

Building Construction in Bush Fire Prone Areas

Bushfire Hazard Assessment Report

REF No. 24.05.135

Address Lot 10 DP 16749
 1027 Barrenjoey Road
 Palm Beach
 NSW 2108

For MHDP Architects for Mr & Mrs Spencer

The site was inspected on 13th May 2024

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 10 DP 16749 1027 Barrenjoey Road Palm Beach NSW 2108
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: MHDP Architects Dated: 03.04.2024 Issue: A
Bushfire Hazard Assessment Report Ref. No.	24.05.135
Report Date:	23.05.2024
BAL Rating:	BAL 12.5
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 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 MHDP Architects on behalf of Mr & Mrs Spencer being the owners of the subject land to prepare a Bushfire 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*.

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

Bushfire Attack Summary

Lot 10 DP 16749

1027 Barrenjoey Road

Palm Beach NSW 2108

Northeast

Vegetation Formation	Forest (Area A)
Vegetation Slope	Upslope degrees
Building Separation Distance metres	65
Separation Slope	Upslope degrees
Fire Danger Index	100
AS 3959 Construction Standard	BAL 12.5

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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Appendix 1 – Proposed dwelling alteration and addition plans ex MHDP Architects

Document Control

Revision No.	Author	Status	Date
01	Craig Burley	Final	23.05.2024

1.0 Introduction

We have been engaged by MHDP Architects on behalf of Mr & Mrs Spencer, the owners of the subject land to prepare a Bushfire 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 13th May 2024 and a review of the proposed construction plans as supplied and prepared by MHDP Architects 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 proponents and perusal of plans supplied, shows for the construction of alterations and additions to an existing Class 1a dwelling.

In broad terms the alterations and additions consist of the addition of a new pool and deck area to the north eastern elevation of the existing dwelling.

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 10 DP 16749
 1027 Barrenjoey Road
 Palm Beach NSW 2108
 LGA Northern Beaches



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 436.8 m² located on south western side Barrenjoey 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 an indirect interface to bushfire hazardous vegetation.

The subject allotment is positioned upon the south westerly aspect slopes of a northwest to southeast ridgeline. The allotment is on the western side of the narrow peninsular of land that lies between the Pacific Ocean to the east and Pittwater to the west.

At present the site has structural improvements being the existing dwelling and also the clearing of vegetation for the provision of asset protection zones has taken place.

In terms of vegetation the subject allotment contains no areas of hazardous vegetation.

The site is shown upon the Northern Beaches Bushfire Prone Land Map (Figure 2) to be wholly within a category 1 vegetation buffer zone (shown yellow). The site inspection and interpretation of aerial photography for the site confirms that the subject allotment is accurately depicted upon this image.

