes.
State of Awareness	Occupants are expected to be awake and conscious of their surroundings.
Familiarity – egress routes, group roles, training	Primary school students are not expected to be familiar with the egress routes and it is further assumed that they would be supervised by teachers or other members of staff.
Mobility	This occupant group is considered to have a similar level of mobility as the general population and do not require special assistance for evacuation. Some occupants may have mobility impairments that require wheel chairs, crutches or the like to evacuate on their own or with assistance from others. Persons with disabilities and/or aged persons are not expected to require special assistance other than from carers or staff members who may already be present.

7.2.3 Occupant Group 3 – Visitors

Characteristics	Description
Distribution – Age, Gender, Location	Visitor characteristics are considered to be representative of the general population with no specific or unusual distributions applicable in gender, age and physical or mental attributes
State of Awareness	The occupants are expected to be awake and conscious of their surroundings.
Familiarity – egress routes, group roles, training	This occupant group is generally expected to be unfamiliar with egress routes, have no particular group roles except for immediate family/friends and have no emergency response training.
Mobility	This occupant group is considered to have a similar level of mobility as the general population and do not require special assistance for evacuation. Some occupants may have mobility impairments that require wheelchairs, crutches or the like to evacuate on their own or with assistance from others. Persons with disabilities and/or aged persons are not expected to require special assistance other than from carers or staff members who may already be present.

7.2.4 Egress for Persons with a Disability

The BCA DtS Provisions do not have any specific requirements for egress of persons with a disability particularly if they are unable to use a stair. Although, there are a number of publications on this topic (1), a conclusive solution has not been agreed upon, or regulated.

Managing the evacuation of a person with a disability from a building relies on individual building management systems, procedures and training, which are outside the scope of the BCA, but substantially contribute to the overall evacuation efficiency. The egress provided for people with a disability in this building are to be at least equivalent to that of the BCA DtS Provisions. Therefore, disabled access and independent disabled egress has not been specifically addressed by this report and should be addressed by others as required.

Notwithstanding the above, the implementation of an emergency evacuation plan for all occupants including persons with disabilities is recommended in accordance with AS 3745:2010. This is considered to reasonably address disabled egress in relation to the fire safety strategy for this building.

7.2.4.1 Personal Emergency Evacuation Plans (PEEP)

A Personal Emergency Evacuation Plan (PEEPS) will be developed for all staff members and students with disabilities. Consideration is to be given to building visitors with disabilities and PEEPs will be completed and provided to floor wardens.

8.0 Reference Information

8.1 Reference Legislation

This assessment is based on the following reference legislation:

1) NSW Environmental Planning and Assessment Act, 1979.
2) NSW Environmental Planning and Assessment Regulation, 2021.
3) NSW Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation, 2021.
4) Building Code of Australia 2022 Volume 1, Australian Building Codes Board, 2022.

8.2 Reference Codes and Guidelines

This assessment is based on the following reference codes and guidelines:

1) Australian Fire Engineering Guidelines, Australian Building Code Board, 2021.
2) Guide to the BCA, Australian Building Codes Board, 2022 Volume 1.
3) Engineers Australia, Society of Fire Safety, Role of Registered Practitioners in Fire Safety Engineering, 2015, available on Lote Consulting Website.
4) Engineers Australia, Code of Ethics, 2018, available on Engineers Australia Website.
5) Rural Fire Service, Planning for Bush Fire Protection, 2019
6) AS 3959:2018 - Construction of Buildings in Bushfire Prone Areas

8.3 Documents Considered

This assessment is based on the following documentation:

1) Architectural Drawings by Marathon Modular listed in Table 8-1.
2) Conceptual Bushfire Design & Compliance Strategy by Helping Hands Planning & Design Pty Ltd dated 26/08/2024.
3) Bush Fire Design Compliance Approvals Report by Helping Hands Planning & Design Pty Ltd dated 22/10/2024.
4) Lote Site Inspection on 01/08/2024.

Table 8-1 – Architectural Drawings

Drawing No.	Title	Issue	Date
SK1C.02F	Site Plan	F	05/09/2024
SK1C.03G	Ground Floor Plan	G	09/09/2024
SK1C.04G	First Floor Plan	G	09/09/2024

9.0 Conclusions

Lote Consulting have been appointed by Marathon Modular to assess the proposed Performance Solutions identified in Section 4.0 of this report against the relevant Building Code of Australia (BCA) 2022 Volume 1 Performance Requirements and prepare a Fire Engineering Concept Design Report (FECDR).

Based on our review of the project documentation, it is our considered opinion that performance-based fire engineering can be undertaken to address identified variations from BCA DtS Provisions.

Appendix A – Bush Fire Design, Compliance & Approvals Report

Helping Hands
Planning & Design Pty Ltd
ABN 51 664 697 885

Bush Fire Design, Compliance, & Approvals Report

New Classroom Building, William Carey Christian School
Bumbera St, Prestons NSW 2170

Prepared for Lote Consulting

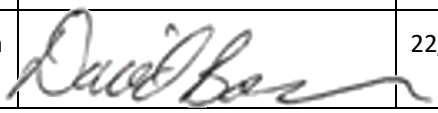
David Boverman
CEO & Principal Advocate/Consultant
Helping Hands Planning & Design PTY LTD, ABN 51664697885

Quality Assurance & Document Control

This document has been prepared consistent with the spirit of the ISO 9000 Standards Series[1].

The below quality assurance and development control are provided, noting the entries for '*Reviewed*'[2] and '*Approved*'[3] have been removed due to the fact that the approach to be adopted for this *Bush Fire Design, Compliance, & Approvals Report* is based on the understood and documented intent of the Australian Building Codes Board in choosing to adopt *Specification 43* in the *National Construction Code 2022* (NCC 2022)[4].

It is also based on the understood and documented policy/technical positions of the NSW Rural Fire Service (NSW RFS) vis a vis the Commissioner RFS on such matters (through the Director Built & Natural Environment's Office[5]), as well as previously supported performance-based designs for proposals of similar (or greater) bush fire hazard, risk, and occupant vulnerability[6].

Quality Assurance				
Role	**Name**	**Signed**	**Date**	**Version**
Author[7]	David Boverman		07/10/2024	0.1 - Draft for client review, comment, & approval
Author	David Boverman		22/10/2024	1.0 - Final for submission to client

Document Control			
Version	**Author**	**Date**	**Notes**
Version 0.1	David Boverman	07/10/2024	Draft for client review, comment, & approval
Version 1.0	David Boverman	22/10/2024	Final for submission to client

[1] "ISO 9000' is defined as a set of international standards on quality management and quality assurance developed to help companies effectively document the quality system elements needed to maintain an efficient quality system. They are not specific to any one industry and can be applied to organizations of any size. ISO 9000 can help a company satisfy its customers, meet regulatory requirements, and achieve continual improvement. It should be considered to be a first step or the base level of a quality system" (https://asq.org/quality-resources/iso-9000).

[2] '*Reviewed by*' denotes the person undertaking a review for readability and technical content.

[3] '*Approved*' denotes the previous two steps were in fact undertaken and is not a technical review or approval.

[4] As Manager Development Planning & Policy with the NSW RFS (vacated 30 March 2023) I was responsible for serving on an Expert Panel for the ABCB in developing the provisions in NCC 2022 for these types of buildings, including *Specification 43*. Because of the diverse nature of types of buildings to which the provisions apply, it was stated that the ABCB acknowledged the prescriptive, or *Deemed to Satisfy* (DTS) Provisions, were envisaged to only apply to a smaller cross section of the types of buildings captured, and that performance-based approaches to compliance would be appropriate.

[5] The Director Built & Natural Environment is the first Executive Level of the NSW RFS authorised to set policy and associated technical matters for and on behalf of the Commissioner RFS.

[6] Although performance-based design, assessment, compliance, and approvals are based on the merits of each particular proposal and do not, in and of themselves, set 'precedent', previously supported proposals can be taken into account assuming Intellectual Property issues do not preclude the same, and methodologies and acceptance criteria adopted where situations warrant based on hazard, risk, occupant vulnerabilities, and/or design approaches, as appropriate.

[7] '*Author*' denotes the person who drafted this document.

Intellectual Property, Confidentiality, & Liability

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Intellectual Property (IP) is owned by Helping Hands Planning & Design PTY LTD, including reports, assessments, strategies, and/or associated modelling.

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Helping Hands Planning & Design PTY LTD is dedicated and committed to providing the highest level of service and quality.

Notwithstanding, it is acknowledged that in certain limited instances issues could possibly arise outside our control and discretion.

Absolute building and/or life safety from bush fires is not guaranteed, consistent with the disclaimers and limitations in the *National Construction Code* (NCC), *Planning for Bush Fire Protection* (PBP-2019), and AS3959:201 *Construction of buildings in bush fire-prone areas*.

Executive Summary

This document presents the *Bush Fire Design, Compliance, & Approvals Report* for the proposed new two (2) story school building at William Carey Christian School at 2 Pinnacle Drive, Rawson, Bumbera St, Prestons NSW 2170.

It sets out context, application, criteria, and outcomes that would apply for a performance-based design and assessment, specifically in terms of compliance with the building bush fire protection and associated land-use planning provisions as intended by section 100B of the *Rural Fires Act 1997* (section 100B), *Planning for Bush Fire Protection 2019* (PBP-2019), *Planning for Bush Fire Protection, A guide for councils, planners, fire authorities and developers Addendum November 2022* (*Addendum 2022*), and the *National Construction Cede 2022* (NCC 2022), as appropriate.

Accordingly, this document can be used as evidence documenting compliance with section 100B, since it is not considered appropriate to comply with the prescriptive approach understood to be currently applied by the NSW Rural Fire Service (NSW RFS) assessment teams (i.e., Planning & Environment Services, or PES).

It can be used as a basis and input into a *Performance-based Design Brief* for the proposed performance-based design and associated assessment, including a fire engineered *Performance Solution* to NCC 2022, since it is not considered appropriate to comply with all the *Deemed to Satisfy* (DTS) provisions of *Specification 43* due to the nature of the occupancy, use, bush fire risk, and type of development.

Three footprint location options for the proposed building were considered, two understood to be located on mapped bush fire prone buffers[8], and one not on an area mapped bush fire prone (i.e., not on land mapped as Bush Fire Prone Vegetation or buffer). These are shown in *Appendix B: Site plan* (Option 1 being on buffer, Option 2 close to or on buffer, and Option 3 not on bush fire prone vegetation or buffer).

We are advised that the school has chosen to move forward based on Option 1 at this point in time, therefore this Bush Fire Design, Compliance, & Approvals Report is based on the same.

Discussions and review indicated that some of the provisions of *Planning for Bush Fire Protection 2019* (PBP-2019) may be difficult, if not impossible, to comply with, such as the following:

- *Performance Criteria* stipulating maximum radiant heat exposure on proposed buildings to be 10kW/m^2 based on asset protection zones (APZ) provided; and
- Perimeter road requirements.

It was also determined that the *Deemed to Satisfy* (DTS) Provisions of NCC 2022, including *Specification 43*, when applied to this proposal, could result in provisions that would be difficult, if not impossible, to comply with (i.e., some measures would be considered over onerous based on assessment of the bush fire risk).

This *Bush Fire Design, Compliance, & Approvals Report* addresses the following provisions of PBP-2019 and NCC 2022 *Specification 43* requiring:

- Maximum radiant heat exposure on proposed buildings to be 10kW/m^2 based on asset protection zones (APZ) provided;
- Tenability to be maintained inside buildings;
- Emergency back-up power;
- Perimeter road(s);
- Construction to BAL-19 as per AS3959:2018 *Construction of buildings in bush fire-prone areas*;
- Separation between buildings (the new building proposed may be less than twelve (12) metres away from existing buildings, however current design calls for compliance);
- Separation between buildings and carparking.

[8] It should be noted that Option 2 may or may not be on land mapped as buffer, detailed location assessment against the bush fire prone land map will be required.

It should be noted that there may be some non-compliances with firefighting water supply and hydrant requirements, and these would be dealt with through the Bush Fire Safety Authority (BFSA), *Review of Environmental Factors* (REF), fire engineering *Performance Solution*, and/or the exemption process in NSW for such systems (i.e., the exemption process that Fire Rescue NSW administers).

It should also be noted that although all three footprint locations were considered feasible, there may be advantage in terms of approval issues if the proposed footprint is not, in and of itself, on an area that would be bush fire prone (i.e., vegetation or buffer). It is presumed these advantages were considered in the decision to move forward with Option 1 (for additional information/context please refer to *Appendix B: Site plan* and *Appendix C: Proposed design*

This *Bush Fire Design, Compliance, & Approvals Report* is based on the nature and content of section 100B, the intent behind the provisions in PBP-2019 and the *Addendum 2022*, and the previous broad policy/technical direction/positions of the Commissioner RFS (vis a vis the Director Built & Natural Environment)[9,10,11].

It is also based on the performance-based nature of NCC 2022, associated compliance approaches, and the author of this *Bush Fire Design, Compliance, & Approvals Report's* experience assisting the Australian Building Codes Board (ABCB) with drafting the provisions of NCC 2022 and *Specification 43*[12], noting the above would be contingent on a fire safety engineered *Performance Solution* being developed and signed-off/certified in accordance with the building approvals regulatory framework in NSW.

It should be noted that this Bush Fire Design, Compliance, & Approvals Report is intended to be accompanied by a Fire Engineering Concept Design Report, and preliminary fire engineering assessment demonstrated compliance with the bush fire protection requirements of NCC 2022 at BFSA/REF submission stage. This is considered to provide an additional layer of corroborating evidence that the proposed development would be considered appropriate and acceptable.

It is proposed that the school be constructed as for Bush fire Attack Level 19 (BAL-19) and provided with asset protection zones (APZ's) in accordance with the NSW Variation to *Specification 43* (and provided external fire separations appropriate to the bush fire risk).

The proposed building is relatively small scale, having a ground floor footprint in the order of approximately 364 m^2, and is comprised of areas that include classrooms, teaching science labs and storage. It is also located on a site that would be considered in a lower bush fire risk location (please see *Appendix A: Project location and Appendix B: Site plan*).

The occupant load of the new building would be expected to be less than approximately 182 persons.

The Option being considered (Option 1) has the proposed classroom building located in a courtyard nestled in-between existing buildings.

The development is located in a suburban/residential area and is exposed to a forest type Bush Fire Vegetation hazard on one side, that being to the west, noting it is classified lower risk Category 2. The proposed building is

[9] This was born out by decisions and views expressed by the Director Built & Natural Environment when serving in my previous capacity/role as Manager Development Planning & Policy with the NSW RFS where I oversaw policy and technical matters based on direction provided for and on behalf of the Commissioner RFS through the Director Built & Natural Environment.

[10] The first level representing the Commissioner RFS would be the Director Built & Natural Environment, currently understood to be Assistant Commissioner Mathew Smith. Advice sought would therefore be vis a vis the escalation process accordingly if/when appropriate.

[11] In my previous role as Manager Development Planning & Policy with the NSW RFS a fundamental responsibility was to gain an appreciation and understanding of the intent of sections 4.14 and 100B of the *Environmental Planning and Assessment Act* and *Rural Fires Act* respectively, the Policy/Technical Positions of the NSW RFS Executives responsible for and with authority to set the same, and associated decisions that have been made resulting from submissions to the BNE Advice Request Service, and to then apply the same for policy promulgation and as a Delegated Officer with authority to issue advice under section 4.14 of the *Environmental Planning and Assessment Act* and General Terms of Approval under section 100B for subsequent processing of DPAP/BNE Advice Request Service requests/submissions.

[12] As Manager Development Planning & Policy with the NSW RFS (vacated 30 March 2023) I was responsible for serving on an Expert Panel for the ABCB in developing the provisions in NCC 2022 for these types of buildings, including *Specification 43*. Because of the diverse nature of types of buildings to which the provisions apply, it was stated that the ABCB acknowledged the prescriptive, or *Deemed to Satisfy* (DTS) Provisions, were envisaged to only apply to a smaller cross section of the types of buildings captured, and that performance-based approaches to compliance would be appropriate.

located in the buffer and is not directly exposed, as there is an existing building located to the hazard side (please refer to *Appendix A: Project location* and *Appendix B: Site plan*).

The school is located in Prestons NSW, which is a suburb of Sydney, 37 kilometres south-west of the Sydney central business district, and in the local government area of the City of Liverpool.

It is important to note that elevations that are not exposed to bush fire prone hazards can be considered a lower risk suburban/residential type setting, and that review indicates evacuation, rescue, and fire brigade intervention can be undertaken to/from areas that are not exposed to bush fire hazards/risk.

The proposed development would be considered to fall under section 100B, the provisions of PBP-2019, *Addendum 2022*, and NCC 2022, including *Specification 43*, within the context of application and approval (BFSA and/or REF submission).

This *Bush fire Design, Compliance, & Approvals Report* is based on, and leverages off of, review of the proposed design and the author's understood intent of the Australian Building Codes Board (ABCB) in adopting the provisions in NCC 2022, specifically *Specification 43*, for these types of buildings[13],[14]. as well as PBP-2019 and *Addendum 2022*.

It is important to note that this approach is within the context of not only applying for a BFSA through the REF process[15], but also construction certificate issuance.

The review indicated that the currently proposed design would be considered appropriate based on its use, bush fire risk, location, occupancy characteristics, and building type if a performance-based design and compliance approach is adopted consistent with the building certification and approvals regulatory framework in NSW.

The assessment contained in this report can also be considered evidentiary that the proposed project would be considered acceptable and appropriate in terms of the Commissioner RFS's broad policy/technical directions, and the intent of PBP-2019 (i.e., compliance with section 100B).

This Bush Fire Design, Compliance, & Approvals Report is also consistent with, follows, and addresses advice provided for previous submissions on proposed projects having similar (or greater) bush fire hazard, risk, and/or occupant vulnerabilities[16].

The ABCB has clearly stated that the DTS Provisions in *Specification* 43 were not intended to all be applied to a substantial portion of developments, and in many situations alternate performance-based approaches would be considered appropriate and acceptable.

It should be noted that this Bush Fire Design, Compliance, & Approvals Report is accompanied by a fire engineered Fire Engineering Concept Design Report, and preliminary fire engineering assessment demonstrated compliance with the bush fire protection requirements of NCC 2022 at BFSA/REF submission stage. This is considered to provide an additional layer of corroborating evidence that the proposed development would be considered appropriate and acceptable.

It should be noted that it is proposed that an Enhanced Bush Fire Protection Management, Operations, & Maintenance Plan, including Emergency Operations and Evacuation, consistent with the performance-based design, be considered an essential component of the proposed design for this project. It should also be noted that these Plans may build off those existing (as appropriate), but due to the nature of Specification 43

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[13] Please see *Footnote* above.

[14] Additional to the previous footnote above, the author of this report, although not practising as a fire safety engineer, has been (and continues to be) registered as such, and therefore serves as a link bridging the bush fire regulatory environment (and associated issues) and performance-based design, assessment, and compliance under the NCC.

[15] Please note it is possible that the NSW RFS could word their *General Terms of Approval* to exclude certain provisions of *Specification 43* (e.g., extended tenability during bush fires, perimeter roads, and/or emergency power), but this would be uncertain, so the strategy is based on undertaking a fire engineering performance-based solution and associated *Performance Solution* in accordance with NCC 2022 and the building approvals regulatory framework in NSW.

[16] Advice has been provided previously on projects of similar occupancy and use that indicated that *Specification 43* was developed with the intention that it be applied to buildings where evacuation from buildings during bush fires would not be expected due to the characteristics and nature of the occupants involved.

and/or any Performance Solution would need to also address matters specific to the performance-based design as it relates to compliance with NCC 2022.

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1 Scope & Limitations

This report addresses identified non-compliances with PBP-2019, *Addendum 2022*, and *Specification 43*, and is based on the summary provided in *Appendix D: Review, analysis, & interpretation of relevant NCC 2022 provisions* and *Appendix H: PBP-2019 Assessment Report.*

Please note also that this *Bush Fire Design, Compliance, & Approvals Report* was developed within the context of regulatory compliance, and therefore the scope of this *Report* does not include loss-control objectives and/or associated issues, unless they are a by-product of regulatory compliance.

The limitations and disclaimers stated in NCC 2022, PBP-2019 and AS3959:2018 *Construction of buildings in bush fire- prone areas* (AS3959) also apply (please see *Attachment 1: Disclaimers/limitations in PBP-2019, AS3959, & NCC* 2022).

This *Bush Fire Design, Compliance, & Approvals Report* also does not address regulatory approvals process/procedural requirements associated with performance-based designs in NSW (e.g., submission of *Performance-based Design Briefs*, assessment reports, FEBQ and/or other documentation to Fire Rescue NSW, etc), nor does it include review and/or assessment for compliance and/or consistency with non-bush fire protection planning, land-use, and/or zoning regulations (and the like).

It is assumed that the proposed development would comply with all relevant planning requirements (e.g., Local Environment Plans, Development Control Plans, zoning, and planning restrictions, etc).

It should also be noted that this report is not to be considered as that from a building practitioner or fire safety engineer within the context of building practitioners and/or building approvals regulations in NSW, but is intended to serve as guidance, advice, and input into processes such as a *Performance-based Design Brief* for a fire engineered *Performance Solution* to NCC 2022, as appropriate (and as discussed in the *Executive Summary* section above).

2 Definitions

Where terms used in this report are defined in NCC 2022 they carry the same definitions as in NCC 2022.

All other terms used carry definitions that would be available in the Macquarie Dictionary (https://www.macquariedictionary.com.au/?time=1723691170694).

The following terms are defined below for the purposes of this document:

Assisted evacuation - Situations whereby occupants would not be expected to be able to evacuate under their own mobility, either due to their being mobility impaired under normal circumstances and/or because of their being incapacitated due to special circumstances associated with the use of the building/occupancy type in question (e.g., occupants who are not considered to be readily mobile due to disability, buildings where occupants may be undergoing surgery and/or are severely infirmed where they cannot be moved and/or evacuate themselves due to the nature of the surgery, etc).

Readily evacuate - Situations whereby occupants can be expected to evacuate under their own mobility, including supervised evacuation conditional on mandated supervisory requirements and staff to client ratios (e.g., child care centres for ages two upwards, primary and secondary schools having required staff to student ratios, etc).

Supervised evacuation - Evacuation whereby occupants can be expected to evacuate under their own mobility, are aware of their immediate surroundings, but would need supervision (e.g., child care centres for ages two upwards, primary and secondary schools having required staff to student ratios, etc).

This *Report* is based/relies on an assessment undertaken by an accredited BPAD consultant for determining compliance with the prescriptive provisions of PBP-2019, including *Addendum 2022*, and therefore said assessment is outside of the scope of this *Report*.

3 Project Description

The development is for a proposed new two (2) story school building at William Carey Christian School, Bumbera St, Prestons NSW 2170.

The proposed building is relatively small scale, having a ground floor footprint of approximately 364 m^2, and is comprised of areas that include classrooms, teaching science labs and storage. It is also located on a site that

would be considered in a lower bush fire risk location (please see *Appendix A: Project location* and *Appendix B: Site plan*).

The Option being considered (Option 1) has the proposed classroom building located in a courtyard nestled in-between existing buildings.

The development is located in a suburban/residential area and is exposed to a forest type Bush Fire Vegetation hazard on one side, that being to the west, noting it is classified lower risk Category 2. The proposed building is located in the buffer and is not directly exposed, as there is an existing building located to the hazard side (please refer to *Appendix A: Project location* and *Appendix B: Site plan*).

It is important to note that elevations that are not exposed to bush fire prone hazards can be considered a low risk suburban/residential type setting, and review indicates evacuation, rescue, and fire brigade intervention can be undertaken to/from the unexposed elevations (i.e., from the areas that are not exposed to the bush fire hazard).

The proposed classroom building would be considered to fall under the provisions of the section 100B, PBP-2019, *Addendum 2022*, and NCC 2022, including *Specification 43*, within the context of issuance of a BFSA/REF and construction certificate building approval.

The school building as proposed would comply with NCC *Specification 43* prescriptively, except for the following provisions[17]:

- Distance to classified vegetation;
- Perimeter roads;
- Tenability for occupants that are unable to evacuate and/or be evacuated by emergency services personnel or staff members responsible;
- Emergency power;
- Twelve (12) metre separation (noting the approach would be to comply via fire separations required);
- Location of water supplies for fire-fighting purposes (noting current approach would be to comply).

Accordingly, it is proposed that the classroom building be constructed as for Bush fire Attack Level 19 (BAL-19) as per NCC 2022 *Specification 43* and provided with asset protection zones (APZ's) in accordance with the NSW Variation to *Specification 43* (or provided external fire separations appropriate to the bush fire risk).

It should be noted that there may be some non-compliances with firefighting water supply and hydrant requirements, and these would be dealt with through the BFSA/REF, fire engineering *Performance Solution*, and/or the exemption process that Fire Rescue NSW administers).

The proposed approach would be to provide the school building as currently designed based on this *Bush Fire Design, Compliance, & Approvals Report*, noting an *Enhanced Bush Protection Management & Maintenance Plan* that includes an *Operations & Evacuation Plan* would be proposed in the unlikely event a potential bush fire situation might dictate appropriate facility closure and/or emergency response by management and staff (to be developed and approved before occupation is approved, and maintained into the future as an essential fire and life safety measure).

For a summary for complying with the relevant bush fire provisions of NCC 2022, Addendum 2022, and Specification 43, please see *Appendix E: Specification 43 provisions, proposed compliance approach, & context* and *Appendix H: PBP-2019 Assessment Report*.

4 Occupant, Building, & Bush Fire Hazard/Risk Characteristics

As discussed previously, the proposed development would be for a new classroom building located in an area that is currently an existing school courtyard.

The proposed building would be exposed on one side (to the west) to a bush fire hazard, currently mapped as lower-risk Category 2 Bush Fire Vegetation, and has an existing building on its bush fire side (i.e., between the proposed building and bush fire hazard).

It is important to note that the school is existing, with the majority of its facilities and grounds being located on land that is not mapped Bush Fire Prone.

Buildings and occupants would be expected to be consistent with the general population for children and staff at a public and/or private school, noting it is understood that this would not be a special needs school.

Nonetheless, it is understood there would be mandated staff to student ratios, and should there be special needs students these ratios would be assumed to address any special needs.

It would be expected that students would be aware, mobile, able to follow instructions and directions, and be supervised.

It would be assumed that any special needs students in need of mobility and/or other assistance would be readily catered for based on mandated staff to student ratios and caring requirements, and that any associated issues involving emergency evacuation would be addressed/catered for in the *Enhanced Bush fire Protection Management & Maintenance Plan* and an *Emergency Management Plan* that includes an *Operations & Evacuation Plan* (noting it would be a specification of the performance-based design and *Performance Solution* that these plans would need to be consistent with the same).

The details of the above would need to be specifically addressed in the *Enhanced Bush fire Protection Management & Maintenance Plan* and an *Emergency Management Plan* that includes an *Operations & Evacuation Plan*.

5 Regulatory Framework

5.1 General

The legislative and regulatory framework from construction, bush fire risk, and associated land-use planning perspectives in this *Bush Fire Design, Compliance, & Approvals Report* is within the context of issuance of a BFSA and associated REF approval for the works to be undertaken. Specifically, this would be in accordance with the planning approvals regulatory framework in NSW, including compliance with NCC 2022 as adopted in NSW (including the NSW Variations to NCC 2022).

It should be noted that it would be proposed that the fire engineered *Performance Solution* to the NCC for the bush fire protection matters to be addressed be used to support not only the BFSA/REF process but also construction certificate issuance approval.

The legislative and regulatory framework from construction, bush fire risk, and associated land-use planning perspectives in this *Bush Fire Design, Compliance, & Approvals Report* is within the context of issuance of a *Bush Fire Safety Authority* under section 100B of the *Rural Fires Act 1997*, which states:

"……..

2) A bush fire safety authority authorises development for a purpose referred to in subsection (1) to the extent that it complies with standards regarding setbacks, provision of water supply and other matters considered by the Commissioner to be necessary to protect persons, property or the environment from danger that may arise from a bush fire."

It is also important to note that section 100B does not reference PBP, and clause 45(2)(h) of the *Rural Fires Regulation 2022* specifically acknowledges that compliance with PBP is not required by stating[18]:

"*An application for a bush fire safety authority must include the following—*

...

[18] One of the author's responsibilities in his previous role as NSW RFS Manager Development Planning & Policy was to participate in the review and revision of the *Rural Fires Regulation* as it applied to development assessment and planning, both from the perspective of aligning with State Government and NSW RFS policy positions as well as that of supporting the NSW RFS Legal Team in ensuring that said regulations could be considered consistent with those policy positions.

(h) an assessment of the extent to which the proposed development conforms with or deviates from Planning for Bush Fire Protection."

5.2 Bush Fire Prone Land

In NSW, *Bush Fire Prone Land* is designated and certified by the Commissioner RFS in accordance with section 10.3 of the *Environmental Planning and Assessment Act 1979* (section 10.3), and is applied legislatively as a trigger for when bush fire protection for buildings and associated land-use planning needs to be considered.

NSW RFS policy has been, and is understood to continue, to consider proposed developments as being on *Bush Fire Prone Land* if/when the building footprints in question actually lie on land that is mapped *Bush Fire Prone*, that being on land mapped as being *Bush Fire Prone Vegetation* or *Buffer*.

it is important to note that the exception would be where proposed developments would be subdivisions and/or large estate type projects (e.g., large SFPP complexes, etc) where lot sizes could be an issue, building footprints may not be identified, and/or there could be water/access issues (as opposed to a single building, where the 'land' in question would only be considered *Bush Fire Prone* if the footprint of the proposed building itself were to be located on *Bush Fire Prone Vegetation* or *Buffer*).

It is also relevant that land designated and certified as being Bush Fire Prone (in NSW) is a legislated requirement, and accordingly the NSW RFS undertakes said processes in terms of technical and administrative efficacy.

It should also be noted that land mapped as *Buffer* is not to be considered nor confused with, from a legislative and technical perspective, as being *Bush Fire Prone Vegetation*. Rather, buffers are provided so that proposed developments located in close enough proximity to *Bush Fire Prone Vegetation* to warrant consideration will be captured (e.g., for forest type vegetation, proposed developments within 100 m of forest *Bush Fire Prone Vegetation* would be required to be assessed in accordance with section 100B and/or section 4.14).

It is also of importance to note that it is understood if the actual lot of a proposed development is not located on *Bush Fire Prone Land* (i.e., on *Bush Fire Prone Vegetation* or *Buffer*) then there would be no requirement for BFSA approval, based on recent legal opinions and associated rulings by the NSW RFS Executive (for and on behalf of the Commissioner RFS).

5.3 Risk framework

As discussed in the previous section, the intent of section 100B is that proposals can be non-compliant with PBP-2019 yet still be considered appropriate and acceptable in terms of issuing BFSAs, associated GTAs, and granting of development consent. It is acknowledged the provisions of PBP-2019 are a blunt set of technical provisions, and the performance-based approach contained herein is to be undertaken for proposals that do not comply yet are associated with bush fire risk that is considered acceptable and/or lower than that of complying designs.

The bush fire hazard exposing the proposed development is mapped as *Bush Fire Prone Vegetation Category 2* which is designated as a lower bush fire risk than Category 1.

The *Guide for Bush Fire Prone Land Mapping version 5b* dated November 2015 states:

"*Vegetation Category 2*

Vegetation Category 2 is considered to be a lower bush fire risk than Category 1 and Category 3 but higher than the excluded areas. It is represented as light orange on a bush fire prone land map and will be given a 30 metre buffer. This vegetation category has lower combustibility and/or limited potential fire size due to the vegetation area shape and size, land geography and management practices. Vegetation Category 2 consists of:

- *Rainforests.*
- *Lower risk vegetation parcels. These vegetation parcels represent a lower bush fire risk to surrounding development and consist of:*
  - *Remnant vegetation;*
  - *Land with ongoing land management practices that actively reduces bush fire risk. These areas must be subject to a plan of management or similar that demonstrates that the risk of bush fire is offset by strategies that reduce bush fire risk; AND include:*

- *Discrete urban reserve/s;*
- *Parcels that are isolated from larger uninterrupted tracts of vegetation and known fire paths;*
- *Shapes and topographies which do not permit significant upslope fire runs towards development;*
- *Suitable access and adequate infrastructure to support suppression by firefighters;*
- *Vegetation that represents a lower likelihood of ignitions because the vegetation is surrounded by development in such a way that an ignition in any part of the vegetation has a higher likelihood of detection."*

It should be noted that the traditional approach to-date has been for regulators and assessing officers to treat situations as jumping immediately from '*No requirements*' to '*BAL-FZ*' when proposals are exposed to bush fire hazards in lower bush fire hazard/risk suburban type settings, and this is not considered appropriate nor acceptable, since in such lower risk areas bush fire risk would be expected to gradually increase rather than jump from 'nothing' to 'everything' on passing a discrete line (or point of demarcation)[19].

This is further reinforced by the fact that the legislative intent of the *Bush Fire Prone Land Map* was for use as a 'trigger', or 'screening tool', to identify what proposed developments need consideration in terms of being required to comply with PBP, subsequent assessment being required so that bush fire protection can be provided commensurate with risk, as opposed to merely hazard, and this was/is one of the reasons development consent can be granted for proposals that do not comply with PBP.

It should be noted that the intent is to demonstrate compliance with the relevant *specifications and requirements* of PBP-2019 within the context of section 100B and clause 45(2)(h).

It is relevant to note that the Tunks Park and Mosman type areas that are currently mapped Bush Fire Prone were case study examples where the current Executive questioned the rationale for having them mapped in the first place due to their lower bush fire suburban type risk profiles. It is also pertinent to note that the immediate 'jump' from 'no hazard' to requiring bush fire protection commensurate with 'highest risk' has been termed the '*Missing Middle*', and this proposal is an excellent example of the same.

5.4 Compliance

The approach adopted is to demonstrate that the proposed development, land use, and building design is appropriate and acceptable in terms of section 100B due to the fact that the sole development for which approval is sought is limited to a new school building which is located on the buffer in the *Bush Fire Prone Land Map* which would apply.

The NSW RFS BNE '*Advice Request Service*' would have been utilised for obtaining formal support, by a Delegated Officer with authority to do so, for the adopted approach as documented in this report consistent with the understood policy/technical positions held by the relevant NSW RFS Executives[20] for and on behalf of the Commissioner RFS (BuiltAndNaturalEnvironment@rfs.nsw.gov.au).

However, the NSW RFS advised they have discontinued this service, and that the above email is for escalating matters to the Director, Built & Natural Environment. The NSW RFS have advised also that the PES 'Pre-DA Advice Service' is to be used for all performance-based designs seeking advice/comment from the NSW RFS (regardless of whether they are in 'Pre-DA' or not).

Accordingly, a *Performance-based Design Brief* would have traditionally been submitted to the NSW RFS Pre-DA Advice Service, and advice/comments addressed in accordance with *International Fire Engineering*

[19] This was born out by decisions and views expressed by the Director Built & Natural Environment when serving in my previous capacity/role as Manager Development Planning & Policy with the NSW RFS where I oversaw policy and technical matters based on direction provided for and on behalf of the Commissioner RFS through the Director Built & Natural Environment.

[20] The first level representing the Commissioner RFS would be the Director Built & Natural Environment, currently understood to be Assistant Commissioner Mathew Smith. Of relevance is the fact that it is understood that all organisational levels below the Director Build & Natural Environment (i.e., the PES assessment and Development Planning & Policy teams) are responsible for, and bound to, carry out assessments consistent with the broad policy/technical positions/views of the Commissioner RFS (as opposed to implementing practices that would be inconsistent with the same).

Guidelines (2005), the *Performance-based Design Brief* amended/revised, and actioning/reasons for the same provided in the appropriate appendix as appropriate.

However, due to concerns raised about timeframes and past experience with the NSW Pre-DA Advice Service, it was not proposed to submit a *Performance-based Design Brief* to the NSW RFS, rather, the *Brief* would be reflected in this *Report*, and any comments received as part of the referral process considered accordingly[21].

Should comments/advice be received that appear to be contrary to understood policy/technical positions advice will be sought urgently from the appropriate NSW RFS Executive Officers[22] so that the 'ground-rules' and amended Policy/Technical Positions can be understood and applied accordingly.

As mentioned above, this Bush Fire Design, Compliance, & Approvals Report is intended to be accompanied by a Fire Engineering Concept Design Report, and preliminary fire engineering assessment demonstrated compliance with the bush fire protection requirements of NCC 2022 at BFSA/REF submission stage. This is considered to provide an additional layer of corroborating evidence that the proposed development would be considered appropriate and acceptable.

It is of additional importance that any requests for additional information requested for matters already covered and addressed and/or issuance of a Bush Fire Safety Authority with associated General Terms of Approval (GTAs) that are inconsistent and/or incompatible with the proposed approach (as documented in this report) would be considered a 'refusal' by the NSW RFS and dealt with accordingly[23].

5.4.1 Relevant specifications & requirements of PBP-2019 - performance-based design, assessment, & compliance

PBP-2019 states in section 1.4.1:

"*Bush fire protection measures BPM's are the relevant specifications and requirements that need to be satisfied to improve life safety, property protection and community resilience to bush fire attack. They include: APZs; Access; Construction, siting and design; Landscaping; Services; and Emergency and evacuation planning*".

'*Relevant specifications & requirements*' were broadened in PBP-2019 from the way they were treated in PBP-2006 to encourage the concept of performance-based compliance for proposed developments and associated recognition in allowing compliance certification of the same under sections 4.14(1)(a) as well as 4.14(1)(b) of the *Environmental Planning and Assessment Act 1979*[24].

This also applied to proposals to which section 100B would apply.

It is important to note that the 'Author' of this report was directly responsible for the revision and amending of PBP-2006 in developing and publishing PBP-2019, and was also tasked with the authority to develop and deliver guidance and materials, including advice, that were, and continue to be, considered consistent with the expectations of the Commissioner RFS (noting it is the Commissioner RFS who is solely responsible in legislation for, and has the authority to, establish and enact bush fire requirements for building bush fire

[21] This was based on experience in the author's current role as well as observations made while serving in the capacity of Manager Development Planning & Policy with the NSW RFS.

[22] Please see *Footnote 20* above.

[23] As of 30 March 2023 NSW RFS *Internal Delegations* required that the sole authority to approve section 100B '*Refusals*' be at the Deputy Commissioner level, noting this was put in place quite some years ago to address possible misalignment, or disconnects, between assessment team outcomes and broad policy/technical direction/positions of the Commissioner RFS.

