



Bushfire Hazard Assessment

42 Beacon Hill Road Brookvale 2100 (Lot 1/-/DP1035344).



Project Details

Assessed as:	Infill Development.
Assessed by	Matthew Noone Accreditation No. BPAD-PD 25584
Highest BAL on any facade	BAL-FZ
Planning for Bushfire Protection (2019) Compliance	The development does not conform to the relevant specification and requirements of Planning for Bushfire Protection in accordance with Section 4.14 of the Environmental Planning and Assessment Act 1979.
Project Description	Proposed Alterations and Additions.
Report Number	BR-273620-B
Date	08/02/2021



BUSHFIRE RISK ASSESSMENT CERTIFICATION

Development Address	42 Beacon Hill Road Brookvale 2100.
Parcel number	(Lot 1/-/DP1035344).
Development description	Proposed alterations and additions
Drawings Reviewed.	Attached to report BR-273620.
Assessed Bushfire Attack Level	BAL-FZ
Does the assessment rely on alternate solutions?	Yes. BAL-FZ construction is an alternate solution.
Assessed by Matthew Noone BPAD Accreditation Scheme No.	FPAA No. BPAD-PD 25584
Certificate Number:	BR-273620-B

I hereby certify, in accordance with s.4.14 of the Environmental Planning and Assessment Act 1979 that;

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

* The relevant specifications and requirements being; specifications and requirements of the document entitled Planning for Bush Fire Protection prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and any other document as prescribed by s.4.14 of the Environmental Planning and Assessment Act 1979.

I am aware that the Bushfire 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 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).

The following have been provided and or included in our assessment.

- ☒ - Bushfire Risk Assessment Report.
- ☒ - Recommendations.
- ☒ - Statement of vegetation impact in relation to APZ.

CONTROLLED DOCUMENT DISTRIBUTION AND REVISION REGISTER

ISSUED TO	DATE	REVISION	ISSUED BY
Simon Duckworth	08/02/2021	B	Matthew Noone
Note: This register identifies the current custodians of controlled copies of this document.			

DISCLAIMER

Bushfire Planning & Design cannot be held liable for any loss of life or property in the event of a bushfire. This report has been based on all relevant bushfire codes and regulations with regard to the construction of a building in a bushfire prone area. Bushfire Planning and Design has no control over workmanship and is not always asked by the Principal Certifying Authority prior to the release of an occupation certificate to advise if the construction standards and recommendations in this report have been adhered to. Buildings degrade over time and vegetation if not managed will regrow. In addition construction standards are subject to change. Due to significant variance of bushfire behaviour, we do not guarantee that the dwelling will withstand the passage of bushfire even if this development is constructed to the prescribed standards.

AS3959 (2018) states *"It should be borne in mind that the measures contained in this Standard cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature of behaviour of fire, and extreme weather conditions."*

This report reflects our opinions of bushfire risk, expected radiant heat loads and required asset protection zones relating to the proposed development. Our views are based on our interpretation of Planning for Bushfire Protection (20019), AS3959 (2018) and the methodology for site specific bushfire assessment. The Rural Fire Service have a higher authority and can upon their review, increase a nominated BAL-rating or reject any recommendation contained within this report. Any such recommendations made by the RFS take precedence. Our role is intermediary between our Client and the consenting authority. We apply our knowledge of the standards for bushfire protection to provide the best possible outcome for our Client, both from a bushfire safety and financial perspective. Should the RFS modify our recommendations or reject a proposal we will not be held liable for any financial losses as a result.

This document may only be used for the purpose for which it was commissioned. Bushfire Planning and Design accepts no liability or responsibility for any use or reliance upon this report and its supporting material by any unauthorized third party. Outcomes within this report may have arisen due to specific advice from our Client and in relation to the specific development application that this report was prepared for. The validity of this report is nullified if used for any other purpose than for which it was commissioned. Unauthorized use of this report in any form is an infringement of our intellectual property.

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SECTION 1. BACKGROUND AND BRIEFING NOTES

1.1 INTRODUCTION

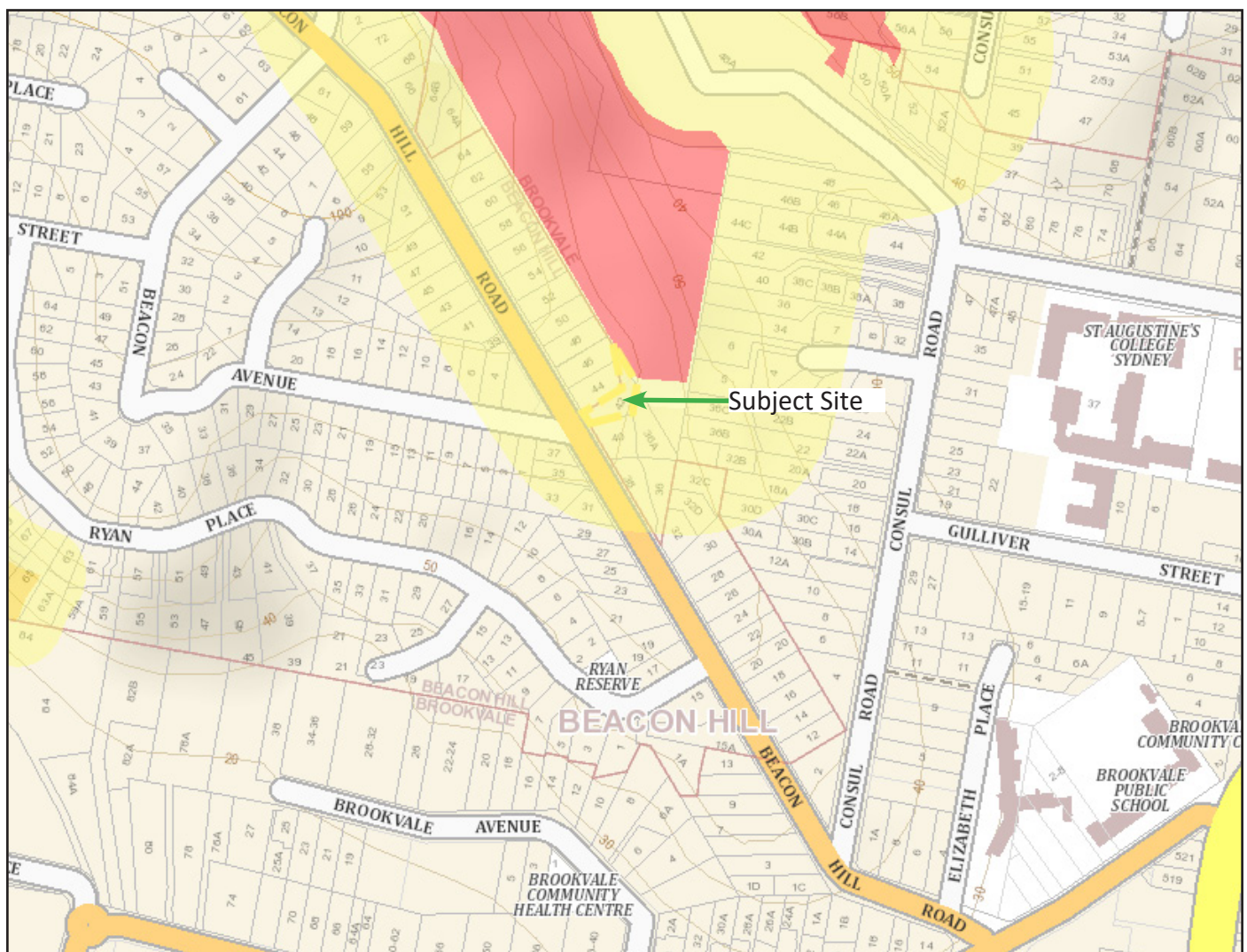
The subject site whether in whole or part is recorded as bushfire affected on a relevant map certified under Section 10.3 (2) of the Environmental Planning and Assessment Act 1979. The development relates to the development of bushfire prone land and therefore must address the legislative requirements stipulated in Section 4.14 of the Environmental Planning and Assessment Act 1979. The development is required to comply with the New South Wales Rural Fire Service document Planning for Bushfire Protection (2019).

