

Building Construction in Bush Fire Prone Areas

Bushfire Hazard Assessment Report

REF No. 23.04.142

Address Lot 1 DP 26168
 52a Consul Road
 Brookvale NSW 2100

For H C Design for J & M Anderson

The site was inspected on 27th April 2023

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 1 DP 26168 52a Consul Road Brookvale NSW 2100
Description of Proposal	Alterations and additions to an existing Class 1a dwelling
Plan Reference: [Relied upon in report preparation]	This assessment is based on plans prepared by: H C Design Dated: 01.08.23 Job No: 230402
Bushfire Hazard Assessment Report Ref. No.	23.04.142
Report Date:	27.09.2023
BAL Rating:	BAL Flamezone
Does the proposal comply with the requirements of <i>Planning for Bush Fire Protection 2019</i> ?	NO
Does the proposal require referral to the NSW Rural Fire Service?	YES
Does the proposal rely on Alternate Solutions?	YES

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 development as contained in the attached Bushfire Hazard Assessment Report **does not conform** to the relevant specifications and requirements due to the potential exposure of the dwelling to Bushfire Attack Level (BAL) Flamezone.

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 Northern Beaches 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 H C Design for J & M Anderson being the owners of the subject land to prepare a bush fire hazard assessment report to be a supplement for inclusion in a development application to Northern Beaches Council, for the proposed construction of alterations and additions to an existing Class 1a 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*.

Bushfire Attack Summary

Lot 1 DP 26168

52a Consul Road Brookvale NSW 2100

	Northeast	Southwest
Vegetation Formation	Remnant Forest (Area A)	Remnant Forest (Area B)
Vegetation Slope	Upslope degrees	Downslope > 5 to 10 degrees
Building Separation Distance metres	2.116	37
Separation Slope	Upslope degrees	Downslope > 10 to 15 degrees
Flame Length (metres)	12.93	N/A
Fire Danger Index	100	100
AS 3959 Construction Standard	BAL Flamezone	BAL 12.5

The proposal contained within this report cannot provide for conformity to *Planning for Bush Fire Protection* 2019 and therefore includes an ***alternate solution*** which 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.

Table of Contents

1.0	Introduction.....	1
1.1	Purpose of Report.....	1
1.2	Scope of Report	1
1.3	Regulatory Controls	1
1.4	Methodology	2
1.5	The Proposal	2
2.0	Site and Adjacent Developments	3
2.1	Site Description.....	3
2.2	Description of Adjoining Lands	5
3.0	Environmental Considerations	6
4.0	Bushfire Hazard Assessment	7
4.1	Classification of Vegetation and Separation Distance from Proposed Development	7
4.2	Slope Assessment	8
4.3	Category of Bushfire Attack	9
5.0	Assessment of the extent to which the development conforms or deviates from <i>Planning for Bush Fire Protection</i> 2019	9
5.1	Asset Protection Zones	10
5.2	Siting and Design of Proposed Development	11
5.3	Construction Level	11
5.4	Access / Egress.....	12
5.5	Utility Supplies	13
5.6	Landscaping	14
6.0	Bushfire Hazard Assessment Recommendations	15
7.0	Conclusion	16
	References	17

Appendix 1 – Proposed dwelling alteration and addition plans ex H C Design

Appendix 2 –Detailed Method 2 for Determining Bushfire Attack Level (BAL)

Document Control

Revision No.	Author	Status	Date
01	Craig Burley	Final	27.09.23

1.0 Introduction

We have been engaged by H C Design for J & M Anderson being the owners of the subject land to prepare a bush fire hazard assessment report to be a supplement for inclusion in a development application to Northern Beaches Council for the proposed construction of alterations and additions to an existing Class 1a 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 Northern Beaches 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 27th April 2023 and a review of the proposed construction plans as supplied and prepared by H C Design has taken place.

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 architect and perusal of plans supplied, shows for the construction of alterations and additions to an existing Class 1a dwelling.

The external finishes for the dwelling have not been fully shown upon the plans supplied although it is anticipated that these will be further developed subject to the findings of this report.

Further details of construction are shown upon plans included within appendix 1 of this report.

However, it must be noted that the plans supplied may not fully satisfy the recommendations included within this report and subject to actual consent conditions issued by the consent authority some modifications or changes may need to occur to achieve the required compliance.

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 1 DP 26168
 52a Consul Road
 Brookvale NSW 2100
 LGA Northern Beaches Council

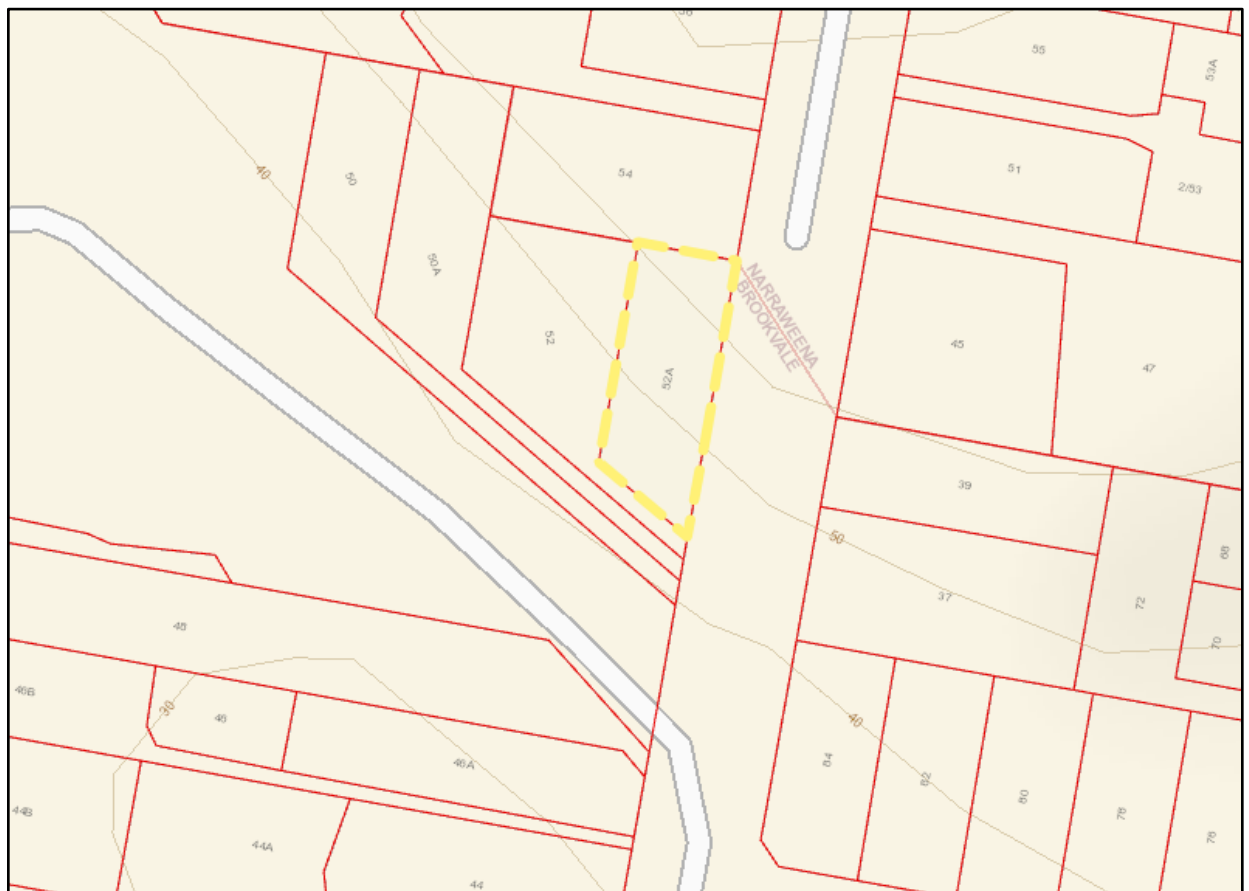


Figure 1: Address validation ex NSW Planning Portal

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 641.5m² located on the north eastern side of Consul Road. The area in which the proposal is located is generally urban residential development that has been established for many years.

