

# Bushfire Assessment Report

***Proposed:***  
**Concept Proposal &  
Stage 1 Works**

***At:***  
**The King's School /  
87 – 129 Pennant Hills  
Road, North Parramatta**

*Reference Number: 230468B*

**28 September 2023**



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| 1               | 09/03/2023 | Stuart McMonnies | Andrew Muirhead | Draft Report |
| 2               | 16/08/2023 | Stuart McMonnies | Andrew Muirhead | Final Draft  |
| 3               | 28/09/2023 | Stuart McMonnies |                 | Final Report |

## List of Abbreviations:

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|          |                                                                                     |
|----------|-------------------------------------------------------------------------------------|
| APZ      | Asset Protection Zone                                                               |
| AS3959   | Australian Standard 3959 'Construction of buildings in bushfire-prone areas' – 2018 |
| BAL      | Bushfire Attack Level                                                               |
| BPMs     | Bushfire Protection Measures                                                        |
| BPLM     | Bushfire Prone Land Map                                                             |
| Council  | Parramatta City Council                                                             |
| ELVIS    | Elevation and Depth Foundation Spatial Data                                         |
| EP&A Act | <i>Environmental Planning and Assessment Act - 1979</i>                             |
| FRNSW    | Fire and Rescue NSW                                                                 |
| IPA      | Inner Protection Area                                                               |
| NASH     | National Association of Steel-framed Housing                                        |
| NCC      | National Construction Code                                                          |
| NP       | National Park                                                                       |
| NSP      | Neighbourhood Safer Place                                                           |
| OPA      | Outer Protection Area                                                               |
| PBP      | <i>Planning for Bush Fire Protection – 2019</i>                                     |
| ROW      | Right of Way                                                                        |
| RF Act   | <i>Rural Fires Act - 1997</i>                                                       |
| RFS      | NSW Rural Fire Service                                                              |
| SEPP     | State Environmental Planning Policy                                                 |
| SFPP     | Special Fire Protection Purpose                                                     |
| SSD      | State Significant Development                                                       |
| SWS      | Static Water Supply                                                                 |
| TKS      | The King's School                                                                   |

## Executive Summary:

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This Bush Fire Assessment Report has been prepared by Building Code and Bushfire Hazard Solution P/L on behalf of The Council of The King's School (**the Applicant**). It accompanies an Environmental Impact Statement (**EIS**) in support of State Significant Development Application for The King's School (**TKS**) at 87 - 129 Pennant Hills Road, North Parramatta (**the site**).

Through the State Significant Development Application (**SSDA**) process, The King's School is seeking to upgrade and enhance existing conditions on site, as well as improve and plan for amenities and facilities to support the current and future student and staff population.

The Minister for Planning, or their delegate, is the consent authority for the SSDA and this application has been lodged with the NSW Department of Planning and Environment (**NSW DPE**) for assessment.

In this instance the site is depicted on Parramatta City Council's Bushfire Prone Land Map (**BPLM**) as containing designated Category 1 and 2 Vegetation and Vegetation Buffer. The site is therefore considered 'bushfire prone'.

In relation to this application item 17 for the Concept Proposal and item 13 for Stage 1 works of the issued Secretary's Environmental Assessment Requirements (**SEARs**) requires a bush fire assessment that details proposed bush fire protection measures and demonstrates compliance with *Planning for Bush Fire Protection 2019* (**PBP**).

The vegetation identified as posing a bushfire hazard was found to be located in the northern portion of the subject site and west, within Lake Parramatta Reserve.

The vegetation in the broader landscape was found to be fragmented, being concentrated along watercourses and surrounded by existing established residential and commercial / industrial developments.

The comprehensive road network and surrounding developments also provide excellent exposure for the early detection of any unplanned fires in the broader landscape, facilitating an early response and ultimately suppression / containment by attending fire services.

The location of the proposed buildings, with the exception of the Boarding House, is such that the available Asset Protection Zones (**APZs**) exceed the minimum required for new development under **PBP**.

Significant environmental constraints prevent the ability to provide **APZs** achieving the maximum 10kW/m<sup>2</sup> requirement for new **SFPP** for the proposed Boarding House.

**APZs** consistent with a Bushfire Attack Level of **BAL 19** have been proposed for the proposed Boarding House. In addition it is proposed to construct the Boarding House to **BAL 29**, one level higher than that determined from Table A1.12.5 of **PBP**. This increase in construction standard will provide greater confidence in this building providing an adequate refuge in the event of a bushfire emergency.

The proposed Prep School works are located within a **BAL Low** area and are therefore exempt from any bushfire construction measures.

The proposed STEAM Building, Staff Residences, Day Boy House and Sport Pavilion must comply with sections 3 and 5 (BAL 12.5) of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2018. The additional construction requirements detailed in section 7.5 of PBP must also be satisfied.

The site contains an existing comprehensive internal road network, which provides attending fire services access to existing and proposed school buildings.

The proposal includes a new road from Masons Drive to the proposed Sports Pavilion and south of the Prep School which will further enhance onsite fire-fighter access.

The site also contains a registered fire trail (Category 7) which provides a vehicle link from the internal road system, across Hunt Creek, to Tallwood Drive to the north. This trail provides valuable access for attending fire service to extinguish or contain an unplanned fire in the early growth phase.

The existing and proposed roads in conjunction with the available Asset Protection Zones provide an appropriate operational environment for emergency services.

It is our opinion the proposal can satisfy all relevant specifications and requirements of *Planning for Bush Fire Protection 2019* and is supported from a bushfire planning perspective.

## 1.0 Introduction

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This Bush Fire Assessment Report has been prepared by Building Code and Bushfire Hazard Solution P/L on behalf of The Council of The King's School (the Applicant). It accompanies an Environmental Impact Statement (EIS) in support of State Significant Development Application for The King's School (TKS) at 87 - 129 Pennant Hills Road, North Parramatta (the site).

Through the State Significant Development Application (SSDA) process, The King's School is seeking to upgrade and enhance existing conditions on site, as well as improve and plan for amenities and facilities to support the current and future student and staff population.

The SSDA will seek approval for the staged works, including:

- **Concept Proposal for the provision of new and upgraded facilities, including:**
  - Building envelope for a new Sports Pavilion within the western sports field precinct (subject to further detailed approval).
  - Building envelope for a new Boarding House within the northern residential precinct to the north of the Doyle Sports Fields and adjacent building envelope for Staff Quarters (subject to further detailed approval).
  - Building envelope for a new Day Boy House between Dalmas House and Burkitt House, including the associated relocation of Ryrie Road (subject to further detailed approval).
  - Earthworks and the associated demolition of existing buildings and structures, and removal of trees and landscaping.
  - Staged increase in staff and student numbers.
  - Detailed Stage 1 works (as outlined below).
- **Detailed Stage 1 works, including:**
  - Earthworks and the associated demolition and existing buildings and structures.
  - Traffic upgrade works including the construction of a new vehicular entrance into the site from Masons Drive, new drop-off pick up facilities, internal access roads and increased car parking and bus parking.
  - The construction of a new Staff Residence Building comprising residences for staff and their families within the Senior School Boarding Precinct.
  - The construction of a new building for Science, Technology, Engineering, Arts and Maths (the 'STEAM building') within the Senior School and associated landscaping.
  - The staged construction of new buildings required to upgrade the Preparatory School, including:
    - Construction of a new Performing Arts and Music Centre comprising a dedicated performance space and music practice rooms to the northwest of Horrocks Road.
    - Construction of a new General Learning Unit building comprising additional classrooms / general learning spaces adjacent to the existing dam.
    - Upgrades to pedestrian access throughout the school.
    - Staged increase in staff and student numbers.
  - The removal and replacement of trees and associated landscaping.

There is a more detailed project description within the Environmental Impact Statement.

In this instance the site is depicted on Parramatta City Council's Bushfire Prone Land Map (BPLM) as containing designated Category 1 and 2 Vegetation and Vegetation Buffer. The site is therefore considered 'bushfire prone'.

