Ref: greatbay.blyth75.v2.aia

ARBORICULTURAL IMPACT ASSESSMENT

NEW DWELLING & ASSOCIATED INFRASTRUCTURE

75 BLYTH PARADE
GREAT BAY 7150

V2
DECEMBER 2024

Prepared for: MATTHEW BAILY-LAWRENCE

Prepared by: PHILIP JACKSON

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EXECUTIVE SUMMARY

This Arboricultural Impact Assessment (AIA) has been prepared for Matthew Baily-Lawrence, to support Council assessment of a development application for the construction of a new dwelling and associated infrastructure at 75 Blyth Parade Great Bay (the site).

Seventeen (17) individual trees at the site were assessed & are subject to this report. The subject trees comprise the Tasmania/Australian native tree species White Gum *(Eucalyptus viminalis)*, Black peppermint *(E. amygdalina)* & White Peppermint *(E. pulchella)*. The overall vitality of the site trees is generally poor with most trees exhibiting physiological stress and having a short remaining life expectancy (5-15 years). The overall structural condition of the site trees is fair-poor with many trees having significant decay in their trunk and scaffold branches.

Trees 3, 5, 6, 10, 11, 12, 13, 14, 15, 16, 19, 27, 32 & 33 have a sufficiently large trunk diameter (DBH) to be ascribed a "High/Very High Conservation Value" (HCV) as described in Kingborough Council Policy 6.10 "Biodiversity Offset Policy" and should be retained and protected wherever practicable as prescribed in "E10.0 - Biodiversity Code" of The Scheme.

RECOMMENDATIONS

1 **Remove trees 5, 11, 14, 15, tk & tl.**

2 **Retain trees 3, 6, 10, 12, 13, 16, 19, 27, 32, 32 & ti and protect them accordance with the Tree Protection Specification in Section 6.**

3 **Construct future access road upgrade works above the present surface grade within the TPZ/SRZ of trees 10, 12 & 19 employing non-destructive, non-compacting 'no dig' methodology in accordance with Items 6.4 & 6.6 of the Tree Protection Specification in Section 6.**

SUMMARY OF SITE ACTIVITIES REQUIRING ARBORICULTURAL INPUT

In accordance with the *Australian Standard, AS 4970-2009, Protection of Trees on Development Sites*, inspections should be conducted by the project arborist at the following key project stages:

- Prior to any work commencing on-site (including demolition, earthworks, or site clearing) and following the installation of tree protection.
- During any excavations, building works, and any other activities carried out within the TPZ of any tree to be retained & protected.
- A minimum of once every 3 months during the construction phase.
- After all major construction has ceased, following the removal of tree protection.

It shall be the responsibility of the project manager to notify the Project Arborist prior to any works within the TPZ of any protected tree at a minimum of 48 hours' notice. To ensure the tree protection plan is implemented, hold points have been specified in the schedule of work below..

Construction Stage	Hold Point	Activity Summary	Trees Affected
Pre-Construction	1	**Pre-commencement meeting:** Meeting on site with all parties to agree protective measures. *Will be carried out before any significant site works begin.*	All trees
	2	**Installing/Altering Tree Protection:** Agreed tree protection measures will be installed and checked. Project Arborist advice will be sought before altering the position of tree protection. *Will be before any significant site works begin.*	All trees to be retained
Construction	3	Scheduled inspection of trees by the project arborist should be undertaken every 3 months during the construction period.	All trees to be retained
	4	**Excavation and works with SRZ/TPZs:** Project Arborist advice before any works, excavation, or significant roots are cut within TPZs	All trees to be retained
Post Construction	5	**Removing Tree Protection:** Tree Protection and fencing can only be removed when there is no risk of damage to retained tree	All trees to be retained

1.0 INTRODUCTION

1.1 Background

1.1.1 This Arboricultural Impact Assessment (AIA) has been prepared for Matthew Baily-Lawrence, to support Council assessment of a development application for the construction of a new dwelling and associated infrastructure at 75 Blyth Parade Great Bay (the site).

1.1.2 The purpose of this report is to determine the potential impact of the proposed works on relevant trees (i.e. High Conservation Value trees with proposed works within their Tree Protection Zone (TPZ). Where appropriate, recommendations are given for amendments to the design or construction methods to minimise adverse impacts on the subject trees.

1.1.3 This report has been prepared in accordance and with reference to the objectives of the *Kingborough Interim Planning Scheme 2015* (The Scheme)*, Kingborough Biodiversity Offset Policy 6.10, Nov. 2016* and the *Australian Standard for Protection of Trees on Development Sites AS4970* (The Standard). This report complies with '*2.3.5 Arboricultural Impact Assessment*' of The Standard.

1.1.4 I conducted a site inspection on 13th November 2024. Relevant inspection methods and background administrative information are presented in **Appendix 4**.

1.2 Documents & Plans Referenced

1.2.1 The conclusions and recommendations in this report are based on the findings from the site inspection, discussions with the client, and analysis of the following plans and documents:

- Unattributed general drawing set - ***"Matthew & Judy Baily-Lawrence 75 Blyth Pde Great Bay Bruny Island"*** Dated: 25/08/24
- ***"Bushfire Hazard Report - 75 Blyth Parade, Great Bay v2.1 "*** Prepared by: Prepared by: Mulcahy Planning & Property Services; Dated: September 2024
- Un-referenced Response To Kingborough Council Request For Further Information (RFI) Prepared by: Mulcahy Planning & Property Services; Dated: 17 September 2024

1.3 Report Limitations

1.3.1 All plans are based on provided information, are illustrative and intended for design purposes only. They should only be used relating to tree issues and are not suitable for any other purpose. Although all data have been verified as far as possible there is no guarantee, nor responsibility for the accuracy of information provided by others.

1.3.2 Although a basic visual tree health and structural condition assessment was conducted as part of the site tree inspections, many factors may contribute to tree failure and cannot always be predicted and accordingly a tree's internal structural condition may not always correlate to visible external indicators. Where relevant, further detailed structural assessment of specific trees is recommended in the Tree Schedule (Appendix 2).

1.3.3 There is no warranty or guarantee, expressed or implied that problems or deficiencies regarding the subject tree(s) or the site may not arise in the future. Information contained in this report covers only the subject tree(s) assessed and reflects their health and structural condition at the time of inspection.