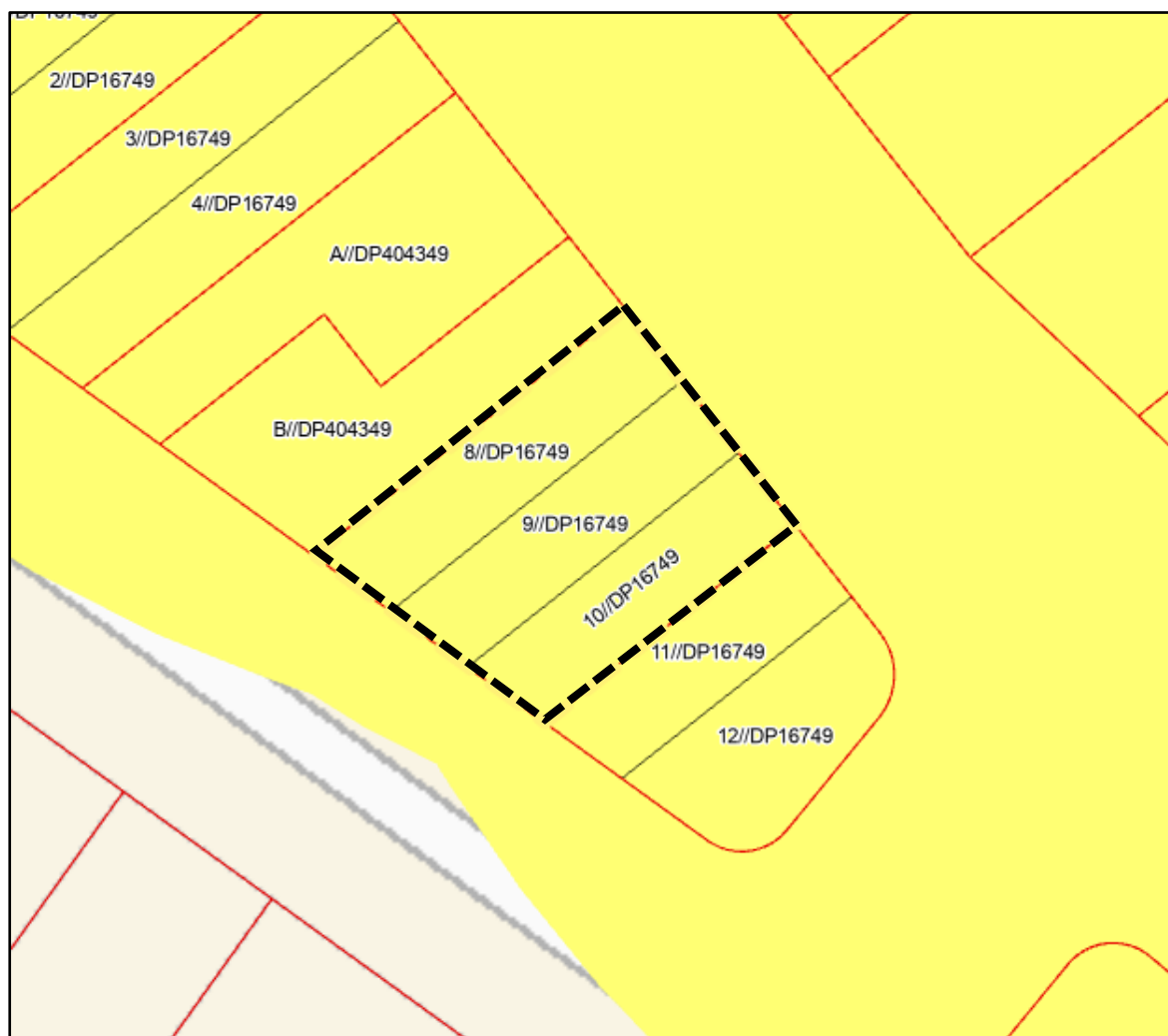


Figure 2; Section Northern Beaches LGA Bushfire Prone Land Map ex NSW Planning Portal

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

2.2 Description of Adjoining Lands

In all directions from the subject allotment is existing residential development and the carriageways of Barrenjoey Road to the northeast) and Iluka Road to the southwest.

Beyond the area of residential development to the northeast is a section of forest which forms the area of vegetation hazard effective upon the proposed development.



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 not necessitate the removal of any vegetation as required 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



Alterations & additions location



Forest

To the northeast of the subject allotment (Area A) is an area of effective bushfire hazardous vegetation and this area should be classified as being a vegetation formation of **Forest** with a minimum separation distance of 65 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 - Upslope degrees (assumed) (elevation 32.51 met / dist. 63.45 met = 27.31 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 12.5** category of bushfire attack. The proposed development is most likely to be subject to the greatest bushfire attack from any area to the **northeast** from the proposed development location.

Bushfire Attack Summary

Northeast	
Vegetation Formation	Forest (Area A)
Vegetation Slope	Upslope degrees
Building Separation Distance metres	65
Separation Slope	Upslope degrees
Fire Danger Index	100
AS 3959 Construction Standard	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 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.

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*.

Given that the proposed development could experience a Bushfire Attack Level (BAL) 12.5 from vegetative fuels to the northeast, this proposed development 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 5 BAL 12.5 of such standard apart from as varied to comply with section 7.5.2 Additional Construction Requirements of *Planning for Bushfire Protection 2019*.

5.4 Access / Egress

5.4.1 To the Proposed Development

The access to the subject site is from Iluka 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.

Iluka 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 Iluka 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 Palm Beach 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 north from the subject allotment on the road verge area of Barrenjoey Road.

