WLPP No.	Item 2
DA No.	RD-2019/1429/A
Proposal	Subdivision - Torrens title - two (2) residential lots and tree removal
Property	6 Gum Tree Lane Thirroul
Applicant	Mr Jason Ward
Responsible Team	Development Assessment and Certification – City Wide Team (KR)

ASSESSMENT REPORT AND RECOMMENDATION

Executive Summary

Reason for consideration by Local Planning Panel

The proposal has been referred to the Local Planning Panel **for advice** pursuant to clause 2.19(1)(a) of the Environmental Planning and Assessment Act 1979. Under Section 1(c) of the Wollongong Local Planning Panel Submissions draft policy of 24 September 2018, the proposal is the subject of five or more unique submissions by way of objection and is a Section 8.2 Review of Determination.

Proposal

The proposal is for subdivision - Torrens title - two (2) residential lots and tree removal.

Permissibility

The site is zoned R2 Low Density Residential pursuant to the Wollongong Local Environmental Plan (WLEP) 2009. Subdivision is permitted pursuant to Clause 2.6 of the WLEP 2009.

Consultation

The proposal was notified in accordance with Council's Community Participation Plan 2019 and received six (6) submissions by way of objection which are discussed at section 1.6 of the assessment report.

Council's Development Engineering and Landscape Officer's have reviewed the application. Council's Development Engineer is satisfied with the proposal however Council's Landscape Officer has found the proposal unsatisfactory.

Main Issues

The main issues are:

- Tree removal
- Lot depth

Likely impacts

There are expected to be adverse impacts on the environment and the amenity of the locality as a result of the proposal.

RECOMMENDATION

It is recommended the application be Refused.

1 APPLICATION OVERVIEW

1.1 PLANNING CONTROLS

The following planning controls apply to the proposal:

State Environmental Planning Policies:

- SEPP No. 55 – Remediation of Land
- SEPP (Koala Habitat Protection) 2019

Local Environmental Planning Policies:

- Wollongong Local Environmental Plan (WLEP) 2009

Development Control Plans:

- Wollongong Development Control Plan 2009

Other policies

- Wollongong City Wide Development Contributions Plan 2019
- Wollongong Community Participation Plan 2019

The proposal is unsatisfactory with regard to the applicable planning controls as discussed in the body of this report.

1.2 DETAILED DESCRIPTION OF PROPOSAL

The proposal is for a two (2) lot Torrens title subdivision of the subject site into Lot 821 and 822 as follows:

- Proposed Lot 821 - 451sqm (472sqm including access handle)
- Proposed Lot 822 - 450sqm

Stormwater is proposed to drain to the existing OSD on proposed Lot 821 to Pass Avenue via an existing inter-allotment drainage over the rear lot (No. 21 Pass Avenue).

The proposal under Review seeks to remove one (1) significant tree, identified as Tree 1 in the submitted Arborist Report. The original proposal also sought to remove a further three (3) trees along the eastern boundary due to conflicts with stormwater drainage – see Figure 1.

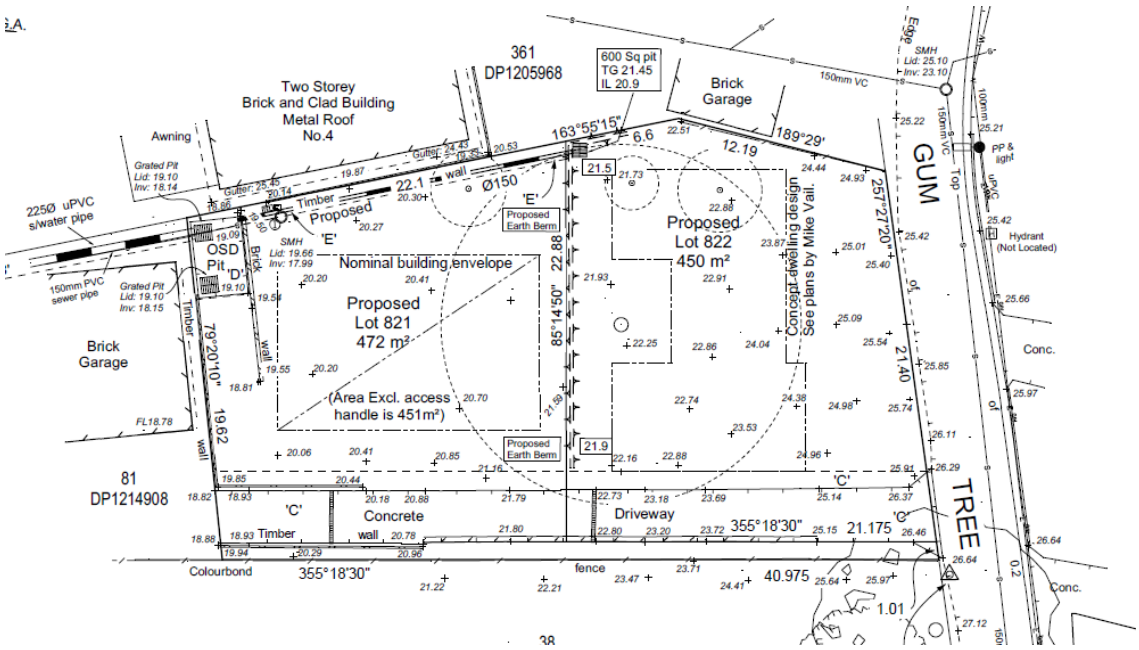


Figure 1: Excerpt from proposed Subdivision Plan submitted in original DA-2019/1429 (also relevant to the Review of Determination application (RD-2019/1429/A)