2.0 THE SITE

***Figure 1**: The site at 75 Blyth Parade, Great Bay (Source –www.maps.thelist.tas.gov.au)*

Address	75 Blyth Parade Great Bay
Planning Scheme (The Scheme)	*Kingborough Interim Planning Scheme 2015*
Status	Undeveloped
PID/Title Ref	5055190/ 15511/20
Zoning	12:Low Density Residential
Scheme Code Overlays	- Biodiversity Protection Area - Bushfire Prone Areas

3.0 THE SUBJECT TREES

3.0.1 Seventeen (17) individual trees at the site were assessed & are subject to this report. The subject trees comprise the Tasmania/Australian native tree species White Gum *(Eucalyptus viminalis)*, Black peppermint *(E. amygdalina)* & White Peppermint *(E. pulchella)*. The overall vitality of the site trees is generally poor with most trees exhibiting physiological stress and having a short remaining life expectancy (5-15 years). The overall structural condition of the site trees is fair-poor with many trees having significant decay in their trunk and scaffold branches. Relevant observations regarding the age class, dimensions, health, structural condition, Remaining Life Expectancy of the subject trees are presented in the Tree Schedule in **Appendix 2.**

3.1 Trees Subject to the Protection

3.1.2 **Trees 3, 5, 6, 10, 11, 12, 13, 14, 15, 16, 19, 27, 32 & 33** have a sufficiently large trunk diameter (DBH) to be ascribed a "High/Very High Conservation Value" (HCV) as described in Kingborough Council Policy 6.10 "Biodiversity Offset Policy" (Section A1.5 in **Appendix 4)**. Accordingly these trees are also considered to have 'Moderate Priority Biodiversity Values" as set out in Table "E10.1- Priority Biodiversity Values" of The Scheme and should be retained and protected wherever practicable as prescribed in "E10.0 - Biodiversity Code" of The Scheme.

4.0 TREES AND DEVELOPMENT (AS-4970)

4.1 Tree Protection & Structural Root Zones

4.1.1 *Australian Standard 4970 Protection of Trees on Development Sites (2009)* (AS-4970) outlines that a **Tree Protection Zone** (TPZ) should be created to protect a tree and its growing environment throughout the development process. The theoretical TPZ is calculated as a radial measurement based on twelve (12) times the tree's diameter at breast height (DBH) (see figure 2 below). This formula is based on extensive research and is generally accepted within the arboricultural industry as being suitable for calculating areas designed to maintain the long term viability of trees on development sites.

4.1.2 The intention of the TPZ is to ensure protection of the root system and canopy from potential damage from construction works and ensure the long-term health and stability of each tree to be retained. Incursions to the root zone often occur due to excavations, changes in ground levels, (either lowering or raising the grade), trenching or other forms of soil disturbance such as ripping, grading or inverting the soil profile. Such works can cause damage or loss of part of the root system, leading to an adverse impact on the tree.

4.1.3 Ideally works should be avoided within the TPZ. Where works within the TPZ are unavoidable, exploratory excavation and/or root mapping can be undertaken to provide information on the size and number of roots located along a specified line of excavation. This information helps to identify the level of root damage that would result from an excavation and therefore the potential impact the works may have on the tree. Root sensitive design and construction techniques can then be specified based on the results of exploratory root trenching/mapping.

4.1.4 In addition to the TPZ, AS-4970 provides calculations to determine a tree's **Structural Root Zone** (SRZ). The SRZ is described in AS-4970 as *"the area around the base of a tree required for the tree's stability in the ground. This zone considers a tree's structural stability only, not the root zone required to maintain the trees vigour and long-term viability, which will usually be a much larger area".* Severance of structural roots (>25mm Ø) within the SRZ is not recommended as it may lead to the destabilisation and/or decline of the tree.

4.1.5 The TPZ & SRZ of the subject trees have been calculated in accordance with the AS-4970 and are included in the Tree Assessment Schedule **(Appendix 2)**.

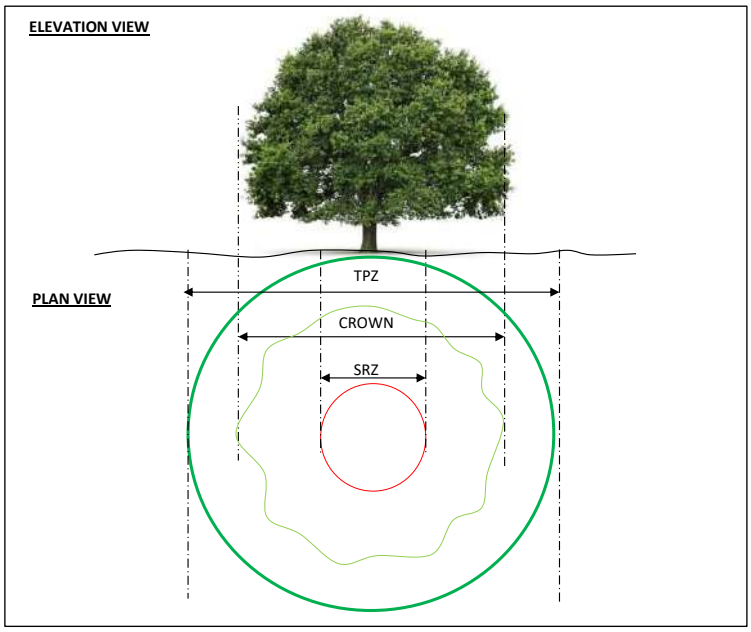


***Figure 3**: Indicative Tree Protection Zone and Structural Root Zone (AS-4970)*

4.2 Acceptable Incursions to the Tree Protection Zone.

4.2.1 Where encroachment to the TPZ is unavoidable, an incursion to the TPZ of not exceeding 10% of the area of the TPZ and outside the SRZ can be acceptable. Greater incursions to the TPZ may result in an adverse impact on the tree. Indicative levels of root zone encroachment are shown in figure 3 below. Various examples of acceptable incursions are also shown in **Appendix 3**.

4.2.2 Where incursions greater than 10% of the TPZ are unavoidable, exploratory excavation using non-destructive methods may be required to evaluate the extent of the root system affected and determine whether or not the tree can remain viable.

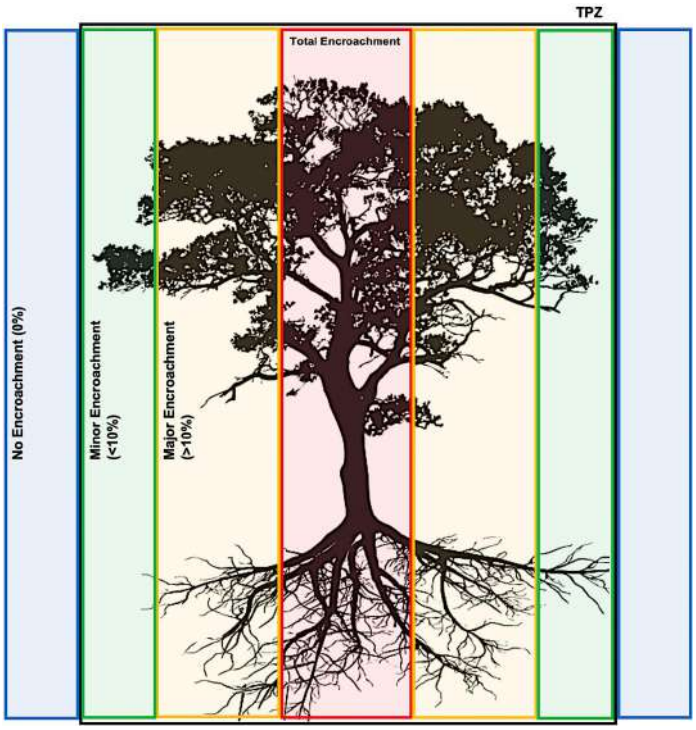


***Figure 4**: Indicative levels of root zone encroachment*

4.2.3 Trees wholly within proposed construction footprints are generally recommended for removal. Similarly, trees with their SRZ and/or with greater than 25% of their TPZ impacted by construction are also generally recommended for removal unless they are subject to regulatory protection . ***However different types of construction incursions (e.g. fill, cut, services, pavement type, retaining walls) produce varying likely tree impacts and each situation must be assessed in its own context and with consideration of the possible application of alternative construction method.*** Existing constraints to root development also vary the TPZ. Compacted fill can be equally as damaging to tree longevity as root development is restricted within heavily compacted soils.