[24] It should be noted that PBP-2006 contained a chapter titled '*Relevant Specifications and Requirements*' that also allowed for performance-based compliance, although it is understood that at the time the NSW RFS had an 'unwritten' policy that '*Relevant Specifications and Requirements*' referred to compliance with the '*Acceptable Solutions*'.

protection and associated land-use planning in NSW)[25,26]. This was also the case for development and promulgation of Addendum 2022.

5.4.2 Intent of NSW RFS Policy Position which underpinned *Planning for Bush Fire Protection, A guide for councils, planners, fire authorities and developers Addendum November 2022*

Building bush fire protection and associated land-use planning regulation has traditionally and historically been dealt with at the planning, or development application (DA), stage of development in NSW, and the NSW RFS has played a pivotal and key role in the assessment and approvals process (noting for schools and similar types of projects this often occurs via the *Review of Environmental Factors*, or REF, process).

In terms of section 100B, proposals need be approved by the NSW RFS through issuance of a BFSA and associated GTAs, otherwise, said proposed developments cannot proceed (unless appeal is sought and successfully obtained as allowed for in legislation).

Accordingly, previous to *Specification 43*, bush fire protection for buildings was addressed prior and separate to the building approvals stage (i.e., issuance of a construction certificate building approval), and said requirements were limited to issues that could be considered DA (or REF, as appropriate) related only, the only construction-type matter being external wall BAL ratings.

The introduction of *Specification 43* placed many of the same requirements in the *Building Code* (e.g., perimeter roads, water supplies, etc), and added others, including, but not limited to, internal tenability and emergency power, thereby creating a regulatory environment where there could be confusion as to scope and authority from technical compliance and/or process perspectives.

This was exacerbated by the fact that the NSW Variations to NCC 2022 allow for the NSW RFS to levy requirements for section 100B proposals that would essentially override and/or add-to those now adopted in NCXC 2022, noting it is understood the NSW RFS does not have the remit nor the expertise to regulate in the *Building Code* space.

Accordingly, *Addendum 2022* was developed and promulgated, at the request of the NSW Department of Fair Trading's Building Codes Unit, to set-out the scope, role, accountability, and authority of the NSW RFS in administering section 100B proposals within the context of *Specification 43*.

5.5 *Approvals*

Approval for this project would be by issuance of a BFSA and associated GTAs by the NSW RFS[27,28].

[25] Although relevant legislation cites the Commissioner RFS, promulgation of building bush fire protection and associated land-use planning guidelines, policies, standards, advice (and the like) are administered under 'internal delegations' - as of 30 March 2023 said delegations and framework dictated the lowest level organisationally to 'set' broad policy/technical/process direction to be the Director Built & Natural Environment (the role responsible for both policy and assessments at the NSW RFS), all lower levels being responsible legislatively for carrying out assessments consistent with the same (noting it would not be envisaged that these delegations would have changed since the author of this report vacated his role as Manager Development Planning & Policy.

[26] Further the previous footnote, based on previous experience with the NSW RFS, it was observed that it was not uncommon for there to be substantial 'disconnects' between PES assessment team practises and the broad policy/technical positions/views of the Commissioner RFS vis a vis the Director Built & Natural Environment (and previous Directors Community Resilience who served in the same capacity in terms of speaking for and on behalf of the Commissioner RFS for establishing broad policy/technical positions) - it is the author's considered opinion this continues.

[27] It is relevant to note that as of 30 March 2023 NSW RFS *Internal Delegations* dictated that section 100B refusals could only occur if approved at the Deputy Commissioner level of the NSW RFS, and observations made in my previous role of Manager Development Planning & Policy indicated that said 'formal' refusals were uncommon, assuming they occurred at all.

[28] Further to the previous footnote, if additional information requests are received from the NSW RFS for matters that are considered to have already been addressed in the submission(s) provided and/or if GTAs are issued that are considered inconsistent with the proposed design, the author of this *Brief* and subsequent *Bush Fire Design & Assessment Report* will treat the same as a '*refusal*' (unless said inconsistencies are not material to outcomes as proposed).

6 Compliance with PBP-2019 & Addendum 2022

6.1 General

The proposed new classroom building would be located in an existing school on a pad which is currently used as an open space for pedestrian circulation and/or recreation/leisure.

The existing school is located in a lower bush fire risk suburban type community/area, with the exposing bush fire hazard mapped as lower risk *Category 2*.

An assessment was undertaken in accordance with the prescriptive requirements of PBP-2019 and is provided in *Appendix H: PBP-2019 Assessment Report.*

Compliance with PBP-2019 and *Addendum 2022* is addressed and dealt with in the *Analysis & Discussion, Recommendations, and Conclusions* sections of this *Report*.

6.2 PBP-2019 infill provisions

Planning for Bush Fire Protection has contained provisions for proposed development that would be considered 'infill' for quite some years, including PBP-2006, 'infill' being development involving existing situations (e.g., existing facilities, sites, etc).

Since the proposed development is to add a classroom building in an existing school, this would be considered 'infill' and therefore would fall under section 6.4 of PBP-2019.

Section 6.4 of PBP-2019 addresses development of existing SFPP facilities, which states "*... The intention for any building work occurring within an existing SFPP development is to achieve a better bush fire outcome than if the development did not proceed. Achieving this may require a combination of measures including improved construction standards, APZs and evacuation management. This may result in a level of retrofitting of existing buildings and managing other portions of the site (i.e. APZs) to ensure an improved level of bush fire protection...*".

PBP-2019 goes further to state:

"*The objectives that apply to existing SFPP development are as follows:*

- *provide an appropriate defendable space;*
- *site the building in a location which ensures appropriate separation from the hazard to minimise potential for material ignition;*
- *provide a better bush fire protection outcome for existing buildings;*
- *new buildings should be located as far from the hazard as possible and should not be extended towards or situated closer to the hazard than the existing buildings (unless they can comply with section 6.8);*
- *ensure there is no increase in bush fire management and maintenance responsibility on adjoining land owners without their written confirmation;*
- *ensure building design and construction enhances the chances of occupant and building survival; and*
- *provide for safe emergency evacuation procedures including capacity of existing infrastructure (such*
- *as roads)*".

Detailed assessment of compliance with this section is provided in the *Analysis & Discussion* and *Summary* sections below.

7 Relevant NCC 2022 Provisions

The following are considered the relevant provisions of NCC 2022 that would apply to the proposed school[29].

[29] They are italicised as they are copied directly from NCC 2022 (https://ncc.abcb.gov.au/editions/ncc-2022/adopted/volume-one/1-definitions/glossary#_a787835e-2f09-4a54-a85c-40e79b54fd1d)

It is important to note that the requirements in NCC 2022 all relate to the building(s) and not the site, therefore, from a NCC perspective the building would be the focus of this assessment.

Notwithstanding, as discussed above it is also important to note that from a section 100B perspective the site would be a focus, but only if the proposed development were to be of a similar nature to a subdivision (as opposed to a single building, where the 'land' in question would only be considered *Bush Fire Prone* if the footprint of the proposed building itself were to be located on *Bush Fire Prone Vegetation* or *Buffer*).

G5O1 Objective

The Objective of this Part is to—

(a) safeguard occupants from injury from the effects of a bushfire; and

(b) protect buildings from the effects of a bushfire; and

(c) facilitate temporary shelter for building occupants who may be unable to readily evacuate the building prior to a bushfire.

G5F1 Construction in bush fire prone areas

A building constructed in a designated bushfire prone area —

(a) is to provide a resistance to bushfires in order to reduce the danger to life and minimise the risk of the loss of the building; and

(b) if occupied by people who may be unable to readily evacuate the building prior to a bushfire, is to be constructed so as to provide its occupants shelter from the direct and indirect actions of a bushfire.

G5P1

Bushfire resistance

A building that is constructed in a designated bushfire prone area must be designed and constructed to—

(a) reduce the risk of ignition from a design bushfire with an annual exceedance probability not more than 1:100 years, or 1:200 years for a Class 9 building; and

(b) take account of the assessed duration and intensity of the fire actions of the design bushfire; and

(c) be designed to prevent internal ignition of the building and its contents; and

(d) maintain the structural integrity of the building for the duration of the design bush fire.

G5P2

Additional bushfire requirements for certain Class 9 buildings

A building that is constructed in a designated bushfire prone area and occupied by people who may be unable to readily evacuate the building prior to a bushfire must, to the degree necessary—

(a) reduce the risk of an untenable indoor environment for occupants during a bushfire event, appropriate to the—

(i) location of the building relative to fire hazards, including—

(A) classified vegetation; and

(B) adjacent buildings, structures and movable objects; and

(C) carparking areas and allotment boundaries; and

(D) other combustible materials; and

(ii) number of occupants to be accommodated within the building; and

(iii) intensity of bushfire attack on the building; and

(iv) duration of occupancy; and

(v) intensity of potential consequential fires; and

(vi) occupant tenability within the building before, during and after the bushfire event; and

(vii) combined effects of structural, fire exposure and other effects to which the building may reasonably be subjected; and

(viii) provision of fire fighting equipment and water supply to facilitate protection of the building; and

(b) be provided with vehicular access to the site to enable firefighting and emergency personnel to defend or evacuate the building; and

(c) have access to a sufficient supply of water for firefighting purposes on the site; and

(d) provide safe access within the site to the building (including carparking areas), as well as safe egress after the bushfire event.

G5D1

Deemed-to-Satisfy Provisions

(1) Where a Deemed-to-Satisfy Solution is proposed, Performance Requirements G5P1 and subject to G5D2, G5P2, are satisfied by complying with G5D3 and G5D4.

(2) Where a Performance Solution is proposed, the relevant Performance Requirements must be determined in accordance with A2G2(3) and A2G4(3) as applicable.

G5D2

Application of Part

The Deemed-to-Satisfy Provisions of this Part apply in a designated bushfire prone area to—

(a) a Class 2 or 3 building; or

(b) a Class 4 part of a building; or

(c) a Class 9 building that is a special fire protection purpose located in an area subject to a Bushfire Attack Level (BAL) not exceeding BAL—12.5, determined in accordance with Planning for Bush Fire Protection; or

(d) a Class 10a building or deck immediately adjacent or connected to a building or part of a type in (a), (b) or (c).

Notes

If a building of a type listed in (c) or (d) where associated with a building listed in (c) is subject to a BAL exceeding BAL—12.5, the building would need to comply with Performance Requirement NSW G5P2 by means of a Performance Solution.

There are no Deemed-to-Satisfy Provisions for these buildings.

G5D4

Protection — certain Class 9 buildings

In a designated bushfire prone area, a Class 9 building that is a special fire protection purpose or a Class 10a building or deck immediately adjacent or connected to a such a building or part, must comply with—

(a) for a Class 9 building that is special fire protection purpose, Specification 43 except as amended by Planning for Bush Fire Protection; or

(b) for a Class 10a building or deck immediately adjacent or connected to a Class 9 building that is a special fire protection purpose—

(i) AS 3959 except as amended by Planning for Bush Fire Protection; and

(ii) S43C13; or

(c) the requirements of (a) or (b) above as modified by the development consent with a bushfire safety authority issued under section 100B of the Rural Fires Act 1997 for the purposes of integrated development.

The above provisions are assessed and discussed in detail in the *Analysis & Discussion, Appendix D: Review, analysis, & interpretation of relevant NCC 2022 provisions*, and *Appendix E: Specification 43 provisions, proposed compliance approach, & context* sections of this *Report*.

It should be noted that during my work on the Expert Panel assisting the ABCB, it was clear that the DTS provisions in *Specification 43* were not intended to apply broadly across all types of buildings/occupancies covered, and that performance-based building solutions were intended accordingly[30].

8 Methodology

The methodology adopted for this assessment was as follows:

1. Review of work already undertaken, including any design and bush fire assessment and reports provided;
2. Undertake a review of the proposed design against the DTS Provisions of NCC 2022 *Specification 43* in order to ascertain which provisions would be expected to be appropriate based on my work previously on the Expert Panel assisting the ABCB in developing the provisions in *Specification 43*, including supporting materials, combined with the ABCB in drafting *Specification 43*;
3. Undertake a review of the proposed design against the provisions of section 100B, PBP-2019, *Planning for Bush Fire Protection Addendum November 2022*, and the author's experience previously as NSW RFS Manager Development Planning & Policy in terms of RFS remit and broad policy/technical direction/positions of the Commissioner[31] RFS (vis a vis the Director Built & Natural Environment);
4. Review the relevant provisions of NCC 2022, including the *Objectives* and *Functional Statements*[32];
5. Develop heads of consideration that can be used to assess the proposed design in terms of the intent of the above-referenced regulations, guidelines, and broad policy/technical direction/positions;
6. Undertake a review of the current proposed design drawings and approach towards compliance with NCC, PBP-2019, Addendum 2022, and Specification 43, including the PBP-2019 assessment and report in *Appendix H: PBP-2019 Assessment Report;*
7. Meet with project team to gain an understanding and appreciation of the nature of the project, its buildings and uses, occupant characteristics, fire brigade intervention needs, fire and life safety systems, and bush fire hazards and associated risks;
8. Hold discussions with the Project Team to ascertain ability to comply given project circumstances/constraints, as well as proposed approaches towards design and compliance;
9. Participate in site visit inspection[33];
10. Consider feasibility of moving forward with the currently proposed design concept options based on the above;
11. Provide advice to project team on approaches towards compliance, and based on desired design(s) consider ways forward;
12. Review previous advice provided on other projects within Australia regarding assessments against the provisions of section 100B, NCC, PBP-2019, *Addendum 2022*, and *Specification 43*, and where appropriate, use said assessments as the basis for this *Bush Fire Design, Compliance, & Approval Report* (noting the only

[30] Please. refer to *Footnote 4* above.

[31] This is considered to be relevant in terms of bush fire risk, policy/technical background, and the role the author if this report played on the Expert Panel assisting the ABCB with drafting *Specification 43* for and on behalf of the Australasian Fire and Emergency Service Authorities Council.

[32] It should be noted that this review is within the context of context of my previous role on the Expert Panel assisting the ABCB in drafting *Specification 43* and expertise in fire safety engineering in Australia, and is intended to assist the Principal Certifying Authority, or PCA, and fire safety engineer of record in accepting and developing the associated *Performance Solution* respectively.

[33] This was undertaken virtually by the author of this *Report*, accompanying Lote Consulting and the client in-site on 1 August 2024.

assessments that the author of this would rely on would be those signed-off by a BPAD Consultant accredited for the type of assessments undertaken[34]);

13. Undertake a review and assessment of the proposed design against the *Heads of Consideration* below to evaluate the proposed design being acceptable appropriate for complying with the bush fire protection provisions of section 100B, NCC 2022, PBP-2019, *Addendum 2022*, and *Specification 43* on a performance-basis within the context of the identified non-compliances;
14. Review the bush fire assessment and associated information to ascertain relevant information in terms of bush fire risk and characteristics that should be addressed in the ensuing performance-based fire engineering *Performance Solution*, from the perspectives of my previous roles on the Expert Panel, in fire safety engineering, as Manager Development Planning & Policy NSW RFS[35], and experience (as above);
15. Undertake an assessment against section 100B as discussed above and document approach and outcomes in this *Report*;
16. Prepare this *Bush Fire Design, Compliance, & Approvals Report* documenting the above for inclusion in the submission for BFSA/REF, and as an appendix in a *Performance-based Design Brief* that documents the above for a fire engineered *Performance Solution* demonstrating compliance with NCC 2022 (as appropriate).

9 Heads of Consideration

The following heads of consideration were developed based on the author's experience serving on the Expert Panel assisting the ABCB in developing and drafting *Specification 43*, for and on behalf of the Australasian Fire and Emergency Service Authorities Council (AFAC):

- Consistency of the proposed design with the understood intent of the ABCB in adopting *Specification 43*;
- Consistency of the proposed design with the relevant provisions of NCC 2022;
- Compliance with section 100B;
- Review and analysis of building uses and occupancy characteristics in terms of the above three heads of consideration.

10 Analysis & Discussion

10.1 Consistency of the proposed design with the understood intent of the ABCB in adopting Specification 43

Review and analysis of building uses and occupancy characteristics as well as ABCB's understood intent in adopting *Specification 43* indicated that the proposed new classroom building would be appropriately dealt with through a fire safety engineered *Performance Solution*, and also that it could be considered to comply with section 100B.

This would also be consistent with the discussions in the *sections* below.

The review indicated that the currently proposed design would be considered* appropriate *based on its use, occupancy characteristics, and building type if a performance-based design and compliance approach is adopted consistent with the BFSA/REF and building approvals regulatory framework in NSW, and that it would be acceptable and appropriate for this report to be used in a Performance-based design Brief for a fire engineered Performance Solution demonstrating compliance with NCC 2022.

[34] BPAD Level 2 and Level 3 Consultants are accredited for prescriptive and prescriptive and performance-based designs/assessments respectively as recognised by the NSW RFS for issuing compliance certifications under 4.14(1)(b) of the *Environmental Planning and Assessment Act 1979* and BAL-Certificates for Complying Development in NSW.

[35] Please see *Footnote 31.*

10.2 Consistency of the proposed design with the relevant provisions of NCC 2022

Review of the proposed design and comparison to the relevant provisions of NCC 2022 indicated that the proposed design would be consistent with the relevant provisions of NCC 2022.

This *Bush Fire Design, Compliance, & Approvals Report* can therefore be used for benchmarking and input into the fire engineered *Performance Solution*, including the *Performance-based Design Brief*, noting the *Performance Solution* would be considered appropriate in supporting BFSA/REF and construction certificate approvals.

Please note this Bush Fire Design, Compliance, & Approvals Report is also predicated on ensuring the Principal Certifying Authority for this job being comfortable with the approach being adopted, and agreeing to the same.

As mentioned above, the DTS provisions in *Specification 43* were not intended to apply broadly across all building and occupancy types covered, and it was always envisaged performance-based design solutions would be applied.

Accordingly, the DTS provisions in *Specification 43* for building tenability and emergency power generation were intended for buildings and associated occupant types where, due to the nature of the buildings and/or occupants, emergency evacuation, other than 'in-situ', would not be expected nor reasonable during bush fire situations/events (e.g., hospitals where patients cannot be evacuated from a practical perspective due to building design and/or nature of their condition, schools in isolated areas of high bush fire risk where evacuation options would be considered limited due to nature of evacuation routes being through high-risk bush fire areas, etc).

It should be noted that the perimeter road provisions are understood to be taken from those for '*Large Isolated Buildings*' in the NCC, and therefore would be considered applicable for larger buildings addressed in *Specification 43*, and/or perhaps in rare situations where fire brigade intervention could utilise the same for protecting buildings/occupants from the effects of bush fires and/or for supporting evacuation efforts in higher-bush fire risk situations.

The review indicated that the currently proposed design would be considered* appropriate *based on its use, occupancy characteristics, and building type if a performance-based design and compliance approach is adopted consistent with the BFSA/REF and building approvals regulatory framework in NSW, and that it would be acceptable and appropriate for this report to be used in a Performance-based design Brief for a fire engineered Performance Solution demonstrating compliance with NCC 2022.

10.3 Compliance with section 100B

An assessment was undertaken in accordance with the methodology set out in this report using the relevant *specifications and requirements* of PBP-2019 and *Addendum 2022* as the relevant criteria, and it was concluded that the proposed new classroom building could be considered to comply with section 100B, and was therefore appropriate and acceptable given the bush fire risk profile and infill provisions (i.e., development of existing SFPPs).

It is important to note that the proposed new classroom building would be considered acceptable and appropriate even if the other provisions of PBP-2019 were to be applied, within the context of section 100B and the understood broad policy/technical direction/positions of the Commissioner RFS (vis a vis the Director Built & Natural Environment).

A summary is provided in the *Summary* section below.

The review indicated that the currently proposed design would be considered* appropriate *based on its use, occupancy characteristics, and building type if a performance-based design and compliance approach is adopted consistent with the BFSA/REF and building approvals regulatory framework in NSW, and that it would be acceptable and appropriate for this report to be used in a Performance-based design Brief for a fire engineered Performance Solution demonstrating compliance with NCC 2022.

10.4 Review and analysis of building uses and occupancy characteristics in terms of the above three heads of consideration

The proposed design was reviewed within the context of building uses and occupancy/occupant characteristics as discussed in the *Occupant, Building, & Bush Fire Hazard/Risk Characteristics* section.

The review indicated that the currently proposed design would be considered appropriate based on its use, occupancy characteristics, and building type if a performance-based design and compliance approach is adopted consistent with the BFSA/REF and construction certificate issuance approvals regulatory framework in NSW.

10.5 Summary

The above analysis and discussion demonstrates that the proposed school building would comply with section 100B and the associated provisions of NCC 2022, noting that for issuance of construction certificate approval it is understood a fire engineered *Performance Solution* would be required.

The proposed approach is to include a Fire Engineering Concept Design Report as part of the submission for BFSA/REF approval so as to corroborate the assessment and conclusions reached in this report.

Preliminary fire engineering assessment demonstrated compliance with the bush fire protection requirements of NCC 2022 at BFSA/REF submission stage. This is considered to provide an additional layer of corroborating evidence that the proposed development would be considered appropriate and acceptable.

The below table provides a high-level summary of assessment and compliance that have been addressed.

Governing Document	**Comply?**	**Where addressed**	***Commentary***
Rural Fires Act 1997	Yes	This report generally and commentary on this requirement.	***This report spells out the approach undertaken as well as the context for which compliance with section 100B has been demonstrated.***
PBP-2022 - prescriptive provisions except: • APZ to 10kW/m^2	Yes	This report generally and commentary on this requirement.	***The new classroom building would be considered 'infill' development (i.e., development of existing SFPPs).*** ***As such, the APZ provisions would not be considered to apply.*** ***Notwithstanding, shielding from the existing building between the proposed classroom building and the bush fire hazard, combined with the fire separation and BAL-19 construction proposed for the external walls, openings, and roof areas in line-of-sight to the hazard would be considered to well-exceed what would otherwise be required.*** ***The lower bush fire risk of the exposing Category 2 Bush Fire Prone Vegetation, combined with the lower bush fire risk suburban type community/area which the school is located, also results in acceptability and appropriateness under section 100B.*** ***It is also of relevance that a good portion of the existing school is not located on mapped Bush Fire Prone Land.***
Addendum 2022 - prescriptive	Yes	This report generally and	***Please see the above comments.***

Governing Document	Comply?	Where addressed	*Commentary*
provisions except perimeter road		commentary on this requirement.	***Additionally, the perimeter road requirements are intended for situations where emergency rescue, evacuation, and fire brigade intervention would be needed on all elevations due to surrounding bush fire hazards/risks.*** ***As the new classroom building is proposed in an existing courtyard and is shielded in large part by an existing building, the exposing hazard is mapped lower risk Category 2, and any evacuation and/or emergency rescue would be possible/available through the non-bush fire prone areas of the school, a perimeter road would not be considered appropriate nor acceptable in terms of the new classroom building itself.*** ***It is important to note that fire brigade access is provided for the existing school to cater for the lower-risk Category 2 hazard, and would also be readily available through roadways independent of the bush fire hazard in question, and through non-exposed school areas not located on Bush Fire Prone Land.***
NCC 2022	Yes	This report generally and commentary on this requirement.	***Please see above commentary.***
Rural Fires Regulation 2022 (clause 45)	Yes	Please see commentary for this item.	***This is addressed in:*** • *Application for Bush Fire Safety Authority**;*** • *Appendix H: PBP-2019 Assessment Report**;*** • *Appendix I: Information Required for Application for BFSA*

Recommendations for next steps in preparing and submitting for BFSA/REF and construction certificate approval are contained in the *Recommendations* section below.

The ABCB has stated that the DTS Provisions in *Specification 43* were not intended to all be applied to a substantial portion of developments, and in many situations alternate approaches would be considered appropriate and acceptable36,37. Compliance of the proposed design with the provisions of NCC 2022 and Specification 43 is summarised and discussed in *Appendix D: Review, analysis, & interpretation of relevant NCC 2022 provisions* and *Appendix E: Specification 43 provisions, proposed compliance approach, & context*

[36] This is based on my role on the Expert Panel representing the Australasian Fire and Emergency Service Authorities Council assisting the ABCB in developing and drafting *Specification 43* and associated provisions. Please see *Footnote 4* also.

[37] This is also considered to be consistent with verbiage in the *Decision Regulatory Impact Statement* dated March 2022 published by the Australian Building Codes Board.

Because of the diverse nature of types of buildings to which the provisions apply, it was stated that the ABCB acknowledged the prescriptive DTS Provisions were envisaged to only apply to a smaller cross section of the types of buildings captured, and that performance-based approaches to compliance would be appropriate38.

It should be noted that an *Enhanced Bush Fire Protection Management, Operations, & Maintenance Plan* that includes an *Operations & Evacuation Plan*, consistent with the performance-based design, would be considered an essential component of the proposed design for this project.

11 Application for Bush Fire Safety Authority

Clause 45 of the *Rural Fires Regulation 2022* states that an application for a bush fire safety authority must be made in writing and needs to include specific matters.

The required matters identified below are taken directly out of clause 45 and have been specifically addressed in *Appendix H: PBP-2019 Assessment Report* and *Appendix I: Information Required for Application for BFSA.*

(a) *A description, including the address, of the property on which the development the subject of the application is proposed to be carried out,*

(b) *A classification of the vegetation on and surrounding the property, out to a distance of 140 metres from the boundaries of the property, in accordance with the system for classification of vegetation contained in Planning for Bush Fire Protection;*

(c) *An assessment of the slope of the land on and surrounding the property, out to a distance of 100 metres from the boundaries of the property;*

(d) *Identification of significant environmental features on the property;*

(e) *The details of a threatened species or threatened ecological community under the Biodiversity Conservation Act 2016 that the applicant knows to exist on the property;*

(f) *The details and location of an Aboriginal object or place, within the meaning of the National Parks and Wildlife Act 1974,that the applicant knows to be situated on the property;*

(g) *A bush fire assessment for the proposed development, including the methodology used in the assessment, that addresses the following matters:*

- *I. The extent to which the development is to provide for setbacks, including asset protection zones;*
- *II. The siting and adequacy of water supplies for firefighting;*
- *III. The capacity of nearby public roads to handle increased volumes of traffic when a bush fire emergency occurs;*
- *IV. Whether or not nearby public roads that link with the fire trail network have two-way access;*
- *V. The adequacy of arrangements for access to and egress from the development site for the purposes of an emergency response;*
- *VI. The adequacy of bush fire maintenance plans and fire emergency procedures for the development site;*
- *VII. The construction standards to be used for building elements in the development;*
- *VIII. The adequacy of sprinkler systems and other fire protection measures to be incorporated into the development;*
- *IX. Registered fire trails on the property.*

(h) *An assessment of the extent to which the proposed development conforms with or deviates from Planning for Bush Fire Protection.*

[38] This is considered totally consistent with the performance-based nature of the *National Construction Cod*e, and has been the case since the *Building Code of Australia's* first performance-based framework/approach circa 1997.

It also states that an application for a bush fire safety authority must also be accompanied by the *prescribed information* if:

- *The proposed development is subdivision for the purposes of dwelling houses, dual occupancies or secondary dwellings on property in an urban release area;*
- *The application includes a request by the applicant that the Commissioner, when deciding the application, considers whether it would be appropriate for the erection of the dwelling houses, dual occupancies or secondary dwellings concerned to be excluded from the application of the Environmental Planning and Assessment Act 1979, section 4.14;*
- *Prescribed information meaning the following:*
    - ✓ *A plan of subdivision that shows:*
        - *The bush fire attack levels that will apply to the property on completion of clearing of vegetation proposed to be carried out as part of subdivision work, within the meaning of the Environmental Planning and Assessment Act 1979;*
        - *Proposed setbacks of buildings that may in future be erected on the property, including asset protection zones, and*
    - ✓ *Other information about the proposed development that the Commissioner may require.*

Notwithstanding the above, it is important to note that the proposed development is limited to a new classroom building on a pad in an existing courtyard area, would be considered SFPP 'infill', and no clearing and/or other work would be considered to necessitate triggering of any of the matters identified above.

It is understood that no other development or work is being proposed for which development consent is being sought.

Accordingly, should any future work and/or development be proposed, said work/development would be subject to review, assessment, and approvals in accordance with applicable legislation, regulations, and policies (as appropriate).

12 Recommendations

Based on the work undertaken in developing this *Bush Fire Design & Compliance, & Approvals Report*, it is recommended that:

1. The design approach comply with this *Bush Fire Design & Compliance, & Approvals Report*;
2. A fire safety engineering performance-based design and *Performance Solution* be adopted and carried out to address the non-compliances with *Specification 43* (including NSW Variations) in accordance with the regulatory framework in NSW for building certification and associated approvals;
3. This would include a *Performance-based Design Brief* engaging with relevant stakeholders (as appropriate), such as[39]:
    a. NSW Rural Fire Service[40];
    b. Fire Rescue NSW;
    c. Project PCA;
    d. Project Team (including the fire safety engineer of record and the author of this report);
    e. Any other parties that might be considered relevant stakeholders.

[39] It should be noted that *engaging with relevant stakeholders* may be through meetings and/or documentation review and comment, and may be direct and/or indirect in nature.

[40] It should be noted that in the author's previous role with the NSW RFS it was his experience that it was not the NSW RFS's remit to review and/or comment on construction certificate stage matters, nor were they considered to have the competencies to do so. Therefore, any request for comment should be submitted to the Director Built & Natural Environment's Office so that a decision can be made as to the scope and boundaries associated with any review/comment that the NSW RFS may provide in terms of a performance-based design brief process.

4. This *Bush Fire Design, Compliance, & Approvals Report* be used to feed into the *Performance-based Design Brief* process for any fire safety engineering performance-based design and assessment required for demonstrating compliance with NCC 2022 and the relevant NSW Variations to the same - this would be recommended so that assumptions and evaluation/acceptance criteria can be considered validated in terms of the intent behind the provisions of *Specification 43*;

5. The *Bush Fire Design, Compliance, & Approvals Report* and *Fire Engineering Concept Design Report* be included in both the BFSA/REF submission and application for construction certificate approval;

6. An *Enhanced Bush Fire Protection Management, Operations, & Maintenance Plan*, that includes an *Operations & Evacuation Plan*, consistent with the performance-based design, be considered an essential component of the proposed design for this project which should be finalised before occupation approval - this would be developed before occupation is approved, and be maintained into the future as an essential fire and life safety measure (noting it may build off current emergency plans that would apply for the school);

7. Notwithstanding that the above *Plan* need only be finalised before occupation approval, a concept-level *Plan* should be developed as early as possible to help ensure it can be consistent with client and operational requirements and the fire safety engineering performance-based design and assessment approach adopted - failure to accomplish this could result in substantial design and/or approvals risks that could be realised at an inappropriate stage of the process;

8. The *Enhanced Bush fire Protection Management & Maintenance Plan* and an *Emergency Management Plan* is proposed to contain the above distinction between *evacuation* and *early closure*, and to address intelligence and monitoring so that bush fire weather and/or neighbouring bush fire conditions would result in *early closure* so *emergency evacuation* would not be needed.

9. It should be noted that the above *Plan* would also be proposed to include bush fire scenario analysis such that scenarios starting in the immediate vicinity would be addressed in terms of intelligence, early detection, notification, and evacuation before untenable conditions would be expected.

13 Conclusions

This report provides evidentiary documentation that the proposed new classroom building can be considered to comply with section 100B.

This *Design & Compliance, & Approvals Report* can form the basis for an ensuing fire safety engineered performance-based design, assessment, and *Performance Solution* to NCC 2022 for supporting the BFSA/REF development consent and construction certificate approval to build.

The review indicated that the currently proposed design would be considered appropriate based on its use, occupancy characteristics, and building type if a performance-based design and compliance approach is adopted consistent with the BFSA/REF and construction certificate issuance approvals regulatory framework in NSW.

The assessment contained in this report can also be considered evidentiary that the proposed project would be considered acceptable and appropriate in terms of the Commissioner RFS's broad policy/technical directions, and the intent of PBP-2019 (i.e., compliance with section 100B).

It should be noted that this Bush Fire Design, Compliance, & Approvals Report is accompanied by a Fire Engineering Concept Design Report, and preliminary fire engineering assessment demonstrated compliance with the bush fire protection requirements of NCC 2022. This is considered to provide an additional layer of corroborating evidence that the proposed development would be considered appropriate and acceptable.

This Bush Fire Design, Compliance, & Approvals Report is also consistent with, follows, and addresses advice provided for previous submissions on proposed projects having similar (or greater) bush fire hazard, risk, and/or occupant vulnerabilities[41].

[41] Advice has been provided previously on projects of similar occupancy and use that indicated that *Specification 43* was developed with the intention that it be applied to buildings where evacuation from buildings during bush fires would not be expected due to the characteristics and nature of the occupants involved.

Appendix A: Project location

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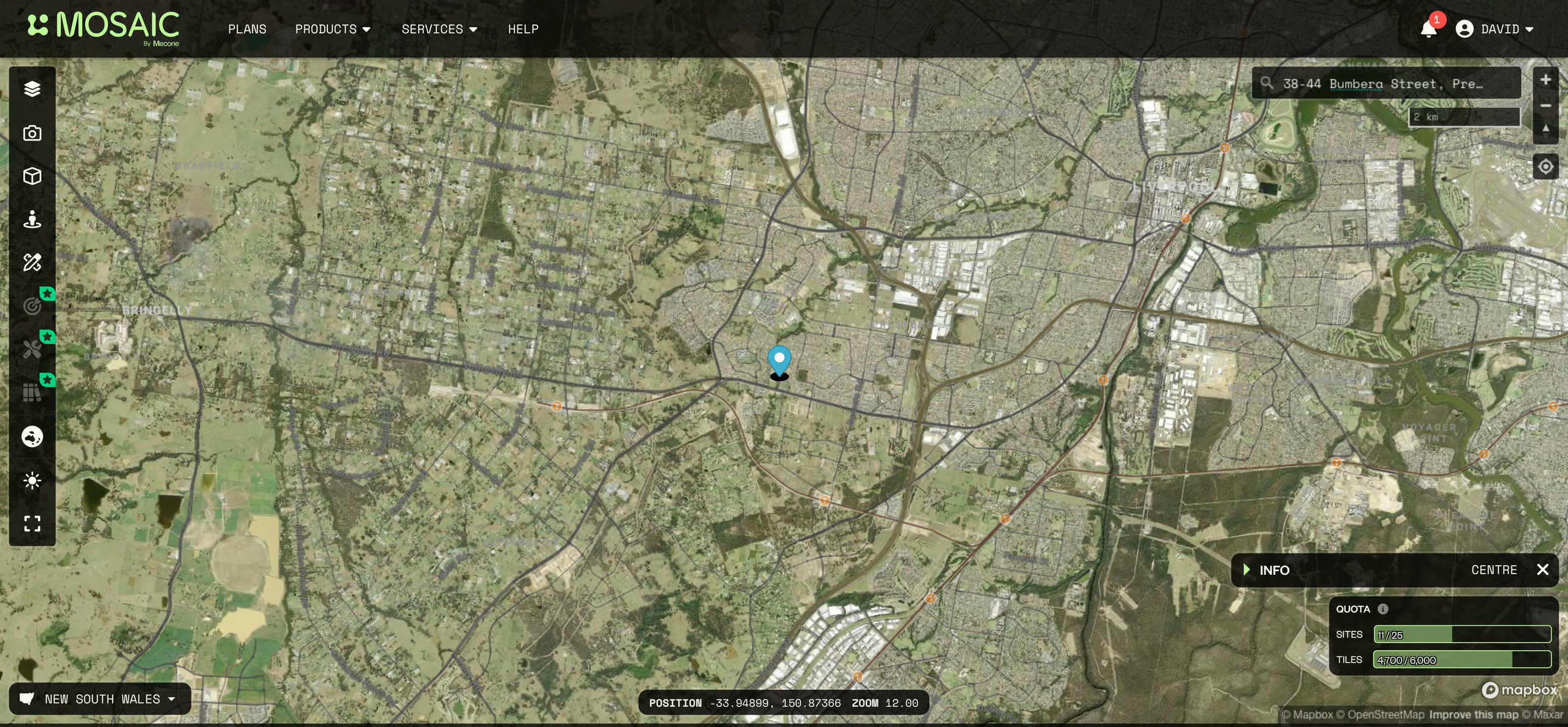
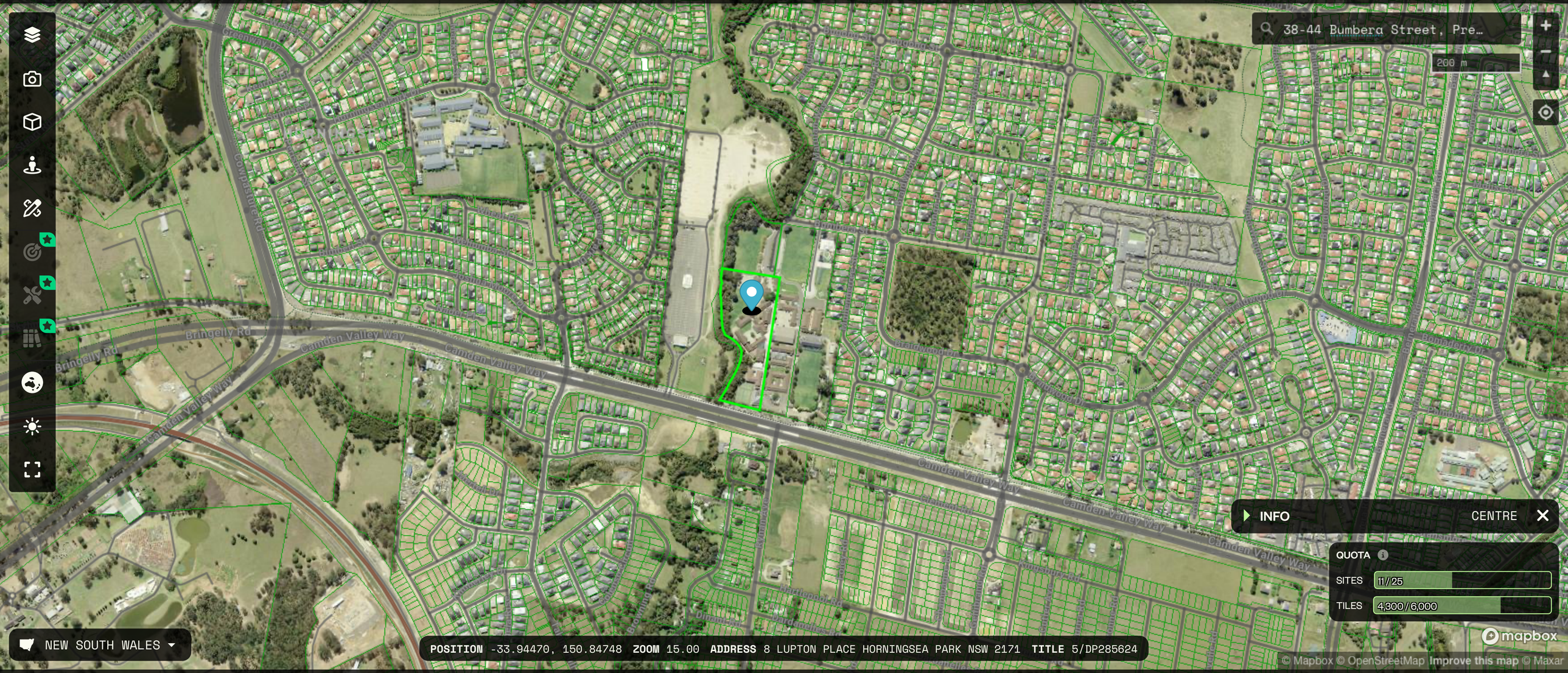
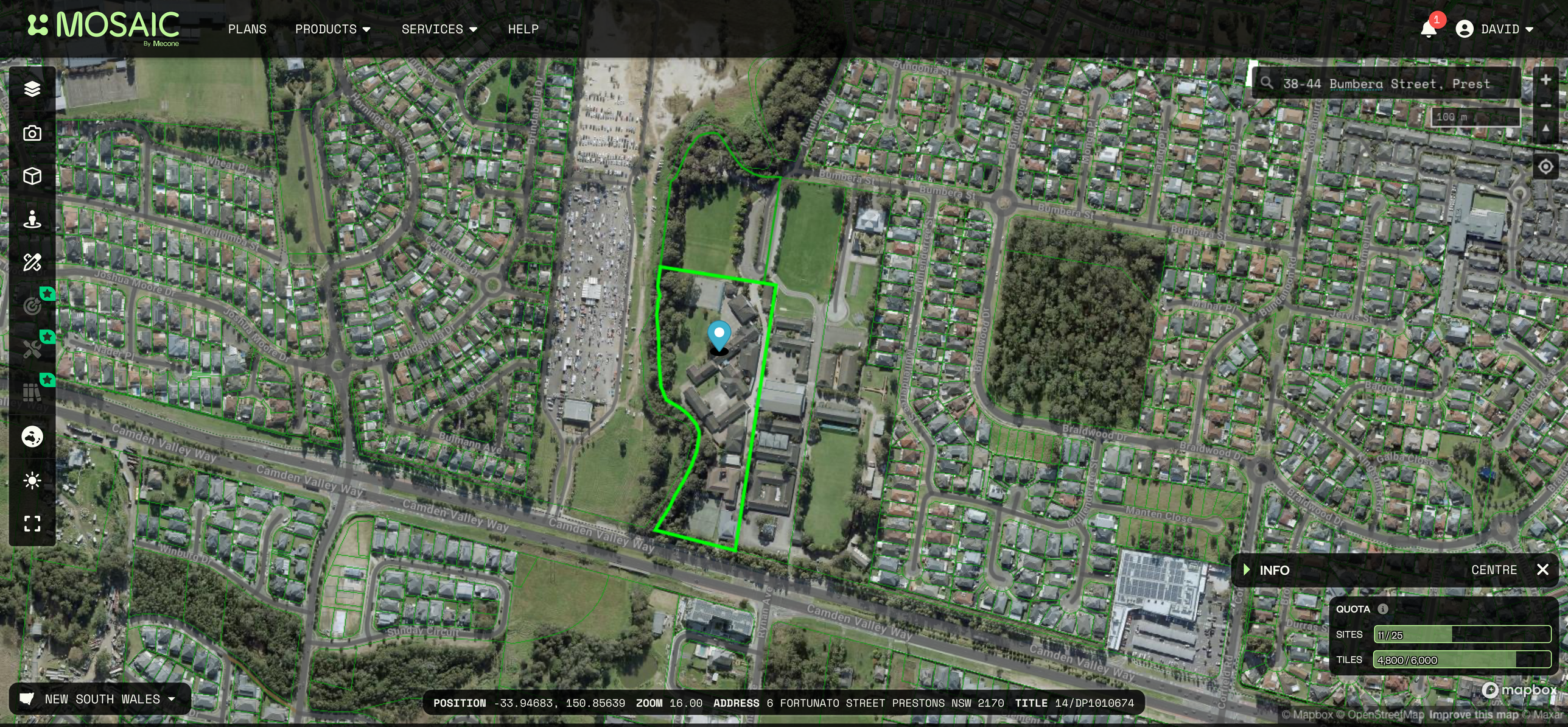