The site inspection confirmed the location of this hydrant.

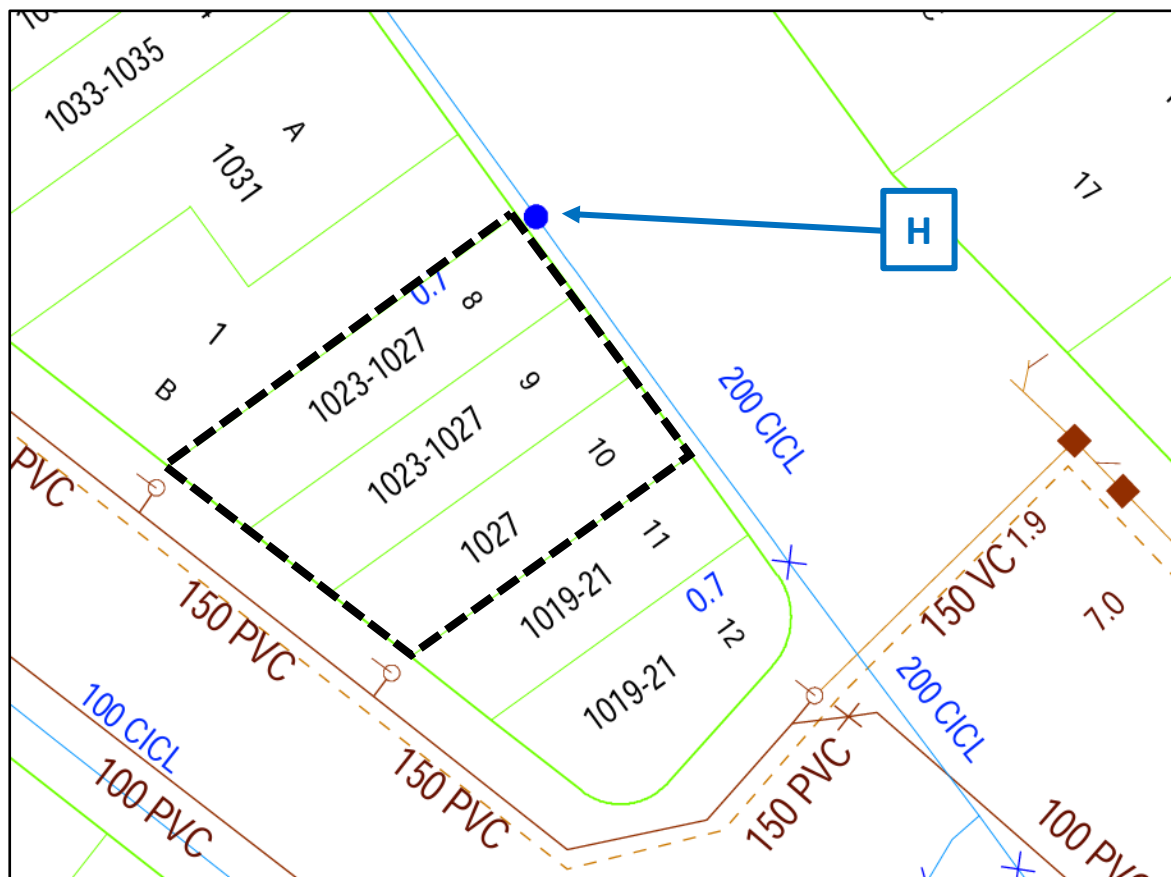


Figure 6: Section Sydney Water Reticulated Mains Water Supply Layout Plans

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 Iluka 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 landscape plan was supplied for perusal and this appears to satisfy the objectives for an asset protection zone as required by *Planning for Bushfire Protection* 2019.

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 proposed development shall be constructed to section 3 Construction General and section 5 BAL 12.5 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.
4. 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.