In relation to this application item 17 for the Concept Proposal and item 13 for Stage 1 works of the issued Secretary's Environmental Assessment Requirements (SEARs) requires a bush fire assessment that details proposed bush fire protection measures and demonstrates compliance with Planning for Bush Fire Protection 2019 (PBP).

As the development is on bushfire prone land this report has been prepared to address the relevant specifications and requirements for SFPP development as detailed in PBP.

Schools are a listed Special Fire Protection Purpose (SFPP) development under section 100b (6 (a)) of the *Rural Fires Act 1997*.

The proposal has therefore been assessed against the aim and objectives detailed in Chapter 1 'Introduction' and the specific objectives and bushfire protection measures detailed in Chapter 6 'Special Fire Protection Purpose Developments' of PBP.

National Construction Code 2022 (NCC) identifies additional bush fire provisions for certain Class 9 buildings accommodating vulnerable occupants on bush fire prone land which has also been considered. This assessment has also considered the addendum to PBP which came into effect on 1 May 2023 in order to coincide with adoption of the NCC.

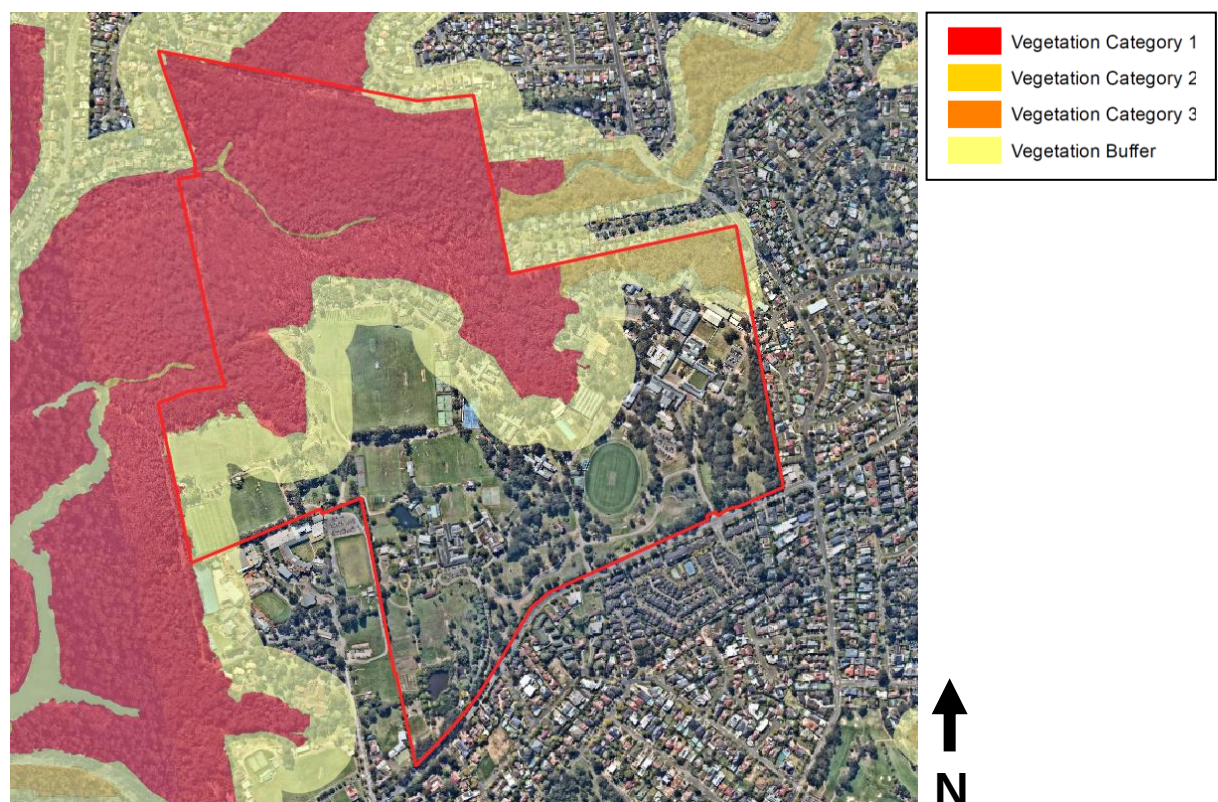


Figure 01: Excerpt from Council's Bushfire Prone Land Map (ePlanning Spatial Viewer)  
Subject site (red outline)

## 2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide an independent bushfire assessment of the subject site and surrounding area and to determine if the State Significant Development will comply with the relevant specifications and requirements of Planning for Bush Fire Protection 2019.

This report specifically addresses item 17 for the Concept Proposal and item 13 for Stage 1 works of the issued Secretary's Environmental Assessment Requirements (SEARs).

## 3.0 Scope of this Report

The scope of this report is limited to providing a bushfire assessment and recommendations for the subject property. Where reference has been made to the surrounding lands, this report does not purport to directly assess those lands; rather it may discuss bushfire impact and/or progression through those lands and possible bushfire impact to the subject property.

## 4.0 Compliance Tables & Notes

The following table sets out the projects compliance with *Planning for Bush Fire Protection – 2019*.

### New STEAM Building:

|                                                 | North                                      | East                                              | South                               | West                      |
|-------------------------------------------------|--------------------------------------------|---------------------------------------------------|-------------------------------------|---------------------------|
| <b>Vegetation Class</b>                         | Forest                                     | Managed Land                                      | Managed Land                        | Managed Land              |
| <b>Effective Slope</b>                          | 5 – 10 degrees down                        | N/A                                               | N/A                                 | N/A                       |
| <b>Required Asset Protection Zone (A1.12.1)</b> | 93 metres                                  | N/A                                               | N/A                                 | N/A                       |
| <b>Available Asset Protection Zone</b>          | >95 metres                                 | >140 metres                                       | >140 metres                         | >140 metres               |
| <b>Significant Landscape Features</b>           | Existing school buildings / internal roads | Access road / neighbouring residential allotments | Existing carpark / school buildings | Existing school buildings |
| <b>Bushfire Attack Level</b>                    | BAL 12.5                                   | BAL Low                                           | BAL Low                             | BAL Low                   |
| <b>Required Construction Level</b>              | BAL 19                                     | BAL 19                                            | BAL 19                              | BAL 19                    |

**New PREP School Performing Arts Centre and General Learning Unit (GLU):**

|                                                 | <b>North</b>          | <b>East</b>               | <b>South</b>              | <b>West</b>               |
|-------------------------------------------------|-----------------------|---------------------------|---------------------------|---------------------------|
| <b>Vegetation Class</b>                         | Managed Land          | Managed Land              | Managed Land              | Managed Land              |
| <b>Effective Slope</b>                          | N/A                   | N/A                       | N/A                       | N/A                       |
| <b>Required Asset Protection Zone (A1.12.1)</b> | N/A                   | N/A                       | N/A                       | N/A                       |
| <b>Available Asset Protection Zone</b>          | >140 metres           | >140 metres               | >140 metres               | >140 metres               |
| <b>Significant Landscape Features</b>           | Existing sports ovals | Existing school buildings | Existing school buildings | Existing school buildings |
| <b>Bushfire Attack Level</b>                    | BAL Low               | BAL Low                   | BAL Low                   | BAL Low                   |

**New Staff Residences:**

|                                        | <b>Northeast</b>          | <b>Southeast</b>          | <b>Southwest</b>      | <b>Northwest</b>      |
|----------------------------------------|---------------------------|---------------------------|-----------------------|-----------------------|
| <b>Vegetation Class</b>                | Forest                    | Managed Land              | Managed Land          | Managed Land          |
| <b>Effective Slope</b>                 | 10 – 15 degrees down      | N/A                       | N/A                   | N/A                   |
| <b>Required Asset Protection Zone*</b> | 45 metres                 | N/A                       | N/A                   | N/A                   |
| <b>Available Asset Protection Zone</b> | 77 metres                 | >140 metres               | >140 metres           | >140 metres           |
| <b>Significant Landscape Features</b>  | Existing school buildings | Existing school buildings | Existing sports ovals | Existing sports ovals |
| <b>Required Construction Level</b>     | BAL 12.5                  | BAL Low                   | BAL Low               | BAL Low               |

\* As this component of the proposal relates to long term residential accommodation the minimum required Asset Protection Zones were determined from Table A1.12.2 of PBP.