Figure A - BUSHFIRE PRONE LAND MAP

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Department of Planning, Industry and Environment (www.planningportal.nsw.gov.au).

Certified Bushfire Prone Land Map extract obtained from the Planning Portal managed by the Department of Planning, Industry and Environment. Found at www.planningportal.nsw.gov.au. The subject site is mapped as bushfire affected.



100m Buffer



Vegetation Category 2



Vegetation Category 1

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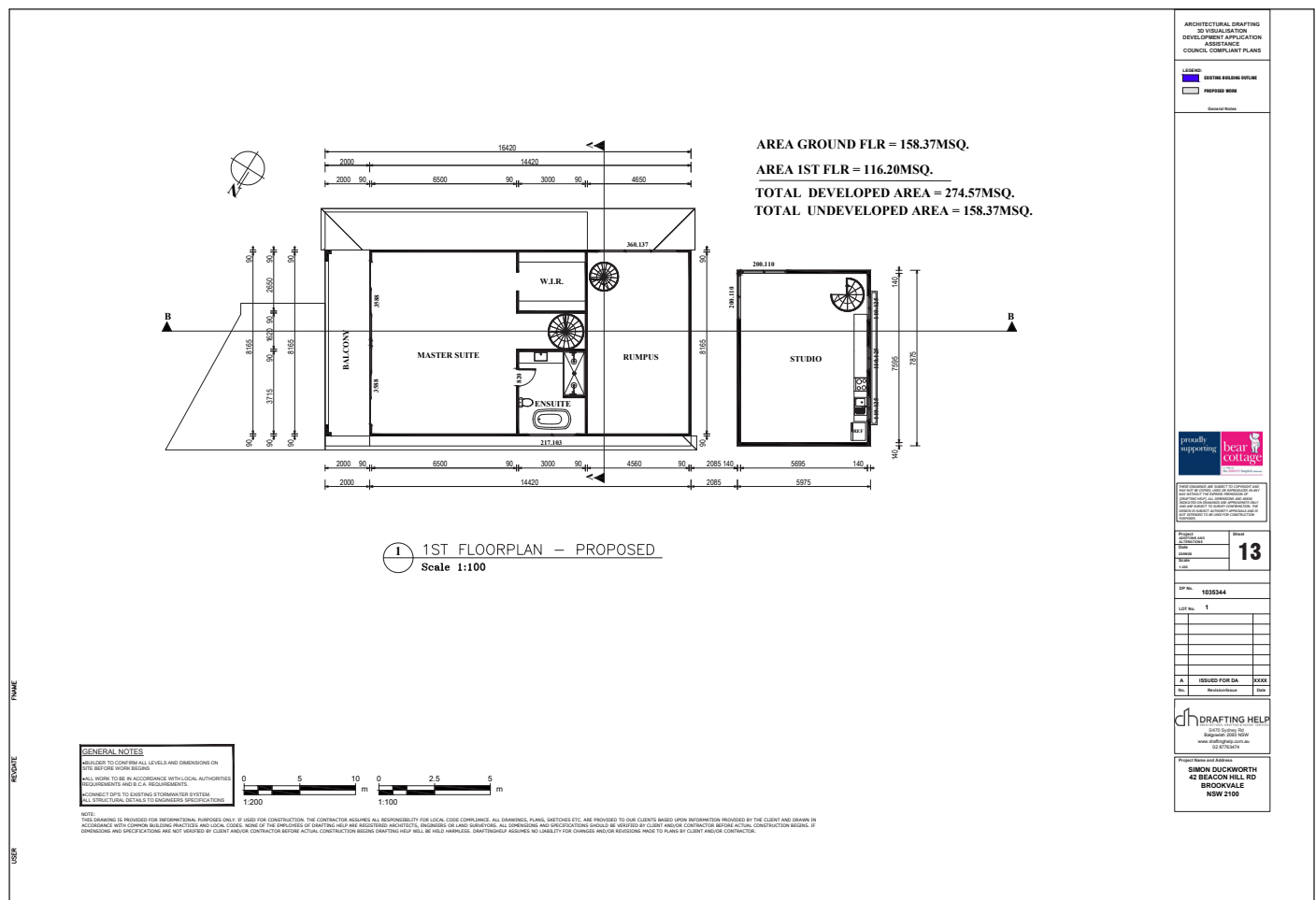
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1.2 DEVELOPMENT PROPOSAL

The development relates to the undertaking of alterations and additions to the existing dwelling. This includes but is not limited to a second floor addition.



1.2.1 Architectural Floor Plan.

1.3 PURPOSE OF THIS REPORT

Development applications on bush fire prone land must be accompanied with a Bush Fire Assessment demonstrating the degree to which the proposed development complies with or deviates from the aims, objectives and performance criteria of Planning for Bushfire Protection (PBP 2019). The purpose of this report is to address the following;