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 4 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

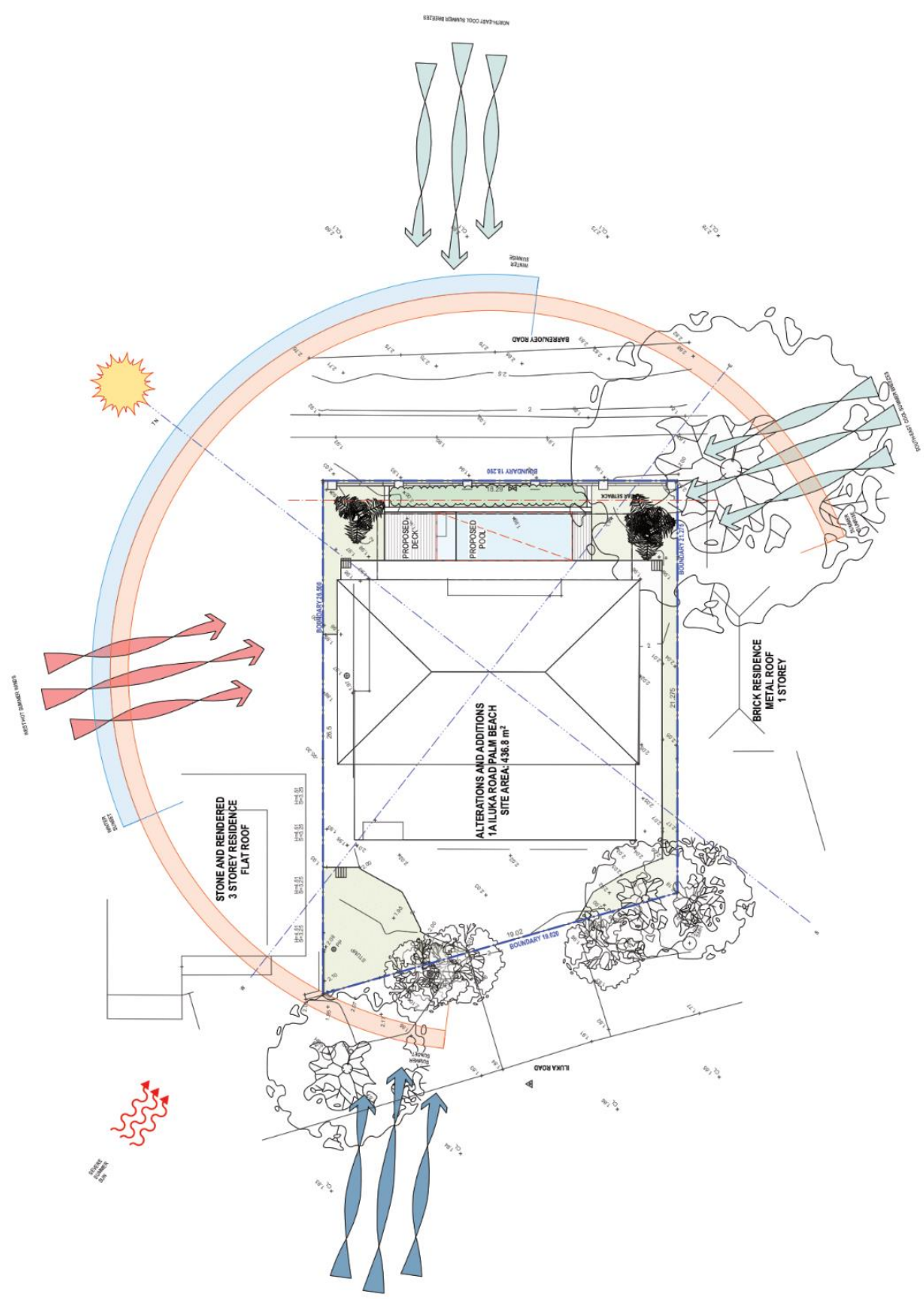
Performance of Building Elements in Bushfire Prone Areas Poon S.L. & England J.P. Warrington Fire Research Australia

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 development plans ex MHDP Architects



