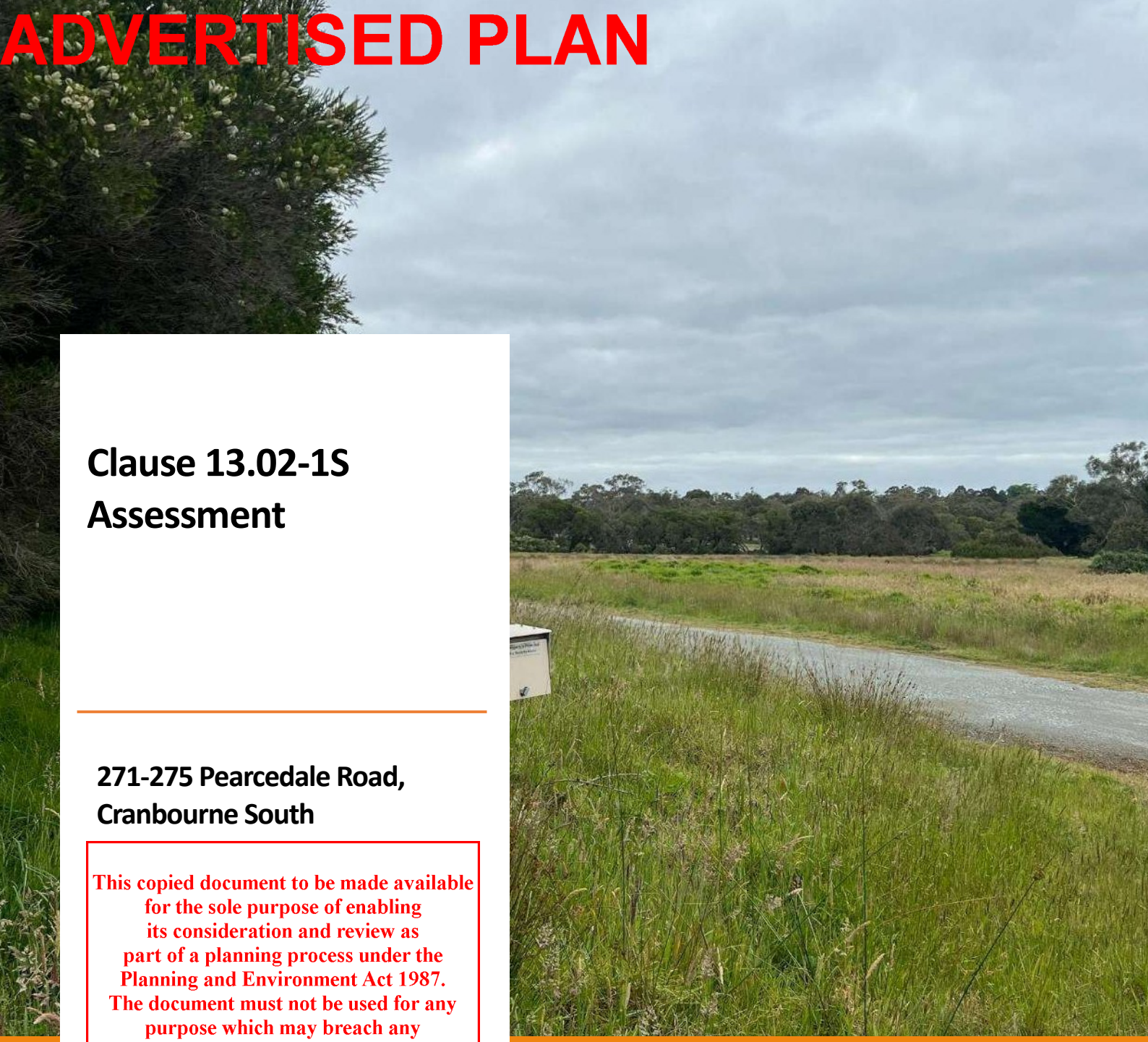

Clause 13.02-1S Assessment

271-275 Pearcedale Road, Cranbourne South

April 2026

FIRE RISK Consultants

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Fire Risk Consultants Pty Ltd

PO Box 12

Glengarry

VIC 3854

0487 790 287 www.fireriskconsultants.com.au

Prepared by: Mark Potter – Risk & Emergency Planning Lead

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Any fire safety work, including but not limited to planned burning, back burning and/or fire suppression, on any property or building is specifically excluded from this report.

Where the term **"Bushfire prevention and mitigation related activities"** (or words to that effect) are used, this is to be defined as the clearance of vegetation in accordance with the Victorian State Government guidelines, including clearing and maintenance of existing fire breaks and/or fire access for fire fighters under electricity pylons and properties that have been constructed to Australian Standard AS3959 and/or the National Construction Code.

Introduction

This document has been developed to describe the bushfire scenarios and risks for the proposed School (Stage 1 School Development) at 271-275 Pearcedale Road, Cranbourne South (the Project). This stage of the Project only involves Stage 1 of the development. A site overview is presented in Figure 1 and the provided plans are presented in Appendix 1 – Site Plans.

The proposed development is located within a Bushfire Prone Area (BPA), but not within a Bushfire Management Overlay (BMO). In the context of this development, the presence of the BPA triggers the requirement to consider the relevant sections of the National Construction Code. The southwestern corner of the site is within the BMO, but the development is not located within this portion of the site.

The assessment methodology is:

- Analyse the available bushfire risk data.
- Based on this data, develop bushfire scenarios considering both current and future design considerations.
- Assess the impact of scenarios on the site layout and building design.
- Determine the areas of the site that will be exposed to less than 10kW/m².
- Assess the development against Specification 43 requirements to inform the fire safety engineering assessment with a particular focus on S43C2 – separation from classified vegetation, exposed external areas (modelling of the 1kW/m² exposure limit), BAL 19 design requirements, vehicle access and water supply.

Application Details

Municipality:	Casey
Title description:	CP157253

Site Description

Existing use and siting of buildings and works on and near the land:	The site currently only has one building on site associated with Stage 0 of the project. The site is surrounded by urban development. The properties immediately adjacent to the site are larger acreage properties, generally consisting of grassland and woodland vegetation. To the east is a golf course.
Existing access arrangements:	Existing access to both dwellings is via Pearcedale Road.
Location of nearest fire hydrant:	A hydrant is located on Pearcedale Road. An internal fire hydrant system is proposed.

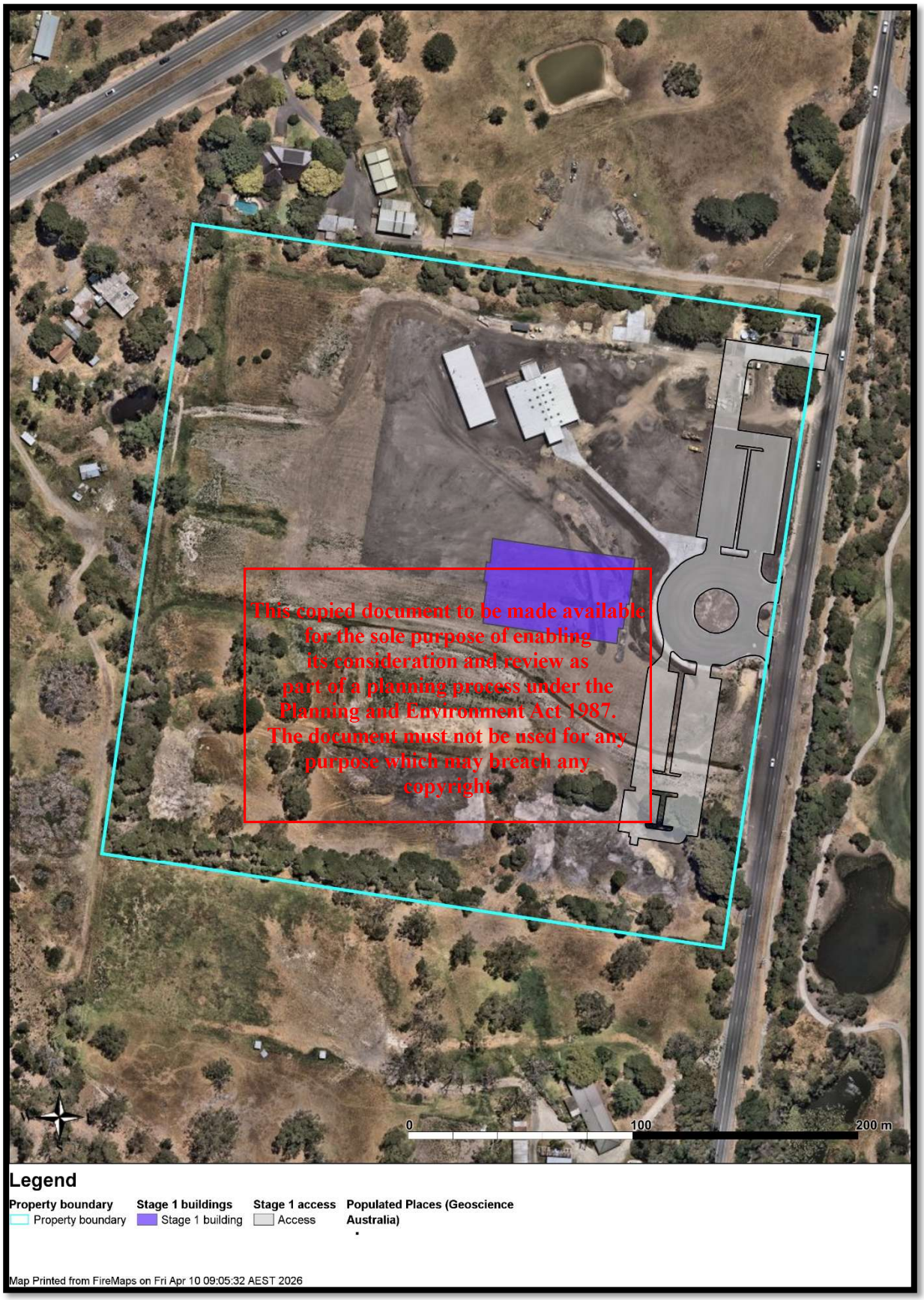


Figure 1 – Site overview

Access and egress

Existing access to the site is via the already constructed accessways from Pearcedale Road, including site carparking areas, dual accessways and a roundabout. The site plans are presented in Appendix 1 – Site Plans.

In the event of a bushfire threatening the site, the most likely direction of egress would be to travel east along Cranbourne-Frankson Road towards the suburb of Cranbourne. Alternatively travel north along Cranbourne-Frankson Road into the adjoining suburban areas would provide a safer location.

