

Bushfire Hazard Assessment
Proposed Residential Dwelling

Lot 104 DP 1049845
Bundabah Road, Bundabah



DA 279/08

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Prepared For
Tea Gardens Farm
Pty Ltd

21 November 2007



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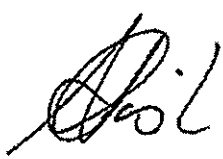
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The preparation of this report has been in accordance with the project brief provided by Tea Gardens Farms Pty Ltd and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

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Orogen Pty Ltd accepts no responsibility for any loss, damage suffered or inconveniences arising from, any person or entity using the plans or information in this study for purposes other than those stated above.

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Proposed Building Footprint and APZ Required
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Glossary

Term/abbreviation	Definition
APZ	Asset Protection Zone
DA	Development Application
FDI	Fire Danger Index
GLC	Great Lakes Council
IPA	Inner Protection Area
LGA	Local Government Area
OPA	Outer Protection Area
PBP	<i>Planning for Bush Fire Protection 2006. A Guide for Councils, Planners, Fire Authorities and Developers.</i>

Introduction

1.1 Background

Orogen Pty Ltd has been commissioned by Tea Gardens Farm Pty Ltd (**the client**) to prepare a Bushfire Hazard Assessment report for the construction of a proposed dwelling on Lot 104 DP 1049845, Bundabah Road, Bundabah (**Figure 1.1**).

A Development Application (DA 423/07) for a dwelling within Lot 104 is has been submitted to Great Lakes Council (GLC). This DA has since been transferred to a new DA (DA 279/2008). The documentation submitted with the original DA was prepared by Tattersall Surveyors Pty Ltd and included an assessment of bushfire risk in accordance with the *Planning for Bushfire Protection* guidelines (RFS/PlanningNSW, 2001).

Following the submission of the DA, a number of changes have been made to the NSW bushfire assessment guidelines. These changes are relevant to the proposed dwelling, particularly with regard to the required Asset Protection Zone setbacks. This report has been prepared as an addendum to the documentation for DA and specifically supersedes the bushfire assessment submitted previously to GLC. This bushfire hazard report has been prepared in accordance with the *Planning for Bush Fire Protection 2006 (PBP)* prepared by the NSW Rural Fire Service (NSW RFS, 2006).

1.2 Objectives of the Bushfire Assessment Report

The objectives of this report are to provide information to:

- Accompany the Development Application to GLC for the proposed dwelling; and
- Ensure that the proposed dwelling is consistent with the provisions prescribed in the *PBP*.

This report assesses the risk of a potential bushfire hazard to the proposed dwelling on the site and whether the bushfire hazard is likely to be altered as a result of the proposed development. Finally, the report will make recommendations in relation to any requirements of the proposed development in accordance with the *PBP*.

1.3 Planning Context

The decision making process for this proposal falls under Part 4 of the *Environmental Planning & Assessment Act 1979 (EP&A Act)*. GLC, in deciding whether to approve the proposed development of the site, must examine and take into account relevant matters for consideration.

