Bushfire Assessment Report

36 Elkin Avenue, Heatherbrae

Prepared for

Department of Education c/- The APP Group

Final / October 2023

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Approval for use:

Matt Doherty - Director

09 October 2023

This report has been prepared in accordance with Appendix 2 of Planning for Bushfire Protection 2019 and certifies the development conforms to the specifications and requirements of Section 100B of the Rural Fires Act 1997 and S4.14 of the Environmental Planning and Assessment Act 1979.

EXECUTIVE SUMMARY

MJD Environmental has been engaged by The APP Group on behalf of School Infrastructure NSW to prepare a Bushfire Assessment Report (BAR) to assess the bushfire impacts and provide management and mitigation recommendations for the proposed development works at Lot 1 DP 120189, 579025 & 540114, 36 Elkin Avenue, Heatherbrae, NSW.

This report has been prepared in relation to the proposed development of Hunter River High School located at 36 Elkin Avenue, Heatherbrae. This report has been prepared to support:

a) A development application for the construction of a gymnasium (Block Y), consisting of a basketball court, equipment storage, canteen kitchen, staff room, first aid room and change room amenities, construction of hardstand civic space north of the gymnasium, construction of full-size rugby field, the construction of new carpark consisting of sixty-five (65) parking spaces (including 6 accessible parking spaces) and the construction and connection of a reticulated sewer pipe.
b) A Part 5 Activity Approval, development permitted without consent, for the construction of a new administration building, student learning hub and provision of essential services.
c) A Part 5 Activity Approval, development permitted without consent, for the construction of a new linking road and kiss and drop bay between Adelaide Street and Elkin Avenue.

This assessment has considered and assessed the bushfire hazard and associated potential threats relevant to the Proposal, and to outline the minimum mitigative measures which would be required in accordance with *Planning for Bush Fire Protection 2019* (PBP), as adopted through the *Environmental Planning & Assessment Amendment* (Planning for Bush Fire Protection) *Regulation 2020.*

The *Planning for Bush Fire Protection Addendum 2022* (Addendum) came into effect as of 1 May 2023 to coincide with the adoption of the National Construction Code (NCC) 2022. The Addendum (2022) was issued to ensure that PBP (2019) was compatible with NCC (2022) and to align the two documents.

The Proposal is to be constructed against the National Construction Code (NCC) 2019 via the transitional arrangements that were put in place to allow practitioners to continue using the relevant provisions of NCC 2019, until the end of the relevant transition period for NCC 2022. This is also in line with the Proposals tender release date and allows construction via NCC 2019. Due to the Proposals construction against the NCC (2019), and the provisions stated, the Proposal has not been assessed against the Addendum (2022).

The proposal type triggers the criteria outlined with PBP (2019) for Special Fire Protection Purposes (SFPP). As such SFPP activates the provisions of integrated development under Section 4.46 of the EP&A Act, thus requiring approval and issue of a Bush Fire Safety Authority from the NSW RFS under 100B of the *Rural Fires Act 1997* (RF Act).

In order to determine whether the proposed development is bushfire-prone, and if so, which setbacks and other relevant Bush Fire Protection Measures (BPM) will be appropriate, this proposal was assessed against the methodology and procedures outlined in PBP (2019) via assessment of acceptable solutions as outlined in Chapter 6 of PBP (2019).

This assessment has been made based on the bushfire hazards in and around the Site at the time of report production.

The assessment found that vegetation representing a hazard north-west of the site to 140m has been conservatively assessed as Grassland-class hazard vegetation with managed land occurring in all other directions. The slope under the primary hazard vegetation has been assessed as either flat and upslope, or 0-5° Downslope. As the site is within the Port Stephens LGA it has been assessed under a Forest Fire Danger Index (FFDI) rating of 100. Furthermore, the school is located on the edge of an urban area with low-

lying cleared agricultural lands or housing adjacent to the Site. The nearest Category 1 vegetation consists of two small pockets (<10ha) >300m to the north and >400m to the west respectively.

In summary, the following key recommendations have been generated to enable the proposal to comply with PBP (2019).

- The proposal will be constructed against the National Construction Code (NCC) 2019 via the transitional arrangements that were put in place to allow practitioners to continue using the relevant provisions of NCC 2019, until the end of the relevant transition period for NCC 2022.
- An APZ of 36m is to be established over the site in association with T1 to the West.
- An APZ of 40m is to be established over the site in association with T2 to the West, and T3, and T4 to the North.
- Currently the Site is bordered to the north and south by residential areas, to the east by the Pacific Highway and to the west by agricultural land. Adjacent to areas of agricultural land, the Site has separation from the conservatively assessed Category 3 vegetation hazard via the schools managed agricultural teaching area. This buffers the existing and proposed development from the grassland vegetation hazard.
- The proposal includes the inclusion of several buildings internal of the existing development, that provides further separation of the Proposal from the conservatively assessed grassland vegetation hazard.
- All development of existing buildings within areas affected by BPMs must comply with Section 6.5 of PBP (2019).
- The proposed support learning hub and gymnasium block will be located internal of the existing development and on a parcel of the lot that is not mapped as being BFPL. As per Table 6.8a of PBP (2019), a construction level of BAL-12.5 under AS 3959 or NASH Standard and section 7.5 of PBP is applied to all new construction as part of a SFPP.
- Access is provided and is to comply with Table 6.8b, Appendix 3 of PBP (2019) as summarised and assessed in Chapter 3, Section 3.2 of this report.
- The existing primary property access to the Site from Elkin Avenue will be retained and a second access point will be incorporated to join onto Adelaide Street under the proposal. Speed limits to Elkin Avenue, and along Adelaide Street are below 70km/h. Emergency access / egress can be gained from both Elkin Avenue and Adelaide Street.
- The proposal is considered to meet the performance criteria for access / egress to the associated lots by providing safe operational access / egress for emergency services personnel while occupants are evacuating the site. Provision must be made for a turning head for any dead-end road longer than 200m. Adequate turning area must be afforded for fire resources to access and egress all areas of the site in line with Appendix 3 of PBP (2019). Any divergence to the acceptable solutions must be assessed as a performance solution.
- Services are to be provided and connected to the site in accordance with Table 6.8c PBP (2019) as summarised and assessed in Chapter 3, Section 3.3 of this report.
- Careful consideration of future site landscaping, fencing and ongoing fuel management must occur to minimise the potential impact of bushfire on the site. All landscaping and fuel management must provide due consideration of PBP (2019) Appendix 4.
- A Bush Fire Emergency Management and Evacuation Plan shall be prepared for the site as set out in Table 6.8d of PBP 2019. A copy of the Bushfire Emergency Management and Evacuation Plan is to be provided to the Local Emergency Management Committee. Any existing emergency management plans must be updated to reflect the proposal and RFS guidelines.
- In accordance with Chapter 6.4, PBP 2019, 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. On this basis, improvements may be required to be made to the existing buildings located within Bushfire Prone Land; although it is not proposed, as the minor nature of the building works have rendered the Proposal as exempt from planning approval. It is considered that retrospective ember

protection could be applied to the existing building if deemed necessary, as set out in Section 7.5.1 of PBP (2019) as follows:

- Subfloor screening
- Openings, vents, and weep holes to be screened with AS3959 compliant mesh
- Installation of gutter guard
- Installation of wire screens to doors and windows.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

GLOSSARY OF TERMS AND ABBREVIATIONS

Term/ Abbreviation	Meaning
API	Aerial Photograph Interpretation
APZ	Asset Protection Zone
AS2419-2005	Australian Standard – Fire Hydrant Installations
AS3959-2018	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BCA	Building Code of Australia
BC Act	Biodiversity Conservation Act 2016
BMP	Bushfire Management Plan
BPA	Bushfire Prone Area (Also Bushfire Prone Land)
BPL	Bushfire Prone Land
BPLM	Bushfire Prone Land Map
BPM	Bushfire Protection Measures
BTA	Bushfire Threat Assessment
DoE	Commonwealth Department of the Environment
DPI Water	NSW Department of Primary Industries – Water
EPA Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LGA	Local Government Area
LLS Act	Local Land Services Act 2013
NCC	National Construction Code
OPA	Outer Protection Area
OEH	NSW Office of Environment and Heritage
PBP or PBP (2019)	Planning for Bushfire Protection 2019
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation
RFS	NSW Rural Fire Service
TSC Act	NSW Threatened Species Conservation Act 1995 (as repealed)

1 Introduction

MJD Environmental has been engaged by The APP Group on behalf of School Infrastructure NSW to prepare a Bushfire Assessment Report (BAR) to assess the bushfire impacts and provide management and mitigation recommendations for the proposed development works at Lot 1 DP 120189, 579025 & 540114, 36 Elkin Avenue, Heatherbrae, NSW, hereafter referred to as the 'Site' (Refer to **Figure 1**).

This report has been prepared in relation to the proposed development of Hunter River High School located at 36 Elkin Avenue, Heatherbrae. This report has been prepared to support:

a) A development application for the construction of a gymnasium (Block Y), consisting of a basketball court, equipment storage, canteen kitchen, staff room, first aid room and change room amenities, construction of hardstand civic space north of the gymnasium, construction of full-size rugby field, the construction of new carpark consisting of sixty-five (65) parking spaces (including 6 accessible parking spaces) and the construction and connection of a reticulated sewer pipe.
b) A Part 5 Activity Approval, development permitted without consent, for the construction of a new administration building, student learning hub and provision of essential services.
c) A Part 5 Activity Approval, development permitted without consent, for the construction of a new linking road and kiss and drop bay between Adelaide Street and Elkin Avenue.

This assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to the Proposal, and to outline the minimum mitigative measures which would be required in accordance with *Planning for Bush Fire Protection 2019* (PBP), as adopted through the *Environmental Planning & Assessment Amendment* (Planning for Bush Fire Protection) *Regulation 2020*.

The proposal type triggers the criteria outlined with PBP (2019) for Special Fire Protection Purposes (SFPP). As such SFPP activates the provisions of integrated development under Section 4.46 of the EP& A Act, thus requiring approval and issue of a Bush Fire Safety Authority from the NSW RFS under 100B of the *Rural Fires Act 1997* (RF Act).

In order to determine whether the proposed development is bushfire-prone, and if so, which setbacks and other relevant Bush Fire Protection Measures (BPM) will be appropriate, this assessment adhered to the methodology and procedures outlined in PBP (2019) via assessment of acceptable solutions as outlined in Chapter 6 of PBP (2019).

This assessment has been made based on the bushfire hazards in and around the Site at the time of report production.

1.1 Aims & Objectives

This assessment has been undertaken in accordance with clause 44 of the RF Regulation 2013. This BAR addresses the aims and objectives of PBP (2019), being:

- Afford buildings and their occupants protection from exposure to a bushfire;
- Provide for a defendable space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
- Ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
- Provide for ongoing management and maintenance of bushfire protection measures; and
- Ensure that utility services are adequate to meet the needs of firefighters.

1.2 Site Particulars

Locality	The site is situated in Heatherbrae
Land Title	Lot 1 DP 120189, 579025 & 540114
LGA	Port Stephens Council
Area	9.17 ha (approx.)
Zoning	The land is currently zoned R2 Low Density Residential (NSW DPIE 2022)
Boundaries	The Lot is bound by residential lots to the north-east and south-west, with the Pacific Highway and commercial lots to the south-west. To the north-west is pasture lands.
Current Land Use	The Lot is currently occupied by the existing Hunter River High School.
Topography	The site is largely flat, with a gentle slope to the west. The site sits at an elevation of ~6 meters.
Climate / Fire History	The site lies within the Port Stephens LGA and therefore is assessed under a Forest Fire Danger Index (FFDI) rating of 100. A portion of the north-west of the site is mapped as being affected by Category 3 bushfire prone vegetation and associated buffer.

1.3 Description of Proposal

The proposal relates to an existing school, Hunter River High School, and the development of both existing and new buildings and infrastructure. Many of the existing school buildings are outdated and some permanent structures do not meet the current Educational Facilities Standards and Guidelines (EFSG). The school needs to be upgraded and updated to meet relevant standards.

The proposed development will see an update to existing buildings and the development of new buildings and infrastructure. The proposed development of the school is also required to cater for the current needs of enrolled students.

The changes to the school will include the following:

- The construction of gymnasium (Block Y), consisting of a basketball court, equipment storage, canteen kitchen, staff room, first aid room and change room amenities, construction of hardstand civic space north of the gymnasium, construction of full-size rugby field, the construction of new carpark consisting of sixty-five (65) parking spaces (including 6 accessible parking spaces) and the construction and connection of a reticulated sewer pipe (Development Application, development requires consent).
- The construction of a new administration building, student learning hub and provision of essential services (Part 5 Activity Approval, development permitted without consent).
- The construction of a new linking road and kiss and drop bay between Adelaide Street and Elkin Avenue (Part 5 Activity Approval, development permitted without consent).

The proposed development includes the implementation of Asset Protection Zones in accordance with PBP (2019) across areas of Lot 1 DP 120189 and 579025.