4.3 Acceptable Encroachments To The Canopy

4.3.1 The removal of a small portion of the crown (foliage and branches) is generally tolerable provided that the extent of pruning required is less than 10% of the total foliage volume of the tree and the removal of branches does not create large wounds or disfigure the natural form and habit of the tree. All pruning cuts must be undertaken in accordance with AS 4373-*Pruning of Amenity Trees*. This generally involves reduction of the affected branches back to the nearest branch collar at the junction with the parent branch, rather than at an intermediate point. The latter is referred to as “lopping” and is not an acceptable arboricultural practice. Generally speaking, the minimum pruning required as possible to accommodate any proposed works is desirable. Extensive pruning can result in a detrimental impact on tree health and may lead to exposure of remaining branches to wind forces that they were previously sheltered from, leading to a greater risk of branch failure.

5.0 THE PROPOSED DEVELOPMENT

5.1 The Proposal

5.1.1 The components of the proposed development relevant to this report include:

- Construction of a new vehicle access to the property to comply with Bushfire Hazard Management requirements
- Construction of a dwelling & carport
- Construction of an on-site waste water management system absorption trench

5.2 Impact Assessment

5.2.1 The intention of this assessment is to evaluate the likely impact of the proposed works on the subject tree(s). A summary of the likely impact of the proposed works on the subject trees is shown in the Tree schedule **Appendix 2**. The following details have been considered as part of this assessment:

- Existing Relative Levels (R.L);
- Tree Protection Zone (TPZ);
- Structural Root Zone (SRZ);
- Footprint and envelope of the proposed works;
- Incursions to the TPZ & SRZ,
- Incursions to the tree canopy;
- Assessment of the likely impact of the works on existing tree(s).

5.2.1 Trees To Be Removed

5.2.1.1 HCV trees **5 & 14** as well as non-HCV trees **tk & tl** are entirely within the footprint of the proposed works and therefore will be required to be removed.

5.2.1.2 Construction of the vehicle access will result in an unacceptable level of encroachment (40%) on the TPZ area of HCV **tree 11.** Excavation, road-base deposition & compaction activities associated with typical road construction works at such a large level of root zone encroachment will most likely result in the rapid decline of the subject tree especially considering its already reduced state of physiological vitality. In addition such a large encroachment on the SRZ of the tree will also likely sever/damage significant woody structural roots leading to its compromised stability. Tree 11 also has significant trunk decay which will continue to increase as it declines resulting in an increasing likelihood of trunk failure. **As such tree 11 should be removed, however it would also be feasible retain & reduce the tree to a habitat stag so long as the property owners are aware of, and prepared to accept, the increasing likelihood of failure of the tree as it declines & continues to degrade over time.**

5.2.1.3 Construction of the vehicle access & carport will result in an unacceptable level of combined encroachment (22%) on the TPZ area of HCV **tree 15.** This tree has significant trunk decay & also exhibits significant associated physiological stress such that it would not tolerate the level of root damage & soil disturbance that will be incurred by the proposed access & carport

construction works. In addition the SRZ encroachment of the access works could sever/damage woody structural roots, compromising the tree's stability. Also, the extent of trunk decay will likely increase as the tree vitality declines, resulting in an associated likelihood of failure in the vicinity of the new carport & dwelling. **As such tree 15 should be removed.**

5.2.2 Trees To Be Retained

UNACCEPTABLE MAJOR ENCROACHMENTS

5.2.2.1 Construction of the vehicle access will result in an unacceptable level of encroachment on the TPZ area of HCV **trees 10** (20%)**, 12**(14%) & **19**(14%). These trees exhibit signs of significant physiological stress such that they would not tolerate the level of root damage & soil disturbance that will be incurred by the proposed access construction works. However it is likely that the works can be successfully achieved with tolerable long term impact to the subject trees if appropriate protective measures are properly implemented and controlled in accordance with the tree protection measures outlined in **Items 6.4 & 6.6** of the Tree Protection Specification. **Specifically, the access works should be constructed above the present surface grade employing non-destructive, non-compacting 'no dig' methodology within the TPZ/SRZ of trees 10, 12 & 19.**

NOTE: Tree 19 has a very large basal fire cavity that has resulted in opposite open trunk faces (figure 5). There presently appears to be sufficient reaction wood associated with the open cavity faces to provide adequate structural stability, however this may be diminished if the tree continues to experience increasingly reduced vitality. As such the tree may develop an increasing likelihood of failure and accordingly it should be inspected regularly (i.e annually) to assess its likelihood of failure and associated risk.

***Figure 5**: Tree 19 with a large open basal fire cavity & associated reaction wood*

ACCEPTABLE ENCROACHMENTS

5.2.2.2 Construction of the vehicle access will result in an acceptable encroachment (<10%) on the TPZ area of HCV **trees 3 & 6** with minimal likely adverse impact.

5.2.2.3 Construction of the new dwelling will result in an acceptable encroachment (~10%) on the TPZ area of HCV **tree 13** with minimal likely adverse impact.

5.2.2.4 The combined encroachemnt of the new dwelling, carport & access will result in an acceptable encroachment (<10%) on the TPZ area of HCV **tree 16** with minimal likely adverse impact.

5.2.2.5 Excavations for the on-site waste water management system absorption trench will result in an acceptable encroachment(<10%) on the TPZ area of HCV **trees 27, 32 & 33** as well as non-HCV tree **ti** with minimal likely adverse impact.

5.3 Recommendations

5.3.1 **Remove trees 5, 11, 14, 15, tk & tl.**

5.3.2 **Retain trees 3, 6, 10, 12, 13, 16, 19, 27, 32, 32 & ti and protect them accordance with the Tree Protection Specification in Section 6.**

5.3.3 **Construct future access road upgrade works above the present surface grade within the TPZ/SRZ of trees 10, 12 & 19 employing non-destructive, non-compacting 'no dig' methodology in accordance with Items 6.4 & 6.6 of the Tree Protection Specification in Section 6.**

6.0 TREE PROTECTION SPECIFICATION

6.0.1 The tree protection measures set out in this specification are supplemented by detailed general explanations and descriptions outlined in the compilation of "*Site Guidance Notes"* produced by Barrell Tree Consultancy and located on their website at https://www.barrelltreecare.co.uk/resources/technical-guidance/. These Site Guidance Notes (SGN) address a range of tree protection and management issues that regularly arise in the construction phase of development. Although the content of the SGNs is generally applicable to tree protection on construction sites worldwide, it should be noted that they are British documents and some terminology and/or references may differ or not be relevant to local conventions, standards and/or legislation. Where relevant, hyperlinks and QR codes to the relevant SGNs are provided at the end of particular sections.

