

Building Construction in Bush Fire Prone Areas

Bushfire Hazard Assessment Report

REF No. 21.11.381

Address Lot 165 DP 1039929
10-18 Fourth Road
Berkshire Park NSW 2765

For Urban City Planning for J Vukoeic

The site was inspected on 19th October 2021

Report Preparation

Craig Burley

Grad Dip Design for Bushfire Prone Areas
FPAA Certified BPAD – Level 3 Practitioner



Bushfire Risk Assessment Certificate

As required by legislation under section 4.14 of the *Environmental Planning and Assessment Act 1979*

Property Address:	Lot 165 DP 1039929 10-18 Fourth Road Berkshire Park NSW 2765
Description of Proposal	Retrospective Class 1a secondary dwelling
Bushfire Hazard Assessment Report Ref. No.	21..11.381
Report Date:	22.11.21
BAL Rating:	BAL Not applicable
Does the proposal comply with the requirements of <i>Planning for Bush Fire Protection 2019</i> ?	YES with incorporation of the recommendations included contained in the attached Bushfire Hazard Assessment Report
Does the proposal require referral to the NSW Rural Fire Service?	NO
Does the proposal rely on Alternate Solutions?	NO

I Craig Burley of Control Line Consulting have carried out a bushfire risk assessment on the above-mentioned proposal and property.

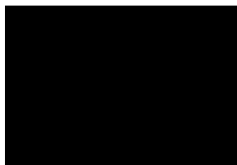
A detailed Bushfire Hazard Assessment Report has been prepared in accordance to the submission requirements as set out in *Planning for Bush Fire Protection 2019* together with recommendations as to how the relevant specifications and requirements are to be achieved.

I hereby certify, in accordance with section 4.14 of the *Environmental Planning and Assessment Act 1979*:

1. That I am a person recognised by the *NSW Rural Fire Service* as a qualified consultant in bushfire risk assessment; and
2. That subject to the recommendations contained in the attached Bushfire Hazard Assessment Report the proposed development conforms to the relevant specifications and requirements.

I am aware that the Bushfire Hazard Assessment Report, prepared for the above mentioned site is to be submitted in support of a development application for this site and will be relied upon by Penrith City Council as the basis for ensuring that the bushfire risk management aspects of the proposed development have been addressed in accordance with *Planning for Bushfire Protection 2019*.

Yours faithfully



Craig Burley
Grad Dip Design in Bushfire Prone Areas
FPA Australia BPAD – Level 3 Certified Practitioner



Executive Summary

We have been engaged by Urban City Planning for J Vukoeic, the owner of the subject land to prepare a bush fire hazard assessment report to be a supplement for inclusion in a development application to Penrith City Council, for the proposed retrospective consideration of an existing Class 1a secondary dwelling upon the subject land.

The site has been identified as being bushfire prone land and therefore the legislative requirements for the proposed development are applicable.

The proposed development is an infill development as defined within *Planning for Bush Fire Protection* 2019 and this report has been prepared in accordance with the requirements of *Section 4.14 of the Environmental Planning and Assessment Act 1979*.

As this development is also considered to be a dual occupancy development the assessment process has conducted the evaluation on the basis of satisfying the requirements of *Planning for Bush Fire Protection* 2019 for a subdivision. This is a methodology requirement of the NSW Rural Fire Service.

The assessment process has found that these requirements are satisfied within the context of the proposal and recommendations arising within this report.

Bushfire Attack Summary

Lot 165 DP 1039929

10-18 Fourth Road Berkshire Park NSW 2765

Northwest	
Vegetation Formation	Forest (Area A)
Vegetation Slope	Downslope > 0 to 5 degrees
Building Separation Distance metres	178
Separation Slope	Downslope > 0 to 5 degrees
Fire Danger Index	100
AS 3959 Construction Standard	BAL Not applicable

The proposal and the recommendations contained within this report can provide for conformity to *Planning for Bush Fire Protection* 2019 and therefore will assist in providing a reasonable level of bushfire protection and improve but not guarantee the chances of building survival, or provision for the occupants with a safe refuge during the passage of a bushfire front and or the provision of a defensible space for fire fighters.