The surrounding landscape provides plenty of egress opportunities to the west, east and north to 'safer places'. Travel south would involve travel into agricultural lands and wouldn't be advisable during a bushfire/grassfire event.

Topography

The topography on and surrounding the site is effectively flat. It is unlikely for bushfire behaviour to be influenced by the surrounding topography.

Vegetation

The properties to the north and northwest are managed and excluded under AS3959. Other adjacent properties to the southwest, south and east contain a mixture of 'grassland' and 'woodland' vegetation when assessed against AS3959. It is anticipated that all grassland on the school site will be managed.

The vegetation in the surrounding landscape is highly fragmented due to the prevalence of small acreage properties, the golf course to the east and the suburban areas of Cranbourne to the north.

Bushfire Prone Areas

The BPA is introduced where land is subject to significant risk from bushfire. This control requires any new dwellings and other buildings to be constructed to the assessed Bushfire Attack Level following an assessment of bushfire risk in accordance with AS3959:2018 Construction of Buildings in Bushfire Prone Areas. In the context of this development, the presence of the BPA triggers the requirement to consider the relevant sections of the National Construction Code (NCC).

Part G5 of the NCC requires certain Class 9 buildings, including primary or secondary schools, to comply with Specification 43 of the NCC. Assessment against Specification 43 of the NCC outlines, among other things, the need to limit the impact of radiant heat onto a building to less than 10kW/m².

This development is within the BPA as shown in Figure 2.

Bushfire Management Overlay

The Bushfire Management Overlay (BMO) applies to land that has been assessed as being at extreme risk from bushfires. The BMO triggers the need for a planning permit for certain developments and requires new developments to include appropriate bushfire protection measures, including defendable space, construction requirements, access and water supply.

The BMO is a planning control applied to land with the potential to be affected by bushfires. New development and uses in the BMO may require a planning permit. This ensures that bushfire hazards, such as vegetation, slope and site access are assessed, and that bushfire protection measures are implemented to manage the risk.

The BMO triggers consideration against Clause 44.06 and Clause 53.02.

The BMO is allocated southwestern part of the property and does not intersect the proposed building footprint. The BMO is shown in Figure 3.

Figure 2 – BPA in relation to the site

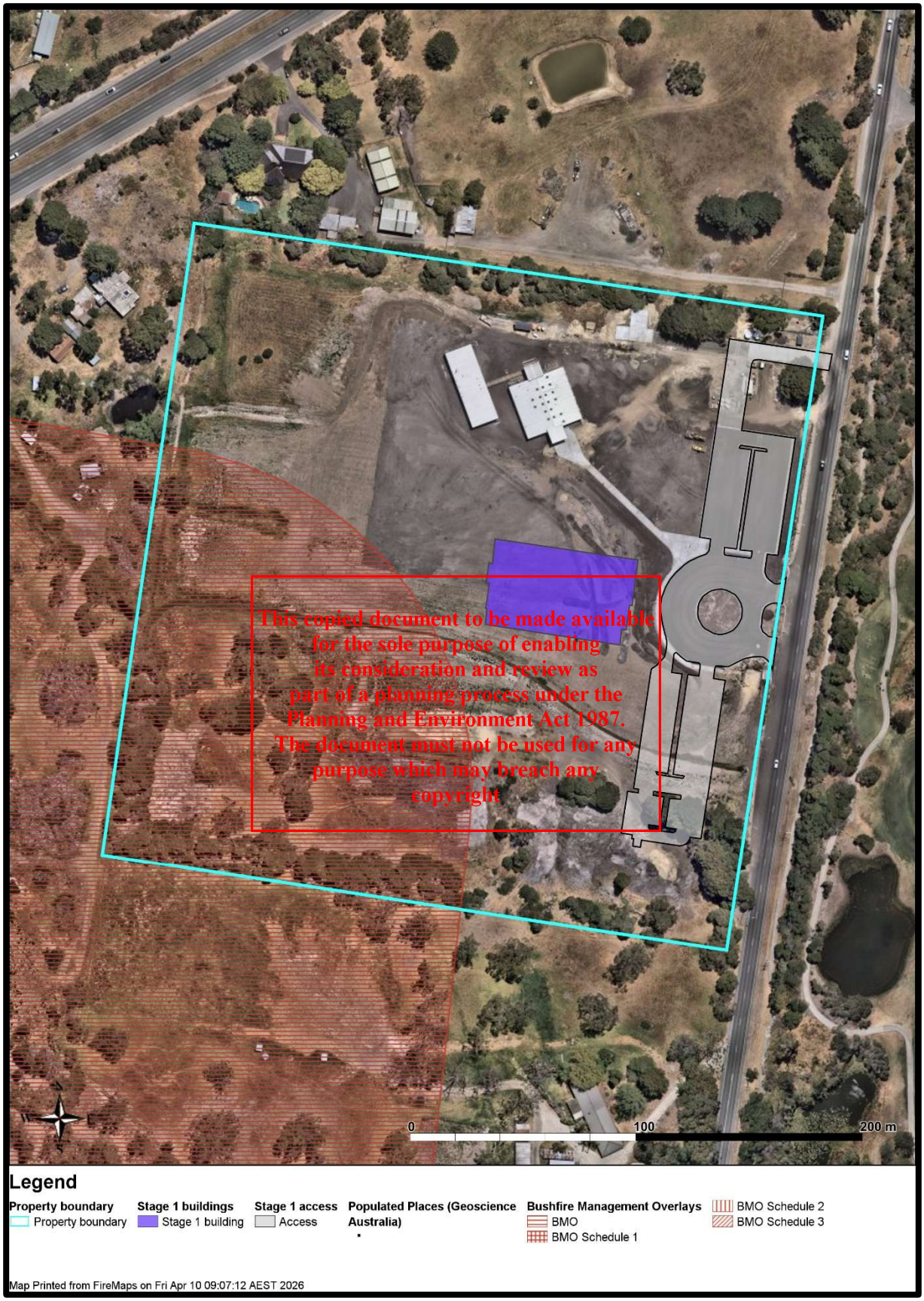


Figure 3 - BMO in relation to the site

Bushfire risk in south east Australia

The south east of Australia is one of the most fire prone areas in the world.

The rate a bushfire can spread is a direct result of the weather, fuel hazard (including dryness, quantity and arrangement) and the topography in which the fire is burning. Bushfire fuel is the only one of these three factors that it is possible to modify.

Extreme fire conditions can occur in south eastern Australia when dry winters and springs are followed by summers where bushfire fuels become very dry.

When these conditions combine, fires can be expected to move quickly under the influence of strong, gusty north westerly winds. These fires can then move rapidly in a different direction when the subsequent south–westerly wind change arrives. Fires that start under these conditions can reach a very high intensity, even in areas of relatively low fuel loads and can be difficult to control until the weather conditions abate.

The height of a bushfire's intensity is directly linked to its destructiveness and the more difficult it is to control. As the intensity increases so does the difficulty of containment and effective suppression. Very high intensity fires with flame heights greater than 10 metres are generally uncontrollable.

Bushfire intensity is a function of the heat content of the fuel, the quantity of fuel and the rate of spread of the bushfire. The heat content of vegetation fuels is roughly constant. It has been found that the quantity and distribution of fine fuels are the main factor influencing bushfire behaviour. Larger fuels burning during a bushfire do not contribute significantly to the spread of a bushfire.

Fine fuels available to a bushfire are fuels such as grass, leaves, dead pine needles and twigs that ignite readily and are consumed rapidly when dry. They are often defined as those dead fuels less than 6mm in thickness. Fine fuel load (measured in tonnes per hectare) has therefore been used as a convenient measure of the underlying bushfire hazard in areas dominated by woody vegetation. The fine fuel load at any given time is a balance between the rate of fuel build up, and factors that remove fuel such as litter decomposition and fire. In the absence of fire, fuel loads in forests and woodlands with a shrubby or heathy understorey build up to a quasi-equilibrium state where the rate of fuel production equals the rate of decomposition. The maximum levels vary for different vegetation types and for the same vegetation types in different locations.

It has been found that fuel structure is possibly more important than the total fine fuel load in determining bushfire behaviour. Fuels in forests, woodlands and shrublands can be categorised into four layers with differing effects on fire behaviour (Hines, et al., 2010). These layers are:

Surface fine fuels: leaves, bark, small twigs and other fine fuel lying on the ground. These fuels provide the horizontal continuity that allows a bushfire to spread

Near surface fine fuels: grasses, low shrubs, bracken etc. up to about .5 m above the ground surface. Fuels in this layer will burn when the surface fuel layer burns and will increase bushfire intensity

Elevated fuels: larger shrubs and small saplings with most of the fuel closer to the top of this layer and a clear gap between them and the surface fuels. These interact with the two-layer fuel layers to further increase bushfire intensity. They also contribute to the vertical continuity of fire that allows fire to 'climb' into the tree canopy

Bark fuels: flammable bark on trees, saplings and large bushes from ground level to the canopy. Loose fibrous bark on string-bark eucalypts, and candle bark on some gums can generate large amounts of burning embers which can start spot fires ahead of the main fire front.

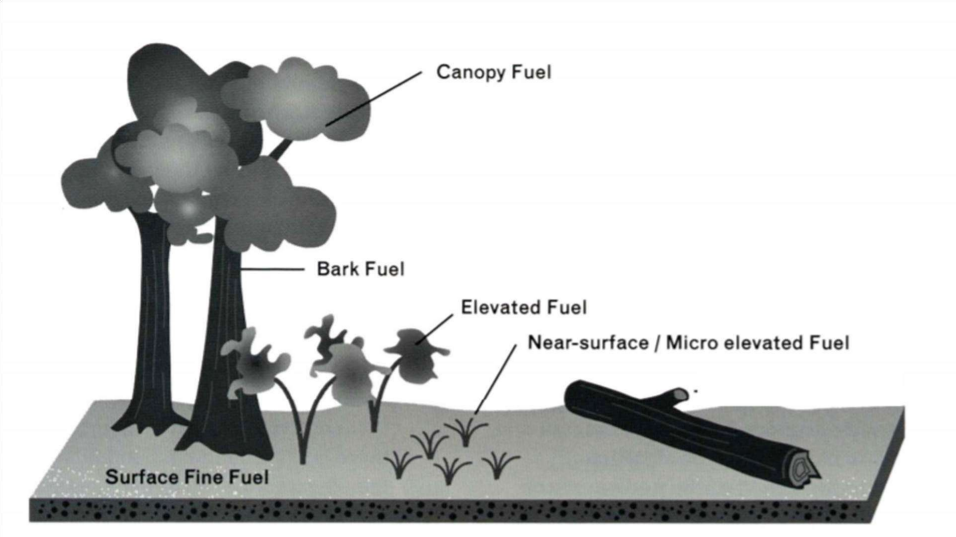


Figure 4 - Overview of fuel structure that affects bushfire behaviour

Bushfire Hazard Landscape Assessment

The Bushfire Hazard Landscape Assessment is completed to provide an assessment of the bushfire hazard more than 150 metres away from the subject site. This assessment considers all available information to determine the effects of a bushfire from more than 150m from the site.

