REF: 4257BF

MAY 7, 2021

BUSHFIRE HAZARD ASSESSMENT

PROPOSED 2 LOT SUBDIVISION

1226 MAMRE ROAD, MOUNT VERNON, NSW

LGA: Penrith

Lot 45 DP 30266

[redacted]

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BUSHFIRE HAZARD ASSESSMENT

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GRAD DIP ENVIRO MANG HERTS, UK,
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VERSION CONTROL

Title	Bushfire Hazard Assessment			
Site address	1226 Mamre Road, Mount Vernon, NSW			
Prepared By	Samantha Orum, B.Env.Sc. (Land Resources and Management) (Honours)			
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DISCLAIMER

The recommendations provided in the summary of this report are a result of the analysis of the proposal in relation to the requirements of Planning for Bushfire Protection 2019. Utmost care has been taken in the preparation of this report however there is no guarantee of human error. The intention of this report is to address the submission requirements for Development Applications on bushfire prone land. There is no implied assurance or guarantee the summary conditions will be accepted in the final consent and there is no way Harris Environmental Consulting is liable for any financial losses incurred should the recommendations in this report not be accepted in the final conditions of consent. This bushfire assessment provides a risk assessment of the bushfire hazard as outlined in the PBP 2019 and AS3959 2018. It does not provide protection against any damages or losses resulting from a bushfire event.

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EXECUTIVE SUMMARY

This report provides a Bushfire Hazard Assessment for a proposed 2 Lot Subdivision at 1226 Mamre Road, Mount Vernon, NSW.

The assessment confirms the subject lot is in land identified as bushfire prone.

This assessment identifies the bushfire prone vegetation within 140m of the proposed subdivision as Grassland located 52 m away on eastern elevation and Grassland located 89 m away on the southern elevation.

The proposed subdivision Lot 2 can meet **BAL LOW** as specified by AS3959 -2018 Construction for Buildings in Bushfire Prone Areas.

An APZ should be established from the commencement of building works and maintained for perpetuity for each entire lot.

The subject lot is located on Mamre Road. This is a two-wheel drive, all weather road. The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles.

The proposed internal access is required to be upgraded to comply with the PBP- Property Access Table 7.4a. This includes:

- A minimum carriageway width of four metres;
- provide enough turning room for a fire tanker that requires an inner minimum turning radius of 6 m and outer minimum radius of 12 m;
- Curves a minimum inner radius of six metres;
- The minimum distance between inner and outer curves is six metres;
- The cross fall is not more than 10 degrees;
- Maximum grades for sealed roads do not exceed 15 degrees (28 per cent) and not more than 10 degrees (18 percent) for unsealed roads;
- The internal road surfaces and bridges have a capacity to carry fully loaded firefighting vehicles (23 tonnes) and provide signage that clearly indicates the bridge capacity; and
- There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.

Any bottled gas will be installed and maintained in accordance with AS1596 and the requirements of the relevant authority. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and away from any combustible material. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

Electrical transmission lines, if above ground, will be managed in accordance with specifications issued by Energy Australia.

1. PROPOSAL

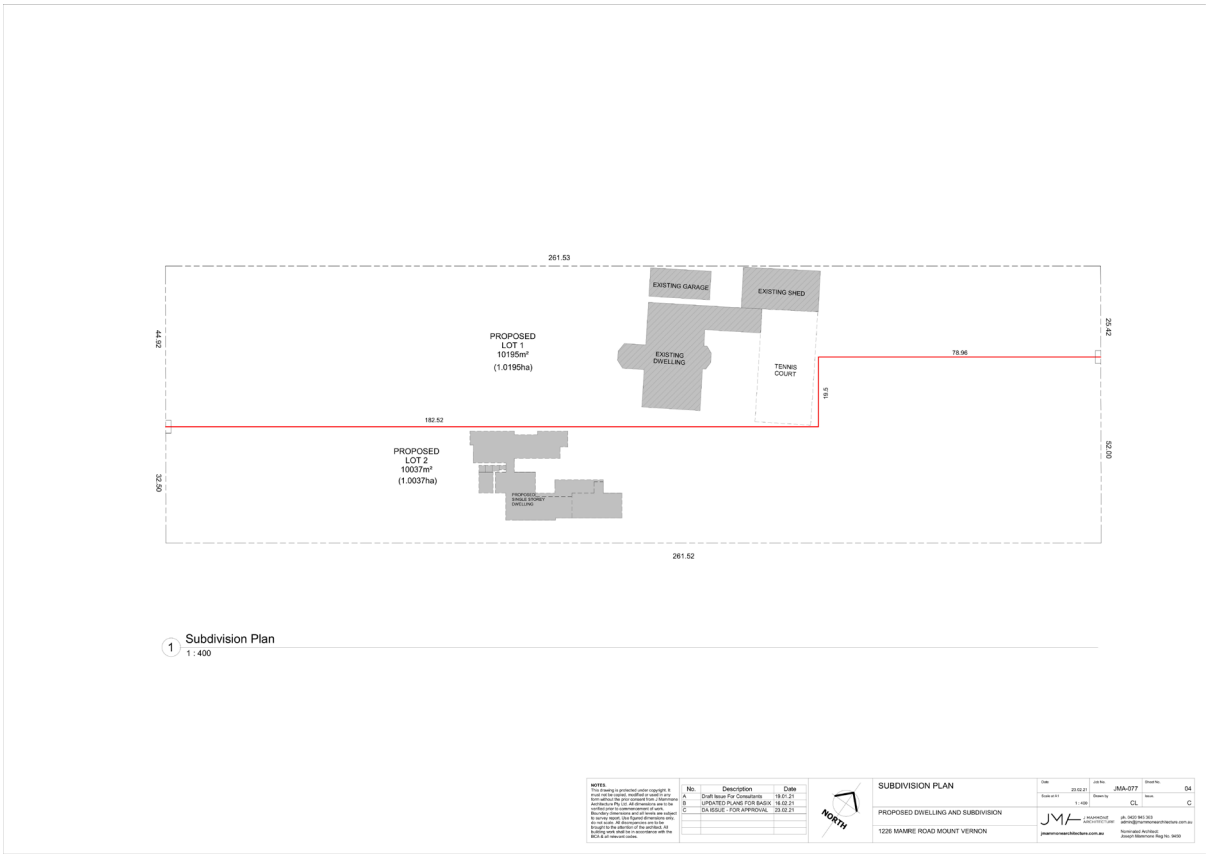
The owners of 1226 Mamre Road, Mount Vernon, NSW, propose a 2 Lot Subdivision on Lot 1 DP 207264. The subdivision will result in the following layout;