1.3 REVIEW OF DETERMINATION

The application is a Review of Determination made in accordance with Section 8.2-8.5 of the Environmental Planning and Assessment Act 1979. Section 8.3 of the Act enables an applicant for development consent to request a consent authority review a determination or decision made by the consent authority. The original DA was refused on 26 March 2020 and the application must be determined prior to 6 months from refusal date in accordance with the Act (i.e prior to 26 September 2020).

In accordance with Section 8.3 of the Act, the applicant may amend the proposed development and Council may review the matter having regard to the amended development, but only if it is satisfied that it is substantially the same development. The application has been amended as described below, however, Council is satisfied that the proposal is substantially the same development.

The original DA-2019/1429 proposed retention of Tree 1 and building envelopes/concept plans were provided to demonstrate that the proposal was capable of accommodating a future dwelling-house on each proposed lot. However Council's Landscape Officer was concerned that the proposed subdivision was not compatible with the retention of Tree 1 and insufficient information was submitted to justify its removal.

The application under Review seeks to remove Tree 1 and additional information, Arbortum Assessment and Risk Assessment Report prepared by The Ents Tree Consultancy dated 10 April 2020, has been submitted to justify its removal.

The original DA-2019/1429 also provided insufficient information to demonstrate that the existing OSD will function as designed with the addition of another dwelling and associated hardstand area to the site. The applicant has provided additional information with the application under Review to demonstrate that the existing OSD is adequate to cater for the proposed development.

1.4 BACKGROUND

Relevant History:

DA-2015/1089

The subject site (Lot 82) was created following the subdivision of 21 Pass Avenue Thirroul (Lot 81) approved under DA-2015/1089.

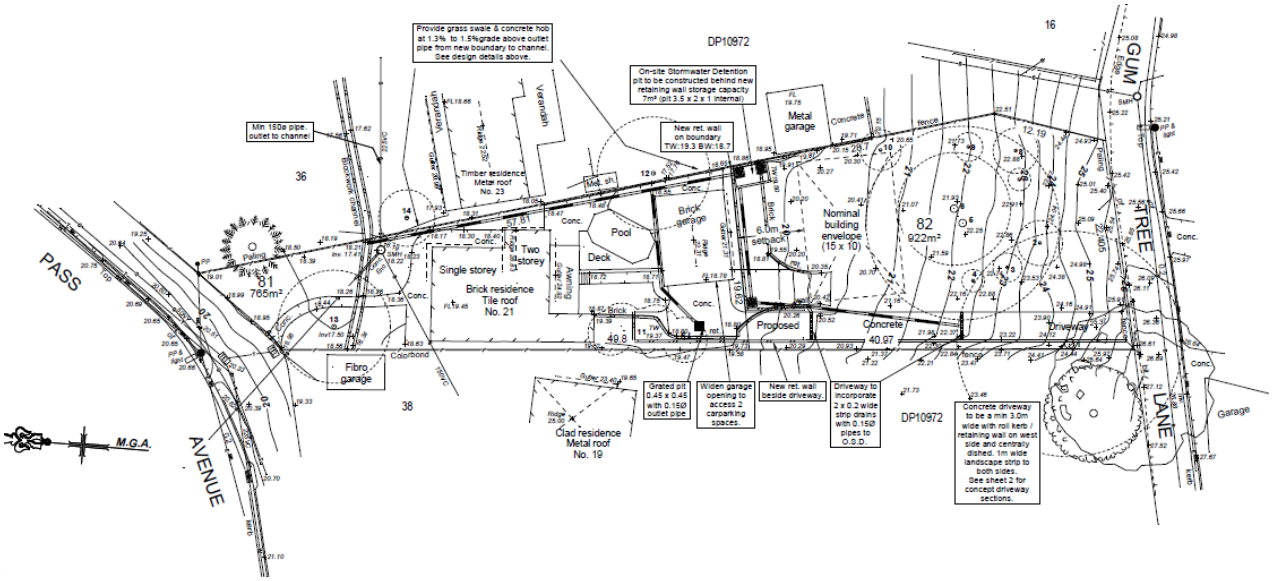


Figure 2: Excerpt from approved Subdivision Plan DA-2015/1089

The consent for DA-2015/1089 approved the removal of four (4) trees – highlighted in yellow in Figure 3 below. Approval was sought for removal of two Blackbutt trees located centrally within the site, one of which is known as 'Tree 1' in the current application under review and a second slightly smaller Blackbutt tree, however consent was not granted for removal of either of these trees.

