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BUSHFIRE HAZARD ASSESSMENT

PROPOSED BOARDING HOUSE

16 WYATT AVENUE, BELROSE NSW

LGA: Northern Beaches

Lot 2566 DP 752038

Applicant: Northern Beaches Essential Services Accommodation

HARRIS ENVIRONMENTAL CONSULTING

KATE@HEC.ECO

HARRIS ENVIRONMENTAL CONSULTING**Version Control**

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|----------------|--|--------------|-------------|----------|
| Proposal | Proposed Boarding House | | | |
| Site Address | 16 Wyatt Avenue, Belrose NSW, Lot 2566 DP 752038 | | | |
| Prepared By | Letara Judd BPAD L2 | | | |
| Approved By: | Katherine Harris – BPAD L3 | | | |
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ASSESSOR & QUALIFICATIONS

Kate Hains



BPAD L3 26947
 GRAD DIP BUSH FIRE PROTECTION, UWS
 GRAD DIP ENVIRO MANG HERTS, UK
 GRAD DIP NAT RES UNE
 BSC APP SC, AGRICULTURE HAC

ABN 541 287 40 549

Phone: (02) 42 360 954

Mobile: 0403 237 072

Email: kate@hec.eco

Web: www.harrisenvironmental.com.au

DISCLAIMER

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

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EXECUTIVE SUMMARY

This report provides a Bushfire Hazard Assessment for a proposal to construct a boarding house consisting of 2 modules at 16 Wyatt Avenue, Belrose NSW. Kate Harris visited the site.

The assessment confirms the subject lot is mapped Bushfire Prone.

The assessment classifies the bushfire prone land within 140 m of the proposed development as:

- Upslope Forest located 92 m on the eastern elevation;
- 10-15° Downslope Forest located 51 m away on the northern elevation;
- 5-10° Downslope Forest located 42 m away on the western elevation;
- Upslope Forest located 88 m on the southern elevation.

Proposed Boarding House Module 1 (south) is proposed to be built to BAL 12.5.

Proposed Boarding House Module 2 (north) is proposed to be built to:

- BAL 29 on the entire roof and subfloor, and north-facing elevations;
- BAL 19 on the south-facing elevations.

The APZ should be maintained from the commencement of building works for perpetuity over the entire subject lot. To the west, 18 Wyatt Avenue received General Terms of Approval from NSW RFS (DA10011866577SM, dated 27 January 2010) to manage the entire property as an inner protection area (IPA). However from a conservative perspective, there is an area of vegetation that remains unmanaged that adjoins the northern forest. Similarly, 10-12 Wyatt Avenue to the east is approved to be managed as an APZ (DA2015/0567). There is a small cluster of trees remaining within the IPA on the adjoining lot on the east. This assessment has classified these trees as part of the IPA because the total canopy forms less than 15 percent and provides a cluster small enough to not present a bushfire risk.

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

The access road is required to provide enough turning room for a fire tanker that requires an inner minimum turning radius of 6 m and outer minimum radius of 12 m.

- A minimum carriageway width of four metres;
- provide enough turning room for a fire tanker that requires an inner minimum turning radius of 6 m and outer minimum radius of 12 m;
- Curves a minimum inner radius of six metres;
- The minimum distance between inner and outer curves is six metres;
- The cross fall is not more than 10 degrees;
- Maximum grades for sealed roads do not exceed 15 degrees (28 per cent) and not more than 10 degrees (18 per cent) for unsealed roads;
- The internal road surfaces and bridges have a capacity to carry fully loaded firefighting vehicles (23 tonnes) and provide signage that indicates the bridge capacity; and

- There is suitable access for a Category 1 fire appliance within 4m of the static water supply where no reticulated supply is available.

The proposed development is more than 70 m from the street hydrant, and the applicant should ensure there is at least a 10,000-litre water supply (per module) available for firefighting purposes. Above ground tanks are required to be manufactured of concrete or metal and raised tanks have their stands protected. All above-ground water pipes external to the building are required to be metal, including and up to any taps. Pumps are to be shielded. Underground tanks should have an access hole of 200 mm and a hardened ground surface within 4 m of the access hole. A suitable connection for firefighting purposes is required, such as a 65 mm Storz outlet and a gate or ball valve.