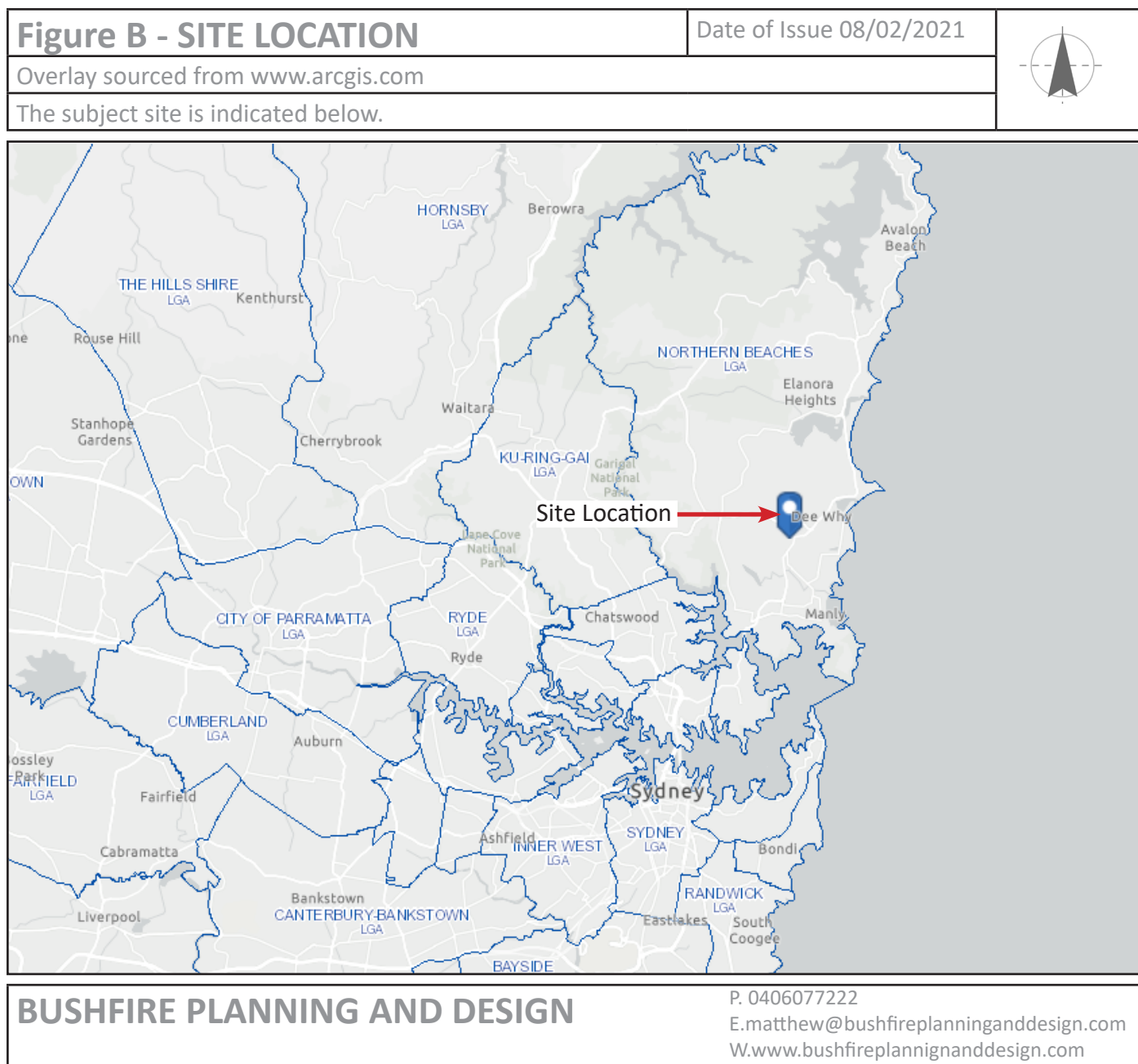
- To determine the expected fire behaviour and threat to the proposed development.
- To provide the land owner, Northern Beaches Council, the RFS and other relevant stakeholders with a bushfire report that determines the bushfire hazard for the proposed development.
- To identify compliance with the specific objectives and performance requirements of Planning for Bushfire Protection (2019).
- To determine the required level of construction required by AS3959 – Australian Standard for the Construction of Buildings in Bushfire Prone Areas.
- Provide bushfire protection recommendations to mitigate the adverse affects from bushfire. The recommendations provided are based on the acceptable solutions stated in PBP (2019).

1.4 SCOPE OF THIS REPORT

This report has been prepared to accompany the specific development application referred to in this document and as attached in Appendix B. This report has considered all current relevant bushfire legislation, planning instruments, codes and standards for the construction of a building in a bush fire prone areas. For the purpose of this report it is necessary to describe the surrounding vegetation to 140m from the boundary and slope to 100m from the boundary. This report does not directly assess the bushfire hazard on any adjacent site and cannot be used to support any development on an adjoining allotment.

1.5 SITE LOCATION AND DESCRIPTION

The subject site is located in a residential area in Brookvale which is under the jurisdiction of the Northern Beaches Council. Access to the site is from Beacon Hill Road to the south. An existing dwelling is located on the site. Forest vegetation is located to the north and north west of the site. The land in all other directions is managed for at least 100m from the site boundary.



1.6 REGULATORY FRAMEWORK

The main legislation, planning instruments, development controls and guidelines that are related to this project are as follows;

4.14 Consultation and development consent— certain bush fire prone land

(1) Development consent cannot be granted for the carrying out of development for any purpose (other than a subdivision of land that could lawfully be used for residential or rural residential purposes or development for a special fire protection purpose) on bush fire prone land unless the consent authority:

(a) is satisfied that the development conforms to the specifications and requirements of the document entitled Planning for Bush Fire Protection, prepared by the NSW Rural Fire Service in co-operation with the Department of Planning (or, if another document is prescribed by the regulations for the purposes of this paragraph, that document) that are relevant to the development (“the relevant specifications and requirements”), or

(b) has been provided with a certificate by a person who is recognised by the NSW Rural Fire Service as a qualified consultant in bush fire risk assessment stating that the development conforms to the relevant specifications and requirements. (EPA & A, 1979).

Class 1, 2, 3, 4, 9 Special Fire Protection Purpose and Class 10a building or deck associated with a Class 1 buildings are required to comply with the Building Code of Australia. The BCA is a performance based code which derives its statutory power from the Environmental Planning and Assessment Act 1979.

The BCA contains both performance requirements and deemed-to-satisfy provisions for all aspects of building, including the construction of buildings in bush fire prone areas. Compliance with the performance requirements of the BCA is achieved by way of a deemed to satisfy solution which is satisfied by;

A	Complying with AS3959, the Australian Standard for the Construction of Buildings in Bushfire Prone Areas except as amended by Planning for Bush Fire Protection; and for Section 9 for Bushfire Attack Level FZ (BAL-FZ); or
B	Complying with the NASH Standard – Steel Framed Construction in Bushfire Areas except—as amended by Planning for Bush Fire Protection; and for buildings subject to Bushfire Attack Level FZ (BAL-FZ); or
C	the requirements above as modified by the development consent following consultation with the NSW Rural Fire Service under section 4.14 of the Environmental Planning and Assessment Act 1979 if required; or
D	the requirements above as modified by development consent with a bushfire safety authority issued under section 100B of the Rural Fires Act 1997 for the purposes of integrated development.

SECTION 2. BUSHFIRE ATTACK LEVEL (BAL) PARAMETERS

2.0 INTRODUCTION

For the purpose of this bushfire assessment, the vegetation is required to be described to a distance of 140m from the boundary and the slope to 100m from boundary. Vegetation type and slope under vegetation are the factors that will significantly affect bushfire behaviour.

‘Research has shown that 85% of houses are lost in the first 100m from bushland and that ember attack is a significant form of attack on properties’ (RFS 2006).