- Lot 1: The exisiting Building Envelope will remain the same;
- Lot 2: The Proposed Building Development is as shown in Figure 1;

Harris Environmental Consulting was commissioned to provide this bushfire assessment.

Figure 1 shows the proposed subdivision plan.

FIGURE 1 PROPOSED SUBDIVISION PLAN



2. ASSESSMENT REQUIREMENTS

2.1 Regulation

As this proposal involves a subdivision it requires Integrated DA approval. This involves obtaining a Bushfire Safety Authority (BFSA) from the NSW Rural Fire Services (RFS).

Integrated development applications under section 100B of the *Rural Fires Act* (RF Act) and section 91 of the *EP&A Act* require the following detailed information:

- Description of property;
- Classification of vegetation out to 140 m from the development;
- An assessment of the effective slope to a distance of 100 m;
- Identification of any significant environmental features;
- Details of threatened species, populations, endangered communities and critical habitat known to the applicant;
- Details of Aboriginal heritage known to the applicant; and
- A bushfire assessment that complies with the relevant requirements of the PBP (2019) and AS 3959:2018.

These relevant specific objectives for subdivision in Chapter 5 of the PBP (2019) include:

- Minimise perimeters of the subdivision exposed to the bush fire hazard;
- Minimise bushland corridors that permit the passage of bush fire;
- Provide for the siting of future dwellings away from ridge tops and steep slopes;
- Ensure that separation distances (APZ) between a bush fire hazard and future dwellings enable conformity with deemed to satisfy requirements of the BCA;
- Ensure the ongoing maintenance of asset protection zones;
- Provide clear and ready access from all properties to the public road for residents and emergency services; and
- Ensure the provision of adequate supply of water and other services to facilitate effective firefighting.

2.2 Emergency Management

In the event of emergency, the residents are advised to become familiar with the RFS Bush Fire Alert Levels and develop a Bush Fire Survival Plan to ensure they know what to do in the event of a bush fire.

2.3 Landscape and Vegetation Management

To incorporate bushfire protection measures into future development, the owner is advised to consider the following:

- Maintain a clear area of low cut lawn or pavement adjacent to the house;
- Ensure any pastures within APZ are regularly slashed;
- Avoid planting trees species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopy;
- Avoid planting deciduous species that may increase fuel at surface/ground level by the fall of leaves;
- Avoid climbing species to walls and pergolas;
- Locate combustible materials such as woodchips/mulch, flammable fuel stores (LPG gas bottles) away from the building;
- Locate combustible structures such as garden sheds, pergolas and materials such as timber furniture away from the building;
- Ensure any vegetation planted around the house is a suitable distance away so these plants do not come into physical contact with the house as they mature; and
- Incorporate suitable impervious area surrounding the house, including courtyards, paths and driveways.

2.4 Construction Standards

The Australian Standard AS3959; 2018 is the enabling standard that addresses the performance requirements of both parts 2.3.4 and Part GF5.1 of the Building Code of Australia for the construction of the Class 1, 2 and Class 3 buildings within a designated Bushfire Prone Area.