**New Day Boy House:**

|                                                | <b>North</b>                                                 | <b>East</b>                                  | <b>South</b>              | <b>West</b>               |
|------------------------------------------------|--------------------------------------------------------------|----------------------------------------------|---------------------------|---------------------------|
| <b>Vegetation Class</b>                        | Northern Hinterlands Wet Sclerophyll Forests                 | Northern Hinterlands Wet Sclerophyll Forests | Managed Land              | Managed Land              |
| <b>Available Fire Run</b>                      | 50 metres                                                    | 130 metres                                   | N/A                       | N/A                       |
| <b>Effective Slope</b>                         | 9 degrees down                                               | 9 degrees down                               | N/A                       | N/A                       |
| <b>Site Slope</b>                              | 9 degrees down                                               | 4 degrees down                               | N/A                       | N/A                       |
| <b>Available Asset Protection Zone</b>         | 30 metres                                                    | 45 metres                                    | >140 metres               | >140 metres               |
| <b>Significant Landscape Features</b>          | Existing managed land / Neighbouring residential development | Existing school buildings / Bettington Road  | Existing school buildings | Existing school buildings |
| <b>Calculated Radiant Heat (SFR Modelling)</b> | 8.43 kW/m <sup>2</sup>                                       | 8.43 kW/m <sup>2</sup>                       | N/A                       | N/A                       |
| <b>Bushfire Attack Level</b>                   | BAL 12.5                                                     | BAL Low                                      | BAL Low                   | BAL Low                   |
| <b>Required Construction Level</b>             | BAL 19                                                       | BAL 19                                       | BAL 19                    | BAL 19                    |

**New Sports Pavilion:**

|                                        | <b>North</b>         | <b>East</b>          | <b>South</b>          | <b>West</b>          |
|----------------------------------------|----------------------|----------------------|-----------------------|----------------------|
| <b>Vegetation Class</b>                | Managed Land         | Managed Land         | Managed Land          | Forest               |
| <b>Effective Slope</b>                 | N/A                  | N/A                  | N/A                   | 5 – 10 degrees down  |
| <b>Available Asset Protection Zone</b> | >140 metres          | >140 metres          | >140 metres           | >91 metres           |
| <b>Significant Landscape Features</b>  | Existing sports oval | Existing sports oval | Tara Anglican College | Existing sports oval |
| <b>Required Construction Level</b>     | BAL Low              | BAL Low              | BAL Low               | BAL 12.5             |
| <b>Required Construction Level</b>     | BAL 19               | BAL 19               | BAL 19                | BAL 19               |

**New Boarding House:**

|                                                 | <b>North</b>         | <b>East</b>                         | <b>South</b>          | <b>West</b>               |
|-------------------------------------------------|----------------------|-------------------------------------|-----------------------|---------------------------|
| <b>Vegetation Class</b>                         | Forest               | Forest                              | Managed Land          | Forest                    |
| <b>Effective Slope</b>                          | 15 – 20 degrees down | 10 – 15 degrees down                | N/A                   | 10 – 15 degrees down      |
| <b>Required Asset Protection Zone (A1.12.1)</b> | 100 metres           | 100 metres                          | N/A                   | 100 metres                |
| <b>Available Asset Protection Zone</b>          | 73 metres            | 73 metres                           | >140 metres           | >100 metres               |
| <b>Significant Landscape Features</b>           | Hunts Creek          | Bishop Barker Harris boarding house | Existing sports ovals | Existing school buildings |
| <b>Required Construction Level</b>              | BAL 19               | BAL 19                              | BAL Low               | BAL Low                   |
| <b>Proposed Construction Level</b>              | BAL 29               | BAL 29                              | BAL 29                | BAL 29                    |

**New Boarding House (Staff Building):**

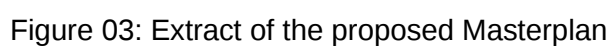
|                                                 | <b>North</b>         | <b>East</b>                         | <b>South</b>          | <b>West</b>             |
|-------------------------------------------------|----------------------|-------------------------------------|-----------------------|-------------------------|
| <b>Vegetation Class</b>                         | Forest               | Forest                              | Managed Land          | Managed Land            |
| <b>Effective Slope</b>                          | 15 – 20 degrees down | 10 – 15 degrees down                | N/A                   | N/A                     |
| <b>Required Asset Protection Zone (A1.12.2)</b> | 56 metres            | 45 metres                           | N/A                   | N/A                     |
| <b>Available Asset Protection Zone</b>          | 79 metres            | 45 metres                           | >140 metres           | >100 metres             |
| <b>Significant Landscape Features</b>           | Hunts Creek          | Bishop Barker Harris boarding house | Existing sports ovals | Proposed Boarding House |
| <b>Required Construction Level</b>              | BAL 19               | BAL 29                              | BAL Low               | BAL Low                 |
| <b>Proposed Construction Level</b>              | BAL 29               | BAL 29                              | BAL 29                | BAL 29                  |

## 5.0 Aerial view & Masterplan



Figure 02: Aerial view of the subject site (thick red outline), proposed building footprints (yellow shade) and 140 metre assessment buffer (dotted blue line)

Courtesy Nearmap – January 2023



## 6.0 Site Assessment

Several detailed site inspections have been undertaken of the subject site by representatives of Building Code & Bushfire Hazard Solutions P/L (2.10.2020, 31.10.2022 and 24.11.2022). In addition to the collected site data this assessment has relied on:

- Aerial imagery of the subject area (NSW Spatial Services & Nearmap);
- 1 metre contour mapping of the subject area (Elevation and Depth Foundation Spatial Data – Geoscience Australia)
- NSW Planning Portal Spatial Viewer
- Vegetation Mapping (Vegetation NSW)
- Masterplan prepared by BVN, dwg no MAR-AR-DA-A10-XX-04, issue 09, dated 27.07.2023

### 6.01 Location

The subject site comprises of nine (9) existing allotments legally identified as:

Lot A in DP 329288  
Lot 10 in DP 812772  
Lot 1 in DP 57491

Lot 1 in DP 64765  
Lot 1 in DP 59169  
Lot A in DP 321595

Lot 1 in DP 581960  
Lot B in DP 329288  
Lot 2 in DP 235857

The site is known as The King's School and located at 87 - 129 Pennant Hills Road, North Parramatta (refer to Figure 02).

The subject site is approximately 115.395 hectares in size.

The property is located within City of Parramatta Council's local government area and zoned SP2: Infrastructure and R2: Low Density Residential.

The site is within the Greater Sydney Region Fire Weather District and is captured by the Hunters Hill Lane Cove Parramatta Ryde Bush Fire Risk Management Plan 2019-2024.



Figure 04: Extract from street-directory.com.au

## 6.02 Vegetation

The vegetation structure, connectivity and attributes are fundamental contributors to bushfire behaviour and its movement through the landscape.

As part of this assessment we have considered the potential bushfire runs that currently exist into the site, as well as the potential fire behaviour and impacts from the retained vegetation within the site.

The vegetation within the subject site was found to comprise of two distinct groups, being either highly modified (managed landscapes, gardens and sports ovals) or bushland (natural and small areas of exotic incursion). The modified landscape is primarily concentrated within the southern portion of the site with the bushland in the northern portion.

To assess the potential fire runs into the site we have considered all bushfire hazards within 1 kilometre of the proposed building footprints as identified on the Bush Fire Prone Lands Map (Figure 05), noting further refinement of the actual onsite hazard is shown in Figure 07.

The vegetation in the broader landscape was found to be fragmented, being concentrated along watercourses and surrounded by existing established residential and commercial / industrial developments.

The comprehensive road network and surrounding developments also provide excellent exposure for the early detection of any unplanned fires in the broader landscape, facilitating an early response and ultimately suppression / containment by attending fire services.

Prevailing weather conditions associated with the bush fire season in the Hunters Hill Lane Cove Parramatta Ryde BFMC area are strong north to north westerly winds, low humidity and high temperatures (Hunters Hill Lane Cove Parramatta Ryde BFRMP 2019-2024).