SWIMMING POOL
1A ILUKA ROAD PALM BEACH

DEMOLITION AND EXCAVATION PLAN

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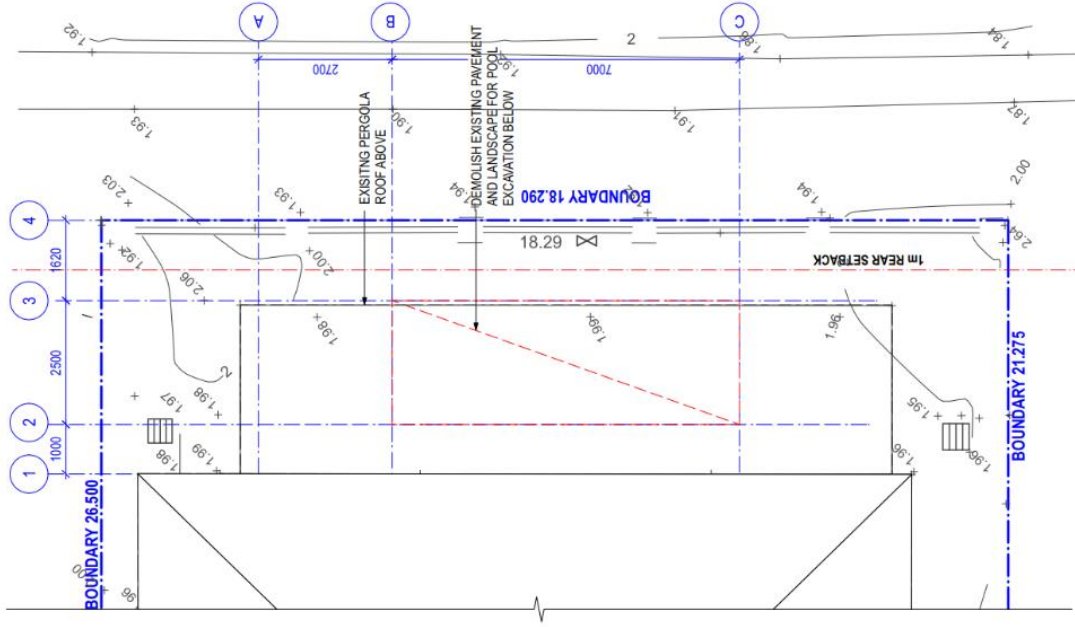
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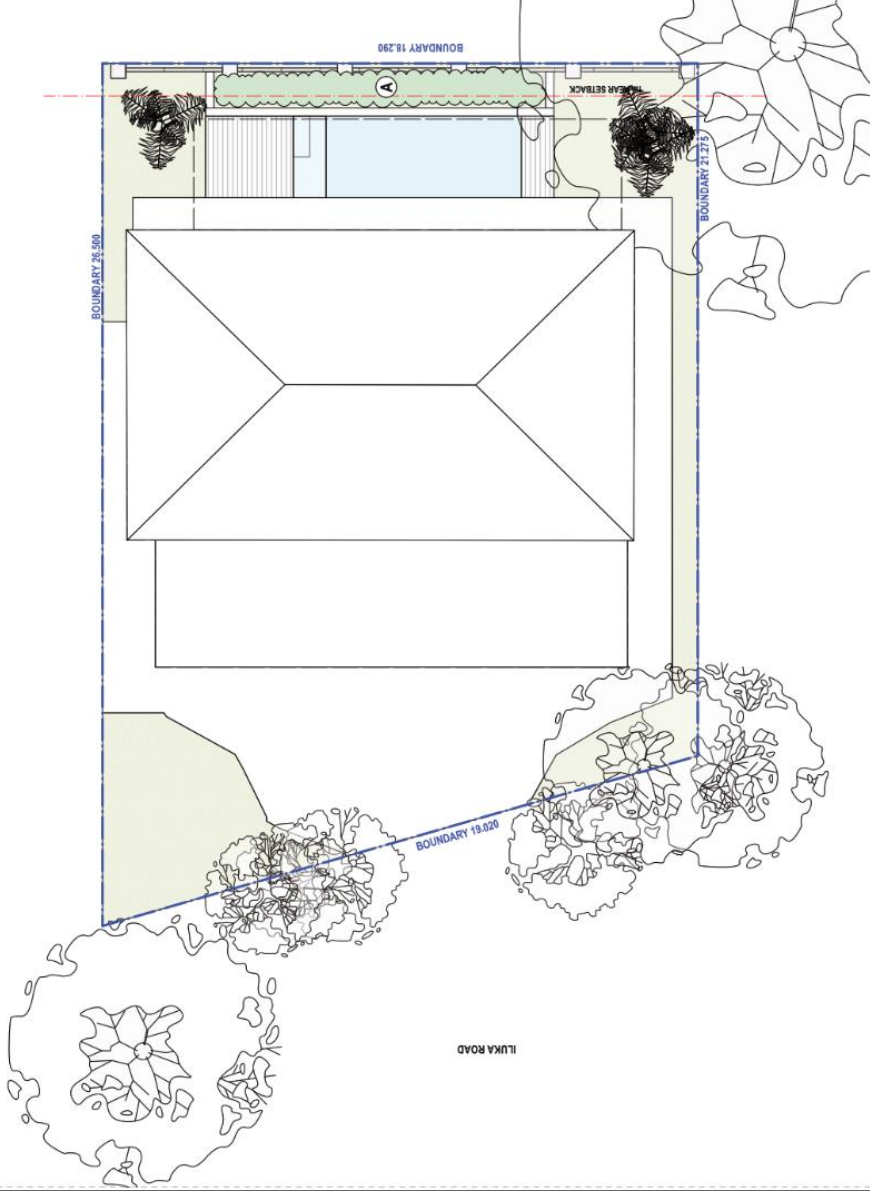
APRIL 2024