38-44 Bumbera Street, Pre…
200 m
Bringelly Rd
Camden Valley Way
Cowpasture Rd
Bradwood Rd
Hartlepool Rd
Dimmock Ave
Broomfield Ave
Lupton Place
INFO
CENTRE
QUOTA
SITES 11/25
TILES 4,300/6,000
NEW SOUTH WALES
POSITION -33.94470, 150.84748 ZOOM 15.00 ADDRESS 8 LUPTON PLACE HORNINGSEA PARK NSW 2171 TITLE 5/DP285624
mapbox
© Mapbox © OpenStreetMap Improve this map © Maxar




MOSAIC
By Mecone
PLANS
PRODUCTS
SERVICES
HELP
1
DAVID
38-44 Bumbera Street, Pre…
100 m
Category 3
Buffer
Category 2
Category 3
Category 2
Category 3
Buffer
Category 3
Category 2
Bumbera St
Braidwood Dr
Camden Valley Way
Manten Close
Sunday Circuit
Wheat Pl
Wellumba St
Joshua Moore Dr
Nader Pl
Tate Cr
Bulmann Ave
Winburd Dr
Ryman Ave
Mollendinee St
Bungonia St
Monaro Pl
Bargo Pl
Galba Close
Jervis St
Manar Pl
Bungalloon Rd
Kosciusko Close
Durras St
Cornfield Rd
LEGEND
Bushfire Risk (RFS)
FILTER
Category 1
Category 3
Category 2
Buffer
NEW SOUTH WALES
INFO
CENTRE
QUOTA
SITES 11/25
TILES 4,800/6,000
POSITION -33.94736, 150.84652 ZOOM 16.00 ADDRESS 35 HORNINGSEA PARK DRIVE HORNINGSEA PARK NSW 2171 TITLE 329/DP879012
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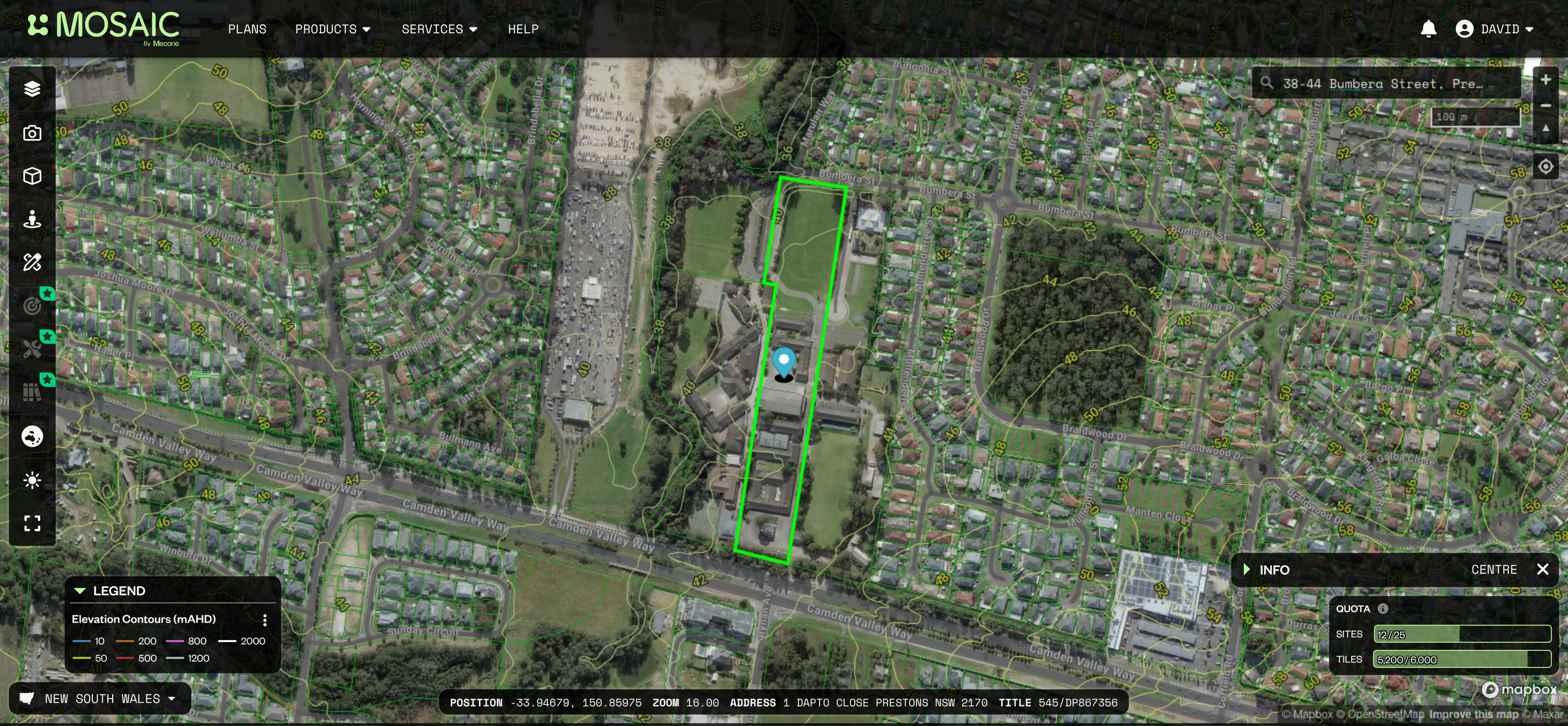

Appendix B: Site plan

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NAME: William Carey Christian School

PROJECT NO: 2408

ADDRESS: 38-44 Bumbera Street
Prestons NSW 2170

ISSUE: I

SK - SHEET LIST

SHEET NO.	SHEET NAME	REVISION DATE	REVISION
SK1C.00	COVER SHEET	30/09/23	I
SK1C.02	SITE PLAN	05.09.24	F
SK1C.02.5	DEMOLITION PLAN - GROUND FLOOR	04.09.24	E
SK1C.02.6	DEMOLITION PLAN - FIRST FLOOR	04.09.24	E
SK1C.03	GROUND FLOOR PLAN	23/09/23	H
SK1C.04	FIRST FLOOR PLAN	09.09.24	G
SK1C.05	ROOF PLAN	30/09/23	I
SK1C.06	ELEVATION 1	30/09/23	I
SK1C.07	ELEVATION 2	30/09/23	I
SK1C.09	SECTIONS	30/09/23	I
SK1C.10	3D PERSPECTIVES	30/09/23	I

GENERAL NOTES

NOTE 01	FINAL POSITION OF THE MODULAR BUILDING IS DEPENDANT ON THE SITE SURVEY PROVIDED TO MARATHON BY A REGISTERED SURVEYOR. ANY LOCATION PLANS PROVIDED BY MARATHON ARE FOR REFERENCE ONLY.
NOTE 02	REFER THE STRUCTURAL ENGINEER DESIGN SET FOR DETAILS ON THE STRUCTURAL STEEL WORKS.
NOTE 03	ALL GPO'S TO BE 300MM ABOVE FINISHED FLOOR LEVEL UNLESS OTHERWISE NOTED.
NOTE 04	ALL LIGHT SWITCHES ARE TO BE INSTALLED BETWEEN 900MM AND 1000MM ABOVE FINISHED FLOOR LEVEL.
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NOTE 09	THE CLIENT IS RESPONSIBLE FOR PAYMENT OF RELEVANT AUTHORITY FEES AND APPLICATIONS TO COMPLETE THE WORKS UNLESS OTHERWISE AGREED.
NOTE 10	EXTENT OF THE SITE SERVICES CONNECTS IS AS PER THE SPECIFICATIONS.

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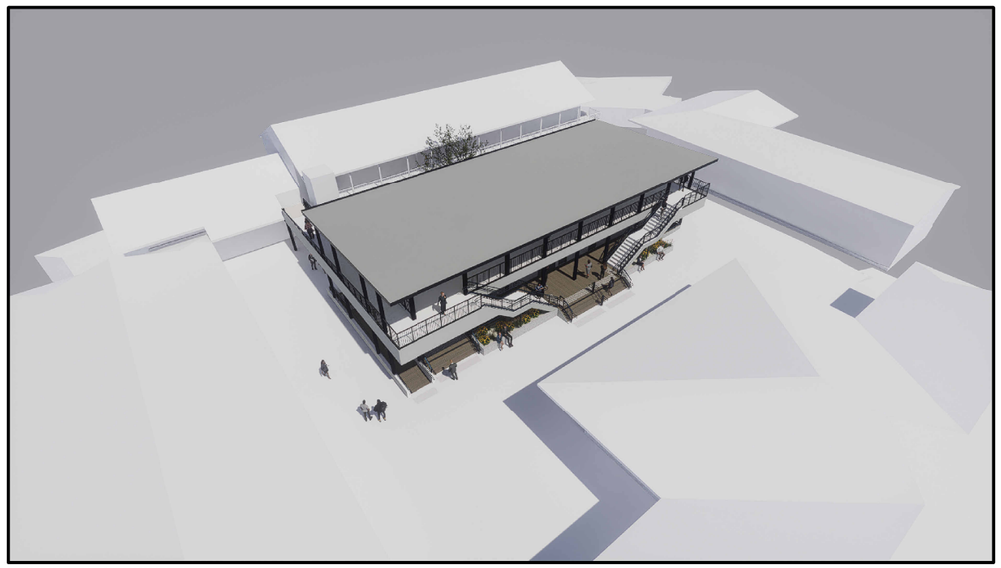

IMAGES FOR ILLUSTRATION PURPOSES ONLY

3 | LOCATION PLAN
SCALE 1 : 1000

Appendix C: Proposed design

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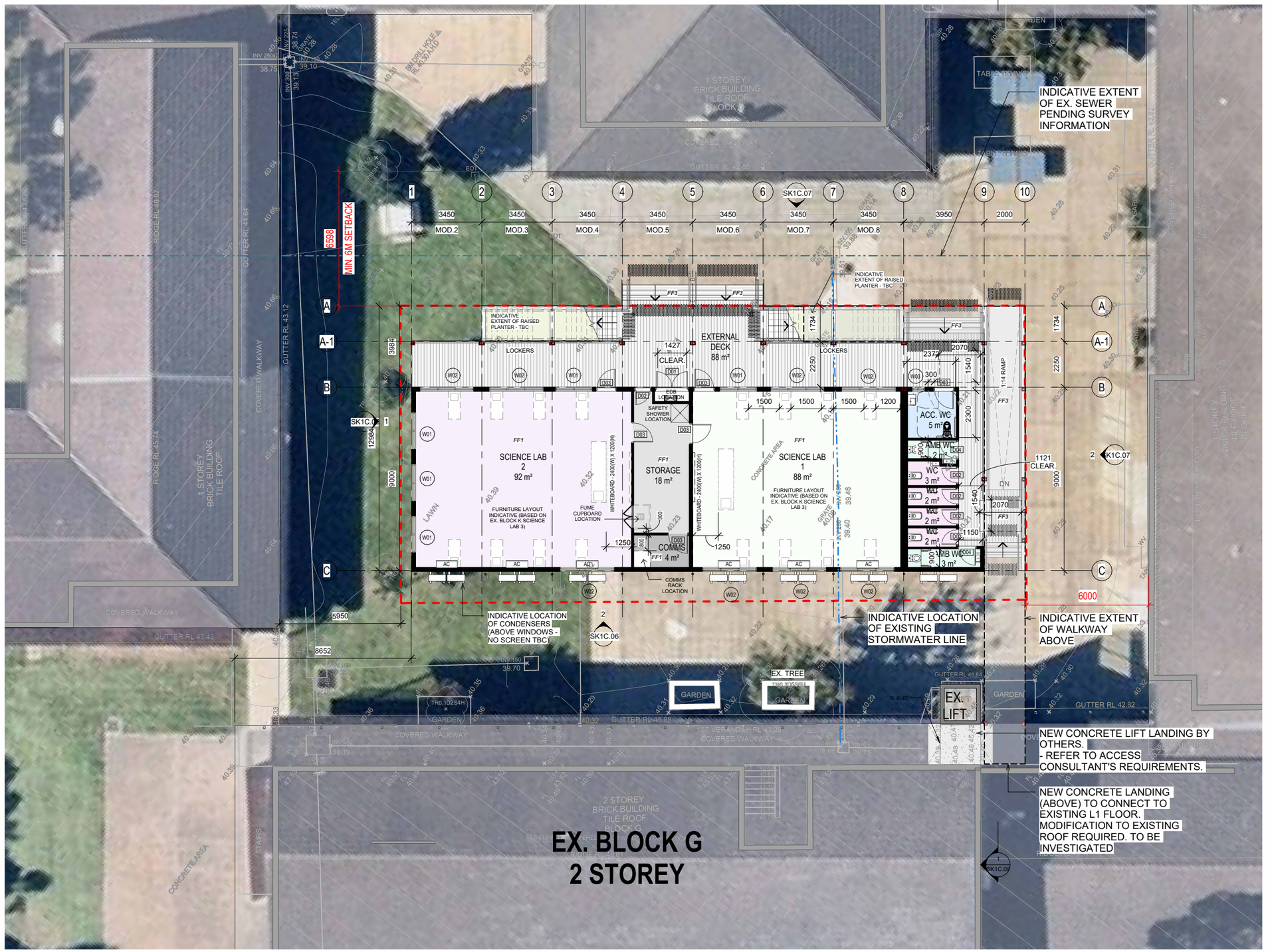

1 | GROUND FLOOR PLAN
SCALE 1 : 100

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DOOR SCHEDULE

Type Mark	WIDTH	HEAD HEIGHT	COUNT
D01	750	2200	1
D02	720	2040	5
D03	920	2040	10
D04	820	2040	2
Grand total: 18			18

WINDOW SCHEDULE

WINDOW TYPE	WIDTH	HEIGHT	SILL HEIGHT	HEAD HEIGHT	COUNT
W01	1810	1030	1000	2030	9
W02	2650	1030	1000	2030	20
W03	610	1030	1000	2030	1
W04	1450	1030	1000	2030	4
Grand total: 34					34

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Rev

Issue	Date	Description
A	22.08.24	ISSUE FOR INFORMATION
B	26.08.24	REVISED TOILET MODULE LOCATION MIRRORED
C	29.08.24	CLIENT & CONSULTANT ISSUE
E	04.09.24	CLIENT ACCEPTANCE
F	05.09.24	CLIENT ACCEPTANCE
H	23/09/23	CONSULTANT ISSUE

Client
Marathon Modular

Project
William Carey Christian School

38-44 Bumbera Street
Prestons NSW 2170

Drawing
GROUND FLOOR PLAN

North	Scale	Date	Project No.	Drawing No.
	As indicated @ A1	03/25/20	2408	SK1C.03 H

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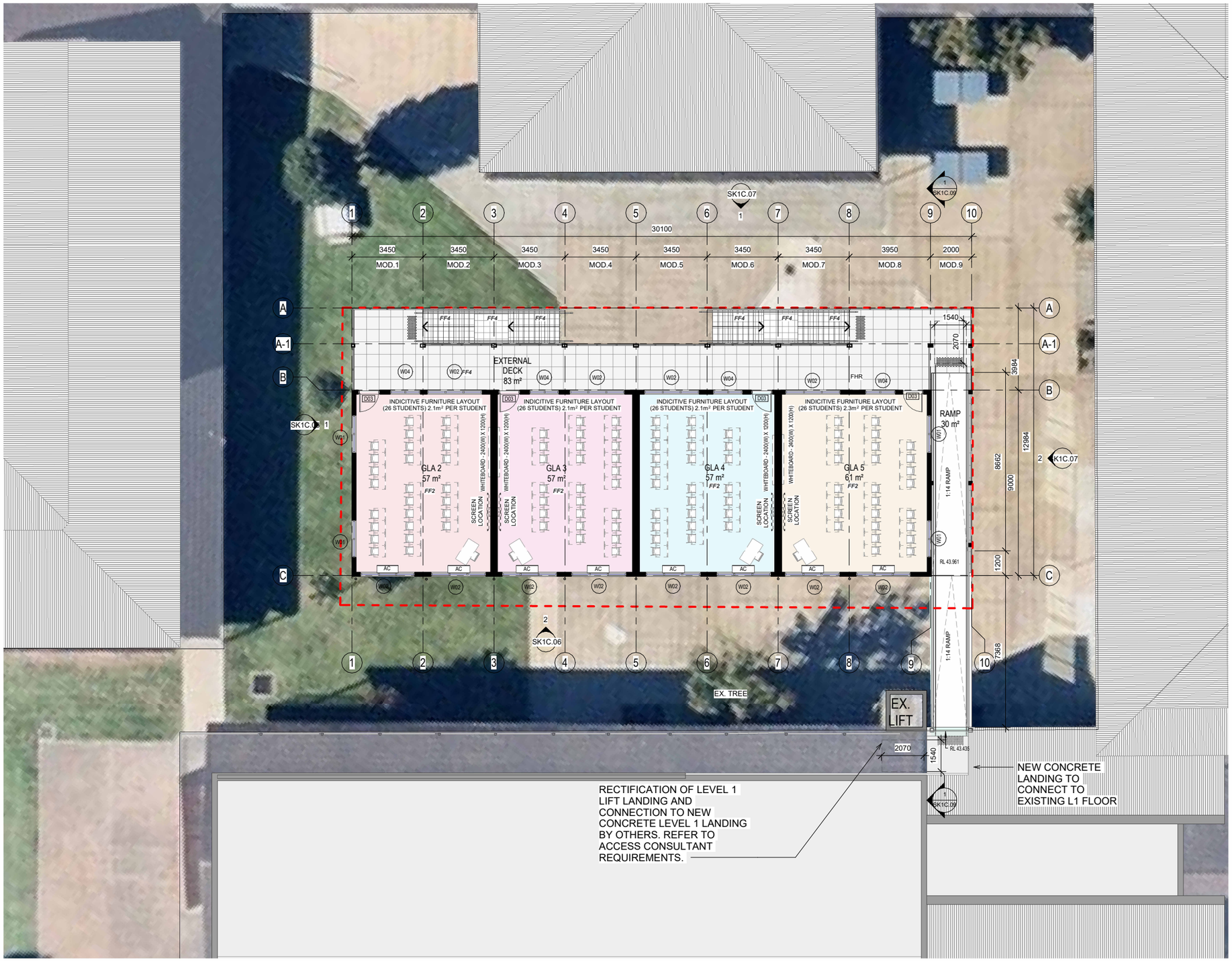
PRELIMINARY



- ACC. WC
- AMB WC
- CIRCULATION
- COMMS
- EDB
- EXTERNAL DECK
- GLA
- GLA 1
- GLA 2
- GLA 3
- GLA 4
- GLA 5
- RAMP
- SCIENCE LAB 1
- SCIENCE LAB 2
- STORAGE
- WC

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W04	1450	1030	1000	2030	4
Grand total: 34					34

1 | FIRST FLOOR PLAN
SCALE 1 : 100

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G	09.09.24	CONSULTANT ISSUE

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Drawing
FIRST FLOOR PLAN

North

Scale	Date	Project No.	Drawing No.
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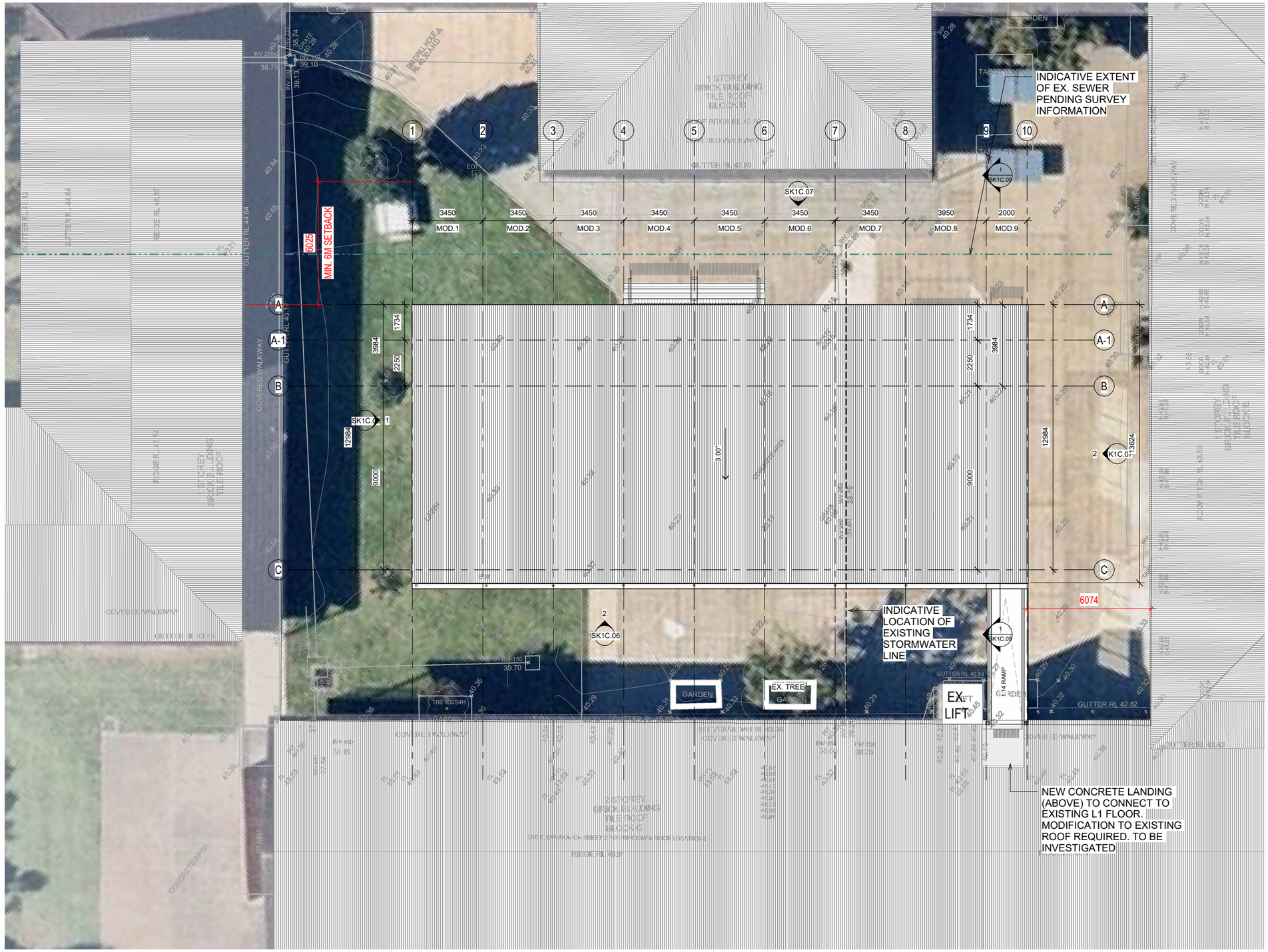

1 | ROOF PLAN
SCALE 1 : 100

Code	Type	Marathon Proposal
FF1	Vinyl Slip Retardant Flooring	Armstring Flooring: Accolade Plus - Camden Grey
FF2	Carpet tile	Interface Carpets: Works Facet Colour: Earthern
FF3	Ground Floor External Verandah	Modwood: 137 x 23mm Blackbean Brushed
FF4	First Floor External Verandah & Stairs to First Floor	Ceramic Tile Colour/Range : Postano Cenere
WC1	Exterior cladding	CFC Cladding 1200 x 2400mm Colour: Deep Ocean
WC2	Exterior cladding	CFC Cladding 1200 x 2400mm Colour: Shale Grey
IF1	Internal Plasterboard Lining Wall & Ceiling Plasterboard	Paint Colour: Dulux Lexicon Qtr
RF	Trimclad Roof Sheeting	Colour: Surf Mist
GT	Halfround Gutter - Size to be Specified by Hyd. Engineer	Colorbond Colour: Deep Ocean
DP	PVC painted downpipes - Size to be Specified by Hyd. Engineer	Colorbond Colour: Deep Ocean
	Fascia	Colour: Deep Ocean
CS	Soffit Lined with CFC cladding	Paint Colour: Dulux Lexicon Qtr
W(0X) As per Windows schedule	Windows Frames	Colour: Deep Ocean
D(0X) As per Windows schedule	Door Frames	Colour: Deep Ocean
	Timber Door Leaves	Colour: Dulux Tin Cat
	External Structural Posts - CFC Cladding	Colour: Deep Ocean

Insulation - Section J Report Requirements		
Roof Insulation	R1.3	Bradford Anticon R1.3 - Or Similar to meet Section J requirement
Ceiling Insulation	R3.5	Bradford Gold Ceiling R3.5 - Or Similar to meet Section J requirement
Wall Insulation	R2.2	Bradford Gold HP R2.2 - Or Similar to meet Section J requirement
Subfloor Insulation	R2.5	Bradford Optimo R2.5 - Or Similar to meet Section J requirement

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Client
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Project
William Carey Christian School

38-44 Bumbera Street
Prestons NSW 2170

Drawing
ROOF PLAN

North | Scale | Date | Project No. | Drawing No.

As indicated @ A1 | 03/25/20 | 2408 | SK1C.05 I

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Appendix D: Review, analysis, & interpretation of relevant NCC 2022 provisions

The following are considered the relevant provisions of NCC 2022 that would apply to the proposed school[42]. This table documents how they are dealt with in terms of submission for a BFSA and subsequent REF approval, as well as for input into a *Performance-based Design Brief* for a fire engineered *Performance Solution* demonstrating compliance with the relevant provisions of NCC 2022.

Clause	***Interpretation based on work w/ Expert Panel***	***Commentary***
G5O1 Objective *The Objective of this Part is to—* *(a) safeguard occupants from injury from the effects of a bushfire; and* *(b) protect buildings from the effects of a bushfire; and* *(c) facilitate temporary shelter for building occupants who may be unable to readily evacuate the building prior to a bushfire.*	Parts (a) and (b) are considered to apply to all building classifications. Part (c) would be considered to apply to buildings that fall under *Specification 43* (i.e., for buildings where "... *occupants who may be unable to readily evacuate the building prior to a bush fire*"). The salient point is considered to be the qualification of occupants and the type of occupancy in question, and whether 'occupants' can be expected to *readily evacuate prior to a bush fire*. Since there could be occupants in literally all building classifications *who may be unable to readily evacuate the building prior to a bush fire*, a distinction between the types of buildings/occupancies for which *Specification 43* would apply and all others would be appropriate from a building code regulatory perspective. This is considered especially relevant since it was acknowledged when drafting and adopting *Specification 43* that a performance-based approach (i.e., a *Performance Solution*) approach would be envisaged to apply to a substantial portion of building designs to which the DTS provisions would apply.	In terms of the regulatory intent and context of *Specification 43*, it is the author's opinion, based on his work on the Expert Panel, that the proposed school would be an occupancy where occupants could be expected to be able to *readily evacuate the building prior to a bush fire* given the following: • The proposed development is understood to be a school building serving the broad community for which its students are drawn (i.e., its 'catchment'), and this is understood to be students representative of the general population; • Its student population would be expected to be representative of the general public, as opposed to 'special needs'; • Students would be expected to be generally ambulatory, able to follow direction, and aware, consistent with those in building classifications that would not fall under *Specification 43*;

[42] The provisions in this table are italicised as they are copied directly from NCC 2022 (https://ncc.abcb.gov.au/editions/ncc-2022/adopted/volume-one/1-definitions/glossary#_a787835e-2f09-4a54-a85c-40e79b54fd1d)

Clause	*Interpretation based on work w/ Expert Panel*	*Commentary*
	It is the author's opinion, based on his work on the Expert Panel, that the qualification would be that *occupants who may be unable to readily evacuate the building prior to a bush fire* was intended to apply to those who were infirmed and/or incapacitated to the point they were unable to evacuate under their own devices. Examples would include occupants who are mobility impaired to the point that rescue would be required by emergency services personnel, occupancies where occupants are unconscious and/or otherwise immobilized, where occupants are confined to beds and/or wards, and/or where by the nature of the occupancy involved building shut-down during bush fire conditions/events would be impracticable and/or impossible (e.g., major hospitals, mental health wards of a secure nature, certain types of dementia wards/facilities). Further, a distinction is made between *early closure* and *evacuation*, and *occupants who may be unable to readily evacuate the building prior to a bush fire* and *occupants who would be expected to be able to readily evacuate but under supervision*. The *Enhanced Bush fire Protection Management & Maintenance Plan* and an *Emergency Management Plan* is proposed to contain the above distinction between *evacuation* and *early closure*, and to address intelligence and monitoring so that bush fire weather and/or neighbouring bush fire conditions would result in *early closure* so *emergency evacuation* would not normally be needed. It should be noted that the above *Plan* would also be proposed to include bush fire scenario analysis such that scenarios starting in the immediate vicinity would be addressed in terms of intelligence, early detection,	• The school would be expected to be required to maintain minimum staff to student ratios, as where 'special needs' students may present , these ratios would be expected to reflect the nature of those 'special needs'; • This report specifies that an *Enhanced Bush fire Protection Management & Maintenance Plan* and an *Emergency Management Plan* that includes an *Operations & Evacuation Plan*, consistent with the performance-based design, be developed and approved before occupation is approved, and this be maintained into the future as an essential fire and life safety measure. It is also important to note that NCC 2022 states, "*G5P2 does not guarantee the safety of building occupants or the maintenance of tenable conditions within a building during a bush fire event*". It is therefore accepted from a regulatory building code perspective that absolute fire and life safety is not practical, and even possible.

Clause	*Interpretation based on work w/ Expert Panel*	*Commentary*
	notification, and evacuation before untenable conditions would be expected.	
G5F1 Construction in bushfire prone areas *A building constructed in a designated bushfire prone area —* *(a) is to provide a resistance to bushfires in order to reduce the danger to life and minimise the risk of the loss of the building; and* *(b) if occupied by people who may be unable to readily evacuate the building prior to a bushfire, is to be constructed so as to provide its occupants shelter from the direct and indirect actions of a bushfire.*	Please see above discussion.	Please see above discussion.
G5P1 ***Bush fire resistance*** *A building that is constructed in a designated bushfire prone area must be designed and constructed to—* *(a) reduce the risk of ignition from a design bushfire with an annual exceedance probability not more than 1:100 years, or 1:200 years for a Class 9 building; and* *(b) take account of the assessed duration and intensity of the fire actions of the design bushfire; and* *(c) be designed to prevent internal ignition of the building and its contents; and*	The design approach for the proposed school would be to comply with the DTS provisions of *Specification 43* for construction levels (i.e., BAL-19), as it is understood incident radiant heat levels would comply with the associated DTS provisions. If required, external walls, openings, and roof areas in direct line-of-sight of any radiant heat exposures greater than 10kW/m^2 would also be provided with fire separation appropriate to the calculated exposure.	Please see above discussion. If required, external walls, openings, and roof areas in direct line-of-sight of any radiant heat exposures greater than 10kW/m^2 would also be provided with fire separation appropriate to the calculated exposure.

Clause	***Interpretation based on work w/ Expert Panel***	***Commentary***
(d) maintain the structural integrity of the building for the duration of the design bush fire.		

G5P2
 	
Additional bushfire requirements for certain Class 9 buildings
 	
A building that is constructed in a designated bushfire prone area and occupied by people who may be unable to readily evacuate the building prior to a bushfire must, to the degree necessary—
 	
(a) reduce the risk of an untenable indoor environment for occupants during a bushfire event, appropriate to the—
 	
(i) location of the building relative to fire hazards, including—
 	
(A) classified vegetation; and
 	
(B) adjacent buildings, structures and movable objects; and
 	
(C) carparking areas and allotment boundaries; and
 	
(D) other combustible materials; and
 	
(ii) number of occupants to be accommodated within the building; and
 	
(iii) intensity of bushfire attack on the building; and
	Please refer to the above discussion.
	
	Additionally, the following would be specifically considered and addressed by the fire safety engineer of record in developing the conceptual approach proposed:
	
	reduce the risk of an untenable indoor environment for occupants during a bush fire event, appropriate to the—
	
	• *location of the building relative to fire hazards, including—*
	  ○ *classified vegetation; and*
	  ○ *adjacent buildings, structures and movable objects; and*
	  ○ *carparking areas and allotment boundaries; and*
	  ○ *other combustible materials; and*
	• *number of occupants to be accommodated within the building; and*
	• *intensity of bush fire attack on the building; and*
	• *duration of occupancy; and*
	• *intensity of potential consequential fires; and*
	• *occupant tenability within the building before, during and after the bush fire event; and*
	• *combined effects of structural, fire exposure and other effects to which the building may reasonably be subjected; and*
		In terms of the regulatory intent and context of *Specification 43*, it is the author's opinion, based on his work on the Expert Panel, that the proposed school would be an occupancy where occupants could be expected to be able to *readily evacuate the building prior to a bush fire* given the following:
		
		• The new classroom building is understood to be part of a school serving the broad community for which its students are drawn (i.e., its 'catchment'), and this is understood to be students representative of the general population;
		• Its student population would be expected to be representative of the general public, as opposed to 'special needs';
		• Students would be expected to be generally ambulatory, able to follow direction, and aware, consistent with those in building classifications that would not fall under *Specification 43*;
		• The school would be required to maintain minimum staff to student ratios, as where 'special needs' students may present , these ratios would be expected to reflect the nature of those 'special needs';
		• This report specifies that a *Bush fire Protection Management & Maintenance*

Clause	***Interpretation based on work w/ Expert Panel***	***Commentary***
(iv) duration of occupancy; and *(v) intensity of potential consequential fires; and* *(vi) occupant tenability within the building before, during and after the bushfire event; and* *(vii) combined effects of structural, fire exposure and other effects to which the building may reasonably be subjected; and* *(viii) provision of fire fighting equipment and water supply to facilitate protection of the building; and* *(b) be provided with vehicular access to the site to enable firefighting and emergency personnel to defend or evacuate the building; and* *(c) have access to a sufficient supply of water for firefighting purposes on the site; and* *(d) provide safe access within the site to the building (including carparking areas), as well as safe egress after the bushfire event.*	• *provision of fire fighting equipment and water supply to facilitate protection of the building; and* *be provided with vehicular access to the site to enable firefighting and emergency personnel to defend or evacuate the building; and* *have access to a sufficient supply of water for firefighting purposes on the site; and* *provide safe access within the site to the building (including carparking areas), as well as safe egress after the bush fire event.*	*Plan* and an *Emergency Management Plan* that includes an *Operations & Evacuation Plan*, consistent with the performance-based design, be developed and approved before occupation is approved, and this be maintained into the future as an essential fire and life safety measure. It is important to note that NCC 2022 states, "*G5P2 does not guarantee the safety of building occupants or the maintenance of tenable conditions within a building during a bush fire event*". It is therefore accepted from a regulatory building code perspective that absolute fire and life safety is not practical, and even possible. Further, a distinction is made between *early closure* and *evacuation*, and *occupants who may be unable to readily evacuate the building prior to a bush fire* and *occupants who would be expected to be able to readily evacuate but under supervision*. The *Enhanced Bush fire Protection Management & Maintenance Plan* and an *Emergency Management Plan* is proposed to contain the above distinction between *evacuation* and *early closure*, and to address intelligence and monitoring so that bush fire weather and/or neighbouring bush fire conditions would result in *early closure* so *emergency evacuation* would not normally be needed.