For this assessment, the landscape risk has been assessed at one kilometre and 20 kilometres.

Fire History

The available records demonstrate that bushfires have impacted some of the surrounding areas but not the site (DEECA, 2025). The closest bushfire occurred 2.2km to the west in 2022 and impacted approximately 1.8ha of land. The bushfire was quickly extinguished and impacted on some sheds and vehicles, but no houses were impacted by the bushfire[1]. Other bushfires and planned burns have occurred in the surrounding landscape further to the west. However, are generally restricted to forested areas.

Based on the history of bushfires and planned burns and the availability of forested landscape in the vicinity, the area is generally considered a low risk of being impacted by bushfires.

Figure 5 shows the bushfire history according to DEECA records (DEECA, 2025).

[1] https://cranbournenews.starcommunity.com.au/news/2022-01-19/lyppards-road-closed-after-grassfire/

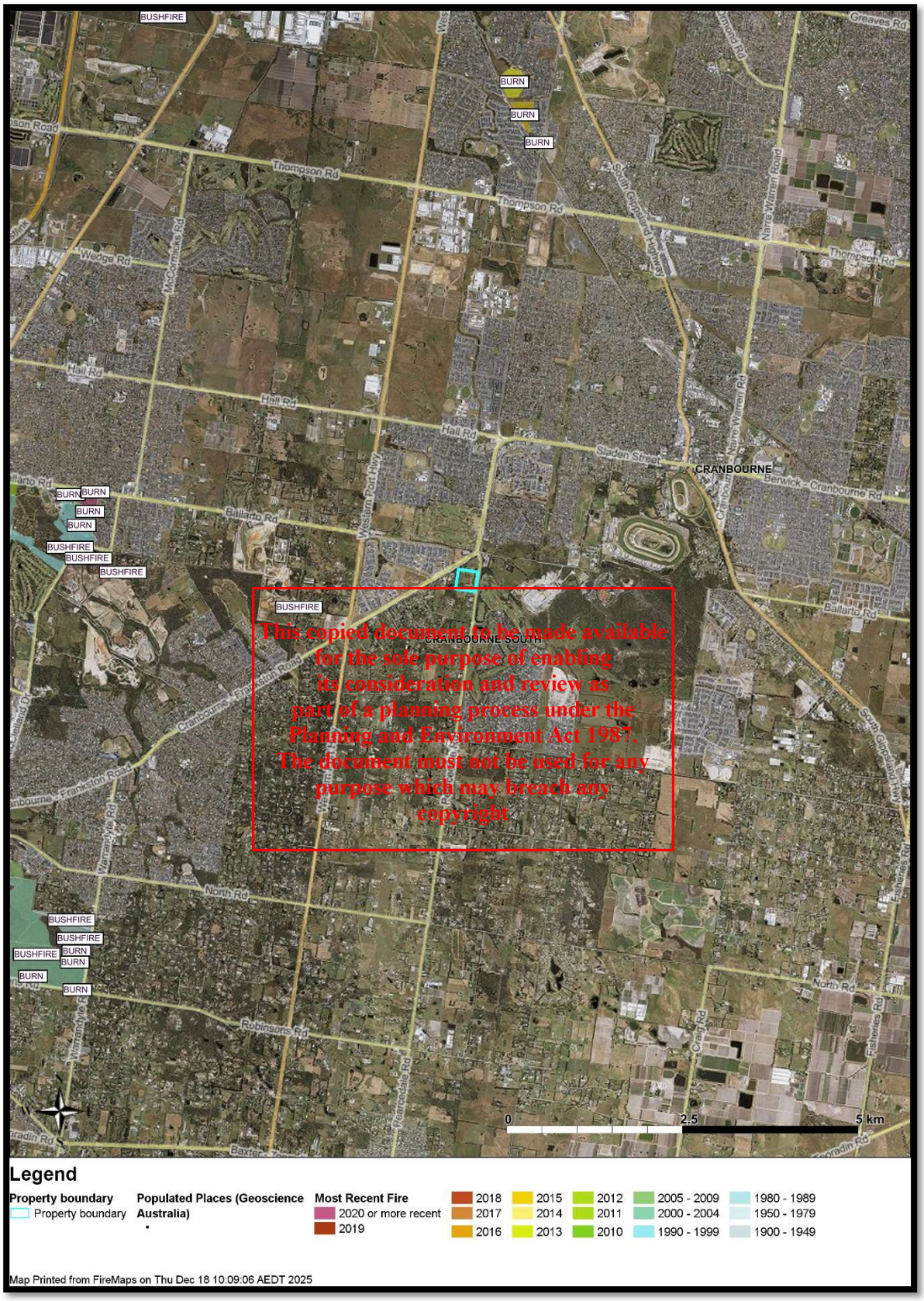


Figure 5 - Bushfire history with the property outlined in blue. The shapes represent multiple bushfire and planned burn events

Existing bushfire risk assessments

An analysis of available bushfire risk information has identified the following sources:

- Casey Municipal Emergency Management Plan (Municipal Emergency Management Planning Committee).

The City of Casey faces a high residual risk from bushfires and grassfires, with the Municipal Emergency Management Plan (MEMP) listing it as a priority hazard under the Community Emergency Risk Assessment (CERA) process. Parts of Cranbourne South and Pearcedale, including the Pearcedale Road corridor, are identified within Bushfire Prone Areas and some Bushfire Management Overlay zones. This semi-rural area comprises a mix of farmland, smallholdings, roadside vegetation, and patches of native vegetation, which could contribute to the potential for rapid grassfire spread under hot, dry, and windy conditions.

Mitigation measures at the municipal level include:

- Fuel reduction and vegetation management by the City of Casey, CFA, and DEECA,
- Neighbourhood Safer Places,
- Delivery of community education programs, and
- Coordination of emergency planning through the Municipal Fire Management Working Group.

5.5 Likely Bushfire Scenarios

Due to the nature of the landscape surrounding the proposed development, the presence of residential and industrial developments will likely reduce the potential for bushfires to approach this development. A bushfire could approach from the east; however, this will likely be under lower fire danger conditions and will be easily suppressed by firefighters.

Table 1 outlines the hazard assessment relating to the proposed development.

Table 1 - Overview of bushfire hazard and likely scenarios

Bushfire hazard type	Description	Scenario/s	Considerations
Landscape conditions (20 kilometres)	The landscape assessment indicates minimal continuous vegetation within 20 km that could support bushfire activity. The only areas are small, isolated vegetated areas more than 5km to the west and 7km to the southwest. While vegetated areas are present to the east, these are considered lesser risk for the reasons detailed in the Bushfire risk in south east Australia section. Surrounding development and roads reduce the connectivity of fuel. Refer to Figure 6 for further detail.	The landscape assessment has identified small areas of vegetation in the surrounding landscape to the west. A bushfire that was to impact the area to the west (Scenario A) will have a maximum fire run of less than 2 kilometres and is set back 5 kilometres from the site. The chance of embers generating and impacting the site from this distance is unlikely. Similarly, to the southwest, a small area of vegetation is present 7 kilometres to the southwest. A bushfire travelling through this area would have a maximum fire run of less than 2 kilometres and would be interrupted by a series of trails throughout the site. As such, chance of embers generating and impacting the site from this distance is considered to be unlikely.	The site is in an area that is surrounded by a fragmented landscape and is generally considered lower risk. Ember attack is unlikely due to the separation and size of these vegetated areas. The site will be managed in a minimum fuel condition. Ecological revegetation beyond typical school landscaping is not anticipated or recommended.
Local conditions (1 kilometre)	Small vegetation patches are present to the west and southwest however are significantly fragmented by urban development and local roads. Refer to Figure 7 for further detail.	Within one kilometre of the site, vegetation is generally unlikely to support intense bushfire activity. However, is still considered for conservatism. To the southwest there are areas within 1km of the site that contain fragmented vegetation. This may support some localised ember generation or radiant heat exposure to the southwest corner of the site as it approaches the site.	As above

Bushfire hazard type	Description	Scenario/s	Considerations
		To the northwest/west of the site is an unmanaged development area. This may support a small grassfire with a maximum fire run of 300m. It is unlikely for a grassfire in this location to impact the site.	
Neighbourhood conditions (400 metres)	To the southwest are areas of fragmented woody vegetation and grassland. Further detail is provided within Figure 7.	If a fire approached within 400m of the site, it would result in ember attack and some radiant heat exposure to the southwest corner of the site. Significant bushfire effects are considered unlikely due to the residential nature of the area to the southwest.	As above.
The site for the development	The site is currently grassland. Once the site is developed, the risk of bushfire activity on the property will be significantly reduced.	Once the development is completed, the ability for bushfires to travel through the property will be limited. The likely bushfire attack on the buildings will be from embers originating from the surrounding area.	As above.