The subject allotment is located within an area that should be considered as having a direct interface to bushfire hazardous vegetation.

The subject allotment is positioned upon the south westerly aspect slopes of a southeast to northwest ridgeline.

The parcel of land is slightly irregular in shape and the access to the subject site from a right of carriageway leading off Consul Road to the southeast corner of the parcel.

At present the site has structural improvements to be the existing Class 1a dwelling that is the subject of this report.

In terms of vegetation the subject allotment contains a combination of managed lands directly adjacent to the dwelling but also unmanaged remnant forest on very steeply ascending slopes across the northern section of the parcel.

The site is shown upon the Northern Beaches Bushfire Prone Land Map (Figure 2) to be wholly within category 1 vegetation buffer zone although the site inspection and interpretation of aerial photography for the site confirms that the subject allotment would be more accurately described as being within a combination category 1 vegetation and the resultant buffer areas. The area of vegetation hazard is understated and not currently mapped across the northern section of the site.



Figure 2; Section Northern Beaches 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 north of the subject allotment is existing residential development.

To the east, northeast and northwest of the subject allotment is a narrow section of remnant vegetation that has connectivity to a larger area of forest vegetation to the northwest.

To the east beyond a narrow section of remnant forest and beyond this is existing residential development. Directly adjoining to the west is existing residential development.

To the southwest beyond a private access road is again a narrow section of remnant forest.

To the south of the subject allotment is a combination of existing residential development and public roads.

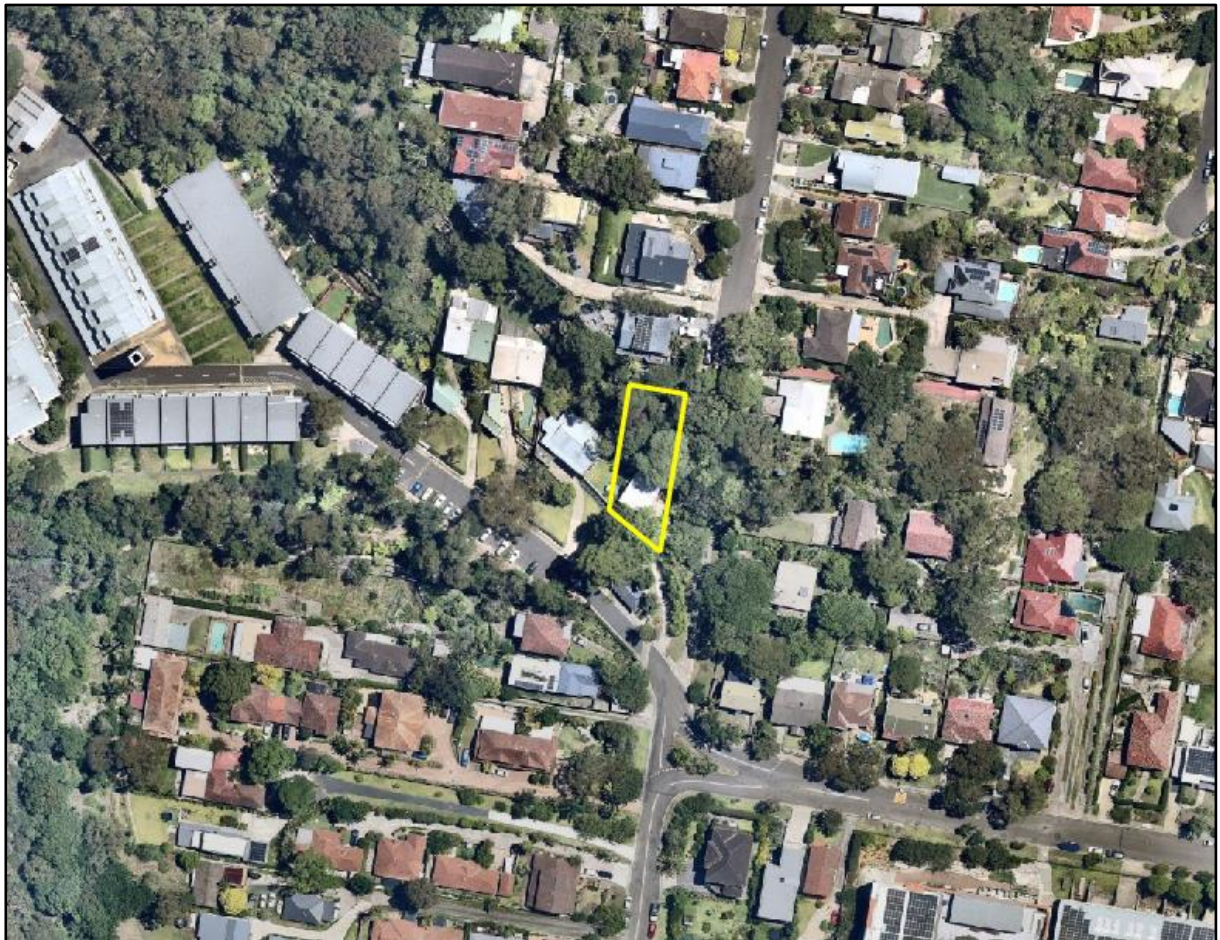


Figure 3: Aerial photo depicting localised terrain and adjoining allotments ex Nearmap

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 necessitate the removal of a limited section of 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.

The proposal is located on a site that has been developed for many years and this proposal does not change the current land use or increase the expected level of occupancy.

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.