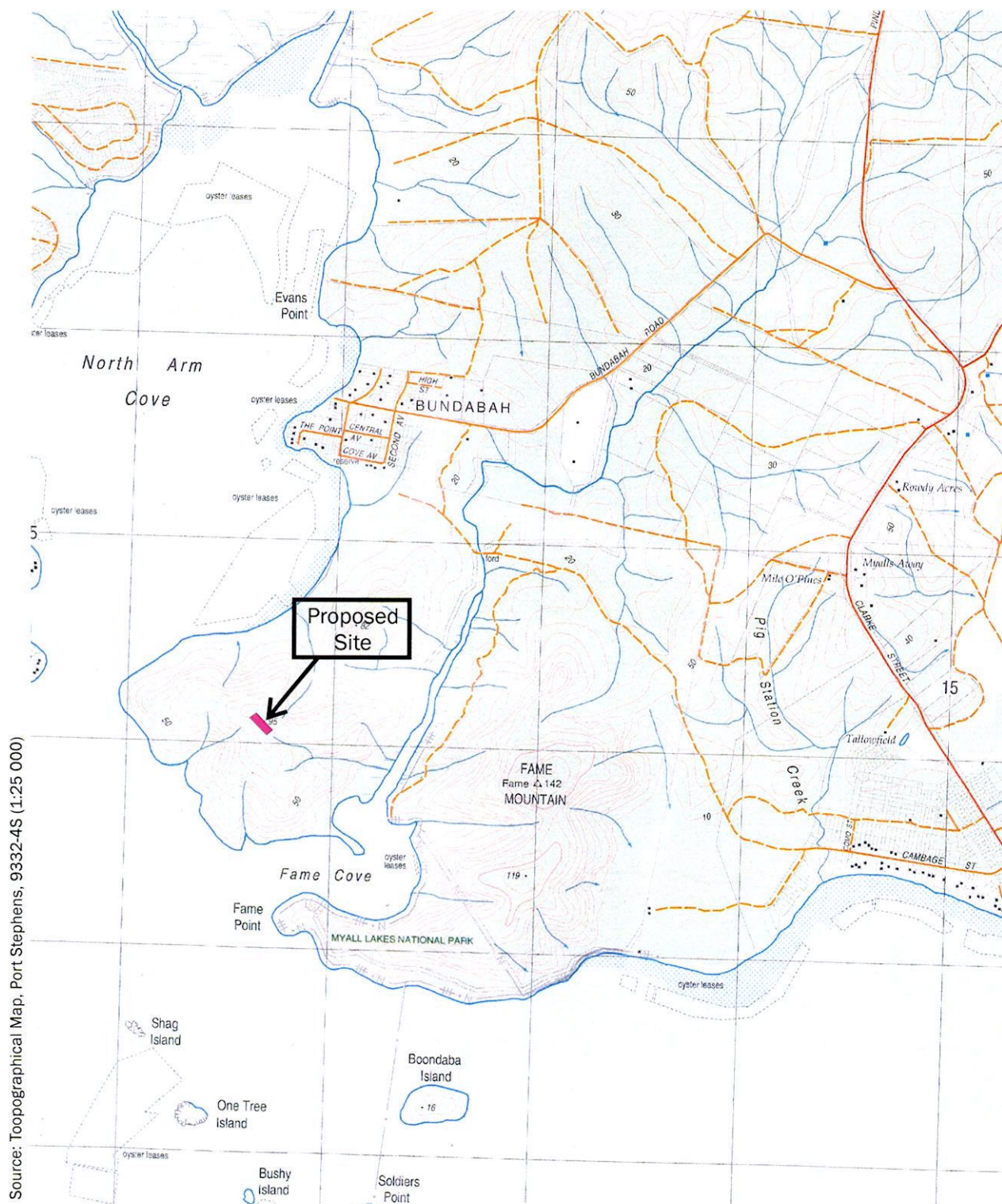


Figure 1.1 - Locality Plan

Site Details

2.1 Site Details

The dwelling is proposed to be constructed within Lot 104 DP 1049845 Bundabah Road, Bundabah (hereafter referred to as the 'subject land'). The subject land is located approximately 8 km west of Tea Gardens (**Figure 1.1**). The subject land is irregular shaped and bounded by rural residential land to the north. Fame Cove forms the eastern boundary of the subject land, and North Arm Cove forms the southern and western boundary.

It is proposed to construct the dwelling on the crest of a hill that is located generally within the centre of the subject land. The proposed dwelling will occupy an area of approximately 3000 m² (hereafter referred to as the 'site').

2.2 Vegetation

The site is located on land that is classified as 'bushfire prone lands' in accordance within GLC's Bushfire Prone Lands Map. The site is predominantly clear of vegetation, however, the land within a 140 m radius to the south, east and west is vegetated predominantly with Tall Sclerophyll Forest Vegetation. This vegetation is classified as 'Forests' in accordance with the *PBP*.

2.3 Topography

Being located on the crest of a hill, the proposed building footprint is located on relatively flat land with slopes ranging between 0 – 5 °. The land surrounding the building footprint, however, exhibits a range of slopes between 5 – 15 ° down slope.

Hazard Protection Requirements

3.1 Asset Protection Zone Setback Requirements and Construction Standards

The site is located within Great Lakes Council Local Government Area. In accordance with Table A2.3 in the *PBP*, a Fire Danger Index (FDI) rating of 80 is applicable to the site.

Calculation of Asset Protection Zone (APZ) width is based on vegetation type over a distance of 140 m, and relevant ground slope over a distance of 100 m, measured from the asset being protected. The APZ's for the site have been determined in accordance with the *PBP* and are shown in **Table 3.1**.

Given the size of the subject land, and the location of the site, the minimum required APZ for the dwelling can be accommodated within the subject land.