The largest fire catchments were identified as being from the northwest and are generally less than 700 metres in length. The existing registered fire trails within the subject site bisect this catchment and provides operational access for attending fire services. There has been no recorded wildfire along this catchment (source NPWS Fire History dataset).

Ecological Australia have undertaken extensive field surveys of the subject site to ascertain the extent of significant vegetation and habitat. These surveys have identified various threatened flora habitat and flora species.

The significant environmental values of the site and subsequent bushfire risk have been the subject of extensive consultation between the ecological expert (Belinda Failes, Ecological Australia) and bushfire expert (Stuart McMonnies, Building Code & Bushfire Hazard Solutions), with minimal environmental impact and suitable bushfire protection measures being key objectives.

In accordance with Appendix 1 'Site Assessment Methodology' of PBP we have undertaken an assessment of all vegetation formations within 140 metres of the development site for each aspect as per Keith (2004).

The vegetation identified as posing a bushfire hazard was found to be located in the northern portion of the subject site and west, within Lake Parramatta Reserve.

The vegetation posing a hazard was found to be mapped (Vegetation NSW) as Northern Hinterland Wet Sclerophyll Forests, Sydney Coastal Dry Sclerophyll Forests and North Coast Wet Sclerophyll Forests.

The following vegetation parameters for the site were adopted for this assessment:

| Plant Community Type                                   | Formation                                       | Class                                        | Surface and Elevation Fuel Load* | Overall Fuel Load (including bark and canopy)* |
|--------------------------------------------------------|-------------------------------------------------|----------------------------------------------|----------------------------------|------------------------------------------------|
| Blue Gum High Forest - <b>3136</b>                     | Wet Sclerophyll Forests (Shrubby sub-formation) | North Coast Wet Sclerophyll Forests          | 22 t/ha                          | 35.98 t/ha                                     |
| Sydney Coastal Enriched Sandstone Forest - <b>3592</b> | Dry Sclerophyll Forests (Shrubby sub-formation) | Sydney Coastal Dry Sclerophyll Forests       | 21.3 t/ha                        | 27.3 t/ha                                      |
| Sydney Coastal Shale-Sandstone Forest - <b>3259</b>    | Wet Sclerophyll Forests (Grassy sub-formation)  | Northern Hinterlands Wet Sclerophyll Forests | 20 t/ha                          | 33.1 t/ha                                      |

\* Fuel loads from NSW Rural Fire Service publication Comprehensive Vegetation Fuel Loads (2019)

The vegetation within the subject site to the north and east of the proposed Day Boy House was found to be isolated from the larger hazard to the west, separated by existing school buildings and managed land (>110m separation).

Formal Asset Protection Zones, enforced by the Development Application associated with the recently constructed HQ facilities building (DA/90/2021), adjoin this area to the south. The existing managed land and APZs will continue to be managed and subsequently are not considered part of the identified bushfire hazard.

The vegetation posing a hazard is approximately 1.6 hectares in size and provides a <130 metre fire run toward the proposed Day Boy House. In accordance with A1.11.2 'Short Fire Run' of PBP specialist bushfire design modelling (attached) was utilised to better reflect the potential bushfire impact from this vegetation.

The extent of the assessed bushfire hazard is shown in Figure 07. This figure excludes the proposed Asset Protection Zones associated with the Day Boy House and Boarding House and existing managed land within the site.

All unshaded areas within the subject site are will be either managed to the standard of an Asset Protection Zone or continue to be managed in its current state (slashed / mown).



Figure 05: Aerial view of the locality overlaid with mapped bushfire hazards (source BPLM)  
Subject site (thick red outline), 1km buffer (blue dotted line)  
and mapped bushfire hazards (green shade)

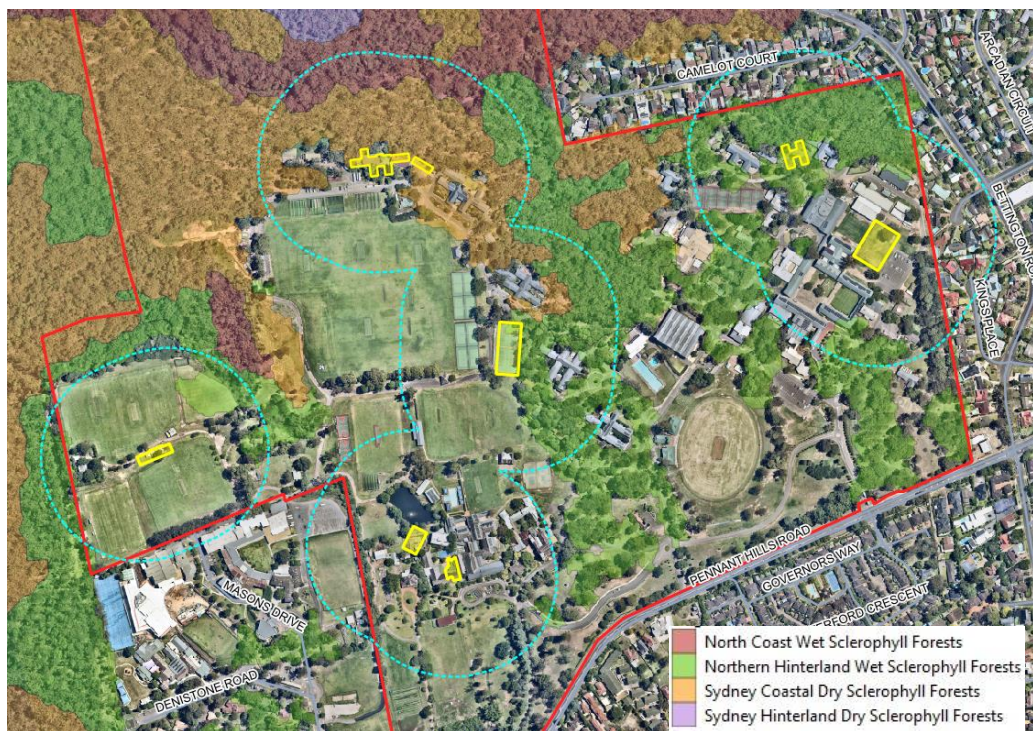


Figure 06: Aerial view of the subject area overlaid with vegetation mapping (Vegetation NSW)



Figure 07: Aerial view of the subject area overlaid with the extent of the assessed bushfire hazard

### 6.03 Slope and Topography

The slope of the land under the classified vegetation has a direct influence on the forward rate of spread, fire intensity and radiant heat exposure. The effective slope is considered to be the slope under the classified vegetation which will most significantly influence bushfire behaviour toward the development site.

In accordance with A1.4 'Determine slope' of PBP the slope assessment is to be derived from the most detailed contour data available.

The slope that would **most significantly** influence bushfire behaviour was determined from topographic imagery (1 metre contours sourced from ELVIS - Geoscience Australia) in conjunction with site observations and are shown in the Compliance Tables in section 4.0 of this report.