The following was determined for this site:

Relevant fire danger index……FDI 100
Flame temperature ……1090 K

The Building Code of Australia (BCA) is a performance based code which contains performance requirements and deemed to satisfy provisions relating to the construction of buildings in bushfire prone areas. These provisions include Class 1, 2, 3 & 4 buildings that are proposed for construction in designated bushfire prone areas. All class 10b (e.g. sheds) should be located >10 metres away from the dwelling, or be constructed to the relevant BAL.

3. SITE LOCATION

The following Figure 2 shows the subject lot location. Figure 3 provides a broad scale aerial view of the subject site. Figure 4 shows a close-up view of the subject lot.

FIGURE 2 LOCATION OF SUBJECT LOT

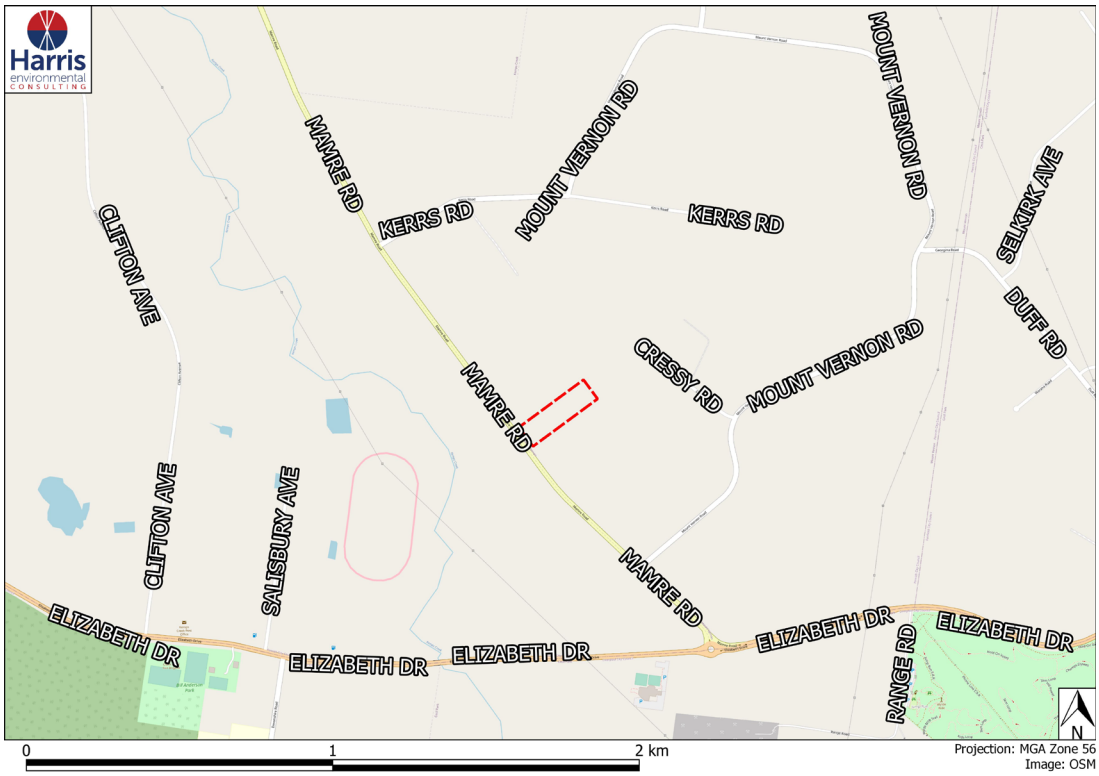
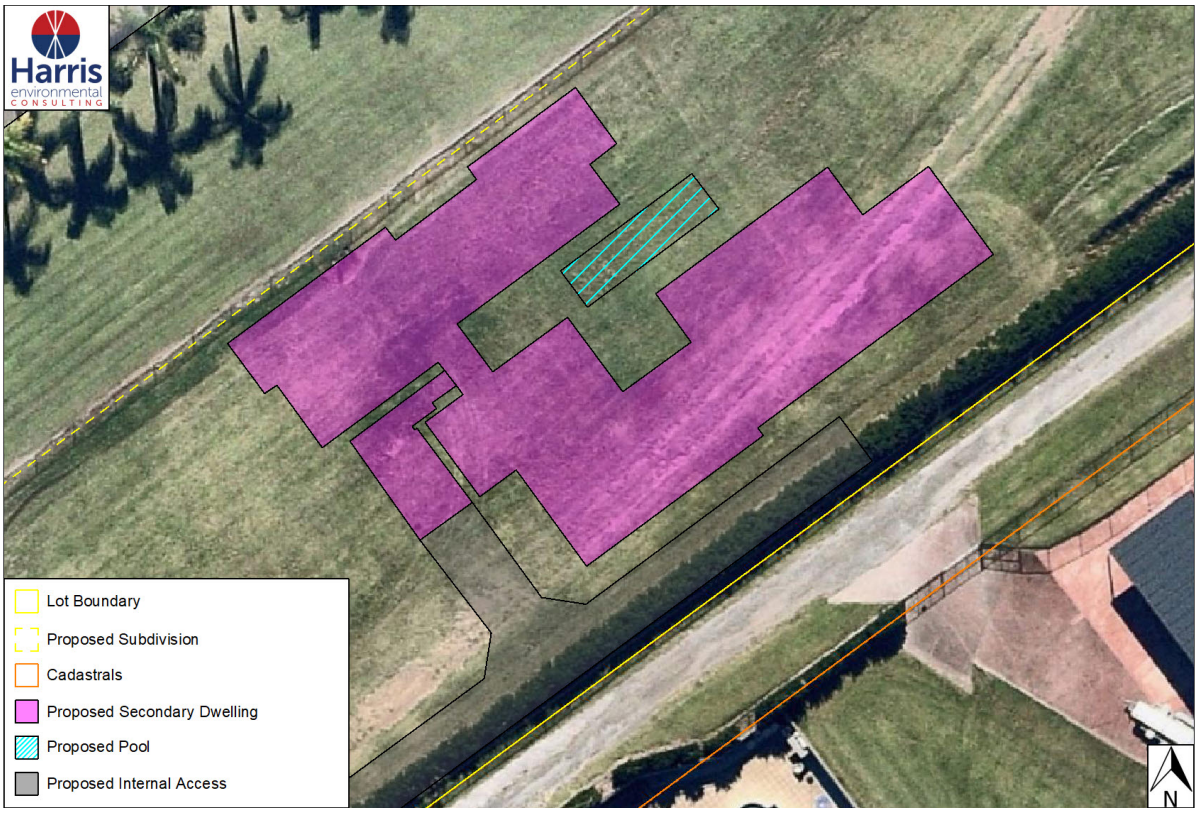