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

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

1 PROPOSAL

The owners of 16 Wyatt Avenue, Belrose NSW, propose a boarding house on Lot 2566 DP 752038. The proposed boarding house consists of two modules, one at the front of the site and one in the centre of the site, that provides 64 rooms plus caretaker room.

This proposal is considered an increased density in accordance with Section 8.2.1 PBP 2019. The same principles and criteria associated with subdivisions in bushfire prone areas apply, including an APZ with a radiant heat threshold of 29kW/m², along with suitable provision for construction, access, water and landscaping.

The assessment confirms the subject lot is mapped as bushfire prone. Harris Environmental Consulting was commissioned to provide this bushfire assessment.

Figure 1 shows the subject lot location.

Figure 2 provides a broad scale aerial view of the subject site.

Figure 3 shows a close up of the subject lot.

Figure 4 shows the proposed plans.

Figure 1 Site location

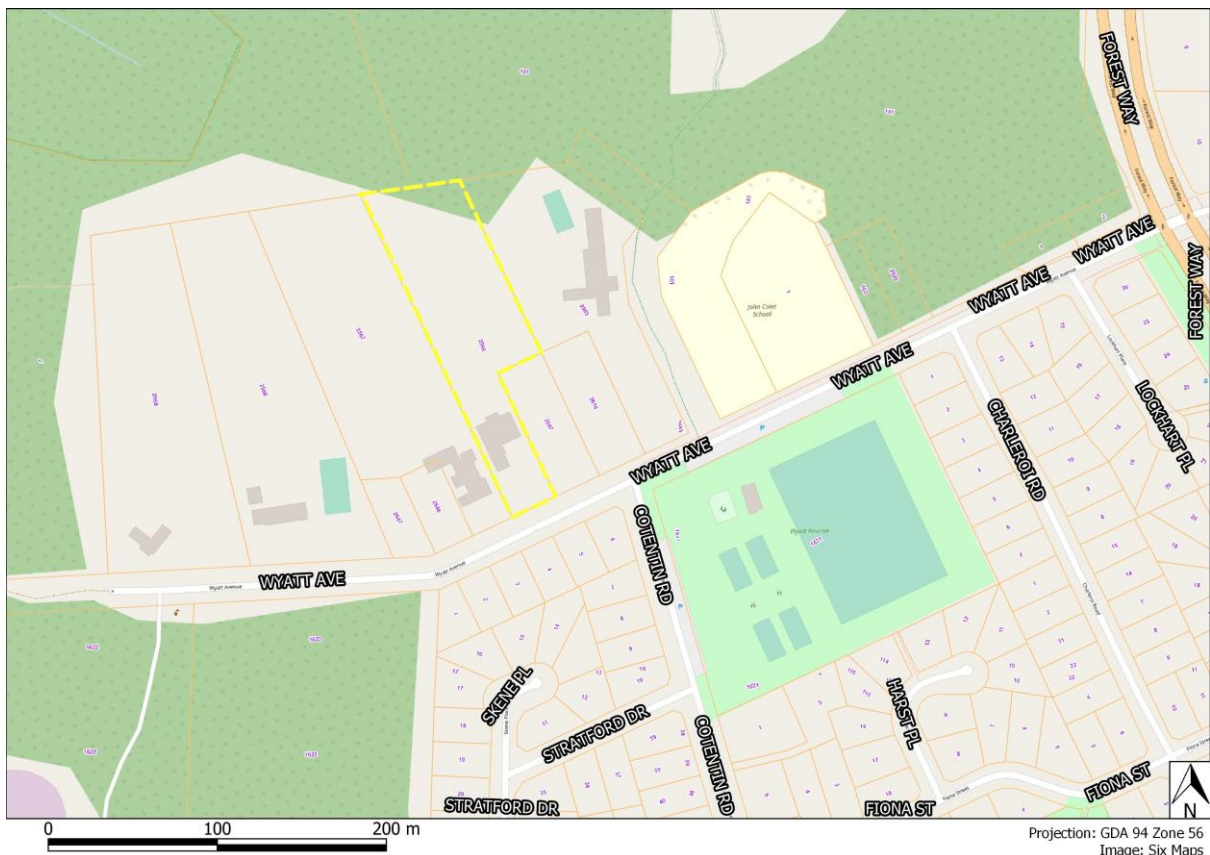


Figure 2 Broad scale aerial view of the subject site



Figure 3 Close up view of Subject Lot



2 PLANNING LAYERS

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

Table 1 Planning Layers

| MAP | FIGURE | DESCRIPTION |
|--------------------------------|--------|---|
| Bushfire Prone Land Map | 5 | The subject site is mapped as "Vegetation Buffer", with the land north and south of the subject land mapped "Vegetation Category 1". |
| LEP Zone Map | 6 | The subject lot is zoned as "DM Deferred Matter". |
| Vegetation Mapping | 7 | The vegetation has been mapped as "Sydney Coastal Dry Sclerophyll Forest" and "Weeds and Exotics" (OEH, 2016). |
| Biodiversity Values Map | N/A | The site is shown to have no biodiversity values, however, the land on the south-west, south and north-west of the subject lot has been mapped as biodiverse. |

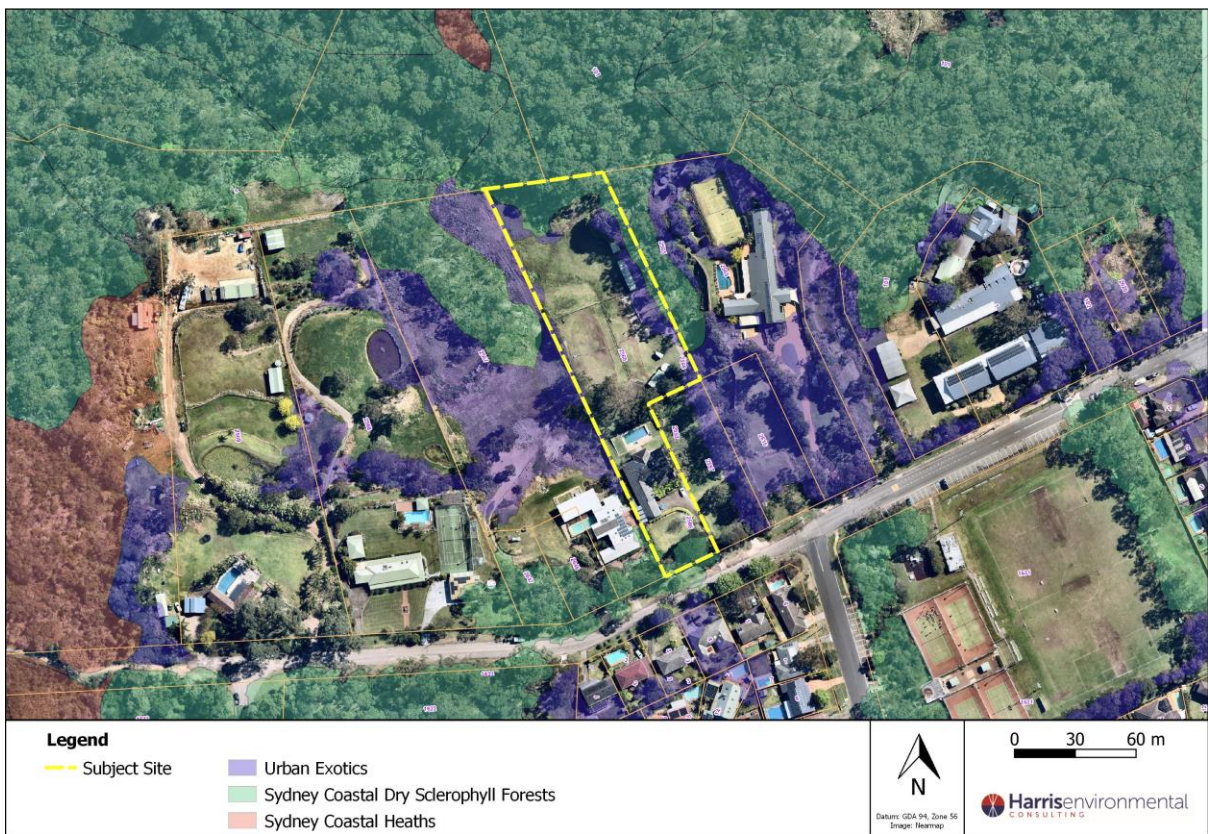
Figure 5 Bushfire Prone Map



Figure 6 LEP Zone Map



Figure 7 Vegetation Mapping



The Native Vegetation of the Sydney Metropolitan Area - Version 3.1 (OEH, 2016) VIS_ID 4489