Clause	*Interpretation based on work w/ Expert Panel*	*Commentary*
		It should be noted that the above *Plan* would also be proposed to include bush fire scenario analysis such that scenarios starting in the immediate vicinity would be addressed in terms of intelligence, early detection, notification, and evacuation before untenable conditions would be expected.
G5D1 ***Deemed-to-Satisfy Provisions*** *(1) Where a Deemed-to-Satisfy Solution is proposed, Performance Requirements G5P1 and subject to G5D2, G5P2, are satisfied by complying with G5D3 and G5D4.* *(2) Where a Performance Solution is proposed, the relevant Performance Requirements must be determined in accordance with A2G2(3) and A2G4(3) as applicable.*	Noted, please see above.	Noted, please see above.

Clause	*Interpretation based on work w/ Expert Panel*	*Commentary*
G5D2 ***Application of Part*** *The Deemed-to-Satisfy Provisions of this Part apply in a designated bushfire prone area to—* *(a) a Class 2 or 3 building; or* *(b) a Class 4 part of a building; or* *(c) a Class 9 building that is a special fire protection purpose located in an area subject to a Bushfire Attack Level (BAL) not exceeding BAL—12.5, determined in accordance with Planning for Bush Fire Protection; or* *(d) a Class 10a building or deck immediately adjacent or connected to a building or part of a type in (a), (b) or (c).* *Notes* *If a building of a type listed in (c) or (d) where associated with a building listed in (c) is subject to a BAL exceeding BAL—12.5, the building would need to comply with Performance Requirement NSW G5P2 by means of a Performance Solution.* *There are no Deemed-to-Satisfy Provisions for these buildings.*	Noted, please see above.	Noted, please see above.

Clause	*Interpretation based on work w/ Expert Panel*	*Commentary*
G5D4 ***Protection — certain Class 9 buildings*** *In a designated bushfire prone area, a Class 9 building that is a special fire protection purpose or a Class 10a building or deck immediately adjacent or connected to a such a building or part, must comply with—* *(d) for a Class 9 building that is special fire protection purpose, Specification 43 except as amended by Planning for Bush Fire Protection; or* *(e) for a Class 10a building or deck immediately adjacent or connected to a Class 9 building that is a special fire protection purpose—* *(i) AS 3959 except as amended by Planning for Bush Fire Protection; and* *(ii) S43C13; or* *(f) the requirements of (a) or (b) above as modified by the development consent with a bushfire safety authority issued under section 100B of the Rural Fires Act 1997 for the purposes of integrated development.*	Noted, it would be proposed that a *Performance Solution* to NCC 2022 be developed consistent with the building approvals regulatory framework in NSW for any non-compliances with this clause/provision, as outlined in this report. Non-compliances would include the following: 1) S43C9 Internal tenability; 2) S43C11 Supply of water for fire-fighting purposes; 3) S43C12 Emergency power supply; 4) S43C14 Vehicular access 5) Separation between buildings; 6) Separation between buildings and carparking.	Please see above comments and narrative. It would be proposed that a *Performance Solution* be developed (i.e., compliance with all relevant *Performance Requirements*) consistent with this report based on the hazards that are expected, occupant and building characteristics, and the associated bush fire scenarios, consistent with the approach in the *Australian Fire Engineering Guidelines 2021*, as well as established fire scenario analysis processes adopted as an essential part of fire safety engineering in Australia. Said approach would be in accordance with the relevant regulatory framework in NSW for building approvals. Please refer to Appendix E: *Specification 43* provisions, proposed compliance approach, & context below.

Appendix E: *Specification 43* provisions, proposed compliance approach, & context

This table documents how they are dealt with in terms of submission for a BFSA and subsequent REF approval, as well as for input into a *Performance-based Design Brief* for a fire engineered *Performance Solution* demonstrating compliance with the relevant provisions of NCC 2022.

NCC (2022) *SPECIFICATION 43* REVIEW			
*The following table provides a summary of *Specification 43* Provisions for the proposed new school building at William Carey Christian School, Bumbera St, Prestons NSW 2170, specifically in regards to and within the context of the understood intent of the Australian Building Codes Board (ABCB) in deciding to adopt the same.			
S43C1 Scope			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
(1)	*This Specification sets out bushfire protection measures for buildings described in G5D4.*	-	Noted.
(2)	*Compliance with this Specification does not guarantee the safety of building occupants or the maintenance of tenable conditions within a building during a bushfire event.*	-	Noted.
S43C2 Separation from classified vegetation			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
	This clause has deliberately been left blank. *S43C2 does not apply in NSW as Asset Protection Zones must be determined in accordance with Planning for Bush Fire Protection.*	Determined accordingly. Complies (assuming clearing is maintained throughout use).	Asset Protection Zones have been reviewed against the prescriptive provisions in *Planning for Bush Fire Protection 2019* (PBP-2019). Please refer to assessment against PBP-2019 in *Appendix H: PBP-2019 Assessment Report.* Asset Protection Zones may not comply (i.e., incident radiant heat flux may exceed 10 kW/m^2) - this has been addressed in that the proposed new classroom building would be considered SFPP 'infill' in terms of PBP-2019. Notwithstanding, if the proposed building does not fall under the scope of *Specification 43* (due to any non-compliances with the same), it would then be designed to comply with the relevant *Performance Requirements*.

NCC (2022) *SPECIFICATION 43* REVIEW			
			It should be noted that NCC 2022 allows for a performance-based approach (subject to confirmation by the Principal Certifying Authority, or PCA, for the project).
S43C3 Separation between buildings			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
(1)	*The building must be located not less than 12m from any other building.*	To comply based on below.	
(2)	*The separation distance by (1) need not be complied with if the building is constructed—*		
	(a) with external walls that have an FRL of not less than 60/60/60 when tested from the outside, including any openings protected in accordance with AS 3959 for BAL-19 or greater; or	To comply.	*It is envisaged that there may be roofing that connects different buildings for weather protection - this would comply or be addressed as part of the fire engineered Performance Solution under NCC 2022.* *It is also understood the twelve (12) metre separation would not be met between the dorm wings and the common room due to the lack of fire rating inherent in the existing external walls. This would also be proposed to be addressed in the Performance Solution.*
	(b) for external walls and roof, using a material or system that satisfies the test criteria of AS 1530.8.1 for a radiant heat flux of 10 kW/m² or greater.	Please see previous option.	Noting the design can opt either for *(a)* or *(b)*. Walls, roofing, penetrations, and openings (i.e., windows and the like) are to be protected as per the *National Construction Code 2022* (NCC 2022).
S43C4 Separation from allotment boundaries and carparking areas			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
(1)	*The building must be located not less than 10 m from any allotment boundary or open carparking area/spots.*	To comply	Based on below alternative options.

NCC (2022) *SPECIFICATION 43* REVIEW			
(2)	*The separation distance required by (1) need not be complied with if the building is constructed —*		
	(a) with external walls that have an FRL of not less than 60/60/60 when tested from the outside, including any openings protected in accordance with AS 3959 for BAL—19 or greater; or	To comply.	Walls, roofing, penetrations, and openings (i.e., windows and the like) are to be protected as per the *National Construction Code 2022* (NCC 2022).
	(b) for external walls and roof, using a material or system that satisfies the test criteria of AS 1530.8.1 for a radiant heat flux of 10 kW/m² or greater.	Please see previous option.	Noting the design can opt either for *(a)* or *(b)*. Walls, roofing, penetrations, and openings (i.e., windows and the like) are to be protected as per the *National Construction Code 2022* (NCC 2022).
S43C5 Separation from hazards			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
(1)	*The external walls and roof of the building must be protected from potential hazards on the site such as liquefied petroleum gas bottles, fuel storage, storage of combustible materials, waste bins, vehicles, machinery, and the like, by—*	To comply.	Noted.
	(a) a separation distance of not less than 10 m; or	See (b) and (c) below.	
	(b) where within the 10 m separation distance described in (a), constructed with external walls that have an FRL of not less than 60/60/60 when tested from the outside, including any openings protected in accordance with AS 3959 for BAL—19 or greater; or	To comply.	
	(c) for external walls and roof, using a material or system that satisfies the test criteria of AS 1530.8.1 for a radiant heat flux of 10 kW/m² or greater.	Please see previous option.	

NCC (2022) *SPECIFICATION 43* REVIEW			
S43C6 Non-combustible path around building			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
(1)	*A non-combustible pathway directly adjacent to the building and not less than 1.5 m wide must be provided around the perimeter of the building.*	To comply.	Deemed to satisfy solution is to be provided. *A non-combustible pathway directly adjacent to the building and not less than 1.5 m wide around the perimeter of the buildings may not be provided should a performance-based design solution be proposed to address this matter and demonstrate compliance in the form of a Performance Solution acceptable to the PCA for the job.* *Should this provision not be proposed to be complied with a performance-based solution would be needed.*
S43C7 Access pathways			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
(1)	*Access pathways that lead to a road or open space must—*	To comply.	
	(a) be readily identifiable; and	To comply.	
	(b) have an even surface; and	To comply.	
	(c) have a minimum clear width of not less than 1 m.	To comply.	
(2)	*If the access pathway is an accessway that is required to comply with Part D4, the requirements of Part D4 override (1) to the extent of any inconsistency.*	To comply.	
S43C8 Exposed external areas			

NCC (2022) *SPECIFICATION 43* REVIEW			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
(1)	*An external area designed to hold people unable to be safely accommodated within the building, that may be exposed to radiant heat flux from a fire front during a bush fire event, must not be exposed to an incident radiant heat flux from the fire front exceeding 1 kW/m^2 above background solar radiant heat flux.*	To comply.	*The proposed* classroom building *exits directly into a residential/suburban area that is in close proximity to an already developed community.* *The proposed school is to be provided with an Enhanced* ***Bush Fire Protection*** *Management, Operations & Maintenance Plan* ***and an Emergency Management Plan*** that *which also includes an Emergency Operations & Evacuation Plan.*
S43C9 Internal tenability			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
	To maintain internal tenability throughout the duration of occupancy during a bush fire event, the building must comply with the following:	-	*To be addressed vis a vis a fire safety engineering performance-based design as per the Recommendations* section of this *report.* As per the above discussions, occupants would be expected to be able to readily evacuate the school prior to bush fire scenarios, with the exception of those bush fires that would start in relatively close proximity to the school. Such bush fires, whilst not allowing for enough advance notice for evacuation, would also be expected to of relatively low risk in terms of fire size and smoke development. It should be noted that the *Enhanced Bush Fire Protection Management, Operations & Maintenance Plan* ***and an Emergency Management Plan that*** *includes an Emergency Operations & Evacuation Plan* would address potential large-scale bush fire scenarios that could pose a landscape-level risk to the school in terms of evacuation and/or school closures. It should also be noted that it would not be expected that the school would be occupied by students *(i.e.,* in *'Specification 43* mode') if/when fire
	(a) An air handling system must be provided that is capable of—	Not proposed to comply.	
	(i) being adjusted for full recycling of internal air for a period of not less than 4 hours to avoid the introduction of smoke into the building; and		
	(ii) maintaining an internal air temperature of not more than 25°C.		
	(b) The building envelope must be designed such that if an air handling system required by (a) fails, then—		
	(i) internal air temperatures can be maintained below 39°C; and		

	(ii) internal surface temperatures can be maintained below 60°C *(c) If the building is divided into separate compartments then, for the purposes of (a), each compartment must have a separate air handling system.* *(d) Each air handling system required by* *(a) must be designed to account for the activation of smoke detectors from low concentrations of smoke from external sources, so as to ensure that air-conditioning and other essential systems remain operational.*		weather forecasting indicates that bush fire risk would be considered too great for school use, as the *Enhanced Bush fire Protection Management, Operations & Maintenance Plan and an Emergency Management Plan that includes an Emergency Operations & Evacuation Plan* would be specified to require closure on said days. Further, a distinction is made between *early closure* and *evacuation*, and *occupants who may be unable to readily evacuate the building prior to a bush fire* and *occupants who would be expected to be able to readily evacuate but under supervision*. The *Enhanced Bush fire Protection Management & Maintenance Plan* and an *Emergency Management Plan* is proposed to contain the above distinction between *evacuation* and *early closure*, and to address intelligence and monitoring so that bush fire weather and/or neighbouring bush fire conditions would result in *early closure* so *emergency evacuation* would not normally be needed. It should be noted that the above *Plan* would also be proposed to include bush fire scenario analysis such that scenarios starting in the immediate vicinity would be addressed in terms of intelligence, early detection, notification, and evacuation before untenable conditions would be expected. It would be proposed that a*a fire engineered Performance Solution* be developed (i.e., compliance with all relevant *Performance Requirements*) consistent with this report based on the hazards that are expected, occupant and building characteristics, and the associated bush fire scenarios, consistent with the approach in the *Australian Fire Engineering Guidelines 2021*, as well as established fire scenario analysis processes adopted as an essential part of fire safety engineering in Australia. *It should be noted this would be in the form of a fire safety engineering Performance Solution for complying with NCC 2022.* *This Bush Fire Design, Compliance, & Approvals Report is intended to be used to feed into the Performance-based Design Brief process for any fire*

NCC (2022) *SPECIFICATION 43* REVIEW			
			safety engineering performance-based design and assessment required for demonstrating compliance with NCC 2022 - this would be recommended so that assumptions and evaluation/acceptance criteria can be considered validated in terms of the intent behind the provisions of Speciation 43.).
S43C10 Building envelope			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
	The building envelope must be constructed in accordance with AS 3959 – BAL 19 or greater, except that where the use of combustible materials is permitted by AS 3959, they are not to be used unless permitted by C2D10(4), (5) or (6).	To comply.	If the incident radiant heat is determined to exceed the 10kW/m^2 threshold, then the building envelope would also be proposed to be constructed to provide a fire separation from exposing bush fire hazards commensurate with reasonable worst-case fire scenarios as per the fire engineered solution (noting currently the approach would be to build to BAL-19).
S43C11 Supply of water for fire-fighting purposes			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
	Water for fire-fighting purposes must be available and consist of—		It should be noted that there may be some non-compliances with firefighting water supply and hydrant requirements, and *these would be dealt with through the REF, BFSA, fire engineering Performance Solution, and/or the exemption process in NSW for such systems (i.e., the exemption process that Fire Rescue NSW administers).*
	(a) A fire hydrant system complying with E1D2; or	To comply.	It is understood that there may be non-compliances in terms of the location of water supplies for firefighting. *This would would be dealt with through the REF, BFSA, fire engineering Performance Solution, and/or the exemption process in NSW for such systems (i.e., the exemption process that Fire Rescue NSW administers).*

NCC (2022) *SPECIFICATION 43* REVIEW			
	(b) A static water supply consisting of tanks, swimming pools, dams or the like, or a combination of these, together with suitable pumps, hoses and fittings, determined in consultation with the relevant fire brigade that—	See item (a) previous.	
	(i) is capable of providing the required flow rate for a period of not less than 4 hours; or	To comply.	
	(ii) has a volume of 10 000 litres for each occupied building.	To comply.	It is understood that there may be non-compliances in terms of the capacity of water supplies for firefighting. *This would would be dealt with through the REF, BFSA, fire engineering Performance Solution, and/or the exemption process in NSW for such systems (i.e., the exemption process that Fire Rescue NSW administers).*
S43C12 Emergency power supply			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
(1)	*Emergency power must be provided to support, for not less than 4 hours before and 2 hours after the passing of the fire front during a bush fire event, the ongoing operation of—*	Not proposed to comply.	*To be addressed vis a vis a fire safety engineering performance-based design as per the Recommendations* section of this *report.* *Please see previous comments regarding tenability which would be considered to apply for these provisions, since emergency power would be required to ensure tenability is maintained, as well as the other systems identified.* *It should be noted this would be in the form of a fire safety engineering Performance Solution for complying with NCC 2022.* *This Bush Fire Design, Compliance, & Approvals Report is intended to be used to feed into the Performance-based Design Brief process for any fire safety engineering performance-based design and assessment required for demonstrating compliance with NCC 2022 - this would be recommended so*

NCC (2022) *SPECIFICATION 43* REVIEW			
			that assumptions and evaluation/acceptance criteria can be considered validated in terms of the intent behind the provisions of Speciation 43.).
	(a) air handling systems to maintain internal tenability; and	Not proposed to comply.	*To be addressed vis a vis a fire safety engineering performance-based design as per the Recommendations* section of this *report*.
	(b) any pumps for fire-fighting; and	Not proposed to comply.	*To be addressed vis a vis a fire safety engineering performance-based design as per the Recommendations* section of this *report*.
	(c) any emergency lighting and exit signs; and	Not proposed to comply.	*To be addressed vis a vis a fire safety engineering performance-based design as per the Recommendations* section of this *report*.
	(d) any other emergency equipment listed in C3D14(6) and required to be provided.	To comply if relevant.	As appropriate.
(2)	*Manual control for emergency back-up power supply must be provided to facilitate manual intervention where the power supply fails or runs out.*	Not proposed to comply.	*To be addressed vis a vis a fire safety engineering performance-based design as per the Recommendations* section of this *report*.
S43C13 Signage			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
(1)	*Signage must be provided to warn building occupants against storing combustible materials under or adjacent to the building*	To comply.	Noted.
S43C14 Vehicular access			
	SPECIFICATION 43 CLAUSES	COMPLIANCE *	COMMENTS
(1)	*Vehicular access to the building must be provided in accordance C3D5(2), as if the building were a large isolated building for the purposes of C3D4.*	Not proposed to comply.	*To be addressed vis a vis a fire safety engineering performance-based design as per the Recommendations* section of this *report.*

NCC (2022) *SPECIFICATION 43* REVIEW			
			It should be noted this would be in the form of a fire safety engineering Performance Solution for complying with NCC 2022 or an approach acceptable to the PCA for the job.

Appendix F: Relevant NCC 2022 Bush fire Provisions (including NSW Variations)

Part G5 Construction in bushfire prone areas

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Introduction to this Part

This Part contains additional requirements for the construction of buildings located in *designated bushfire prone areas*, to address the additional risks posed by bushfire attack.

Objectives

+ G5O1 Objective [2019: GO5]

Functional Statements

+ G5F1 Construction in bushfire prone areas [2019: GF5.1]

Performance Requirements

− G5P1 Bushfire resistance [2019: GP5.1]

A building that is constructed in a designated bushfire prone area must be designed and constructed to—

(a) reduce the risk of ignition from a design bushfire with an annual exceedance probability not more than 1:100 years, or 1:200 years for a Class 9 building; and

(b) take account of the assessed duration and intensity of the fire actions of the design bushfire; and

(c) prevent internal ignition of the building and its contents; and

(d) maintain the structural integrity of the building for the duration of the design bushfire.

Applications

NSW G5P1 only applies in a designated bushfire prone area to—

(a) a Class 2 or 3 building; or

(b) a Class 4 part of a building; or

(c) a Class 9 building that is a special fire protection purpose; or

(d) a Class 10a building or deck immediately adjacent or connected to a building or part of a type listed in (a), (b) or (c).

Options | Guide

State variations: Clear variation — NSW QLD TAS VIC

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− G5P2 Additional bushfire requirements for certain Class 9 buildings [New for 2022]

A building that is constructed in a designated bushfire prone area and occupied by people who may be unable to readily evacuate the building prior to a bushfire must, to the degree necessary—

(a) reduce the risk of an untenable indoor environment for occupants during a bushfire event, appropriate to the—

(i) location of the building relative to fire hazards, including—

(A) classified vegetation; and

(B) adjacent buildings, structures and movable objects; and

(C) carparking areas and allotment boundaries; and

(D) other combustible materials; and

(ii) number of occupants to be accommodated within the building; and

(iii) intensity of bushfire attack on the building; and

(iv) duration of occupancy; and

(v) intensity of potential consequential fires; and

(vi) occupant tenability within the building before, during and after the bushfire event; and

(vii) combined effects of structural, fire exposure and other effects to which the building may reasonably be subjected; and

(viii) provision of fire fighting equipment and water supply to facilitate protection of the building; and

(b) be provided with vehicular access to the site to enable firefighting and emergency personnel to defend or evacuate the building; and

(c) have access to a sufficient supply of water for firefighting purposes on the site; and

(d) provide safe access within the site to the building (including carparking areas), as well as safe egress after the bushfire event.

Applications

NSW G5P2 applies to a Class 9 building that is a special fire protection purpose located in a designated bushfire prone area.

Notes

NSW G5P2 does not guarantee the safety of building occupants or the maintenance of tenable conditions within a building during a bushfire event.

Options | Guide

State variations: Clear variation — NSW TAS VIC

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Verification Methods

+ G5V1 Buildings in bushfire prone areas [2019: GV5]

Deemed-to-Satisfy Provisions

− G5D1 Deemed-to-Satisfy Provisions [2019: G5.0]

(1) Where a Deemed-to-Satisfy Solution is proposed, Performance Requirements G5P1 and subject to G5D2, G5P2, are satisfied by complying with G5D3 and G5D4.

(2) Where a Performance Solution is proposed, the relevant Performance Requirements must be determined in accordance with A2G2(3) and A2G4(3) as applicable.

Options | Guide

State variations: SA

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− G5D2 Application of Part [2019: G5.1]

The Deemed-to-Satisfy Provisions of this Part apply in a designated bushfire prone area to—

(a) a Class 2 or 3 building; or

(b) a Class 4 part of a building; or

(c) a Class 9 building that is a special fire protection purpose located in an area subject to a Bushfire Attack Level (BAL) not exceeding BAL—12.5, determined in accordance with Planning for Bush Fire Protection; or

(d) a Class 10a building or deck immediately adjacent or connected to a building or part of a type in (a), (b) or (c).

Notes

(1) If a building of a type listed in (c) or (d) where associated with a building listed in (c) is subject to a BAL exceeding BAL—12.5, the building would need to comply with Performance Requirement NSW G5P2 by means of a Performance Solution.

(2) There are no Deemed-to-Satisfy Provisions for these buildings.

Options | Guide

State variations: Clear variation — NSW QLD VIC

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+ G5D3 Protection — residential buildings [2019: G5.2]

− G5D4 Protection — certain Class 9 buildings [New for 2022]

In a designated bushfire prone area, a Class 9 building that is a special fire protection purpose or a Class 10a building or deck immediately adjacent or connected to such a building or part, must comply with—

(a) for a Class 9 building that is special fire protection purpose, Specification 43 except as amended by Planning for Bush Fire Protection; or

(b) for a Class 10a building or deck immediately adjacent or connected to a Class 9 building that is a special fire protection purpose—

(i) AS 3959 except as amended by Planning for Bush Fire Protection; and

(ii) S43C13; or

(c) the requirements of (a) or (b) above as modified by the development consent with a bushfire safety authority issued under section 100B of the Rural Fires Act 1997 for the purposes of integrated development.

Options | Guide

State variations: Clear variation — NSW VIC

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+ SA G5D5 Bushfire attack levels [New for 2022]

Specification 43 Bushfire protection for certain Class 9 buildings

Hide images/tables | Close all

S43C1 Scope

[New for 2022]

(1) This Specification sets out bushfire protection measures for buildings described in G5D4.

(2) Compliance with this Specification does not guarantee the safety of building occupants or the maintenance of tenable conditions within a building during a bushfire event.

Explanatory information

The measures set out in this Specification are intended to operate in conjunction with other bushfire safety measures that lie outside the scope of the NCC. Information about these measures can be found in the Guide to NCC Volume One for Part G5.

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S43C2 Separation from classified vegetation

[New for 2022]

This clause has deliberately been left blank.

S43C2 does not apply in NSW as Asset Protection Zones must be determined in accordance with Planning for Bush Fire Protection.

State variation | Clear variation

NSW

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S43C3 Separation between buildings

[New for 2022]

(1) The building must be located not less than 12 m from any other building.

(2) The separation distance *required* by (1) need not be complied with if the building is constructed—

(a) with external walls that have an FRL of not less than 60/60/60 when tested from the outside, including any openings protected in accordance with AS 3959 for BAL—19 or greater; or

(b) for external walls and roof, using a material or system that satisfies the test criteria of AS 1530.8.1 for a radiant heat flux of 10 kW/m² or greater.

Print Clause | Save Clause | Copy Clause | Email

S43C4 Separation from allotment boundaries and carparking areas

[New for 2022]

(1) The building must be located not less than 10 m from any allotment boundary or open carparking area/spots.

(2) The separation distance required by (1) need not be complied with if the building is constructed—

(a) with external walls that have an FRL of not less than 60/60/60 when tested from the outside, including any openings protected in accordance with AS 3959 for BAL—19 or greater; or

(b) for external walls and roof, using a material or system that satisfies the test criteria of AS 1530.8.1 for a radiant heat flux of 10 kW/m² or greater.

Print Clause | Save Clause | Copy Clause | Email

S43C5 Separation from hazards

[New for 2022]

The external walls and roof of the building must be protected from potential hazards on the site such as liquefied petroleum gas bottles, fuel storage, storage of combustible materials, waste bins, vehicles, machinery, and the like, by—

(a) a separation distance of not less than 10 m; or

(b) where within the 10 m separation distance described in (a), constructed with external walls that have an FRL of not less than 60/60/60 when tested from the outside, including any openings protected in accordance with AS 3959 for BAL—19 or greater; or

(c) for external walls and roof, using a material or system that satisfies the test criteria of AS 1530.8.1 for a radiant heat flux of 10 kW/m² or greater.

Print Clause | Save Clause | Copy Clause | Email

S43C6 Non-combustible path around building

[New for 2022]

A non-combustible pathway directly adjacent to the building and not less than 1.5 m wide must be provided around the perimeter of the building.

Print Clause | Save Clause | Copy Clause | Email

S43C7 Access pathways

[New for 2022]

(1) Access pathways that lead to a road or open space must—

(a) be readily identifiable; and

(b) have an even surface; and

(c) have a minimum clear width of not less than 1 m.

(2) If the access pathway is an accessway that is required to comply with Part D4, the requirements of Part D4 override (1) to the extent of any inconsistency.

Print Clause | Save Clause | Copy Clause | Email

S43C8 Exposed external areas

[New for 2022]

An external area designed to hold people unable to be safely accommodated within the building, that may be exposed to radiant heat flux from a fire front during a bushfire event, must not be exposed to an incident radiant heat flux from the fire front exceeding 1 kW/m² above background solar radiant heat flux.

Print Clause | Save Clause | Copy Clause | Email

S43C9 Internal tenability

[New for 2022]

To maintain internal tenability throughout the duration of occupancy during a bushfire event, the building must comply with the following:

(a) An air handling system must be provided that is capable of—
  (i) being adjusted for full recycling of internal air for a period of not less than 4 hours to avoid the introduction of smoke into the building; and
  (ii) maintaining an internal air temperature of not more than 25°C.

(b) The building envelope must be designed such that if an air handling system required by (a) fails, then—
  (i) internal air temperatures can be maintained below 39°C; and
  (ii) internal surface temperatures can be maintained below 60°C.

(c) If the building is divided into separate compartments then, for the purposes of (a), each compartment must have a separate air handling system.

(d) Each air handling system required by (a) must be designed to account for the activation of smoke detectors from low concentrations of smoke from external sources, so as to ensure that air-conditioning and other essential systems remain operational.

Print Clause | Save Clause | Copy Clause | Email

S43C10 Building envelope

[New for 2022]

The building envelope must be constructed in accordance with AS 3959 – BAL 19 or greater, except that where the use of combustible materials is permitted by AS 3959, they are not to be used unless permitted by C2D10(4), (5) or (6).

Print Clause | Save Clause | Copy Clause | Email

S43C11 Supply of water for fire-fighting purposes

[New for 2022]

Water for fire-fighting purposes must be available and consist of—

(a) A fire hydrant system complying with E1D2; or

(b) A static water supply consisting of tanks, swimming pools, dams or the like, or a combination of these, together with suitable pumps, hoses and fittings, determined in consultation with the relevant fire brigade that—
  (i) is capable of providing the required flow rate for a period of not less than 4 hours; or
  (ii) has a volume of 10 000 litres for each occupied building.

State variation | Clear variation

NSW

Print Clause | Save Clause | Copy Clause | Email

S43C12 Emergency power supply

[New for 2022]

(1) Emergency power must be provided to support, for not less than 4 hours before and 2 hours after the passing of the fire front during a bushfire event, the ongoing operation of—

(a) air handling systems to maintain internal tenability; and

(b) any pumps for fire-fighting; and

(c) any emergency lighting and exit signs; and

(d) any other emergency equipment listed in C3D14(6) and required to be provided.

(2) Manual control for emergency back-up power supply must be provided to facilitate manual intervention where the power supply fails or runs out.

Print Clause | Save Clause | Copy Clause | Email

S43C13 Signage

[New for 2022]

Signage must be provided to warn building occupants against storing combustible materials under or adjacent to the building.

Print Clause | Save Clause | Copy Clause | Email

S43C14 Vehicular access

[New for 2022]

Vehicular access to the building must be provided in accordance C3D5(2), as if the building were a large isolated building for the purposes of C3D4.

Print Clause | Save Clause | Copy Clause | Email

Appendix G: Section 6.4 PBP-2019, Development of existing SFPP facilities

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6.3.2 Specific residential-based SFPP

- **Manufactured home estates** – Manufactured housing can be built to achieve all levels of construction required under the NCC. However, SEPP 36—*Manufactured Home Estates* does not require a separate development consent for each manufactured home after development consent is given for the estate.

  Due to the nature of manufactured home estates, there is no mechanism within the development consent process to ensure that the dwellings will be constructed to the standards applied within AS 3959 or NASH Standard. Therefore, the acceptable solution for manufactured housing is the provision of an APZ which achieves 10kW/m^2 commensurate with SFPP development in line with Table A1.12.1.

  Where evidence can be provided which confirms that dwellings within the manufactured home estate will be constructed to the appropriate construction standards under AS 3959 or NASH Standard, an APZ can be provided which meets 29kW/m^2 in line with Tables A1.12.2 - A1.12.3.

- **Home based child care** - Due to their residential setting and lower occupant numbers, this use is not considered to be a SFPP. The specific standards for home-based child care can be found in Chapter 7. It should be noted that there are other forms of child care which are considered to be SFPP development, including centre based child care and school based child care.

- **Tertiary institutions** - Tertiary institutions such as universities and TAFEs may accommodate large numbers of people with various physical capabilities.

  Where the university or TAFE includes accommodation, the residential component is SFPP.

  Other uses in tertiary institutions may not be defined as SFPP by the RF Reg but require approval under the EP&A Act s4.14. This may include assembly occupancies (see Chapter 8).

6.4 Development of existing SFPP facilities

In circumstances where new building projects within existing SFPP developments are proposed, an appropriate combination of BPMs are required.

This will involve the BFDB process where relevant stakeholders agree on the basis for any assessment and measures that will result in a better bush fire outcome for the proposal. The NSW RFS should be consulted early in the design stage. Refer to Appendix 2 for more detailed information on the BFDB process.

The intention for any building work occurring within an existing SFPP development is to achieve a better bush fire outcome than if the development did not proceed. Achieving this may require a combination of measures including improved construction standards, APZs and evacuation management. This may result in a level of retrofitting of existing buildings and managing other portions of the site (i.e. APZs) to ensure an improved level of bush fire protection.

Intensification of the use or increase in occupancy must consider the risk to occupants and firefighters. Where practically achievable, full compliance should be provided before variations to the required BPMs are considered. Proposals that involve internal alterations only, are not subject to any specific requirements unless the proposal results in a change of use, re-purpose and/or involves an increase in occupants.

Existing SFPP facilities constructed without the benefit of current bush fire requirements need to consider providing a designated safe refuge building to accommodate all occupants. The safe refuge shall provide a radiant heat threshold of no greater than 10kW/m^2 and a minimum BAL-12.5 construction.

Existing services such as water supplies and access may also require upgrading.

Existing structures located within an APZ may be problematic for a new building due to the potential risk of building to building fire spread. Where this occurs, a performance based solution will be required to provide a safer outcome.

A Bush Fire Emergency Management Plan that is consistent with the NSW RFS publication: A Guide *to Developing a Bush Fire Emergency Management and Evacuation Plan*, and the Australian Standard AS 3745:2010 *Planning for emergencies in facilities* will be required to be prepared for the existing facility.

The objectives that apply to existing SFPP development are as follows:

- provide an appropriate defendable space;
- site the building in a location which ensures appropriate separation from the hazard to minimise potential for material ignition;
- provide a better bush fire protection outcome for existing buildings;

- new buildings should be located as far from the hazard as possible and should not be extended towards or situated closer to the hazard than the existing buildings (unless they can comply with section 6.8);
- ensure there is no increase in bush fire management and maintenance responsibility on adjoining land owners without their written confirmation;
- ensure building design and construction enhances the chances of occupant and building survival; and
- provide for safe emergency evacuation procedures including capacity of existing infrastructure (such as roads).

6.5 Minor development in SFPP facilities

Minor development includes the following:

- Internal works;
- Flag poles;
- Aerials and antennas;
- Satellite dishes;
- Paved areas;
- Earth works and draining;
- Class 10a structures located further than 6m from a habitable building; and
- Minor non-structural building alterations (external) such as the following:
  - painting, plastering, cement rendering, cladding, attaching fittings or decorative work;
  - the replacement of an external window, glazing areas or a door (however, the opening and/or external glazed area of the window or door must not be increased in size);
  - the repair to or replacement of a non-structural wall or roof cladding;
  - the installation of a security screen or grill to a door or window or a security door;
  - the repair to or replacement of a balustrade; and
  - re-stumping or repairing structure foundations without increasing the height of the structure.

The development types listed above do not have any influence on potential bush fire impacts and the bush fire protection of the building. For this reason, the NSW RFS does not consider that a BFSA is necessary for the development types listed above. Wherever applicable, the building elements concerned will need to comply with the requirements of AS 3959 or NASH Standard under the NCC.

6.6 Alpine resorts

Alpine resorts are located within the Kosciuszko National Park and include:

- Thredbo;
- Perisher – including Perisher, Smiggin Holes, Mount Blue Cow and Guthega;
- Charlotte Pass;
- Selwyn Snow Resort;
- Ski Rider Hotel;
- Kosciuszko Tourist Park;
- Sponars Chalet; and
- Bullocks Flat Terminal.

The alpine resorts are located within the environmentally significant setting of the Kosciusko National Park. The alpine resort areas are predominantly used for short- term tourist accommodation and are considered to be SFPP development. Much of the existing building stock has not been constructed to current requirements for development in a bush fire prone area.

Leasehold arrangements combined with conflicting land management objectives present challenges in achieving APZs for SFPP developments in the alpine areas.

The specific objectives that apply to SFPP infill development in the alpine resort areas are as follows:

- provide an appropriate defendable space;
- provide a better bush fire protection outcome for existing structures (e.g. via ember protection measures);
- ensure new building work complies with the construction standards set out in AS 3959;
- to ensure ongoing management and maintenance responsibilities are in place where APZs are proposed outside of the sub lease or leasehold area;
- written consent from the land managers is provided for all proposed works outside of the sub lease or leasehold area;
- proposed APZs outside of the sub lease or leasehold area are supported by a suitable legal mechanism to ensure APZs are managed under a binding legal agreement in perpetuity;
- ensure building design and construction standards enhance the chances of occupant and building survival; and

Appendix H: PBP-2019 Assessment Report

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Date: 17/10/2024

Our Ref: BR-848324-A

BUSHFIRE PLANNING & DESIGN

BUSH FIRE ASSESSMENT

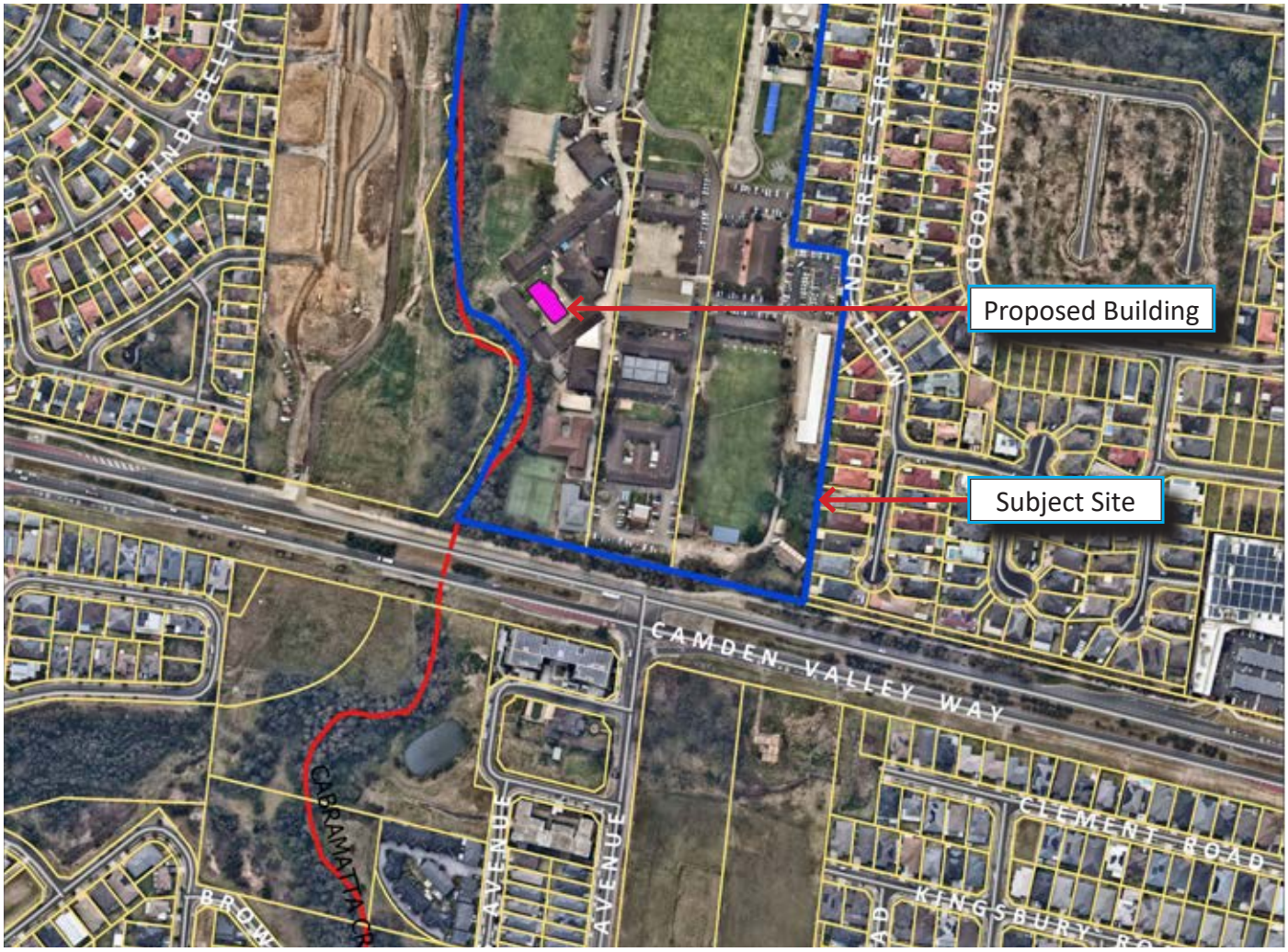
38-44 Bumbera Street Prestons 2170

Assessed as: Special Fire Protection Purpose (SFPP)

Prepared by: Matthew Noone | Accreditation NO: BPAD-25584 (BPAD Level 3)

Site Address: 38-44 Bumbera Street Prestons 2170 | Lot / DP: (Lot 50/-/DP1082480)

Project Description: Proposed Double Story Classroom Building



REPORT NUMBER
BR-848324-A

DATE	ISSUED TO	REV.	NOTES
09.10.2024	Helping Hands Planning & Design PTY LTD	A (Draft-1)	Issued for comment
17.10.2024	Helping Hands Planning & Design PTY LTD	A	Issued for Part 5 Approval

DISCLAIMER and TERMS OF USE

Bush Fire Planning & Design cannot be held liable for the loss of life or property caused by a Bush Fire event. This report has considered the relevant planning instruments, Bush Fire constructions codes and practices applicable at the time of writing. Should additional information be provided after this report has been issued, we reserve the right to review and if necessary modify our report. Bush Fire Planning and Design has no control over workmanship, buildings degrade over time and vegetation if not managed will regrow. In addition legislation and construction standards are subject to change. Due to significant variance of Bush Fire behaviour, we do not guarantee that the dwelling will withstand the passage of Bush Fire even if this development is constructed to the prescribed standards.