Table 3.1 - Minimum Asset Protection Zone Requirements for the Proposed Dwelling#

Direction Relative to Site	PBP Classification of Predominant Vegetation Type*	Slope **	Minimum APZ (m) (Level 3 construction)	IPA (m)	OPA (m)
North East	Forest	> 10 ° - 15 ° down slope	40	15	25
South East	Forest	> 5 ° - 10 ° down slope	30	15	15
South West	Forest	> 10 ° - 15 ° down slope	40	15	25
North West	Forest	> 5 ° - 10 ° down slope	30	15	15

Note: # - FDI 80 Fire Area,

* Maximum vegetation category within a 140 m radius of the site.

** Slope averaged over 100 m from site.

3.2 Construction Standards

Construction standards in accordance with AS 3959-1999 will be applicable to the proposed dwelling. The category of bushfire attack relevant to dwelling is based on an FDI rating of 80 and the criteria provided in Table A3.4 of the *PBP*. Calculations are based on the distance from the proposed building envelope to the bushfire threat (*ie.* vegetation category) and relevant ground slope. **Table 3.2** shows the

category of potential bushfire attack posed by the surrounding vegetation and the minimum setbacks required for Level 1, Level 2, and Level 3 construction standards. The APZ setbacks for Level 3 and Level 2 construction are also demonstrated on a plan drawing in **Appendix A**.

The minimum required APZ can be accommodated within the subject land and therefore there is no requirement to seek concession from the NSW RFS to reduce the allowable APZ area in order to accommodate the dwelling within the lot. The proposed dwelling would therefore not be subject to the 'Flame Zone' as defined in Table A3.4 of the PBP and the site is able to support a dwelling that would be within the scope of AS3959-1999.

Table 3.2 - Determination of Construction Standards for the Proposed Dwelling#

Direction Relative to Site	PBP Classification of Predominant Vegetation Type*	Slope **	Level 3 (Extreme)	Level 2 (High)	Level 1 (Medium)
North East	Forest	> 10 ° - 15 ° down slope	38 - < 47 m	47 - < 63	63 - 100 m
South East	Forest	> 5 ° - 10 ° down slope	28 - < 38 m	38 - < 52	52 - 100 m
South West	Forest	> 10 ° - 15 ° down slope	38 - < 47 m	47 - < 63	63 - 100 m
North West	Forest	> 5 ° - 10 ° down slope	28 - < 38 m	38 - < 52	52 - 100 m

Note: # - FDI 80 Fire Area,

* Maximum vegetation category within a 140 m radius of the site

** Slope averaged over 100 m from site.

3.3 Land Title Considerations

As it has been shown that there is a requirement for the establishment of an APZ for the proposed dwelling, there is also the requirement regarding maintenance of this APZ. Statutory responsibility to manage the fire risk on site in accordance with Section 63 (2) of the *Rural Fires Act 1997* will apply to the land within the site. The management of APZ's within the site will be the responsibility of the land owner. Details regarding bushfire management measures on site are provided in **Section 4.2**.

No adjoining private lands would be burdened with an APZ and the proposed development of the site would not increase the potential bushfire risk to adjoining properties.

3.4 Site Access

The site is currently accessed from Bundabah Road by an internal track. This rural private access track is approximately 2.2 km long. The track will be upgraded (sealed) to provide access for plant and equipment for construction of the dwelling. The upgraded track will, however, need to have a minimum trafficable width of 4 m, with a 1 m shoulder either side. Passing bays (20 m long by 2 m wide) will also need to be provided and should be constructed every 200 m along the track. Maximum grades of the track will not exceed 15°.

Given the distance from the proposed dwelling to Bundabah Road (2.2 km) and the lot configuration where it adjoins Bundabah Road, it is not possible to provide an alternative property access. It is proposed to compensate for the lack of property access by:

- increasing the APZ to a width from 38 m to 47m, which satisfies Level 2 construction standard; and
- providing an additional dedicated 20,000 L of static water supply at the dwelling site (**Section 4.2.2**).

It is submitted that these measures provide an adequate level of safety which compensates for the inability of the development to provide for an alternative property access and that their implementation provides an acceptable solution to satisfy the performance criteria for isolated rural residential development.

Bushfire Risk Management

4.1 Overview

The assessment provided in this report indicates that the minimum APZ applicable to the proposed dwelling for Level 3 construction is 40 m to the north east and south west, and 30 m to the south east and north west of the site. The minimum APZ required for the dwelling can be accommodated within the subject land and therefore the site is able to support a dwelling that would be within the scope of AS3959-1999.