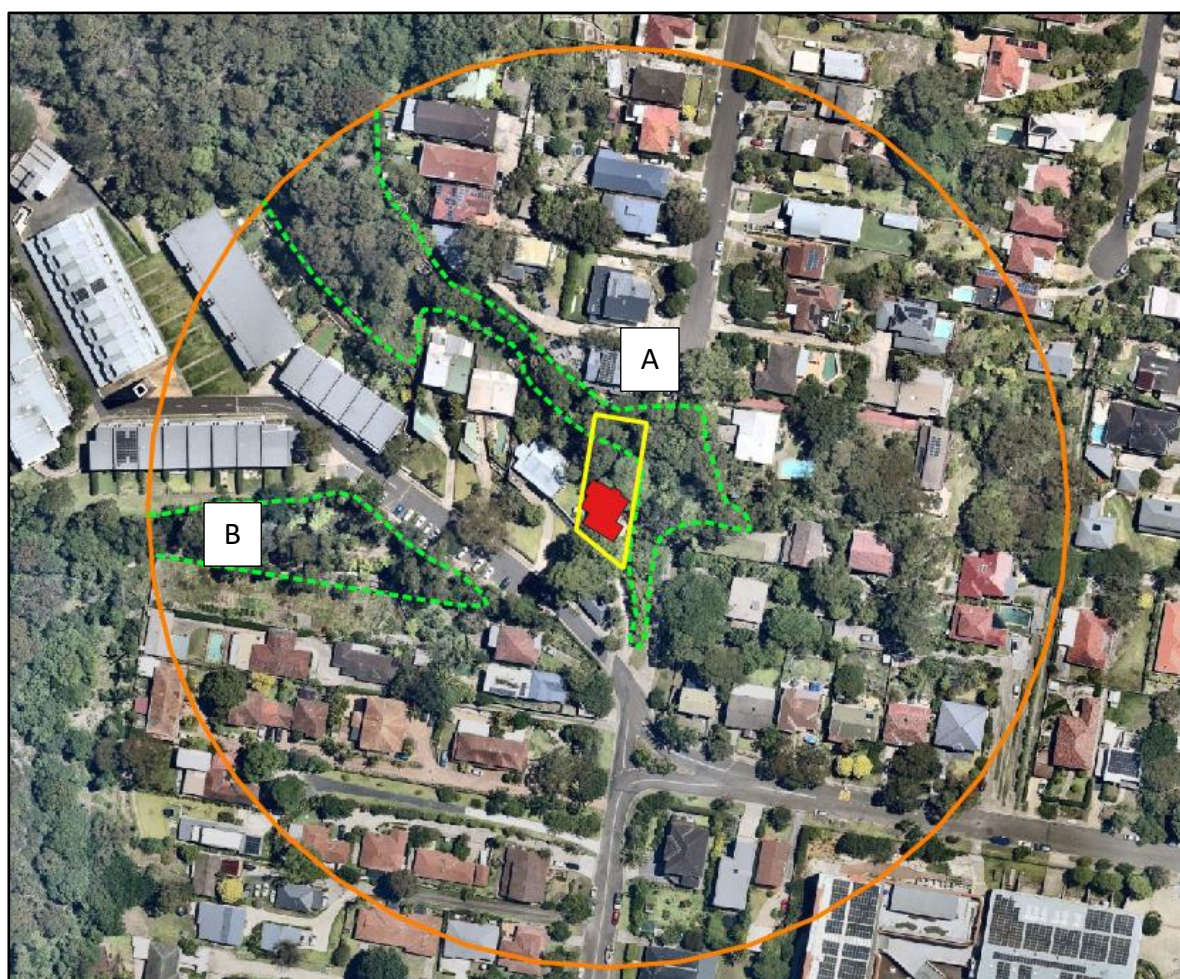


Figure 4: Vegetation study area



140 metre radius approx. Image ex Nearmap



Subject dwelling location



Remnant Forest

To the east, northeast and northwest of the subject dwelling (Area A) is an area of effective bushfire hazardous vegetation, and this area should be classified as being a vegetation formation of Remnant Forest with a minimum separation distance of 2.116 metres.

To the southwest of the subject allotment (Area B) is an area of effective bushfire hazardous vegetation and this area should be classified as being a vegetation formation of Remnant Forest with a minimum separation distance of 37 metres.

4.2 Slope Assessment

The slope was assessed for a distance of 100 metres 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 Image ex

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 – Remnant Forest - Upslope degrees (assumed) (elevation 17.54 met / dist. 26.49 met = 33.51 degrees)
- Area B – Remnant Forest - > 5 to 10 degrees downslope (assumed) (elevation 3.27 met / dist. 31.34 met = 5.96 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 could experience a BAL Flamezone category of bushfire attack. The proposed development is most likely to be subject to the greatest bushfire attack from any area to the northwest, north or northeast from the proposed development location.

Bushfire Attack Summary

	Northeast	Southwest
Vegetation Formation	Remnant Forest (Area A)	Remnant Forest (Area B)
Vegetation Slope	Upslope degrees	Downslope > 5 to 10 degrees
Building Separation Distance metres	2.116	37
Separation Slope	Upslope degrees	Downslope > 10 to 15 degrees
Flame Length (metres)	12.93	N/A
Fire Danger Index	100	100
AS 3959 Construction Standard	BAL Flamezone	BAL 12.5

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 alterations and additions to an existing Class 1a dwelling cannot conform to the requirements of *Planning for Bush Fire Protection 2019* when considered in conjunction of both the proposal supplied for this assessment and the recommendations include **alternate solutions** within this bushfire hazard assessment 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 entire area upon the subject allotment currently would not 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 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 as follows;

- a) From the north elevation of the dwelling for a distance of 12.0 metres; and
- b) From the eastern, western and southern elevations of the dwelling to the adjacent sections of the allotment boundaries.

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 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 alterations and additions 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*.

Given that the proposed development could experience a Bushfire Attack Level (BAL) Flamezone from vegetative fuels to the northwest, north and northeast, this proposed dwelling alterations and additions for the roof and eaves section, and eastern, northern and western elevations should therefore be designed and constructed to the requirements of AS 3959-2018 and must be constructed to comply with section 3 Construction General and section 9 BAL Flamezone of such standard apart from as varied to comply with section 7.5.2 Additional Construction Requirements of *Planning for Bushfire Protection 2019*.

After consideration of the calculated flame length being 12.93 metres the proposed dwelling alterations and additions for the southern elevation should therefore be designed and constructed to the requirements of AS 3959-2018 and must be

constructed to comply with section 3 Construction General and section 8 BAL 40 of such standard apart from as varied to comply with section 7.5.2 Additional Construction Requirements of *Planning for Bushfire Protection* 2019.

Additionally, to satisfy the guidance of the NSW RFS for “best practice” the existing dwelling shall be upgraded where or if necessary, to improve ember protection. This is to be achieved by enclosing all openings (excluding roof tile spaces) or covering of openings with a non-corrosive metal screen with a maximum aperture of 2mm. Where applicable, this includes any sub floor areas, openable windows, vents, weepholes and eaves. External doors are to be fitted with draught excluders.

5.4 Access / Egress

5.4.1 To the Proposed Development

The access to the subject site is from Consul 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.

Consul 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 will not be possible to all elevations of the dwelling, although a fire tanker will be able to park in reasonably close proximity to the southern building elevation upon the Consul Road carriageway and foot access will be available to each of the other building elevations.

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 Brookvale 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 14 metres to the east from the subject allotment on the private road adjacent to the eastern boundary



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 Consul 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 site where not built upon shall have the vegetation reduced where 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 as described below;
 - a) From the north elevation of the dwelling for a distance of 12.0 metres; and
 - b) From the eastern, western and southern elevations of the dwelling to the adjacent sections of the allotment boundaries.

These areas are to form a continuous and linked buffer around the entire dwelling.


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 proposed dwelling alterations and additions to the roof and eaves section, and the western, northern and eastern elevations constructions shall comply with section 3 Construction General and section 9 BAL FZ of Australian Standard AS3959-2018 *Construction of buildings in bush fire prone areas together with section 7.5 Additional Construction Requirements of Planning for Bush Fire Protection* 2019. Except for windows, flaming of the specimen is not permitted and there shall be no exposed timber.
4. That the proposed dwelling alterations and additions southern elevation shall be constructed to section 3 Construction General and section 8 BAL 40 of AS3959-2018 *Construction of buildings in bushfire prone areas* with the exception that the construction requirements shall be varied to comply with section 7.5.2 Additional Construction Requirements of *Planning for Bush Fire Protection* 2019.
5. That if the supply of gas to the subject dwelling is undertaken it shall be installed and maintained in accordance with AS 1596-2014 and the requirements of relevant authorities.
6. The residents should complete a *Bush Fire Survival Plan* as formulated by the NSW Rural Fire Service and the NSW Fire & Rescue.