A copy of the proposed Site Plan is enclosed as **Appendix A**.

HUNTER RIVER HIGH SCHOOL,
RAYMOND TERRACE

FIGURE 1: Site Location

Legend

- Site
- Cadastral Boundaries

N
W E
S

0 87.5 175 350

Meters

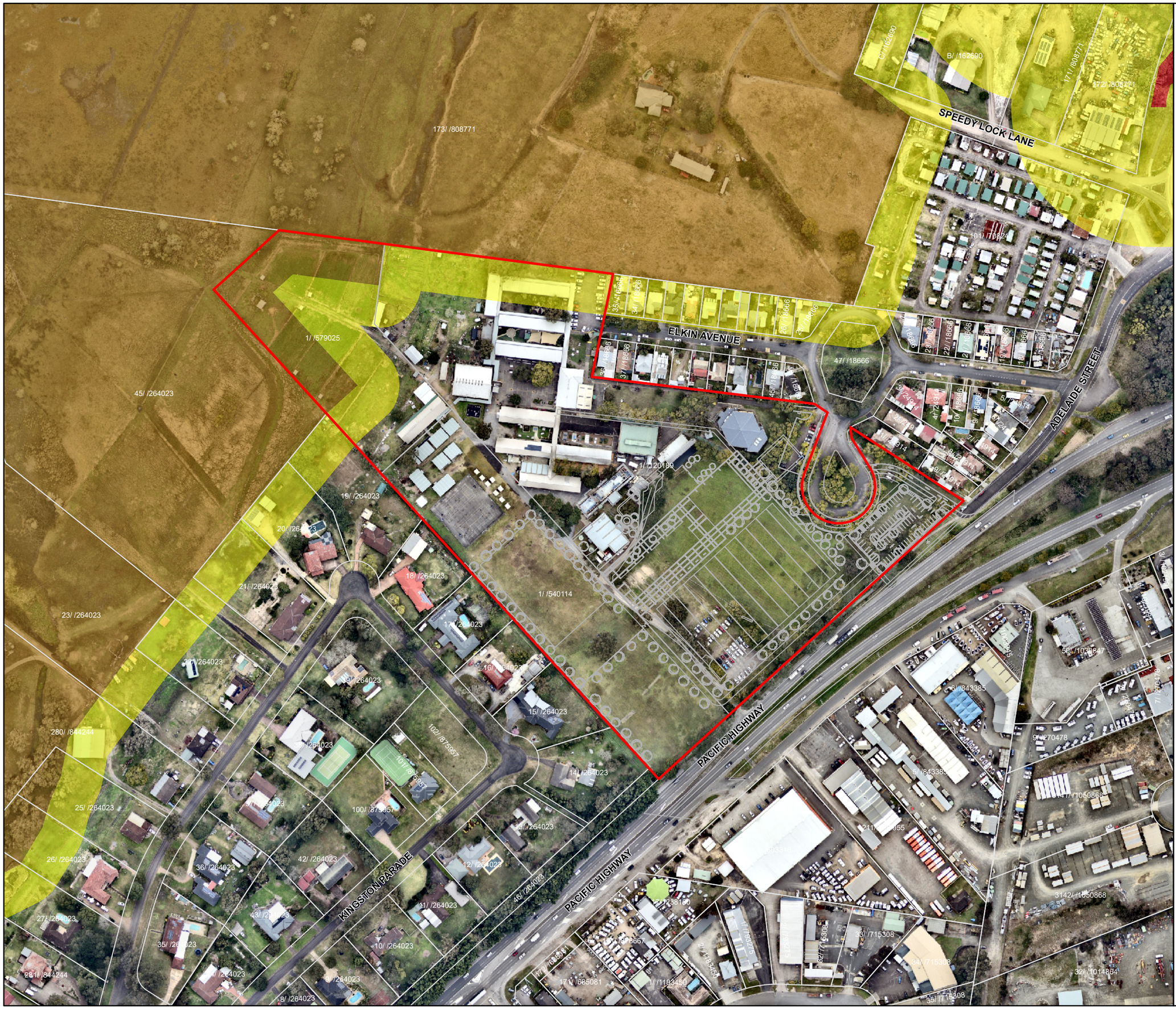
1:5,000

MJD Environmental

Aerial: Spatial Services (2022) | Data: MJD Environmental (2022), Spatial Services (2020) | Datum/Projection: GDA 2020 MGA Zone 56 | Date: 19/09/2022| Version 1 | GIS\20053 - Hunter River High School | This plan should not be relied upon for critical design dimensions.

HUNTER RIVER HIGH SCHOOL, RAYMOND TERRACE

FIGURE 2: Bushfire Prone Land



Legend

- Proposed Development Layout
- Site
- Cadastral Boundaries

Bush Fire Prone Vegetation

- Category 1
- Category 3
- BFPV Buffer

N W E S

0 40 80 160

Meters

1:2,500

MJD Environmental

Aerial: Nearmap (2022) | Data: MJD Environmental, Terras (2023), Spatial Services, RFS (2020) | Datum/Projection: GDA 2020 MGA Zone 56 | Date: 21/04/2023| Version 3 | Z:\22057 - Hunter River HS & Irrawang HS\ | This plan should not be relied upon for critical design dimensions.

2 Bushfire Hazard Analysis

2.1 Vegetation Assessment

Methodology

The vegetation in and around the Site, has been assessed to 140m from the building envelope, in accordance with PBP 2019. This assessment has been made via a combination of:

- aerial photo interpretation;
- on site vegetation classification; and
- reference to regional community vegetation mapping (including LMCC and Keith 2004).

These vegetation communities have been classified for bushfire purposes into structure and formation using the system adopted by Keith (2004) and using Figure A1.2 of PBP (2019) with due regard to Section A1.10 (low threat vegetation – exclusions) and A1.11.1 (remnant bushland – simplified approach) where present and Appendix 1 of PBP (2019).

Refer to Photos 1 to 7 for vegetation observed in and around the Site during site inspection.

Vegetation Classification

Vegetation classification has been presented in **Table 1** below and **Figure 3**.

Table 1 Vegetation Classification

Direction	Description	Primary Hazard Vegetation Classification
North*	▪ Pasture lands – conservatively assessed as grasslands	Grassland
North-east	▪ Residential lots	Managed
South-east	▪ Pacific Highway ▪ Commercial lots	Managed
South-west	▪ Residential lots	Managed
West*	▪ Pasture lands – conservatively assessed as grasslands	Grassland

*** Note:** The hazard to the North and West has been broken into four (4) transects for more accurate analysis.

2.2 Slope Assessment

Methodology

In accordance with PBP (2019), an assessment of the slope was conducted throughout the Site (where a hazard is present) and for a distance of 100m around the Site in the hazard direction. Both the average slope and maximum slopes were considered to determine the level of gradient which will most significantly influence fire behaviour on the Site. The slope was categorised within the slope classification under PBP Appendix A1.4.