Further, the minimum APZ required to satisfy Level 2 construction can be accommodated within the subject land (**Appendix A**). The proposed development is therefore capable of satisfying the requirements of the *PBP* (NSW RFS, 2006). As indicated in **Section 3.4**, however, it is proposed to increase the APZ width to satisfy Level 2 construction standard.

The potential impact of clearing vegetation for the dwelling and APZ has been assessed in a separate report prepared by Orogen Pty Ltd.

4.2 Management Recommendations

The following management measures are accepted as best management practice and should be implemented for the site to minimise the risk of bushfire attack to life and property.

4.2.1 Vegetation Management on Site

An important consideration in relation to bushfire risk management is post-development vegetation management. Vegetation within the site should be maintained so that all non-retardant understorey plants, leaf litter, branches and other fuels are cleared. Regular maintenance in and around the house will minimise the threat of fire from ember attack. Clearing of gutters and roofs of leaf litter, as well as the regular maintenance of low fuel levels on the site, will reduce the risk to the dwelling from bushfire attack.

Suggested measures for management of gardens to reduce risks are:

- Low cut lawn to be maintained adjacent to dwellings;
- Areas under fences and gates to be maintained free of fuel;
- Trees and shrubs should not overhang dwelling roofs;

- Tree canopies should not be continuous;
- Gutters and valleys to be kept clear of leaves at all times;
- Plant densely foliated deciduous or fire resistant evergreen trees;
- Plant smooth barked as opposed to rough barked trees;
- Minimise mulched areas; and
- Keep gardens well watered.

A list of fire retardant species is provided in the brochure 'Tree selection for fire prone areas' and can be obtained from the NSW Rural Fire Service.

4.2.2 Water Supply

Reticulated water supply is not available to the site. It is recommended that a dedicated static water supply with a minimum capacity of 30,000 L is provided on site for fire fighting purposes. Given the large size and elongated footprint of the proposed dwelling, it is recommended this water supply be provided as three (3) separate 10,000 L tanks, placed at either end and near the middle of the dwelling. There are also numerous dams within the subject land that may be used for emergency water supply, as well as a large in-ground swimming pool (capacity >200,000 L).

Pumps, hoses and power supply will need to satisfy RFS specifications.

4.2.3 APZ Management

As demonstrated in **Table 3.2** the minimum APZ required to satisfy Level 2 construction is:

- 47 m to the north east and south west; and
- 38 m to the south east and north west (**Appendix A**).

Fuel loads within the APZ areas will need to be managed in accordance with NSW RFS standards. In order to reduce the clearing required to establish the APZ for the dwelling it is recommended that:

- 25 m of the APZ to the north east and south west be managed to an Outer Protection Area (OPA) standard; and
- 15 m of the APZ to south east and north west be managed to an OPA standard.

A higher density of vegetation is permissible within the OPA.

4.2.4 Access tracks

As discussed in **Section 3.4**, the access track will need to be upgraded to comply with requirements of PBP. Management responsibility for maintenance of the access will reside with the landowner.

Conclusion

5.1 Conclusion

The assessment that has been provided in this report indicates that the proposed construction of a dwelling on the site is subject to an extreme/medium level of bushfire threat. The determination of construction standards have been based on this level of bush fire threat. The maximum construction standard required for the proposed dwelling on the site was determined to be Level 3.

The required APZ can be accommodated within the existing lot, however, some additional clearing will be required. The potential ecological impacts associated with the clearing of vegetation for the dwelling and APZ has been assessed in a separate report (Orogen, 2007). These assessments determined that the proposed clearing is unlikely to have a significant impact on Threatened species, populations or endangered ecological communities.

As indicated in **Section 3.4**, it is proposed to maintain an APZ to accommodate a Level 2 construction standard, however, additional measures to assist in meeting performance criteria for the proposed development include additional static water supply dedicated for fire fighting purposes.

It is therefore concluded that the proposed development is able to satisfy the planning requirements of the Rural Fire Service, provided it adheres to the information and recommendations provided in this report, which are summarised below.

5.2 Recommendations

With respect to the proposed development described in this report, the following recommendations are made:

- Maintain the APZ width for a Level 2 construction dwelling as discussed in **Section 4.2**;
- Upgrade access track to comply with PBP requirements;
- Dwelling to be constructed to Level 2, in accordance with AS 39595-1999 (Standards Australia, 1999);
- Provision of 30,000 L static water supply, to be supplied in three separate locations, with 10,000 L capacity tanks; and
- The owners/occupiers of the proposed dwelling should be made aware of their obligations under Section 63 (2) of the *Rural Fires Act (1997)* to manage fuel over the site.