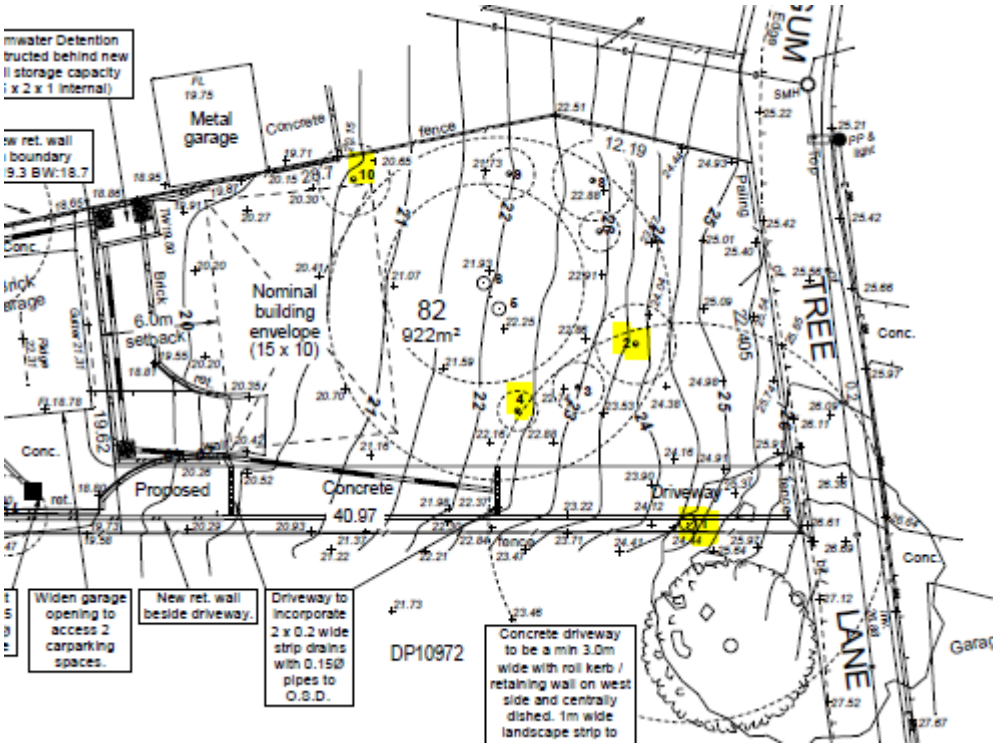


Figure 3: Excerpt from approved Subdivision Plan DA-2015/1089 showing the four trees approved for removal

Tree Management Orders

There were three TMO's in 2017 and 2019. TMO-2017/24 sought removal of the two Blackbutt trees. Consent was granted to remove the smaller one. The Blackbutt tree, known as 'Tree 1' in the current application under review was not permitted to be removed.

TMO-2017/724/A and TMO-2019/505 sought removal of the Blackbutt tree known as 'Tree 1' however it was not permitted to be removed.

DA-2019/1429

The original DA-2019/1429 for a two lot Torrens title subdivision of Lot 82 was refused on 26 March 2020. An excerpt from the Subdivision Plan is provided at Figure 1. The Tree Protection Plan is provided at Figure 4 below showing proposed retention of Tree 1 and removal of three (3) trees along the eastern boundary.

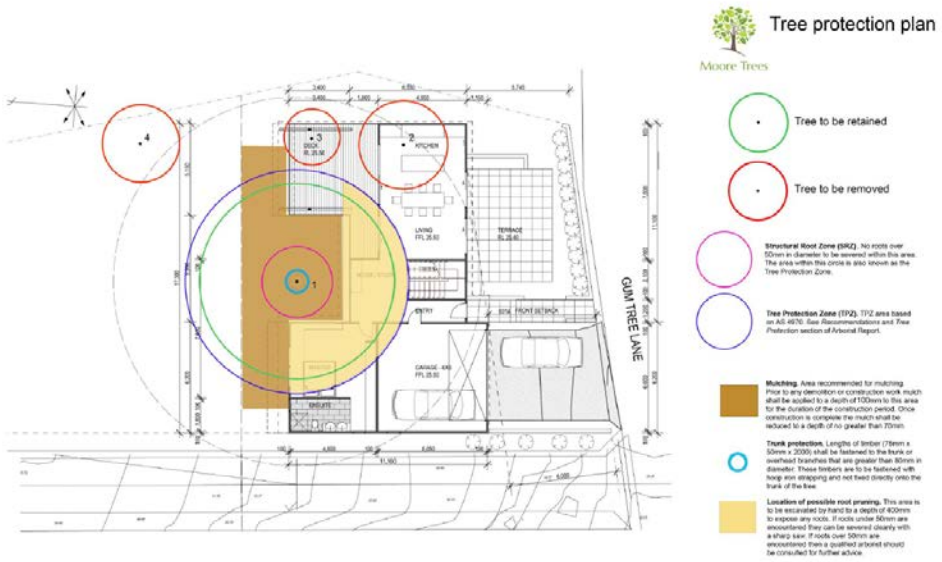


Figure 4: Excerpt from Tree Protection Plan DA-2019/1429

The reasons for the refusal of DA-2019/1429 are as follows:

1 *Pursuant to the provisions of Section 4.15 (1)(a)(iii) of the Environmental Planning and Assessment Act 1979, it is considered the proposal fails to demonstrate consistency with the provisions of the Wollongong Development Control Plan 2009:*