2.1 SLOPE

The effective slope has been assessed for a distance of at least 100m from the proposed development. The slope data has been calculated from 1m LiDAR contours. The source data sets have been captured to standards that are generally consistent with the Australian ICSM LiDAR Acquisition Specifications with require a fundamental vertical accuracy of at least 0.30m (95% confidence) and horizontal accuracy of at least 0.80m (95% confidence). The slope arrows indicated in figure C represent the slope calculated across the length of the arrow direct from the digital elevation model. The calculated slope as shown in figure C has not been manipulated or modified in any way.

2.2 PREDOMINANT VEGETATION CLASS

This assessment includes vegetation both within and external to the site boundaries. Where mixes of vegetation formations are located together, the vegetation formation providing the greater hazard shall be used for the purpose of assessment. The combination of vegetation and slope that yields the worst case scenario shall be used (A1.2 PBP 2019).

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TABLE 1 - BAL ASSESSMENT (To be read in conjunction with Figure C).						
LGA = Northern Beaches Council				Forest Fire Danger Index = FDI 100		
PRIMARY DWELLING						
ASPECT ¹	Vegetation Class ²	Max Effective Slope ³	Site slope ³	Required APZ ⁴	Proposed APZ / EML ⁵	BAL-Rating
N, NE	Forest	5-10 ⁰ D-S	N/A	> 28m	< 28m	BAL-FZ (NW, NE, SE)
AOD	Managed residential land. No bushfire threat within 100m.					BAL-40 (SW)

Abbreviations		
AOD All other directions	EML Extent of managed land	NVC Narrow vegetation corridor

¹	<i>Cardinal direction from each proposed building facade based on magnetic north.</i>
²	<i>Vegetation Classifications are as described in PBP (2019) A1.2.</i>
³	<i>Site slope is calculated from 1m LiDAR contours.</i>
⁴	<i>Minimum APZ required stated as Acceptable Solutions within Table 1.12.2 and A1.12.5. PBP (2019).</i>
⁵	<i>Actual dimensional setback from the face of the building to the assessed vegetation. Achieved Asset Protection Zone (APZ) or extent of managed land (EML).</i>
⁶	<i>Where the direct line of sight between the proposed building and assessed vegetation is obstructed (by a wall or building) the assessed rating can be lowered by one BAL-rating (PBP 2019, s. A1.8).</i>
⁷	<i>Remnant bushland and narrow vegetation corridors (NVC) as stated in PBP (2019) s.A1.11 can be assessed as rainforest as a simplified approach or be assessed as Short Fire Run using method 2 (AS3959).</i>
⁸	<i>Deeming provisions for grassland s.7.9 PBP (2019).</i>

2.3 BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT SUMMARY.

To clarify the findings above, due to the proximity of the vegetation to the boundary, there is insufficient space within the site to mitigate potential radiant heat loads in excess of 40 kW/m² and flame contact in the event of a bushfire. This is an existing scenario regardless of the proposed works.

The proposed works are to comply with Chapter 9 (BAL-FZ) AS3959 (2018).

2.4 ASSET PROTECTION ZONE (APZ) ASSESSMENT SUMMARY.

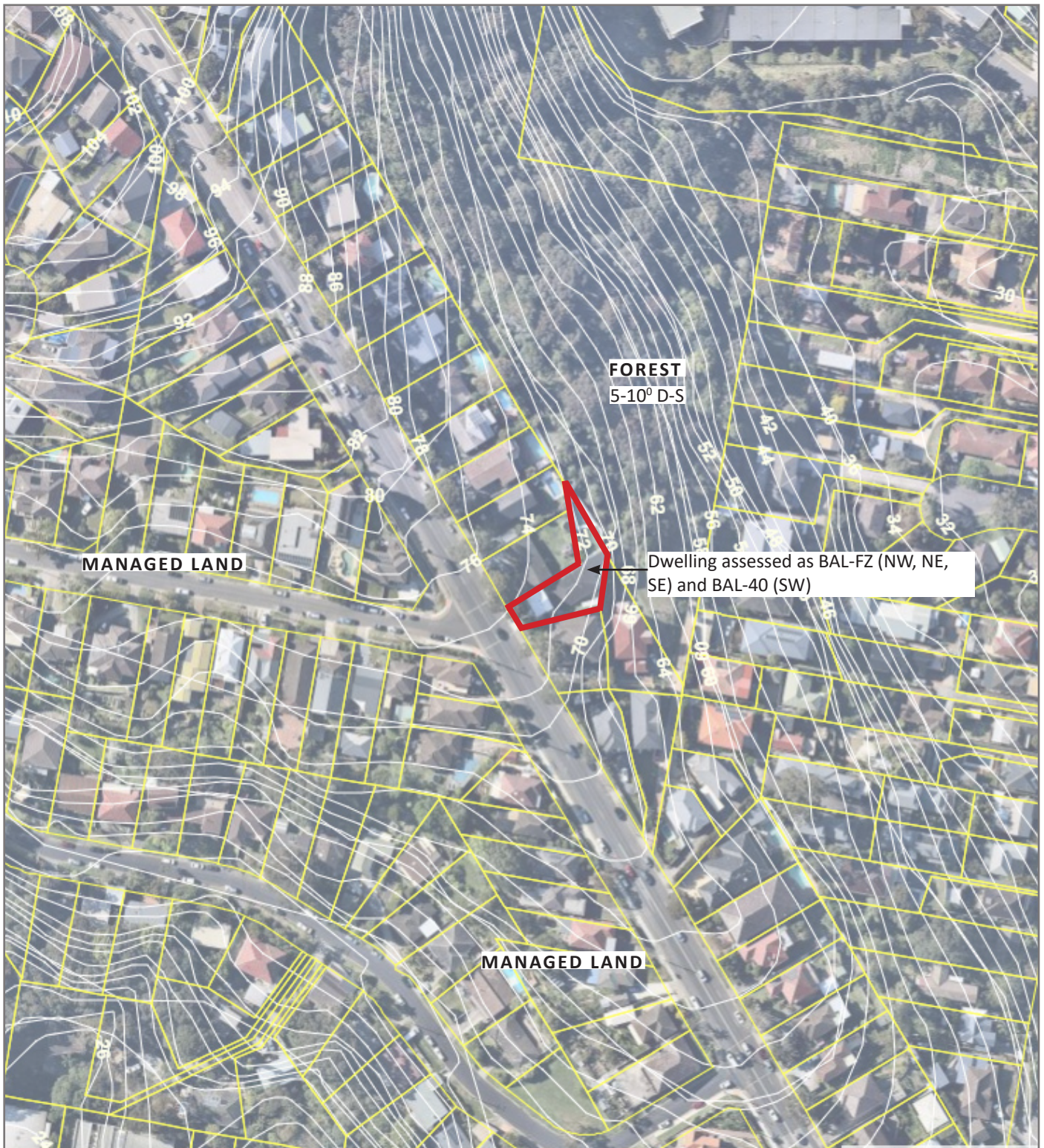
Due to the infill nature of the development, there is limited space within the site to provide an asset protection zone (APZ). There is insufficient space within the site to avoid potential flame contact and radiant heat loads in excess of 40 kW/m² in the event of a bushfire. Defendable space is provided in the form of pedestrian access only. The site is to be managed as an inner APZ for perpetuity.