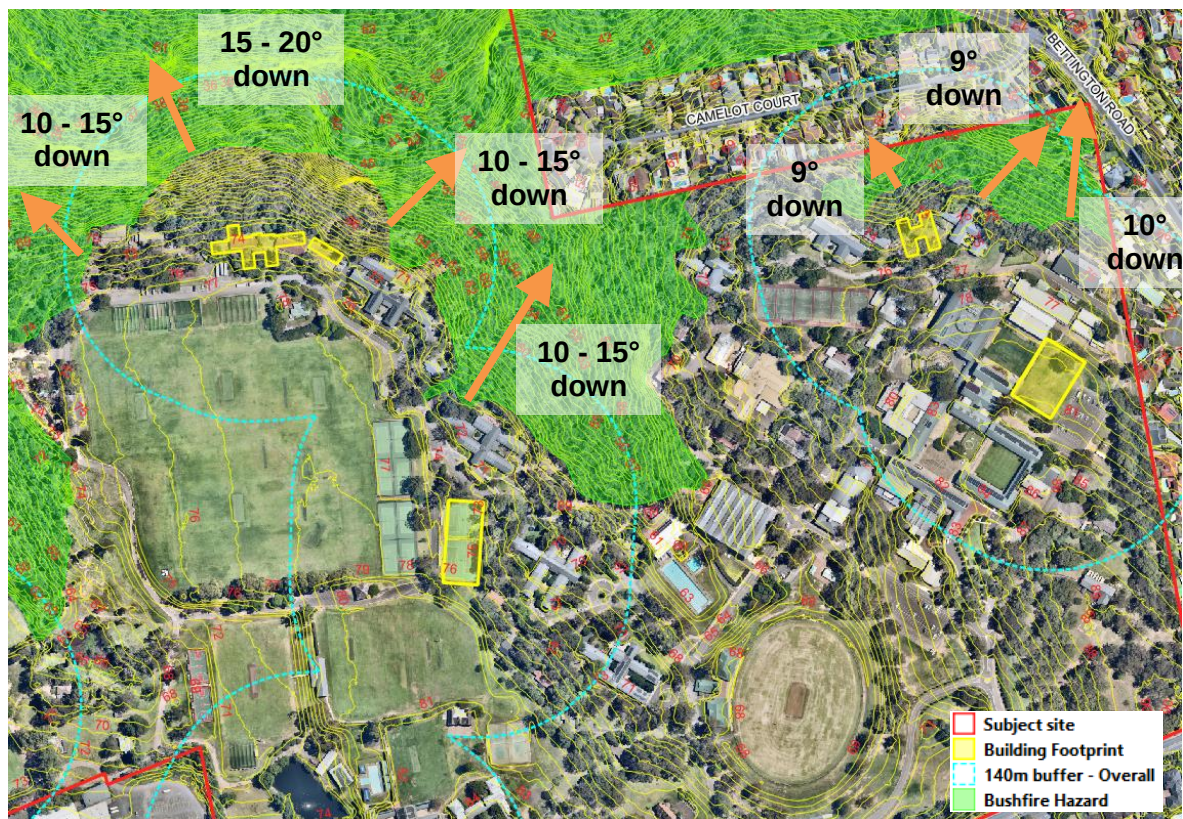


Figure 08: 1 metre LiDar contours of the subject area



Figure 09: 1 metre LiDar contours of the subject area (southwestern portion of the site)

## 6.04 Fire Weather

All development which attracts an Asset Protection Zone under PBP requires the identification of the relevant Fire Danger Index (FDI). The FDI required to be used for development assessment purposes is based on the local government boundaries, being Parramatta City Council in this instance.

In accordance with the NSW Rural Fire Service publication 'NSW Local Government Areas FDI' (2017) Parramatta City Council form part of the Greater Sydney Region Fire Weather District and attracts an FFDI of 100.

## 6.05 Fire History

There are areas within NSW which have significant fire history and are recognised as known fire paths. While the fire history is more commonly considered as part of strategic planning (to ensure future development is not exposed to an unacceptable risk), it is useful to consider at a Development Application phase to ensure the land is suitable for development in the context of bushfire risk.

In this instance the closest recorded wildfire was found to be located >5.7 kilometres to the northeast of the subject site (source NPWS Fire History dataset). This fire occurred in the 2001-02 fire season.

NSW RFS fire history mapping indicates a small unplanned fire occurred >350 metres to the west of the subject site, within the adjacent Lake Parramatta Reserve. This fire occurred in the 2001-02 fire season.

The Hunters Hill Lane Cove Parramatta Ryde BFMC area has on average 8 bushfires per year, of which none can be considered a major fire (Hunters Hill Lane Cove Parramatta Ryde BFRMP 2019-2024).

The subject site is therefore not considered to be within a known fire path.

Fire & Rescue NSW recently conducted a hazard reduction burn within the subject site between existing school buildings and Hunts Creek. It should be noted that the application of the proposed 73 metre Asset Protection Zone to the north of the Boarding House will provide permanent fuel reduction of that area.



Figure 10: Extract from the Fire & Rescue NSW Hazard Reduction Notification (2021)

## 7.0 Bushfire Assessment

### 7.01 Planning for Bush Fire Protection - 2019

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and or the Rural Fire Service.

In this instance the subject site is depicted on Parramatta City Council's Bushfire Prone Land Map (BPLM) as containing designated Category 1 and 2 Vegetation and Vegetation Buffer. The subject site is therefore considered 'bushfire prone'.

In relation to this application item 17 for the Concept Proposal and item 13 for Stage 1 works of the issued Secretary's Environmental Assessment Requirements (SEARs) requires a bush fire assessment that details proposed bush fire protection measures and demonstrates compliance with Planning for Bush Fire Protection 2019 (PBP).

Schools are a listed Special Fire Protection Purpose (SFPP) development under section 100b (6 (a)) of the *Rural Fires Act 1997*.

The proposal has therefore been assessed against the aim and objectives detailed in Chapter 1 'Introduction' and the specific objectives and bushfire protection measures detailed in Chapter 6 'Special Fire Protection Purpose Developments' of PBP.

National Construction Code 2022 (NCC) identifies additional bush fire provisions for certain Class 9 buildings accommodating vulnerable occupants on bush fire prone land which has also been considered. This assessment has also considered the addendum to PBP which coincides with adoption of the NCC.

Mckenzie Group (BCA Consultant) have identified the Day Boy House, Sport Pavilion, STEAM Building and Prep School General Learning Unit and Performing Arts Centre as Class 9b buildings. The proposed Staff Residences, Boarding House and Boarding House -Staff have been identified as Class 3 buildings, with a 7a component for the Staff Residences.

The NSW RFS have released the following advice in relation to exclusions that apply to the application of Specification 43:

#### *Developments in Areas Assessed as BAL-LOW*

*Development used for schools, child care centres, hospitals and residential care buildings in bush fire-prone areas assessed as BAL-LOW in accordance with PBP 2019 may seek an exemption from the Addendum to PBP and Specification 43 of Volume One of the NCC 2022 on a case by case basis and for inclusion in the BFSa for a specific site.*

*Under NSW G5D4(c) of Volume One of NCC 2022, the requirements of Specification 43 may be modified by the development consent with a BFSa. The consent authority must ensure that any modifications to Specification 43 are specified in the development consent.*

In this regard as the proposed Prep School General Learning Unit and Performing Arts Centre are identified as being in a BAL Low area we seek the exemption of Specification 43 under NSW G5D4(c) of Volume One of NCC 2022 and request this is identified in the Bush Fire Safety Authority.

## 7.02 Specific Objectives

The following table lists the specific objectives for Special Fire Protection Purpose development in accordance with section 6.2 of PBP applicable to the proposal and our comments on compliance or otherwise.

| Specific Objective                                                                                                                  | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>minimise levels of radiant heat, localised smoke and ember attack through increased APZ, building design and siting;</i>         | <p>The highest radiant heat exposure to all proposed building footprints, with the exception of the Boarding House and Staff Residences, is less than the maximum 10kW/m<sup>2</sup> requirement for new SFPP.</p> <p>Significant environmental constraints prevent the ability to provide Asset Protection Zones (APZs) achieving the maximum 10kW/m<sup>2</sup> requirement for new SFPP for the proposed Boarding House.</p> <p>APZs consistent with a Bushfire Attack Level of BAL 19 have been proposed for the proposed Boarding House. In addition it is proposed to construct the Boarding House to BAL 29, one level higher than that determined from Table A1.12.5 of PBP.</p> <p>This increase in construction standard will provide greater confidence in this building providing an adequate refuge in the event of a bushfire emergency.</p> <p>The proposed Boarding House follows the existing pattern of development, and will provide a better bushfire safety outcome for the adjacent Bishop Barker Harris boarding house with the application of the proposed 73m APZ.</p> |
| <i>provide an appropriate operational environment for emergency service personnel during firefighting and emergency management;</i> | <p>The subject site has street frontage to Pennant Hills Road to the south.</p> <p>The site contains an existing comprehensive internal road network, which provides attending fire services access to existing and proposed school buildings.</p> <p>The proposed new road from Masons Drive to the proposed Sports Pavilion and south of the Prep School will further enhance onsite fire-fighter access.</p> <p>The site is mapped (NSW RFS Common Operating Picture) as containing a registered fire trail (Category 7). In addition, there are numerous walking trails in the north portion of the site, supporting the Military/ Cadets use of this area. These trails provide valuable access for attending fire service to extinguish or contain an unplanned fire in the early growth phase.</p> <p>The existing and proposed roads in conjunction with the available Asset Protection Zones provide an appropriate operational environment for emergency services.</p>                                                                                                                |