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, whilst not being fully achieved due to the potential Flamezone category of bushfire attack upon sections of the development, will be enhanced by the incorporation of the 6 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
Grad.Dip. Building in Bushfire Prone Areas (UWS)
FPA Australia Certified BPAD – Level 3 Practitioner



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

Building Code of Australia Volume 2 2013 Australian Building Codes Board

AS 3959 –2018 Construction of buildings in bushfire prone areas Standards Australia & Australian Building Codes Board

Landscape and building Design for Bushfire Areas Ramsay C. & Rudolph L. CSIRO 2003

Quantifying bushfire penetration into urban areas in Australia Keping Chan & McAneney J. Geophysical Research Letters, Volume 31, L12212, doi:10.1029/2004GL020244,2004

Bushfires in Australia Luke R.H. & McArthur CSIRO 1978

Performance of Building Elements in Bushfire Prone Areas Poon S.L. & England J.P. Warrington Fire Research Australia

Address Validation Search Department of Lands www.maps.nsw.gov.au

Standards for Asset Protection Zones NSW Rural Fire Service 2005

Ocean Shores to Dessert Dunes Keith D. Department of Environment and Conservation Sydney 2004

Appendix 1- Proposed dwelling plans ex H C Design

PROPOSED ALTERATIONS & ADDITIONS

AT

52A CONSUL ROAD

BROOKVALE N.S.W. 2100

FOR

Mr. M. & Mrs. J. ANDERSON

AUGUST 2023

PRELIMINARY ONLY
NOT FOR
CONSTRUCTION
CONCEPTUAL DESIGN

H&C DESIGN PTY. LTD. * * * *

BASIX REQUIREMENTS

TO BE READ IN CONJUNCTION WITH THE
BASIX CERTIFICATE NUMBER *

ROOF AREA TO TANK TO BE USED FOR GARDEN USE	170	m ²
WATER STORAGE TANK CAPACITY	6000	MIN. LITRES
NEW SHOWER HEAD MINIMUM RATING	3	STAR RATING
NEW TOILET MINIMUM RATING	3	STAR RATING
ALL NEW TAP FITTINGS MINIMUM RATING	3	STAR RATING
GLAZING TO ALUMINIUM FRAMED WINDOWS OR OTHERWISE NOTED ARE TO BE IN ACCORDANCE WITH THE BASIX & BUSH FIRE REPORTS		
ROOF COLOUR	MEDIUM 0.46 - 0.70	SA
FLOOR ABOVE ENCLOSED SUBFLOOR	R2.5	RATING
ROOF SHEETING ON INSULATION	R1.5	RATING
EXTERNAL WALLS INSULATION	R2.5	RATING
RAKED CEILING INSULATION	R2.5	RATING
HEAT PUMP HOT WATER SERVICE		
COOLING SYSTEM TO BE IN AT LEAST 1 LIVING AREA & 1 BEDROOM TO BE A 1-PHASE AIR CONDITIONING WITH AN ENERGY RATING OF EER 3.0-3.5 OR MUST PROVIDE FOR DAY/NIGHT ZONING BETWEEN LIVING & BEDROOM AREAS.		
HEATING SYSTEM IN AT LEAST 1 LIVING AREA & 1 BEDROOM TO BE 1-PHASE AIR CONDITIONING WITH AN ENERGY RATING OF EER 3.0 - 3.5 OR BETTER.		
ELECTRIC FIRE PLACE		
FIXED OUTDOORS CLOTHES DRYING LINE TO BE INSTALLED		
INDUCTION COOKER WITH ELECTRIC OVEN		
APPLICANT MUST ENSURE THAT THE 'PRIMARY TYPE OF ARTIFICIAL LIGHTING' IS FLUORESCENT OR LIGHT EMITTING DIODE (LED) LIGHTING IN EACH OF THE FOLLOWING ROOMS, AND WHERE THE 'DEDICATED' APPEARS, THE FITTINGS MUST BE CAPABLE OF ACCEPTING FLUORESCENT OR LIGHT EMITTING DIODE (LED) LAMPS.		
THE LAUNDRY, AT LEAST 5 OF THE BEDROOMS (DEDICATED)		
STUDY, LIVING/DINING, FAMILY & RUMPUS ROOMS (DEDICATED)		
ALL BATHROOMS/TOILETS, KITCHEN, HALLWAYS (DEDICATED)		

INDUCTION COOKER WITH ELECTRIC OVEN.

APPLICANT MUST ENSURE THAT THE 'PRIMARY TYPE OF ARTIFICIAL LIGHTING' IS FLUORESCENT OR LIGHT EMITTING DIODE (LED) LIGHTING IN EACH OF THE FOLLOWING ROOMS, AND WHERE THE 'DEDICATED' APPEARS, THE FITTINGS MUST BE CAPABLE OF ACCEPTING FLUORESCENT OR LIGHT EMITTING DIODE (LED) LAMPS.

- THE LAUNDRY, AT LEAST 5 OF THE BEDROOMS (DEDICATED)
- STUDY, LIVING/DINING, FAMILY & RUMPUS ROOMS (DEDICATED)
- ALL BATHROOMS/TOILETS, KITCHEN, HALLWAYS (DEDICATED)

NOTE:-

ALL CONSTRUCTION TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE BUSH FIRE REPORT PREPARED BY CONTROL LINE CONSULTING.

SITE CRITERIA

No.52A CONSUL ROAD BROOKVALE N.S.W. 2100
LOT 1 D.P. 26166

SITE AREA = 641.5 sq. m. (BY CALC.)

EXISTING LOWER GROUND FLOOR AREA	= 50.3	sq. m.
PROPOSED LOWER GROUND FLOOR AREA	= 55.2	sq. m.
POST LOWER GROUND FLOOR AREA	= 71.8	sq. m.
EXISTING GROUND FLOOR AREA	= 34.5	sq. m.
PROPOSED GROUND FLOOR AREA	= 106.3	sq. m.
PROPOSED GROUND FLOOR FRONT DECK AREA	= 21.2	sq. m.
PROPOSED GROUND FLOOR REAR DECK AREA	= 72.1	sq. m.
PROPOSED TOTAL FIRST FLOOR AREA	= 9.7	sq. m.
PROPOSED FIRST FLOOR FRONT DECK AREA	= 104.3	sq. m.
EXISTING ROOF AREA	= 100.9	sq. m.
PROPOSED ROOF AREA	= 166.9	sq. m.
POST ROOF AREA	= 9.7	sq. m.
POST LANDSCAPED AREA > 2.0m WIDE	= 9.7	sq. m.
POST LANDSCAPED AREA < 2.0m WIDE	= 9.7	sq. m.
POST SOFT OPEN SPACE AREA	= 9.7	sq. m.
POST HARDEST AND OPEN SPACE AREA	= 9.7	sq. m.
POST TOTAL OPEN SPACE	= 9.7	sq. m.
TOTAL HARDEST AND POST DEVELOPMENT	= 9.7	sq. m.

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CONSTRUCTION
CONCEPTUAL DESIGN

Date AUG. 2023

Drawn HENK.

Scale 1:200

Job No. 230402-01

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50 FULLER STREET COLLAROY PLATEAU