Figure C - Site Analysis Drawing

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Aerial image modified from Near Map (www.nearmap.com.au)



LEGEND

-  Not used
-  Not used
-  Not used

NOTES:

1. The slope data used for this assessment has been based on 2m LiDAR contours.

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SECTION 3. ASSET PROTECTION ZONE (APZ) REQUIREMENTS

PERFORMANCE CRITERIA (PBP 2019)

Intent of measures: to minimise the risk of bush fire attack and provide protection for emergency services personnel, residents and others assisting fire fighting activities.

- APZs are to be provided commensurate with the construction of the building; and
- A defendable space is to be provided.
- APZs are to be managed and maintained to prevent the spread of a fire to the building.
- The APZ is to be provided in perpetuity.
- APZ maintenance is to be practical, soil stability is not compromised and the potential for crown fires is minimised.

The asset protection zones (APZ) requirements have been derived from the methodology of A1.12.2 or A1.12.3 in Appendix 1 of PBP (2019). Asset protection zones and in particular the Inner Asset Protection Zones are critical for providing defendable space and reducing flame length and rate of spread (PBP 2019). APZs are designed to provide sufficient open space for emergency workers to operate and for occupants to egress the site safely. They are divided into Inner and Outer Asset Protection Zones (IPAs and OPAs) and are required to be maintained for the life of the development. The IPA provides for defendable space and a reduction of radiant heat levels at the building line and the OPA provides for the reduction of the rate of spread and filtering of embers.

GENERAL REQUIREMENTS

- The APZ should be located completely within the boundary of the site. The required APZ will often be satisfied by surrounding managed land.
- The APZ should not be located on slopes greater than 18° unless terracing is introduced.
- The APZ is to be managed in accordance with Appendix 4 (PBP 2019).
- Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions
- A clear area of low-cut lawn or pavement is maintained adjacent to the house;.
- Where the fence is within 6m of a building or in areas of BAL-29 or greater, they should be made of non-combustible material only.

INNER APZ (IPA) IS TO CONSIDER THE FOLLOWING RECOMMENDATIONS (PBP 2019).

The Inner APZ (IPA) is the managed area closest to the asset (eg. dwelling). The IPA is managed to minimal fuel conditions and aims to mitigate the impact of direct flame contact and radiant heat on the development. The IPA also aims to provide defensible space.

TREES

- Canopy cover should be less than 15% (at maturity)
- Trees (at maturity) should not touch or overhang the building
- Lower limbs should be removed up to a height of 2m above ground
- Canopies should be separated by 2 to 5m
- Preference should be given to smooth barked and evergreen trees.

SHRUBS

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

GRASS

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

OUTER APZ (OPA) IS TO CONSIDER THE FOLLOWING RECOMMENDATIONS (PBP 2019).

The Outer APZ (OPA) is the part of the APZ that is located between the IPA and the bushfire vegetation threat.

The reduction in the available fuels and canopy connections in the OPA aims to mitigate the intensity of an approaching fire and restricts the pathways to crown fuels thus reducing the level of direct flame, radiant heat and ember attack on the IPA and asset (dwelling).

TREES

- Canopy cover should be less than 30% (at maturity)
- Trees should have canopy separation canopies should be separated by 2 to 5m.

SHRUBS

- Shrubs should not form a continuous canopy.
- Shrubs should form no more than 20% of ground cover.

SECTION 4. CONSTRUCTION REQUIREMENTS

PERFORMANCE CRITERIA (PBP 2019)	ACCEPTABLE SOLUTION
<p>It must be demonstrated that the proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. The BAL construction requirements have been determined in accordance with the appropriate table from A1.12.2 to A1.12.7 (PBP 2019) and in accordance with the NCC and as modified by section 7.5.</p> <p>The building requirements for the specified BAL-rating will mitigate bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. The proposed development is to be constructed to BAL-FZ as indicated in figure C and as specified in AS3959 (2018). This includes the general requirements of Section 3 of AS3959 (2018) and the additional construction requirements stipulated in s.7.5 of the New South Wales Rural Fire Service (RFS) document Planning for Bushfire Protection (PBP 2019). We recommend that the existing dwelling be upgraded with regard to ember protection commensurate with BAL-12.5 as specified in AS3959 (2018). The following principals should be considered.</p>	

GENERAL
<ul style="list-style-type: none"> Seal all gaps (>3mm) around the house (excluding subfloor) with: Appropriate joining strips; Flexible silicon based sealant; or Mesh with a maximum aperture of 2mm, made from corrosion resistant steel, bronze or aluminium.
WALLS
<ul style="list-style-type: none"> Install sarking with a flammability index of not more than 5 behind weatherboards or other external cladding when they are being replaced for maintenance or other reasons.
SUBFLOOR SPACE
<ul style="list-style-type: none"> Removal of combustible materials and keeping areas clear and accessible.
DOORS
<ul style="list-style-type: none"> Install weather strips, draught excluders or draught seals at the base of side hung doors.
WINDOWS
<ul style="list-style-type: none"> Install mesh with a maximum aperture of 2mm, made from corrosion resistant steel, bronze or Aluminium to all external doors and openable windows.
VENTS AND WEEPHOLES
<ul style="list-style-type: none"> Seal vents and weepholes in external walls with mesh (with an aperture size of 2 mm) of corrosion resistant steel, bronze or aluminium.
ROOFS
<ul style="list-style-type: none"> Seal around roofing and roof penetrations with a non-combustible material. Install sarking with a flammability index of not more than 5 beneath existing roofing when it is being replaced for maintenance or other reasons. If installed, gutter and valley leaf guards shall be non-combustible.

SECTION 5. ACCESS REQUIREMENTS

PERFORMANCE CRITERIA (PBP 2019)

Intent of measures: To provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area.

- Fire-fighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.
- The capacity of access roads is adequate for fire-fighting vehicles.
- There is appropriate access to water supply.
- Fire-fighting vehicles can access the dwelling and exit the property safely.

PUBLIC ROADS - SPECIFIC REQUIREMENTS

Beacon Hill Road is sealed public road. The public road system is deemed to be adequate for emergency services appliances. Figure D shows the road systems in the area.

PROPERTY ACCESS - SPECIFIC REQUIREMENTS

In the event of a bushfire, emergency response workers will operate from the public road system. The subject site is located in an area that is serviced by NSW fire and Rescue. Figure 5A below is an extract from NSW Fire and Rescue requirements (2016) "Fire Requirements for Minor Residential Development". The subject site has a fire hydrant within 60m of the boundary. Therefore suitable water provisions are provided for fire fighting with regard to proximity and access.