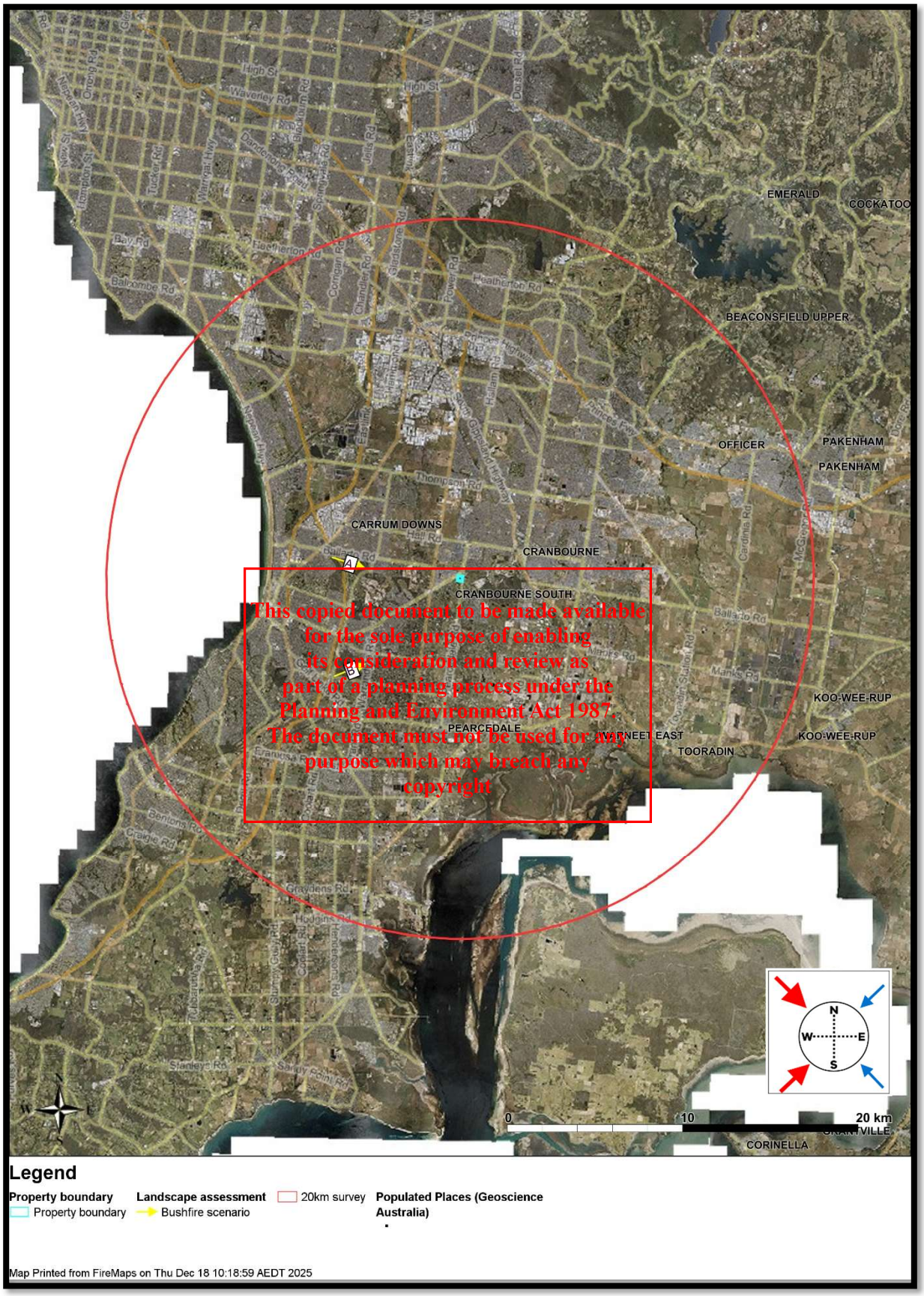


Figure 6 - 20 kilometre landscape risk analysis

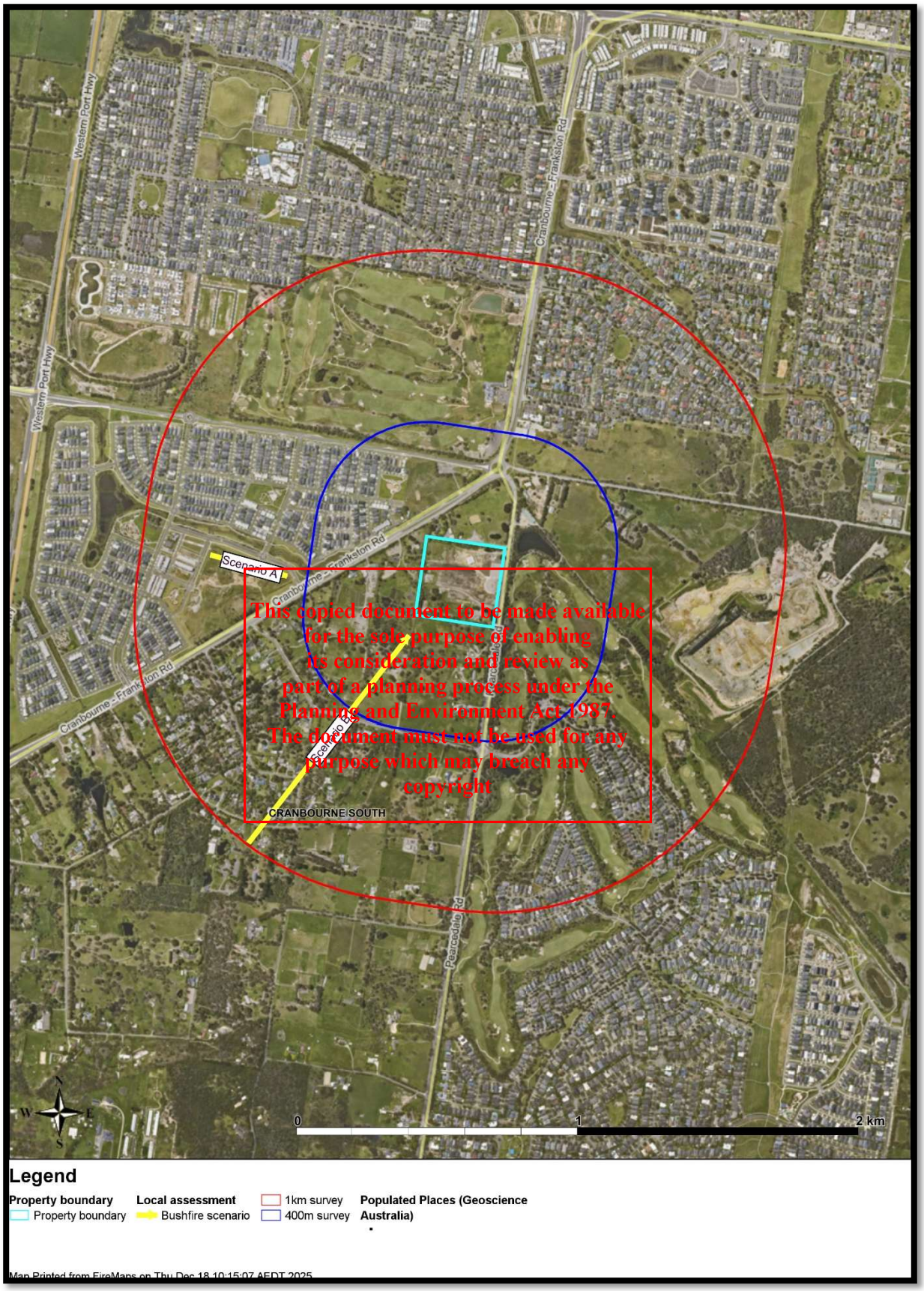


Figure 7 - 1 kilometre and 400 metre landscape risk analysis

In summary, both scenarios are possible. Ember attack from grassfires that start locally will be the most likely bushfire scenario. The site is unlikely to be impacted by fires from the broader landscape.

Landscape type

The determination of the landscape type enables the consideration of other treatments depending on the level of risk. These treatments may include additional construction requirements, vegetation management or other solutions. Note that whilst the determination of a landscape risk level is part of this analysis, the determination of the need for additional treatments will be considered as part of further assessments within this report.

Table 2 -Bushfire landscape assessment

	Landscape risk descriptors
Type 1	There is little vegetation beyond 150 metres of the site (except grasslands and low threat vegetation). • Extreme bushfire behaviour is not possible. • The type and extent of vegetation is unlikely to result in neighbourhood-scale destruction of property. • Immediate access is available to a place that provides shelter from bushfire.
Type 2	The type and extent of vegetation located more than 150 metres from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to a site. • Bushfire can only approach from one aspect and the site is located in a suburban, township or urban area managed in a minimum fuel condition. • Access is readily available to a place that provides shelter from bushfire. This will often be the surrounding developed area.
Type 3	The type and extent of vegetation located more than 150 metres from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to a site. • Bushfire can approach from more than one aspect. • The site is located in an area that is not managed in a minimum fuel condition. • Access to an appropriate place that provides shelter from bushfire is not certain
Type 4	The broader landscape presents an extreme risk. • Fires have hours or days to grow and develop before impacting. • Evacuation options are limited or not available.

In accordance with the Technical Guide, the landscape has been assessed as Type 2 (DELWP, 2017). Potential mitigation methods will be explored in the following sections.

Clause 13.02 Assessment

Introduction

Clause 13.02 of the Planning Scheme states:

> *This policy must be applied to all planning and decision making under the Planning and Environment Act 1987 relating to land that is:*
>
> - *Within a designated bushfire prone area;*
> - *Subject to a Bushfire Management Overlay; or*
> - *Proposed to be used or developed in a way that may create a bushfire hazard.*

As the development is located within a designated bushfire prone area, an assessment against Clause 13.02 is required to be completed. The development will not create a bushfire hazard. Instead, it will reduce the hazard in the local area.

Strategy response – Protection of human life

Table 3 - Clause 13.02 strategy assessment response

	Strategy	Response
1	Prioritising the protection of human life over all other policy considerations.	Prioritisation of human life can be achieved by applying the requirements of the Bushfire Management Overlay, including using the following design considerations: • The proposed building is located outside the BMO. • The proposed building is located in an area exposed to <10kW/m^2. • Manage all vegetation on site, particularly during the fire danger period. • Provision of firefighting water supplies, as required by Specification 43. • Development of a Bushfire Emergency Plan that will outline the requirement to close the site on days where the forecast is catastrophic.
2	Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.	The landscape risk has been identified as Type 2. The proposed building will be required to comply with Specification 43 of the NCC and be located in areas exposed to <10 kW/m^2. It is recommended that buildings are located away from the most likely direction of bushfire attack (southwest). This is achieved in the proposed layout.
3	Reducing the vulnerability of communities to bushfire through the consideration of bushfire risk in decision making at all stages of the planning process.	The building placement is considered to be low risk for the following reasons: • The landscape has been classified as Type 2. • The building is located outside the Bushfire Management Overlay, • The building will be exposed to less than 10 kW/m^2 in a bushfire event (identified in Figure 11), and • The building is located away from the most likely direction of bushfire attack.

Strategy response – Bushfire Hazard Identification and Assessment

Table 4 - Bushfire Hazard Identification and Assessment response

	Strategy	Response
1	Applying the best available science to identify vegetation, topographic and climatic conditions that create a bushfire hazard	The site has been assessed and the data inputs into the assessment of the bushfire risk are consistent with AS3959. The analysis of required setbacks will be compliant with Specification 43 of the NCC.
2	Considering the best available information about bushfire hazard including the map of designated bushfire prone areas prepared under the Building Act 1993 or regulations made under that Act.	The site is within the Bushfire Prone Area, and the southwest of the site is within the Bushfire Management Overlay. The site is located within an area this is built up; however, some areas in the landscape still contain grassland and small forest. The landscape has been classified as Type 2 as per the Technical Guide.
3	Applying the Bushfire Management Overlay to areas where the extent of vegetation can create an extreme bushfire hazard.	The proposed development is not located within the BMO.
4	Considering and assessing the bushfire hazard on the basis of: • Landscape conditions - meaning conditions in the landscape within 20 kilometres (and potentially up to 75 kilometres) of a site; • Local conditions - meaning conditions in the area within approximately 1 kilometre of a site; • Neighbourhood conditions - meaning conditions in the area within 400 metres of a site; and • The site for the development.	The site has been assessed using 400 metres, 1 kilometre, and 20 kilometres. The assessment identified predominantly developed areas in the broader landscape with some small grassland and forested areas to the west. At the local level, bushfire attack is most likely from the southwest, which can support a level of ember generation. Ember attack, smoke, and some low levels of radiant heat exposure to the southwest corner are the likely mechanisms of bushfire attack. Buildings have been located away from this area. Due to the likely managed nature of the site, it is unlikely for a fire to spread through the school. The landscape has been classified as Type 2.
5	Consulting with emergency management agencies and the relevant fire authority early in the process to receive their recommendations and implement appropriate bushfire protection measures.	Relevant agencies will be consulted as required throughout the development process.