FIGURE 3 EXTENDED AERIAL VIEW OF THE SUBJECT LOT

FIGURE 4 CLOSE-UP AERIAL



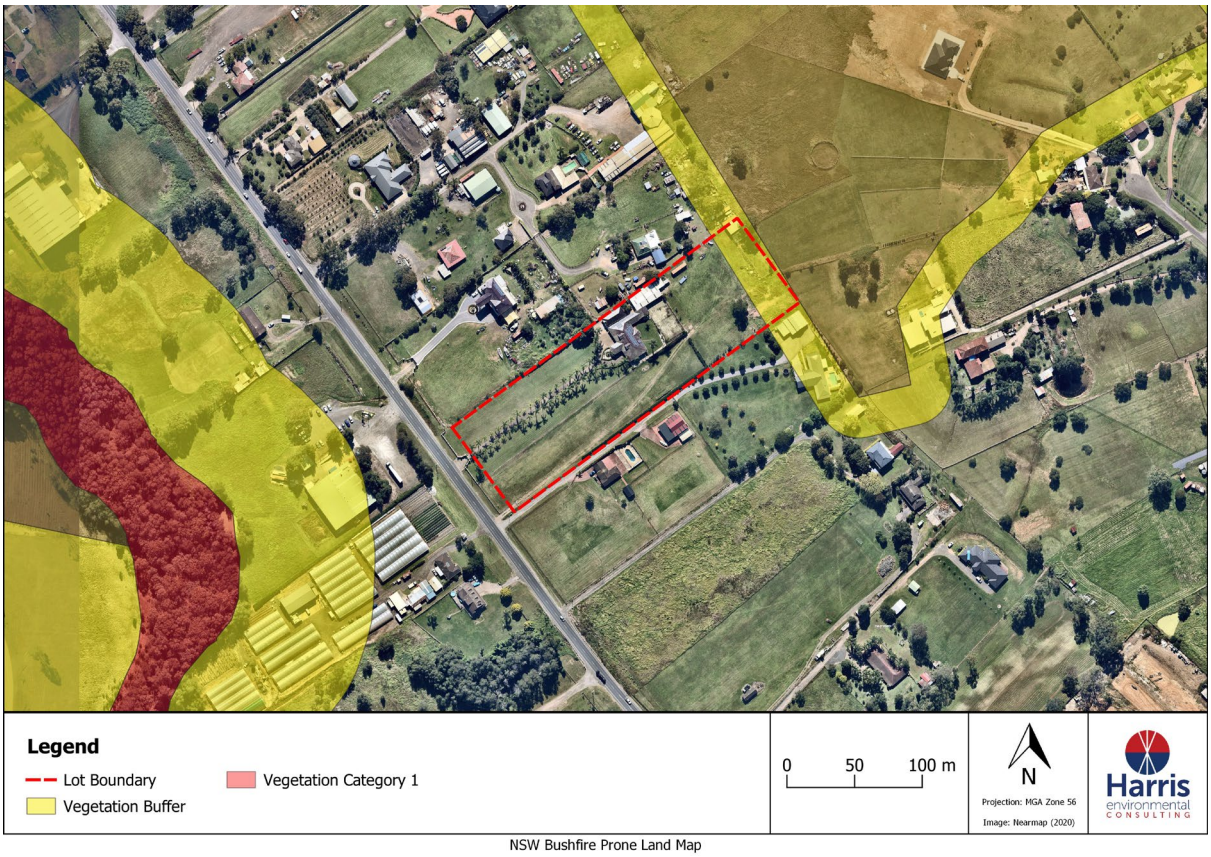
4. PLANNING LAYERS

The following planning layers are described in Table 1 and shown in the Figures below:

TABLE 1 PLANNING LAYERS

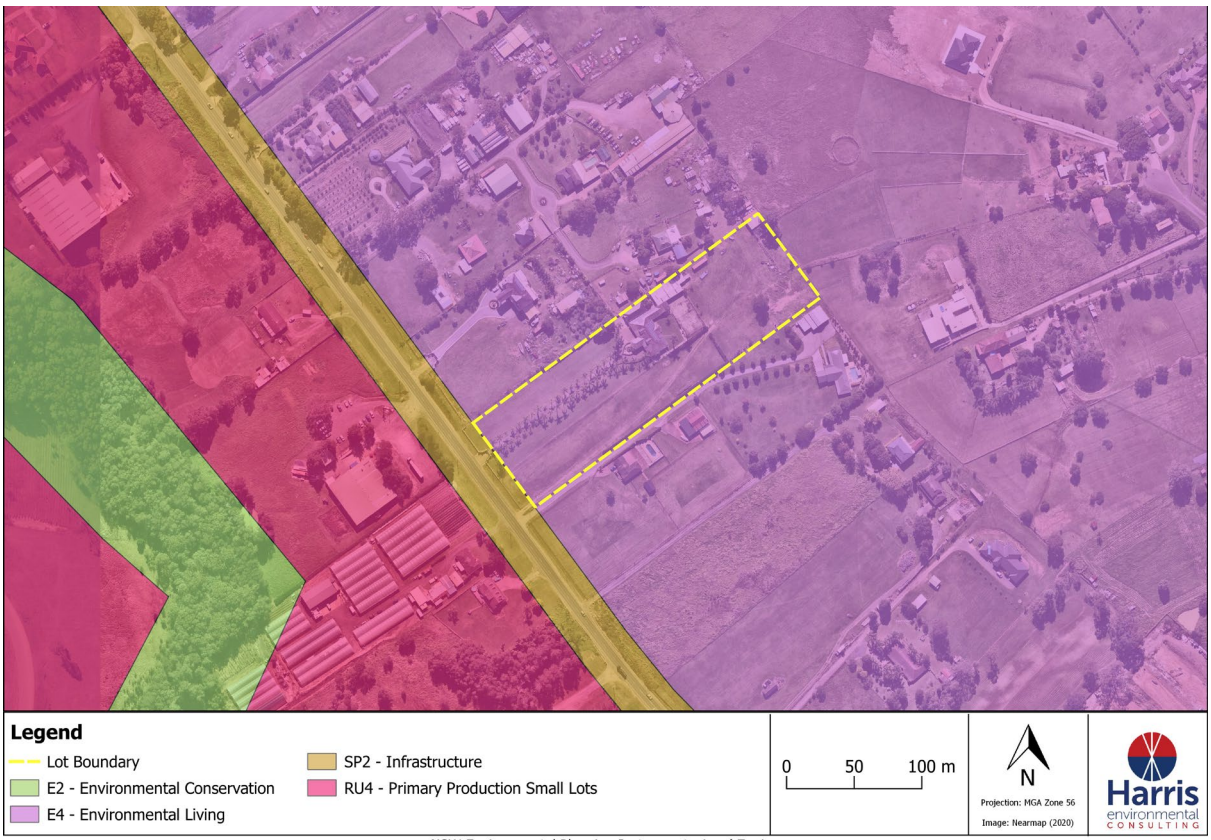
MAP	FIGURE	DESCRIPTION
Bushfire Prone Land Map	5	The subject lot is mapped 'Vegetation Buffer'.
LEP Zone Map	6	The subject lot is zoned as 'E4 Environmental Living' zoning.
Vegetation Mapping	7	The vegetation surrounding the subject lot has been mapped as Coastal Valley Grassy Woodlands.