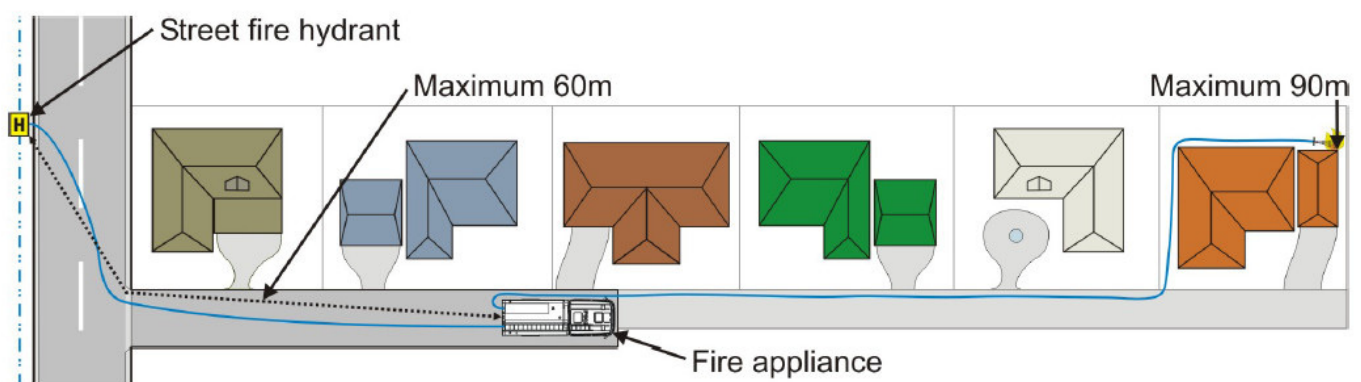


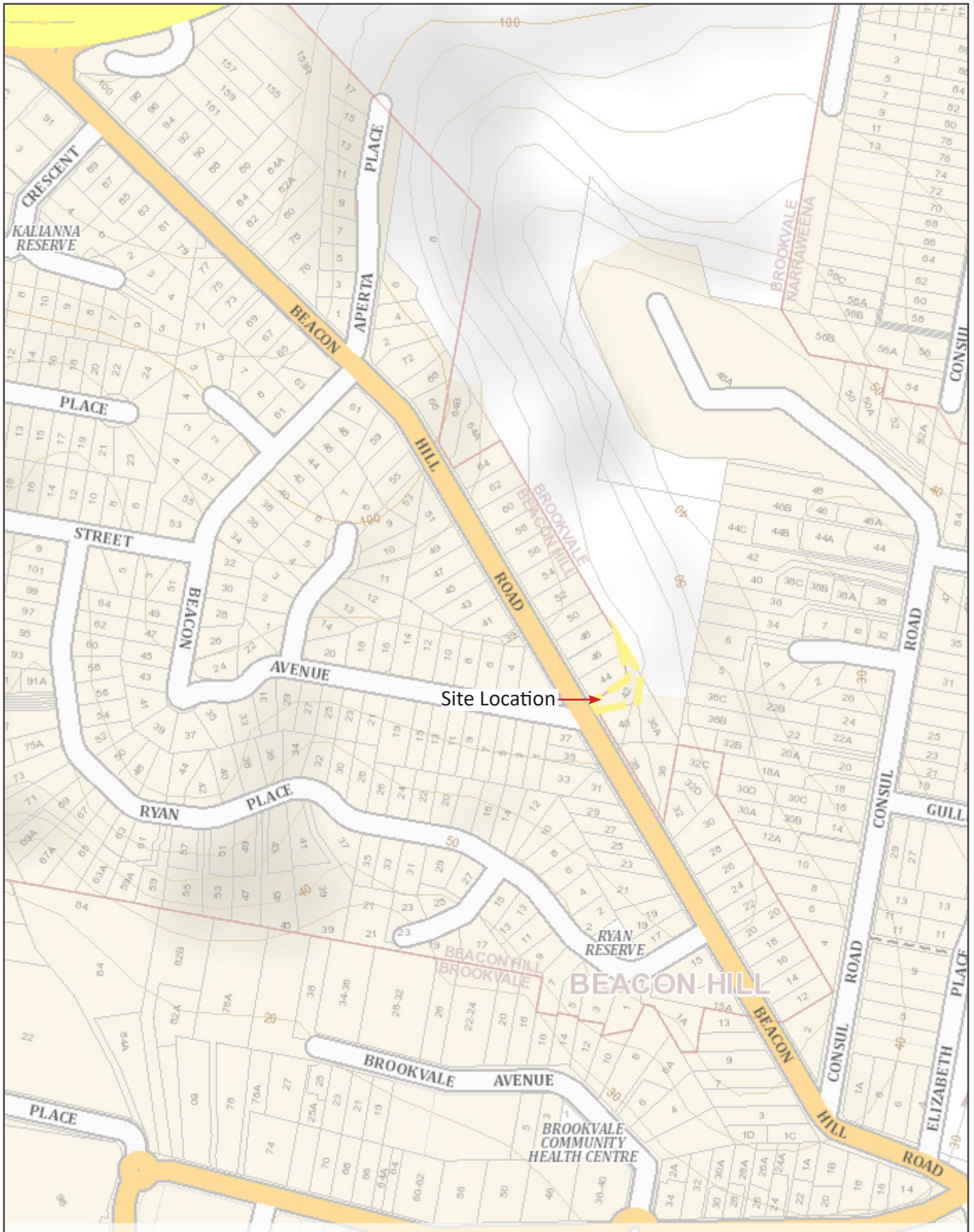
Figure 5A: Extract from NSW Fire and Rescue requirements (2016).

ADDITIONAL COMMENTS IN RELATION TO ACCESS

ACCEPTABLE SOLUTION

The proposed development can comply with the intent of PBP (2019) with regards to site access requirements.

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SECTION 6. SERVICES REQUIREMENTS - WATER

PERFORMANCE CRITERIA (PBP 2019)

Intent of measures: To provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

- An adequate water supply is to be provided for fire-fighting purposes.
- Water supplies are to be located at regular intervals.
- The water supply is to be accessible and reliable for fire-fighting operations.
- Flows and pressure are to be appropriate
- The integrity of the water supply is to be maintained.
- A static water supply is to be provided for fire-fighting purposes in areas where reticulated water is not available.

WATER - SPECIFIC REQUIREMENTS

The proposed development can comply with the PBP (2019) with regards to water requirements. Reticulated water is provided however the hydrant sizing, spacing or pressures have not been tested. No additional water for the suppression of bushfire is required for the proposed development.

The following points are to be adhered to for the life of the development.

- All above-ground water service pipes (including taps and connections) external to the building are to be metal.

ADDITIONAL COMMENTS IN RELATION TO THE PROVISION OF WATER

ACCEPTABLE SOLUTION

The proposed development can comply with PBP (2019).

Space left intentionally blank.