6.1 Arboricultural Supervision

6.1.1 An Arborist (the Project Arborist) experienced in tree protection on construction sites *and* having gained a minimum arboricultural qualification of Australian Qualifications Framework (AQF) Certificate Level 5 (i.e diploma) should be engaged and the site specific requirements for tree protection fencing, temporary TPZ/SRZ access, and other specific tree protection measures confirmed through consultation between the Site Manager and the Project Arborist prior to the commencement of site establishment and construction work on the site. In addition the Project Arborist should oversee any excavation, machine trenching, compacted fill placement and other designated site specific activities within the TPZ/SRZ of all retained trees.

6.2 Tree Removal

6.2.1 Trees approved for removal as part of the Development Consent Conditions shall be removed **prior to the establishment of the tree protection measures.** Tree removal shall not damage the trees to be retained. Stumps located within the TPZs of trees to be retained shall be grubbed-out where required using a mechanical stump grinder (or by hand where less than 150mm in diameter) without damage to the root system of other trees. Where trees to be removed are within the SRZ of any trees to be retained, consideration should be given to cutting the stump close to ground level and retaining the root crown intact. **Stumps within the Tree Protection Zone of other trees to be retained shall not be pulled out using excavation equipment or similar.**

6.2.2 Tree removal works shall be undertaken in accordance with the Safe Work Australia "Guide To Managing Risks of Tree Trimming and Removal Work" (2016).

6.3 Tree Protection

6.3.1 The TPZ is the area surrounding retained trees that must be protected from any disturbance by the construction activity. In practice, TPZ establishment can be done by any combination of fencing, trunk protection &/or ground protection to be finalised and agreed to by the Project Arborist. Whether the TPZ is protected by fencing or trunk/ground protection, all the protective measures should be installed before the start of any site works that could affect trees. ***No protective measures should be removed or temporarily dismantled without consulting the Project Arborist.*** Furthermore, the condition of all the protective measures should be regularly monitored to ensure they remain fit for purpose. The main means of preventing

damage to trees and their root zones in the TPZ/SRZ are fencing, barriers and ground protection. Where possible following activities should be avoided within specified Tree Protection Zones:-

- Excavations and trenching (with exception of approved works);
- Ripping or cultivation of soil;
- Mechanical removal of vegetation;
- Soil disturbance or movement of natural rock;
- Soil level changes including the placement of fill material
- Movement and storage of plant, equipment & vehicles;
- Erection of site sheds;
- Affixing of signage or hoardings to trees;
- Storage of building materials, waste and waste receptacles;
- Disposal of waste materials and chemicals including paint, solvents, cement slurry, fuel, oil and other toxic liquids;
- Other physical damage to the trunk or root system; and
- Any other activity likely to cause damage to the tree.

6.3.2 **Tree Protection Fencing**: Protective fencing shall be installed at the locations shown on the Tree Protection Plan in **Appendix 1** by an **orange line**. Where Tree Protection Zones merge a single fence encompassing the area is deemed to be adequate. The actual form of the fencing can vary, provided it is fit for purpose in that it *effectively physically restricts access and damaging activities within the TPZ/SRZ that it encloses for the duration of the proposed works* and it is approved by the Project Arborist. **In the context of the proposed works it is appropriate to construct the fencing from medium duty (160 gsm minimum) barrier mesh attached to star pickets (droppers) at 5m minimum spacing**. In order to maintain tension 2mm fencing wire should be run through the top of the barrier mesh & droppers (see figure 4 below).

Figure 4*- Tree Protection Fencing constructed with barrier mesh.*

6.3.3 **Tree Signage**: Appropriate signage shall be installed on the fencing to prevent unauthorised movement & or storage of plant and equipment or entry to the TPZ/SRZ (see figure 6 below). A sample Tree Protection Zone sign is attached to the back of this document.

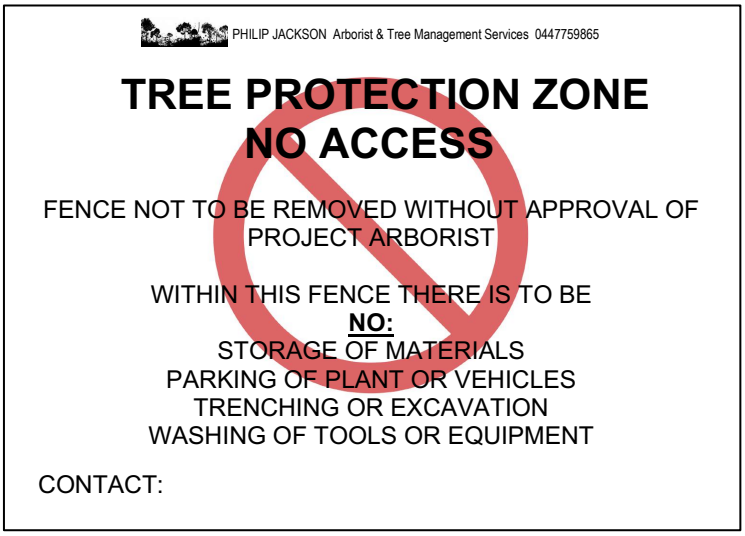


Figure 6*- Appropriate Tree Protection Zone Signage*

6.3.5 **Ground Protection:** If temporary access for machinery is required within the TPZ ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. A range of methods can be used, including retaining existing hard surfacing or structures that already protect the soil, installing new materials, or a combination of both. Commonly employed methods include a permeable membrane such as geotextile fabric beneath a 100mm layer of hardwood mulch or crushed rock below rumble boards. **Whatever the choice of method, the end result must be that the underlying soil (rooting environment) remains undisturbed and retains the capacity to support existing and new roots.**

6.3.3 More detailed illustrative guidance on ground protection in TPZs can be accessed via the following hyperlink:

https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn03?stage=Stage

6.3.6 **Tree damage:** In the event of a protected tree becoming damaged for any reason during the works period the Project Arborist shall be required to inspect and provide advice on any remedial action to minimise any adverse impact. Such remedial action shall be implemented as soon as practicable and certified by the arborist.

6.4 Working Within Tree Protection Zones

6.4.0 In some cases works within the TPZ may be authorized. **These works shall be supervised by, or at a minimum notified to, the Project Arborist**. When undertaking works within the TPZ, care should be taken to avoid damage to the tree's root system, trunks and lower branches.

6.4.1 General Excavation & Dealing With Roots

6.4.1.1 **Prior to any mechanical excavations for building/wall or post footings or foundations, batter cuts or pavement sub-grade** within the Tree Protection Zone of all trees nominated for retention, exploratory excavation using non-destructive techniques shall be undertaken at the proposed footing site or along the perimeter of the structure or pavement within the TPZ. Non-destructive excavation techniques may include the use of hand-held implements, air pressure (using an Air-spade® device) or water pressure. For walls or slabs the exploratory excavation shall be undertaken along the perimeter of the foundation or pavement (within the TPZ) to the depth of the foundation or to a maximum of 800mm from surface levels, to locate and expose any woody roots prior to any mechanical excavation. All care shall be undertaken to preserve woody roots intact and undamaged during exploratory excavation.