| Specific Objective                                                                                                                                                                | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>ensure the capacity of existing infrastructure (such as roads and utilities) can accommodate the increase in demand during emergencies as a result of the development; and</i> | <p>The section of Pennant Hills Road servicing the subject site provides two lanes east and west and existing carriageway of &gt;12m (kerb to kerb). This significantly exceeds the requirements for Perimeter Roads as described in Table 6.8b of PBP.</p> <p>In consideration of the Bushfire Risk posed to the school and time necessary to co-ordinate and execute a safe and complete evacuation (relocation) it is expected that the default primary response to a bushfire emergency would be 'Shelter in Place'.</p> <p>The external utility providers have systems in place to cater for increased demand as necessary.</p> |
| <i>ensure emergency evacuation procedures and management which provides for the special characteristics and needs of occupants.</i>                                               | This assessment includes a recommendation that a Bushfire Emergency Management and Evacuation Plan be prepared.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## 7.03 Bushfire Protection Measures

Section 6.8 'Bush fire protection measures' of PBP outlines the specific Bushfire Protection Measures (BPMs) applicable to Special Fire Protection Purpose development, including APZs, Landscaping, Construction, Access, Services & Emergency Management Plan.

The following section addresses each BMP and the proposals compliance or otherwise.

### Asset Protection Zones

Asset Protection Zones for new Special Fire Protection Purpose (SFPP) development are determined from Table A1.12.1 of PBP or bushfire design modelling achieving a radiant heat impact of no more than 10kW/m<sup>2</sup> at the closest point of the available building footprint.

The minimum required APZs were determined from the Table A1.12.1 of PBP, with the exception of the Day Boy House, Staff Residences and Sports Pavilion.

In accordance with A1.11.2 'Short Fire Run' of PBP specialist bushfire design modelling (attached) was utilised to better reflect the potential bushfire impact to the proposed Day Boy House. This modelling concluded that the 30 metre APZ to the north and 45 metre APZ to the east the proposed building is exposed to a maximum radiant heat exposure of 8.43 kW/m<sup>2</sup>.

The proposed Staff Residences will be occupied exclusively by staff and their families, with a minimum occupation period of >6 weeks. PBP recognises the duration of stay directly influences the vulnerability level of the occupants. In this regard occupants that stay longer periods are generally more familiar with their surroundings and potential threats and subsequently better equipped to respond to an emergency.

Similarly, the small building proposed to the east of the Boarding House will be used exclusively for staff accommodation.

In consideration of the characteristics of the proposed Staff Residences and small building proposed to the east of the Boarding House the minimum required APZs for this component of the proposal were determined from Table A2.12.2 of PBP for residential development.

As the proposed Sports Pavilion only comprises of covered seating, canteen, equipment store, office and amenities it does not warrant the application of the minimum required APZs for new SFPP development. Regardless, the available APZs to this structure exceed the minimum requirements for new SFPP development.

As shown in the Compliance Tables in section 4.0 of this report all proposed buildings, with the exception of the Boarding House, exceed the associated minimum required APZs under PBP.

Significant environmental constraints prevent the ability to provide Asset Protection Zones (APZs) achieving the maximum 10kW/m<sup>2</sup> requirement for new SFPP for the proposed Boarding House.

APZs consistent with a Bushfire Attack Level of BAL 19 have been proposed. In addition, it is proposed to construct the Boarding House to BAL 29, one level higher than that determined from Table A1.12.5 of PBP.

This increase in construction standard will provide greater confidence in this building providing an adequate refuge in the event of a bushfire emergency.

The proposed Boarding House follows the existing pattern of development, located no closer to the bushfire hazard than existing buildings and will provide a better bushfire safety outcome for the adjacent Bishop Barker Harris boarding house with the application of the proposed 73 metre APZ.

The adjacent Bishop Barker Harris boarding house accommodates 85 students and as 4 staff flats, 3 x one bedroom and 1 x 2 bedroom. The boarding house also has the house masters residence attached.

The available APZs consist of grounds entirely within the subject site.

All APZs within the subject site will be maintained in accordance with an Inner Protection Area as detailed in Appendix 4 of *Planning for Bush Fire Protection* 2019 and the NSW Rural Fire Service publication 'Standards for Asset Protection Zones'.

The separation from classified vegetation satisfies NSW S43C2 NCC 2022 for the Day Boy House, Sport Pavilion and STEAM Building.

## Landscaping

I have reviewed the concept Landscape Report prepared by Taylor Brammer (2023) and am satisfied that the proposed landscaping within the minimum required Asset Protection Zones has capacity to comply with the requirements detailed in Appendix 4 of *Planning for Bush Fire Protection* 2019.

I am also satisfied that the proposed landscaping within the balance of the site has been designed to minimise flame contact and radiant heat to the building and potential for wind-driven embers, satisfying the Performance Criteria for Landscaping detailed in Table 6.8a of PBP.

## Construction

The proposed buildings are required to be constructed to the relevant Bushfire Attack Level under Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2018.

In this instance the highest Bushfire Attack Level to the proposed buildings were determined from Table A1.12.5 of PBP and are shown in the Compliance Tables in section 4.0 of this report.

The proposed Prep School works are located within a BAL Low area and are therefore exempt from any construction measures.

In accordance with NCC 2022 and the addendum to PBP the proposed STEAM Building, Day Boy House and Sport Pavilion must comply with BAL 19 and subsequently comply with sections 3 and 6 (BAL 19) of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2018 and the additional construction requirements detailed in section 7.5 of PBP.

To provide greater confidence in the Boarding House providing an adequate refuge in the event of a bushfire emergency it is proposed to increase the construction standard from the determined BAL 19 to BAL 29.

The proposed Boarding House will therefore comply with sections 3 and 7 (BAL 29) of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2018. The additional construction requirements detailed in section 7.5 of PBP must also be satisfied.

## Access

Access to the subject property is available Pennant Hills Road to the south. Currently the subject site has two vehicle connection points onto Pennant Hills Road, one being a gated left lane in - left lane out and the other (primary) controlled by traffic lights allowing entry / exit in either direction.

The site contains an existing comprehensive internal road network, which provides attending fire services access to existing and proposed school buildings.

The proposal includes the construction of a new road from Masons Drive to the proposed Sports Pavilion and south of the Prep School. This new road provides an additional access / egress route for the subject site.

The proposed internal road will comply with the Non-Perimeter Road requirements outlined in section 6.8.2 'Access' of PBP.

The site is mapped (NSW RFS Common Operating Picture) as containing a registered fire trail (Category 7). In addition, there are numerous walking trails in the north portion of the site, supporting the Military/ Cadets use of this area. These trails provide valuable access for attending fire service to extinguish or contain an unplanned fire in the early growth phase.

The adjacent Lake Parramatta Reserve also contains an existing service trail (fire trail) and walking trail network, which can be utilised by attending fire services.

Attending fire appliances also have direct and comprehensive vehicle access to the identified hazards via the existing internal road network, service (fire) and walking trails and existing public roads.

In consideration of the comprehensive access available to and through the identified bushfire hazard and its exposure to the public the identification and subsequent early extinguishment of an unplanned fire is considered probable.

It is acknowledged that the Acceptable Solution listed in Table 3 of the addendum to PBP requires the provision of a 6 metre wide unobstructed path around the proposed STEAM Building, Day Boy House and Sport Pavilion, being the identified Class 9 buildings.

The site constraints, including presence of existing school buildings and open space, prevent the ability to install new perimeter roads around each of these buildings. Compliance with Table 3 of the addendum to PBP has therefore be addressed by satisfying the Performance Criteria, being;

*Firefighting vehicles are provided safe, all-weather access to structures and hazardous vegetation.*

STEAM Building:

The proposed STEAM building is located adjacent an existing on-grade sealed carpark to the southeast and abuts existing school buildings and courtyard to the northeast, southwest and northwest.