AS3959 (2018) states "*It should be borne in mind that the measures contained in this Standard cannot guarantee that a building will survive a Bush Fire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature of behaviour of fire, and extreme weather conditions*."

This report has been based on our interpretation of Planning for Bush Fire Protection (2019), AS3959 (2018) and the methodology for site specific Bush Fire assessment. Our opinions may differ from the opinions provided by you the Client (or Client Representative), the Council, the RFS or another Bush Fire consultant. Our role is intermediary between our Client (or Client Representative) and the consenting authority. We apply our knowledge of the relevant Bush Fire protection standards to provide the best possible outcome for our Client (or Client Representative), both from a Bush Fire safety and financial perspective. Should the RFS modify our recommendations or reject the proposal to which this report relates to we will not be held liable for any financial losses as a result. By using this document, you the Client (or Client Representative) agree to and acknowledge the above statements.

TABLE OF CONTENTS

GLOSSARY

The abbreviations that are commonly used are explained below. Not all are present in this report.

APZ	Asset Protection Zone
AS3959	Australian Standard for the Construction of a Building in a Bush fire Prone Area
BAL	Bush Fire Attack Level
BCA	Building Code of Australia
BFPL	Bush Fire Prone Land
BFPLM	Map Bush Fire Prone Land Map
BFDB	Bush Fire Design Brief
BPM	Bush Fire Protection Measure
DA	Development Application
DCP	Development Control Plan
DPIE	Department Of Planning, Industry And Environment
DTS	Deemed to Satisfy
EPA ACT	Environmental Planning And Assessment Act 1979
FDI	Fire Danger Index
FFDI	Forest Fire Danger Index
GFDI	Grassland Fire Danger Index
IPA	Inner Protection Area
LEP	Local Environmental Plan
NASH	National Association of Steel Framed Housing
NCC	National Construction Code
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection
RF ACT	Rural Fires Act
RF REG	Rural Fires Regulation
NSW RFS	New South Wales Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SFR	Short Fire Run
SSD	State Significant Development

PART A - PROJECT DETAILS

ASSESSMENT DETAILS

Client		Helping Hands PTY LTD	
Location		38-44 Bumbera Street Prestons 2170	
Title reference		(Lot 50/-/DP1082480)	
LGA		Liverpool City Council	
Zoning		R2 Low Density Residential	
Development Type		Double Story Classroom Building	
PBP (2019) Assessment Type		Special Fire Protection Purpose (Chapter 6)	
Bushfire Consultancy		Bushfire Planning and Design - Director Matthew Noone - Accreditation number BPAD-25584 (Level 3)	
Report no.	Date of Issue	BR-848324-A	17/10/2024

SCOPE

The first intended audience is our Client and the Design Team. The recommendations in this report should be adopted integral to design development. Our report addresses the submission requirements for a Bush Fire Safety Authority (PBP 2019, s.A2.1) and provides and assessment against the Acceptable Solutions for Special Fire Protection Purpose development (Chapter 5 PBP 2019). Any deviations from the Acceptable Solutions are being addressed in the Bush Fire Design, Compliance, & Approvals Report prepared by others.

A.01 BUSH FIRE PRONE LAND

The subject site whether in whole or part is recorded as bush fire affected on a relevant map certified under Section 10.3 (2) of the Environmental Planning and Assessment Act 1979 (Refer figure A.01). The proposed classroom building is located in the buffer to the east of the Category 2 Vegetation.

Source: https://portal.spatial.nsw.gov.au/server/rest/services/Hosted/NSW_Bush_Fire_Prone_Land/FeatureServer/0 (17/10/2024)

FIGURE A.01 BUSHFIRE PRONE LAND MAP	Plot date:08/10/2024	Project CRS: EPSG:28356	A.01
Buffer 0 Category 1 Category 2 Category 3 Subject Site Proposed Classroom Building	0 60 120 180 240 m Meters		
	BUSHFIRE PLANNING & DESIGN bpad.matthew.noone@gmail.com / 0406077222		

A.02 DEVELOPMENT PROPOSAL

The development relates to the construction of a two storey classroom building having a footprint of 364m^2. The proposed classroom building is located in the courtyard surrounded on all sides by existing buildings (Block G to the west, Block E to the south, block D to the east and the existing one story brick building to the north (See concept drawing below).

Concept Drawing.

A.03 REGULATORY FRAME WORK

The subject site whether in whole or part is recorded as Bush Fire affected on a relevant map certified under Section 10.3 (2) of the Environmental Planning and Assessment Act 1979. The proposed school development is being lodged under Part 5 of the Environmental Planning and Assessment Act 1979 (EPA Act), which requires an environmental assessment to determine the potential impact of the project. While the development is not considered integrated under the Act, it must be referred to the NSW Rural Fire Service (RFS) in accordance with Section 100B of the Rural Fires Act 1997. The following legislative instruments are applicable.

PRE-DEVELOPMENT CONSENT

- Part 5 of the Environmental Planning and Assessment Act 1979
- s.100B Rural Fire Act (1997) Bush fire safety authorities.
- s.45 Rural Fire Regulation (2022).
- Planning for Bush Fire Protection (2019).
- Planning for Bushfire Protection (2022) Addendum.
- National Construction Code (2022) Specification 43.

POST-DEVELOPMENT CONSENT

- National Construction Code (2022).
- AS3959 (2018) Construction of Buildings in Bush Fire Prone Areas.

The project is assessed as Special Fire Protection Purpose (SFPP) as defined in section 6 (PBP 2019). An

"*SFPP development is one which is occupied by people who are considered to be at-risk members of the community. In a bush fire event, these occupants may be more susceptible to the impacts of bush fire. Evacuating at-risk members of the community is more challenging because they may be physically or psychologically less able to relocate themselves or are unfamiliar with their surroundings. Examples of SFPP developments are schools, hospitals, nursing homes and tourist accommodation*" (PBP 2019, p.49).

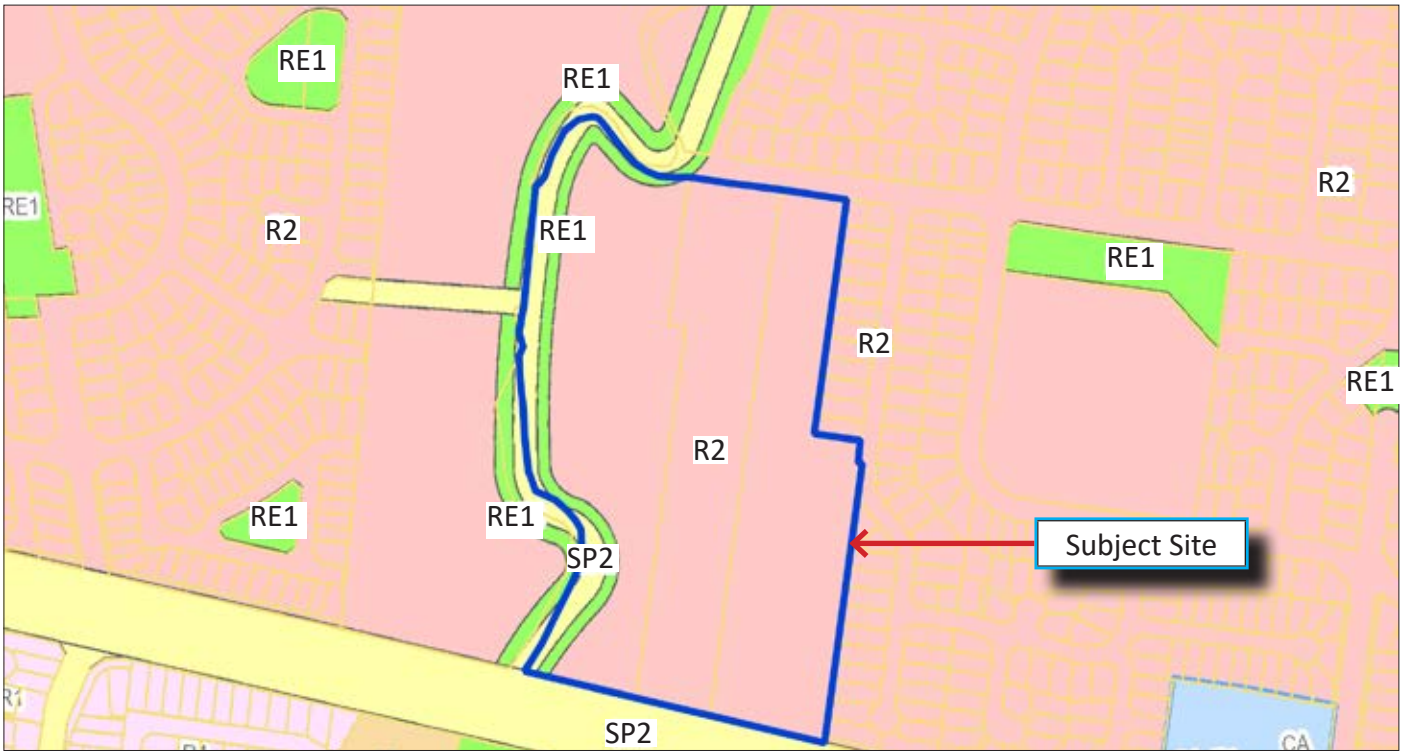
A.04 SITE LOCATION, DESCRIPTION AND POTENTIAL BUSH FIRE THREATS

The subject site is located in Prestons, within the Liverpool City Local Government Area (LGA). It is occupied by William Carey Christian School, which has been on the site since 1988. The school offers independent co-educational early learning, as well as primary and secondary day schooling. The established school grounds contain various buildings, playing fields, open spaces, and car parks, typical of school infrastructure.

To the west of the site, a narrow vegetation corridor (NVC), identified as a Forested Wetland, surrounds Cabramatta Creek. The entire site is maintained with minimal fuel conditions. The land to the east and south is managed residential land. The riparian corridor is mapped as Vegetation Category 2, which has lower combustibility and/or limited potential fire size due to its shape, size, land geography, and management practices (RFS 2015).

A.05 LAND USE, ZONING AND PERMISSIBILITY

The subject site is primarily zoned R2 Low Density Residential. A portion of the western boundary is zoned SP2 Infrastructure and RE1 Public Recreation.



Source: NSW Planning Portal Spatial Viewer accessed online at https://www.planningportal.nsw.gov.au/spatialviewer (17/10/2024)

LAND ZONING LEGEND

R2 Low Density Residential

SP2 Infrastructure

RE1 Public Recreation

FIGURE A.04 - LOCATION DWG (CONTEXT)

Image source: Nearmap accessed on line 17/10/2024

FIGURE A.04 LOCATION DRAWING	Plot date:08/10/2024	Project CRS: EPSG:28356	A.04
Subject Site Proposed Classroom Building NamedWatercourse	0 40 80 120 160 m Meters		
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A.06 SIGNIFICANT ENVIRONMENTAL FEATURES

It is our observation that there are no notable environmental features within the site. Cabramatta Creek runs north to south following the western boundary.

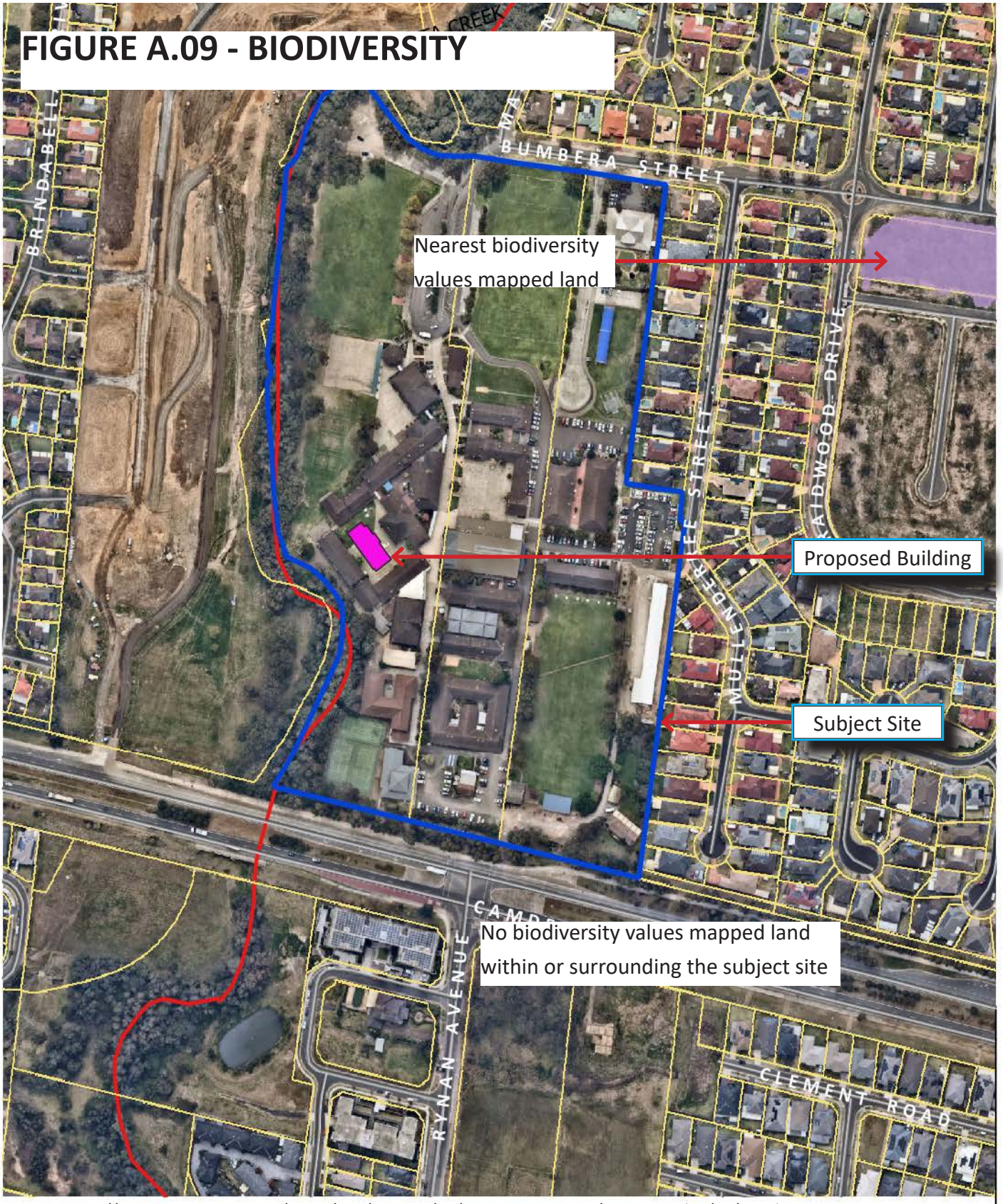
A.07 DETAILS OF ABORIGINAL HERITAGE

To our knowledge the site is not associated with any items of Aboriginal heritage.

A.08 THREATENED SPECIES, COMMUNITIES AND CRITICAL HABITATS

The subject site is not mapped by the Department of Planning, Industry and Environment (DPIE) under Part 7 of the Biodiversity Conservation Act 2016 (BC Act) as having Biodiversity Values (BV). There is no BV mapped land within the proposed development area. Refer to Figure A.09.

FIGURE A.09 - BIODIVERSITY



Source: https://www.lmbc.nsw.gov.au/arcgis/rest/services/BV/BiodiversityValues/MapServer(17/10/2024).

FIGURE A.09 BIODIVERSITY	Plot date:08/10/2024	CRS: EPSG:28356	A.09
BIODIVERSITY VALUES Biodiversity Values Biodiversity Values added in the last 90 days Subject Site Proposed Classroom Building NamedWatercourse The BV Map has been prepared by the Department of Planning, Industry and Environment (DPIE) under Part 7 of the Biodiversity Conservation Act 2016 (BC Act).	0 — 150 m Meters	BUSHFIRE PLANNING & DESIGN bpad.matthew.noone@gmail.com / 0406077222	

A.09 REPORT LIMITATIONS

This report is provided for assessing relevant building bush fire protection and associated land use requirements within the context of PBP (2019). For further information refer to section 1.3 PBP (2019).

This bush fire assessment is developed based on the current accepted standards. The severity of bush fire attack is reliant on many variables. Due to these variables the bush fire attack on any given day could be higher due to the limitations outline below. The bush fire protection measures contained in this document does not guarantee that loss of life, injury or property damage will not occur during a bush fire event.

Legislative Standards

Recommendations relating to development of bush fire prone land are a directive through the legislative standards applicable at the time of writing. Legislative standards change over time. All recommendations made are based on the current standards. We cannot guarantee that the current standards will be suitable in comparison to future standards.

Maintenance

After the issuance of an Occupancy Certificate (OC) it is imperative that the bush fire protection recommendations are carried out for the life of the development. Failure to maintain a property in accordance with the RFS standards for Asset Protection Zones could lead to the failure of the building, property and life. We have no control over the extent of how well a property will be maintained post OC.

PART B - BUSH FIRE ATTACK LEVEL (BAL) ASSESSMENT METHODOLOGY

B.01 INTRODUCTION

For the purpose of this bush fire assessment, the vegetation is required to be described to a distance of 140m from the boundary and the slope to 100m from boundary. Vegetation type and slope under vegetation are the factors that will significantly affect bush fire behaviour.

'Research has shown that 85% of houses are lost in the first 100m from bushland and that ember attack is a significant form of attack on properties' (RFS 2006).

B.02 SLOPE DETERMINATION

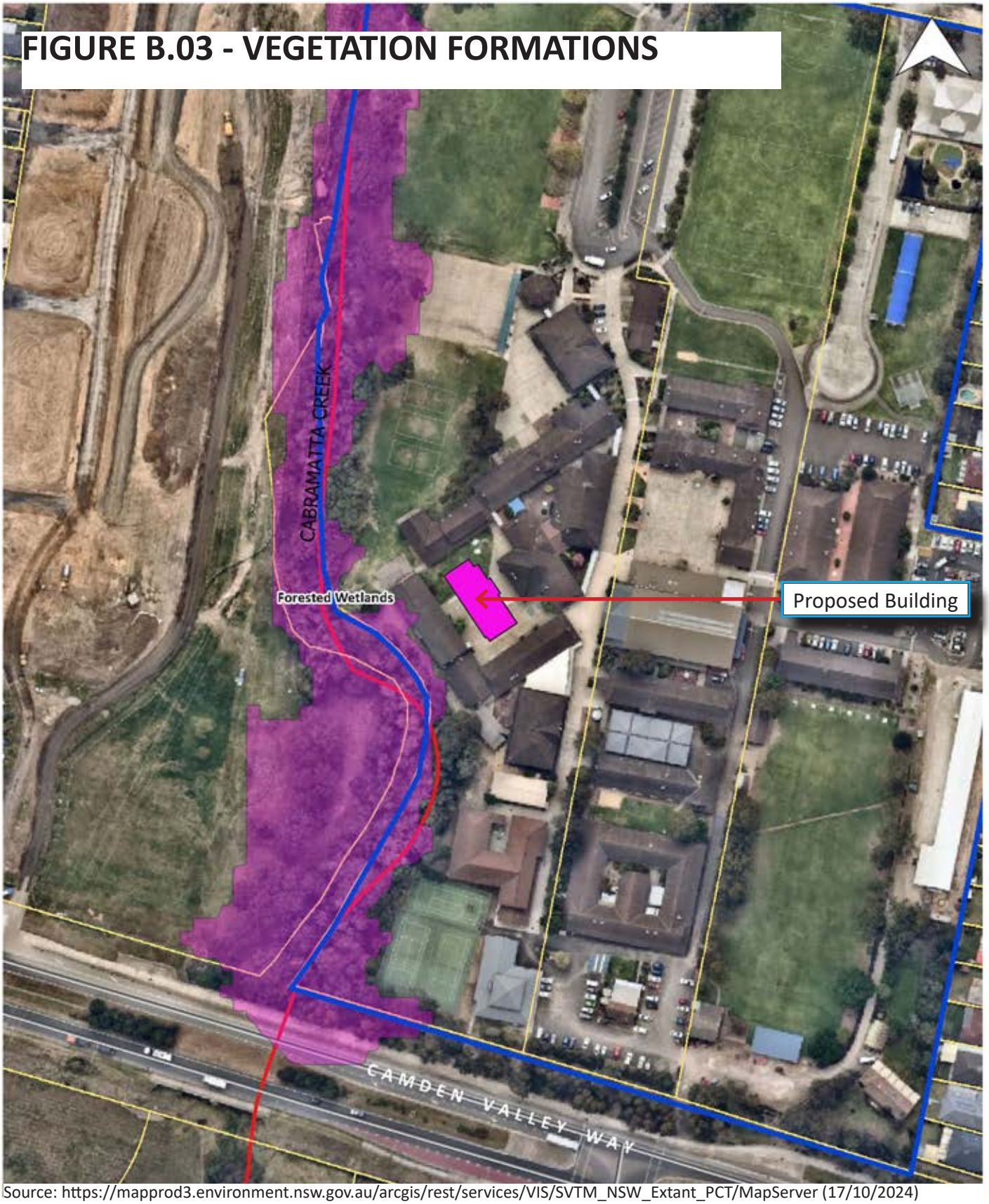
The effective slope has been assessed for a distance of at least 100m from the proposed development. The slope data has been calculated from a 1m LiDAR Digital Elevation Model (DEM). The source data sets have been captured to standards that are generally consistent with the Australian ICSM LiDAR Acquisition Specifications with require a fundamental vertical accuracy of at least 0.30m (95% confidence) and horizontal accuracy of at least 0.80m (95% confidence). The slope arrows indicated in figure A represent the slope calculated across the length of the arrow direct from the digital elevation model. The calculated slope as shown in Figure A has not been manipulated or modified in any way.

B.03 PREDOMINANT VEGETATION FORMATIONS

This assessment considers the vegetation within the site and if relevant, vegetation external to the site boundaries. Where mixes of vegetation formations are located together, the vegetation formation providing the greater hazard (highest radiant heat load) shall be used to determine the BAL and APZ. The combination of vegetation and slope that yields the worst case scenario shall be used (A1.2 PBP 2019). The vegetation mapping provides an overview of the types of vegetation proximal to the site. The vegetation mapping shown in Figure B.04 is not intended to be conclusive.

Based on the above assessment methodology, the predominant bush fire prone vegetation within 140m of the proposed development is Forested Wetland.

FIGURE B.03 - VEGETATION FORMATIONS



Source: https://mapprod3.environment.nsw.gov.au/arcgis/rest/services/VIS/SVTM_NSW_Extant_PCT/MapServer (17/10/2024)

FIGURE B.03 - VEGETATION FORMATIONS

Subject Site | Forested Wetlands | Proposed Classroom Building | NamedWatercourse

CRS: EPSG:28356

Plot date:08/10/2024

0 Meters 100 m

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projects@bpad-nsw.com / 0406077222

B.04 BUSH FIRE ATTACK LEVEL (BAL) ASSESSMENT.

Cabramatta Creek is located to the west of the proposed building, closely following the western boundary. The vegetation within and surrounding the Creek is mapped as Forested Wetland (Refer State Vegetation Mapping (Figure B.04). The thin band of Forested Wetland is mapped as Vegetation Category 2. Vegetation Category 2 has lower combustibility and/or limited potential fire size due to the vegetation area shape and size, land geography and management practices (RFS 2015).

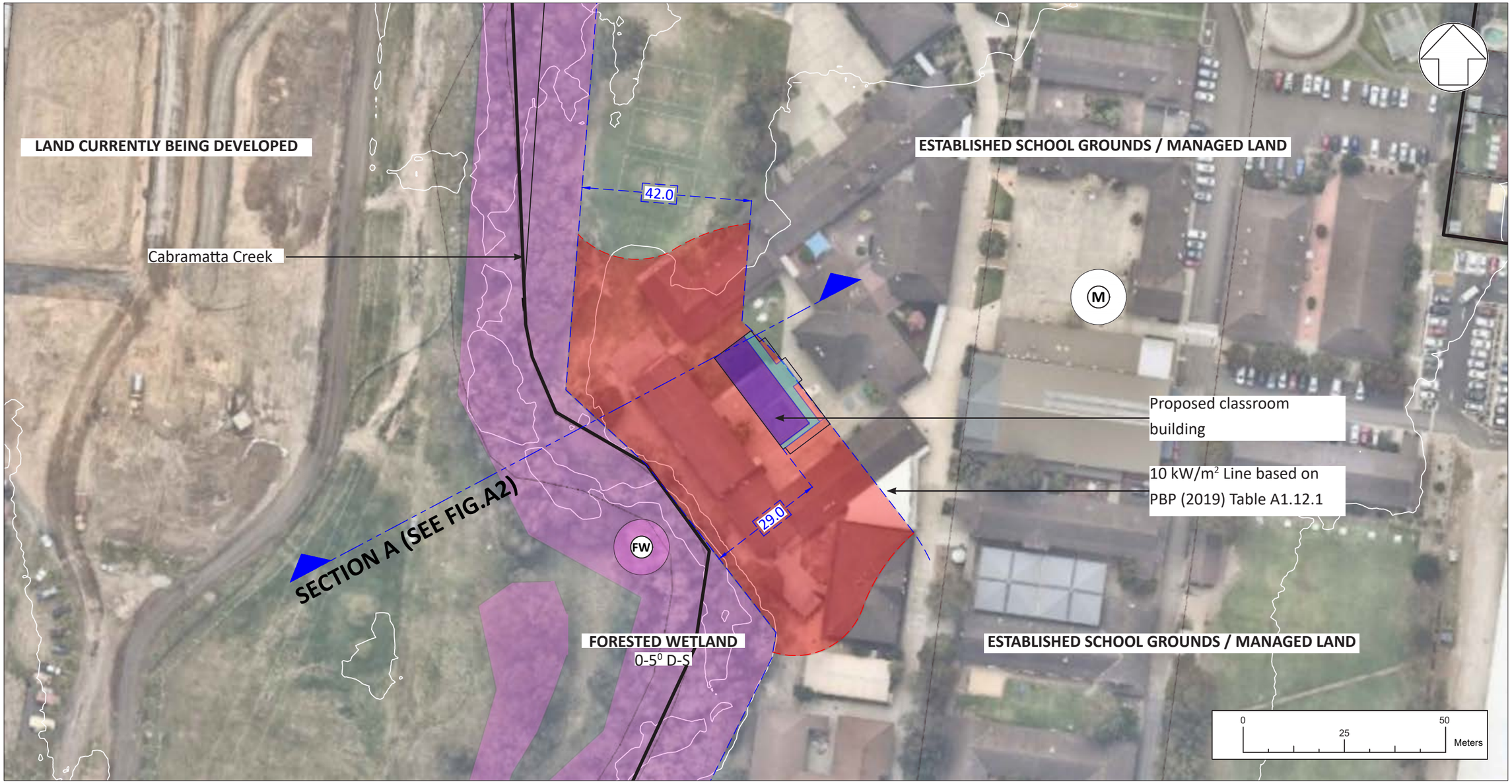
As per the PBP (2019) SFPP development is required to demonstrate that radiant heat levels greater than 10kW/m² (calculated at 1200K) will not be experienced on any part of the building. The 10 kW/m^2 cannot be achieved via a deemed to satisfy pathway. The available APZs are shown below in Table 1 and in Figure A1 (page 17).

Figure A2 has been provided as supplementary information. Method 2 (AS3959) modelling indicates the proposed classroom building could experience radiant heat loads up to 14.62 kW/m^2 if exposed to bushfire. This calculation does not consider other factors such as shielding by the surrounding buildings or the ability for the creek vegetation to support a fully developed fire. The calculation is therefore considered to be an over estimate.

TABLE 1 (To be read in conjunction with Figure A1.				
LGA = Liverpool City			Fire Danger Index = FDI 100	
ASPECT [1]	Vegetation Class [2]	Max Effective Slope [3]	Required APZ [4]	Achieved APZ
W	Forested Wetland [6]	0-5^0 D-S	42m	29m

Abbreviations		
AOD All other directions	EML Extent of managed land	NVC Narrow vegetation corridor
D-S Down Slope		

1	*Cardinal direction from each proposed building facade based on grid north.*
2	*Vegetation Classifications are as described in PBP (2019) A1.2.*
3	*Site slope is calculated from 1m LiDAR contours.*
4	*Acceptable Solutions for Infill as presented in Table A1.12.1 PBP (2019).*
5	*Actual dimensional setback from the face of the building to the assessed vegetation. Achieved Asset Protection Zone (APZ) or extent of managed land (EML).*



VEGETATION KEY

M — Managed Land

FW — Forested Wetland

DRAWING LEGEND

Site Boundary

Proposed Classroom Building

Proposed Stairs and Ramps

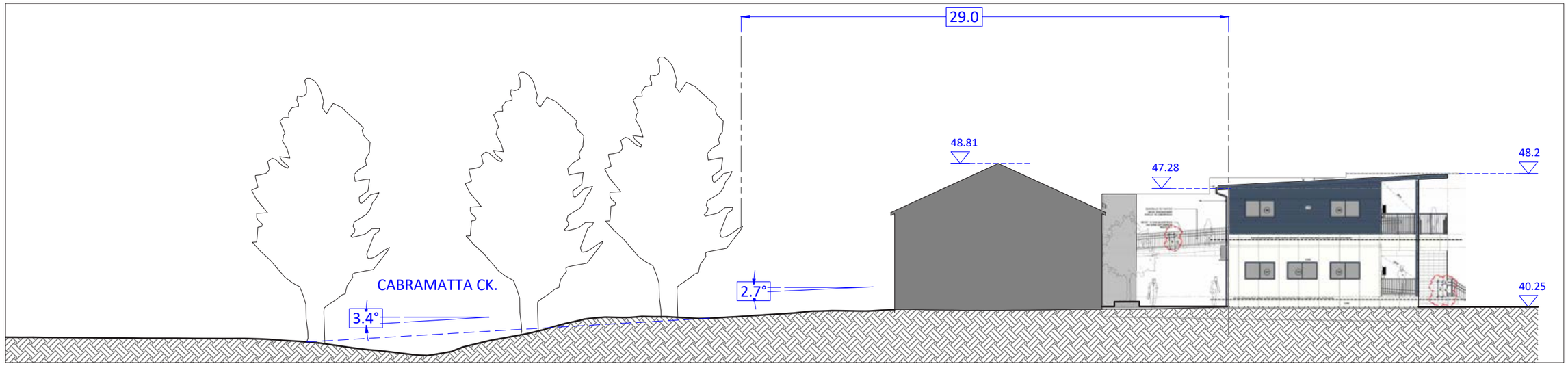
DTS APZ required to achieve 10 kW/m2 (PBP 2019 Table A1.12.1)

BUSHFIRE PLANNING & DESIGN

projects@bpad-nsw.com
0406077222

Figure:

A1



SECTION A-A

1:250

NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 12/10/2024 **Assessment Date:** 12/10/2024

Site Street Address: William Carey Christian School, Prestons

Assessor: Matthew Noone; Bushfire Planning and Design

Local Government Area: Liverpool **Alpine Area:** No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001/Vesta/Catchpole
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

Run Description: W

Vegetation Information

Vegetation Type:	Forested Wetland (excluding Coastal Swamp Forest)		
Vegetation Group:	Forest and Woodland		
Vegetation Slope:	3.4 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	8.2	**Overall Fuel Load(t/ha):**	15.1
Vegetation Height(m):	2	Only Applicable to Shrub/Scrub and Vesta	

Site Information

Site Slope:	2.7 Degrees	**Site Slope Type:**	Downslope
Elevation of Receiver(m):	Default	**APZ/Separation(m):**	29

Fire Inputs

Veg./Flame Width(m):	100	**Flame Temp(K):**	1200

Calculation Parameters

Flame Emissivity:	95	**Relative Humidity(%):**	25
Heat of Combustion(kJ/kg	18600	**Ambient Temp(K):**	308
Moisture Factor:	5	**FDI:**	100

Program Outputs

Level of Construction:	BAL 19	**Peak Elevation of Receiver(m):**	3.53
Radiant Heat(kW/m2):	14.62	**Flame Angle (degrees):**	82
Flame Length(m):	9.9	**Maximum View Factor:**	0.16
Rate Of Spread (km/h):	1.24	**Inner Protection Area(m):**	29
Transmissivity:	0.818	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	9707		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	8	11	17	24	39	6

Run Description: W

Vegetation Information

Vegetation Type:	Forested Wetland (excluding Coastal Swamp Forest)		
Vegetation Group:	Forest and Woodland		
Vegetation Slope:	3.4 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	8.2	**Overall Fuel Load(t/ha):**	15.1
Vegetation Height(m):	2	Only Applicable to Shrub/Scrub and Vesta	

Site Information

Site Slope:	2.7 Degrees	**Site Slope Type:**	Downslope
Elevation of Receiver(m):	Default	**APZ/Separation(m):**	29

Fire Inputs

Veg./Flame Width(m):	100	**Flame Temp(K):**	1090

Calculation Parameters

Flame Emissivity:	95	**Relative Humidity(%):**	25
Heat of Combustion(kJ/kg	18600	**Ambient Temp(K):**	308
Moisture Factor:	5	**FDI:**	100

Program Outputs

Level of Construction:	BAL 12.5	**Peak Elevation of Receiver(m):**	3.53
Radiant Heat(kW/m2):	9.84	**Flame Angle (degrees):**	82
Flame Length(m):	9.9	**Maximum View Factor:**	0.16
Rate Of Spread (km/h):	1.24	**Inner Protection Area(m):**	29
Transmissivity:	0.809	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	9707		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	8	11	17	24	39	6

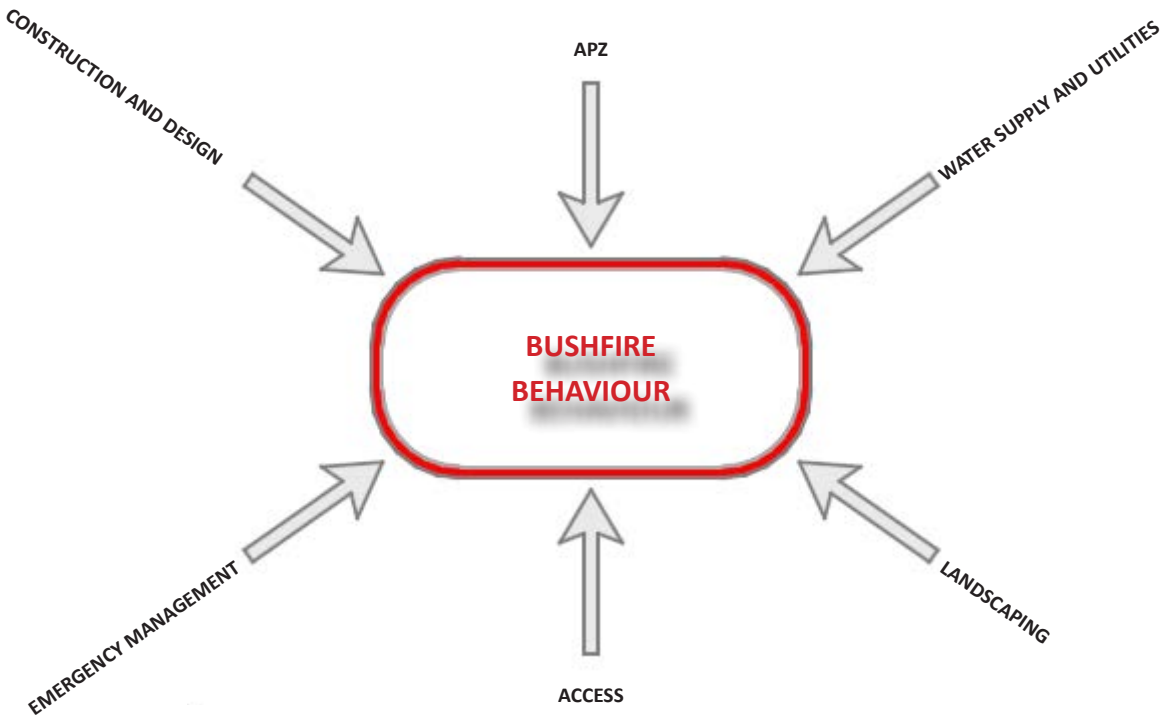
BUSHFIRE PLANNING & DESIGN
projects@bpad-nsw.com
0406077222

Figure:

A2

PART C BUSHFIRE PROTECTION MEASURES (BPMS)

BPMs can mitigate the impact of bush fire attack on people and assets. The types of protection measures include APZs, access, landscaping, water supply, building design and construction and emergency management arrangements. These measures assist building survival during a bush fire. They also contribute to the safety of firefighters and members of the community occupying buildings during the passage of a bush fire front. There are a range of different BPMs which should be applied in combination based upon the development type and the level of bush fire risk. All requirements for BPMs that relate to the development must be provided, as required by this document.