MHP
ARCHITECTS



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HEDGE SCREENING

A variety of up to 3 species of plants to be selected from the list below, subject to nursery availability. Boundary hedging limited to approx 2-4m in height

COMMON NAME	SPECIES	HEIGHT
ROUGH FRUIT PITTOPOBIUM	Pittosporum walteri	1.5m max
SMALL LEAF LILLY PILLY	Syzygium smithii "hedge master"	1.5m max
MAUREL	Syzygium australe	1.5m max
COASTAL MATTLE	Acacia saligna	1.5m max
TEDDY BEAR MAGNOLIA	Magnolia grandiflora	1.5m max

HEDGES



MAGENTA LILLY PILLY
Syzygium paniculatum



ROUGH LEAF
PITTOPOBIUM
Pittosporum walteri



HEDGING LILLY PILLY
Syzygium australe Bush
Ornamental



TEDDY BEAR MAGNOLIA
Magnolia grandiflora

ISSUED FOR DEVELOPMENT APPLICATION
AND SUBMITTAL
DATE: 15/03/2024
REVISION: A
PROJECT: 1A ILUKA ROAD PALM BEACH
DRAWN BY: JESSICA MARTIN
CHECKED BY: JESSICA MARTIN
DATE: 15/03/2024
SCALE: 1:150 @ A3
NOT FOR CONSTRUCTION
© 2024 MHD Architects Pty Ltd