- *Chapter B2: Residential Subdivision;*
- *Chapter E6: Landscaping;*
- *Chapter E14: Stormwater Management; and*
- *Chapter E17: Preservation and Management of Trees and Vegetation.*

2 *Pursuant to the provisions of Section 4.15 (1)(b) of the Environmental Planning and Assessment Act, 1979, it is considered the proposal fails to demonstrate the likely impacts of the development will not be adverse.*

3 *Pursuant to the provisions of Section 4.15 (1)(c) of the Environmental Planning and Assessment Act, 1979, it is considered the proposal fails to demonstrate that the site is suitable for the development.*

4 *Pursuant to the provisions of Section 4.15 (1)(d) of the Environmental Planning and Assessment Act 1979, it is considered that having regard for public submissions, the development is unsuitable with respect to:*

- *Tree removal;*

- *Lot depth variations; and*
- *Stormwater management.*

5 *Pursuant to the provisions of Section 4.15 (1)(e) of the Environmental Planning and Assessment Act, 1979, it is considered that approval of the development would set an undesirable precedent for similar inappropriate development and is therefore, not in the public interest.*

In summary DA-2019/1429 was refused as the proposed subdivision was not compatible with the retention of Tree 1 and insufficient information was submitted to justify its removal, the proposal had insufficient lot depth and the subdivision was not designed taking into account the inherent site constraints and insufficient information to demonstrate that the existing OSD will function as designed with the addition of another dwelling and associated hardstand area to the site.

RD-2019/1429/A

The Review of Determination application (RD-2019/1429/A) was submitted on 12 May 2020.

No pre-lodgement meeting was held for the proposal.

Application History

A full application history of the development site is as follows:

Application Number	Description	Decision	Decision Date
BA-1974/1685	Garage	Approved	02-Aug-1974
PC-2001/40086	New	Approved	01-Jul-2003
DA-2015/344	Subdivision - Torrens title - two (2) residential lots	None	09-Apr-2015
DA-2015/527	Subdivision - Torrens title - two (2) residential lots	Rejected	23-Jul-2015
DA-2015/1089	Subdivision - Torrens title - two (2) residential lots and associated works	Approved	04-Nov-2015
PL-2016/15	Three units	Completed	18-Feb-2016
CS-2016/5	Subdivision - Torrens title - two (2) residential lots and associated works	Approved	19-May-2016
SC-2016/116	Subdivision - Torrens title - two (2) residential lots	Approved	31-Jan-2017
TMO-2017/724	Remove 2 trees	Approved	4-Jul-2017
TMO-2017/724/A	Review - Remove Tree 1	Approved	11-Sep-2017
PL-2017/170	Residential - multi dwelling housing (4) and Strata subdivision	Completed	25-Oct-2017
TMO-2019/505	Remove 1 tree	Refused	05-June-2019
DA-2019/648	Subdivision - Torrens title - two (2) residential lots and tree removal	Withdrawn	26-Aug-2019
DA-2019/1429	Subdivision - Torrens title - two (2) residential lots	Refused	26-Mar-2020

Customer service actions

There are no outstanding customer service requests of relevance to the development.

1.5 SITE DESCRIPTION

The site is located at 6 Gum Tree Lane, THIRROUL and the title reference is Lot 82 DP 1214908.

The subject site is currently a vacant lot. There are five (5) trees located on the site. Four (4) along the eastern side boundary and a significant mature tree more central to the site, a 20m high Blackbutt.

The land is an irregular shaped allotment with an overall site area of 922m². The site falls steeply to the rear of the block.

The subject site is accessed via a shared Right of Carriage Way off Gum Tree Lane.

There is an existing OSD located at the rear of the lot which drains to Pass Avenue via an inter-allotment drainage easement over No. 21 Pass Avenue to the rear.

The street scene in the immediate vicinity is characterised by low density residential dwellings of single and double storey construction. Adjoining development consists of double storey dwellings to the North and East and single storey clad dwelling to the West.

Property constraints

Council records identify the land as being impacted by the following constraints:

- Unstable land.
- Easement:
  - Right of Access (5m wide)
  - On-site Stormwater Detention Pit
- 88b restriction for:
  - The registered proprietor of the lot burdened must not make or permit to suffer the making of any alterations and/or removal to any on-site stormwater detention system located within the bounds of their subject lot without prior consent in writing of Wollongong City Council.
  - The registered proprietor of the lot burdened are liable for the upkeep, repair and maintenance of the on-site stormwater detention system located on the lot.

For full details see Section 88b instrument for D.P. 1214908.