EMAIL hcdesign@optusnet.com.au

PHONE 0412386411

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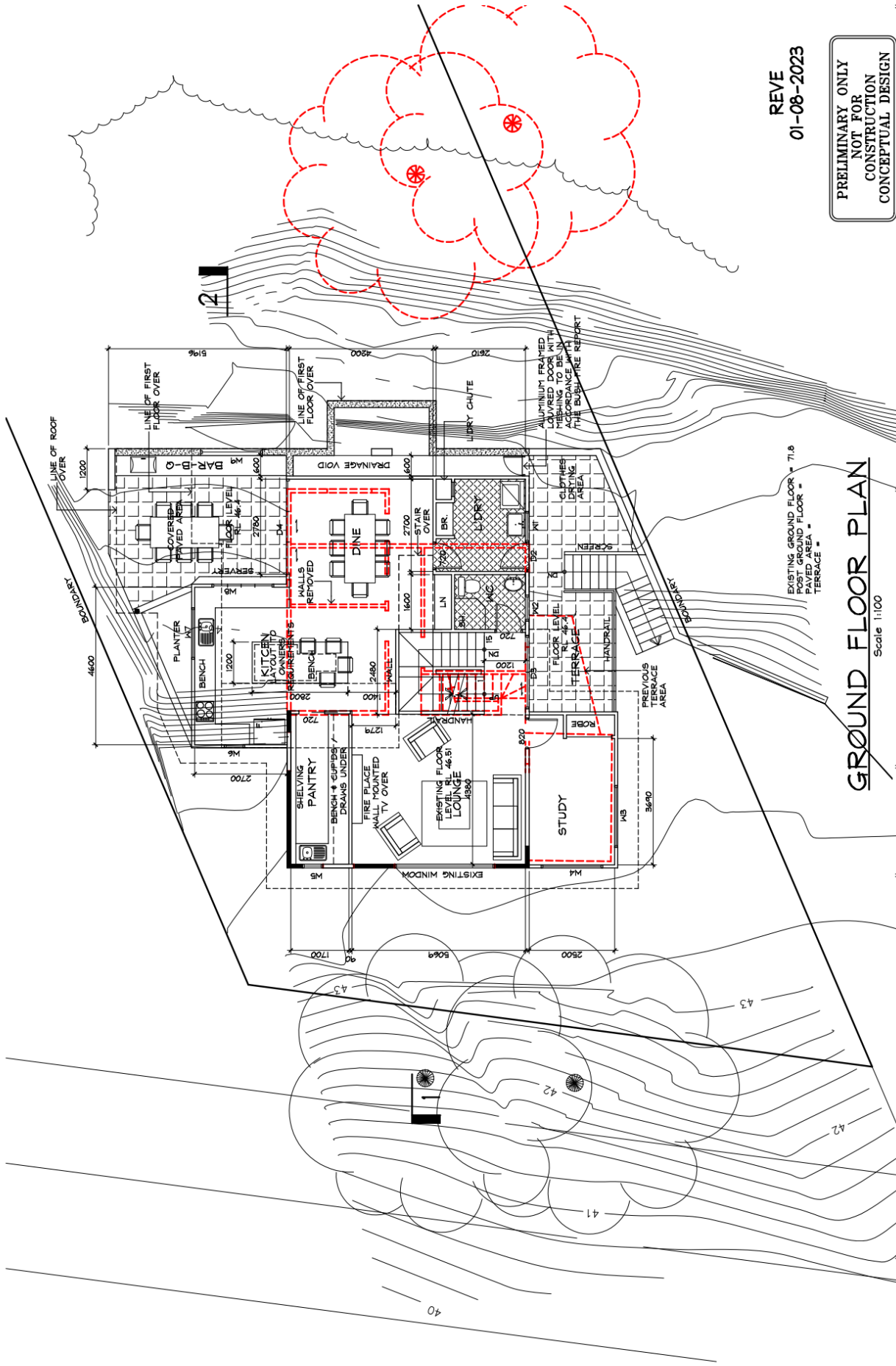
Project PROPOSED ALTERATIONS & ADDITIONS
52A CONSUL ROAD BROOKVALE

FOR Mr. M. & Mrs. J. ANDERSON

NOTES:-
1. Builder to check and confirm all necessary dimensions on site prior to the commencement of construction. DO NOT SCALE THE DRAWING.
2. All work to be in accordance with the B.C.A. / NCC & to the satisfaction of the Council Engineer.
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- NOTES:-
- ALL GLAZING TO WINDOWS & DOORS SHALL BE IN ACCORDANCE WITH THE BASIX AND THE BUSH FIRE REPORTS.
 - EXTERNAL WALL CLADDING SHALL BE SELECTED IN ACCORDANCE WITH THE BASIX REPORT.
 - AN APPROVED RATED INSULATION TO ALL EXTERNAL THERMALLY TRANSPARENT WALLS IN ACCORDANCE WITH THE BASIX REPORT.
 - SPACE WITHIN THE PERIMETER OF ALL EXTERNAL WALLS IN ACCORDANCE WITH THE BASIX REPORT.
 - AN APPROVED RATED CONDENSATION BLANKET PLACED UNDER ROOF WITH THE BASIX REPORT.
 - ROOF FINISHES TO BE IN ACCORDANCE WITH THE BASIX REPORT AND THE BUSH FIRE REPORT.
 - EXTERNAL WALL FINISHES TO BE IN ACCORDANCE WITH THE BASIX REPORT.
 - ALL WINDOWS AND DOORS TO HAVE WEATHER STRIPPING.
 - ALL WINDOWS & DOORS AS NOTED ON PLAN WITH SPECIFIED COLOUR FINISH.
 - ALL PAINTING TO OWNERS REQUIREMENTS.
 - ALL GLAZING TO CODE AS1298.
 - ALL TREATMENT TO CODE AS3660.1-2000.
 - SPOKE ALARM DENOTED SA ON PLAN TO B.C.A. 3.7.2 & AS3786.
 - ALL THERMALLY TRANSPARENT WALLS TO CODE AS3740.
 - ALL THERMALLY TRANSPARENT WALLS TO CODE AS3740.
 - ALL THERMALLY TRANSPARENT WALLS TO CODE AS3740.
 - ALL WORK CARRIED OUT TO BE IN ACCORDANCE WITH THE B.C.A.

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ASK



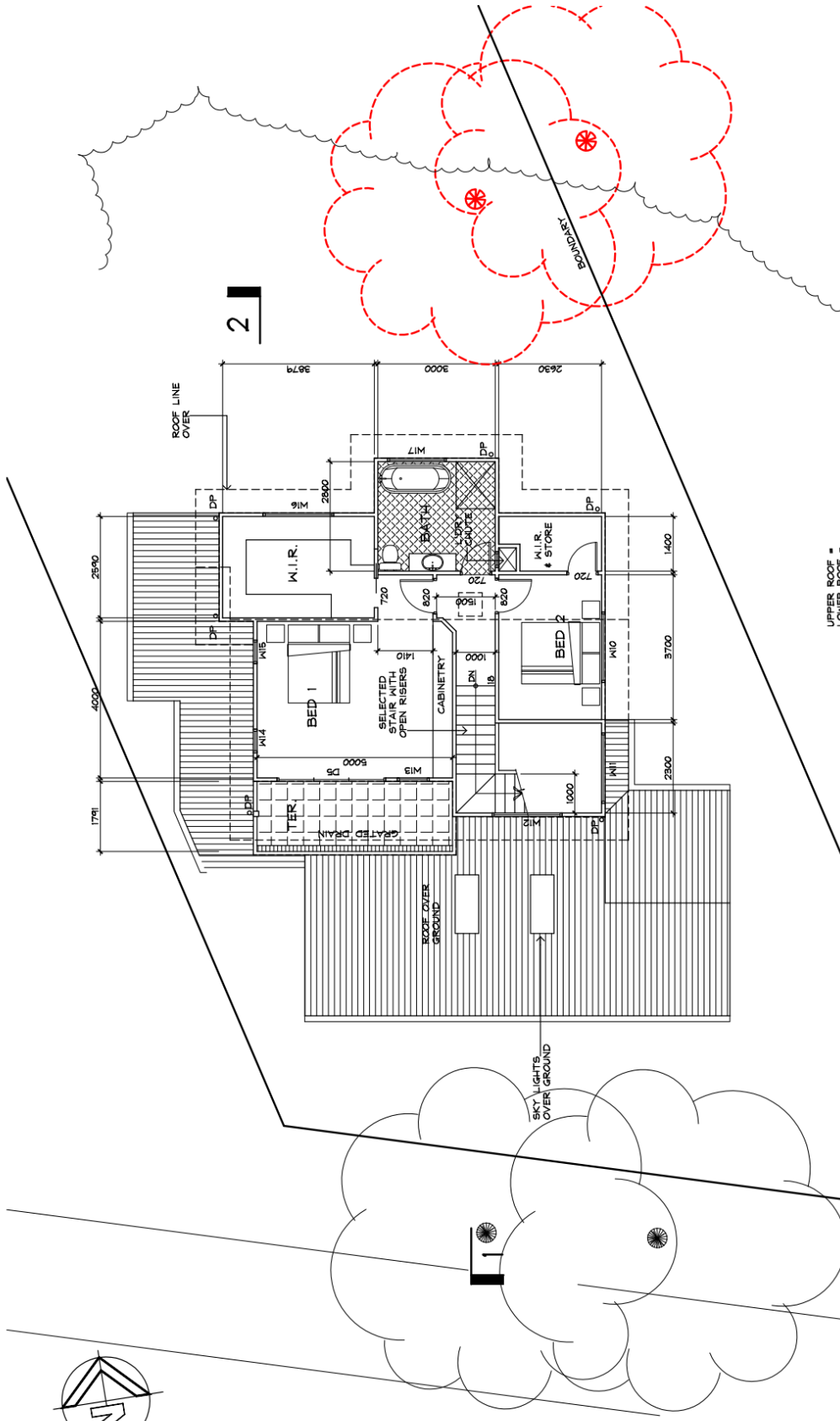
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GROUND FLOOR PLAN