The carpark is accessed via the existing sealed two-way internal road, which has a carriageway of 6 metres. Additional informal / overflow carparking is also present to the northeast and southwest of the proposed building. The carpark would be the logical fire fighting platform for attending fire services.



Figure 11: Aerial view of subject site

Day Boy House:

The proposed Day Boy House is located immediately adjacent the existing sealed internal access road, which has a carriageway of 6 metres. The most distant external point of the proposed building is located within 70 metres of this road.

Access to the identified hazardous vegetation is also available from the existing sealed internal road.



Figure 12: Aerial view of subject site

#### Sport Pavilion:

The proposed Sports Pavilion is located immediately adjacent the existing internal access road and surrounded by existing sports ovals. The proposal includes a road from the Sports Pavilion to the new access road from Pennant Hills Road.

The road will improve access for occupants and fire services into the rear portion of the site.

The most distant external point of the proposed building is located within 70 metres of this road.

Access to the identified hazardous vegetation is available from the existing internal road and sports ovals.



Figure 12: Aerial view of subject site

The proposed access provisions are considered adequate to provide safe operational access for emergency service personnel in suppressing a bushfire or undertaking property protection activities.

We therefore seek acknowledgment that the access arrangements for the proposed STEAM Building, Day Boy House and Sport Pavilion satisfy the Performance Criteria of Table 3 of the addendum to PBP.

## Services – Water, electricity & gas

The site is connected to the reticulated town's water main for its commercial and domestic needs.

Existing in ground hydrants are available along Pennant Hills Road and surrounding streets for the replenishment of attending fire services.

The hydrant network has also been extended into the site to service the existing school buildings. This internal system will be extended further as necessary to ensure adequate coverage to the proposed new buildings.

The hydrant spacing, design, sizing, flows and pressures must comply with AS2419.1-2021 for any new extension. Hydrants are not permitted within the carriageway of any road.

The existing and proposed water supply is considered adequate for the replenishment of attending fire services.

The proposed water supply is considered adequate for the replenishment of attending fire services and will satisfy Table 4 of the addendum to PBP.

Recommendations will be included to ensure compliance with any new electricity and gas services.

## Bushfire Emergency Management Plan

The intent of the Bushfire Emergency Management and Evacuation Plan measure is to provide suitable emergency and evacuation arrangements for occupants of SFPP developments.

This assessment includes a recommendation that the Bushfire Emergency Management and Evacuation Plan be updated to capture the new buildings. This recommendation satisfies the acceptable solutions detailed in Table 6.8d of PBP.

### 7.04 Aim & Objectives

The following table details the aim and objectives of *Planning for Bush Fire Protection 2019* and the proposal's ability to comply.

| Aim / Objective                                                                                                                                                                                                                               | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.</i> | With the inclusion of the recommendations made herein it is of our opinion that the aim of PBP has been satisfied.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| (i) afford buildings and their occupants protection from exposure to a bush fire;                                                                                                                                                             | <p>The location of the proposed buildings, with the exception of the Boarding House, is such that the available APZs exceed the minimum required for new development under PBP.</p> <p>Significant environmental constraints prevent the ability to provide Asset Protection Zones (APZs) achieving the maximum 10kW/m<sup>2</sup> requirement for new SFPP for the proposed Boarding House.</p> <p>APZs consistent with a Bushfire Attack Level of BAL 19 have been proposed for the proposed Boarding House. In addition, it is proposed to construct the Boarding House to BAL 29, one level higher than that determined from Table A1.12.5 of PBP.</p> <p>This increase in construction standard will provide greater confidence in this building providing an adequate refuge in the event of a bushfire emergency.</p> <p>In conjunction with the construction measures outlined herein the buildings and their occupants will be afforded the protection from exposure to a bushfire.</p> |

| Objective                                                                                                                                                          | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>(ii) provide for a defensible space to be located around buildings;</i>                                                                                         | <p>The available APZs, with the exception of the Boarding House, exceed the minimum required for new development under PBP.</p> <p>The proposed Boarding House follows the existing pattern of development, and will provide a better bushfire safety outcome for the adjacent Bishop Barker Harris boarding house with the application of the proposed 73m APZ.</p> <p>The proposal provides managed land and good operational space around the proposed buildings.</p> <p>The existing and proposed roads in conjunction with the available Asset Protection Zones provide an appropriate defensible space.</p> |
| <i>(iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;</i> | <p>The location of the proposed buildings, with the exception of the Boarding House, is such that the available APZs exceed the minimum required for new development under PBP.</p> <p>In conjunction with the application of the construction measures outlined herein the likely fire spread to the buildings is prevented.</p>                                                                                                                                                                                                                                                                                 |
| <i>(iv) ensure that appropriate operational access and egress for emergency service personnel and occupants is available;</i>                                      | <p>Attending fire appliances have direct and comprehensive vehicle access to the identified hazards via the internal roads, existing service / fire trails and public roads.</p> <p>Egress routes are available from the subject site via existing public roads away from the identified bushfire hazards.</p> <p>The proposed new road from Masons Drive to the proposed Sports Pavilion and south of the Prep School will further enhance onsite fire-fighter access.</p>                                                                                                                                       |

| Aim / Objective                                                                                         | Comment                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>(v) provide for ongoing management and maintenance of bush fire protection measures, (BPMs); and</i> | The Asset Protection Zones within the subject site are to be maintained in accordance with the NSW Rural Fire Service's document 'Standards for Asset Protection Zones' and Appendix 4 of <i>Planning for Bush Fire Protection 2019</i> .                                                                                                                                                                   |
| <i>(vi) ensure that utility services are adequate to meet the needs of firefighters.</i>                | <p>Existing in ground hydrants are available along Pennant Hills Road and surrounding streets for the replenishment of attending fire services.</p> <p>The existing internal hydrant network will be extended as required to service the proposed buildings.</p> <p>The spacing, design, sizing, flows and pressures of the new hydrant statement will comply with AS2419.1-2021 for any new extension.</p> |

It is of our opinion that the proposal can satisfactorily comply with the aim and objectives of Planning for Bush Fire Protection 2019.

## 8.0 Recommendations

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The following recommendations are provided as the minimum necessary for compliance with Planning for Bush Fire Protection – 2019. Additional recommendations are provided to supplement these minimum requirements where considered necessary.

### Asset Protection Zones

1. That at the commencement of construction and in perpetuity, all grounds for a minimum distance of 73 metres to the north, east and west from the proposed Boarding House shall be maintained as an Inner Protection Area as detailed in the NSW Rural Fire Service's document 'Standards for Asset Protection Zones' and Appendix 4 of Planning for Bush Fire Protection 2019.
2. That at the commencement of construction and in perpetuity, all grounds for a minimum distance of 30 metres to the north from the proposed Day Boy House shall be maintained as an Inner Protection Area as detailed in the NSW Rural Fire Service's document 'Standards for Asset Protection Zones' and Appendix 4 of Planning for Bush Fire Protection 2019.
3. That any new landscaping in the minimum required Asset Protection Zones is to comply with the provisions of Table 7.4a and Appendix 4 of Planning for Bush Fire Protection 2019.

### Construction

4. New construction for the proposed Boarding House and associated staff building shall comply with sections 3 and 7 (BAL 29) Australian Standard AS3959-2018 "Construction of buildings in bush fire-prone areas" and section 7.5 of "Planning for Bush Fire Protection" 2019.
5. New construction for the proposed STEAM Building, Staff Residences, Day Boy House and Sport Pavilion shall comply with sections 3 and 6 (BAL 19) Australian Standard AS3959-2018 "Construction of buildings in bush fire-prone areas" and section 7.5 of "Planning for Bush Fire Protection" 2019.

### Emergency Management

6. That prior to occupation a bushfire emergency management and evacuation plan is prepared consistent with the NSW Rural Fire Service *Guide to developing a Bush Fire Emergency Management and Evacuation Plan*.