Figure 1: Aerial photograph

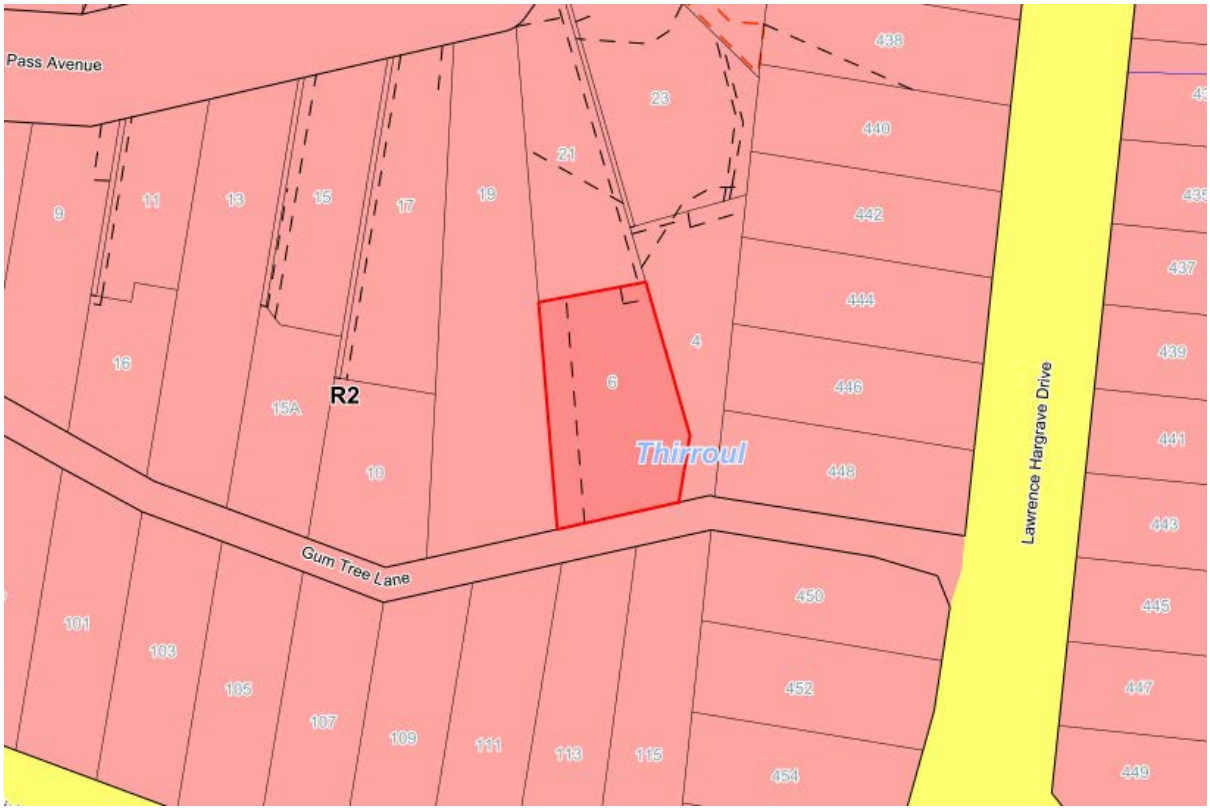


Figure 2: WLEP 2009 zoning map

1.6 SUBMISSIONS

The application was notified in accordance with Council's Community Participation Plan 2019. Six (6) submissions were received and the issues identified are discussed below.

Figure 3: Notification map

Table 1: Submissions

Concern	Comment
1. Tree Removal • Tree 1 is a landmark tree. • The submitted Arborist Report identified that the tree is healthy and that failure is not imminent. • Tree removal to date does not comply with conditions of consent of DA-2015/1089	Tree 1 is also considered a landmark tree that contributes to the amenity of the area. Council's Landscape officer also does not support removal of Tree 1 as the submitted Arborist Report identified that the tree structural strength is within the acceptable range. Tree removal to date is generally consistent with recent DA and TMO approvals.
2. Stormwater disposal	Council's Development Engineering Officer has reviewed the application submission in regard to stormwater matters and is satisfied the existing OSD is able to accommodate the proposed subdivision.
4. Minimum Lot Size	The minimum allotment size for the subdivision of land under Part 4.1 of WLEP2009 is 449m². The proposed subdivision results in proposed Lot 821 having a lot size of 451m² as the area of the area of the access handle is not included in accordance with WLEP 2009 Clause 4.1(4A). Proposed Lot 822 has a lot size of 450m². Therefore both lots are compliant with this clause. Proposed Lot 822 would also benefit of the right of carriage way to access Lot 821 and this area is not deducted from the minimum lot size calculations.

5. Building envelope and lot depth variations	In respect to concerns raised regarding the proposed building envelope and lot depth variation, it is also considered that insufficient information has been submitted to demonstrate that there is a suitable building envelope available and the variation to the minimum lot depth can be justified when the inherent site constraints are taken into account.

1.7 CONSULTATION

1.7.1 INTERNAL CONSULTATION

Landscape Architect

Council's Landscape Officer has reviewed the application and given an unsatisfactory referral. Council's Landscape Officer does not support the proposed removal of Tree 1 on the basis of the findings within the submitted Arbortum Assessment and Risk Assessment Report prepared by The Ents Tree Consultancy dated 10 April 2020 that testing (at 7m) of structural strength indicate it is in the acceptable range and therefore does not justify its removal at this time.

The original application DA-2019/1429 also sought approval for removal three (3) trees along the eastern boundary due to conflicts with stormwater drainage. These trees included an Illawarra Flame Tree, Macadamia tree and Bottle-brush. Council's Landscape Officer did not support removal of Tree 2, a 10m Brachychiton acerifolius Illawarra Flame tree with SULE rating of 1a and 95% live canopy as it is in a location along the boundary that is capable of being designed around and provides screening to adjoining dwelling. Council's Landscape Officer did not indicate any objection to removal of Tree 3 and 4, (Macadamia and Bottle-brush).