3 SITE DESCRIPTION

3.1 Slope and Aspect of the Site within 100m

The slope that would most significantly influence fire behaviour was determined over a distance of 100 m out from the proposed residence. This assessment was made using 2 m contour intervals.

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

As shown in Figure 8, the subject lot lies on land that slopes downwards on the north elevation.

Figure 8 Slope



3.2 Vegetation Formation Within 140m of Proposed Development

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

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

The vegetation on the north, northeast and south-west is classified as Sydney Coastal Dry Sclerophyll Forest, and classified as Forest in accordance with PBP. The forest vegetation is shown in Photo 1.

To the west, 18 Wyatt Avenue received General Terms of Approval from NSW RFS (DA10011866577SM, dated 27 January 2010) to manage the entire property as an inner protection area (IPA). However, an area of vegetation remains unmanaged, and connected to the vegetation on the northern elevation. This vegetation is classified as Forest.

Similarly, 10-12 Wyatt Avenue to the east is required to manage the entire lot as an APZ (DA2015/0567). There is a small cluster of trees remaining within the IPA on the adjoining lot on the east. This assessment has classified these trees as part of the IPA because the total canopy forms less than 15 percent and provides a cluster small enough to not present a bushfire risk.

Table 2 Predominate Vegetation Classification

| | Vegetation Formation | Effective Slope | Distance from façade to hazard |
|--------------|-----------------------------|------------------------|---------------------------------------|
| North | Forest | 10-15° Downslope | 51 m |
| East | Forest | Upslope | 92 m |
| South | Forest | Upslope | 88 m |
| West | Forest | 5-10° Downslope | 42 m |