Slope assessment was assisted by:

- Preparation of a digital elevation model based on LiDAR;
- Preparation of slope assessment based on 1m contours derived from the DEM;
- On-site slope classification; and
- Aerial overlay.

Effective Slope

The slope class under any bushfire hazard within 100m is presented in **Table 2** below and **Figure 3**. Hazard

Table 2 Slope Class

Direction	Primary Hazard Vegetation Classification	Slope-Class
T1: West	Grassland	Upslope and Flat
T2: West	Grassland	0-5° Downslope
T3: North	Grassland	0-5° Downslope
T4: North	Grassland	0-5° Downslope

Note: The hazard to the North and West has been broken into four (4) transects for more accurate analysis.

HUNTER RIVER HIGH SCHOOL, RAYMOND TERRACE

FIGURE 3: Vegetation and Slope Classification

Legend

- Proposed Development Layout
- Elevation
- Transect
- Contours (1m)
- Site
- Slope Classification Buffer (100m)
- Vegetation Classification Buffer (140m)
- Cadastral Boundaries

Vegetation Classification

- Grassland
- Managed Land
- Development Footprint

N
W E
S

0 40 80 160

Meters

1:2,500

MJD Environmental

Aerial: Nearmap (2022) | Data: MJD Environmental, Terras (2023), Spatial Services (2020) | Datum/Projection: GDA 2020 MGA Zone 56 | Date: 21/04/2023| Version 3 | Z:\22057 - Hunter River HS & Irrawang HS\ | This plan should not be relied upon for critical design dimensions.

3 Bushfire Protection Measures

PBP 2019 sets out a suite of BPMs and criteria that require consideration and assessment for applicable proposals on bushfire prone land in order to provide an adequate level of protection to new developments.

The following measures have been considered and discussed throughout this chapter with due regard to PBP (2019):

- Asset Protection Zones (APZ)
- Bushfire Attack Levels (BAL) set out in PBP 2019
- Access
- Services – Water supply, Gas and Electricity
- Landscaping and Fuel Management
- Emergency Management

3.1 Asset Protection Zone

An APZ is a buffer zone between the hazard and buildings that is progressively managed to minimise bushfire hazard (fuel loads and reduce potential radiant heat levels, flame, ember and smoke attack) PBP (2019), in order to mitigate risk to life and asset.

An APZ can include the following:

- Lawns;
- discontinuous gardens;
- swimming pools;
- driveways;
- detached garages;
- open space / parkland;
- car parking; and
- cycleway and formed walkways.

3.1.1 Determining APZs

The site lies within the Port Stephens LGA and therefore is assessed under a FFDI (Forest Fire Danger Index) rating of 100. APZ have been determined with reference to Chapters 6 and Appendix 1 (as relevant) of PBP (2019). Acceptable solution setbacks have been calculated using Table 6.8a PBP (2019) and A1.12.1.

Notably as the proposal is for a SFPP development, performance criteria for APZ and BAL are satisfied to a radiant heat level of 10kW/m^2 at 1200K as experienced at the building.

Refer to **Table 3** below and **Figure 4** for the required APZ.

Table 3 Required APZ

Direction	Primary Hazard Vegetation Classification	Slope-Class	APZ (Table A1.12.1 PBP 2019)
T1: West	Grassland	Upslope and Flat	36m
T2: West	Grassland	0-5° Downslope	40m
T3: North	Grassland	0-5° Downslope	40m
T4: North	Grassland	0-5° Downslope	40m

3.1.2 Determining BAL

By considering the bushfire hazard analysis outcomes presented above, Table A1.12.5 of PBP (2019) was applied to the vegetation classification and slope analysis to calculate BAL for development based on separation from the hazard for the site. Refer to **Table 4** and **Figure 5**.

Notably as the proposal is for a SFPP development, performance criteria for APZ and BAL are satisfied to a radiant heat level of 10kW/m^2 at 1200K as experienced at the building. As per Table 6.8a of PBP (2019), a construction level of BAL-12.5 under AS 3959 or NASH Standard and section 7.5 of PBP is applied to all new construction as part of a SFPP.

Table 4 Required BAL

Direction	Primary Hazard Vegetation Classification	Slope-Class	APZ (Table A1.12.1 PBP 2019)	Separation Distance (m)	BAL
T1: West	Grassland	Upslope and Flat	36m	<8 8-<10 10-<15 15-<22 22-<50 >50m	BAL- FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low
T2: West	Grassland	0-5° Downslope	40m	<9 9-<12 12-<17 17-<25 25-<50 >50m	BAL- FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low
T3: North	Grassland	0-5° Downslope	40m	<9 9-<12 12-<17 17-<25 25-<50 >50m	BAL- FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low
T4: North	Grassland	0-5° Downslope	40m	<9 9-<12 12-<17 17-<25 25-<50 >50m	BAL- FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low

An APZ of 36m will be established from T1, and an APZ of 40m will be established from T2, T3 and T4 to the buildings on site. Therefore, based on the acceptable solution APZ and BAL criteria set out in PBP (2019), and Table 6.8a, the new building construction will be constructed to BAL-12.5, including entire roofline.

HUNTER RIVER HIGH SCHOOL,
RAYMOND TERRACE

FIGURE 4: Required Asset Protection Zone (PBP 2019)

Legend

- Proposed Development Layout
- Site
- Cadastral Boundaries
- Required Asset Protection Zone (PBP 2019)

Vegetation Classification

- Grassland
- Managed Land
- Development Footprint

N
W E
S

0 40 80 160

Meters

1:2,500

MJD Environmental

Aerial: Nearmap (2022) | Data: MJD Environmental, Terras (2023), Spatial Services (2020) | Datum/Projection: GDA 2020 MGA Zone 56 | Date: 21/04/2023| Version 3 | Z:\22057 - Hunter River HS & Irrawang HS\ | This plan should not be relied upon for critical design dimensions.