Development Engineering Officer

The application has been assessed in regard to proposed stormwater drainage matters and found to be satisfactory. Conditions of consent were recommended and are included in the consent.

1.7.2 EXTERNAL CONSULTATION

None required

2 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

1.7 Application of Part 7 of Biodiversity Conservation Act 2016 and Part 7A of Fisheries Management Act 1994

This Act has effect subject to the provisions of Part 7 of the Biodiversity Conservation Act 2016 and Part 7A of the Fisheries Management Act 1994 that relate to the operation of this Act in connection with the terrestrial and aquatic environment.

NSW BIODIVERSITY CONSERVATION ACT 2016

Section 1.7 of the Environmental Planning and Assessment Act 1979 (EP&A Act) provides that Act has effect subject to the provisions of Part 7 of the Biodiversity Conservation Act 2016 (BC Act).

Part 7 of the BC Act relates to Biodiversity assessment and approvals under the EP&A Act where it contains additional requirements with respect to assessments, consents and approvals under this Act.

Clause 7.2 of the Biodiversity Conservation Regulation 2017 provides the minimum lot size and area threshold criteria for when the clearing of native vegetation triggers entry of a proposed development into the NSW Biodiversity offsets scheme. For the subject site, entry into the offset scheme would be

triggered by clearing of an area greater than 0.25 hectares based upon the minimum lot size of the WLEP 2009 R2 zoned land (i.e. less than 1 hectare minimum lot size).

An approximate area of 0.002 hectares of native vegetation is proposed to be cleared for the development. The minimum subdivision lot size for the land under WLEP 2009 is 449sqm. Therefore the proposal does not trigger the requirement for a biodiversity offset scheme.

The site is not identified as being of high biodiversity value on the Biodiversity Values Map.

None of the trees on the site were identified as containing hollows.

The development would therefore not be considered to result in adverse impacts on biodiversity and is consistent with the provisions of the Biodiversity Conservation Act 2016.

Notwithstanding, Council's Landscape Officer has reviewed the application submission and provided an unsatisfactory referral advice noting that the subdivision is not compatible with the retention of Tree 1 and insufficient information has been submitted to justify its removal and the removal of Tree 2 is also not supported.

2.1 SECTION 4.15(1)(A)(1) ANY ENVIRONMENTAL PLANNING INSTRUMENT

2.1.1 STATE ENVIRONMENTAL PLANNING POLICY NO. 55 – REMEDIATION OF LAND

7 Contamination and remediation to be considered in determining development application

(1) A consent authority must not consent to the carrying out of any development on land unless—

(a) it has considered whether the land is contaminated, and

(b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and

(c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

(2) Before determining an application for consent to carry out development that would involve a change of use on any of the land specified in subclause (4), the consent authority must consider a report specifying the findings of a preliminary investigation of the land concerned carried out in accordance with the contaminated land planning guidelines.

(3) The applicant for development consent must carry out the investigation required by subclause (2) and must provide a report on it to the consent authority. The consent authority may require the applicant to carry out, and provide a report on, a detailed investigation (as referred to in the contaminated land planning guidelines) if it considers that the findings of the preliminary investigation warrant such an investigation.

(4) The land concerned is—

(a) land that is within an investigation area,

(b) land on which development for a purpose referred to in Table 1 to the contaminated land planning guidelines is being, or is known to have been, carried out,

(c) to the extent to which it is proposed to carry out development on it for residential, educational, recreational or child care purposes, or for the purposes of a hospital—land—

(i) in relation to which there is no knowledge (or incomplete knowledge) as to whether development for a purpose referred to in Table 1 to the contaminated land planning guidelines has been carried out, and

(ii) on which it would have been lawful to carry out such development during any period in respect of which there is no knowledge (or incomplete knowledge).

Council records do not indicate any historic use that would contribute to the contamination of the site and the land is not identified as being contaminated on Council mapping. There are no earthworks proposed and the proposal does not comprise a change of use. No concerns are raised in regard to contamination as relates to the intended use of the land and the requirements of clause 7.

2.1.2 STATE ENVIRONMENTAL PLANNING POLICY (KOALA HABITAT PROTECTION) 2019

https://www.legislation.nsw.gov.au/#/view/EPI/2019/658

This Policy commenced on 1 March 2020. Savings provision apply for applications made before this date

The aim of the SEPP to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline.

The Policy applies to all land within the Wollongong LGA excluding land owned or operated by the NSW National Parks and Wildlife Service. The *Map* identifies two extents

1 Koala Development Application Map

2 Site Investigation Area for Koala Plans of Management Map

Wollongong LGA at present does not have approved koala plan of management and therefore clause 9 of the SEPP is relevant.

Clause 9 Development assessment process—no approved koala plan of management for land

(1) This clause applies to land to which this Policy applies if the land—

(a) is identified on the Koala Development Application Map, and

(b) has an area of at least 1 hectare (including adjoining land within the same ownership), and

(c) does not have an approved koala plan of management applying to the land.

The site is not identified on the Koala Development Application Map and is less than 1 hectare in size therefore this Cause does not apply.