Figure 9 Bushfire Prone Vegetation within 140 meters

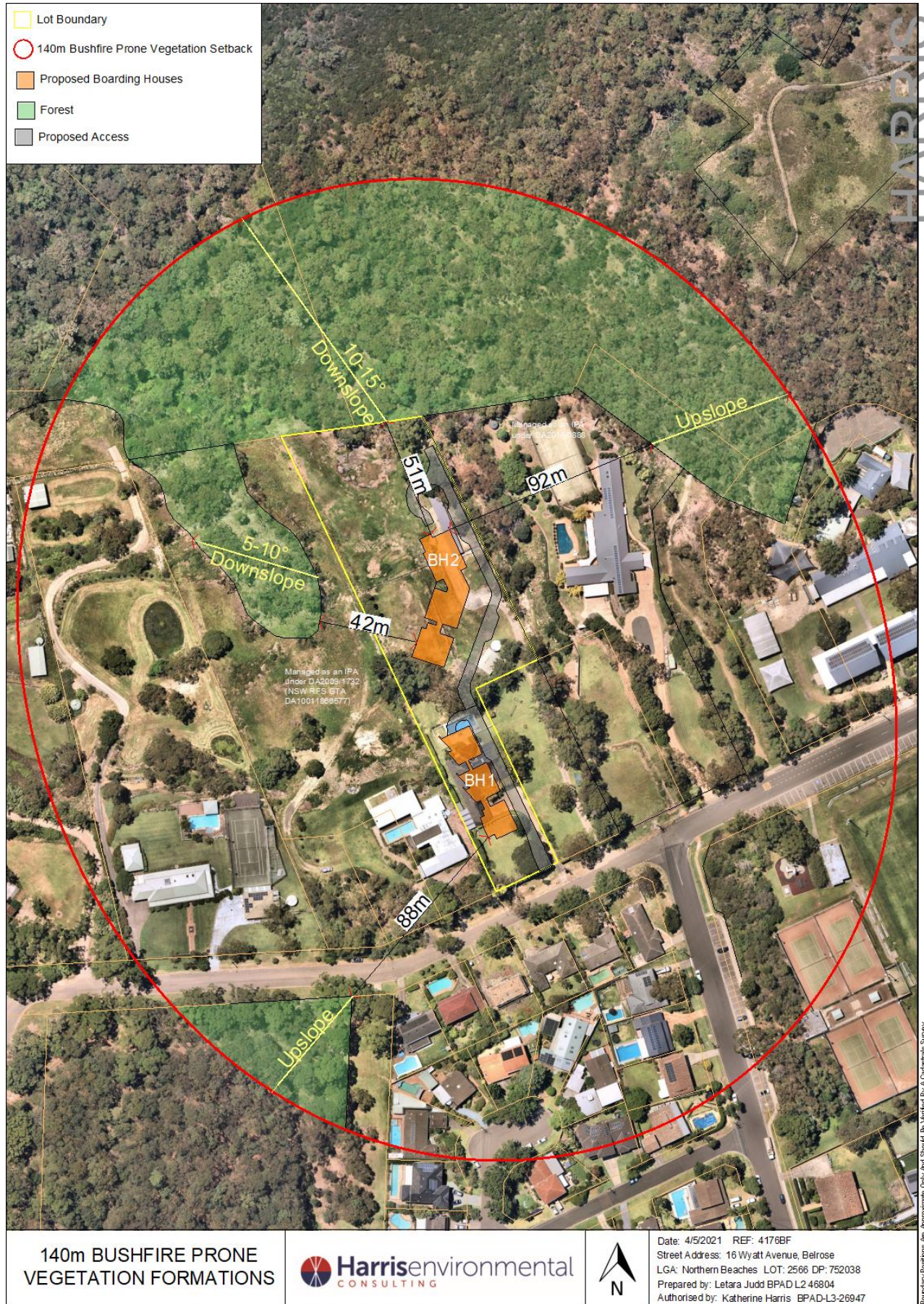


Photo 1: View of Forest on northern elevation



Photo 2: View of managed IPA and tree cluster of 15% on eastern elevation



4 BUSHFIRE THREAT ASSESSMENT

4.1. Asset Protection Zones (APZ)

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

Table 3 below shows the APZ and BAL Determination for Boarding House module 2 in the centre of the site (north).

The current development site meets the requirements for an Inner Protection Area (APZ) without the need for any clearing. No clearing on the development site or neighbouring properties is required to meet the APZ requirements outlined in this report.

The existing APZ should be maintained for perpetuity over the entire subject lot.

It is noted that the site currently benefits from the 10/50 clearing code and currently has one main house and two farm buildings. Both farm buildings have a floor area in excess of 50m² in size. Under 6.5 and 7.1 of the 10/50 clearing code of practice for NSW, both farm buildings have a clearing entitlement as outlined in section 7.1. Based on the clearing entitlements from the main house and the two farm buildings, almost the entire site benefits from a 10/50 clearing entitlement.

Table 3 APZ and BAL Determination

| | NORTH | EAST | SOUTH | WEST |
|---|--------------------|---------------------|---------------------|--------------------|
| Vegetation | Forest | Forest | Forest | Managed |
| Gradient | 10-15° Downslope | Upslope | Upslope | 5-10° Downslope |
| Distance between façade and hazard | 51 m | 92 m | 88 m | 42 m |
| BAL 29 required APZ | 45-<60 m | 24 -< 33 m | 24 -< 33 m | 36-<49 m |
| BAL 19 required APZ | 60-<77 m | 33 -< 45 m | 33 -< 45 m | 49-<65 m |
| BAL 12.5 required APZ | 77-<100 m | 45-<100 m | 45-<100 m | 65-<100 m |
| BAL Required | BAL 29 | BAL 12.5 | BAL 12.5 | BAL 29 |

4.2. Relevant Construction Standard

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

The following was determined for this site:

Relevant fire danger index.....FDI 100
Flame temperature1090 K

Proposed Boarding House 1 (south) is proposed to be built to **BAL 12.5**.