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Document Control

Revision No.	Author	Status	Date
01	Craig Burley	Final	22.11.2021

1.0 Introduction

We have been engaged by Urban City Planning for J Vukoeic, the owner of the subject land to prepare a bush fire hazard assessment report to be a supplement for inclusion in a development application to Penrith City Council, for the proposed retrospective consideration of an existing Class 1a secondary dwelling upon the subject land.

The site has been identified as being bushfire prone land and therefore the legislative requirements for the proposed development are applicable.

The proposed development is an infill development as defined within *Planning for Bush Fire Protection* 2019 and this report has been prepared in accordance with the requirements of *Section 4.14 of the Environmental Planning and Assessment Act 1979*.

1.1 Purpose of Report

- To determine the vegetation type, the expected fire behaviour and the threat to the proposal; and
- To assess the proposal with reference to *Planning for Bush Fire Protection* 2019; and
- To assess the proposed construction with reference to the National Construction Code of Australia Volume 2; and
- To determine the level of construction with reference to AS 3959-2018 *Construction of buildings in bushfire prone areas*; and
- To identify any other such measures as to improve the chances of building survival during a bushfire event; and
- To assist the consent authority Penrith City Council in the determination of the development application subject to this proposal.

1.2 Scope of Report

The scope of this report is limited to the Bushfire Hazard Assessment for the proposed development and only contains recommendations for the subject property. Where reference is made to adjacent or adjoining lands, this report does not purport to assess those lands; rather it may discuss bushfire progression on and through those lands with the possible bushfire impact to the subject property and the proposed development.

1.3 Regulatory Controls

The preparation of this report has given consideration to the various legislative and regulatory requirements including the *Environmental Planning and Assessment Act 1979*, the National Construction Code of Australia, *Planning for Bush Fire Protection* 2019 and AS 3959-2018 *Construction of buildings in bushfire prone areas*.

1.4 Methodology

A site inspection for the purpose of assessing bushfire related matters affecting this site was conducted on the 19th October 2021.

An assessment of slope was conducted out to a distance of 100 metres and assessment of vegetation to a distance of 140 metres from the proposed development.

The findings were related and assessed with reference to *Planning for Bush Fire Protection* 2019 and AS 3959-2018 *Construction of buildings in bushfire prone areas* for the formulation of the Bushfire Hazard Assessment.

1.5 The Proposal

The proposal as indicated by consultation with the engaged planner for the retrospective consideration of an existing single storey Class 1a secondary dwelling.

The dwelling is located within a section of an existing Class 10a building being a steel framed Colorbond storage shed.

The building is set on concrete slab and includes aluminium framed windows and doors.

2.0 Site and Adjacent Developments

The following seeks to describe the site, the adjoining lands and land uses effective upon the development proposal.

2.1 Site Description

The site is identified as Lot 165 DP 1039929
10-18 Fourth Road
Berkshire Park NSW 2765
LGA Penrith City Council