Figure 3: Koala Plans of Management Map

https://webmap.environment.nsw.gov.au/Html5Viewer291/index.html?viewer=KoalaSEPP.htm5

Assessment actions

The subject site is not identified on the *Koala Development Application Map* and is less than 1 hectare in area.

2.1.3 WOLLONGONG LOCAL ENVIRONMENTAL PLAN 2009

Part 1 Preliminary

Clause 1.4 Definitions

Subdivision of land for the purposes of the Environmental Planning & Assessment Act 1979, means the division of land into two or more parts that, after the division, would be obviously adapted for separate occupation, use or disposition. The division may (but need not) be effected:

(a) by conveyance, transfer or partition, or

(b) by any agreement, dealing, plan or instrument rendering different parts of the land available for separate occupation, use or disposition.

Torrens Title is a system of title, based on registration. The property owner is referred to as the 'registered proprietor' who holds the land subject to interests and other rights recorded in the register but is free from all other interests. The registered proprietor is issued with a Certificate of Title (CT) that is a duplicate copy of the folio entry in the central Torrens Lands Title register, held by the NSW Department of Lands (Land & Property Information).

Part 2 Permitted or prohibited development

Clause 2.2 – zoning of land to which Plan applies

The zoning map identifies the land as being zoned R2 Low Density Residential.

Clause 2.3 – Zone objectives and land use table

The objectives of the zone R2 Low Density Residential are as follows:

- *To provide for the housing needs of the community within a low density residential environment.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*

The proposal would be considered generally satisfactory with regard to the above objectives as it is for subdivision of a residential lot which would provide for the housing needs of the community within a low density residential environment.

Clause 2.6 Subdivision—consent requirements

Subdivision is permissible with consent.

Part 4 Principal development standards

Clause 4.1 Minimum subdivision lot size

The minimum allotment size for the subdivision of land is 449m². The proposal is for a two (2) lot Torrens title subdivision of the subject site into Lot 821 and 822 as follows:

- Proposed Lot 821 - 451sqm (472sqm including access handle)
- Proposed Lot 822 - 450sqm

Both lots are compliant with this clause.

Part 7 Local provisions – general

Clause 7.1 Public utility infrastructure

The subject site is already serviced by public utilities which could be augmented to service the new proposal.

2.2 SECTION 4.15(1)(A)(II) ANY PROPOSED INSTRUMENT

None.

2.3 SECTION 4.15(1)(A)(III) ANY DEVELOPMENT CONTROL PLAN

2.3.1 WOLLONGONG DEVELOPMENT CONTROL PLAN 2009

CHAPTER A1 – INTRODUCTION

8 Variations to development controls in the DCP

The proposal involves a variation to the 25m lot depth required in clause 6.3 Chapter B2 Residential Subdivisions. Proposed Lot 821 has a lot depth of only 20-21.5m and proposed Lot 822 has a lot depth of 18.5-21.2m. The Applicant's Variation Statement submitted as part of the original DA-2019/1429 is provided at Attachment 4.

The original DA-2019/1429 was refused in part as Council did not support a variation to the 25m minimum lot depth requirement for both proposed lots as the site is further constrained by a significant tree, identified as Tree 1. It was considered that the proposed subdivision had not been designed having regard to the inherent site constraints.

The application under Review seeks the removal of Tree 1 in an attempt to resolve the variation to lot depth, as it would remove a significant constraint to future development, however Council's Landscape Officer does not support the removal of Tree 1 as insufficient information has been submitted to justify its removal at this time. The application under Review has therefore not resolved this issue. The proposal is still not considered to have adequately demonstrated consistency with the objective of Clause 6.3 to ensure residential lots are designed to provide sufficient lot width and depth, to cater for a suitable range of dwelling styles having regard to any site constraints or environmental qualities of that land.

Notwithstanding the site constraints, the proposal is also not considered to meet the objective of Clause 6.3 to ensure residential lots in low density residential areas provide sufficient site area to cater for detached dwelling-houses with sufficient rear private open space which gains appropriate sunlight access during mid-winter. No plans were submitted demonstrating a compliant 10 x 15m building envelope or concept plans of a future dwelling that demonstrated compliance with the residential development controls in Chapter B1.

CHAPTER A2 – ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Development controls to improve the sustainability of development throughout Wollongong are integrated into the relevant chapters of this DCP.

Generally speaking, the proposal is considered to be inconsistent with the principles of Ecologically Sustainable Development as there is no reason to remove Tree 1.

CHAPTER B1 – RESIDENTIAL DEVELOPMENT

Plans of a concept dwelling/building envelopes were submitted as part of the original DA-2019/1429 to demonstrate a dwelling, that satisfies the controls as detailed for residential development under Chapter B1, could be constructed on proposed Lot 822 whilst retaining Tree 1, however the concept dwelling does not form part of this application. The application under review of determination seeks to remove Tree 1 and does not provide any concept plans for future dwellings on each lot and therefore this Chapter is not applicable.