FIGURE 5 BUSHFIRE PRONE MAP



NSW Bushfire Prone Land Map

FIGURE 6 LEP ZONE MAP



NSW Environmental Planning Instrument - Land Zoning

FIGURE 7 VEGETATION MAPPING

CumberlandPlainWest_2013_E_4207

5. SITE DESCRIPTION

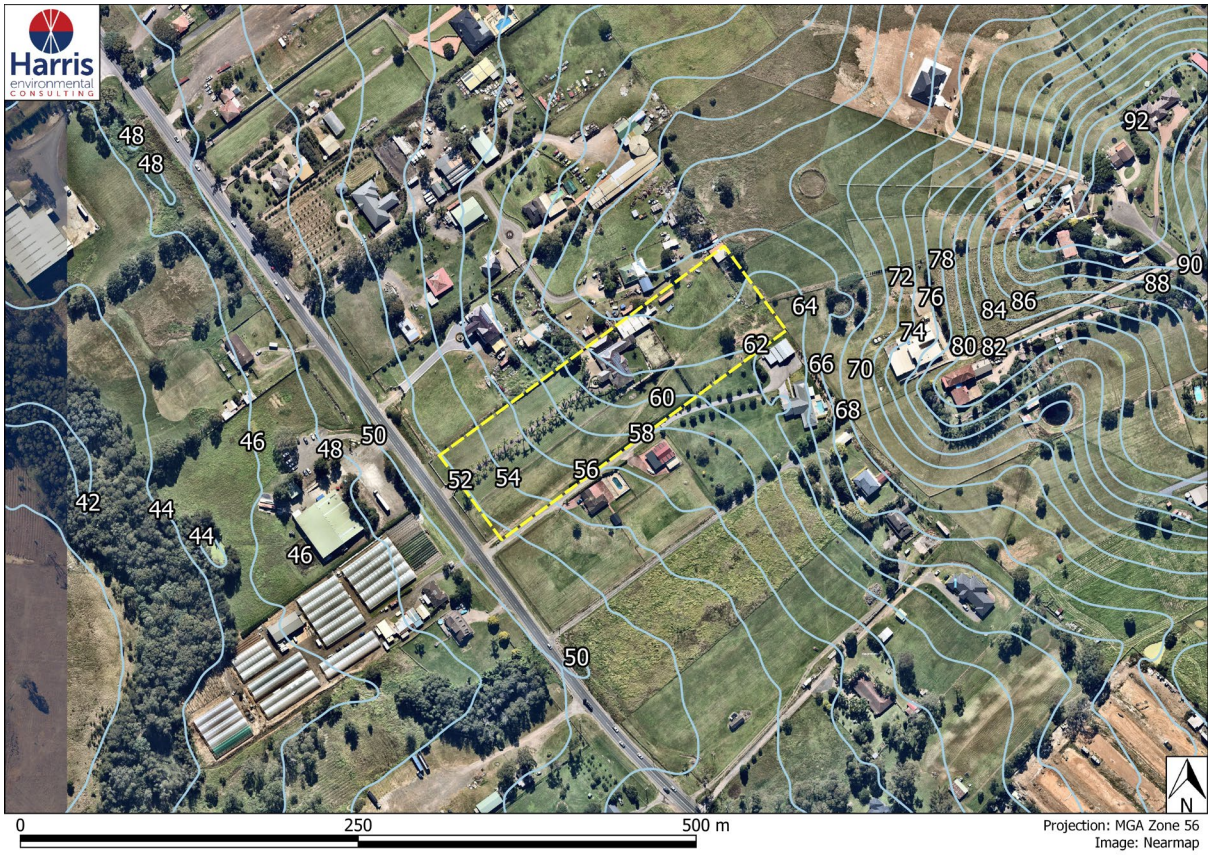
5.1. Slope and aspect of the site within 100 m

The slope that would most significantly influence fire behaviour was determined over a distance of 100m out from the proposed residence. This assessment was made using 1 m contour intervals and field inspection.

The Australian Standard AS3959:2018 identifies that the slope of the land under the classified vegetation is much more important than the slope between the site and the edge of the classified vegetation.

As can be seen in Figure 8 the subject site is located on topography that exhibits a gentle upslope towards the eastern elevations.

FIGURE 8 SLOPE



5.2. Identification of significant environmental features

The owner has not provided any studies of environmental significance.

5.3. Vegetation formation within 140 m of proposed development

Figure 9 shows the managed and unmanaged land within 140 m of the proposed subdivision.

The vegetation formations are described below and summarised in Table 2.

The vegetation on the east and south elevations has been classified as Grasslands.

TABLE 2 PREDOMINATE VEGETATION CLASSIFICATION ON LOT 2

	Vegetation Formation	Effective Slope	Distance from façade to hazard
North	Manged	-	-
East	Grasslands	Upslope	52 m
South	Grasslands	Upslope	89 m
West	Manged	-	-

FIGURE 9 BUSHFIRE PRONE VEGETATION WITHIN 140 M OF PROPOSED SUBDIVISION

6. BUSHFIRE THREAT ASSESSMENT

6.1. Asset Protection Zones (APZ)

Table A1.12.2 *PBP 2019* has been used to determine the width of the required APZ for the proposed development using the vegetation and slope data identified. An FDI of 100 was used for this location.

On the eastern elevations Table A1.12.5 *PBP 2019* has been used to assess the required BAL determination results shown in Table 3 and Table 4.