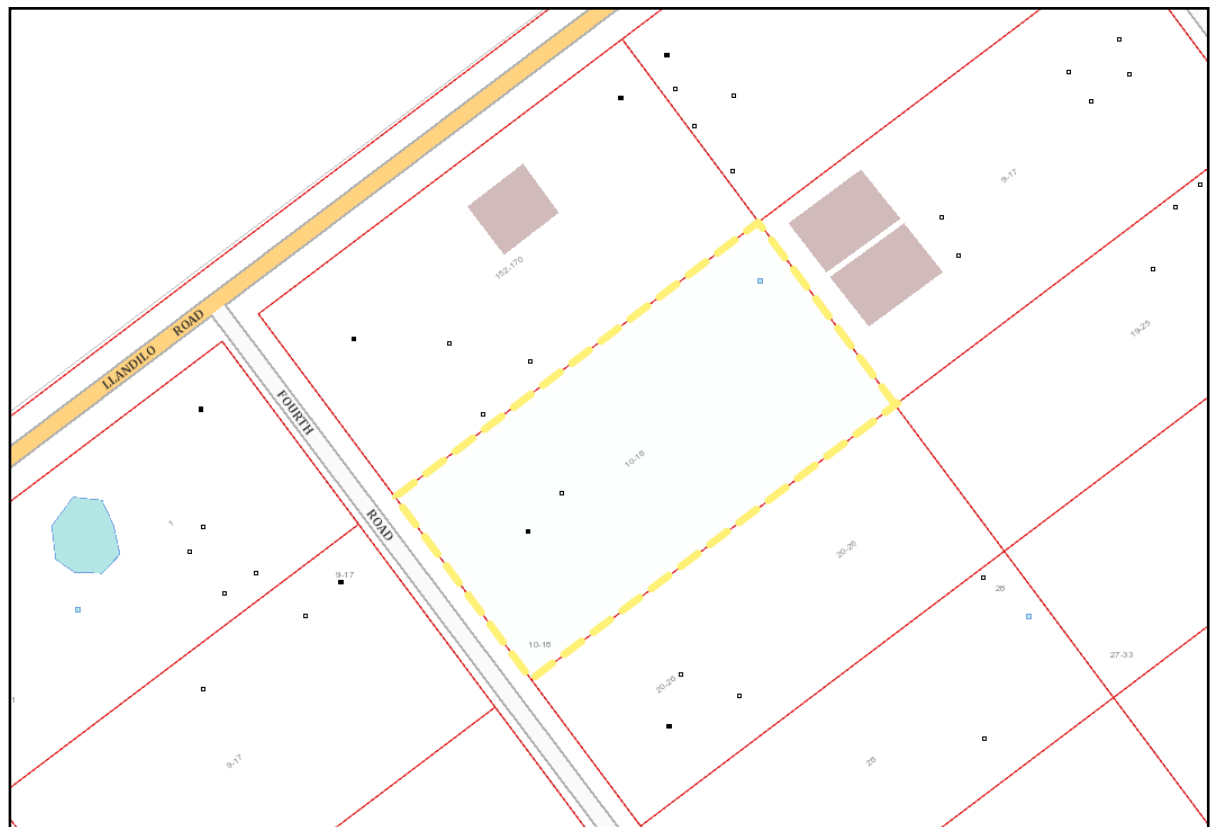


Figure 1: Address validation ex NSW Planning Portal

The subject allotment was created prior to the current subdivisional requirements contained within *Planning for Bush Fire Protection 2019*.

The site is a residential allotment of approximately 2.2 hectares located on the north eastern side of Fourth Road. The area in which the proposal is located is generally similar development that has been established for many years.

The subject allotment is located within an area that should be considered as not having a direct interface to bushfire hazardous vegetation.

The subject allotment is positioned upon the essentially level terrain typical for this area of Berkshire Park.

The parcel of land is rectangular in shape and the south western boundary is the road frontage for the subject site.

At present the site has structural improvements to be an existing Class 1a dwelling and an existing Class 10a building within which is the proposed Class 1a dwelling.

In terms of vegetation the subject allotment contains only a limited area of grassland which this report recommends is managed as an asset protection zone.

The site is shown upon the Penrith Bushfire Prone Land Map (Figure 2) to be wholly within category 3 vegetation (shown dark orange). The site inspection and interpretation of aerial photography for the site confirms that the subject allotment would be more accurately described as being only within a limited area of category 1 vegetation.