References

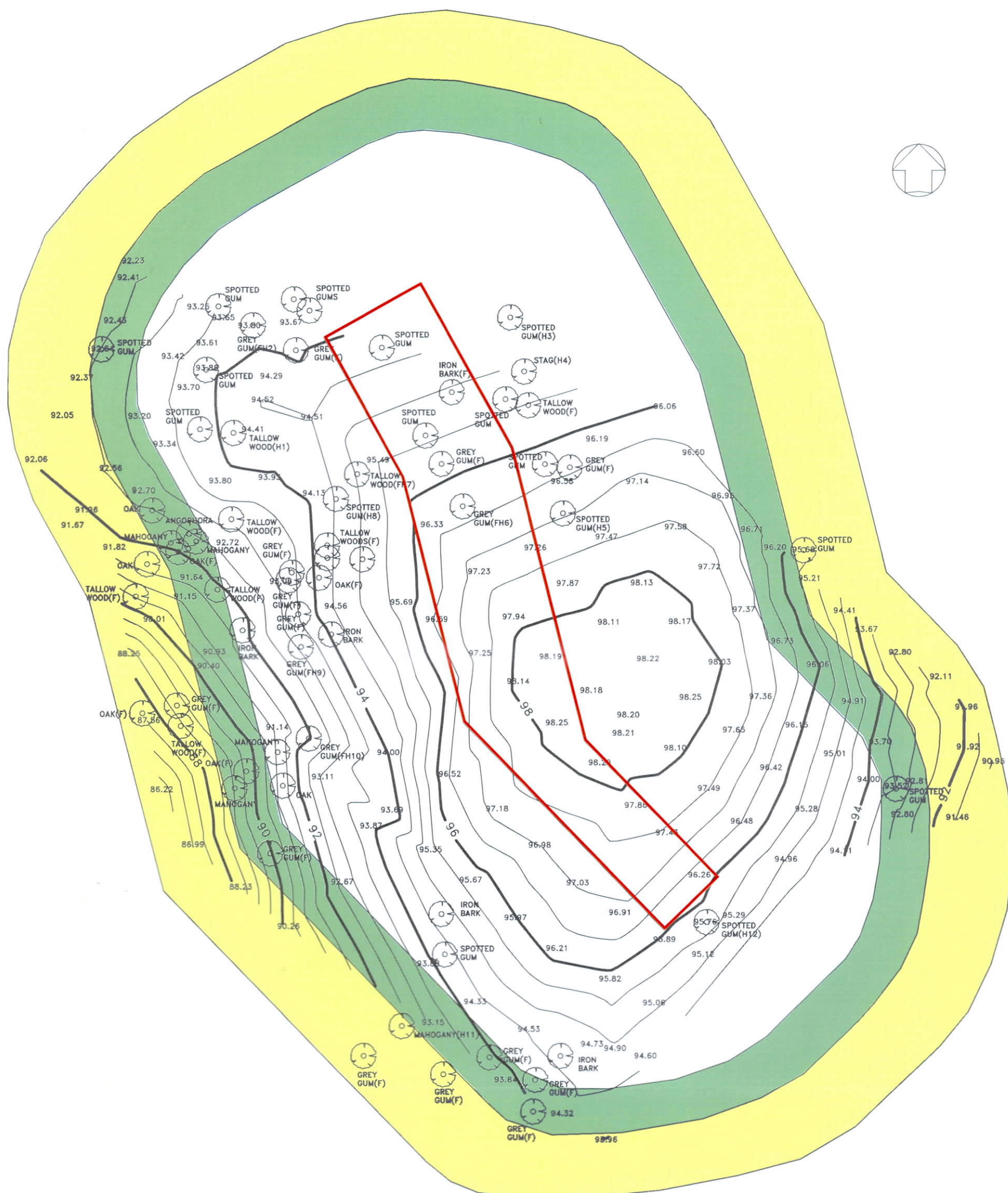
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Appendix A

PROPOSED BUILDING FOOTPRINT AND APZ REQUIRED
FOR LEVEL 2 AND LEVEL 3 CONSTRUCTION STANDARDS



100 metres

LEGEND

- Building Footprint
- Level 3 Construction
- Level 2 Construction