Scale 1:100

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FIRST FLOOR PLAN

Scale 1:100

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Date AUG. 2023

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Scale 1:100

Job No. 230402-04

NOTES:-

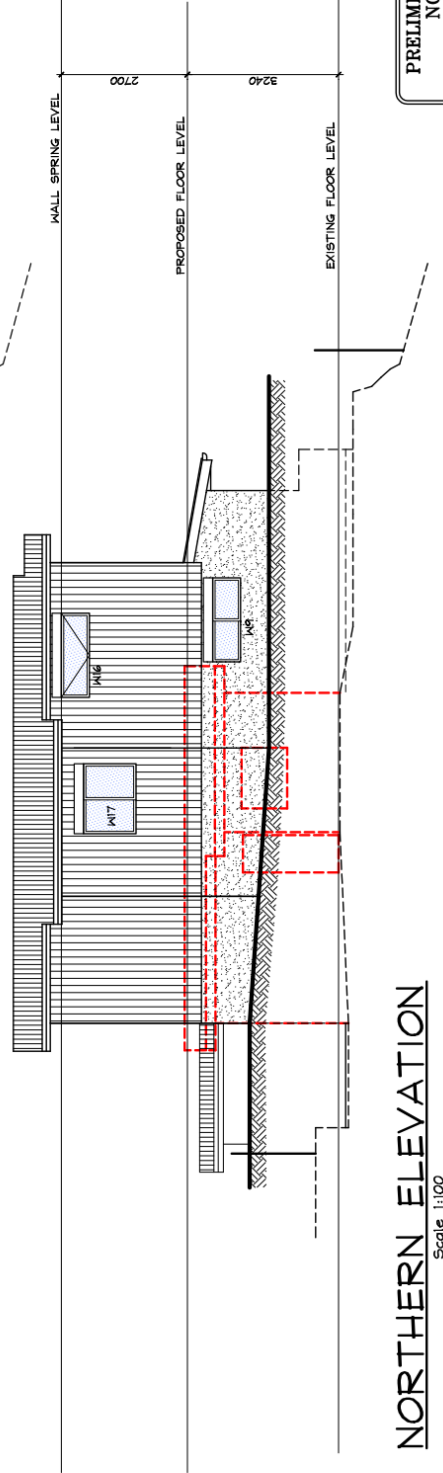
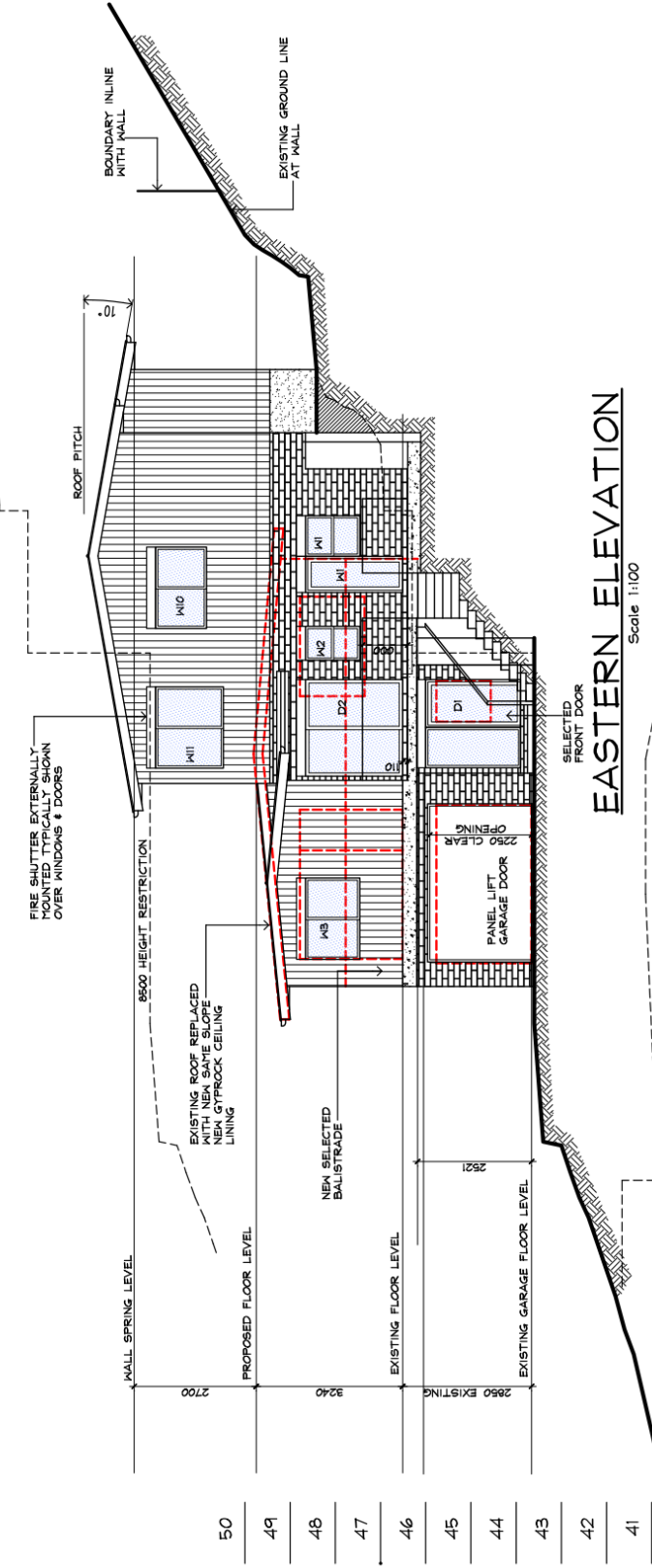
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Project PROPOSED ALTERATIONS & ADDITIONS