HUNTER RIVER HIGH SCHOOL,
RAYMOND TERRACE

FIGURE 5: Required Bushfire Attack Levels (PBP 2019)

Legend

- Proposed Development Layout
- Site
- Cadastral Boundaries
- Required Asset Protection Zone (PBP 2019)

Required Bushfire Attack Level

(PBP 2019)

- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5

N
W E
S

0 40 80 160

Meters

1:2,500

MJD Environmental

Aerial: Nearmap (2022) | Data: MJD Environmental, Terras (2023), Spatial Services (2020) | Datum/Projection: GDA 2020 MGA Zone 56 | Date: 21/04/2023| Version 3 | Z:\22057 - Hunter River HS & Irrawang HS\ | This plan should not be relied upon for critical design dimensions.

3.2 Access

In the event of a serious bushfire threat to the proposed development, it will be essential to ensure that adequate ingress/ egress and the provision of defendable space are considered in the development design with due regard to the requirements of Table 6.8b, and Appendix 3 of PBP (2019).

The existing primary property access to the Site from Elkin Avenue will be retained and a second access point will be incorporated to join onto Adelaide Street under the proposal. Speed limits to Elkin Avenue, and along Adelaide Street are below 70km/h. Emergency access / egress can be gained from both Elkin Avenue and Adelaide Street.

The proposal is considered to meet the performance criteria for access by providing safe operational access for emergency services personnel while occupants are evacuating the site. Provision must be made for a turning head for any dead-end road longer than 200m. Adequate turning area must be afforded for fire resources to access and egress all areas of the site in line with Appendix 3 of PBP (2019). Any divergence to the acceptable solutions must be assessed as a performance solution.

Refer to **Appendix A** for Site Plan showing access.

The following summarises the requirements of Table 6.8b, Appendix 3 of PBP (2019). Deviations from the above acceptable solutions for access may be considered (depending on the situation) through a performance-based assessment.

Table 5 Acceptable solutions for Access (PBP 2019)

<table>
<tr><th>▪ Performance Criteria</th><th>Acceptable Solutions</th></tr>
<tr><td colspan="2">The intent may be achieved where:</td></tr>
<tr><td>General Requirements
▪ Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.</td><td>▪ SFPP access roads are two-wheel drive, all-weather roads;
▪ access is provided to all structures;
▪ traffic management devise are constructed to not prohibit access by emergency services vehicles;
▪ access roads must provide suitable turning areas in accordance with Appendix 3; and
▪ one way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants outside of these areas to ensure accessibility to reticulated water for fire suppression.
<table>
<tr><th>Curve radius (inside edge in metres)</th><th>Swept path (metres width)</th></tr>
<tr><td>< 40</td><td>4.0</td></tr>
<tr><td>40 - 69</td><td>3.0</td></tr>
<tr><td>70 - 100</td><td>2.7</td></tr>
<tr><td>> 100</td><td>2.5</td></tr>
</table>
</td></tr>
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	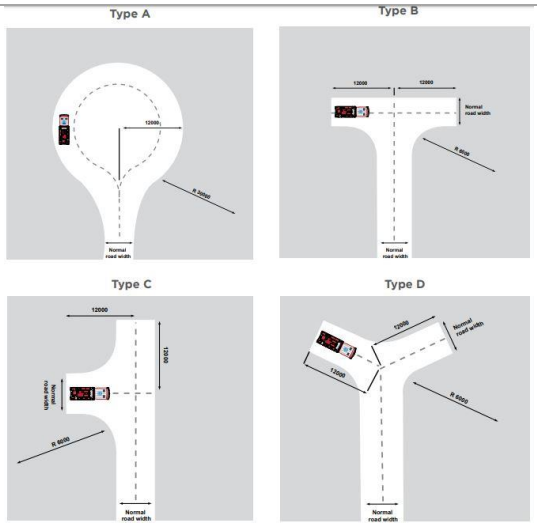
▪ the capacity of access roads is adequate for firefighting vehicles.	▪ the capacity of perimeter and non-perimeter road surfaces and any bridges/ causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/ causeways are to clearly indicate load rating.
▪ there is appropriate access to water supply.	▪ hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression; ▪ 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.
Perimeter access roads ▪ perimeter access roads are designed to allow safe access and egress for firefighting vehicles while occupants are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	▪ there are two-way sealed roads; ▪ 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; and ▪ a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.
Non-perimeter access roads ▪ non-perimeter access roads are designed to allow safe access and egress for firefighting vehicles while occupants are evacuating.	▪ minimum 5.5m carriageway width kerb to kerb; ▪ parking is provided outside of the carriageway width; ▪ hydrants are 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 provided.

3.3 Services – Water, Electricity, Gas

The Site is to be developed in accordance with the acceptable solutions detailed in Table 6.8c of PBP (2019) for services s summarised below in **Table 6**.

The proposal is able to satisfy these requirements given:

- The site will be connected to existing reticulated water supply,
- The site will be connected to the existing power service available from Elkin Avenue,
- Gas supply if available shall be provided within the sites in accordance with the provisions of PBP 2019.
- Fire hydrant spacing, design and sizing can comply with the relevant clauses of AS 2419.1:2005.

Table 6 Acceptable solutions for Services (PBP 2019)

Performance Criteria	Acceptable Solutions
The intent may be achieved where:	
▪ An adequate water supply for firefighting purposes is installed and maintained.	▪ Reticulated water is to be provided to the development, where available; or ▪ a 10,000 litres minimum static water supply for firefighting purposes is provided for each occupied building where no reticulated water is available. ▪
▪ Water supplies are located at regular intervals. ▪ The water supply is accessible and reliable for firefighting operations.	▪ Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005; ▪ hydrants are not located within any road carriageway; and ▪ reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads.
▪ Flows and pressure are appropriate.	▪ Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.
▪ The integrity of the water supply is maintained.	▪ All above-ground water service pipes external to the building are metal, including and up to any taps.
▪ Water supplies are adequate in areas where reticulated water is not available.	▪ A connection for firefighting purposes is located within the non-hazard side / away from the structure; a 65mm Storz outlet with a ball valve is fitted to the outlet; ▪ ball valve and pipes are adequate for water flow and are metal; ▪ supply pipes from tank to ball valve have the same bore size to ensure flow volume; ▪ underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank; ▪ a hardened ground surface for truck access is supplied within 4m of the access hole; ▪ above-ground tanks are manufactured from concrete or metal; ▪ raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F AS 3959); ▪ unobstructed access is provided at all times; ▪ tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters; and ▪ underground tanks are clearly marked, ▪ all exposed water pipes external to the building are metal, including any fittings;

Performance Criteria	Acceptable Solutions
	▪ where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; Any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and ▪ fire hose reels are constructed in accordance with AS/NZS 1221:1997 Fire hose reels and installed in accordance with the relevant clauses of AS 2441:2005 Installation of fire hose reels.
Electricity Services ▪ Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings	▪ Where practicable, electrical transmission lines are underground. ▪ Where practicable, electrical transmission lines are underground; where overhead, electrical transmission lines are proposed as follow: ○ lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and ○ 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*.
Gas services ▪ Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings	▪ Reticulated or bottled gas is installed and maintained in accordance with AS/NZ 1596:2014 – *The storage and handling of LP Gas*, 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 10 metres 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; ▪ polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used; and ▪ above-ground gas service pipes are metal, including and up to any outlets.