6.4.1.2 Any located roots less than 40mm in diameter can be cleanly severed with clean sharp pruning implements 10–20cm behind the final face of the excavation. The root zone in the vicinity of the excavation shall be kept moist following excavation for the duration of construction to minimise stress on the tree. ***Where large woody roots (greater than 40mm diameter) are encountered during excavations, further advice from the Project Arborist shall be sought prior to severance.***

6.4.1.3 Where necessary, (to avoid severing large amounts of woody and or fibrous roots) consideration should be given to the installation of an elevated structure (e.g. pier and beam footing, suspended slab or floor supported on piers, cantilevered slab, up-turned edge beam etc) in preference to structures requiring a deep edge beam or continuous perimeter strip footing. The beam section of any pier and beam footing should be placed ***above*** grade to avoid excavation within the SRZ. Pier footings intersecting large woody roots should be slightly offset where necessary to avoid root severance.

6.4.1.4 More detailed illustrative guidance on excavating and installing structures in TPZs can be accessed via the following hyperlinks codes:

https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn07?stage=Stage

https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn10?stage=Stage

6.4.2 Fill Material

6.4.2.1 Placement of fill material within the Tree Protection Zone of trees to be retained should be avoided wherever possible. Where placement of fill is unavoidable, the material should be a well-drained friable material, equivalent in texture to the existing site topsoil material (heavy clay or shale sub- soil material is unacceptable). The fill should be free from rocks, vegetation and other extraneous material complying with AS 4419:2003 (*Soils for Landscaping and Garden Use*). The fill may be consolidated but should not be compacted to engineering standards. No fill material should be placed in direct contact with the trunk. Plant and equipment used to place and spread fill material should be stationed outside the TPZ where possible. Where not possible, suitable ground protection should be installed in accordance to avoid compaction of the underlying soil.

6.5 Canopy And Root Pruning

6.5.1 All pruning work required shall be carried out in accordance with Australian Standard 4373- – *Pruning of Amenity Trees*. The arborist undertaking the pruning works shall possess a minimum arboricultural qualification of Australian Qualifications Framework (AQF) Level 3 or its recognised equivalent. The arborist should have a minimum of 3 years' experience in practical Arboriculture. Pruning work should be undertaken in accordance with *Australian Standard 4373: Pruning of Amenity Trees (2007), Workcover Code of Practice for the Amenity Tree Industry* (1998) and other applicable legislation and codes.

6.5.2 Care shall be taken when operating cranes, excavators, drilling rigs and similar equipment near trees to avoid damage to tree canopies (foliage and branches). ***Under no circumstances shall branches be torn-off by construction equipment. Where there is potential conflict between tree canopy and construction activities, the advice of the Project Arborist must be sought.***

6.5.3 Where root pruning is required, roots shall be severed with clean, sharp pruning implements and retained in a moist condition during the construction phase using Hessian material or mulch where practical.

6.6 Construction of Vehicular Access Within TPZs

6.6.1 ***Basic principles:*** New vehicle accesses & footpaths are potentially damaging to trees because it may require changes to existing ground levels, result in localised soil structure degradation and/or disrupt the efficient exchange of water and gases in and out of the soil. Mature and over-mature trees are much more prone to suffer because of these changes than young and maturing trees. Adverse impact on trees can be reduced by minimising the extent of these changes in TPZs. Generally, the most suitable surfacing will be relatively permeable to allow water and gas movement, load spreading to avoid localised compaction and require little or no excavation to limit direct damage. ***The actual specification of the access material is an engineering issue that needs to be considered in the context of the bearing capacity of the soil, the intended loading and the frequency of loading. The detail of product and specification are beyond the scope of this guidance and must be provided separately by the appropriate specialist.***

6.6.2 **Establishing the depth of excavation and surfacing gradient:** The precise location and depth of roots within the soil is unpredictable and will only be known when careful digging starts on site. Ideally, all new surfacing in TPZs should be no-dig, i.e. requiring no excavation whatsoever, but this is rarely possible on undulating surfaces. New surfacing normally requires an evenly (gap) graded sub-base layer, which can be made up to any high points with granular, permeable fills such as crushed stone or sharp sand. This sub-base must not be compacted as would happen in conventional surface installation. Some limited excavation is usually necessary to achieve this and need not be damaging to trees if carried out carefully and large roots are not cut. On undulating surfaces, finished gradients/levels must be planned with sufficient flexibility to allow on-site adjustment if excavation of any high points reveals large unexpected roots near the surface.

6.6.3 If the roots exposed are less than 50mm in diameter, it would normally be acceptable to cut them and the gradient formed with the preferred minimal excavation of up to 50mm. However, if roots over 50mm in diameter are exposed, cutting them may be too damaging and further excavation may not be possible. If that is the case, the surrounding levels must be adjusted to take account of these high points by filling with suitable material. If this is not practical and

large roots have to be cut, the situation should be discussed with the Project Arborist before a final decision is made.

6.6.4 **Base and finishing layers (Fill Material):** Sub-base should be formed from coarse, gap-graded material such as 20–50mm crushed basalt (Blue Metal) or equivalent to provide some aeration to the root zone. Note that road-base or crushed sandstone or other material containing a high percentage of fines is unacceptable for this purpose. The fill material should be consolidated with a non-vibrating roller to minimise compaction of the underlying soil. A permeable geotextile may be used beneath the sub-base to prevent migration of the stone into the sub-grade. Suitable surface finishes usually include washed gravel, permeable tarmac such as asphalt or permeable block paving set on a sand base. In certain circumstances the load spreading sub-base will be cellular and filled with suitable materials***. (See below for illustrative guidance for installing cellular confinement surfacing within TPZs).***

6.6.5 **Edge retention:** Conventional kerb edge retention set in concrete filled excavated trenches is likely to result in damage to roots and should be avoided. Effective edge retention in TPZs must be custom designed to avoid any significant excavation into existing soil levels. For most surfaces, the use of pre-formed edging secured by metal pins or wooden pegs is normally an effective way of minimising any adverse impact on trees from the retention structure. Railway sleepers pinned in place or wooden boards offer alternative options, depending on the expected loading of the surfacing. If the edge retention needs to be battered down to lower surrounding ground levels, a permeable soil fill will be used, as agreed with the Project Arborist.

6.6.6 **New Surfacing Near Trunks:** All new surfacing should be set back from trunks and buttress roots by at least 50cm to allow space for future growth and minimise the risk of distortion.

6.6.7 More detailed illustrative guidance on installing/upgrading surfacing in TPZs can be accessed via the following hyperlink :

https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn09?stage=Stage

6.7 Installing Services Within TPZs

6.7.1 All proposed stormwater lines and other underground services should be located outside TPZs of trees proposed to be retained wherever possible or installed by alternative measures. Alternative measures include suspending pipelines beneath the floor of a building or structure (to avoid excavation with the TPZ), non-destructive excavation methods or Horizontal Directional Drilling (HDD). Where the installation of service lines within TPZs is unavoidable, the pipelines or conduits should be installed as follows:

6.7.2 Where the extent of the incursion to the root zone is less than 10% of the TPZ including any excavations for benching and shoring the trench, the pipeline or conduit may be installed by open trenching using standard construction methods (excavator or trenching machine).