SECTION 7. SERVICES REQUIREMENTS - ELECTRICITY & GAS

PERFORMANCE CRITERIA (PBP 2019)

Intent of measures: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

- Location of electricity services is to limit the possibility of ignition of surrounding bush land or the fabric of buildings.
- Location and design of gas services is not to not lead to the ignition of surrounding bushland or the fabric of buildings.

ELECTRICITY AND GAS - SPECIFIC REQUIREMENTS

The proposed development can comply with the PBP (2019) with regards to electricity and gas requirements. The following points are to be adhered to (where applicable) for the provision of electricity and gas services where applicable.

ELECTRICITY REQUIREMENTS

- Where practicable place electrical transmission lines are underground or,
- If overhead electrical transmission lines are proposed:- lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002).
- No part of a tree is to be closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines.

GAS REQUIREMENTS

- Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is to be used.
- All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side.
- Connections to and from gas cylinders are to be metal.
- Polymer-sheathed flexible gas supply lines are not to be used.
- Above-ground gas service pipes are to be metal, including and up to any outlets.

ADDITIONAL COMMENTS IN RELATION TO THE PROVISION OF ELECTRICITY AND GAS.

ACCEPTABLE SOLUTION

The proposed development can comply with PBP (2019) with regard to the provision of gas and electricity.

SECTION 8. DEVELOPMENT RECOMMENDATIONS

The following points are recommended for inclusion in the DA conditions of consent;

1.	Construction	Construct the development to BAL-FZ (Section 2 and 4).
2.	APZs	Nominated APZs to be managed as an inner APZ for perpetuity (Section 3).
3.	Access	None.
4.	Services	Comply with the services provisions noted in Section 6 and 7 (where applicable).
5.	In the event that Council or the NSW Rural Fire Service modifies our recommendations then this report should no longer be referred to. The bushfire requirements as stated in the DA Consent conditions will take precedence.	
6.	We strongly recommend that the applicant cross references the bushfire requirements within the DA consent conditions and our report and alert us to any discrepancies.	

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SECTION 9. CONCLUSION

The development relates to the undertaking of alterations and additions to the existing dwelling. This includes but is not limited to a second floor addition.

The development is captured under Section 4.14 of the Environmental Planning and Assessment Act 1979; Consultation and development consent – certain bush fire prone land. For the purpose of bushfire assessment the development is considered infill development as described in the New South Wales Rural Fire Service document Planning for Bushfire Protection (2019).

The subject site is located in a residential area in Brookvale which is under the jurisdiction of the Northern Beaches Council. Access to the site is from Beacon Hill Road to the south. An existing dwelling is located on the site. Forest vegetation is located to the north and north west of the site. The land in all other directions is managed for at least 100m from the site boundary.

Due to the infill nature of the development, there is limited space within the site to provide an asset protection zone (APZ). There is insufficient space within the site to avoid potential flame contact and radiant heat loads in excess of 40 kW/m² in the event of a bushfire. Defendable space is provided in the form of pedestrian access only. The site is to be managed as an inner APZ for perpetuity.

The proposed development is assessed as BAL-FZ as indicated in figure C and as specified in AS3959 (2018) the Australian Standard for the Construction of Buildings in a Bushfire Prone Area. The existing dwelling should be upgraded with regard to ember protection commensurate with BAL-12.5 as per section 4 of this report.

The project can comply with the construction requirements of AS3959 (2018) and the performance requirements of the BCA. The objectives and performance requirements of PBP (2019) are also achieved.

Site access, including access via the public road system is suitable for emergency response vehicles. The development complies with PBP (2019) with regards to the provision of water. The requirements for electricity and gas can also be complied with.

Should Council or the NSW Rural Fire Service have any objection to any part of this report, please provide the professional courtesy to get in contact to discuss.

Regards,



Matthew Noone

Grad.Dip. Design for Bushfire Prone Areas.

BSc (Geology)

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T/A Bushfire Planning and Design



SECTION 10. REFERENCES

AS3959 (2018)	Australian Standard, Construction of buildings in bushfire-prone areas, AS 3959, Third edition 2018 Standards Australia International Ltd, Sydney.
BCA (2019)	Building Code of Australia 2019, Building Code of Australia, Australian Building Codes Board, Canberra 2019.
EPA Act (1979)	Environmental Planning and Assessment Act 1979, NSW Government, NSW, legislation found at www.legislation.nsw.gov.au
PBP (2019)	Planning for Bushfire Protection, a Guide for Councils,Planners, Fire Authorities, Developers and Home Owners. Rural Fire Service 2019, Australian Government Publishing Service, Canberra.
RFS (2015)	Rural Fire Service, Guide For Bush Fire Prone Land Mapping, Version 5b.

SECTION 11. APPENDICES

Appendix A - Standards for Asset Protection.

Appendix B - Architectural Drawings.

Appendix C - Photos.

APPENDIX A - STANDARDS FOR ASSET PROTECTION

RFS STANDARDS FOR ASSET PROTECTION

The following information has been taken directly from the RFS document “Standards for Asset Protection”. The full version of this document can be found at www.rfs.nsw.gov.au.

The intensity of bush fires can be greatly reduced where there is little to no available fuel for burning. In order to control bush fire fuels you can reduce, remove or change the state of the fuel through several means.

Reduction of fuel does not require removal of all vegetation, which would cause environmental damage. Also, trees and plants can provide you with some bush fire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns. Some ground cover is also needed to prevent soil erosion.

RAKING OR MANUAL REMOVAL OF FINE FUELS

- Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. This is fuel that burns quickly and increases the intensity of fire.
- Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.

MOWING OR GRAZING OF GRASS

- Grass needs to be kept short and, where possible, green.

REMOVAL OR PRUNING OF TREES, SHRUBS AND UNDERSTOREY

- The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation.
- Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by two to five metres. A canopy should not overhang within two to five metres of a dwelling.
- Native trees and shrubs should be retained as clumps or islands and should maintain a covering of no more than 20% of the area.

WHEN CHOOSING PLANTS FOR REMOVAL, THE FOLLOWING BASIC RULES SHOULD BE FOLLOWED

- Remove noxious and environmental weeds first. Your local council can provide you with a list of environmental weeds or ‘undesirable species’. Alternatively, a list of noxious weeds can be obtained at www.agric.nsw.gov.au/noxweed/;
- Remove more flammable species such as those with rough, flaky or stringy bark; and
- Remove or thin understorey plants, trees and shrubs less than three metres in height
- The removal of significant native species should be avoided.

GARDEN DESIGN

The following information has been taken directly from the RFS document “Standards for Asset Protection”. The full version of this document can be found at www.rfs.nsw.gov.au.