	Strategy	Response
6	Ensuring that strategic planning documents, planning scheme amendments, planning permit applications and development plan approvals properly assess bushfire risk and include appropriate bushfire protection measures.	Bushfire risk has been assessed for the proposed development, and the landscape has been determined to be Type 2. Compliance with Specification 43 will ensure the building has appropriate levels of protection.
7	Not approving development where a landowner or proponent has not satisfactorily demonstrated that the relevant policies have been addressed, performance measures satisfied, or bushfire protection measures can be adequately implemented.	The design solution for this development ensures bushfire risk has been adequately addressed and policies have been addressed. The design solution includes: • The proposed building is located outside the BMO. • The building will be exposed to less than 10 kW/m^2 in a bushfire event. • All vegetation on site will be managed, particularly around fire danger periods. • Provision of firefighting water supplies, as required by Specification 43. • Development of a Bushfire Emergency Plan that will outline the requirement to close the College on days where the forecast is catastrophic.

Strategy Response – Settlement Planning

Table 5 - Settlement Planning Strategy response

	Strategy	Response
1	Directing population growth and development to low risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS 3959-2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2018).	Buildings will be subject to Specification 43 Clause 2 of the NCC, which requires the building to be exposed to a maximum of 10 kW/m^2.
2	Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS 3959-2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2018) where human life can be better protected from the effects of bushfire.	Areas on site are recommended to be managed in a low-fuel state with short-cropped grass, particularly around fire danger periods. This will ensure buildings located more than 100m away from the vegetation hazard are located in BAL-LOW areas.
3	Ensuring the bushfire risk to existing and future residents, property and community infrastructure will not increase	It is also unlikely that any ecological revegetation requirements will be associated with development on this site. Any landscaping on site should be managed in accordance with the CFA guide *Landscaping for bushfire.*

	Strategy	Response
	as a result of future land use and development.	
4	Achieving no net increase in risk to existing and future residents, property and community infrastructure, through the implementation of bushfire protection measures and where possible reducing bushfire risk overall.	The proposed development will decrease the net risk to existing and future residents.
5	Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction.	The landscape assessment has been completed. It has identified a Type 2 landscape hazard. This can be managed through the implementation of standard bushfire management measures, including management of grass on site and complying with vegetation setbacks required to achieve <10 kW/m^2 radiant heat flux exposure.
6	Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis.	The site is subject to a Type 2 landscape hazard and low risk. The site is appropriate for the scale and type of development. It is not necessary for Project to consider alternate low risk offsite locations.
7	Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS 3959-2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2018).	The development is not a strategic planning document, local planning policy, or planning scheme amendment

Bushfire Hazard Site Assessment

The assessment has been undertaken from the site boundary to ensure vegetation is adequately accounted for in the radiant heat modelling. The bushfire hazard within 150 metres of the site boundary is shown below in Figure 8.

Figure 8 - Bushfire Site Hazard Assessment map

Table 6 - Bushfire Site Hazard Assessment vegetation assessment

Plot	Vegetation classification	Slope classification	Distance from vegetation	BAL Level
1	Class G – Grassland	Flat/Upslope	124 metres	BAL-12.5
2	Class B – Woodland	Flat/Upslope	245 metres	BAL-12.5
3	Class B – Woodland	Flat/Upslope	81 metres	BAL-12.5
4	Excluded	N/A	N/A	BAL-12.5

*The BAL rating has not considered landscape risk.

The outcome of the assessment has identified grassland and woodland offsite. While the assessment only needs to consider areas within 100m of the development, areas within 150m of the whole site have been included to assist with Specification 43 assessments, specifically the <1kW/m2 Assessment.

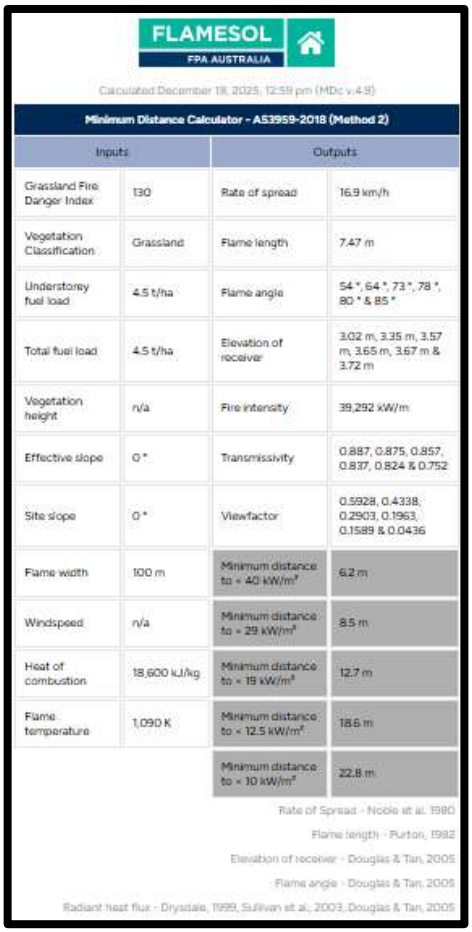
Radiant Heat Assessment

Specification 43 of the National Construction Code outlines an option to limit the impact of radiant heat onto a building to less than 10 kW/m².

The method outlined within Appendix B of AS3959 and FPA Australia's Flamesol system has been used to calculate the BAL setback requirements. Flamesol outputs for the grassland and woodland areas surrounding the development are presented in Figure 9 and Figure 10 respectively.

Figure 11 shows areas on site that will be exposed to less than 10kW/m^2.

The majority of the site is located within the areas exposed to less than 10kW/m^2. Radiant heat flux exposure on buildings is based on the setbacks presented in Table 6.



FLAMESOL
FPA AUSTRALIA

Calculated December 18, 2025, 12:59 pm (MDc v.4.9)

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Grassland Fire Danger Index	130	Rate of spread	16.9 km/h
Vegetation Classification	Grassland	Flame length	7.47 m
Understorey fuel load	4.5 t/ha	Flame angle	54 °, 64 °, 73 °, 78 °, 80 ° & 85 °
Total fuel load	4.5 t/ha	Elevation of receiver	3.02 m, 3.35 m, 3.57 m, 3.65 m, 3.67 m & 3.72 m
Vegetation height	n/a	Fire intensity	39,292 kW/m
Effective slope	0 °	Transmissivity	0.887, 0.875, 0.857, 0.837, 0.824 & 0.752
Site slope	0 °	Viewfactor	0.5928, 0.4338, 0.2903, 0.1963, 0.1589 & 0.0436
Flame width	100 m	Minimum distance to < 40 kW/m²	6.2 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	8.5 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	12.7 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	18.6 m
		Minimum distance to < 10 kW/m²	22.8 m

Rate of Spread - Noble et al. 1980
Flame length - Purton, 1982
Elevation of receiver - Douglas & Tan, 2005
Flame angle - Douglas & Tan, 2005
Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Figure 9 – Flamesol output (grassland areas)

FLAMESOL
FPA AUSTRALIA

Calculated December 18, 2025, 12:59 pm (MDc v.4.9)

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Fire Danger Index	100	Rate of spread	1.79 km/h
Vegetation Classification	Woodland	Flame length	14.7 m
Understorey fuel load	15 t/ha	Flame angle	53 °, 63 °, 71 °, 75 °, 77 ° & 82 °
Total fuel load	25 t/ha	Elevation of receiver	5.86 m, 6.54 m, 6.94 m, 7.09 m, 7.16 m & 7.27 m
Vegetation height	n/a	Fire intensity	23,249 kW/m
Effective slope	0 °	Transmissivity	0.872, 0.853, 0.827, 0.801, 0.788 & 0.727
Site slope	0 °	Viewfactor	0.6012, 0.4446, 0.3013, 0.2047, 0.1664 & 0.0452
Flame width	100 m	Minimum distance to < 40 kW/m²	12.1 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	16.3 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	23.7 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	33.3 m
		Minimum distance to < 10 kW/m²	39.4 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980
Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980
Elevation of receiver - Douglas & Tan, 2005
Flame angle - Douglas & Tan, 2005
Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Figure 10 – Flamesol output (Woodland areas)

Figure 11 – Areas <10kW/m² Assessment

Specification 43 Assessment

Table 7 provides guidance on compliance with other clauses of Specification 43. The following is provided as a guide only. Assessment against Specification 43 should be confirmed by the Fire Safety Engineer.

Table 7 – Assessment against Specification 43

	Strategy	Response
C2	The building must be separated from classified vegetation— a. by not less than the minimum distances specified in Table S43C2; or b. such that radiant heat flux on exposed building elements will not exceed 10kW/m².	As shown in Figure 11, the proposed development is within the areas identified to be exposed to less than 10kW/m².
C3	(1) The building must be located not less than 12 m from any other building. (2) The separation distance required by (1) need not be complied with if the building is constructed— a. with external walls that have an FRL of not less than 60/60/60 when tested from the outside, including any openings protected in accordance with AS 3959 for BAL—19 or greater; or b. for external walls and roof, using a material or system that satisfies the test criteria of AS 1530.8.1 for a radiant heat flux of 10 kW/m² or greater.	There is only one building being proposed at this stage. A stage 2 building will be located within 12m and as such, this building will be subject to Clause 3(2).
C4	(1) The building must be located not less than 10 m from any allotment boundary or open carparking area/spots. (2) The separation distance required by (1) need not be complied with if the building is constructed— a. with external walls that have an FRL of not less than 60/60/60 when tested from the outside, including any openings protected in accordance with AS 3959 for BAL—19 or greater; or b. for external walls and roof, using a material or system that satisfies the test criteria of AS 1530.8.1 for a radiant heat flux of 10 kW/m² or greater.	The proposed building is more than 10m from the boundary and open carparking area, complying with (1).
C5	The external walls and roof of the building must be protected from potential hazards on the site such as liquefied petroleum gas bottles, fuel storage, storage of combustible materials, waste bins, vehicles, machinery, and the like, by— a. a separation distance of not less than 10 m; or	Dangerous goods must be stored more than 10m from the building. If this cannot be achieved, compliance with Clause 5b or 5c must be achieved.