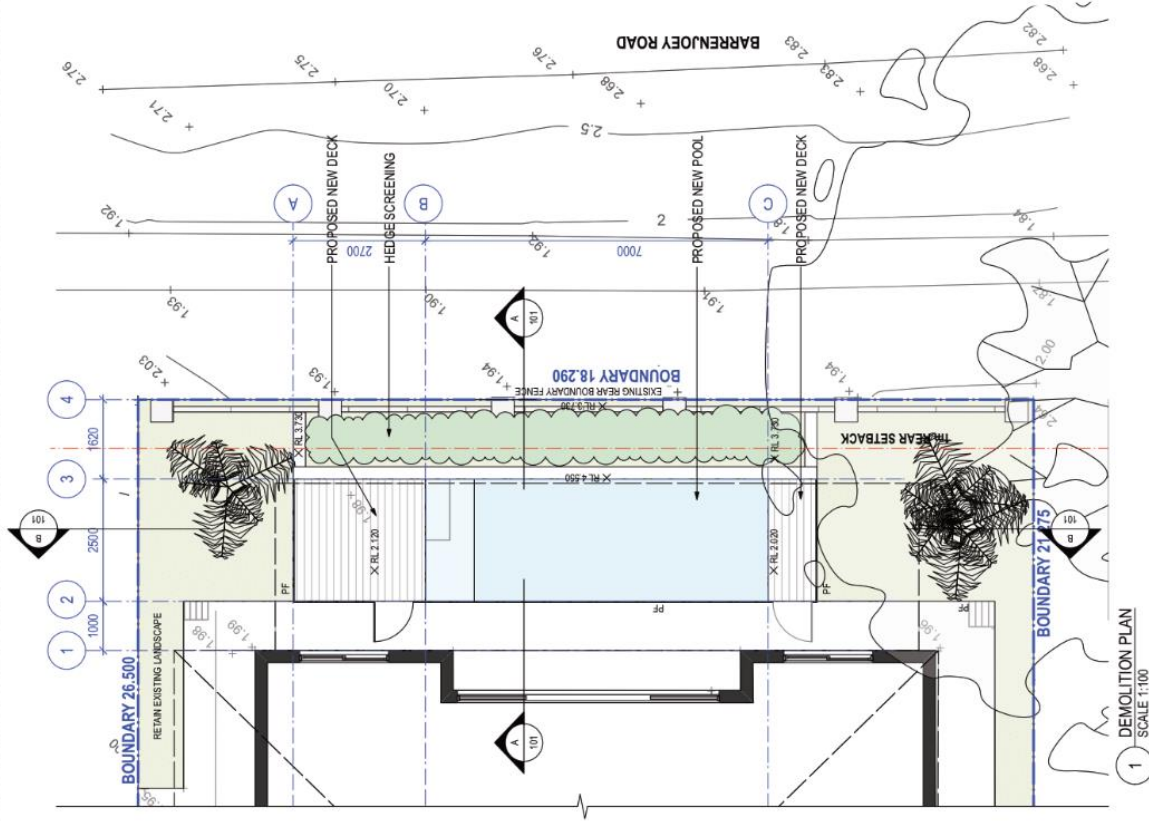
SWIMMING POOL 1A ILUKA ROAD PALM BEACH

LANDSCAPE PLAN

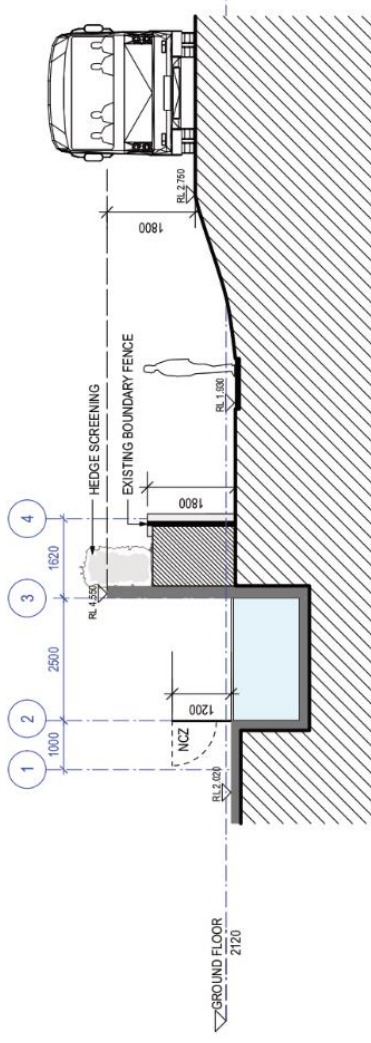
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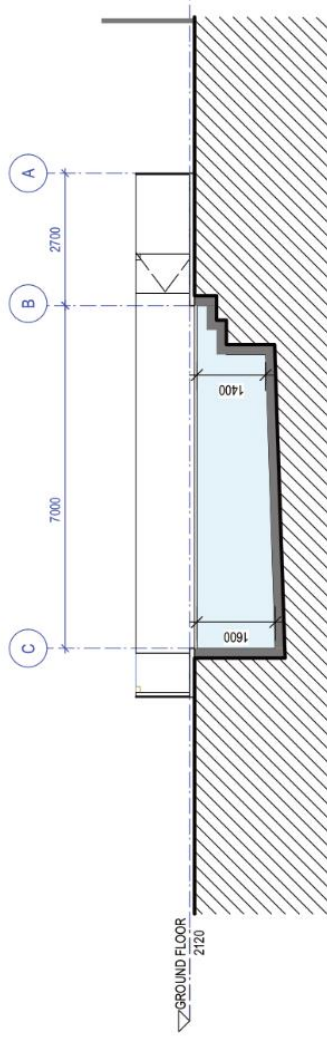