C.01 ASSET PROTECTION ZONES (APZs)

We have undertaken an assessment of the development against the acceptable solutions which requires an APZ to be provided to demonstrate radiant heat levels of greater than 10kW/ m² (calculated at 1200K) will not be experienced on any part of the building. Our assessment identifies that a 42m APZ is required to comply with the acceptable solutions. As shown in Figure A2, the achieved APZs do not comply with the Acceptable Solutions. The entire site which is occupied by a number of existing buildings, playing fields, open space, carparks and circulation is managed as an Inner Asset Protection Zone. We recommend the site continue to be managed as an inner APZ. The following guidelines are to be maintained in perpetuity.

TREE CANOPY TREATMENT

- Inner APZ tree canopy cover should be less than 15% at maturity;
- Inner APZ trees at maturity should not touch or overhang the building;
- Inner APZ lower limbs should be removed up to a height of 2m above the ground;
- Outer APZ tree canopy cover should be less than 30% at maturity;
- tree canopies should be separated by 2 to 5m; and
- preference should be given to smooth barked and evergreen trees.

SHRUBS

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- shrubs should not be located under trees;
- shrubs in the Inner APZ should not form more than 10% groundcover; and
- shrubs in the Outer APZ should not form more than 20% groundcover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

GRASS

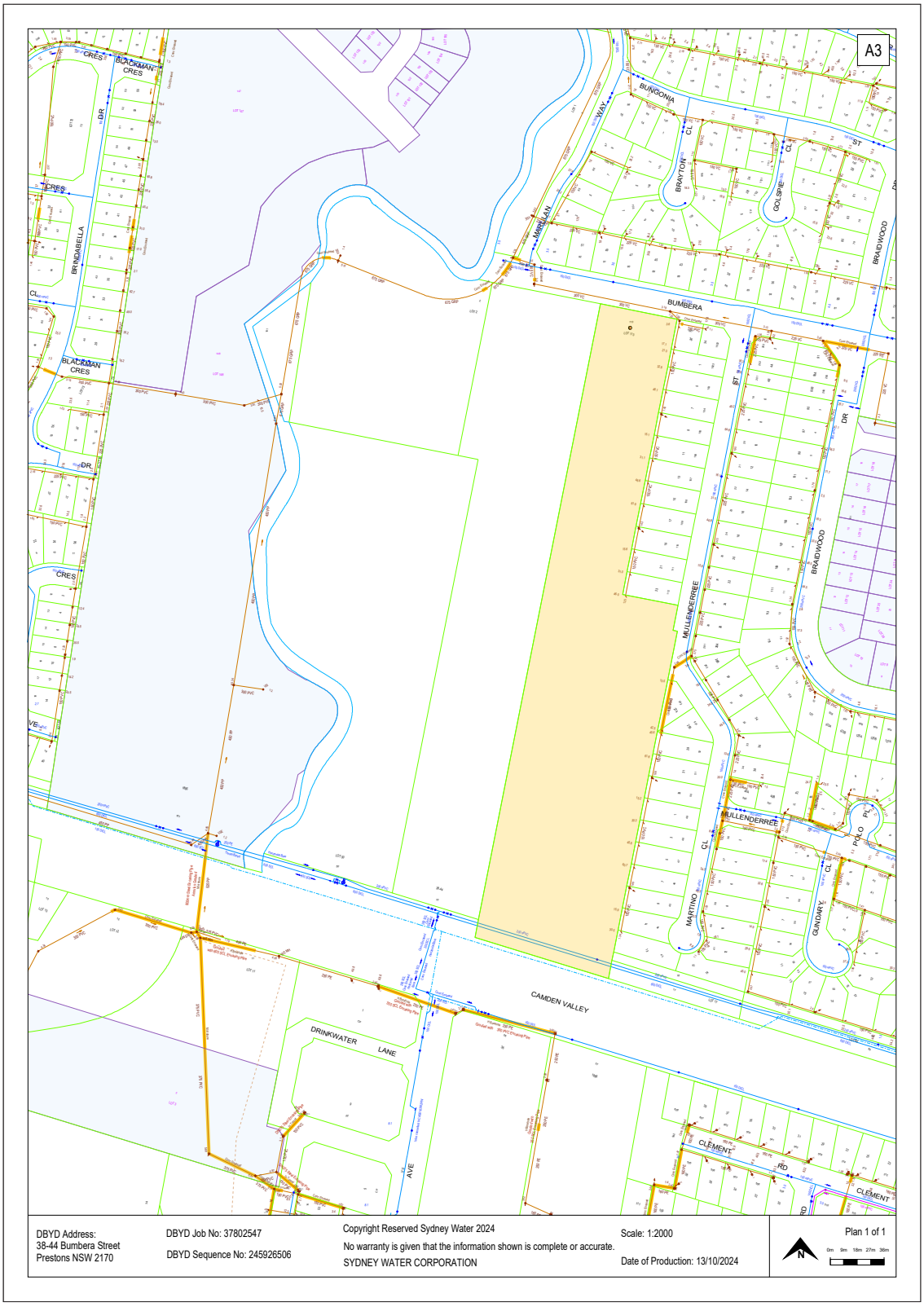
- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed.

VEGETATION IMPACT STATEMENT

The subject site is managed to minimal fuel conditions. From a bushfire protection perspective, no trees are required to be removed to satisfy PBP (2019) Appendix 4.

C.02 WATER

The site is serviced by existing reticulated water infrastructure, with water supply available from Bumbera Street to the north, Mullenenderree Street to the east, and Camden Valley Way to the south (refer to the Sydney Water Map below). While the exact design and location of hydrants within the site are currently unknown, a qualified hydraulic engineer will be engaged to design a suitable firefighting water supply system. This system will be in accordance with the requirements set out in Planning for Bush Fire Protection (PBP) and the National Construction Code (NCC).



C.03 ACCESS

ACCESS - PUBLIC ROADS

The public road system consists of two-lane roads, with a nominal carriage width of 8 meters kerb to kerb, providing sufficient capacity for emergency vehicles and evacuations. The surrounding road networks, including access points from Bumbera Street and Mullenderree Street, are not identified as bushfire-affected, ensuring reliable access and egress during a bush fire emergency.

ACCESS - FIRE TRAILS

It is noted the development site is located in what is essentially an urban area. There are no fire trails on or near the subject site, and as such, there are no nearby public roads linking to a fire trail network. However, the existing road infrastructure, including Bumbera Street to the north and Mullenderree Street to the east, provides two-way access, ensuring efficient vehicle movement in case of an emergency. There are no registered fire trails on the subject site.

ACCESS - PROPERTY ACCESS

Firefighting vehicles can access the site from Mullenderree Street to the east and Bumbera Street to the north without being impacted by radiant heat loads exceeding 10 kW/m^2. Access to the vegetation is available via Camden Valley Way to the south. It is likely the vegetation will be accessible via the new development to the west of Cabramatta Creek which is currently under development. However the details of that development are not confirmed.

C.04 EMERGENCY MANAGEMENT

In our reporting for the recently approved car park development (**CNR67805 DA-144/2024)** we had recommended the School update their emergency management plan to include a bushfire emergency management plan. The plan is to be consistent with the NSW RFS document: *A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan* or, the *NSW RFS Schools Program Guide* or the Australian Standard AS 3745:2010 Planning for emergencies in facilities. None the less, this recommendation is also applicable to this development and the previous bushfire emergency management and evacuation plan may need to be updated to include the proposed classroom development.

C.05 CONSTRUCTION

Our assessment of the Bushfire Attack Level indicates the proposed classroom building could experience radiant heat loads greater than 10 kW/m^2 if exposed to bushfire (based on the Acceptable Solutions and Table A1.12.1 (PBP (2019).

The proposed classroom building is to be constructed to comply with the NCC.

C.06 SPRINKLER SYSTEMS

To our knowledge, there are no existing or proposed sprinkler systems.

PART C ASSESSMENT AGAINST PBP (2019) SFPP S.6.4 OBJECTIVES

PBP Objectives for Existing SFPP Development	BPAD Comments	Compliance
provide an appropriate defendable space;	The proposed classroom building is located in the courtyard surrounded on all sides by existing buildings (Block G to the west, Block E to the south, block D to the east and the existing one story brick building to the north. Defendable Space is provided.	Yes
site the building in a location which ensures appropriate separation from the hazard to minimise potential for material ignition;	As above.	Yes
provide a better bush fire protection outcome for existing buildings;	With regard to the existing buildings surrounding the proposed classroom (Eg. Block G, E and un-named building to the north), we recommend improving the facades facing the creek only with regard to ember protection.	Yes
new buildings should be located as far from the hazard as possible and should not be extended towards or situated closer to the hazard than the existing buildings (unless they can comply with section 6.8);	The proposed classroom building does not extend closer to the hazard than existing buildings. Block G sits between the proposed building and Forested Wetland.	Yes
ensure there is no increase in bush fire management and maintenance responsibility on adjoining land owners without their written confirmation;	There is no additional bush fire management and maintenance responsibility on adjoining land owners.	Yes
ensure building design and construction enhances the chances of occupant and building survival; and	The building will be constructed to the specified requirements.	Yes
provide for safe emergency evacuation procedures including capacity of existing infrastructure (such as roads).	Addressed in our reporting for the previous carpark development (ref: BL-700023-B-2 dated 21/05/2024).	Yes

PART D RURAL FIRE REGULATION CLAUSE 45 (G) REVIEW

CLAUSE 45 ASSESSMENT REQUIREMENTS / ITEMS TO BE ADDRESSED			REFER
2(a)	*a description, including the address, of the property on which the development the subject of the application is proposed to be carried*		A.04
2(b)	*a classification of the vegetation on and surrounding the property, out to a distance of 140 metres from the boundaries of the property, in accordance with the system for classification of vegetation contained in Planning for Bush Fire Protection,*		B.03
2(c)	*an assessment of the slope of the land on and surrounding the property, out to a distance of 100 metres from the boundaries of the property,*		B.02
2(d)	*identification of significant environmental features on the property,*		A.06
2(e)	*the details of a threatened species or threatened ecological community under the Biodiversity Conservation Act 2016 that the applicant knows to exist on the property,*		A.08 A.09
2(f)	*the details and location of an Aboriginal object or place, within the meaning of the National Parks and Wildlife Act 1974, that the applicant knows to be situated on the property,*		A.07
2(g)	*a bush fire assessment for the proposed development, including the methodology used in the assessment, that addresses the following matters—*		
	(i)	*the extent to which the development is to provide for setbacks, including asset protection zones,*	B.04 C.01
	(ii)	*the siting and adequacy of water supplies for fire fighting,*	C.02
	(iii)	*the capacity of nearby public roads to handle increased volumes of traffic when a bush fire emergency occurs,*	C.03
	(iv)	*whether or not nearby public roads that link with the fire trail network have two-way access,*	C.03
	(v)	*the adequacy of arrangements for access to and egress from the development site for the purposes of an emergency response,*	C.03
	(vi)	*the adequacy of bush fire maintenance plans and fire emergency procedures for the development site,*	C.04
	(vii)	*the construction standards to be used for building elements in the development,*	C.05
	(viii)	*the adequacy of sprinkler systems and other fire protection measures to be incorporated into the development,*	C.06
	(ix)	*registered fire trails on the property,*	C.03

PART E RECOMMENDATIONS

Based on the above assessment, it is recommended that a performance based design in accordance with the International fire Engineering Guidelines (2005) and the Australian Fire Engineering Guidelines (2021) be developed to address the following issues;

- APZs to achieve 10 kW/m^2 and,
- Construction BAL-rating.
- NCC Specification 43.

PART F SUMMARY

The development relates to the construction of a two storey classroom building having a footprint of 364m^2. The proposed classroom building is located in the courtyard surrounded on all sides by existing buildings (Block G to the west, Block E to the south, block D to the east and the existing one story brick building to the north (See concept drawing below).

The proposed school development is being lodged under Part 5 of the Environmental Planning and Assessment Act 1979 (EPA Act), which requires an environmental assessment to determine the potential impact of the project. While the development is not considered integrated under the Act, it must be referred to the NSW Rural Fire Service (RFS) in accordance with Section 100B of the Rural Fires Act 1997. Our bushfire report has addressed the requirements for the submission of a bushfire safety authority as listed in Clause 45 of the Rural Fires Regulation 2022.

The subject site is located in Prestons, within the Liverpool City Local Government Area (LGA). It is occupied by William Carey Christian School, which has been on the site since 1988. The school offers independent co-educational early learning, as well as primary and secondary day schooling. The established school grounds contain various buildings, playing fields, open spaces, and car parks, typical of school infrastructure.

To the west of the site, a narrow vegetation corridor (NVC), identified as a Forested Wetland, surrounds Cabramatta Creek. The entire site is maintained with minimal fuel conditions. The land to the east and south is managed residential land. The riparian corridor is mapped as Vegetation Category 2, which has lower combustibility and/or limited potential fire size due to its shape, size, land geography, and management practices (RFS 2015).

We have undertaken an assessment of the development against the acceptable solutions which requires an APZ to be provided to demonstrate radiant heat levels of greater than 10kW/ m² (calculated at 1200K) will not be experienced on any part of the building. Our assessment identifies that a 42m APZ is required to comply with the acceptable solutions. As shown in Figure A1, the achieved / proposed APZs do not comply with the acceptable solutions. The entire site which is occupied by a number of existing buildings, playing fields, open space, carparks and circulation is managed as an Inner Asset Protection Zone. We recommend the site continue to be managed as an inner APZ.

Firefighting vehicles can access the site from Mullenderree Street to the east and Bumbera Street to the north without being impacted by radiant heat loads exceeding 10 kW/m². Access to the vegetation is available via Camden Valley Way to the south. It is likely the vegetation will be accessible via the new development to the west of Cabramatta Creek which is currently under development. However the details of that development are not confirmed.

The site is serviced by existing reticulated water infrastructure, with water supply available from Bumbera Street to the north, Mullenenderree Street to the east, and Camden Valley Way to the south (refer to the Sydney Water Map below). While the exact design and location of hydrants within the site are currently unknown, a qualified hydraulic engineer will be engaged to design a suitable firefighting water supply system. This system will be in accordance with the requirements set out in Planning for Bush Fire Protection (PBP) and the National Construction Code (NCC).

The construction of the building is to comply with the NCC. The Bushfire Attack Level specification is being addressed in the Bush Fire Design Brief prepared by others.

A Bush Fire emergency management and evacuation plan is to be prepared in accordance with the NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan. The emergency management plan is to be prepared as a condition of consent and to be completed prior to the release of the Occupancy Certificate.

Based on our assessment of the proposed development, it is recommended that a performance based design in accordance with the International fire Engineering Guidelines (2005) and the Australian Fire Engineering Guidelines (2021) be developed to address the items that demonstrate compliance via a performance pathway eg., APZs, Construction and in part, NCC Specification 43.

Report prepared by:	**Bushfire Planning and Design** Matthew Noone	
		

F.01 REFERENCES

AS3959 (2018)	Australian Standard, Construction of buildings in Bush Fire-prone areas, AS 3959, Third edition 2018 Standards Australia International Ltd, Sydney.
BCA (2019)	Building Code of Australia 2019, Building Code of Australia, Australian Building Codes Board, Canberra 2019.
EPA Act (1979)	Environmental Planning and Assessment Act 1979, NSW Government, NSW, legislation found at www.legislation.nsw.gov.au
Keith (2004)	Keith, D.A. (2004), Ocean shores to desert dunes: The Native Vegetation of New South Wales and the ACT. NSW Department of Environment and Conservation (2004).
PBP (2019)	Planning for Bush Fire Protection, a Guide for Councils,Planners, Fire Authorities, Developers and Home Owners. Rural Fire Service 2019, Australian Government Publishing Service, Canberra.
RFS (2015)	Rural Fire Service, Guide For Bush Fire Prone Land Mapping, Version 5b.

F.02 APPENDICES

Appendix A - Architectural Drawings.

Appendix B - Assessment Against Prescriptive Provisions - PBP (2019) Chapter 6.

Appendix C - Method 2 Calculations

APPENDIX A -

ARCHITECTURAL DRAWINGS

- ACC. WC
- AMB WC
- CIRCULATION
- COMMS
- EDB
- EXTERNAL DECK
- GLA
- GLA 1
- GLA 2
- GLA 3
- GLA 4
- GLA 5
- RAMP
- SCIENCE LAB 1
- SCIENCE LAB 2
- STORAGE
- WC

GENERAL NOTES

NOTE 01	FINAL POSITION OF THE MODULAR BUILDING IS DEPENDANT ON THE SITE SURVEY PROVIDED TO MARATHON BY A REGISTERED SURVEYOR. ANY LOCATION PLANS PROVIDED BY MARATHON ARE FOR REFERENCE ONLY.
NOTE 02	REFER THE STRUCTURAL ENGINEER DESIGN SET FOR DETAILS ON THE STRUCTURAL STEEL WORKS.
NOTE 03	ALL GPO'S TO BE 300MM ABOVE FINISHED FLOOR LEVEL UNLESS OTHERWISE NOTED.
NOTE 04	ALL LIGHT SWITCHES ARE TO BE INSTALLED BETWEEN 900MM AND 1000MM ABOVE FINISHED FLOOR LEVEL.
NOTE 05	COLOUR & FINISHES MAY BE ALTERED DEPENDING ON FINAL SELECTIONS AND AVAILABILITY. MARATHON WILL ENDEAVOR TO SWAP FINISHES FOR SIMILAR WHEREVER POSSIBLE.
NOTE 06	THE ARCHITECTURAL SERVICES LAYOUT DRAWING AND PRODUCT SPECIFICATION OUTLINE IS PRODUCED TO CONVEY THE INTENT ONLY. FIXTURES AND FITTINGS MAY VARY DEPENDING ON AVAILABILITY.
NOTE 07	POSITIONS OF BOTH INTERNAL AND EXTERNAL AC UNITS MAY VARY TO SUIT TRANSPORT REQUIREMENTS. MARATHON RESERVES THE RIGHT TO RELOCATE THESE UNITS TO BEST SUIT THE DESIGN.
NOTE 08	PROVIDED RENDER OR SKETCH 3D IN THIS DOCUMENTATION PACKAGE MAY NOT ACCURATELY REPRESENT THE FINAL PRODUCT.
NOTE 09	THE CLIENT IS RESPONSIBLE FOR PAYMENT OF RELEVANT AUTHORITY FEES AND APPLICATIONS TO COMPLETE THE WORKS UNLESS OTHERWISE AGREED.
NOTE 10	EXTENT OF THE SITE SERVICES CONNECTS IS AS PER THE SPECIFICATIONS.

DOOR SCHEDULE

Type Mark	WIDTH	HEAD HEIGHT	COUNT
D01	750	2200	1
D02	720	2040	5
D03	920	2040	10
D04	820	2040	2
Grand total: 18			18

WINDOW SCHEDULE

WINDOW TYPE	WIDTH	HEIGHT	SILL HEIGHT	HEAD HEIGHT	COUNT
W01	1810	1030	1000	2030	10
W02	2650	1030	1000	2030	20
W03	610	1030	1000	2030	1
W04	1450	1030	1000	2030	4
Grand total: 35					35

1 GROUND FLOOR PLAN
SCALE 1 : 100

marathon MODULAR
3 Rosella street, Singleton NSW, 2330
www.mgpl.com.au
P. 02 6575 2900

Rev	Date	Description
A	22.08.24	ISSUE FOR INFORMATION
B	26.08.24	REVISED TOILET MODULE LOCATION MIRRORED
C	29.08.24	CLIENT & CONSULTANT ISSUE
E	04.09.24	CLIENT ACCEPTANCE
F	05.09.24	CLIENT ACCEPTANCE

Client: Marathon Modular

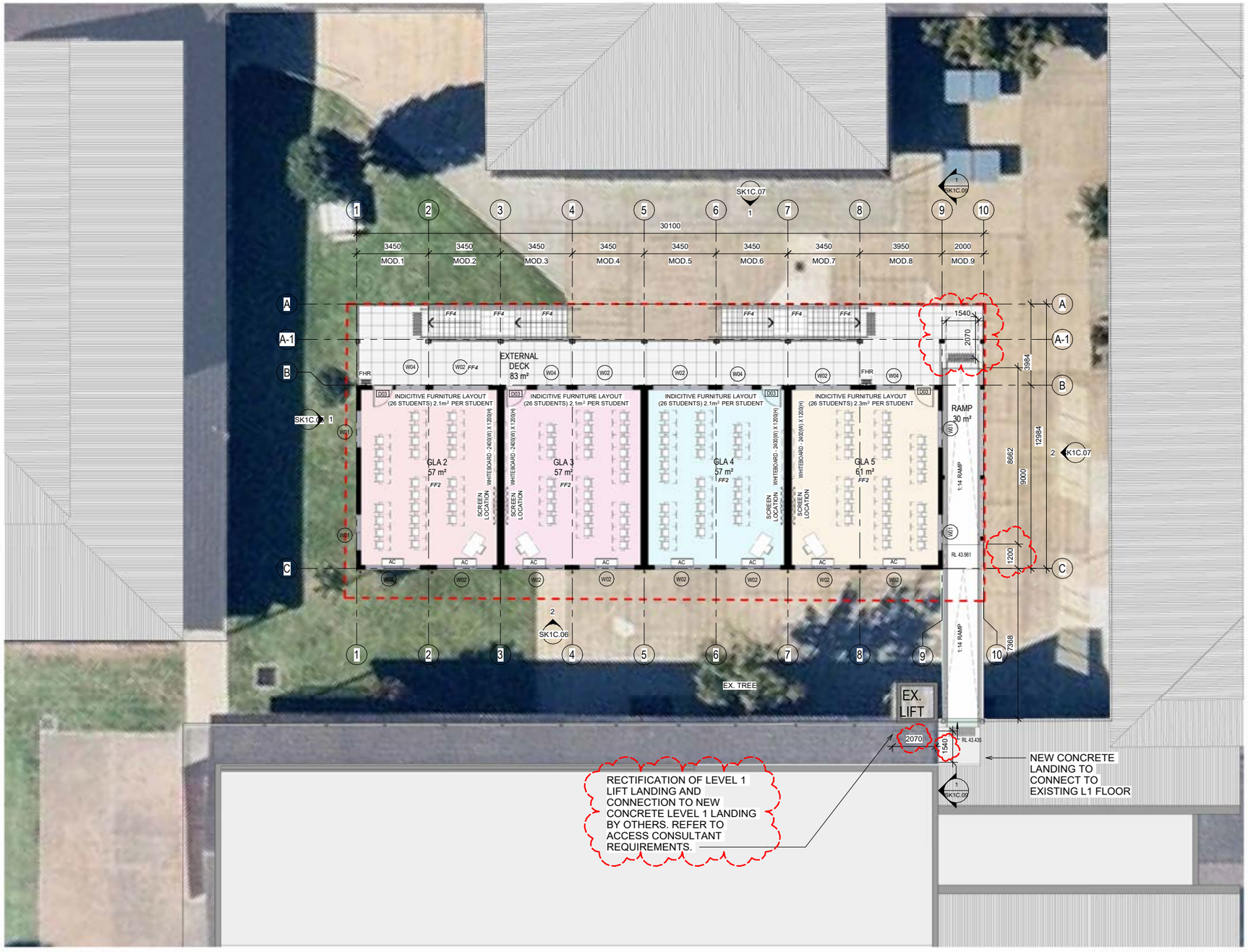
Project: William Carey Christian School

38-44 Bumbera Street
Prestons NSW 2170

Drawing: GROUND FLOOR PLAN

North | Scale: As indicated @ A1 | Date: 03/25/20 | Project No.: 2408 | Drawing No.: SK1C.03 G

Issued for: PRELIMINARY



- ACC. WC
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DOOR SCHEDULE

Type Mark	WIDTH	HEAD HEIGHT	COUNT
D01	750	2200	1
D02	720	2040	5
D03	920	2040	10
D04	820	2040	2
Grand total: 18			18

WINDOW SCHEDULE

WINDOW TYPE	WIDTH	HEIGHT	SILL HEIGHT	HEAD HEIGHT	COUNT
W01	1810	1030	1000	2030	10
W02	2650	1030	1000	2030	20
W03	610	1030	1000	2030	1
W04	1450	1030	1000	2030	4
Grand total: 35					35

1 | FIRST FLOOR PLAN
SCALE 1 : 100

marathon MODULAR

3 Rosella street, Singleton NSW, 2330
www.mgpl.com.au
P. 02 6575 2900

Rev

Issue	Date	Description
A	22.08.24	ISSUE FOR INFORMATION
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F	05.09.24	CLIENT ACCEPTANCE
G	09.09.24	CONSULTANT ISSUE

Client
Marathon Modular

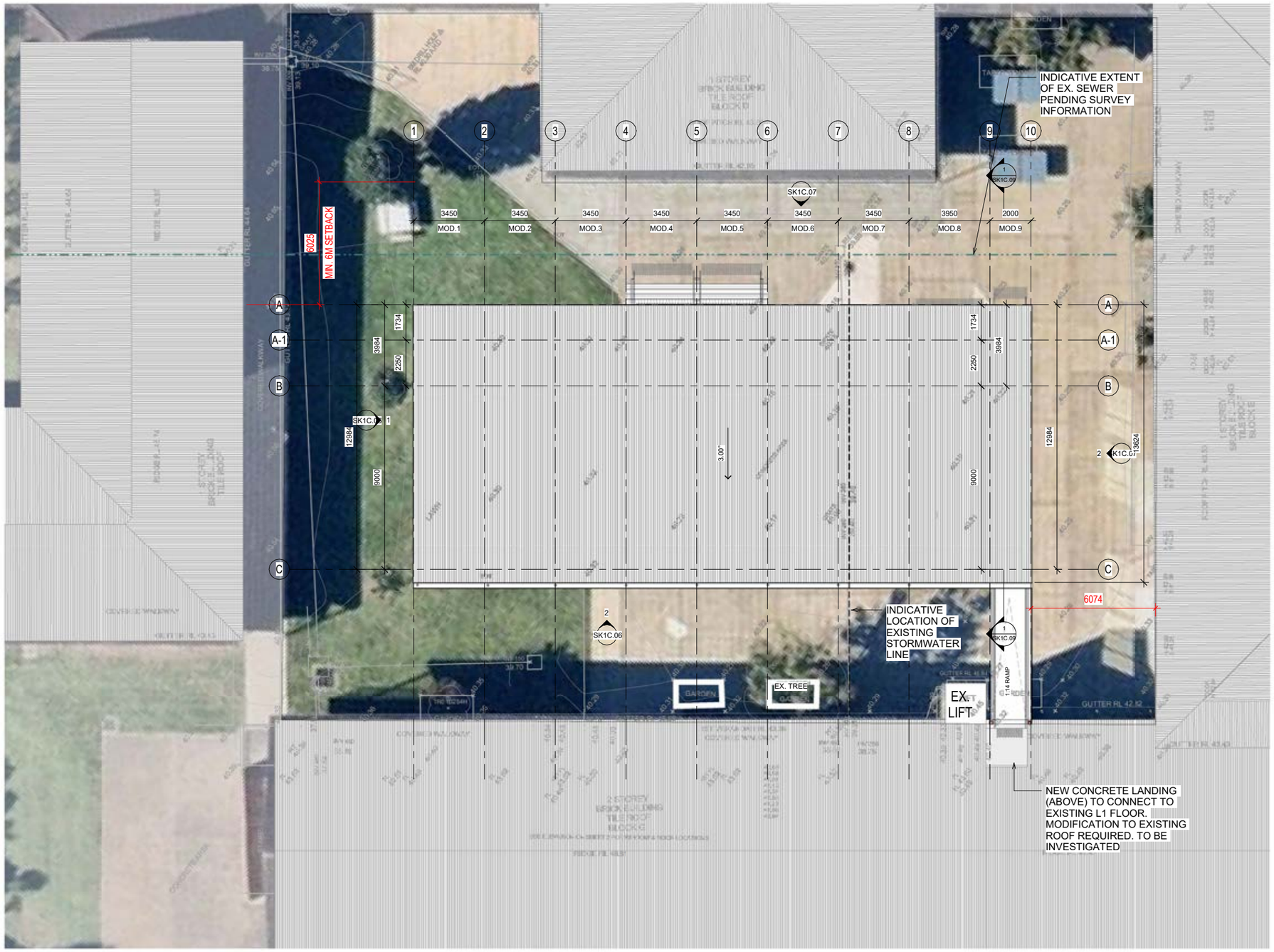
Project
William Carey Christian School

38-44 Bumbera Street
Prestons NSW 2170

Drawing
FIRST FLOOR PLAN

North	Scale	Date	Project No.	Drawing No.
	As indicated @ A1	03/25/20	2408	SK1C.04 G

Issued for
PRELIMINARY



1 | ROOF PLAN
SCALE 1 : 100

Code	Type	Marathon Proposal
FF1	Vinyl Slip Retardant Flooring	Armstring Flooring: Accolade Plus - Camden Grey
FF2	Carpet tile	Interface Carpets: Works Facet Colour: Earthern
FF3	Ground Floor External Verandah	Modwood: 137 x 23mm Blackbean Brushed
FF4	First Floor External Verandah & Stairs to First Floor	Ceramic Tile Colour/Range : Positano Cenere
WC1	Exterior cladding	Colorbond Custom Orb - Horizontal Colour: Deep Ocean
WC2	Exterior cladding	CFC Cladding 1200 x 2400mm Colour: Shale Grey
IF1	Internal Plasterboard Lining Wall & Ceiling Plasterboard	Paint Colour: Dulux Lexicon Qtr
RF	Trimclad Roof Sheeting	Colour: Surf Mist
GT	Halfround Gutter - Size to be Specified by Hyd. Engineer	Colorbond Colour: Deep Ocean
DP	PVC painted downpipes - Size to be Specified by Hyd. Engineer	Colorbond Colour: Deep Ocean
	Fascia	Colour: Deep Ocean
CS	Soffit Lined with CFC cladding	Paint Colour: Dulux Lexicon Qtr
W(0X) As per Windows schedule	Windows Frames	Colour: Deep Ocean
D(0X) As per Windows schedule	Door Frames	Colour: Deep Ocean
	Timber Door Leaves	Colour: Dulux Tin Cat
	External Structural Posts - CFC Cladding	Colour: Deep Ocean

Insulation - Section J Report Requirements		
Roof Insulation	R1.3	Bradford Anticon R1.3 - Or Similar to meet Section J requirement
Ceiling Insulation	R3.5	Bradford Gold Ceiling R3.5 - Or Similar to meet Section J requirement
Wall Insulation	R2.2	Bradford Gold HP R2.2 - Or Similar to meet Section J requirement
Subfloor Insulation	R2.5	Bradford Optimo R2.5 - Or Similar to meet Section J requirement

GENERAL NOTES

NOTE 01	FINAL POSITION OF THE MODULAR BUILDING IS DEPENDANT ON THE SITE SURVEY PROVIDED TO MARATHON BY A REGISTERED SURVEYOR. ANY LOCATION PLANS PROVIDED BY MARATHON ARE FOR REFERENCE ONLY.
NOTE 02	REFER THE STRUCTURAL ENGINEER DESIGN SET FOR DETAILS ON THE STRUCTURAL STEEL WORKS.
NOTE 03	ALL GPO'S TO BE 300MM ABOVE FINISHED FLOOR LEVEL UNLESS OTHERWISE NOTED.
NOTE 04	ALL LIGHT SWITCHES ARE TO BE INSTALLED BETWEEN 900MM AND 1000MM ABOVE FINISHED FLOOR LEVEL.
NOTE 05	COLOUR & FINISHES MAY BE ALTERED DEPENDING ON FINAL SELECTIONS AND AVAILABILITY. MARATHON WILL ENDEAVOR TO SWAP FINISHES FOR SIMILAR WHEREVER POSSIBLE.
NOTE 06	THE ARCHITECTURAL SERVICES LAYOUT DRAWING AND PRODUCT SPECIFICATION OUTLINE IS PRODUCED TO CONVEY THE INTENT ONLY. FIXTURES AND FITTINGS MAY VARY DEPENDING ON AVAILABILITY.
NOTE 07	POSITIONS OF BOTH INTERNAL AND EXTERNAL AC UNITS MAY VARY TO SUIT TRANSPORT REQUIREMENTS. MARATHON RESERVES THE RIGHT TO RELOCATE THESE UNITS TO BEST SUIT THE DESIGN.
NOTE 08	PROVIDED RENDER OR SKETCH 3D IN THIS DOCUMENTATION PACKAGE MAY NOT ACCURATELY REPRESENT THE FINAL PRODUCT.
NOTE 09	THE CLIENT IS RESPONSIBLE FOR PAYMENT OF RELEVANT AUTHORITY FEES AND APPLICATIONS TO COMPLETE THE WORKS UNLESS OTHERWISE AGREED.
NOTE 10	EXTENT OF THE SITE SERVICES CONNECTS IS AS PER THE SPECIFICATIONS.

marathon MODULAR

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Rev

Issue	Date	Description
A	22.08.24	ISSUE FOR INFORMATION
B	26.08.24	REVISED TOILET MODULE LOCATION MIRRORED
C	29.08.24	CLIENT & CONSULTANT ISSUE
E	04.09.24	CLIENT ACCEPTANCE
F	05.09.24	CLIENT ACCEPTANCE

Client
Marathon Modular

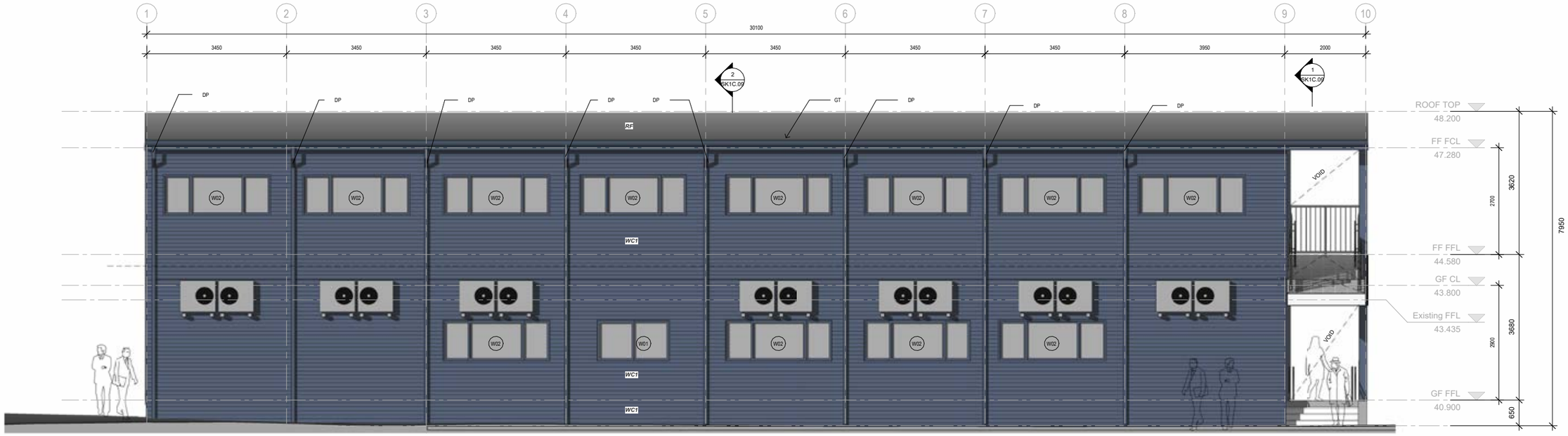
Project
William Carey Christian School

38-44 Bumbera Street
Prestons NSW 2170

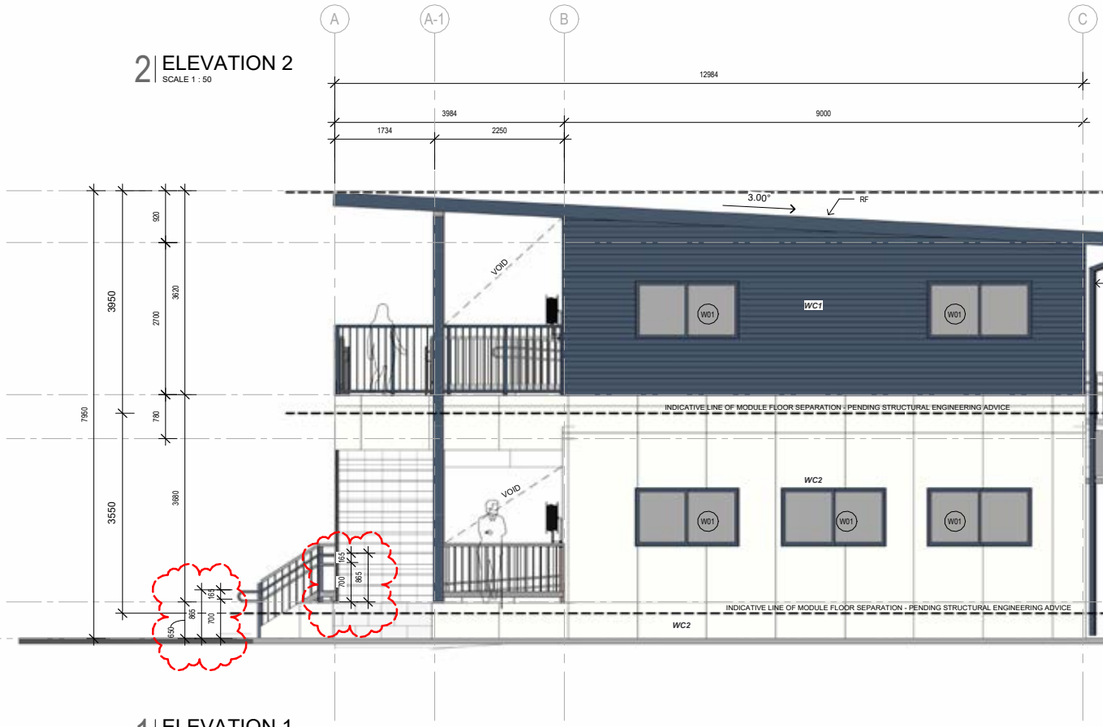
Drawing
ROOF PLAN

North | Scale | Date | Project No. | Drawing No.
As indicated @ A1 | 03/25/20 | 2408 | SK1C.05 G