3.4 Landscaping & Fuel Management

All future landscaping on the site should be designed and managed to minimise the impact of bushfire based on the principles set out in PBP (2019) being:

- Prevent flame contact / direct ignition on the building;
- Provide a defendable space for property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed.

In this manner, consideration should be given to species selection, planting location, flammability, and size at maturity to ensure discontinuous canopy/ structure both vertically and horizontally to ensure the above principles are met.

Ongoing fuel management across the site as part of the maintenance regime should give due consideration to the NSW RFS 'Asset Protection Zone Standards' and Appendix 4 Asset Protection Zone Requirements of PBP (2019) which provides guidance on maintenance activities to assist in achieving the landscape principles.

Fencing and gates are to be constructed in accordance with PBP (2019) section 7.6 as follows:

Fences and gates in bush fire prone areas may play a significant role in the vulnerability of structures during bush fires. In this regard, all fences in bush fire prone areas should be made of either hardwood or non-combustible material.

However, in circumstances where the fence is within 6m of a building or in areas of BAL-29 or greater, they should be made of non-combustible material only.

3.5 Emergency Management

Any fire within the site would be attended in the first instance by Fire and Rescue Raymond Terrace, with support from Raymond Terrace Rural Fire Brigade, Fire and Rescue NSW Tarro Fire Station and Thornton Rural Fire Brigade if needed.

A Bush Fire Emergency Management and Evacuation Plan shall be prepared for the Site as set out in Table 6.8d of PBP 2019 and summarised in **Table 7** below. A copy of the Bushfire Emergency Management and Evacuation Plan is to be provided to the Local Emergency Management Committee. Any existing emergency management plans must be updated to reflect the proposal and RFS guidelines.

Table 7 Acceptable solutions for Emergency Management (PBP 2019)

Performance Criteria	Acceptable Solutions
The intent may be achieved where:	
a Bush Fire Emergency Management and Evacuation Plan is prepared.	▪ a Bush Fire Emergency Management and Evacuation Plan is prepared consistent with the NSW RFS document: *A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan*, and AS 3745:2010 *Planning for emergencies in facilities* ▪ the Bush Fire Emergency Management and Evacuation Plan should include planning for the early relocation of occupants. 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.
appropriate and adequate management arrangements are established for consultation and implementation of the Bush Fire Emergency Management and Evacuation Plan.	▪ an Emergency Planning Committee is established to consult with residents (and their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedures Manual; and ▪ detailed plans of all emergency assembly areas including onsite and off-site arrangements as stated in AS 3745:2010 are clearly displayed, and an annually emergency evacuation is conducted.

3.6 Development of Existing SFPP Facilities

The Proposal is to be incorporated into an existing SFPP development, in the form of the Hunter River High School.

A review of bushfire protection measures applying to the Hunter River High School Campus has determined that:

- The Hunter River High School site whilst located in an urban area is bound by agricultural lands to the north west with a conservatively assessed Category 3 grassland hazard. The nearest Category 1 vegetation consists of two small pockets (<10ha) ~300m to the north and ~400m to the west respectively.
- Whilst there is no encroachment of acceptable solution APZs over the new development, there is encroachment over one of the buildings in the existing development.
- The Proposal will be situated internal of the existing development and at its closest point has ~130m separation from the conservatively assessed grassland hazard adjacent to the site.
- Pedestrian access / egress to the new building is provided in all directions into the existing School campus and primary site access. However, in an emergency situation, occupants are able to egress to the east onto the adjacent sporting fields in a direction that is away from the primary hazard.
- Further evacuation from the site is possible to the immediate east into built up residential areas and the Pacific Highway easement where bushfire hazards have been reduced or removed.
- In accordance with Chapter 6.4, PBP 2019, 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. On this basis, improvements may be required to be made to the existing buildings located within Bushfire Prone Land; although it is not proposed, as the minor nature of the building works have rendered the Proposal as exempt from planning approval. It is considered that retrospective ember protection could be applied to the existing building if deemed necessary, as set out in Section 7.5.1 of PBP (2019) as follows:
    - Subfloor screening.
    - Openings, vents, and weep holes to be screened with AS3959 compliant mesh.
    - Installation of gutter guard.
    - Installation of wire screens to doors and windows.

3.6.1 Designated Safe Refuge

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/m² and a minimum BAL-12 construction.

The proposed gymnasium (Block Y) to the south of the site provides a radiant heat threshold of no greater than 10kW/m^2 and will be constructed to BAL-12.5, offering an ideal safe refuge building. Capacity of the proposed gymnasium to accommodate all occupants for Hunter River High School needs to be considered.

4 Conclusion & Recommendations

MJD Environmental has been engaged by The APP Group on behalf of School Infrastructure NSW to prepare a Bushfire Assessment Report (BAR) to assess the bushfire impacts and provide management and mitigation recommendations for the proposed development works at Lot 1 DP 120189, 579025 & 540114, 36 Elkin Avenue, Heatherbrae, NSW.

This report has been prepared in relation to the proposed development of Hunter River High School located at 36 Elkin Avenue, Heatherbrae. This report has been prepared to support:

d) A development application for the construction of a gymnasium (Block Y), consisting of a basketball court, equipment storage, canteen kitchen, staff room, first aid room and change room amenities, construction of hardstand civic space north of the gymnasium, construction of full-size rugby field, the construction of new carpark consisting of sixty-five (65) parking spaces (including 6 accessible parking spaces) and the construction and connection of a reticulated sewer pipe.
e) A Part 5 Activity Approval, development permitted without consent, for the construction of a new administration building, student learning hub and provision of essential services.
f) A Part 5 Activity Approval, development permitted without consent, for the construction of a new linking road and kiss and drop bay between Adelaide Street and Elkin Avenue.

This assessment has considered and assessed the bushfire hazard and associated potential threats relevant to the Proposal, and to outline the minimum mitigative measures which would be required in accordance with *Planning for Bush Fire Protection 2019* (PBP)*,* as adopted through the *Environmental Planning & Assessment Amendment* (Planning for Bush Fire Protection) *Regulation 2020.*

The *Planning for Bush Fire Protection Addendum 2022* (Addendum) came into effect as of 1 May 2023 to coincide with the adoption of the National Construction Code (NCC) 2022. The Addendum (2022) was issued to ensure that PBP (2019) was compatible with NCC (2022) and to align the two documents.