1 DEMOLITION PLAN
SCALE 1:100



2 SECTION AA
SCALE 1:100



3 SECTION BB
SCALE 1:100

ROUTED DEVELOPMENT APPLICATION
AMENDMENT
DATE 13/02/24
REVISION A
NOTES: 1. The pool and deck area is to be demolished and replaced with a new pool and deck area.
2. The pool and deck area is to be replaced with a new pool and deck area.
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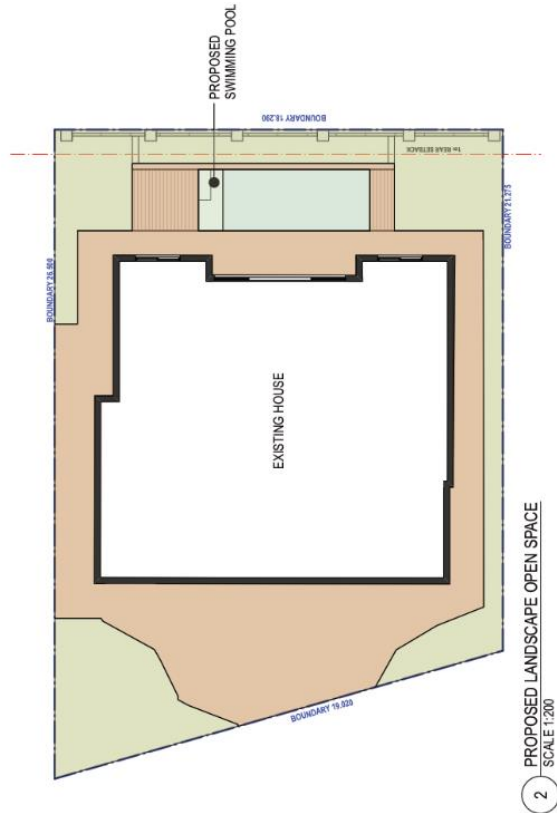
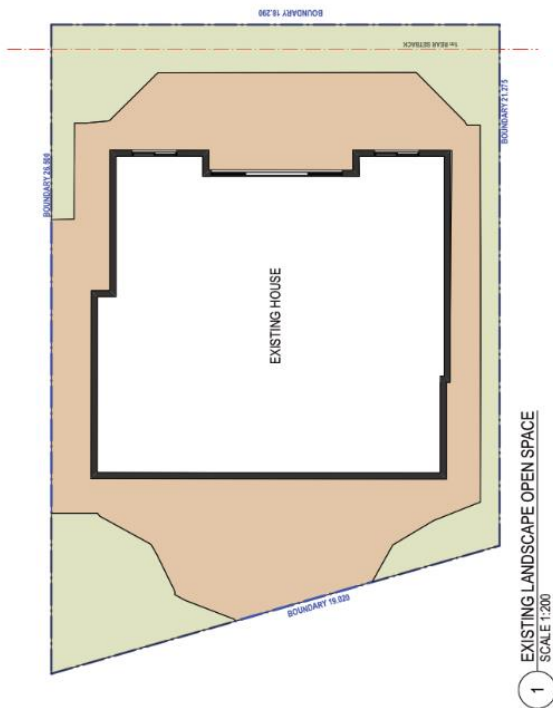
SWIMMING POOL 1A ILUKA ROAD PALM BEACH

POOL AND DECK AREA

2322 A101 A
1:100 @ A3 APRIL 2024

0 1:100 2m





LANDSCAPE OPEN SPACE CALCULATION	
TOTAL SITE AREA	436.86 SQ.M
LANDSCAPE AREA REQUIRED	218.43 SQ.M - 50%
EXISTING LANDSCAPE AREA	99 SQ.M - 22.7% (existing non-compliance)
EXISTING PAVED AREA	150.46 SQ.M
PROPOSED LANDSCAPE AREA	97.7 SQ.M - 22.4% (0.3% less than existing non-compliance)
PROPOSED PAVED AREA	134.63 SQ.M
PROPOSED POOL AREA	17.5 SQ.M