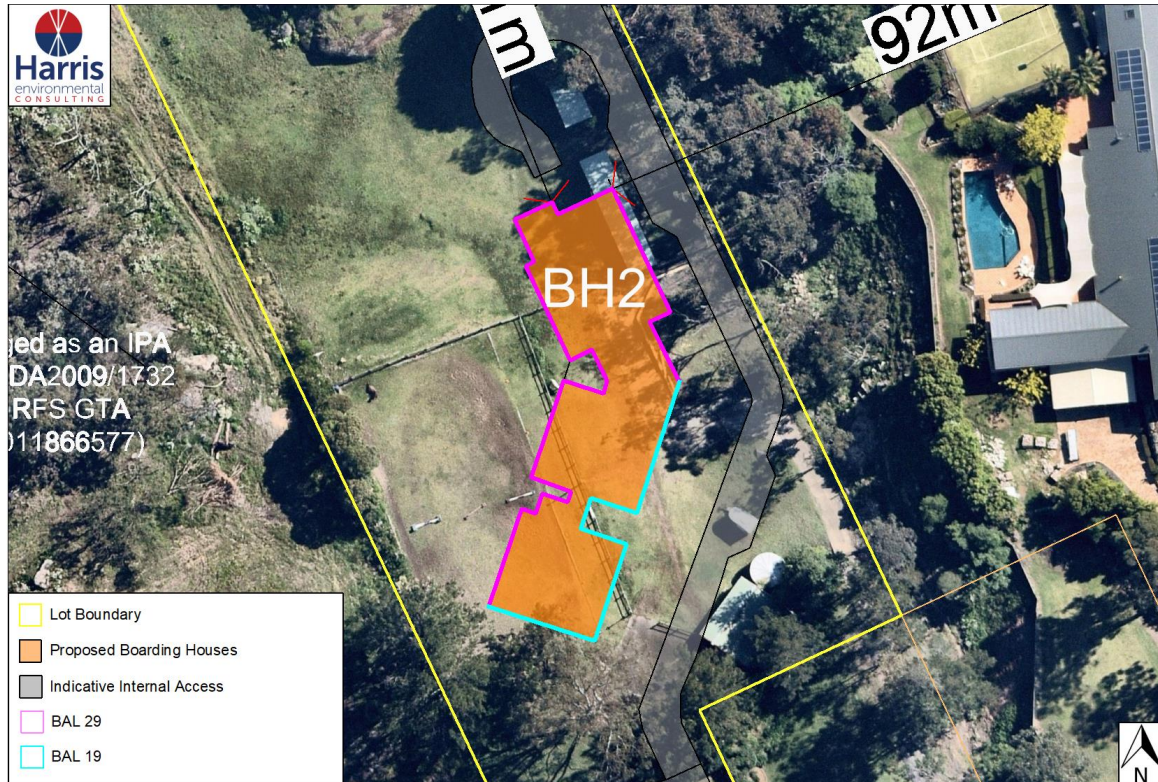
As shown in Figure 10, Proposed Boarding House 2 (north) is proposed to be built to:

- **BAL 29** on the entire roof and subfloor, and north facing elevations;
- **BAL 19** on the south facing elevations.

The following variations to AS 3959 apply in NSW for the purposes of NSW G5.2(a)(i) of Volume One and NSW 3.10.5.0(c)(i) of Volume Two of the NCC;

- Clause 3.10 of AS 3959 is deleted and any sarking used for BAL-12.5, BAL-19, BAL-29 or BAL-40 shall:
 - be non-combustible; or
 - comply with AS/NZS 4200.1.
- Be installed on the outside of the frame and have a flammability index of not more than 5 as determined by AS 1530.2; and clause 5.2 and 6.2 of AS 3959 is replaced by clause 7.2 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL;
- Clause 5.7 and 6.7 of AS 3959 is replaced by clause 7.7 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL.

Figure 10 Walls Subject to Shielding



4.3. Emergency Management

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

4.4. Adequate Water and Utility Services

A hydrant is located at the front of 14 Wyatt Avenue (ie 30m from the front of the development property). However, the furthest part of the proposed development is more than 70 m in distance from the existing hydrant.