An APZ should be established from the commencement of building works and maintained for perpetuity for each entire lot.

The BAL was determined for each lot on the subdivision.

TABLE 3 APZ AND BAL DETEMINATION FOR LOT 2 USING PBP 2019

	North	East	South	West
Vegetation	Managed	Grasslands	Grasslands	Managed
Gradient	-	Upslope	Upslope	-
Between façade and vegetation	-	52 m	89 m	-
BAL LOW required APZ	-	> 50 m	> 50 m	-

6.2. Relevant Construction Standard

The Australian Standard AS3959:2018 is the enabling standard that addresses the performance requirements of both parts 2.3.4 and Part GF5.1 of the Building Code of Australia for the construction of the Class 1, 2 and Class 3 buildings within a designated Bushfire Prone Area.

The following was determined for this site:

Relevant fire danger index……FDI 100
Flame temperature ……1090 K

The proposed Lot 2 can achieve **BAL LOW**

6.3. Safe Operational Access

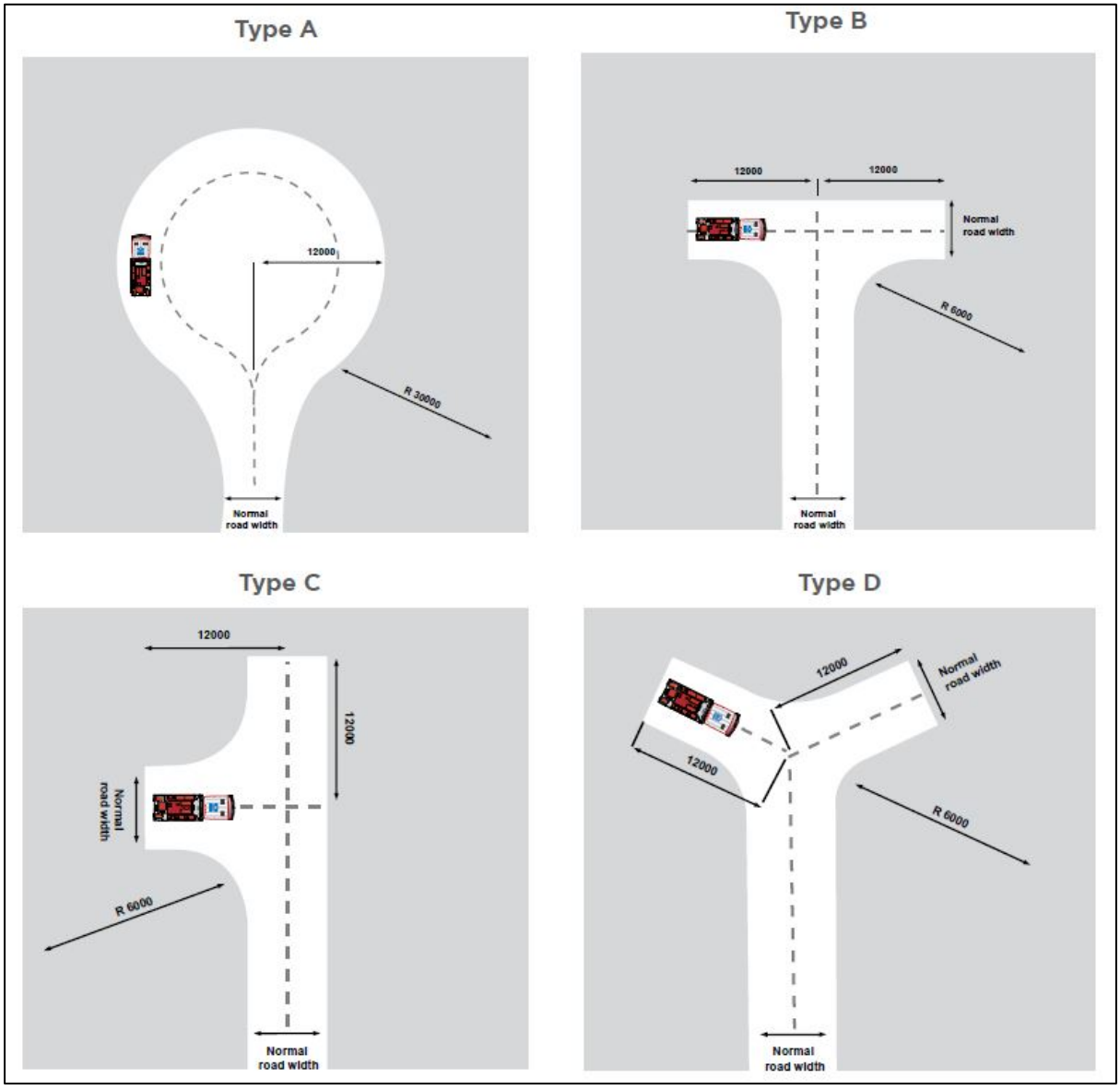
The PBP (2019) requires the provision of safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.