6.7.3 Where the extent of the incursion to the root zone exceeds 10% of the TPZ, but is outside the SRZ, non-destructive excavation methods must be adopted in accordance with paragraph 6.5.1. Where large woody roots are encountered during excavation or trenching (root diameter greater than 50mm), these shall be retained intact wherever possible (e.g. by tunnelling beneath roots and inserting the pipeline or conduit beneath or re-routing the service

etc). Where this is not practical and root pruning is the only alternative, proposed root pruning should be assessed by a qualified arborist [AQF 5] to evaluate the potential impact on the health and stability of the subject tree.

6.7.4 More detailed illustrative guidance on installing services in TPZs can be accessed via the following hyperlink and/or QR code

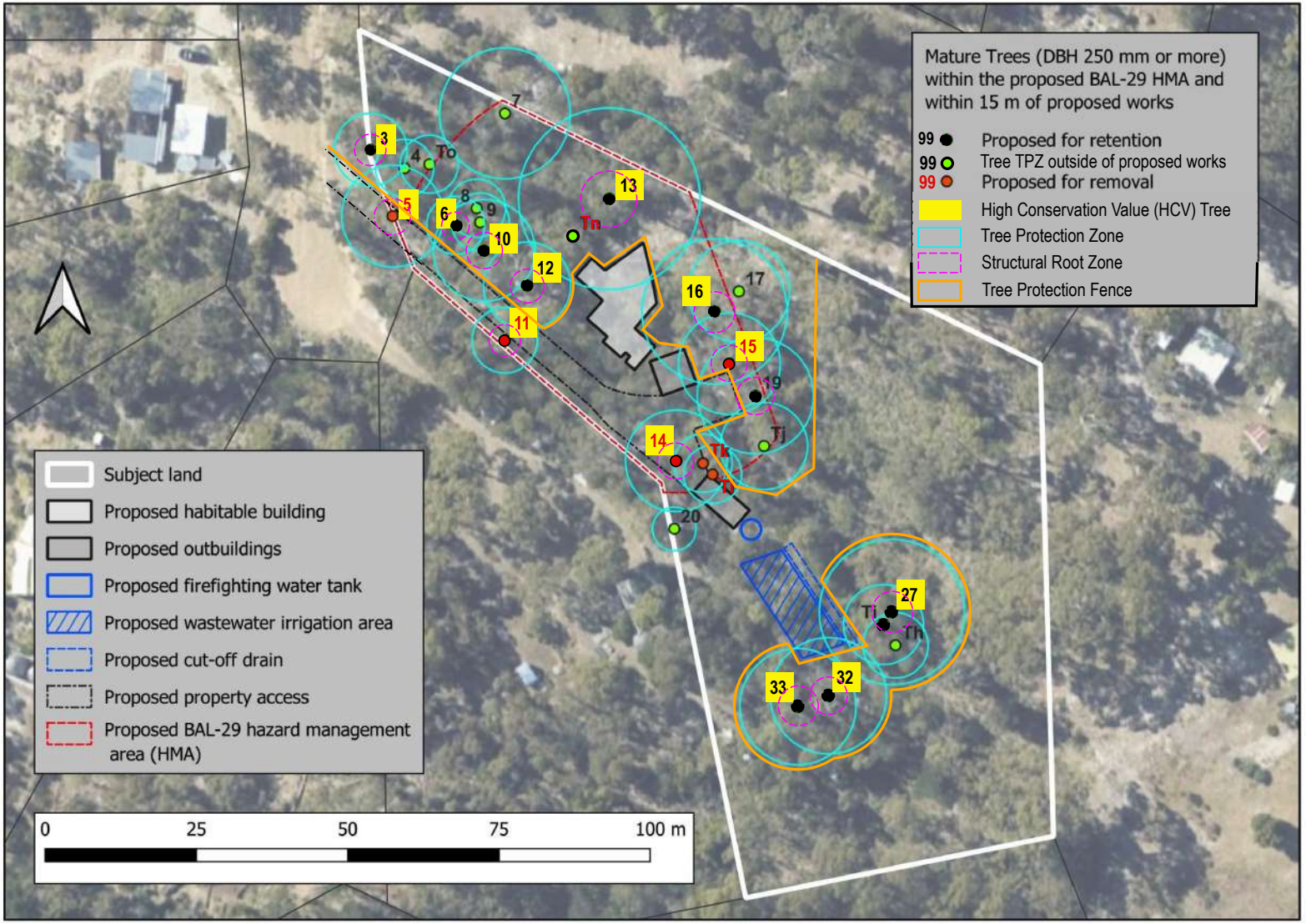
https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn11?stage=Stage

6.8 Pollution Control Within TPZs

6.8.1 Detailed illustrative guidance on pollution control in TPZs can be accessed via the following hyperlink:

https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn4-v3/

APPENDIX 1: TREE PROTECTION PLAN



TREE PROTECTION PLAN :
75 BLYTH PARADE
GREAT BAY

PHILIP JACKSON
Arborist & Tree Management Services
0447759865
tastreereports@gmail.com

Drawing based on:
"Tree Plan, 75 Blyth Parade Great Bay"
Prepared by: Mulcahy Planning & Property Services
Dated: 17/09/24

DWG No: BLY-75-2412-01

DATE: 03/12/24

Not to scale

APPENDIX 2 – TREE SCHEDULE

NOTES:

Age Class: Y = young, SM = semi-mature, EM = early-mature, M = mature, PM = post-mature (senescent)

Height: **Class**: 0-5m; 6-10m; 11-15m; 16-20m; 21-25m; >25m

DBH: Diameter at Breast Height

DAB: diameter of base measure at point above basal flare

TPZ = Tree Protection Zone

SRZ = Structural Root Zone

Overall Vitality: G= Good; M=Moderate; P=Poor; Mo= Moribund; D= Dead

Overall Structure: G = Good; F = Fair; P = Poor; D= Dead.