52A CONSUL ROAD BROOKVALE

FOR Mr. M. & Mrs. J. ANDERSON

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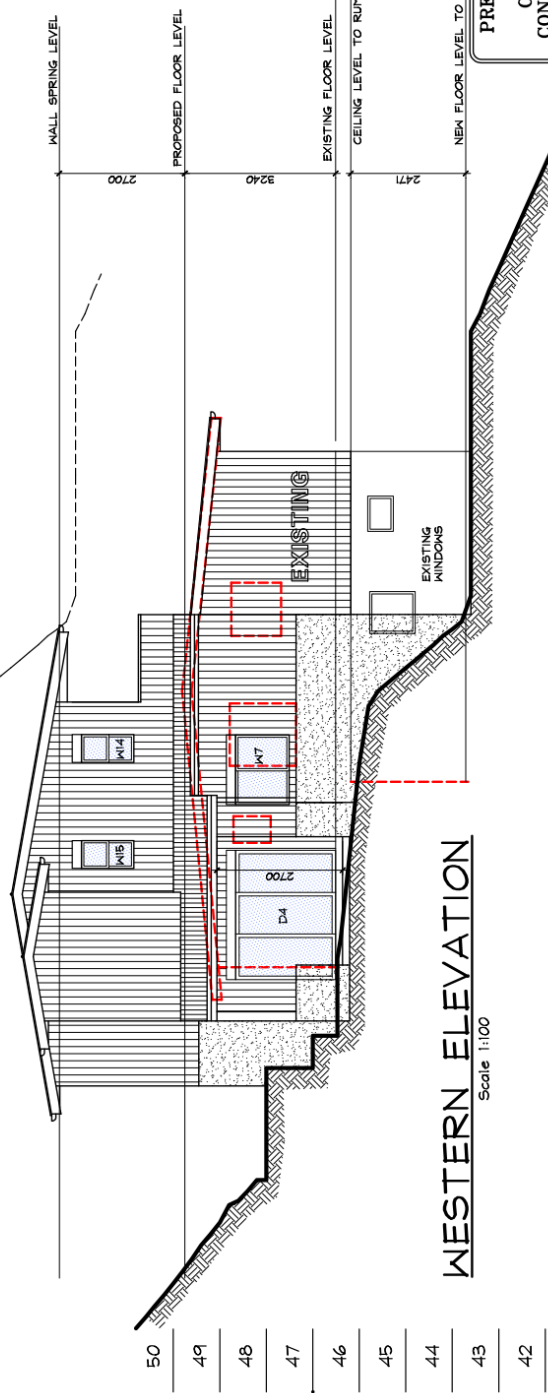
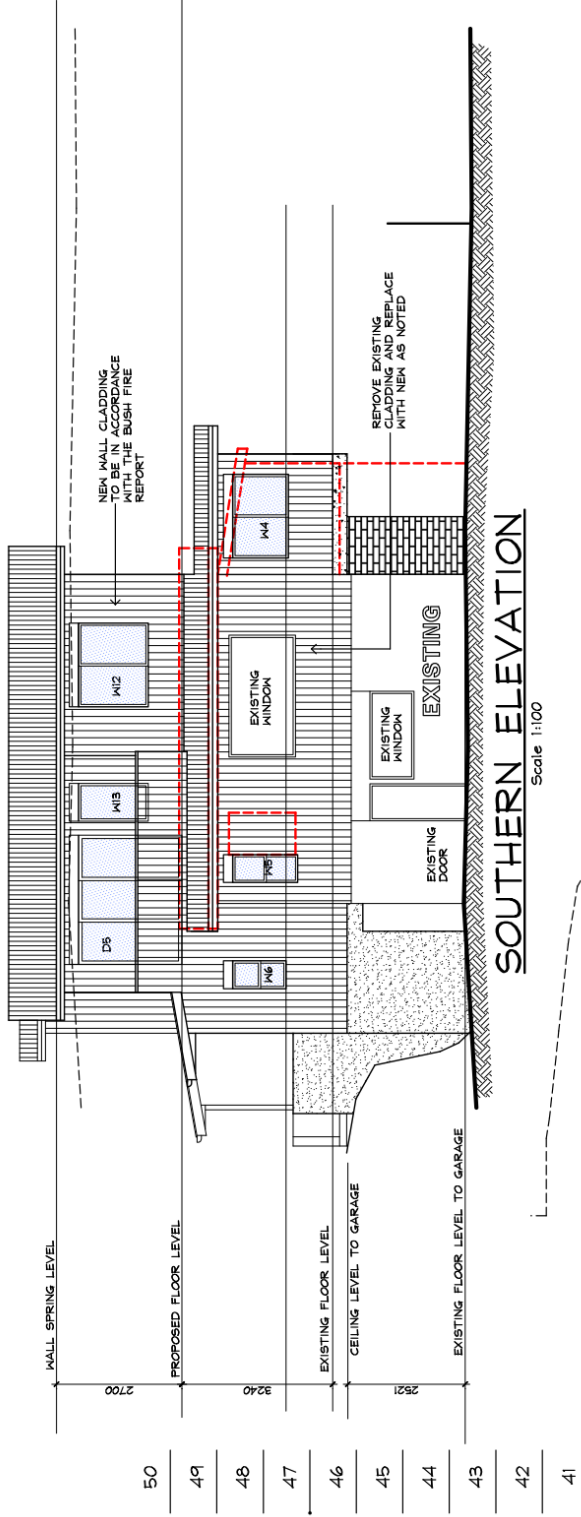
Project PROPOSED ALTERATIONS & ADDITIONS
52A CONSUL ROAD BROOKVALE
FOR Mr. M. & Mrs. J. ANDERSON

NOTES:-
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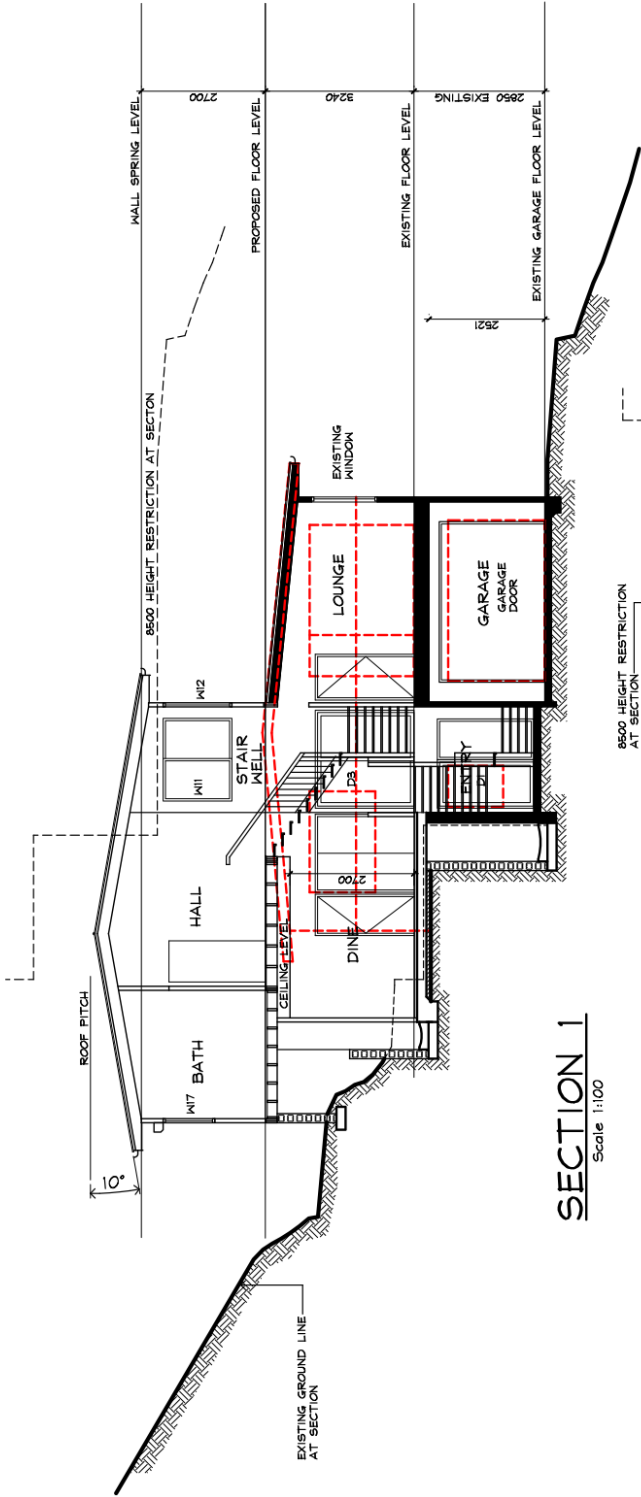
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52A CONSUL ROAD BROOKVALE
FOR Mr. M. & Mrs. J. ANDERSON