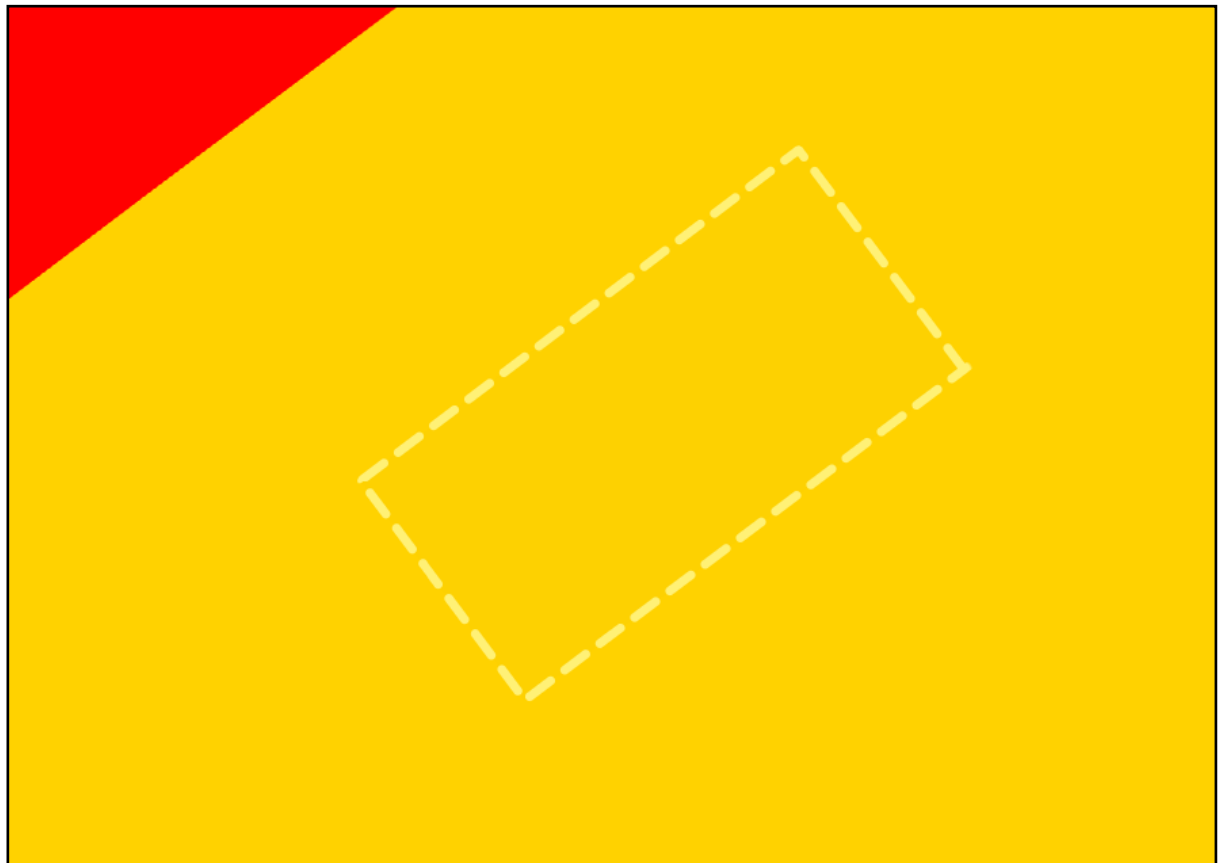


Figure 2; Section Penrith LGA Bushfire Prone Land Map ex NSW Planning Portal

Provision of mains reticulated water supply, electricity and phone is available to the proposal by existing infrastructure.

2.2 Description of Adjoining Lands

To the northwest of the subject allotment is managed lands associated with rural lifestyle developments. Beyond this is the carriageway of Llandilo Rd and then a large and expansive area of forest vegetation. However this section of forest is beyond the mandated study area of this report.

To the northeast of the subject allotment is a horticultural development which consists of numerous greenhouse structures with no areas of bushfire or bushfire hazardous vegetation.

To the southeast and southwest of the subject development are managed lands associated with other rural lifestyle developments.



Figure 3: Aerial photo depicting localised terrain and adjoining allotments ex NSW Planning Portal

3.0 Environmental Considerations

The scope of this report has not been to provide an environmental survey although this report will be a supplement to a Statement of Environmental Effects as part of the development application process.

The proposed scope of works does not necessitate the removal of any standing vegetation to satisfy the recommendations for asset protection zones. It is also our opinion that the bushfire protection measures as recommended within this report will have little or no adverse environmental effects.

4.0 Bushfire Hazard Assessment

The bushfire hazard assessment was conducted for the proposed development, using the procedures as outlined in *Planning for Bush Fire Protection 2019* to determine the bushfire attack level (BAL) likely upon the development.

The assessment was conducted on the assumption of the building footprint being positioned as described in section 1.5 The Proposal of this report and the site plan.

4.1 Classification of Vegetation and Separation Distance from Proposed Development

The vegetation was assessed for a distance of 140 metres from the proposed development building footprint in each of the following directions. To the north, east, south and west being the general direction adjacent and away from the proposed building elevations within such building footprint.