Remaining Life Expectancy L =Long (>40 years); M=Medium (15-40 years); S=Short (5-15 years) ; T=Transient (< 5 years)

Conservation Value &/or Covenant Protection VH= Very High; H= High (see Section A1.5 in Appendix 4);

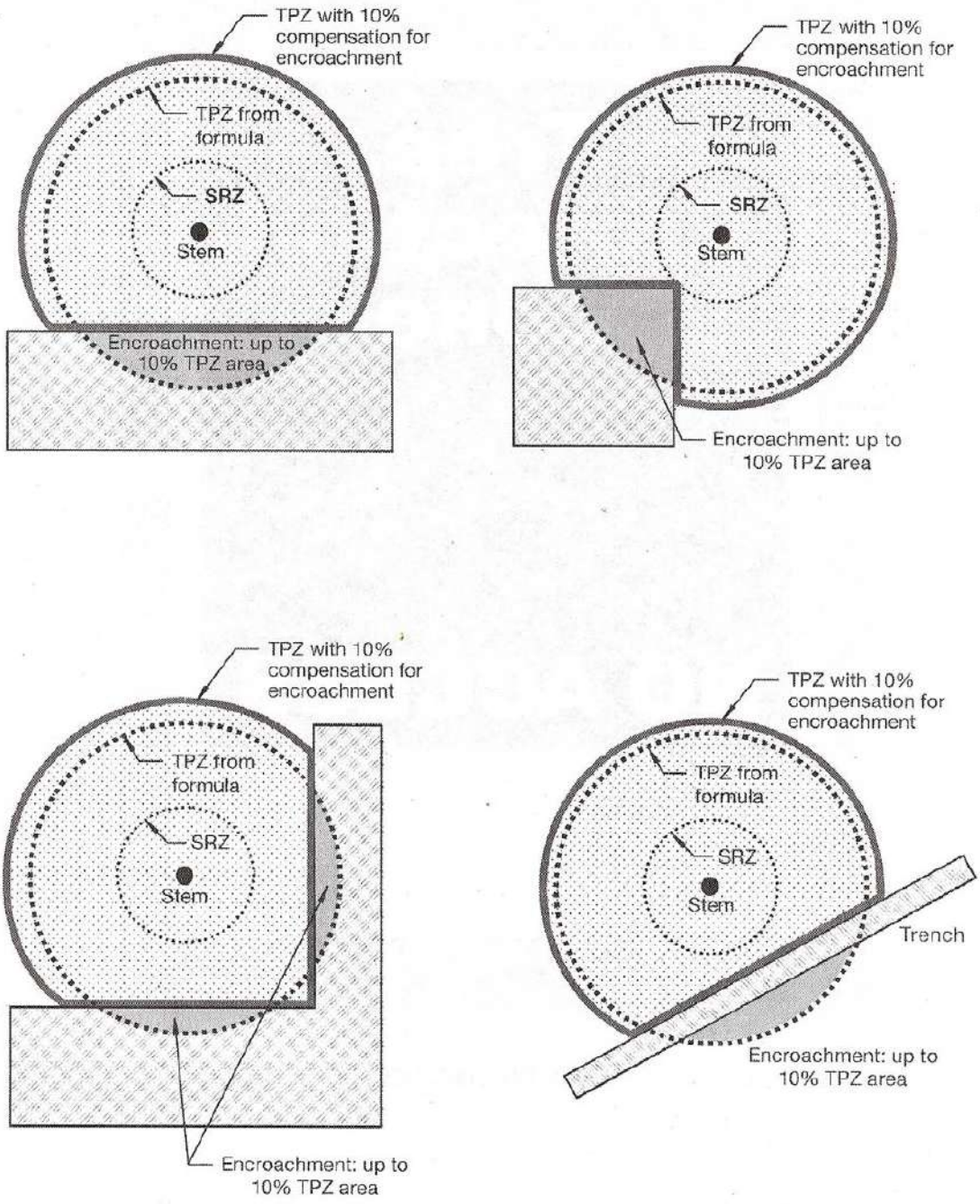
Recommendations: **Rm**= Remove, **Rt**= Retain, **Rt+ =** Retain by re-designing and/or employing alternative non-destructive construction methods

Tree	Euc species	Age Class	Height (m)	Spread (m)	DBH (m)	DAB(m)	Overall Vitality	Overall Structure	Life expectancy	Conservation Value	TPZ(m)	SRZ(m)	TPZ/SRZ Encroachment	Likely Impact	Recommendation	Comments
3	**White Gum** *(Eucalyptus viminalis)*	M	16-20m	7	0.50	0.55	P-M	G	S	H	6.0	2.6	<10%	**Acceptable** encroachment. Minimal impact.	**Rt**	Tree stressed.
5	**Black Peppermint** *(Eucalyptus amygdalina)*	M	16-20m	8	0.70	0.77	G	G	M	H	8.4	3.0	100%	**Tree entirely within access footprint**	**Rm**	Immediately adjacent existing access
6	**White Gum** *(Eucalyptus viminalis)*	M	11-15m	7	0.40	0.44	M	F	T	H	4.8	2.3	<10%	**Acceptable** encroachment. Minimal impact.	**Rt**	Tree in terminal decline
10	**Black Peppermint** *(Eucalyptus amygdalina)*	M	16-20m	8	0.70	0.77	P-M	P	S	H	8.4	3.0	20%	**Unacceptable** encroachment with adverse impact	**Rt***	Tree stressed with basal fire cavity. **Construct access upgrade & drainage above existing level using non-destructive methods including no excavation or compaction**.
11	**White Gum** *(Eucalyptus viminalis)*	M	16-20m	12	0.50	0.55	P-M	P	S	H	6.0	2.6	40% + SRZ	**Unacceptable** encroachment with probable instability & death of tree	**Rm**	Tree stressed with significant trunk decay. Will become increasingly likely to fail due to increasing decay. Could consider retention as habitat stag if congnisant of failure potential.
12	**White Gum** *(Eucalyptus viminalis)*	M	16-20m	12	0.60	0.66	P-M	G	S	H	7.2	2.8	14%	**Unacceptable** encroachment with adverse impact	**Rt***	Tree stressed. Immediately next to existing access. **Construct access upgrade & drainage above existing level using non-destructive methods including no excavation or compaction.**

Tree	Euc species	Age Class	Height (m)	Spread (m)	DBH (m)	DAB(m)	Overall Vitality	Overall Structure	Life expectancy	Conservation Value	TPZ(m)	SRZ(m)	TPZ/SRZ Encroachment	Likely Impact	Recommendation	Comments
13	**Black Peppermint** *(Eucalyptus amygdalina)*	M	21-25m	15	1.30	1.43	P-M	F	S	VH	15.0	3.9	~10%	**Acceptable** encroachment. Acceptable impact.	**Rt**	Tree stressed with most of canopy response growth & stem decay
14	**White Peppermint** *(Eucalyptus pulchella)*	M	11-15m	12	0.70	0.77	G	F	M	VH	8.4	3.0	100%	**Tree entirely within access footprint**	**Rm**	trunk decay
15	**Black Peppermint** *(Eucalyptus amygdalina)*	M	11-15m	9	0.70	0.77	P	P	S	H	8.4	3.0	**Access:** 17% + SRZ **Carport:** 5%	**Unacceptable** encroachment with potential instability & likely death of tree	**Rm**	Tree stressed with canopy mostly response growth & trunk decay. Will become increasingly likely to fail due to increasing decay with new development within failure impact zone.
16	**Black Peppermint** *(Eucalyptus amygdalina)*	M	16-20m	15	1.00	1.10	P-M	F	S	VH	12.0	3.4	**Combined Access, Carport & Dwelling:** <10%	**Acceptable** encroachment. Acceptable impact.	**Rt**	Tree stressed. Basal fire cavity & trunk decay.
19	**White Peppermint** *(Eucalyptus pulchella)*	M	11-15m	12	0.80	0.88	P-M	P	S	VH	9.6	3.1	14%	**Unacceptable** encroachment with adverse impact	**Rt***	Tree stressed with most of canopy response growth & very large basal fire cavity requiring regular inspection. **Construct access upgrade & drainage above existing level using non-destructive methods including no excavation or compaction.**
27	**Black Peppermint** *(Eucalyptus amygdalina)*	M	16-20m	10	1.00	1.10	G	F	M	VH	12.0	3.4	<10%	**Acceptable** encroachment. Minimal impact.	**Rt**	Stem decay & inhabited basal habitat cavity