## Services (where applicable)

### Water:

7. That any new internal hydrant system is to comply with the requirements detailed in Table 6.8c of *Planning for Bush Fire Protection 2019*, specifically:
  - fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2021;
  - hydrants are not located within any road carriageway;
  - fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2021.
  - all above-ground water service pipes external to the building are metal, including and up to any taps.
  - 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:

8. Any new electrical services must comply with Table 6.8c of *Planning for Bush Fire Protection 2019*, specifically:
  - where practicable, electrical transmission lines are underground.
  - where overhead electrical transmission lines are proposed:
    - lines are installed with short pole spacing (30 metres), 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 *ISSC3 Guideline for Management Vegetation Near Power Lines*.

### Gas:

9. Any new gas services must comply with Table 6.8c of *Planning for Bush Fire Protection 2019*, specifically:
  - reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - *The storage and handling of LP Gas*, 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;
  - 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.

## Access

10. That the proposed internal roads shall comply with the Access requirements as detailed in Table 6.8b of PBP, specifically:

- SFPP access roads are two-wheel drive, all-weather roads;
- access is provided to all structures;
- traffic management devices are constructed to not prohibit access by emergency services vehicles;
- one way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.
- 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.
- 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
- minimum 5.5m carriageway width kerb to kerb for two-way roads;
- parking is provided outside of the carriageway width;
- hydrants are located clear of parking areas;
- 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.

## 9.0 Conclusion

Through the State Significant Development Application (SSDA) process, The King's School is seeking to upgrade and enhance existing conditions on site, as well as improve and plan for amenities and facilities to support the current and future student and staff population.

In this instance the site is depicted on Parramatta City Council's Bushfire Prone Land Map (BPLM) as containing designated Category 1 and 2 Vegetation and Vegetation Buffer. The site is therefore considered 'bushfire prone'.

In relation to this application item 17 for the Concept Proposal and item 13 for Stage 1 works of the issued Secretary's Environmental Assessment Requirements (SEARs) requires a bush fire assessment that details proposed bush fire protection measures and demonstrates compliance with Planning for Bush Fire Protection 2019 (PBP).

In accordance with the bushfire safety measures contained in this report, and consideration of the site specific bushfire risk assessment it is our opinion that when combined, they will provide a reasonable and satisfactory level of bushfire protection to the subject development.

It is of our opinion that the proposal satisfies all relevant specifications and requirements of PBP.

We are therefore in support of the development.

Should you have any enquiries regarding this project please contact our office.

Prepared by  
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FPA Australia BPAD Level 2 Accredited Practitioner  
BPAD Accreditation No. BPAD46966



## 10.0 Annexure 01

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### List of Referenced Documents

Australian Building Codes Board (2022). *National Construction Code Volume One - Building Code of Australia*. ABCB

BVN (2023). Masterplan dwg no MAR-AR-DA-A10-XX-04, issue 09, dated 27.07.2023

ELVIS -Elevation -Foundation Spatial Data. Elevation.fsdf.org.au. Available at: <http://elevation.fsdf.org.au/>

Hunters Hill Lane Cove Parramatta Ryde Bush Fire Management Committee (2019-2024). Bush Fire Risk Management Plan

Keith, D. (2004). "Ocean Shores to Desert Dunes" Department of Environment and Conservation, Sydney

NSW Department of Planning and Environment (2019). *Planning Portal*. Accessed at: <https://www.planningportal.nsw.gov.au/>

NSW Rural Fire Service (2019). *Planning for Bush Fire Protection. A Guide for Councils, Planners, Fire Authorities and Developers*.

NSW Rural Fire Service (2022). Addendum to *Planning for Bush Fire Protection*.

Rural Fire Service NSW (2005). *Standards for Asset Protection Zones*

Standards Australia (2018). *AS3959:2018 Construction of buildings in bushfire-prone areas*.

Standards Australia (2014). *AS/NZS 1596 The storage and handling of LP Gas*

Taylor Brammer (2023). SSDA Landscape Report, 4 August 2023

Acknowledgements to:

Geoscience Australia  
Street-directory.com.au  
Nearmap

### Attachments

Attachment 01: Bushfire Design Modelling



# NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 8/03/2023

Assessment Date: 8/03/2023

Site Street Address: The King's School, North Parramatta

Assessor: Please Enter Your Name; Please Enter Company Name

Local Government Area: Parramatta

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

Short Fire Run - Methodology for Assessing Bush Fire Risk for Low Risk Vegetation May 2019; NSW RFS

Run Description: East - SFR - Day Boy House

## Vegetation Information

Vegetation Type: Northern Hinterlands WSF (Grassy)

Vegetation Group: Wet Sclerophyll Forests (Grassy)

Vegetation Slope: 9 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 20

Overall Fuel Load(t/ha): 33.1

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

Site Slope: 4 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m) Default

APZ/Separation(m): 45

## Fire Inputs

Veg./Flame Width(m): 47.58

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 12.5

Peak Elevation of Receiver(m): 4.16

Radiant Heat(kW/m2): 8.43

Flame Angle (degrees): 78

Flame Length(m): 14.95

Maximum View Factor: 0.096

Rate Of Spread (km/h): 4.47

Inner Protection Area(m): 45

Transmissivity: 0.788

Outer Protection Area(m): 0

Fire Intensity(kW/m): 76374

## Short Fire Run Calculations

Fire Run(m): 130

Length to Breadth Ratio: 2.82

Full Ellipse Length(m): 149.59

Headfire Backfire Ratio: 29.85

Travel Duration (mins): 1.75

Total Ellipse Length(m): 134.35

ROS and H/B Ratio: 76.92

|                                    |  |                                   |                                          |
|------------------------------------|--|-----------------------------------|------------------------------------------|
| Run Description:                   |  | North - SFR - Day Boy House       |                                          |
| <u>Vegetation Information</u>      |  |                                   |                                          |
| Vegetation Type:                   |  | Northern Hinterlands WSF (Grassy) |                                          |
| Vegetation Group:                  |  | Wet Sclerophyll Forests (Grassy)  |                                          |
| Vegetation Slope:                  |  | 9 Degrees                         | Vegetation Slope Type: Downslope         |
| Surface Fuel Load(t/ha):           |  | 20                                | Overall Fuel Load(t/ha): 33.1            |
| Vegetation Height(m):              |  | 0.9                               | Only Applicable to Shrub/Scrub and Vesta |
| <u>Site Information</u>            |  |                                   |                                          |
| Site Slope:                        |  | 9 Degrees                         | Site Slope Type: Downslope               |
| Elevation of Receiver(m)           |  | Default                           | APZ/Separation(m): 30                    |
| <u>Fire Inputs</u>                 |  |                                   |                                          |
| Veg./Flame Width(m):               |  | 18.3                              | Flame Temp(K): 1200                      |
| <u>Calculation Parameters</u>      |  |                                   |                                          |
| Flame Emissivity:                  |  | 95                                | Relative Humidity(%): 25                 |
| Heat of Combustion(kJ/kg           |  | 18600                             | Ambient Temp(K): 308                     |
| Moisture Factor:                   |  | 5                                 | FDI: 100                                 |
| <u>Program Outputs</u>             |  |                                   |                                          |
| Level of Construction:             |  | BAL 12.5                          | Peak Elevation of Receiver(m): 2.4       |
| Radiant Heat(kW/m2):               |  | 8.43                              | Flame Angle (degrees): 73                |
| Flame Length(m):                   |  | 14.95                             | Maximum View Factor: 0.092               |
| Rate Of Spread (km/h):             |  | 4.47                              | Inner Protection Area(m): 30             |
| Transmissivity:                    |  | 0.819                             | Outer Protection Area(m): 0              |
| Fire Intensity(kW/m):              |  | 76374                             |                                          |
| <u>Short Fire Run Calculations</u> |  |                                   |                                          |
| Fire Run(m):                       |  | 50                                | Length to Breadth Ratio: 2.82            |
| Full Ellipse Length(m):            |  | 149.59                            | Headfire Backfire Ratio: 29.85           |
| Travel Duration (mins):            |  | 0.67                              | Total Ellipse Length(m): 51.67           |
| ROS and H/B Ratio:                 |  | 76.92                             |                                          |