Figure 4: Vegetation study area



140 metre radius approx. Image ex Nearmap



Proposed dwelling location



Forest

To the northwest of the subject allotment (Area A) is an area of bushfire hazardous vegetation and this area should be classified as being a vegetation formation of **Forest** with a minimum separation distance of 178 metres.

4.2 Slope Assessment

The slope was assessed for a distance of 100 meters within the bushfire hazardous vegetation and reference to slope classifications has been undertaken considering the procedure specified within *Planning for Bush Fire Protection* 2019.



Figure 5; Slope assessment study area – Contour data ex Geoscience Australia

The **effective slope** of the land, out to a distance of 100 metres from the proposed scope of works (that is, the slope of the land most likely to influence bushfire behaviour for the purposes of calculating the Category of Bushfire Attack and Asset Protection Zones, has been assessed (using a clinometer) and desktop analysis as being;

- Area A – Forest - > 0 to 5 degrees downslope (assumed) (elevation 0.73 met / dist. 103.77 met = 0.40 degrees)

4.3 Category of Bushfire Attack

The bushfire attack level (BAL) for the proposed development was determined by using the information gathered with respect to the classification of the vegetation, the effective slope and provision of asset protection zones specified in this report with reference given to *Planning for Bush Fire Protection* 2019.

It is the determination of the site inspection, the assessment procedure with incorporation of the recommendations in this report that the proposed development will not experience any influential Bushfire Attack Level.

Bushfire Attack Summary

Northwest	
Vegetation Formation	Forest (Area A)
Vegetation Slope	Downslope > 0 to 5 degrees
Building Separation Distance metres	178
Separation Slope	Downslope > 0 to 5 degrees
Fire Danger Index	100
AS 3959 Construction Standard	BAL Not applicable

5.0 Assessment of the extent to which the development conforms or deviates from *Planning for Bush Fire Protection 2019*

The proposed development being the construction of a Class 1a secondary dwelling will conform to the requirements of *Planning for Bush Fire Protection 2019* when considered in conjunction with both the proposal supplied for this assessment and the recommendations arising from this bushfire hazard assessment report.

The assessment process has considered the future implications for potential subdivision given the dual occupancy created by this development and found that the proposed should satisfy the requirements of *Planning for Bush Fire Protection 2019* and an application for a Bushfire Safety Authority is likely to be issued if sought at this point in time although a guarantee of this approval is not undertaken by this report.

5.1 Asset Protection Zones

The provision of asset protection zones for the proposed building footprint cannot be fully provided for onsite to satisfy the requirements of *Planning for Bush Fire Protection 2019* but is improved by the utilization of the adjoining developments.

The maintenance of the majority of area upon the subject allotment currently would satisfy the requirements of an inner protection area of an asset protection zone as contained in *Planning for Bush Fire Protection 2019*.

This report will recommend that the entire site where not built upon is maintained to the requirements of an inner protection area of an asset protection zone and managed to these provisions for the lifetime of the development.

The following is a summary of the requirements for an asset protection zone inner protection area as described within the documents *Planning for Bush Fire Protection 2019* and *NSW RFS Standards for Asset Protection Zones*.

Inner Protection Area (IPA)

The IPA is the area closest to the building and creates a fuel management area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 10cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building consisting of a mown lawn and well-maintained gardens.

When establishing and maintaining in IPA the following requirements apply;

Trees

- tree canopy cover should be listed 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed to a height of two metres above the ground;
- preference should be given to smooth bark and Evergreen trees

Shrubs

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

Grass

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

The creation and continued maintenance of the full asset protection zone is one of the primary factors in bushfire protection measures for developments in bushfire prone areas.

5.2 Position and Design of Proposed Development

The design and siting of the proposed dwelling must take into consideration the actual bushfire risk and this report contains recommendations to assist in mitigating the mechanisms of bushfire attack.

5.3 Construction Level

The National Construction Code contains both the performance requirements and the 'deemed to satisfy' provisions relating to construction of class 1, 2 & 3 buildings that are proposed for *construction in bushfire prone areas*. To satisfy the performance provision P2.3.4 of the National Construction Code of Australia Vol. 2, a Class 1a building that is constructed in a designated bushfire prone area must be designed and constructed to reduce the risk of ignition from a bushfire while the fire front passes.