Tree	Euc species	Age Class	Height (m)	Spread (m)	DBH (m)	DAB(m)	Overall Vitality	Overall Structure	Life expectancy	Conservation Value	TPZ(m)	SRZ(m)	TPZ/SRZ Encroachment	Likely Impact	Recommendation	Comments
32	**Black Peppermint** *(Eucalyptus amygdalina)*	M	16-20m	7	0.80	0.88	P	F	S	VH	9.6	3.1	<10%	**Acceptable** encroachment. Minimal impact.	**Rt**	Tree stressed with sparse canopy comprised of mostly response growth. Decay in stem & Primary branches
33	**Black Peppermint** *(Eucalyptus amygdalina)*	M	16-20m	8	0.90	0.99	P-M	F	S	VH	10.8	3.3	<10%	**Acceptable** encroachment. Minimal impact.	**Rt**	Tree stressed with most of canopy response growth. Decay in stem & Primary branches
Ti	**Black Peppermint** *(Eucalyptus amygdalina)*	M	16-20m	6	0.55	0.61	M	P	M	n/a	6.6	2.7	<10%	**Acceptable** encroachment. Minimal impact.	**Rt**	Trunk decay.
Tk	**White Peppermint** *(Eucalyptus pulchella)*	M	16-20m	10	0.35	0.39	M	F	M	n/a	4.2	2.2	100%	**Tree entirely within access footprint**	**Rm**	
Tl	**Black Peppermint** *(Eucalyptus amygdalina)*	M	16-20m	8	0.35	0.39	M	F	M	n/a	4.2	2.2	100%	**Tree entirely within access footprint**	**Rm**	

APPENDIX 3 - ACCEPTABLE INCURSIONS TO THE TREE PROTECTION ZONE (TPZ)



NOTE: Less than 10% TPZ area and outside SRZ. Any loss of TPZ compensated for elsewhere.

REF:- Council of Standards Australia (August 2009)
AS 4970 – 2009 – Protection of Trees on Development Sites
Standards Australia, Sydney.

APPENDIX 4 – METHODOLOGY

A1.0 Qualifications

1.0.1 I have based this report on my site observations and the information provided to me. I have over fifteen years' experience in the field of tree management and arboricultural practice. A summary of my relevant qualifications includes:

- Bachelor of Science (Hons) – Plant Ecology - University of NSW
- Bachelor of Science – Botany/Environmental. Studies - Tasmania University
- Diploma of Horticulture - Aboriculture - Ryde TAFE
- VALID Tree Risk-Benefit Assessment certified validator
- Quantified Tree Risk Assessment certified advanced practitioner - Lic. No. 4148

A1.1 General

1.1.1 I conducted a survey and basic inspection of the subject trees from the ground. No aerial or climbing inspections, core testing, drilling or ultrasound diagnosis were undertaken. No excavations to determine the location and/or condition of roots were conducted. No plant samples were analysed for formal identification of any pests or disease.

1.1.2 The biological and mechanical features of the trees were assessed for health & vitality, structural condition and defects.

1.1.3 Tree trunk diameter at breast height (DBH) was measured or estimated at 1.4 metres above ground level and rounded to the nearest 0.10 metres. Tree Basal diameter was estimated to be 0.1x greater than the DBH. Tree height was estimated. All distances were taken from the centre of the trunk unless otherwise indicated.

A1.2 Tree Health Assessment

1.2.1 The overall health of the trees was rated as follows:

	Description
Good	**Good** health and vitality - exhibiting minor pest/disease, good extension growth, minor abnormalities in foliage size, colour or density.
Moderate	**Moderate** health and vitality - containing defects and/or damage that may be able to be remediated to provide an acceptable level of risk.
Poor	**Poor** health and vitality - exhibiting extensive or untreatable pest/disease, poor extension growth, significant deadwood and dieback, evidence of rapid decline, sparse foliage cover, abnormal foliage colour or size.
Moribund	Tree is in terminal decline, Lacking vitality or vigour
Dead	Tree is dead

A1.3 Tree Structure Assessment

1.3.1 The overall structure of the tree was rated as follows:

	Description
Good	Good structure - may contain minor defects and/or damage that can be successfully remediated or do not require treatment with an acceptable level of risk.
Fair	Fair structure - containing defects and/or damage that may be able to be remediated to provide an acceptable level of risk.
Poor	Poor structure - Evidence of instability or contains defects and/or damage which render the tree potentially hazardous/ prone to failure or cannot be successfully remediated.
Dead	Tree is dead

A1.4 Remaining Life Expectancy

1.4.1 The remaining life expectancy (RLE) is an estimate of the sustainable longevity of the subject tree(s) in its growing environment. The RLE is modified where necessary to take in consideration tree(s) health, structural condition and site suitability. The tree(s) has been allocated one of the following RLE categories (Modified from Barrell, 2001):

I. Long (>40 years)
II. Medium (15-40 years)
III. Short (5-15 years)
IV. Transient (< 5 years)

The estimated RLE of the subject tree is shown in the Tree Schedule in **Appendix 2**.

A1.5 Conservation Value Assessment

Table 1: *Kingborough Council working definition of native tree conservation value set out in Kingborough Council Policy 6.10 "Biodiversity Offset Policy".*

Species	Characteristics	Rationale	Conservation Value
Eucalyptus globulus or *E. ovata*	DBH >70cm	Swift parrot foraging habitat	Very high
E. viminalis	DBH >25cm and within or directly adjacent to significant forty-spotted pardalote habitat	Forty-spotted pardalote habitat	Very high
Native trees with known or potential nesting hollows	Hollows present; and/or, DBH > 70cm in dry forests or cleared settings; or, DBH >100cm in wet forests	Habitat for hollow dependent species	Very high
Eucalyptus globulus or *E. ovata*	DBH >40cm and <70cm	Swift parrot foraging habitat	High
E. viminalis	DBH >25cm and within 3,000m of significant forty-spotted pardalote habitat or within potential forty-spotted pardalote habitat	Forty-spotted pardalote habitat	High
A species that is listed in the *Threatened Species Protection Act 1995* or the *Environment Protection and Biodiversity Conservation Act 1999 (C'th)*	N/A	Listed threatened species	High

REFERENCES

Barrell, J 2001, *"* SULE: Its use and status into the new millennium" in *Management of mature trees.* Proceedings of the 4th NAAA Tree Management Seminar, NAAA, Sydney.

Barrell Tree Consultancy (2020) *"Manual For Managing Trees on Development Sites" (2020) https://www.barrelltreecare.co.uk/resources/technical-guidance*

Council of Standards Australia (2009) **AS 4970– Protection of Trees on Development Sites** Standards Australia, Sydney.

Council of Standards Australia (2007) **AS 4373 – Pruning of Amenity Trees** Standards Australia, Sydney.

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