The Proposal is to be constructed against the National Construction Code (NCC) 2019 via the transitional arrangements that were put in place to allow practitioners to continue using the relevant provisions of NCC 2019, until the end of the relevant transition period for NCC 2022. This is also in line with the Proposals tender release date and allows construction via NCC 2019. Due to the Proposals construction against the NCC (2019), and the provisions stated, the Proposal has not been assessed against the Addendum (2022).

The proposal type triggers the criteria outlined with PBP (2019) for Special Fire Protection Purposes (SFPP). As such SFPP activates the provisions of integrated development under Section 4.46 of the EP&A Act, thus requiring approval and issue of a Bush Fire Safety Authority from the NSW RFS under 100B of the *Rural Fires Act 1997* (RF Act).

In order to determine whether the proposed development is bushfire-prone, and if so, which setbacks and other relevant Bush Fire Protection Measures (BPM) will be appropriate, this proposal was assessed against the methodology and procedures outlined in PBP (2019) via assessment of acceptable solutions as outlined in Chapter 6 of PBP (2019).

This assessment has been made based on the bushfire hazards in and around the Site at the time of report production.

The assessment found that vegetation representing a hazard north-west of the site to 140m has been conservatively assessed as Grassland-class hazard vegetation with managed land occurring in all other directions. The slope under the primary hazard vegetation has been assessed as either flat and upslope, or 0-5° Downslope. As the site is within the Port Stephens LGA it has been assessed under a Forest

Fire Danger Index (FFDI) rating of 100. Furthermore, the school is located on the edge of an urban area with low-lying cleared agricultural lands or housing adjacent to the Site. The nearest Category 1 vegetation consists of two small pockets (<10ha) >300m to the north and >400m to the west respectively.

In summary, the following key recommendations have been generated to enable the proposal to comply with PBP (2019).

- The proposal will be constructed against the National Construction Code (NCC) 2019 via the transitional arrangements that were put in place to allow practitioners to continue using the relevant provisions of NCC 2019, until the end of the relevant transition period for NCC 2022.
- An APZ of 36m is to be established over the site in association with T1 to the West.
- An APZ of 40m is to be established over the site in association with T2 to the West, and T3, and T4 to the North.
- Currently the Site is bordered to the north and south by residential areas, to the east by the Pacific Highway and to the west by agricultural land. Adjacent to areas of agricultural land, the Site has separation from the conservatively assessed Category 3 vegetation hazard via the schools managed agricultural teaching area. This buffers the existing and proposed development from the grassland vegetation hazard.
- The proposal includes the inclusion of several buildings internal of the existing development, that provides further separation of the Proposal from the conservatively assessed grassland vegetation hazard.
- All development of existing buildings within areas affected by BPMs must comply with Section 6.5 of PBP (2019).
- The proposed support learning hub and gymnasium block will be located internal of the existing development and on a parcel of the lot that is not mapped as being BFPL. As per Table 6.8a of PBP (2019), a construction level of BAL-12.5 under AS 3959 or NASH Standard and section 7.5 of PBP is applied to all new construction as part of a SFPP.
- Access is provided and is to comply with Table 6.8b, Appendix 3 of PBP (2019) as summarised and assessed in Chapter 3, Section 3.2 of this report.
- The existing primary property access to the Site from Elkin Avenue will be retained and a second access point will be incorporated to join onto Adelaide Street under the proposal. Speed limits to Elkin Avenue, and along Adelaide Street are below 70km/h. Emergency access / egress can be gained from both Elkin Avenue and Adelaide Street.
- The proposal is considered to meet the performance criteria for access / egress to the associated lots by providing safe operational access / egress for emergency services personnel while occupants are evacuating the site. Provision must be made for a turning head for any dead-end road longer than 200m. Adequate turning area must be afforded for fire resources to access and egress all areas of the site in line with Appendix 3 of PBP (2019). Any divergence to the acceptable solutions must be assessed as a performance solution.
- Services are to be provided and connected to the site in accordance with Table 6.8c PBP (2019) as summarised and assessed in Chapter 3, Section 3.3 of this report.
- Careful consideration of future site landscaping, fencing and ongoing fuel management must occur to minimise the potential impact of bushfire on the site. All landscaping and fuel management must provide due consideration of PBP (2019) Appendix 4.
- A Bush Fire Emergency Management and Evacuation Plan shall be prepared for the site as set out in Table 6.8d of PBP 2019. A copy of the Bushfire Emergency Management and Evacuation Plan is to be provided to the Local Emergency Management Committee. Any existing emergency management plans must be updated to reflect the proposal and RFS guidelines.
- In accordance with Chapter 6.4, PBP 2019, 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. On this basis, improvements may be required to be made to the existing buildings located within Bushfire Prone Land; although it is not proposed, as the minor nature of the building works

have rendered the Proposal as exempt from planning approval. It is considered that retrospective ember protection could be applied to the existing building if deemed necessary, as set out in Section 7.5.1 of PBP (2019) as follows:

- Subfloor screening.
- Openings, vents, and weep holes to be screened with AS3959 compliant mesh.
- Installation of gutter guard.
- Installation of wire screens to doors and windows.