Australian Standard 3959-2018 *Construction of buildings in bushfire prone areas* is referenced by the NCC as the deemed to satisfy construction standard for residential dwellings in designated bushfire prone areas with the exception that in NSW the requirements shall be varied to comply with section 7.5.2 Additional construction requirements of *Planning for Bushfire Protection 2019*.

However, the proposed development is not likely to experience any category of bushfire or grassfire attack as the development is located greater 100 metres from an area of bushfire hazardous vegetation and greater than 50 metres from an area of grassfire hazardous vegetation. Beyond these distances the requirements of AS 3959-2018 does not apply.

Therefore, this report will only recommend that construction is undertaken in accordance with other provisions of the National Construction Code and that AS 3959-2018 *Construction of buildings in bushfire prone areas* does not apply in this instance.

5.4 Access / Egress

5.4.1 To the Proposed Development

The access to the subject site is from Fourth Road which is a sealed two lane road in a well maintained condition and under most conditions should provide adequate access and egress for both residents and emergency service vehicles.

Fourth Road links to other through roads at each end which would afford the residents the ability to evacuate the area to a location not being directly implicated by the mechanisms of bushfire attack, although under most bushfire conditions this would generally not be required.

5.4.2 Within the Site

The site plan for the proposal does show that vehicle access may not be possible to all elevations of the dwelling, although a fire tanker will be able to park in close proximity to the south western building elevation upon the existing driveway carriageway and foot access will be available to each of the other building elevations.

The existing driveway would comply with the requirements of *Planning Bush Fire Protection* 2019.

It should be considered by the residents that during a major bushfire event the following may occur;

- The suppression or defensive operations by fire authorities may not be possible in the general area of the development due to safety considerations for fire fighters; and
- That there may not be adequate fire authority resources to protect this development or others in the general area.

Whilst all fire authorities will endeavour to assist all occupants and protect all buildings during major bushfire events this is not always possible and cannot be guaranteed.

5.5 Utility Supplies

5.5.1 Water

This section of Berkshire Park is serviced by a mains reticulated water system and a search of the mains reticulated water supply layout plans (see figure 6 below) indicates that a hydrant is located approximately 2 metres to the southwest from the subject allotment on the road verge area of Fourth Road.

The site inspection confirmed the location of this hydrant.

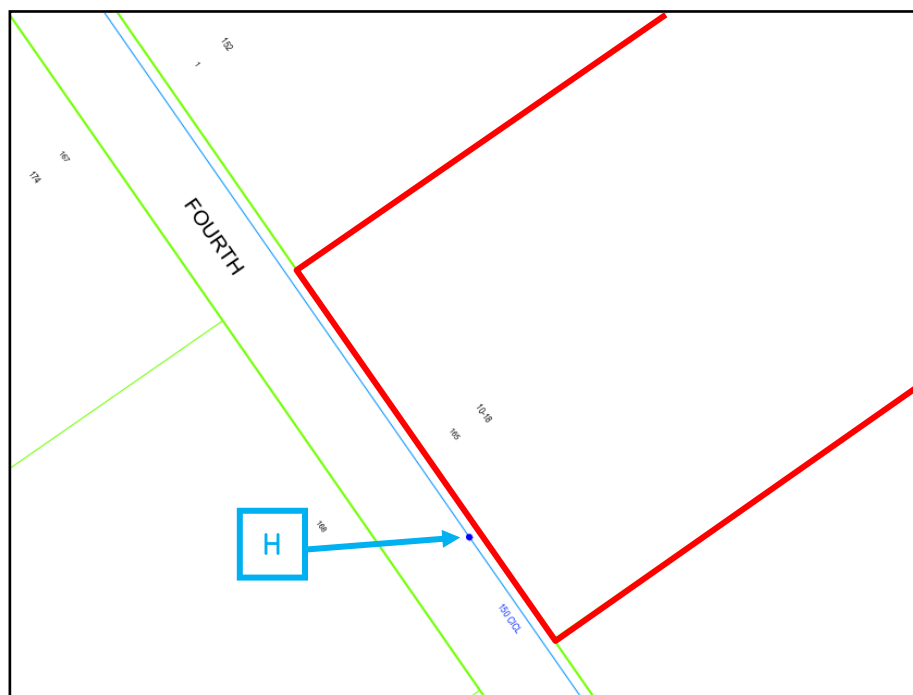


Figure 6: Section Sydney Water Reticulated Mains Water Supply Layout Plans

The location of this hydrant and the distance to the furthest point of the dwelling satisfies the requirements of *Planning for Bush Fire Protection 2019* and the provisions of *AS 2419.1-2005 Fire hydrant installations*.