	Strategy	Response
	b. where within the 10 m separation distance described in (a), constructed with external walls that have an FRL of not less than 60/60/60 when tested from the outside, including any openings protected in accordance with AS 3959 for BAL—19 or greater; or c. for external walls and roof, using a material or system that satisfies the test criteria of AS 1530.8.1 for a radiant heat flux of 10 kW/m² or greater.	
C6	A non-combustible pathway directly adjacent to the building and not less than 1.5 m wide must be provided around the perimeter of the building.	A garden is located adjacent to the proposed building. It is recommended that a 1.5m non-combustible pathway be provided around the perimeter of the building.
C7	(1) Access pathways that lead to a road or open space must— a. be readily identifiable; and b. have an even surface; and c. have a minimum clear width of not less than 1 m. (2) If the access pathway is an accessway that is required to comply with Part D4, the requirements of Part D4 override (1) to the extent of any inconsistency.	Proposed pathways appear to comply with Clause 7 and will be readily identifiable, have an even surface, and a width greater than 1 metre.
C8	An external area designed to hold people unable to be safely accommodated within the building, that may be exposed to radiant heat flux from a fire front during a bushfire event, must not be exposed to an incident radiant heat flux from the fire front exceeding 1 kW/m² above background solar radiant heat flux.	To achieve a radiant heat flux of <1kW/m², setbacks of 107m from grassland vegetation and 152m from woodland vegetation will need to be achieved, as detailed in Figure 12 and Figure 13. Areas that achieve this setback are presented in Figure 14.
C9	To maintain internal tenability throughout the duration of occupancy during a bushfire event, the building must comply with the following: a. An air handling system must be provided that is capable of— i. being adjusted for full recycling of internal air for a period of not less than 4 hours to avoid the introduction of smoke into the building; and ii. maintaining an internal air temperature of not more than 25°C. b. The building envelope must be designed such that if an air handling system required by (a) fails, then—	Modelling will need to be completed by the Fire Safety Engineer to demonstrate compliance with Clause 9.

	Strategy	Response
	i. internal air temperatures can be maintained below 39°C; and ii. internal surface temperatures can be maintained below 60°C. c. If the building is divided into separate compartments then, for the purposes of (a), each compartment must have a separate air handling system. d. Each air handling system required by (a) must be designed to account for the activation of smoke detectors from low concentrations of smoke from external sources, so as to ensure that air-conditioning and other essential systems remain operational.	
C10	The building envelope must be constructed in accordance with AS 3959 – BAL 19 or greater, except that where the use of combustible materials is permitted by AS 3959, they are not to be used unless permitted by C2D10(4), (5) or (6).	Buildings must be constructed to BAL 19 or higher to achieve compliance with Clause 10.
C11	Water for fire-fighting purposes must be available and consist of— a. a fire hydrant system complying with E1D2, or b. a static water supply consisting of tanks, swimming pools, dams or the like, or a combination of these, together with suitable pumps, hoses and fittings, capable of providing the required flow rate for a period of not less than 4 hours, determined in consultation with the relevant fire brigade.	A hydrant system will likely be required. The hydrant system will need to comply with E1D2.
C12	(1) Emergency power must be provided to support, for not less than 4 hours before and 2 hours after the passing of the fire front during a bushfire event, the ongoing operation of— a. air handling systems to maintain internal tenability; and b. any pumps for firefighting; and c. any emergency lighting and exit signs; and d. any other emergency equipment listed in C3D14(6) and required to be provided. (2) Manual control for emergency back-up power supply must be provided to facilitate manual intervention where the power supply fails or runs out.	Emergency power must be supplied that meets the requirements of Clause 12.
C13	Signage must be provided to warn building occupants against storing combustible materials under or adjacent to the building.	Signage must be provided to ensure combustible materials are not stored around buildings.

	Strategy	Response
C14	Vehicular access to the building must be provided in accordance C3D5(2), as if the building were a large, isolated building for the purposes of C3D4.	Vehicular access will need to meet the following requirements: a. must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building; and b. must have a minimum unobstructed width of 6 m with no part of its furthest boundary more than 18 m from the building and in no part of the 6 m width be built upon or used for any purpose other than vehicular or pedestrian movement; and c. must provide reasonable pedestrian access from the vehicular access to the building; and d. must have a load bearing capacity and unobstructed height to permit the operation and passage of fire brigade vehicles; and e. must be wholly within the allotment except that a public road complying with (a), (b), (c) and (d) may serve as the vehicular access or part thereof. Due to the low bushfire risk that has been identified through this assessment, it would be expected for a variation from these requirements to be accepted by the relevant fire service. It is of the position of FRC that the current carparking and access layout is sufficient for firefighting activities.

Radiant heat (1 kW/m^2) Assessment

As detailed previously, Clause 8 of Specification 43 requires that external areas intended to accommodate people who cannot be safely sheltered within the building must not be exposed to a radiant heat flux exceeding 1 kW/m² above the background solar radiant heat flux.

The radiant heat values for grassland and woodland were calculated using the method described in Appendix B of AS3959 and FPA Australia's Flamesol system. The required setbacks to achieve a radiant heat value of <1 kW/m^2 are displayed in Figure 12 and Figure 13. The areas that will be exposed to a radiant heat flux of less than 1 kW/m^2 are presented in Figure 14.

While most of the northern area is exposed to <1kW/m^2, external area designed to hold people in a bushfire event should be located as far away from the boundary and vegetation as possible.

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FPA AUSTRALIA

Calculated August 12, 2025, 1:48 pm (BALc v.4.3)

Bushfire Attack Level calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Grassland Fire Danger Index	130	Rate of spread	16.9 km/h
Vegetation Classification	Grassland	Flame length	7.47 m
Understorey fuel load	4.5 t/ha	Flame angle	86 °
Total fuel load	4.5 t/ha	Panel height	7.45 m
Vegetation height	n/a	Elevation of receiver	3.72 m
Effective slope	0 °	Fire intensity	39,292 kW/m
Site slope	0 °	Transmissivity	0.718
Distance to vegetation	107 m	Viewfactor	0.0182
Flame width	100 m	Radiant heat flux	0.99 kW/m²
Windspeed	n/a	Bushfire Attack Level	BAL-12.5
Heat of combustion	18,600 kJ/kg		
Flame temperature	1,090 K		

Rate of Spread - Noble et al. 1980
Flame length - Purton, 1982
Elevation of receiver - Douglas & Tan, 2005
Flame angle - Douglas & Tan, 2005
Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Figure 12 - <1kW/m² Assessment Calculator Output (Grassland)

FLAMESOL
FPA AUSTRALIA

Calculated August 12, 2025, 1:50 pm (BALc v.4.3)

Bushfire Attack Level calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Fire Danger Index	100	Rate of spread	1.79 km/h
Vegetation Classification	Woodland	Flame length	14.7 m
Understorey fuel load	15 t/ha	Flame angle	85 °
Total fuel load	25 t/ha	Panel height	14.64 m
Vegetation height	n/a	Elevation of receiver	7.32 m
Effective slope	0 °	Fire intensity	23,249 kW/m
Site slope	0 °	Transmissivity	0.6889999999999999
Distance to vegetation	152 m	Viewfactor	0.0189
Flame width	100 m	Radiant heat flux	0.99 kW/m²
Windspeed	n/a	Bushfire Attack Level	BAL-12.5
Heat of combustion	18,600 kJ/kg		
Flame temperature	1,090 K		

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980
Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980
Elevation of receiver - Douglas & Tan, 2005
Flame angle - Douglas & Tan, 2005
Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Figure 13 - <1kW/m² Assessment Calculator Output (Woodland)

Figure 14 - <1kW/m² areas

Recommendations

The following is recommended for the site:

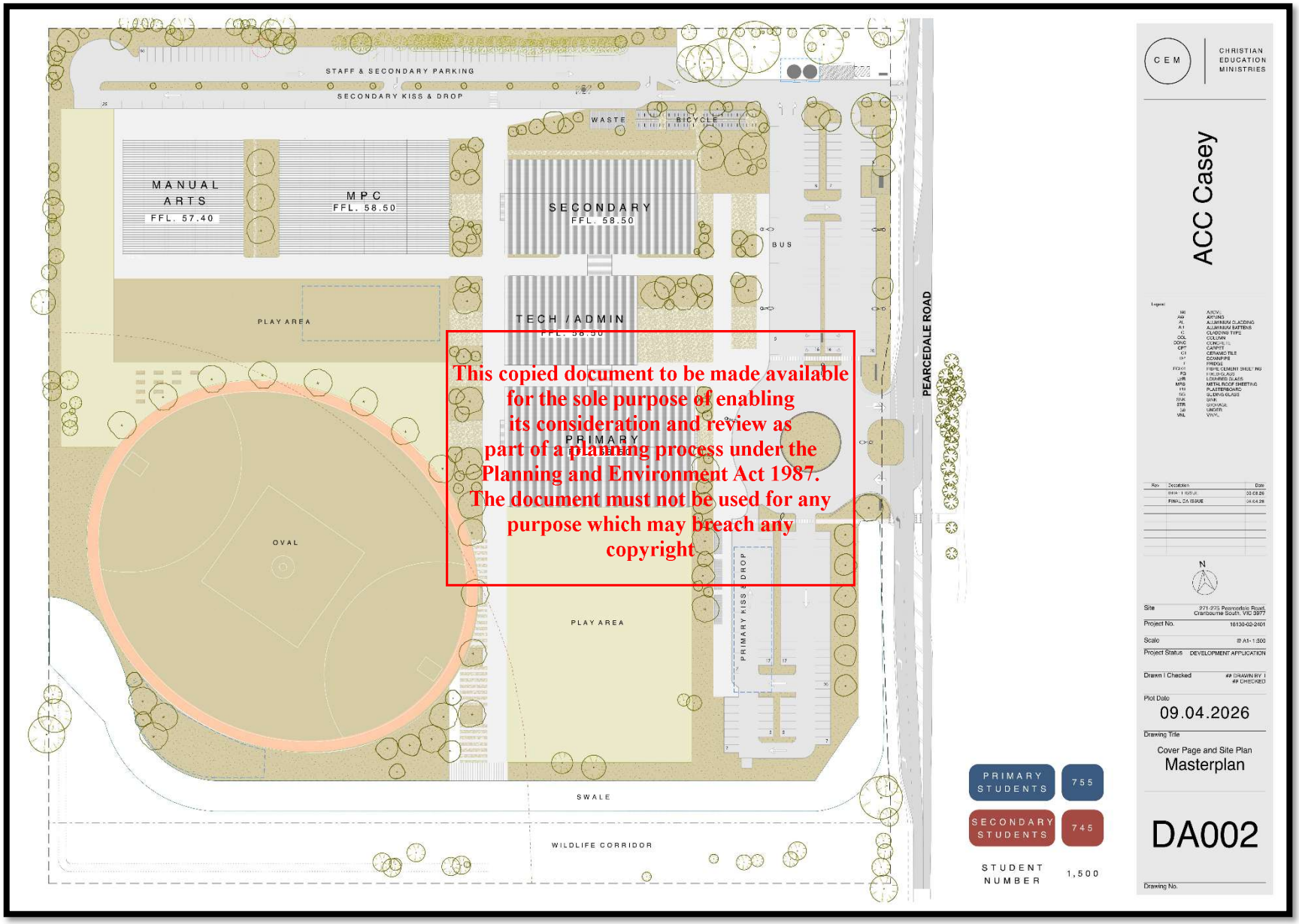
- Manage on site vegetation to reduce bushfire fuel loads to the extent practicable, including maintenance of grass at low height and management of fine fuel accumulation during the fire danger period and ahead of forecast high risk days.
- Design and implement landscaping and revegetation in line with CFA Landscaping for Bushfire guideline to avoid, where practicable, the establishment of unmanaged shrubs or continuous fuel structures within or immediately surrounding the developed footprint.
- Develop, implement, and maintain a Bushfire Emergency Plan addressing staff roles, decision triggers, communication procedures, and site closure on catastrophic fire danger days, supported by coordination with relevant emergency management agencies.