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Job No. 230402-06

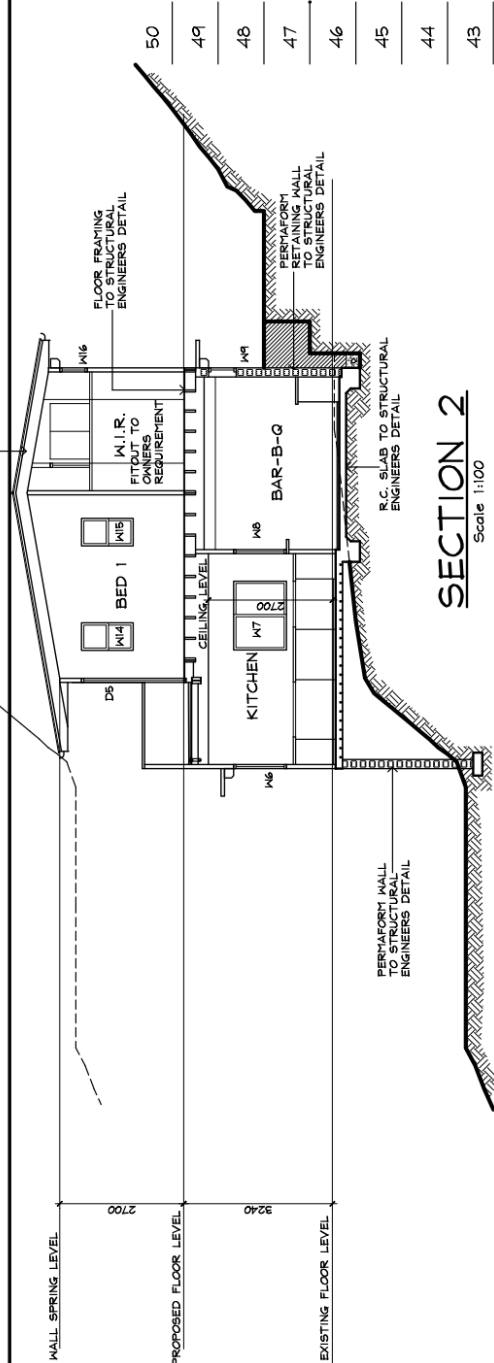
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SECTION 1

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SECTION 2

Scale 1:100

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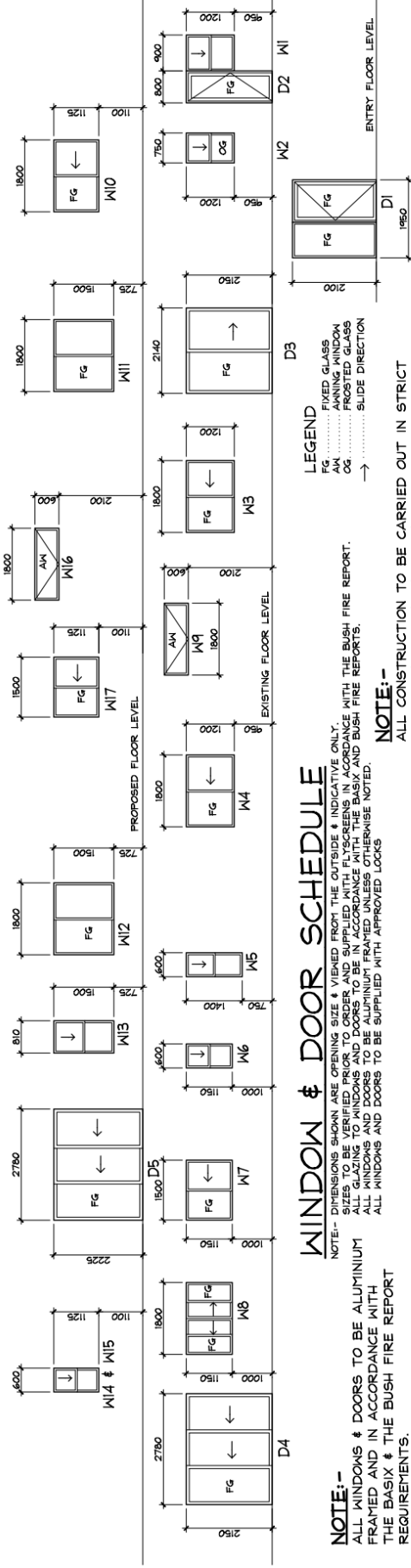
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Job No.230402-07

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Project
**PROPOSED ALTERATIONS & ADDITIONS
52A CONSUL ROAD BROOKVALE**
FOR **Mr. M. & Mrs. J. ANDERSON**



WINDOW & DOOR SCHEDULE

NOTE:- DIMENSIONS SHOWN ARE OPENING SIZE & VIEWED FROM THE OUTSIDE & INDICATIVE ONLY.
SIZES TO BE VERIFIED PRIOR TO ORDER AND SUPPLIED WITH FLYSCREENS IN ACCORDANCE WITH THE BUSH FIRE REPORT.
ALL GLAZING TO WINDOWS AND DOORS TO BE IN ACCORDANCE WITH THE BASIX AND BUSH FIRE REPORTS.
ALL WINDOWS AND DOORS TO BE SUPPLIED WITH APPROVED LOCKS.
ALL WINDOWS AND DOORS TO BE SUPPLIED WITH APPROVED LOCKS.

NOTE:-
ALL WINDOWS & DOORS TO BE ALUMINIUM
FRAMED AND IN ACCORDANCE WITH
THE BASIX & THE BUSH FIRE REPORT
REQUIREMENTS.

NOTE:-
ALL CONSTRUCTION TO BE CARRIED OUT IN STRICT
ACCORDANCE WITH THE BUSH FIRE REPORT PREPARED
BY CONTROL LINE CONSULTING.

LEGEND
FG FIXED GLASS
AW AWNING WINDOW
OG FROSTED GLASS
→ SLIDE DIRECTION

REVE
06-08-2023

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PHONE: 0412986411 A.C.N.002079192 *

Date AUG. 2023
Drawn
HENK.
Scale 1:100
Job No. 230402-08

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Project
**PROPOSED ALTERATIONS & ADDITIONS
52A CONSUL ROAD BROOKVALE**
FOR **Mr. M. & Mrs. J. ANDERSON**

Appendix 2 –Detailed Method 2 for Determining Bushfire Attack Level (BAL)



Calculated September 27, 2023, 4:27 pm (BALc v.4.9)

52a Consul Road Brookvale - North exposure

Bushfire Attack Level calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	100	Rate of spread	1.32 km/h
Vegetation classification	Forest	Flame length	12.93 m
Understorey fuel load	22 t/ha	Flame angle	1 °
Total fuel load	36.1 t/ha	Panel height	0.22 m
Vegetation height	n/a	Elevation of receiver	0.48 m
Effective slope	-10 °	Fire intensity	24,697 kW/m
Site slope	-10 °	Transmissivity	1
Distance to vegetation	2.1 m	Viewfactor	1
Flame width	100 m	Radiant heat flux	76.03 kW/m ²
Windspeed	n/a	Bushfire Attack Level	BAL-FZ
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