5.5.2 Electricity

The existing dwelling is connected to the mains electricity supply from overhead wiring within the carriageway of Fourth Road. The wiring is also brought to the house by overhead wiring and the proposed scope of works does not alter or modify this connection methodology.

5.5.3 Gas

At the time of report preparation it was not known if it is proposed to connect gas supply to the subject dwelling. However any future connection to either mains or portable gas supply should be undertaken and maintained to the provisions of *AS 1596-2002 Storage and handling of LP Gas*. All piping associated with the installation must be metal.

5.6 Landscaping

A formal landscaping plan was not supplied for perusal at the time of formulating this report however recommendations are made with respect to the maintenance of the area on the site.

It is highly probable that in the future landscaping and garden establishment may occur on the site. However no future planting of trees or shrubs, or combustible landscaping features should be undertaken or constructed in a manner which creates a path for bushfire progression towards the dwelling or allows for a potential compromise to the integrity of the asset protection zone.

5.7 Emergency Procedures

Preparation of procedures and actions by individuals and occupants of lands within bushfire prone areas has clearly been shown to increase chances of personal safety and building survival should a bushfire event occur.

The NSW Rural Fire Service and the NSW Fire and Rescue have formulated a Bush Fire Survival Plan and this is readily available from either the NSW RFS website or the local district office.

This document should be completed by the residents in conjunction with all occupants of the household so as to better prepare all persons for a bushfire event.

After completion it should be regularly reviewed (at least once a year) and stored in a location as to be easily accessible for reference during a bushfire emergency.

6.0 Bushfire Hazard Assessment Recommendations

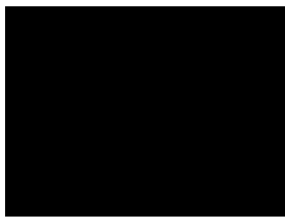
1. That the entire site where not built upon shall have the vegetation reduced where or if necessary to satisfy the requirements of *Planning for Bush Fire Protection* 2019 and the NSW Rural Fire Service document “Standards for Asset Protection Zones” for an inner protection area of an asset protection zone and this area shall be maintained at this vegetation level for the lifetime of the development.
2. That no future landscaping features, planting of shrubs, trees or other vegetation shall occur in such a manner as to compromise the integrity of the asset protection zone.
3. That the external elevations of the dwelling shall be constructed to the provisions as required by the National Construction Code of Australia and AS 3959- 2018 is not applicable.

These recommendations are the opinions of the author of this report and are compiled to assist the consent authority and the NSW Rural Fire Service in the assessment of this proposed development and that the final conditions as imposed by the consent authority must be adhered to at all stages and where required for the lifetime of the development.

7.0 Conclusion

The objectives and performance requirements for the proposed development as required by the National Construction Code Volume 2 and the document *Planning for Bush Fire Protection* 2019 will be achieved by the incorporation of the 3 recommendations contained within this report.

The recommendations contained within this report will assist in providing a reasonable level of bushfire protection and improve but not guarantee the chances of building survival, or provision for the occupants with a safe refuge during the passage of a bushfire front and or the provision of a defensible space for fire fighters.



Craig Burley
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Caveat

Quote from *Planning for Bush Fire Protection* 2006, '*notwithstanding the precautions adopted, it should always be remembered that bushfire burn under a wide range of conditions and an element of risk, no matter how small always remains.*'

Quote from Standards Australia, '*Although the standard is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any one building will withstand bushfire attack on every occasion.*'

References

Planning for Bush Fire Protection 2019 Planning NSW in conjunction with NSW Rural Fire Service

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