LAYOUT OF GARDENS IN AN APZ

When creating and maintaining a garden that is part of an APZ you should:

- ensure that vegetation does not provide a continuous path to the house;
- remove all noxious and environmental weeds;
- plant or clear vegetation into clumps rather than continuous rows;
- prune low branches two metres from the ground to prevent a ground fire from spreading into trees;
- locate vegetation far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission;
- plant and maintain short green grass around the house as this will slow the fire and reduce fire intensity. Alternatively, provide non-flammable pathways directly around the dwelling;
- ensure that shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non flammable ground cover such as pebbles and crush tile; and
- avoid erecting brush type fencing and planting “pencil pine” type trees next to buildings, as these are highly flammable.

LAYOUT OF GARDENS IN AN APZ

When designing your garden it is important to consider the type of plant species and their flammability as well as their placement and arrangement.

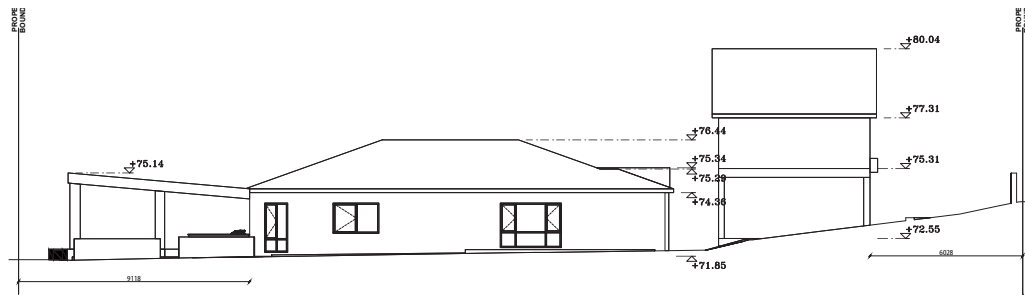
Given the right conditions, all plants will burn. However, some plants are less flammable than others.

- Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage the ground fire to spread up to, and then through, the crown of the trees.

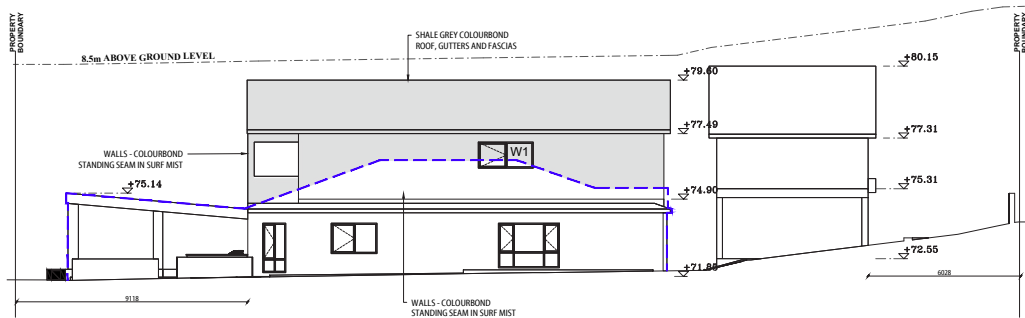
Plants that are less flammable, have the following features:

- high moisture content
- high levels of salt
- low volatile oil content of leaves
- smooth barks without “ribbons” hanging from branches or trunks; and
- dense crown and elevated branches.

APPENDIX B - ARCHITECTURAL DRAWINGS

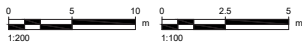


1 NORTH ELEVATION – EXISTING
Scale 1:100



1 NORTH ELEVATION – PROPOSED
Scale 1:100

GENERAL NOTES
 1. DRAWING TO BE IN ACCORDANCE WITH LOCAL AUTHORITIES REQUIREMENTS AND B.C.A. REQUIREMENTS.
 2. ALL DIMENSIONS TO BE IN ACCORDANCE WITH LOCAL AUTHORITIES REQUIREMENTS AND B.C.A. REQUIREMENTS.
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LEGEND:
 EXISTING BUILDING OUTLINE
 PROPOSED WORK

ARCHITECTURAL DRAFTING
 TO VISUALISATION
 DEVELOPMENT APPLICATION
 ASSISTANCE
 COUNCIL COMPLIANT PLANS

LEGEND:
 EXISTING BUILDING OUTLINE
 PROPOSED WORK

General Notes

Project Name and Address:
 42 BEACON HILL RD
 BROOKVALE NSW 2100

Project No. 1035344

Lot No. 1

Scale 1:100

Issue 4

Issued For DA

Project Name and Address:
 42 BEACON HILL RD
 BROOKVALE NSW 2100

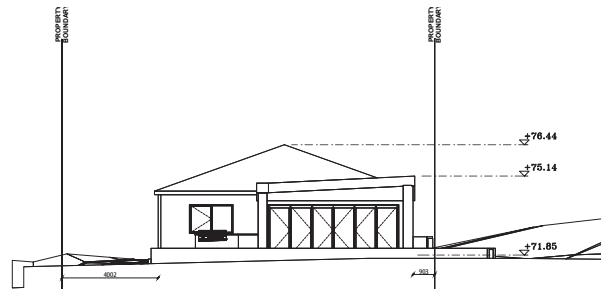
Project No. 1035344

Lot No. 1

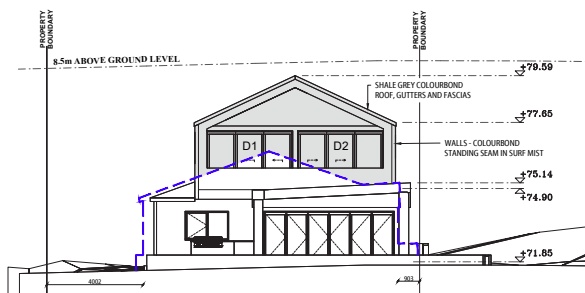
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Issue 4

Issued For DA

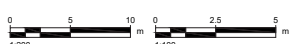


1 EAST ELEVATION – EXISTING
Scale 1:100



1 EAST ELEVATION – PROPOSED
Scale 1:100

GENERAL NOTES
 1. DRAWING TO BE IN ACCORDANCE WITH LOCAL AUTHORITIES REQUIREMENTS AND B.C.A. REQUIREMENTS.
 2. ALL DIMENSIONS TO BE IN ACCORDANCE WITH LOCAL AUTHORITIES REQUIREMENTS AND B.C.A. REQUIREMENTS.
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ARCHITECTURAL DRAFTING
 TO VISUALISATION
 DEVELOPMENT APPLICATION
 ASSISTANCE
 COUNCIL COMPLIANT PLANS

LEGEND:
 EXISTING BUILDING OUTLINE
 PROPOSED WORK

General Notes

Project Name and Address:
 42 BEACON HILL RD
 BROOKVALE NSW 2100

Project No. 1035344

Lot No. 1

Scale 1:100

Issue 5

Issued For DA

Project Name and Address:
 42 BEACON HILL RD
 BROOKVALE NSW 2100

Project No. 1035344

Lot No. 1

Scale 1:100

Issue 5

Issued For DA

NAME
 PROJECT
 USER

APPENDIX C - PHOTOS / IMAGES



Photo 1: Forest to the north of the site.



Photo 2: View looking north west.