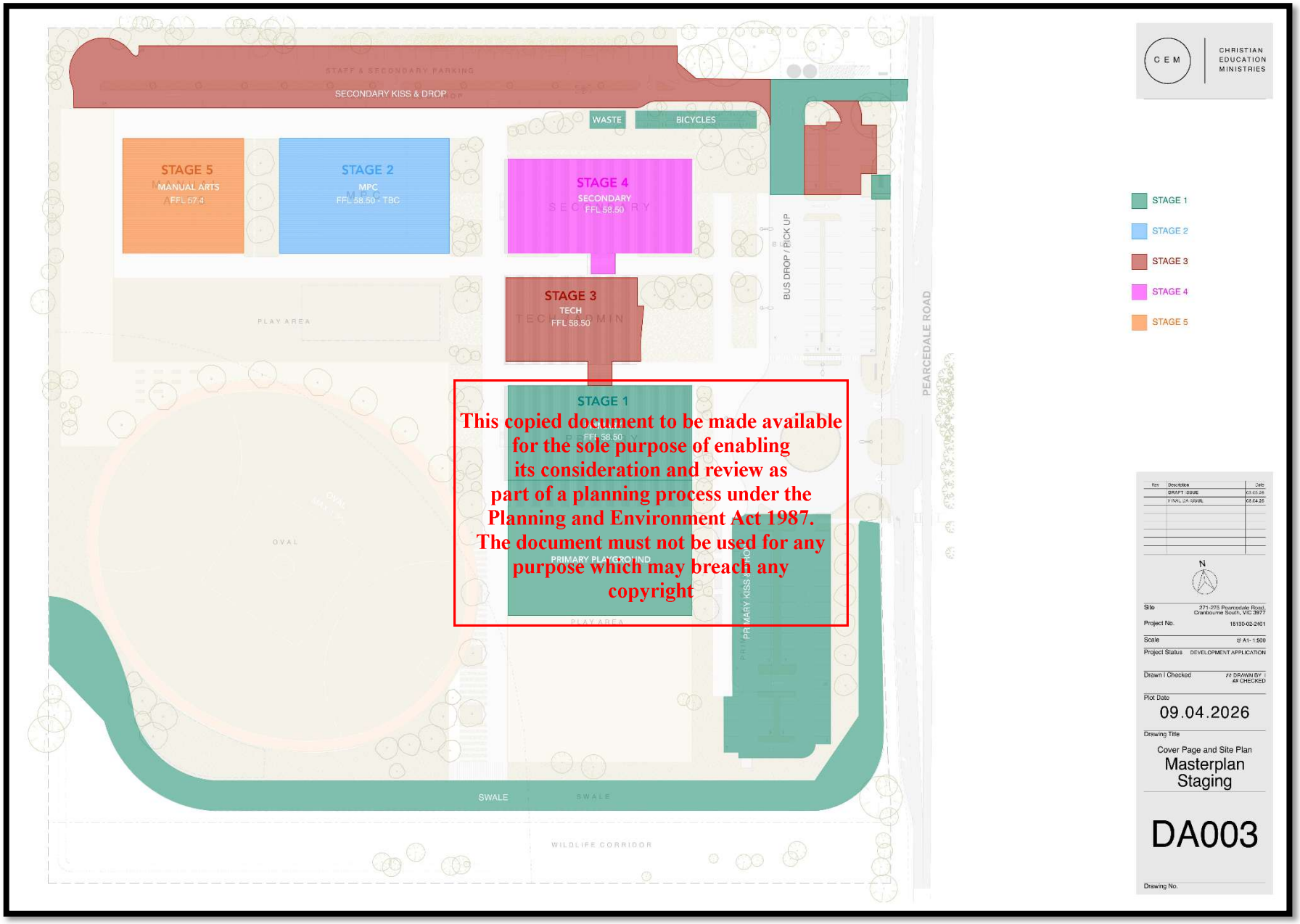
Conclusion

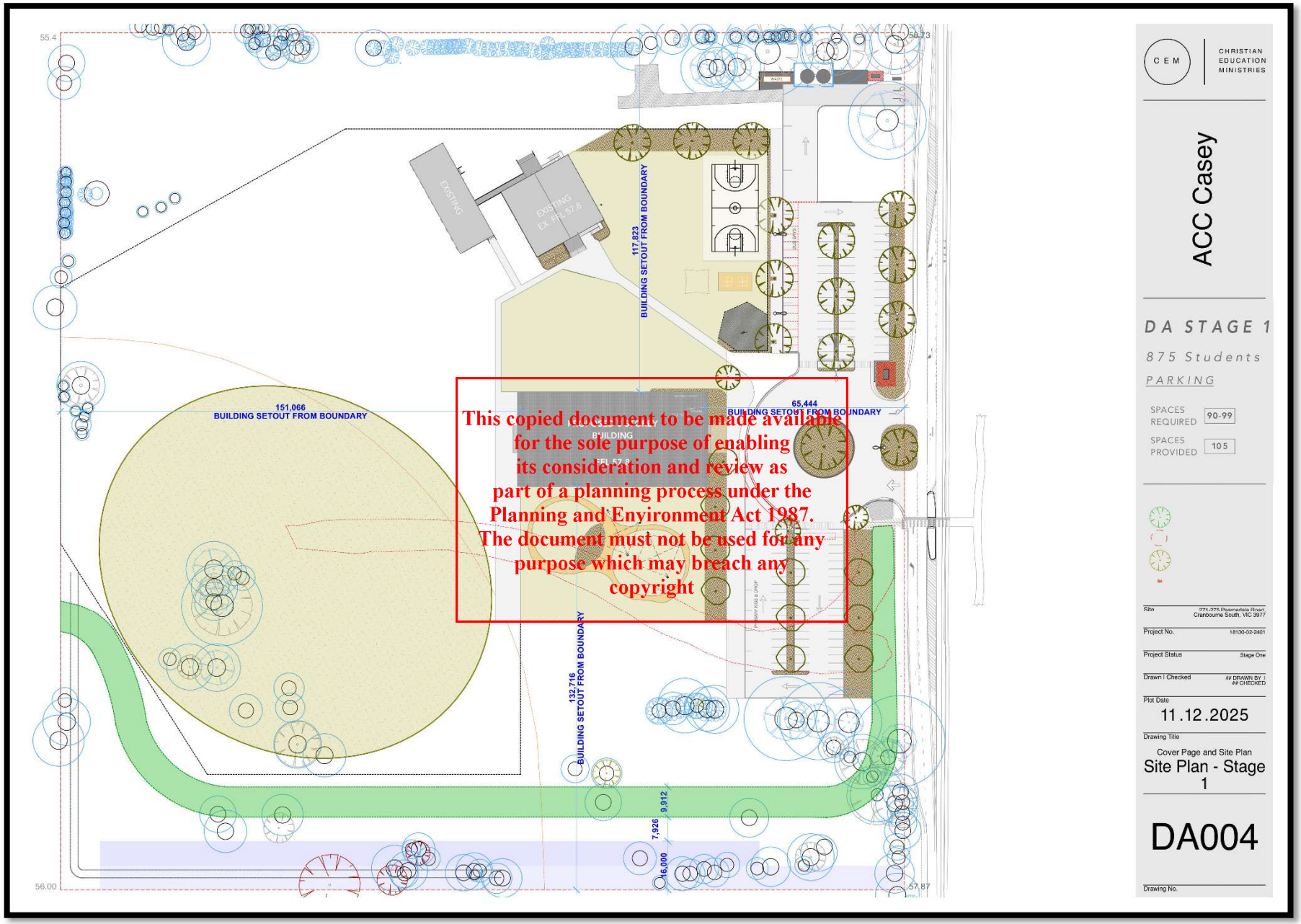
The bushfire risk assessment confirms that the proposed development site at 271-275 Pearcedale Road is generally low risk due to its fragmented surrounding landscape and managed vegetation. However, the site is located within the BPA, triggering the need to consider Clause 13.02 and Specification 43 of the National Construction Code.

Recommendations have been made that avoid additional building costs and assist with achieving specification 43 of the National Construction Code.