Issued for
PRELIMINARY



2 | ELEVATION 2
SCALE 1 : 50



1 | ELEVATION 1
SCALE 1 : 50

Code	Type	Marathon Proposal
FF1	Vinyl Slip Retardant Flooring	Armstring Flooring: Accolade Plus - Camden Grey
FF2	Carpet tile	Interface Carpets: Works Facet Colour: Earthern
FF3	Ground Floor External Verandah	Modwood: 137 x 23mm Blackbean Brushed
FF4	First Floor External Verandah & Stairs to First Floor	Ceramic Tile Colour/Range : Positano Cenere
WC1	Exterior cladding	Colorbond Custom Orb - Horizontal Colour: Deep Ocean
WC2	Exterior cladding	CFC Cladding 1200 x 2400mm Colour: Shale Grey
IF1	Internal Plasterboard Lining Wall & Ceiling Plasterboard	Paint Colour: Dulux Lexicon Qtr
RF	Trimclad Roof Sheeting	Colour: Surf Mist
GT	Halfround Gutter - Size to be Specified by Hyd. Engineer	Colorbond Colour: Deep Ocean
DP	PVC painted downpipes - Size to be Specified by Hyd. Engineer	Colorbond Colour: Deep Ocean
	Fascia	Colour: Deep Ocean
CS	Soffit Lined with CFC cladding	Paint Colour: Dulux Lexicon Qtr
W(0X) As per Windows schedule	Windows Frames	Colour: Deep Ocean
D(0X) As per Windows schedule	Door Frames	Colour: Deep Ocean
	Timber Door Leaves	Colour: Dulux Tin Cat
	External Structural Posts - CFC Cladding	Colour: Deep Ocean

WINDOW SCHEDULE

WINDOW TYPE	WIDTH	HEIGHT	SILL HEIGHT	HEAD HEIGHT	COUNT
W01	1810	1030	1000	2030	10
W02	2650	1030	1000	2030	20
W03	610	1030	1000	2030	1
W04	1450	1030	1000	2030	4
Grand total: 35					35

DOOR SCHEDULE

Type Mark	WIDTH	HEAD HEIGHT	COUNT
D01	750	2200	1
D02	720	2040	5
D04	920	2040	10
D04	820	2040	2
Grand total: 18			18

Insulation - Section J Report Requirements		
Roof Insulation	R1.3	Bradford Anticon R1.3 - Or Similar to meet Section J requirement
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marathon MODULAR

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G	09.09.24	CONSULTANT ISSUE

Client: Marathon Modular

Project: William Carey Christian School

38-44 Bumbera Street
Prestons NSW 2170

Drawing: ELEVATION 1

North

Scale: 1 : 50 @ A1

Date: 03/25/20

Project No.: 2408

Drawing No.: SK1C.06 G

Issued for: PRELIMINARY

1 | ELEVATION 3
SCALE 1 : 50

2 | ELEVATION 4
SCALE 1 : 50

NOTE: LEVELS ARE INDICATIVE. PENDING SURVEY INFORMATION FROM REGISTERED SURVEYOR.
NOT FOR CONSTRUCTION

DOOR SCHEDULE

Type Mark	WIDTH	HEAD HEIGHT	COUNT
D01	750	2200	1
D02	720	2040	5
D03	920	2040	10
D04	820	2040	2
Grand total: 18			18

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Client
Marathon Modular

Project
William Carey Christian School

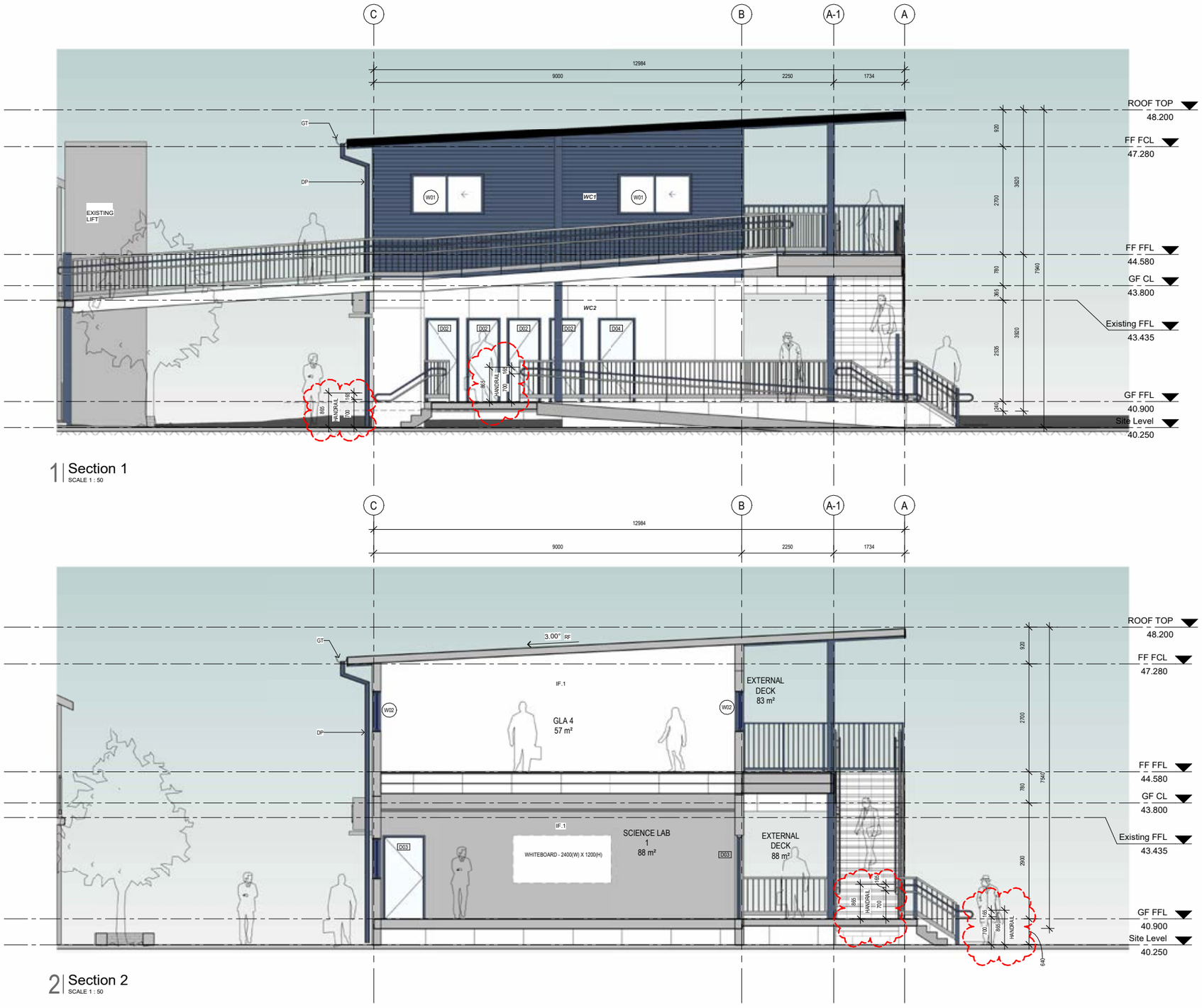
38-44 Bumbera Street
Prestons NSW 2170

Drawing
ELEVATION 2

North	Scale	Date	Project No.	Drawing No.
	1 : 50 @ A1	03/25/20	2408	SK1C.07 F

Issued for
PRELIMINARY

Verify all dimensions before commencing work. Use figured dimensions. Do not scale off drawing.



1 | Section 1
SCALE 1 : 50

2 | Section 2
SCALE 1 : 50

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NOT FOR CONSTRUCTION

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Client
Marathon Modular

Project
William Carey Christian School

38-44 Bumbera Street
Prestons NSW 2170

Drawing
SECTIONS

North	Scale	Date	Project No.	Drawing No.
	1 : 50 @ A1	02/15/18	2408	SK1C.09 F

Issued for
PRELIMINARY

VIEW TOWARDS ENTRANCE

VIEW FROM BLOCK D

VIEW OF BRIDGE CONNECTION

BIRD'S-EYE VIEW OF NORTH ELEVATION

IMAGES FOR ILLUSTRATION PURPOSES ONLY

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Client
Marathon Modular

Project
William Carey Christian School

38-44 Bumbera Street
Prestons NSW 2170

Drawing
3D PERSPECTIVES

North

Scale	Date	Project No.	Drawing No.
@ A1	02/15/18	2408	SK1C.10 F

Issued for
PRELIMINARY

APPENDIX B -

ASSESSMENT AGAINST PRESCRIPTIVE PROVISIONS - PBP (2019) CHAPTER 6.

ASSESSMENT AGAINST PBP (2019) PRESCRIPTIVE PROVISIONS

The following tables provide a review of the development design in comparison to the acceptable solutions PBP (2019) tables 6.8.2a, 6.8.2b, 6.8.2c, 6.8.2d.

	ACCEPTABLE SOLUTIONS	BPAD COMMENTS	COMPLIANCE *
ASSET PROTECTION ZONES	*the building is provided with an APZ in accordance with Table A1.12.1 in Appendix 1.*	An APZ that complies with Table A1.12.1 cannot be provided.	N
	APZs are located on lands with a slope less than 18 degrees.	A review of the site slope based on LiDAR data indicates the maximum cross fall is less than 5^0.	Y
	the APZ is managed in accordance with the requirements of Appendix 4 of this document, and is wholly within the boundaries of the development site;	The APZ is to be maintained in accordance with Appendix 4. APZs to comply with PBP (2019) Appendix 4.	TBS
	APZ are wholly within the boundaries of the development site; and	The APZ is solely within the subject site. An off site APZ is not proposed.	Y
	other structures located within the APZ need to be located further than 6m from the refuge building.	No refuge building proposed (or existing)	N/A
LANDSCAPING	*landscaping is in accordance with Appendix 4; and*	No landscape drawings provided for review. Landscape drawings to comply with PBP (2019) Appendix 4.	TBS
	fencing is constructed in accordance with section 7.6.	No fencing proposed. Fencing to comply with PBP (2019) s.7.6 if required.	TBS

* (Y = Yes), (N=No), (TBS=To be Specified), (N/A= Not Applicable).

CONSTRUCTION (Includes PBP (2022) Addendum)	ACCEPTABLE SOLUTIONS	BPAD COMMENTS	COMPLIANCE *
	A construction level of BAL-19 or greater under AS 3959 and section 7.5 of PBP is applied	Requirement noted. The construction requirements for the building are to comply with the NCC. The construction specifications for the building are addressed in the Bush Fire Design, Compliance, & Approvals Report prepared by others.	TBS

* (Y = Yes), (N=No), (TBS=To be Specified), (N/A= Not Applicable).

ACCESS (Includes PBP (2022) Addendum)	ACCEPTABLE SOLUTIONS	BPAD COMMENTS	COMPLIANCE *
	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; and	Vehicular access is not provided around the entire building.	N
	Must have a minimum unobstructed width of 6m with no part of its furthest boundary more than 18m from the building and in no part of the 6m width be built upon or used for any purpose other than vehicular or pedestrian movement; and	xx	Y
	Must provide reasonable pedestrian access from the vehicular access to the building; and	Safe access is provided from the public road system to the building. A large portion of the site is not bushfire affected.	Y
	Must have a load bearing capacity and unobstructed height to permit the operation and passage of fire fighting vehicles; and	None proposed.	N/A
	Must be wholly within the allotment except that a public road complying with above may serve as the vehicular access or part thereof.	No new access ways proposed within the site.	N/A
	the capacity of road surfaces and any bridges/ causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges and causeways are to clearly indicate load rating.	No new access ways proposed within the site.	N/A
	hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;	No new hydrants proposed. Suitable water provisions are being addressed in the Bush Fire Design, Compliance, & Approvals Report prepared by others.	TBS
	hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005; and		
	there is suitable access for a Category 1 fire appliances to within 4m of the static water supply where no reticulated supply is available		

* (Y = Yes), (N=No), (TBS=To be Specified), (N/A= Not Applicable).

	ACCEPTABLE SOLUTIONS	BPAD COMMENTS	COMPLIANCE *
PERIMETER ROADS	*there are two-way sealed roads;*	Perimeter road not proposed.	N/A
	minimum 8m carriageway width kerb to kerb;		
	parking is provided outside of the carriageway width;		
	hydrants are to be located clear of parking areas;		
	there are through roads, and these are linked to the internal road system at an interval of no greater than 500m;		
	curves of roads have a minimum inner radius of 6m;		
	the maximum grade road is 15 degrees and average grade of not more than 10 degrees;		
	the road crossfall does not exceed 3 degrees;		
	a minimum vertical clearance of 4m to any overhanging obstructions, including tree ranches, is provided.		

* (Y = Yes), (N=No), (TBS=To be Specified), (N/A= Not Applicable).

	ACCEPTABLE SOLUTIONS	BPAD COMMENTS	COMPLIANCE *
NON PERIMETER ROADS	*minimum 5.5m carriageway width kerb to kerb*	No internal road systems proposed. The development will rely on existing infrastructure (currently being constructed).	N/A
	parking is provided outside of the carriageway width; hydrants are located clear of parking areas;		
	hydrants are to be located clear of parking areas;		
	there are through roads, and these are linked to the internal road system at an interval of no greater than 500m.		
	curves of roads have a minimum inner radius of 6m;		
	the maximum grade road is 15 degrees and average grade of not more than 10 degrees;		
	the road crossfall does not exceed 3 degrees; and		
	a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches is to be provided.		

* (Y = Yes), (N=No), (TBS=To be Specified), (N/A= Not Applicable).

	ACCEPTABLE SOLUTIONS	BPAD COMMENTS	COMPLIANCE *
WATER (Includes PBP (2022) Addendum)	*Reticulated water is to be provided to the development, where available; and*	No new hydrants proposed. Suitable water provisions are being addressed in the Bush Fire Design, Compliance, & Approvals Report prepared by others.	TBS
	Water for firefighting purposes must be made available and consist of –		
	A fire hydrant system installed in accordance with AS2419.1; or		
	Where no reticulated water is available, a static water supply consisting of tanks, swimming pools, dams or the like, or a combination of these, together with suitable pumps, hoses and fittings, determined in consultation with NSW RFS that –		
	is capable of providing the required flow rate for a period of not less than 4 hours or		
	has a volume of 10,000 litres for each occupied building		
ELECTRICITY	*where practicable, electrical transmission lines are underground;*	Electrical design not yet finalised.	TBS
	where overhead, electrical transmission lines are proposed as follow: • *lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian area.* • *no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines.*	Electrical design not yet finalised.	TBS

* (Y = Yes), (N=No), (TBS=To be Specified), (N/A= Not Applicable).

GAS	*reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used;*		
	all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;		
	connections to and from gas cylinders are metal;		
	if gas cylinders need to be kept close to the building, safety valves are directed away from the building and at least 2m away from any combustible material, so they do not act as a catalyst to combustion;	Hydraulic design not yet finalised.	TBS
	polymer-sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used; and		
	above-ground gas service pipes external to the building are metal, including and up to any outlets.		

* (Y = Yes), (N=No), (TBS=To be Specified), (N/A= Not Applicable).

EMERGENCY MANAGEMENT	Bush Fire Emergency Management and Evacuation Plan is prepared consistent with the: • The NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan; • NSW RFS Schools Program Guide; • Australian Standard AS 3745:2010 Planning for emergencies in facilities; and • Australian Standard AS 4083:2010 Planning for emergencies– Health care facilities (where applicable).	Requirement noted.	TBS
	• the Bush Fire Emergency Management and Evacuation Plan should include planning for the early relocation of occupants	Requirement noted.	TBS
	Note: A copy of the Bush Fire Emergency Management and Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development.	Requirement noted.	TBS

* (Y = Yes), (N=No), (TBS=To be Specified), (N/A= Not Applicable).

APPENDIX C -

METHOD 2 CALCULATIONS

NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 12/10/2024 **Assessment Date:** 12/10/2024

Site Street Address: William Carey Christian School, Prestons

Assessor: Matthew Noone; Bushfire Planning and Design

Local Government Area: Liverpool **Alpine Area:** No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001/Vesta/Catchpole
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

Run Description: W

Vegetation Information

Vegetation Type: Forested Wetland (excluding Coastal Swamp Forest)

Vegetation Group: Forest and Woodland

Vegetation Slope: 3.4 Degrees **Vegetation Slope Type:** Downslope

Surface Fuel Load(t/ha): 8.2 **Overall Fuel Load(t/ha):** 15.1

Vegetation Height(m): 2 Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 2.7 Degrees **Site Slope Type:** Downslope

Elevation of Receiver(m): Default **APZ/Separation(m):** 29

Fire Inputs

Veg./Flame Width(m): 100 **Flame Temp(K):** 1200

Calculation Parameters

Flame Emissivity: 95 **Relative Humidity(%):** 25

Heat of Combustion(kJ/kg 18600 **Ambient Temp(K):** 308

Moisture Factor: 5 **FDI:** 100

Program Outputs

Level of Construction: BAL 19 **Peak Elevation of Receiver(m):** 3.53

Radiant Heat(kW/m2): 14.62 **Flame Angle (degrees):** 82

Flame Length(m): 9.9 **Maximum View Factor:** 0.16

Rate Of Spread (km/h): 1.24 **Inner Protection Area(m):** 29

Transmissivity: 0.818 **Outer Protection Area(m):** 0

Fire Intensity(kW/m): 9707

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	12	16	23	33	39	6

Run Description:	W

Vegetation Information

Vegetation Type:	Forested Wetland (excluding Coastal Swamp Forest)		
Vegetation Group:	Forest and Woodland		
Vegetation Slope:	3.4 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	8.2	**Overall Fuel Load(t/ha):**	15.1
Vegetation Height(m):	2	Only Applicable to Shrub/Scrub and Vesta	

Site Information

Site Slope:	2.7 Degrees	**Site Slope Type:**	Downslope
Elevation of Receiver(m):	Default	**APZ/Separation(m):**	29

Fire Inputs

Veg./Flame Width(m):	100	**Flame Temp(K):**	1090

Calculation Parameters

Flame Emissivity:	95	**Relative Humidity(%):**	25
Heat of Combustion(kJ/kg	18600	**Ambient Temp(K):**	308
Moisture Factor:	5	**FDI:**	100

Program Outputs

Level of Construction:	BAL 12.5	**Peak Elevation of Receiver(m):**	3.53
Radiant Heat(kW/m2):	9.84	**Flame Angle (degrees):**	82
Flame Length(m):	9.9	**Maximum View Factor:**	0.16
Rate Of Spread (km/h):	1.24	**Inner Protection Area(m):**	29
Transmissivity:	0.809	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	9707		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	8	11	17	24	39	6

Appendix I: Information Required for Application for BFSA

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Clause 45 Information Required - Application for a Bush Fire Safety Authority

Clause 45 of the *Rural Fires Regulation 2022* states that an application for a bush fire safety authority must be made in writing and needs to include specific matters.

The required matters identified below are taken directly out of clause 45 and have been specifically addressed in the below table.

Required Information	***Status***	***Commentary***
1. A description, including the address, of the property on which the development the subject of the application is proposed to be carried out	Provided	
2. A classification of the vegetation on and surrounding the property, out to a distance of 140 metres from the boundaries of the property, in accordance with the system for classification of vegetation contained in Planning for Bush Fire Protection	Provided	*A classification of the vegetation on and surrounding the property, out to a distance of 140 metres from the boundaries of the property, was undertaken in accordance with the system for classification of vegetation contained in Planning for Bush Fire Protection.* *The vegetation can be considered as Forest type vegetation as described in this Report.*
3. An assessment of the slope of the land on and surrounding the property, out to a distance of 100 metres from the boundaries of the property	Provided	*An assessment of the slope of the land on and surrounding the property, out to a distance of 100 metres from the boundaries of the property was undertaken.* *It should be noted that the radiant heat profiles based on the 'Effective Slope' approach in Appendix 1 of PBP-2019 indicated that the prescriptive limit of 10kW/$m^2$was not met.* *The assessment and conclusions in this Report were considered independent of the precise value of the slopes in question, as the proposed design, assessment, and compliance approach was based on a conservative methodology as discussed in this Report.*

Required Information	***Status***	***Commentary***
4. Identification of significant environmental features on the property	Not considered relevant - not provided	*The proposed development is for new building on existing sites/lots that have already been developed in a well-established suburb/area.*
5. The details of a threatened species or threatened ecological community under the Biodiversity Conservation Act 2016 that the applicant knows to exist on the property	Not considered relevant - not provided	*The proposed development is for new building on existing sites/lots that have already been developed in a well-established suburb/area.*
6. The details and location of an Aboriginal object or place, within the meaning of the National Parks and Wildlife Act 1974, that the applicant knows to be situated on the property	Not considered relevant - not provided	*The proposed development is for new building on existing sites/lots that have already been developed in a well-established suburb/area.*
7. A bush fire assessment for the proposed development, including the methodology used in the assessment, that addresses the following matters: *a. The extent to which the development is to provide for setbacks, including asset protection zones;* *b. The siting and adequacy of water supplies for firefighting;* *c. The capacity of nearby public roads to handle increased volumes of traffic when a bush fire emergency occurs;* *d. Whether or not nearby public roads that link with the fire trail network have two-way access;* *e. The adequacy of arrangements for access to and egress from the development site for the purposes of an emergency response;* *f. The adequacy of bush fire maintenance plans and fire emergency procedures for the development site;* *g. The construction standards to be used for building*	Provided	This information has been provided in the associated sections of this *Report*, please refer to relevant sections and appendices accordingly.

Required Information	***Status***	***Commentary***
elements in the development; *h. The adequacy of sprinkler systems and other fire protection measures to be incorporated into the development;* *i. Registered fire trails on the property.*		
8. An assessment of the extent to which the proposed development conforms with or deviates from Planning for Bush Fire Protection.	Provided	*The proposed development can be considered to comply with PBP-2019, except for the criteria for the 10kW/m^2 'Rule' in the associated Acceptable Solutions and Performance Criteria.* *This information has been provided in the associated sections of this Report, please refer to relevant sections and appendices accordingly.*
It also states that an application for a bush fire safety authority must also be accompanied by the *prescribed information* if: • *The proposed development is subdivision for the purposes of dwelling houses, dual occupancies or secondary dwellings on property in an urban release area;* • *The application includes a request by the applicant that the Commissioner, when deciding the application, considers whether it would be appropriate for the erection of the dwelling houses, dual occupancies or secondary dwellings concerned to be excluded from the application of the Environmental Planning and Assessment Act 1979, section 4.14*	Not applicable	The proposed development is not located in an *urban release area*, nor does this application include a *request by the applicant that the Commissioner, when deciding the application, considers whether it would be appropriate for the erection of the dwelling houses, dual occupancies or secondary dwellings concerned to be excluded from the application of the Environmental Planning and Assessment Act 1979, section 4.14*.

References

The following list of references considered relevant to preparation of this report include:

1. *Addendum Appendix 3 Planning for Bush Fire Protection 2010*, NSW Rural Fire Service
2. *An Introduction to Fire Dynamics 3rd Edition* by Dougal Drysdale, WILEY
3. AS3959:2018 *Construction of buildings in bush fire-prone areas*, Standards Australia
4. AS ISO 31000:2018 *Risk management - Guidelines*
5. *Australian Fire Engineering Guidelines 2021*, Australian Building Codes Board
6. *Bush fire protection for certain Class 9 buildings Decision Regulation Impact Statement 2022*, Australian Building Codes Board, March 2022
7. *Environmental Planning and Assessment Act 1979*, NSW Government
8. *Environmental Planning and Assessment Regulation 2021*, NSW Government
9. *Fire Brigade Intervention Model Manual Guideline Version 3.0*, April 2020 Doctrine ID 3068, Australasian Fire and Emergency Service Authorities Council Limited
10. *International Fire Engineering Guidelines 2005*, Australian Building Codes Board (and others)
11. ISO 9000:2015(en), *Quality management systems - Fundamentals and vocabulary* (https://www.iso.org/obp/ui/#iso:std:iso:9000:ed-4:v1:en)
12. *NASH Standard for Steel-Framed Construction in Bush fire Areas 2021* (NS300), National Association of Steel Frame Housing Inc
13. *National Construction Code 2022* - Australian Building Codes Board
14. *Site Analysis Plan*, Issue F, dated 05/09/2024, Marathon Modular
15. *Site Plan*, Issue F, dated 05/09/2024, Marathon Modular
16. Site visit undertaken by Lote Consulting on 1 August 2024
17. *Planning for Bush Fire Protection, A guide for councils, planners, fire authorities and developers Addendum November 2022*, NSW Rural Fire Service
18. *Planning for Bush Fire Protection 2006*, NSW Rural Fire Service
19. *Planning for Bush Fire Protection 2019*, NSW Rural Fire Service
20. *BUSH FIRE ASSESSMENT, 38-44 Bumbera Street Prestons 2170*, Revision A dated 17/10/2024
21. *Rural Fires Act 1997*, NSW Government
22. *Rural Fires Regulation 2022*, NSW Government

Attachment 1: Disclaimers/limitations in PBP-2019, AS3959, & NCC 2022

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AS3959:2018 *Construction of buildings in bushfire-prone areas* (disclaimer)

"*It should be borne in mind that the measures contained in this Standard cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature and behaviour of fire, and extreme weather conditions.*

The survivability of buildings is also dependent on a combination of measures such as landscaping, water supplies, access, building design and maintenance. Care should also be exercised when siting and designing for these measures when constructing a building under this Standard."

NCC 2022 *Specification 43* (disclaimer)

S43C1 Scope

(1) This Specification sets out bushfire protection measures for buildings described in G5D4[1].

(2) Compliance with this Specification does not guarantee the safety of building occupants or the maintenance of tenable conditions within a building during a bushfire event.

PBP-2019

"***1.3 Limitations of this document***

Due to a range of limitations, the measures contained in this document do not guarantee that loss of life, injury and/or property damage will not occur during a bush fire event…."

Attachment 2: *Planning for Bush Fire Protection, A guide for councils, planners, fire authorities and developers Addendum November 2022*

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NSW GOVERNMENT

NSW RURAL FIRE SERVICE

PLANNING FOR BUSH FIRE PROTECTION

A guide for councils, planners, fire authorities and developers

ADDENDUM NOVEMBER 2022

PREPARE. ACT. SURVIVE.

ISBN 978-0-646-99126-9

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Contents

List of tables

1 Introduction

The 2022 edition of the National Construction Code (NCC 2022) contains amendments to its bush fire protection provisions. This includes a suite of new provisions for Class 9 Buildings in bush fire prone areas that accommodate certain types of vulnerable occupants. This Addendum aligns *Planning for Bush Fire Protection* 2019 (PBP 2019) with NCC 2022.

Since the publication of PBP 2019, there have also been amendments to referenced legislation, standards, guidelines and policies. The purpose of this Addendum is to amend PBP 2019 and to update outdated references.

2 Application

The effective date of this Addendum is 1 May 2023 to coincide with adoption of the National Construction Code 2022.

3 National Construction Code 2022

NCC 2022 provides a uniform set of technical provisions for the design, construction and performance of buildings. The Building Code of Australia component of NCC 2022 is given legal effect through the *Environmental Planning and Assessment Act 1979* whilst the Plumbing Code of Australia component is given effect through the *Plumbing and Drainage Act 2011*.

NCC 2022 is comprised of:

- National Construction Code Volume One – Building Code of Australia (2022)
- National Construction Code Volume Two – Building Code of Australia (2022)
- National Construction Code Volume Three – Plumbing Code of Australia (2022)

In NSW, all new buildings and new building work must comply with the NCC. NCC 2022 contains bush fire protection requirements that operate in conjunction with the bush fire protection measures (BPMs) in PBP 2019. Accordingly, developments in bush fire prone areas must comply with both the requirements of PBP and the NCC.

All references to the NCC in PBP 2019 are superseded by NCC 2022. For the purposes of comparison, refer to Appendix A of this Addendum for a schedule of changes and the replacement provisions.

Key Changes

NCC 2022 identifies additional bush fire provisions for the construction, separation and access requirements for certain Class 9 buildings accommodating vulnerable occupants on bush fire prone land.

Class 9 buildings include some Special Fire Protection Purpose (SFPP) developments under section 100B of the *Rural Fires Act 1997*, such as Class 9a hospitals, Class 9b schools and child care centres and Class 9c residential care buildings.

Additional Performance Criteria and Acceptable Solutions relevant to BPMs within PBP for SFPP Class 9 buildings are identified in Appendix B of this Addendum. These Acceptable Solutions are consistent with the relevant provisions of NCC 2022.

Consistent with section 100B of the *Rural Fires Act 1997*, proposed SFPP's that are Class 9 Buildings in bush fire prone areas may be required to have bush fire protection measures additional to those specified in NCC 2022.

4 Asset Protection Zones

The minimum distances for Asset Protection Zones (APZs) for SFPP developments remain as prescribed in Table A1.12.1 of PBP 2019. Please note clause S43C2 of *Specification 43 of Volume One of NCC 2022* does not apply in relation to SFPP developments.

5 Consolidation of State Environmental Planning Policies

As of 1 March 2022, the NSW Government consolidated numerous State Environmental Planning Policies (SEPP) into twelve SEPPs.

For the purposes of PBP 2019:

- The *Coastal Management SEPP* has been repealed and consolidated into the *State Environmental Planning Policy (Resilience and Hazards) 2021*;
- *SEPP 36 – Manufactured Home Estates* has been repealed and consolidated into the *State Environmental Planning Policy (Housing) 2021*; and
- Clause 30 of the *SEPP (Educational Establishments and Child Care Facilities) 2017* has been consolidated into Chapter 3 Educational establishments and child care facilities of the *State Environmental Planning Policy (Transport and Infrastructure) 2021*.

6 Remade Regulations

1. Environmental Planning and Assessment Regulation

The *Environmental Planning and Assessment Regulation 2021* commenced on 17 December 2021 and remade various provisions of the *Environmental Planning and Assessment Regulation 2000*.

The NSW Government pathway for streamlined assessment is covered by Part 14 of the *Environmental Planning and Assessment Regulation 2021* for new lots in Urban Release Areas (URAs) that are located on Bush Fire Prone Land (BFPL).

For the purposes of comparison, clauses 272, 273 and 273A of the *Environmental Planning and Assessment Regulation 2000* correspond to Part 14 of the *Environmental Planning and Assessment Regulation 2021*.

2. Rural Fires Regulation

The Rural Fires Regulation 2022 commenced on 15 May 2022 and remade various provisions of the Rural Fires Regulation 2013.

The remade regulation provides greater clarity around the types of developments that will not require a bush fire safety authority such as driveways, pathways and carrying out earthworks or drainage works.

For the purposes of comparison, clauses 43, 44, 45 and 46 of the *Rural Fires Regulation 2013* correspond to sections 44, 45, 46 and 47 of the *Rural Fires Regulation 2022*.

7 Primitive Camping

The Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2021 commenced on 1 September 2021 and remade various provisions of the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005*.

Primitive camping is covered by the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2021*.

8 Holiday Lets

The NSW Government definition for '*Holiday Lets*' changed after the publication of PBP 2019.

As of 1 November 2021, Holiday Lets were renamed Short Term Rental Accommodation (STRA). STRA are now deemed as a "use" of a residential dwelling under the *State Environmental Planning Policy (Housing), 2021* rather than new development that was previously considered under section 100B of the *Rural Fires Act 1997*.

The approval process for a residential dwelling remains unchanged for developments referred to the NSW Rural Fire Service under section 4.14 and 4.15 of the *Environmental Planning and Assessment Act, 1979*.

9 Fire Hydrant Installation

All references to *AS2419.1: 2005 Fire hydrant installations – System design, installation and commissioning*, except for those provisions relating to residential infill development, are superseded by the relevant provisions in *AS 2419.1: 2021 Fire hydrant installations – System design, installation and commissioning*.

10 Updated References

All references to Standards, SEPPs and Regulations which have been repealed as outlined in Parts 5-9 of this Addendum are taken to refer to the replacement documents as named in those Parts. References to the following standards, guidelines and government agencies are updated to reflect the following:

- All references to the *NSW Department of Planning, Industry and Environment (DPIE)* are replaced by *NSW Department of Planning and Environment (DPE)*.
- All references to the *National Association of Steel Framed Housing (2014) Steel Framed Construction in Bush Fire Areas* are superseded by the provisions in the *National Association of Steel Framed Housing (2021) Steel Framed Construction in Bush Fire Areas*.
- All references to the *International Fire Engineering Guidelines (2005)* are superseded by the provisions in the *Australian Fire Engineering Guidelines (2021)* edition.

APPENDIX A

NCC 2022 schedule of changes

For the purposes of comparison, Table 1 shows certain provisions of NCC 2019, as in force immediately before the commencement of this Addendum, and the corresponding new provisions of NCC 2022.

Table 1: NCC 2022 schedule of changes

PBP 2019			NCC 2019 Am 1	NCC 2022
Section	**Page number**	**Location**	**Old Provisions**	**New provisions**
Section 7.5.2 NSW State Variations under G5.2(a)(i) and 3.10.5.0(c)(i) of the NCC	70	In the heading and second paragraph	NSW G5.2(a)(i)	NSW G5D3(a)(i)
			NSW 3.10.5.0(c)(i)	NSW H7D4(3)(a)
Section 7.9 Grassland Deeming Provisions	71	In the fifth paragraph	NSW G5.2(a)(i)	NSW G5D3(a)(i)
			NSW 3.10.5.0(c)(i)	NSWH7D4(3)(a)
Section 8.3.3 Private Bush Fire Shelters	77	In the third paragraph	P2.7.6	H7P6
Appendix 1 A1.1 Application	80	In the third paragraph	NSW G5.2(a)(i)	NSW G5D3(a)(i)
			NSW 3.10.5.0(c)(i)	NSW H7D4(3)(a)
			NSW 3.10.5.0(d)(i)	NSW H7D4(4)(a)
Appendix 2 A2.4 Submission Requirements and Assessment Methods for Performance Based Solutions – Assessment Method	97	In the fourth paragraph	GV5	G5V1
			V2.7.2	H7V2
			NSW GP5.1	NSW G5P1
			NSW P2.7.5	H7P5

APPENDIX B

Performance Criteria and Acceptable Solutions for hospitals, schools, child care centres and residential care buildings

PBP 2019 identifies a suite of BPMs for SFPP's within tables 6.8a, 6.8b and 6.8c. Hospitals, schools, child care centres and residential care buildings have modified requirements in NCC 2022. These specific Performance Criteria and Acceptable Solutions are identified in Table 2, Table 3 and Table 4 below.

These requirements are to be used in conjunction with the existing BPMs in PBP 2019.

Table 2: SFPP Development Construction Standards – Specific requirements for hospitals, schools, child care centres and residential care buildings

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
CONSTRUCTION STANDARDS	› The proposed building can withstand bush fire attack in the form of wind, embers, radiant heat and flame contact.	› A construction level of BAL-19 or greater under AS 3959 and section 7.5 of PBP is applied.

Table 3: SFPP Development Access – Specific requirements for hospitals, schools, child care centres and residential care buildings

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
ACCESS	› Firefighting vehicles are provided with safe, all-weather access to structures and hazardous vegetation.	› 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; and › Must have a minimum unobstructed width of 6m with no part of its furthest boundary more than 18m from the building and in no part of the 6m width be built upon or used for any purpose other than vehicular or pedestrian movement; and › Must provide reasonable pedestrian access from the vehicular access to the building; and › Must have a load bearing capacity and unobstructed height to permit the operation and passage of fire fighting vehicles; and › Must be wholly within the allotment except that a public road complying with above may serve as the vehicular access or part thereof.

Table 4: SFPP Development Water Supply – Specific requirements for hospitals, schools, child care centres and residential care buildings

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
WATER SUPPLY	➢ An adequate water supply for firefighting purposes is installed and maintained.	➢ Reticulated water is to be provided to the development, where available; and ➢ Water for firefighting purposes must be made available and consist of – ➢ A fire hydrant system installed in accordance with AS2419.1; or ➢ Where no reticulated water is available, a static water supply consisting of tanks, swimming pools, dams or the like, or a combination of these, together with suitable pumps, hoses and fittings, determined in consultation with NSW RFS that – ➢ is capable of providing the required flow rate for a period of not less than 4 hours or ➢ has a volume of 10,000 litres for each occupied building.

Related documents

- NSW Rural Fire Service (2019). Planning for Bush Fire Protection 2019
- Australian Building Codes Board (2019). National Construction Code Volume One – Building Code of Australia. ABCB
- Australian Building Codes Board (2019). National Construction Code Volume Two – Building Code of Australia. ABCB
- Australian Building Codes Board (2022). National Construction Code Volume One – Building Code of Australia. ABCB
- Australian Building Codes Board (2022). National Construction Code Volume Two – Building Code of Australia. ABCB
- National Association of Steel Framed Housing (2014). Steel Framed Construction in Bush Fire Areas. NASH
- National Association of Steel Framed Housing (2021). Steel Framed Construction in Bush Fire Areas. NASH
- Standards Australia (2005). AS 2419.1 – 2005 Fire hydrant installations – System design, installation and commissioning
- Standards Australia (2021). AS 2419.1 – 2021 Fire hydrant installations – System design, installation and commissioning
- Australian Building Codes Board (2005). International Fire Engineering Guidelines. ABCB
- Australian Building Codes Board (2021). Australian Fire Engineering Guidelines. ABCB

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PC220004

Attachment 3: Clause 45 Rural Fires Regulation 2022 (application for Bush Fire Safety Authority)

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Rural Fires Regulation 2022

Current version for 31 May 2024 to date (accessed 7 October 2024 at 13:45)

45 Application for bush fire safety authority—the Act, s 100B

(1) For the purposes of the Act, section 100B(4), an application for a bush fire safety authority must be made in writing.