5 Bibliography

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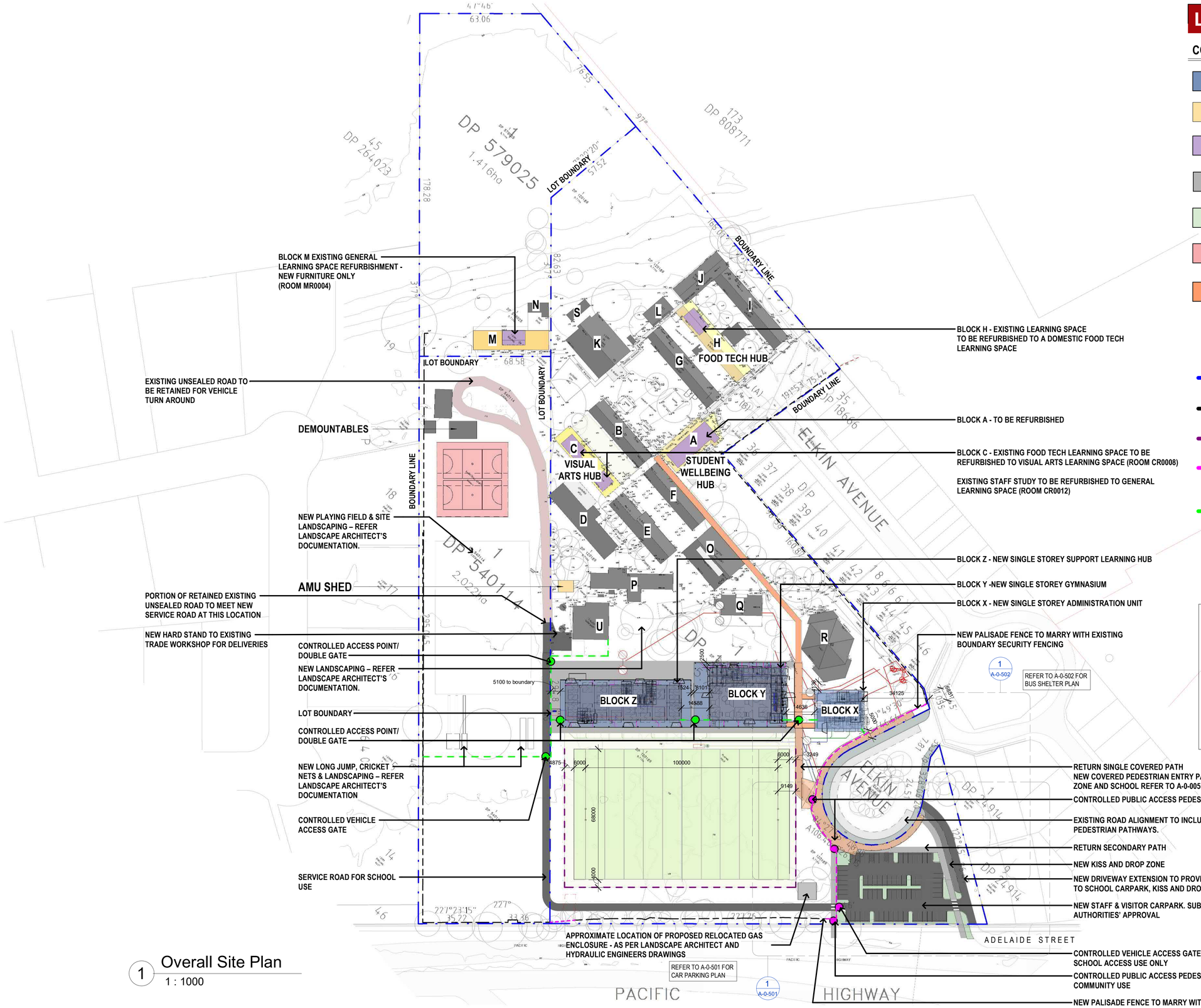
Appendix A Site Plan



1 Overall Site Plan
1 : 1000

LEGEND

CONSTRUCTION LEGEND:

- NEW CONSTRUCTIONS
- EXISTING BUILDING BLOCKS FOR REFURBISHMENT
- SCOPE OF AREAS WITHIN EXISTING BLOCKS TO BE REFURBISHED
- EXISTING BUILDINGS OUT OF SCOPE
- EXISTING ACTIVE PLAY
- EXISTING HARDSTAND PLAY
- NEW COVERED WALKAWAY
- EXISTING TREES AS PER LANDSCAPE ARCHITECT
- PROPERTY BOUNDARY LINE
- EXISTING PALISADE FENCING
- PROPOSED LOW HEIGHT FENCE – 1000mm MIN.
- PROPOSED PALISADE SECURITY FENCING TO MATCH EXISTING (EXTERIOR SECURITY BOUNDARY FENCING)
- PROPOSED PALISADE SECURITY FENCING (INTERNAL SCHOOL ACCESS CONTROL)
- PROPOSED SECURITY ACCESS GATES TO BOUNDARY FENCING (EXTERIOR SECURITY)
- PROPOSED CONTROLLED ACCESS GATES TO INTERNAL SCHOOL ACCESS FENCING

NOTE:
REFER SSU DRAFT SECURITY DESIGN FOR SITE & BUILDING SECURITY & ACCESS REQUIREMENTS, AS WELL AS GATE TYPES, AUTOMATION & ELECTRONIC ACCESS & MONITORING REQUIREMENTS.

REFER TO A-0-005 TYPICAL COVERED WALKWAY FOR GENERAL CONSTRUCTION DETAILS

REFER TO LANDSCAPE ARCHITECT DOCUMENTATION AND ARBORIST REPORT FOR EXISTING TREES TO BE RETAINED, REMOVED AND NEW PLANTING DETAILS

REFER TO HYDRAULIC ENGINEER'S DOCUMENTATION FOR PROPOSED NEW SEWER LOCATION. EFFECTED AND DISTRUBED AREA TO BE MADE GOOD WHERE WORKS PASS THROUGH EXISTING SCHOOL SITE.

EJE ARCHITECTURE
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0 25mm 100mm 150mm ON ORIGINAL A1

NSW GOVERNMENT

REV	DATE	COMMENTS	DRN	CHKD	VRFD
F	29/07/2022	100% Schematic Design Issue	MJD	HN	
G	03/08/2022	Revised 100% Schematic Design Issue	MJD	HN	
H	05/08/2022	Revised 100% Schematic Design Issue	MJD	HN	
J	09/08/2022	Revised 100% Schematic Design Issue	MJD	HN	
K	25/08/2022	Final Schematic Design Issue	MJD	HN	
L	25/01/2023	Revised Carparking & Access Road For Review	MJD	HN	
M	07/03/2023	REQUESTED DESIGN CHANGES ISSUE	MJD	HN	
N	17/03/2023	REVISED DESIGN FOR COORDINATION	MJD	HN	
P	22/03/2023	REVISED BUS BAYS FOR COORDINATION	MJD	HN	
Q	11/04/2023	FINAL ISSUE FOR COORDINATION	MJD	HN	
R	18/04/2023	SCHEMATIC DESIGN ISSUE FOR TENDER	MJD	HN	

PROJECT : **Hunter River High School Upgrade**
CLIENT : **School Infrastructure NSW**
SITE : **36 Elkin Ave, Heatherbrae, 2324**
DRAWING : **Overall Site Plan**

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

Autodesk Docs://Hunter River High School/HRHS-EJE-ZZ-ZZ-M3-A-0001.rvt

PROJECT No :	DRAWN :	DATE :	SCALES :
14276	MJD	18/04/2023	As indicated @ A1 1 : 2000 @ A3

PHASE :	BUILDING ID:	Level No:	DRAWING No :	REV :
DA	000	000	A-0-001	R

EJE architecture