Appendix 1 – Site Plans






55.4
56.73
EXISTING
EXISTING
EX FFL 57.8
117,823
BUILDING SETOUT FROM BOUNDARY
151,066
BUILDING SETOUT FROM BOUNDARY
65,444
BUILDING SETOUT FROM BOUNDARY
BUILDING
FFL 57.8
132,716
BUILDING SETOUT FROM BOUNDARY
7,926
9,912
16,000
56.00
57.87
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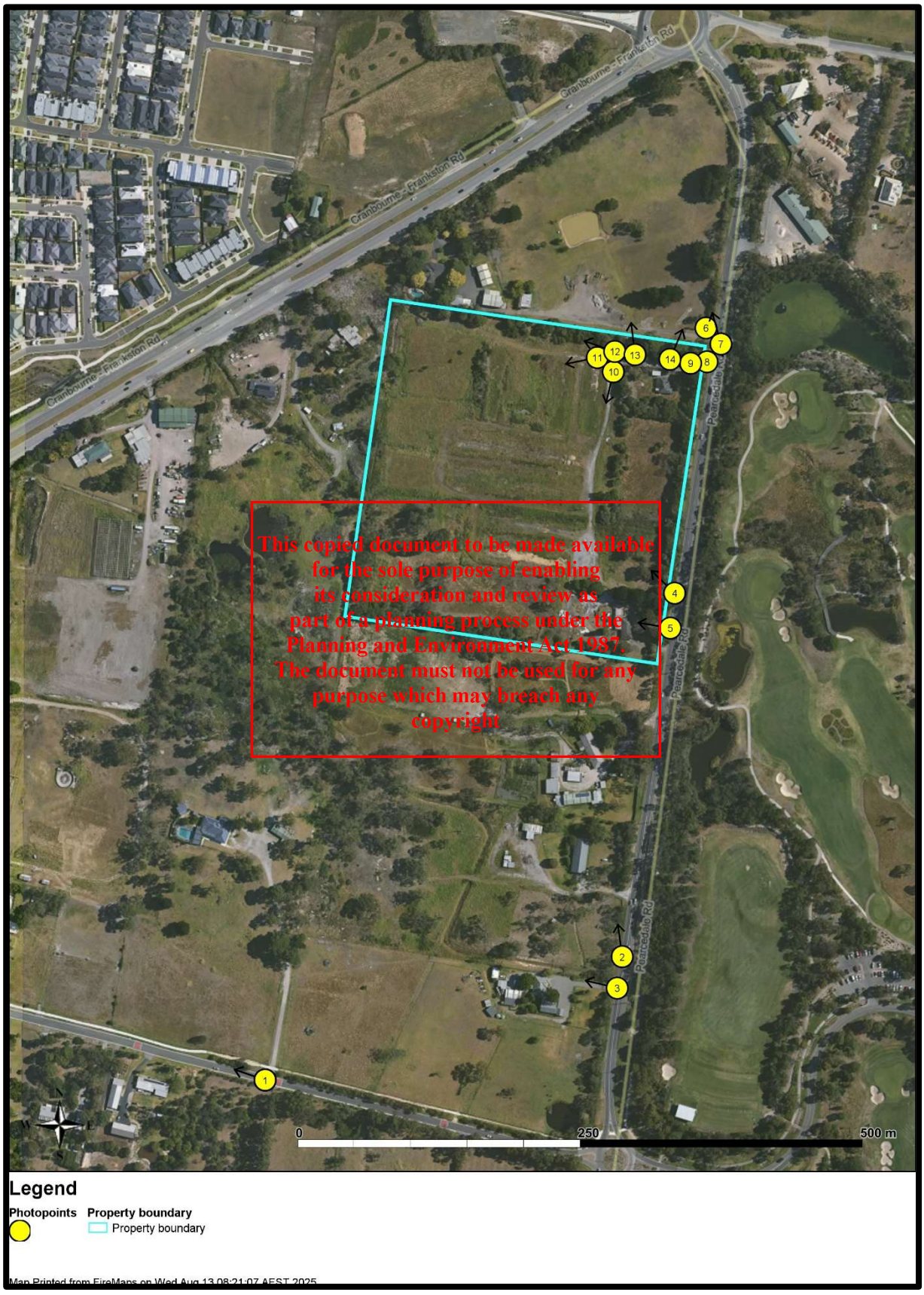
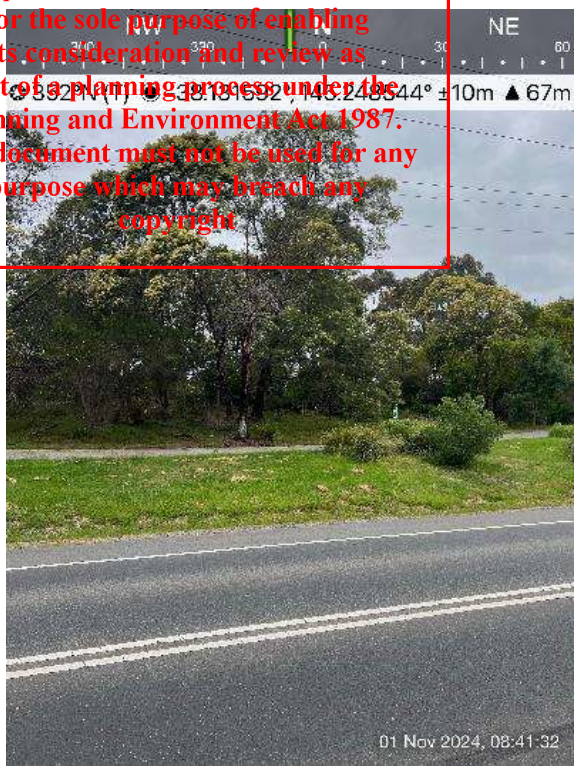
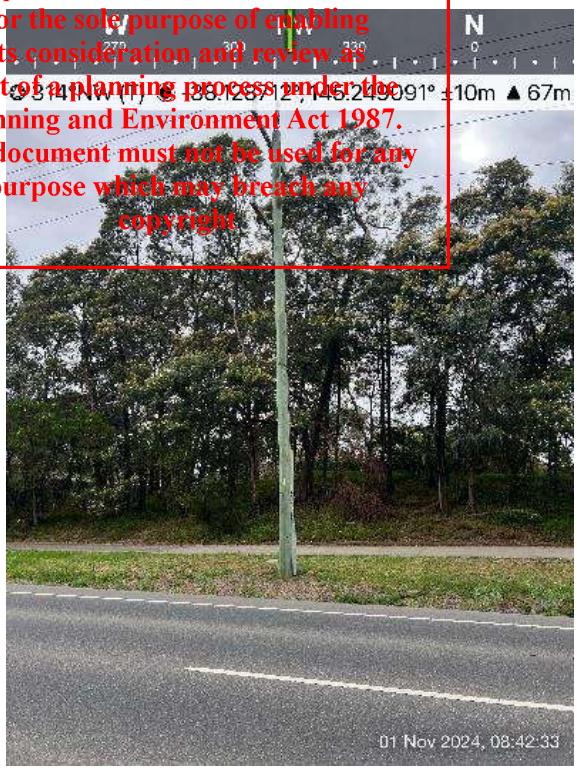
CEM
CHRISTIAN EDUCATION MINISTRIES
ACC Casey
DA STAGE 1
875 Students
PARKING
SPACES REQUIRED
90-99
SPACES PROVIDED
105
Site
271-275 Pearcedale Road, Cranbourne South, VIC 3977
Project No.
18130-02-2401
Project Status
Stage One
Drawn | Checked
DRAWN BY | ## CHECKED
Plot Date
11.12.2025
Drawing Title
Cover Page and Site Plan
Site Plan - Stage 1
DA004
Drawing No.

Appendix 2 – Photos

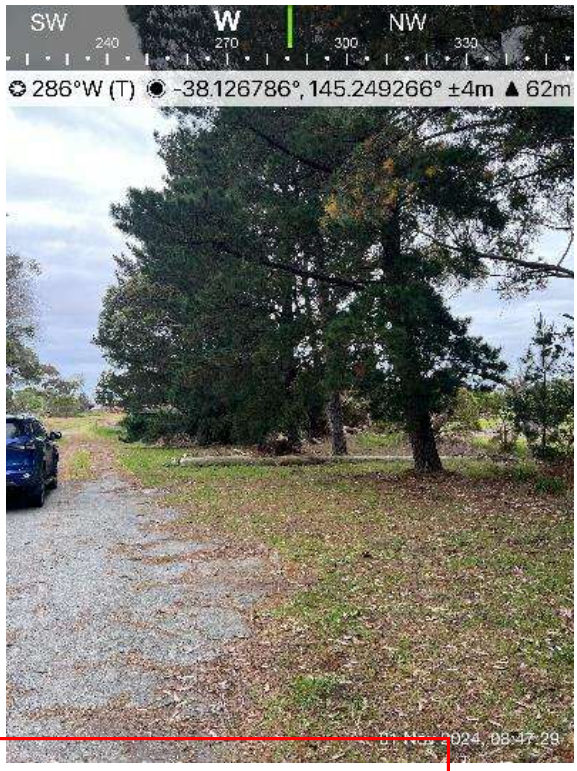


1. View looking north from Chevron Ave at the property to the south of the development. Note: it is acknowledged that the GPS direction on the photo is incorrect.	
2. Looking northwest at the vegetation along Pearcedale Road to the south of the development.	

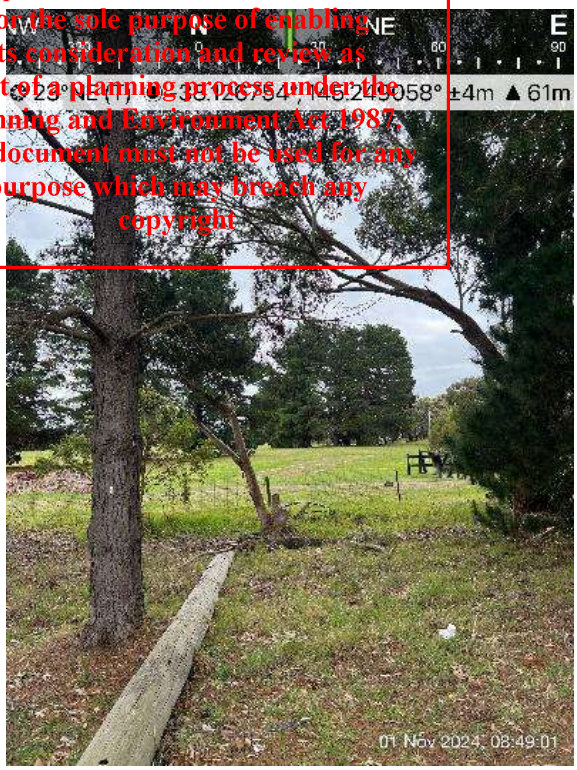
3. View looking west from Pearcedale Road at the vegetation along the roadside.	
4. Looking west at the vegetation adjacent to Pearcedale Road on the south side of the site.	

5. Looking west at the Pearcedale Road vegetation at the south side of the site.	
6. View of property to the north side of the entrance.	

7. Roadside vegetation to the west of the site.	
8. Looking west at the northern site entrance.	

9. Vegetation along the northern site entrance.	
10. Looking south at the site from the north side of the site.	

11. Looking west at the site from the north side of the site.	
12. Looking west along the northern site boundary.	

13. Looking north at the northern managed property.	
14. Looking north at the northern managed property.	

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