(2) An application for a bush fire safety authority must include the following—

(a) a description, including the address, of the property on which the development the subject of the application is proposed to be carried out,

(b) a classification of the vegetation on and surrounding the property, out to a distance of 140 metres from the boundaries of the property, in accordance with the system for classification of vegetation contained in *Planning for Bush Fire Protection*,

(c) an assessment of the slope of the land on and surrounding the property, out to a distance of 100 metres from the boundaries of the property,

(d) identification of significant environmental features on the property,

(e) the details of a threatened species or threatened ecological community under the *Biodiversity Conservation Act 2016* that the applicant knows to exist on the property,

(f) the details and location of an Aboriginal object or place, within the meaning of the *National Parks and Wildlife Act 1974*, that the applicant knows to be situated on the property,

(g) a bush fire assessment for the proposed development, including the methodology used in the assessment, that addresses the following matters—

(i) the extent to which the development is to provide for setbacks, including asset protection zones,

(ii) the siting and adequacy of water supplies for fire fighting,

(iii) the capacity of nearby public roads to handle increased volumes of traffic when a bush fire emergency occurs,

(iv) whether or not nearby public roads that link with the fire trail network have two-way access,

(v) the adequacy of arrangements for access to and egress from the development site for the purposes of an emergency response,

(vi) the adequacy of bush fire maintenance plans and fire emergency procedures for the development site,

(vii) the construction standards to be used for building elements in the development,

(viii) the adequacy of sprinkler systems and other fire protection measures to be incorporated into the development,

(ix) registered fire trails on the property,

(h) an assessment of the extent to which the proposed development conforms with or deviates from *Planning for Bush Fire Protection*.

(3) An application for a bush fire safety authority must also be accompanied by the prescribed information if—

(a) the proposed development is subdivision for the purposes of dwelling houses, dual occupancies or secondary dwellings on property in an urban release area, and

(b) the application includes a request by the applicant that the Commissioner, when deciding the application, considers whether it would be appropriate for the erection of the dwelling houses, dual occupancies or secondary dwellings concerned to be excluded from the application of the *Environmental Planning and Assessment Act 1979*, section 4.14.

(4) In this section—

prescribed information means the following—

(a) a plan of subdivision that shows—

(i) the bush fire attack levels that will apply to the property on completion of clearing of vegetation proposed to be carried out as part of subdivision work, within the meaning of the *Environmental Planning and Assessment Act 1979*, and

(ii) proposed setbacks of buildings that may in future be erected on the property, including asset protection zones, and

(b) other information about the proposed development that the Commissioner may require.

Note—

More information about bush fire attack levels, including the flame zone, can be found in *Planning for Bush Fire Protection*, Table A1.7.

urban release area has the same meaning as in the *Environmental Planning and Assessment Regulation 2021*, section 270.

dual occupancy, ***dwelling house*** and ***secondary dwelling*** have the same meanings as in the standard instrument prescribed by the *Standard Instrument (Local Environmental Plans) Order 2006*.

Attachment 4: Evidence of competency & expertise (resume dated 20 May 2023)

In acknowledgement that the author of this report, David Boverman, is not accredited as a Bush fire Planning and Design (BPAD) Accredited Practitioner under the FPA Australia Scheme, the following *Evidence of Competency & Expertise* is provided in the form of a resume (dated 20 May 2023).

A comprehensive *Competency/Expertise Demonstration Report* is available on request that provides evidence of expertise and competency.

David Asher Boverman – Curriculum Vitae 20 May 2023

Narrative Summary

David is a professional with extensive qualifications in fire safety and fire protection engineering and building and fire code compliance acquired through formal education and more than thirty years of comprehensive and specialised practise. His background is unique, consisting of international work in both the public and private sectors with experience as a regulatory building and fire code official, and as an engineering consultant. His experience ranges from broad public policy development within the context of the political process to detailed design, review, and other work involving highly complex technical issues.

He has earned higher education credentials in the areas of fire safety and fire protection engineering, as well as in fire brigade operations and administration, fire prevention, hazardous materials, and fire investigation, having successfully completed with honours undergraduate degrees in Fire Protection Engineering from the University of Maryland and Fire Science from Montgomery College respectively (both in the U.S.A.).

His experience also includes work as a fire safety and fire protection engineer undertaking public policy development, risk analysis, fire safety strategy and policy development and upgrade proposals, building code and fire safety standards development, incident investigations, and design review, inspection, testing, and approval for launch critical facilities and related fire protection systems at the Kennedy Space Center in Florida.

He has also served as an adjunct instructor responsible for course development and lecturing in Fire Engineering, Building Fire Services, Fire Prevention, Fire Protection Systems, and Mathematics at the university and community college (ie TAFE) levels.

David has significant experience in public policy development and administration and management of personnel and municipal fire prevention programs gained as Manager Development Assessment and Planning New South Wales Rural Fire Service where he was responsible for a division of 15 full-time employees and an annual budget of approximately $1.5 million and as Fire Marshal and Fire Engineering Manager for the City of Eugene Oregon where he was responsible for a division of nine full time employees and an annual budget of approximately $1 million, and the delivery of a full service fire prevention program which included public education, fire investigations, hazardous materials (ie dangerous goods) regulation, code development, adoption, and administration, new construction/fire protection systems plan review, inspection, testing, and approvals, and fire and building code enforcement programs.

He continues to be responsible for participating in and leading public policy and regulatory reforms associated with fire protection and safety, as well as public policy involving the nexus between the socio-political-legal and technical in order to achieve more appropriate and acceptable assessment and approvals pathways, processes and technical requirements.

Helping Hands Planning & Design PTY LTD (April 2023 to present)

In his capacity of CEO & Principal Advocate/Consultant, David is responsible for bringing what he had previously accomplished in his previous role with the NSW Rural Fire Service (NSW RFS) out to Industry and the Public so they can achieve compliance with bush fire regulations, guidelines, policies, and the like consistent with bush fire hazards and associated risks.

In his previous role with the NSW RFS, David was instrumental in putting systems and processes in place so that performance-based outcomes could be consistent with the Commissioner's intent as communicated through the Director, Built & Natural Environment, the first level of authority to speak for and on behalf of the Commissioner on such matters.

In so doing, proposed developments that would otherwise have been 'No-Goers' were able to be

considered appropriate and acceptable based on the bush fire hazards and associated risks (examples include Special Fire Protection Purpose Developments, such as child care centres and nursing homes, that are proposed in urban type settings that are exposed on one or two sides to calculated radiant heat levels exceeding 10kW/sqm, as well as dwellings exposed technically to BAL-FZ, exposures of which on a risk basis are actually in-line with lower BAL's and/or Low-threat exclusions).

The decision to leave the NSW RFS was based principally on David's commitment to help people and influence change in the bushfire planning and design industry so that performance-based approaches can be supported and realised consistent with the educational standards taught in recognised higher-education programs, and adopted for accreditation by FPA Australia in their role as the only current accreditation body for NSW RFS recognition legislatively.

New South Wales Rural Fire Service (2009 to March 2023)

David served as the Manager Development Planning & Policy (MDPAP - previously Development Assessment and Planning) with the New South Wales Rural Fire Service (NSW RFS), a position he has held since July 2009. In his capacity as MDPAP he was directly responsible for an office of 7 full-time employees and an annual budget of approximately $1.5 million. He had program and policy responsibility related to approximately thirty NSW RFS assessment officers and broad oversight responsibility over the state of NSW's Bush Fire Planning and Design industry and allied professionals, as well as other State Agencies and consent authorities, including councils.

In this capacity he was responsible for oversight and management of state-wide compliance with bush fire planning and building requirements. This has included work with councils to ensure that they were able to enforce bush fire requirements found in *Planning for Bush Fire Protection* (PBP), the document which governs bush fire protection for buildings, associated land-use planning, and new development in NSW. This included policy development and training of both councils and NSW RFS regional staff to ensure that the requirements found in PBP are complied with.

As part of this role David was responsible for a revision to PBP to accommodate changes to the Building Code and revisions to the national standard on construction of buildings for bush fire protection. This required addressing of complex building and fire code issues regarding implementation of requirements for developments already assessed under the previous requirements that were required to meet the new requirements.

In recent years David was responsible and actively involved in leading and managing reforms and other changes considered fundamental and necessary to move the Bush Fire Planning and Design Consulting industry into the regulatory compliance and approvals framework that has been in place Australia-wide since 1998, including the performance-based approach to design, assessment, and compliance. This has included instituting assessment and approvals processes in the NSW RFS that leverage off broad legislative powers available to support alternative approvals pathways, systems, and processes to enable and promote performance-based design so that better bush fire protection and safety outcomes can be realised whilst allowing for flexibility and cost-effective design.

A major component of the reforms being initiated and implemented included introduction of fire engineering assessment approaches, methodologies, and tools into building bush fire protection and associated land-use planning design and assessment, as well as involving fire safety engineering and engineers into design and approval of building designs previously considered off-limits due to the traditional institutionalised approaches to assessment and regulatory assessments and approvals.

Systems and processes implemented in August 2021 included the Built & Natural Environment/Development Planning & Policy (BNE/DPAP) Advice Request Services, alternative pathways for consideration of performance-based proposals consistent with the Commissioner

RFS's vision for dealing with such matters.

Additionally, recognition by the Director Built & Natural Environment that advice and General Terms of Approval granted by the NSW RFS under sections 4.14 and 100B of the *Environmental Planning and Assessment* and *Rural Fire* Acts respectively could be reconsidered by the NSW RFS without the need to go to the Land and Environment Court was obtained and the directive issued accordingly to NSW RFS Assessment Teams Management.

As part of the roll-out of the BNE/DPAP Advice Request Service, David offered all BPAD Level 3 Consultants individualised training in undertaking the performance-based design, assessment, and compliance process which included developing and drafting a Performance-based Design Brief for a performance-based proposal of their choice, a decision that was made to start the ball rolling on supporting Industry so they could undertake performance-based designs and assessments consistent with standards that have been in place since the Bushfire Planning and Design (BPAD) Accreditation Scheme was first implemented.

These reforms are considered significant and substantial in that the gains benefit those who need them most, those individuals and families building their homes.

In his role as MDPAP, David also led research efforts following the unprecedented losses during the 2019/2020 Bush Fires during Black Summer to obtain information on performance of buildings so the appropriateness and adequacy of bush fire protection regulatory systems in NSW and Nationally can be considered.

David was also responsible for roll-out of the *2019/2020 Bush Fires Rebuilding Compliance Support Scheme* which included a performance-based approach that allowed those rebuilding in the highest bush fire risk areas to do so in a cost-effective fashion, avoiding excessive costs associated with traditional compliance with prescriptive requirements. This was considered to result holistically in higher levels of bush fire protection and safety, and in so doing allowed those who lost their homes to return to their land which would have otherwise been unachievable and severely obstructed their resilience and recovery.

David also assisted those suffering in advocating and supporting them in their design, compliance, and approvals/consent processes, working with Bushfire Recovery Officers at the State and Commonwealth levels as well as with those rebuilding individually, a once-in-a-lifetime opportunity to help people who needed it most, and also establish relationships that will last into the years to come.

New South Wales Fire Brigades (2002 to 2009)

David previously served as a Fire Safety Engineer with the New South Wales Fire Brigades (NSWFB), a position appointed to on 15 July 2002. As this appointment was for a newly created position, his primary role is to serve as the technical expert on fire engineering and building code matters involving the brigades. This is within the context of both the performance of specific engineering duties, as well as undertaking those responsibilities needed to further strategic development of the fire engineering program for the NSWFB.

This includes participation in broad public policy development such as work on development control and building approvals processes, leadership roles in professional societies, influencing change through education, and assisting the Building Professionals Board through committee membership (Accreditation Committee) and participation in investigations and disciplinary hearings.

Since his appointment, David has served as the Brigades' technical expert on all engineering aspects of fire safety and the Building Code of Australia. This has included evaluation of technical briefs and documents (such as Fire Engineering Design Briefs, Fire Engineering Assessments,

consultants' reports and submissions, etc) for consistency with current engineering standards of care as well as for technical adequacy and appropriateness.

Responsibilities have also involved review of submittals for verification of relevant engineering principles and associated computer modelling, providing guidance and assistance in inspecting and assessing complex and/or large fire safety systems, and in determining compliance with specified performance requirements.

In addition to his primary brigade duties, he also assists with corporate support in the areas of risk assessment and management involving occupational health and safety issues, and other duties as required by the broader organisation.

He has also continued to develop and maintain a network of peers with technical expertise to ensure access to best practice information and has been actively involved in the Society of Fire Safety at the State and National Executive and Committee Levels.

David also continues to actively contribute to the profession through work with The Institution of Engineers and the Building Professionals Board, Australia in the areas of professional engineering membership, registration, and competency and through presentations and other work at the local, national, and international levels.

University of Western Sydney (February 2007 to December 2010)

Adjunct Lecturer

- Developed and delivered university level courses in Fire Engineering, Fire Protection Systems, and Building Fire Services

Stephen Grubits & Associates (1997 to 2002)

Prior to his appointment with the New South Wales Fire Brigades, David worked as a Senior level Fire Safety Engineer and consultant with Stephen Grubits & Associates Pty Ltd (SGA) where he obtained significant experience and expertise in fire safety engineering, including design project management, fire and life safety strategy development, marketing and sales, and performance-based design, analysis, and related implementation and certification. He also acquired considerable experience and expertise in reviewing and assessing performance-based designs in the capacity of peer reviewer involving large scale projects and complex issues, including major projects for the 2000 Olympic Games.

As a design engineering consultant with Stephen Grubits & Associates David also obtained considerable expertise in developing complex risk assessment models and performing risk analyses in evaluating not only building code compliance issues but also in determining levels of safety for underground transportation systems to evaluate acceptability.

City of Eugene, Oregon (1994 to 1997)

In addition to expertise in the technical areas discussed above, he has significant experience in the administration and management of personnel and municipal fire prevention programs gained as Fire Marshal and Fire Engineering Manager for the City of Eugene where he was responsible for a division of nine full time employees and an annual budget of approximately $1 million, and the delivery of a full service fire prevention program which included public education, fire investigations, hazardous materials regulation (ie dangerous goods), code development, adoption, and administration, new construction/fire protection systems plan review, inspection, testing, and approvals, and fire and building code enforcement programs.

Additionally, David gained considerable experience and expertise in prevention of wildland (i.e.,

bush fire) fire hazards and risk management for the same.

City of Las Vegas, Nevada (1986 to 1994)

His experience with the special hazards associated with the space flight program has been complemented with his following work as a fire safety and fire protection engineer for the cities of Las Vegas, Nevada and Eugene, Oregon where he was responsible as the final authority for the development, adoption, interpretation, and administration of building and fire code requirements, as well as for design review, inspection and testing, and approval of fire protection systems, facilities, regulated processes and uses, alternative methods and materials, and fire engineered designs.

Community College of Southern Nevada (1989 to 1994)

He has also served as an adjunct instructor responsible for course development and lecturing in Fire Prevention, Fire Protection Systems, and Mathematics at the community college (ie TAFE) level.

Kennedy Space Center, Florida (1983 to 1986)

In his role working for the Base Operations and Maintenance Contractor, David participated in the Launch Readiness Review and meeting process in support of decisions to launch.

He has also gained considerable experience undertaking risk assessment and analyses for high hazard risks of significance.

This was obtained as a fire safety and fire protection engineer performing risk analysis, fire safety strategy development and upgrade proposals, building code and fire safety standards development, incident investigations, firefighting apparatus specification and acceptance testing, and design review, inspection, testing, and approval for launch critical facilities and related fire protection systems at the Kennedy Space Center in Florida.

During his employment at the Space Center he was also trained and involved in accident investigations and managing system outages to launch critical facilities.

He also acted in the capacity of engineering supervisor on a regular basis and oversaw development of proposals for major capital works projects intended to improve fire and life safety for launch critical and other base facilities.

City of Alexandria Virginia (1978 to 1983)

David served as a Firefighter, Emergency Medical Technician, and Acting Lieutenant in the Alexandria Virginia Fire Department from 1978 through 1983, a role that included instructing recruits, engine and truck company operations and command, emergency medical treatment, and vehicle extrication responsibilities.

In his capacity he gained considerable experience and expertise in fire behaviour, dynamics, suppression, smoke movement and ventilation, building structural behaviour, and human behaviour during fires and other emergency situations. This also included traffic management during the same.

Rockville Volunteer Fire Department Inc (1973 to 1983)

David served as a live-in Firefighter, Emergency Medical Technician, and Paramedic in a volunteer capacity in a suburb close to Washington D.C. from 1973 through 1983. This included in being in a first/immediate response capacity for fires, emergency medical, and other emergencies from a station with an annual response of approximately 2,300 calls per year.

This also provided considerable experience and expertise in fire behaviour, dynamics, suppression, smoke movement and ventilation, building structural behaviour, and human behaviour during fires and other emergency situations. This also included traffic management during the same.

For additional details and other information please refer to *Attachment A* of this document.

Specific Areas of Expertise

The above professional credentials, combined with 10 years of service as an active Firefighter, Acting Fire Officer, and Emergency Medical Technician provides David with the solid background of training, education, and experience to demonstrate expertise in the following areas:

- ✓ *Public policy development and administration;*
- ✓ *Personnel management;*
- ✓ *Fire science;*
- ✓ *Fire behaviour*
- ✓ *Fire dynamics;*
- ✓ *Fire engineering;*
- ✓ *Performance-based design, assessment, and compliance (Building Codes and Standards, including building bush fire protection and associated land-use planning);*
- ✓ *Land-use planning for bush fire hazards and risks;*
- ✓ *Fire-ground operations;*
- ✓ *Fire protection engineering;*
- ✓ *Risk assessment;*
- ✓ *Fire prevention;*
- ✓ *Codes and Standards development and administration;*
- ✓ *Fire investigations;*
- ✓ *Fire safety design & management;*
- ✓ *Fire insurance;*
- ✓ *Fire safety engineering research and teaching.*

Professional Registration and Memberships

- Registered Professional Engineer, College of Mechanical Engineers (Building Services Engineering), Fire Safety Engineering, National Engineering Register (#2122239), Institution of Engineers, Australia (Engineers Australia);
- Fellow, Chartered Professional Engineer, The Institution of Engineers, Australia;
- Society of Fire Safety, The Institution of Engineers, Australia.

Professional Affiliations

Current

- Fire Protection Association Australia; (FPA Australia);
- National Fire Protection Association ((NFPA, USA);
- Australasian Fire and Emergency Service Authorities Council (AFAC).

Previous (USA)

- International Conference of Building Officials;
- Western Fire Chiefs Association;
- International Association of Fire Chiefs;
- International Fire Code Institute.

Education

- December 1982, Bachelor of Science (BS), Fire Protection Engineering, University of Maryland College Park, College Park, Maryland (USA) - Four-year undergraduate engineering degree in fire safety and fire protection engineering;
- May 1978, Associate of Arts (AA), Fire Science, Montgomery College, Rockville, Maryland (USA) - Two-year technical degree in Fire Brigade operations, fire prevention, investigations, command, administration, hazardous materials, and management.

Presentations

Presentations authored and/or delivered include:

- Engineers Australia Society of Fire Safety Webinar - *Fire engineering for bush fire protection in NSW*;
- Blue Mountains Bushfire Conference 2022 - *Applying Performance Solutions in Small Scale Residential Development, A case study;*
- Building Designers Association of Australia Series - *Performance-based design, assessment, and compliance for building bush fire protection and associated land-use planning*;
- Engineers Australia College of Leadership and Management Newcastle Division - *Bush Fire Resilience, Recovery Response and Rebuilding following the 2019/20 NSW Bush Fires*;
- FSE 2009 (Society of Fire Safety) - *Design Fires - How Do We Know We Have Them Right?;*
- Society of Fire Protection Engineers 7th International Conference on Performance-Based Codes and Fire Safety Design Methods - *Fire Brigade Intervention Model in Australia – Understanding and Applying the Concepts*;
- FSE 2004 (Society of Fire Safety) - *Fire Engineered Compliance - A Perspective by Comments*;

- Fire Australia 2003 (Fire Protection Association Australia and Institution of Fire Engineers) - *Public Safety in the Built Environment through fire engineered compliance with BCA96: Are the community expectations being met?*;

- Australian Institute of Building Surveyors State Conference 2004 - *The New Approach to Alternative Solutions - Forensic Involvement*;

- Australian Institute of Building Surveyors State Conference 2003 - *Fire safety Perspectives-Building Professional Standards*;

- Society of Fire Protection Engineers 5th International Conference on Performance-Based Codes and Fire Safety Design Methods - *Performance Design Downunder - Still Learning*;

- Australian Institute of Building Surveyors State Conference 2005 - *The Hypothetical - "A Fire Safety Engineering Brief"* (a role play);

- Society of Fire Safety (Institution of Engineers, Australia Technical Society) Technical Seminars - miscellaneous presentations on fire detection and fire engineering issues including *Design Fires - Credible OR Incredible?*

Professional Contributions

Additional to the presentations given and ongoing work associated with the professional groups referenced above, specific contributing work to the profession includes:

- Implemented Development Planning & Policy/Built & Natural Environment Advice Request Service as an alternative to the NSW RFS Planning & Environment Assessment Teams in order to assist NSW RFS Executive in reforms to enable performance-based design, assessment, and compliance, and to allow for direct feedback to the Executive on Planning & Environment Assessment Teams practices and decisions;

- Document and influence policy and technical positions of NSW RFS through role as MDPAP;

- Support FPA Australia Bushfire Improvement Group;

- Assisted FPA Australia NSW BPAD Working Group;

- Supported engagement and drafting of PBP-2006 *Addendum Appendix 3*, PBP-2019, and *Addendum to Planning for Bush Fire Protection 2019*;

- Vice President, Executive Member - National Chapter, Society of Fire Safety (Institution of Engineers Australia);

- Secretary/Treasurer, Executive Member - National Chapter, Society of Fire Safety;

- Chairman, Executive Member - NSW Chapter, Society of Fire Safety;

- Vice-Chairman, Executive Member - NSW Chapter, Society of Fire Safety;

- Interview panel participation - assisted The Institution of Engineers, Australia with professional membership and registration interviews;

- Accreditation Committee participation - served on the New South Wales Building Professionals Board Accreditation Committee to evaluate candidates for their professional accreditation to practice as engineers and building surveyors (i.e., Building Officials);

- National Professional Engineering Register Continuing Professional Development auditing work - Institution of Engineers, Australia;
- Committee member contributing to revision and promulgation - *Code of Practice for Fire Safety Design, Certification & Peer Review in Accordance with the Building Code of Australia* (a Society of Fire Safety Executive Initiative);
- Review and revision work for and on behalf of the Society of Fire Safety (Institution of Engineers, Australia) - *International Fire Engineering Guidelines (2005);*
- Work on competency issues and standards - The Institution of Engineers, Australia;
- Review of issues - Fire Brigade Intervention Model - Australasian Fire Authorities Council (AFAC);
- Review and revision work, Building Code of Australia - AFAC;
- Assisted student research, Fire Modelling in Australia Project - Worcester Polytechnic Institute and AFAC;
- Participated in work experience program for overseas students migrating to Australia - The Institution of Engineers, Australia;
- NFPA Technical Committee on Hazard and Risk of Contents and Furnishings (HAR-AAA);
- NFPA Technical Committee on Professional Qualifications (NFPA 1037).

References

Happily available on request.

Address and Contact Details

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Attachment A: Detailed Experience

Helping Hands Planning & Design PTY LTD (April 2023 to present)

CEO & Principal Advocate/Consultant

- Responsible for bringing what he had previously accomplished in his previous role with the NSW Rural Fire Service (NSW RFS) out to Industry and the Public so they can achieve compliance with bush fire regulations, guidelines, policies, and the like consistent with bush fire hazards and associated risks;

- This includes systems and processes so that performance-based outcomes could be consistent with the Commissioner's intent as communicated through the Director, Built & Natural Environment, the first level of authority to speak for and on behalf of the Commissioner on such matters;

- Developments that would otherwise have been 'No-Goers' were able to be considered appropriate and acceptable based on the bush fire hazards and associated risks (examples include Special Fire Protection Purpose Developments, such as child care centres and nursing homes, that are proposed in urban type settings that are exposed on one or two sides to calculated radiant heat levels exceeding 10kW/sqm, as well as dwellings exposed technically to BAL-FZ, exposures of which on a risk basis are actually in-line with lower BAL's and/or Low-threat exclusions);

- Decision to leave the NSW RFS was based principally on David's commitment to help people and influence change in the bushfire planning and design industry so that performance-based approaches can be supported and realised consistent with the educational standards taught in recognised higher-education programs, and adopted for accreditation by FPA Australia in their role as the only current accreditation body for NSW RFS recognition legislatively.

New South Wales Rural Fire Service (2009 to March 2023)

Manager Development Assessment & Planning, Manager Development Planning & Policy

- Served as the Manager Development Planning & Policy (DPAP - previously Development Assessment and Planning) with the New South Wales Rural Fire Service (NSW RFS), a position he has held since July 2009;

- Directly responsible for an office of 7 full-time employees and an annual budget of approximately $1.5 million;

- Program and policy responsibility related to approximately thirty NSW RFS assessment officers and broad oversight responsibility over the state of NSW's Bush Fire Planning and Design industry and allied professionals, as well as other State Agencies and consent authorities, including councils;

- Responsible for oversight and management of state-wide compliance with bush fire planning and building requirements. This has included work with councils to ensure that they were able to enforce bush fire requirements found in *Planning for Bush Fire Protection* (PBP), the document which governs bush fire protection for buildings, associated land-use planning, and new development in NSW. This included policy development and training of both councils and NSW RFS regional staff to ensure that the requirements found in PBP are complied with;

- Responsible for a revision to PBP to accommodate changes to the Building Code and revisions to the national standard on construction of buildings for bush fire protection. This required addressing of complex building and fire code issues regarding implementation of requirements

for developments already assessed under the previous requirements that were required to meet the new requirements;

- Responsible and actively involved in leading and managing reforms and other changes considered fundamental and necessary to move the Bush Fire Planning and Design Consulting industry into the regulatory compliance and approvals framework that has been in place Australia-wide since 1998, including the performance-based approach to design, assessment, and compliance;

- Included instituting assessment and approvals processes in the NSW RFS that leverage off broad legislative powers available to support alternative approvals pathways, systems, and processes to enable and promote performance-based design so that better bush fire protection and safety outcomes can be realised whilst allowing for flexibility and cost-effective design;

- A major component of the reforms being initiated and implemented included introduction of fire engineering assessment approaches, methodologies, and tools into building bush fire protection and associated land-use planning design and assessment, as well as involving fire safety engineering and engineers into design and approval of building designs previously considered off-limits due to the traditional institutionalised approaches to assessment and regulatory assessments and approvals;

- Systems and processes implemented in August 2021 included the Built & Natural Environment/Development Planning & Policy (BNE/DPAP) Advice Request Services, alternative pathways for consideration of performance-based proposals consistent with the Commissioner RFS's vision for dealing with such matters;

- Additionally, recognition by the Director Built & Natural Environment that advice and General Terms of Approval granted by the NSW RFS under sections 4.14 and 100B of the *Environmental Planning and Assessment* and *Rural Fire* Acts respectively could be reconsidered by the NSW RFS without the need to go to the Land and Environment Court was obtained and the directive issued accordingly to NSW RFS Assessment Teams Management;

- As part of the roll-out of the BNE/DPAP Advice Request Service, offered all BPAD Level 3 Consultants individualised training in undertaking the performance-based design, assessment, and compliance process which included developing and drafting a Performance-based Design Brief for a performance-based proposal of their choice, a decision that was made to start the ball rolling on supporting Industry so they could undertake performance-based designs and assessments consistent with standards that have been in place since the Bushfire Planning and Design (BPAD) Accreditation Scheme was first implemented;

- Led research efforts following the unprecedented losses during the 2019/2020 Bush Fires during Black Summer to obtain information on performance of buildings so the appropriateness and adequacy of bush fire protection regulatory systems in NSW and Nationally can be considered;

- Responsible for roll-out of the *2019/2020 Bush Fires Rebuilding Compliance Support Scheme* which included a performance-based approach that allowed those rebuilding in the highest bush fire risk areas to do so in a cost-effective fashion, avoiding excessive costs associated with traditional compliance with prescriptive requirements. This was considered to result holistically in higher levels of bush fire protection and safety, and in so doing allowed those who lost their homes to return to their land which would have otherwise been unachievable and severely obstructed their resilience and recovery;

- Assisted those suffering in advocating and supporting them in their design, compliance, and approvals/consent processes, working with Bushfire Recovery Officers at the State and Commonwealth levels as well as with those rebuilding individually, a once-in-a-lifetime

opportunity to help people who needed it most, and also establish relationships that will last into the years to come.

University of Western Sydney (February 2007 to December 2010)

Adjunct Lecturer

Developed and delivered university level courses in Fire Engineering, Fire Protection Systems, and Building Fire Services.

New South Wales Fire Brigades (2002 to 2009)

Fire Safety Engineer

- Inspected sites and building services in conjunction with Officers of the Brigades' Fire Safety Division to assess compliance with regulations, Australian Standards and NSWFB requirements. (examples include pre-occupancy inspection of the St. Vincent's Hospital renovation and addition involving fire safety engineered performance - based solutions and complex fire protection systems, assistance with fire safety inspections of existing hospitals, etc);

- Liaised with industry and Government bodies regarding technical issues of fire safety to promote the NSWFB and present, both formally and informally, the Brigades' position regarding these issues (examples include liaising with Institution of Engineers Australia, Planning NSW, Metropolitan Fire Brigades (Melbourne), CSIRO, SSL, etc);

- Assisted NSWFB representatives on the Australasian Fire Authorities Council on the AS2419.1 committee to ensure that the interests of AFAC and the NSWFB were considered, specifically in regard to requirements for supply and delivery fire hydrant systems;

- Assessed technical and engineering submissions/analyses and their application, and evaluated plans and specifications to assess compliance with regulations, Australian Standards and NSWFB requirements and to ensure proposals are relevant and accurate (this has included review of fire protection system designs and performance - based fire engineering submittals involving deterministic and risk-based methodologies for a wide variety of building types and uses, including carparks, existing and new high rise buildings, assembly and entertainment uses, retail buildings, storage facilities, and manufacturing/production buildings);

- Assessed the use and application of computer modelling in order to evaluate fire engineering design analyses submitted to the NSWFB (including numerous zone and field modelling);

- Assisted in training regarding technical fire safety matters and in providing officers of the Brigades with technical advice to assist with their legislative requirements of providing consent and report on behalf of the Commissioner (examples include training regarding the fire engineering design process, appropriate application of fire and smoke modelling techniques, the role of the Fire Safety Engineering Brief in fire engineering design, the application of risk-based methodologies and issues relevant to compliance with the Performance Requirements of the BCA, etc);

- Continued to maintain currency in regard to industry practices, standards, technology and other related issues where they affect fire safety;

- Provided consultation to industry, supplying information regarding fire service operations, firefighter life safety, and application of the Fire Brigade Intervention Model;

- Assessed alternative fire safety system design solutions for compliance with the Performance Requirements of the BCA and consistency with the standard of care provided by the *Fire Safety Engineering Guidelines* as well as other recognised engineering standards of practise.

Stephen Grubits & Associates Pty Ltd (1997 to 2002)

Senior Fire Safety Engineer

- Fire safety and code compliance strategy development, management, and oversight for numerous significant projects;
- Fire and life safety design, consulting, and analysis for a variety of projects ranging in value from approximately $300,000 to $500 million[1] involving qualitative, deterministic, and probabilistic (i.e., risk) performance-based methodologies, and performance and/or oversight of related fire, smoke, egress, and risk modelling;
- Performance of financial and economic analysis of proposed fire safety concept design options;
- Oversight and development of the *TRAFFIC* risk analysis model (*Tunnel Risk Assessment for Fire Incidents and Catastrophes* is a proprietary development by SGA) and other risk analysis for tunnels and building applications;
- Development of commissioning, inspection, and testing protocols and performance and oversight of respective tests, such as hot smoke testing;
- Specification, design review, inspection, system testing, and other activities related to design implementation, including project certification;
- Performance of peer and other contract review/approval activities of fire engineered designs for major projects;
- Coordination of fire and life safety concept design and implementation with other design elements and developing of alternative/revised strategies when needed;
- Validation assessment and reporting of a proprietary radiant heat attenuation model;
- Project involvement includes:
  - ⇨ International Broadcast Centre - Fire safety engineer and certifier providing overall project oversight and responsible for concept design development, analysis, reporting, implementation, and certification for conversion of approximately 70,000 m^2 of warehouse space to broadcast studios and production area serving as the broadcast centre for the Sydney Olympics (project value of approximately $50 million);
  - ⇨ New Southern Railway Project - Fire safety engineer for underground railway tunnel extension which included four new underground stations, responsible for performance-based design involving deterministic and probabilistic risk analyses for the stations and tunnels respectively (project value of approximately $500 million). Included development of risk analysis model to assess the influence that emergency services intervention shafts would have on risk associated with fire and accident casualties;
  - ⇨ City Underground Railway Project - Fire safety engineer responsible for development of fire safety strategy, oversight of risk analysis model development for assessment of

[1] All dollars referenced in this section are in 2002 dollars.

underground tunnel systems, and performance and documenting of System Risk Evaluation for the existing system in order to evaluate the effectiveness of safety upgrade options. Performed financial and economic analysis of proposed fire safety upgrade concept design options to assess influence on risk in financial and economic terms. This also included program, quality, and project management responsibilities;

- ⇨ Bondi Beach Railway Extension - Fire safety engineer for design of underground rail tunnel extension and design of new underground station. Responsibilities included project oversight and management, fire safety strategy development, development of the fire engineering design brief, approvals facilitation, and analysis and reporting for deterministic and probabilistic (risk) performance-based designs for the station and tunnels respectively (project value of approximately $400 million);

- ⇨ Darling Park Towers - Fire safety engineer responsible for development of concept design strategy and risk analysis modelling for newly completed high rise office building and proposed tenancy fitouts (fire engineered design resulted in upgrade savings in the order of $1-3 million as well as significant savings in lost rent due to space which would have been otherwise lost);

- ⇨ Coles Myer Distribution Centre - Fire safety engineer responsible for fire engineered design and System Performance Evaluation of a 90,000 m^2 warehouse facility;

- ⇨ Stadium Australia - Fire safety engineer responsible for oversight, coordination, and performance of hot smoke testing during commissioning and approval of fire protection systems which included scoping, development of testing protocols, evaluation criteria, project resourcing, and documentation;

- ⇨ Tech Pacific Warehouse - Fire safety engineer responsible for oversight, coordination, and performance of hot smoke testing during commissioning and approval of fire protection systems which included scoping, development of testing protocols, evaluation criteria, project resourcing, and documentation;

- ⇨ Sydney 2000 Darling Harbour Olympic Overlay Peer/Contract Review - Fire safety engineer responsible for peer and contract review of Olympic Games Overlay involving significant changes in use and design for the Convention and Entertainment Centres, the Exhibition Halls, and the Carpark and perimeter outside areas;

- ⇨ Olympic Park (Homebush) - Peer/Contract Review - Fire safety engineer responsible for peer and contract review of Olympic Games Overlay for Common Domain venues. Because of the constantly changing nature of the temporary venue designs, the emphasis on compliance and approvals needed to shift from that of design review to construction (or set-up) and inspection. This required coordination and development of a fire engineering design guideline which served as the construction and approval specification for the temporary venues;

- ⇨ Numerous Sub System Equivalence and System Performance Evaluations on projects to assess issues such as fire resistance levels, travel distances, smoke hazard management strategies, compartmentation, and opening protection.

City of Eugene Oregon (1994 to 1997)

Fire Protection Engineering Manager/Fire Marshal

- Administration and management of personnel and municipal fire prevention programs;

- Responsible for a division of nine full time employees and an annual budget of approximately $1 million[2], and the delivery of a full-service fire prevention program which included:
  - ⇨ public education;
  - ⇨ fire investigations;
  - ⇨ hazardous materials (i.e., dangerous goods) regulation;
  - ⇨ code development, adoption, and administration;
  - ⇨ new construction/fire protection systems plan review, inspection and testing, approvals;
  - ⇨ routine inspections and fire and building code enforcement programs;
- Considerable experience and expertise in prevention of wildland (i.e., bush fire) fire hazards and risk management for the same;
- Building and fire code development, interpretation, and review and approval of alternate materials and methods including performance-based designs;
- Review and approval of building designs and construction, and design review, inspection and testing for approval of fire protection systems;
- Development and delivery of fire prevention and protection training programs.

Community College of Southern Nevada (1989 to 1994)

Adjunct Instructor

- Developed and delivered community college (ie TAFE) level courses in Fire Prevention, Fire Protection Systems, and Mathematics.

City of Las Vegas Nevada (1986 to 1994)

Fire Protection Engineer

- Performed as the final authority for the development, adoption, interpretation, and administration of building and fire code requirements, as well as for performance of design review, inspection and testing, and approval of fire protection systems, facilities, regulated processes and uses, alternative methods and materials, and fire engineered designs;
- Responsible for the administration and management of the new construction and fire protection systems building approvals, design review, inspection and testing, and occupancy certification programs;
- Performed employee training in the areas of building and fire codes and fire protection systems;
- Responsible for assisting in fire investigations when requested.

[2] 1997 dollars

EG&G, Florida, Kennedy Space Center (1983 to 1986)

Fire Protection Engineer

- In role working for the Base Operations and Maintenance Contractor, participated in the Launch Readiness Review and meeting process in support of decisions to launch;
- Fire safety and fire protection engineer performing risk analysis, fire safety strategy development and upgrade proposals, building code and fire safety standards development, incident investigations, firefighting apparatus specification and acceptance testing, and design review, inspection, testing, and approval for launch critical facilities and related fire protection systems at the Kennedy Space Center in Florida;
- Served as acting engineering supervisor providing technical and management oversight as needed on an ongoing basis;
- Responsible for the development and administration of the fire protection system outage program assessing the technical impact on fire safety risk and recommending alternative safety requirements for system outages;
- Performed as project manager for the firefighting apparatus acceptance and testing program;
- Acted as a community liaison requiring the development and delivery of the high school outreach program in order to orient students to engineering disciplines practised at the Space Center.

Cities of Rockville Maryland and Alexandria Virginia (1974 to 1983)

Acting Officer, Firefighter, Emergency Medical Technician, and Paramedic

- Responsible for fire suppression and delivery of emergency medical care for departments each having an annual response rate of approximately 12,000 calls per year;
- Performed fire prevention and pre-fire planning inspections for new and existing occupancies which included residential and commercial properties such as apartments, hotels, public entertainment, transportation, medical and institutional, retail, and industrial buildings;
- Performed firefighter training for new recruits;
- Responsible for initial fire attack tactics and strategy as Acting Officer in charge of firefighting, rescue, ventilation, and forcible entry operations;
- Responsible for providing basic and advanced life support, other emergency medical care, emergency rescue, and transportation of the sick and injured.