The applicant should ensure there is at least 10,000-litre (5,000 litres per boarding house) water supply available for firefighting purposes. Above ground tanks are required to be manufactured of concrete or metal and raised tanks have their stands protected. All above ground water pipes external to the building are required to be metal including and up to any taps. Pumps are to be shielded. Underground tanks should have an access hole of 200 mm and a hardened ground surface within 4 m of the access hole. A suitable connection for firefighting purposes is required such as a 65 mm storz outlet and a gate or ball valve.

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

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

4.5. Safe Operational Access

The *Planning for Bushfire Protection 2019* requires the provision of safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.

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

The proposed internal access to the proposed development will be from Wyatt Avenue and traverse approximately 190 m, as shown in Figure 11.

The access road for the proposed development provides enough turning room for a fire tanker that requires an inner minimum turning radius of 6 m and outer minimum radius of 12 m.

The proposed internal access can comply with the PBP- Property Access Table 7.4a. This includes:

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

Figure 11 Access



5 LANDSCAPING

The existing APZ is required to be maintained for perpetuity.

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

Appendix 4 (*PBP 2019*) provides guidelines for landscaping and Bushfire Provisions within the APZ. To incorporate bushfire protection measures into future development, the owner is advised to consider the following:

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

The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defensible space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm 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.

6 SUMMARY

- Proposed Boarding House Module 1 (south) is proposed to be built to **BAL 12.5**.
- Proposed Boarding House Module 2 (north) is proposed to be built to:
 - **BAL 29** on the entire roof and subfloor, and north-facing elevations;
 - **BAL 19** on the south-facing elevations.
- The APZ should be maintained from the commencement of building works and maintained for perpetuity over the entire subject lot.
- The subject lot is located on Wyatt Avenue. This is a two-wheel drive, all weather road. The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles.
- The access road is required to provide enough turning room for a fire tanker that requires an inner minimum turning radius of 6 m and outer minimum radius of 12 m.
 - A minimum carriageway width of four metres;
 - provide enough turning room for a fire tanker that requires an inner minimum turning radius of 6 m and outer minimum radius of 12 m;
 - Curves a minimum inner radius of six metres;
 - The minimum distance between inner and outer curves is six metres;
 - The cross fall is not more than 10 degrees;
 - Maximum grades for sealed roads do not exceed 15 degrees (28 per cent) and not more than 10 degrees (18 percent) for unsealed roads;
 - The internal road surfaces and bridges have a capacity to carry fully loaded firefighting vehicles (23 tonnes) and provide signage that clearly indicates the bridge capacity; and
 - There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.
- The applicant should ensure there is at least 10,000 litre water supply available for firefighting purposes. Above ground tanks are required to be manufactured of concrete or metal and raised tanks have their stands protected. All above ground water pipes external to the building are required to be metal including and up to any taps. Pumps are to be shielded. Underground tanks should have an access hole of 200 mm and a hardened ground surface within 4 m of the access hole. A suitable connection for firefighting purposes is required such as a 65 mm storz outlet and a gate or ball valve.
- Any bottled gas will be installed and maintained in accordance with AS1596 and the requirements of the relevant authority. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and away from any combustible material. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.
- Electrical transmission lines, if above ground, will be managed in accordance with specifications issued by Energy Australia.

7 REFERENCES

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

NSW Department of Planning and Environment. Planning Portal. Accessed at:
<https://www.planningportal.nsw.gov.au/>

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

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

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

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

Appendix i Definition of Asset Protection Zones

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

- 1) Discontinuous shrub layer (clumps or islands of shrubs not rows);
- 2) Vertical separation between vegetation strata;
- 3) Tree canopies not overhanging structures;
- 4) Management and trimming of trees and other vegetation in the vicinity of power lines and tower lines in accordance with the specifications in “Vegetation Safety Clearances” issued by Energy Australia (NS179, April 2002);
- 5) Maintain low ground covers by mowing / whipper snipper / slashing; and
- 6) Noncombustible mulch e.g. stones and removing stores of combustible materials;
- 7) Vegetation to be planted should consist of fire retardant/ less flammable species strategically located to reduce attack from embers (i.e. as ember traps when in small clumps and short wind breaks).

Appendix ii Biodiversity Values Map