The subject lot is located on Mamre Road. This is a two-wheel drive, all weather road. The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles.

The proposed internal access is required to be upgraded to comply with the PBP- Property Access Table 7.4a. This includes:

- A minimum carriageway width of four metres;
- provide enough turning room for a fire tanker that requires an inner minimum turning radius of 6 m and outer minimum radius of 12 m;
- Curves a minimum inner radius of six metres;
- The minimum distance between inner and outer curves is six metres;
- The cross fall is not more than 10 degrees;
- Maximum grades for sealed roads do not exceed 15 degrees (28 per cent) and not more than 10 degrees (18 percent) for unsealed roads;
- The internal road surfaces and bridges have a capacity to carry fully loaded firefighting vehicles (23 tonnes) and provide signage that clearly indicates the bridge capacity; and
- There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.

FIGURE 10 MULTIPOINT TURNING OPTIONS



6.4. Emergency Management

The owners are advised to obtain the *NSW Rural Fire Service – "Guidelines for the Preparation of Bush Fire Evacuation Plans"* & *'Bush Fire Survival Plan'* In the event of emergency, the owners should ensure they are familiar with the RFS Bush Fire Alert Levels and use their Bush Fire Survival Plan.

6.5. Adequate Water and Utility Services

Reticulated water is supplied to the subdivision. A hydrant is located on Larmer Avenue.

Any bottled gas will be installed and maintained in accordance with AS1596 and the requirements of the relevant authority. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and away from any combustible material. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

Electrical transmission lines, if above ground, will be managed in accordance with specifications issued by Energy Australia.

7. LANDSCAPING

The APZ is required to be maintained for perpetuity.

When landscaping, vegetation should be located greater than 2 m from any part of the roofline of a dwelling or the shed. Garden beds of flammable shrubs are not to be located under trees and should be no closer than 10 m from an exposed window or door. Trees should have lower limbs removed up to a height of 2 m above the ground.

Appendix 4 (PBP) provides guidelines for landscaping and Bushfire Provisions within the APZ. To incorporate bushfire protection measures into future development, the owner is advised to consider the following:

- Avoid planting trees species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopy;
- Avoid planting deciduous species that may increase fuel at surface/ground level by the fall of leaves;
- Avoid climbing species to walls and pergolas;
- Locate combustible materials such as woodchips/mulch, flammable fuel stores (LPG gas bottles) away from the building;
- Locate combustible structures such as garden sheds, pergolas and materials such as timber furniture away from the building;
- Ensure any vegetation planted around the house is a suitable distance away so these plants do not come into physical contact with the house as they mature; and
- The property should be developed to incorporate suitable impervious area surrounding the house, including courtyards, paths and driveways.

8. SUMMARY

- The proposed subdivision Lot 2 can meet **BAL LOW** as specified by AS3959 -2018 Construction for Buildings in Bushfire Prone Areas.

- An APZ should be established from the commencement of building works and maintained for perpetuity for each entire lot;

- The subject lot is located on Mamre Road. This is a two-wheel drive, all weather road. The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles.

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- Any bottled gas will be installed and maintained in accordance with AS1596 and the requirements of the relevant authority. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and away from any combustible material. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

- Electrical transmission lines, if above ground, will be managed in accordance with specifications issued by Energy Australia.

9. REFERENCES

Geoscience Australia (2020). *ELVIS - Elevation - Foundation Spatial Data*. Elevation.fsdf.org.au. Available at: http://elevation.fsdf.org.au/

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

NSW Department of Planning and Environment (2020). Planning Portal. Accessed at: https://www.planningportal.nsw.gov.au/

NSW Office of Environment and Heritage (2020). Biodiversity Value Map. Accessed at: https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap

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

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

Tozer MG, Turner K, Keith DA, Tindall D, Pennay C, Simpson C, MacKenzie B, Beukers P, Cox S 2010. *Native Vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands*. Cunninghania 11:359-406.

APPENDIX I DEFINITION OF ASSET PROTECTION ZONES

Vegetation within the APZ should be managed in accordance with APZ specifications for the purposes of limiting the travel of a fire, reducing the likelihood of direct flame contact and removing additional hazards or ignition sources. The following outlines some general vegetation management principles for APZs:

1) Discontinuous shrub layer (clumps or islands of shrubs not rows);

2) Vertical separation between vegetation stratums;

3) Tree canopies not overhanging structures;

4) Management and trimming of trees and other vegetation in the vicinity of power lines and tower lines in accordance with the specifications in “Vegetation Safety Clearances” issued by Energy Australia (NS179, April 2002);

5) Maintain low ground covers by mowing / whipper snipper / slashing; and

6) Non-combustible mulch e.g. stones and removing stores of combustible materials;

7) Vegetation to be planted should consist of fire retardant/ less flammable species strategically located to reduce attack from embers (i.e. as ember traps when in small clumps and short wind breaks).