CHAPTER B2 – RESIDENTIAL SUBDIVISION

Controls/objectives	Complete	Compliance
5 Topography, landform conservation, cut and fill	The proposed subdivision is not considered to take into account the inherent site constraints, in particular a significant tree on the subject site, identified as Tree 1 in the submitted Arborist Report. The application was referred to Council's Landscape Officer who is not satisfied with the proposal. Council's Landscape Officer does not support the proposed removal of Tree 1 at this time on the basis of the findings within the submitted Arbortum Assessment and Risk Assessment Report prepared by The Ents Tree Consultancy dated 10 April 2020 that testing (at 7m) of structural strength indicate it is in the acceptable range.	No
6 Subdivision design		
6.1 Lot Layout - Aspect and solar access	The lots are oriented north/south which normally maximises solar access and energy efficiency opportunities for future dwellings and private open space areas. However the proposal does not comply with minimum 25m lot depth and is highly constrained by a significant tree located centrally within the site. Notwithstanding the site constraints, the proposal does not demonstrate that the proposal provides sufficient site area to cater for detached dwelling-houses with sufficient rear private open space which gains appropriate sunlight access during mid-winter. No plans were submitted demonstrating a compliant 10 x 15m building envelope or concept plans of a future dwelling that demonstrated compliance with the residential development controls in Chapter B1. The proposal is not considered to demonstrate compliance with this Clause.	No

6.2 Lot Size	The minimum allotment size for the subdivision of land under Part 4.1 of WLEP2009 is 449m². The proposed subdivision results in lot sizes of 451m² (472m² including access handle) for proposed Lot 821 and 450m² for proposed Lot 822. Therefore both lots are compliant with this clause. Advice received from Council's Development Engineering Officer indicates there are no issues with the proposed lot sizes.	Yes
6.3 Lot Width and Depth	The proposed lots comply with the minimum 12m lot width required for a north/south oriented lot. However the proposed lots do not comply with the minimum 25m lot depth. A variation is requested however it is not supported as discussed in Chapter A1.	No
6.4 Battle-axe Lots	The proposal will create a battle-axe allotment being proposed Lot 821. Proposed Lot 822 has direct frontage to the street. The access for lot 821 is proposed to be via a right of carriage way to Gum Tree Lane. A road pavement with a minimum width of 3m is maintained for the length of the proposed Right of Carriage Way accessing the proposed lot. Advice received from Council's Development Engineering Officer in the assessment of the original DA-2019/1429 stated that there are no issues with the proposed battle-axe lot and access arrangements.	Yes

6.5 Building envelopes	The proposal is required to demonstrate a minimum 10 x 15m building envelope, where there are inherent site constraints. The site is constrained by a significant mature Blackbutt tree that stands 20m high and is located approximately central to the site. The Subdivision Plan submitted in the original DA-2019/1429 demonstrates a building envelope for each proposed lot however the building envelope for proposed Lot 822 is irregular shaped and both building envelopes encroach significantly within the tree protection zone of Tree 1. The application under Review is seeking to remove Tree 1 which may enable a regular shaped compliant building envelope to be provided for each lot, clear of site constraints. An amended Subdivision Plan was not submitted as part of the application under Review to demonstrate compliance with this Clause. However the application was referred to Council's Landscape Officer for comment. Council's Landscape Officer does not support the removal of Tree 1 at this time as advice received in the applicant's submitted Arborist Report prepared by The Ents Tree Consultancy dated 10 April 2020, states that the testing undertaken at 7m indicates the structural strength of the tree is still within the acceptable range. It is considered that a suitable building envelope is not available on proposed lot 822 and significant site features in particular the significant trees on proposed Lot 822 have not been taken into account which is inconsistent with objectives 6.5(b) and (c).	No
6.6-6.7 and 7-14	Not Applicable	N/A

15 Stormwater drainage	The original DA-2019/1429 was refused in part as Council's Stormwater Engineer indicated that insufficient information was submitted to demonstrate that the existing OSD will function as designed with the addition of another dwelling and associated hardstand area to the site. The OSD was installed as part of the initial two (2) lot subdivision approved in 2015. The applicant has provided additional information with the application under Review to demonstrate that the existing OSD is adequate to cater for the proposed development. Council's Stormwater Engineer has assessed the Review and is satisfied.	Yes
16 Riparian land management	N/A	N/A
17 Servicing Arrangements	Services are available to the site and these can be augmented to service the proposed subdivision.	Yes
18 Road addressing	N/A	N/A
19 Subdivision handover	N/A	N/A

CHAPTER D1 – CHARACTER STATEMENTS

Thirroul

The proposed two lot subdivision could be considered to be consistent with the desired future character for Thirroul for residential development to remain primarily low density in nature with some medium density within close vicinity to the Thirroul village centre and railway station.

CHAPTER E6: LANDSCAPING

The application under Review seeks to remove Tree 1 and additional information has been submitted to justify its removal. Council's Landscape Officer does not support the removal of Tree 1 as detailed in this report.

The proposal is considered to be inconsistent with the objectives of this Chapter to minimise the impacts from development on natural site features in particular retaining existing trees where feasible.

CHAPTER E14 STORMWATER MANAGEMENT

Stormwater is proposed to be disposed of to the existing OSD on proposed Lot 821 to Pass Avenue via an existing inter-allotment drainage over the rear lot (No. 21 Pass Avenue).

The original DA-2019/1429 was refused in part as Council's Stormwater Engineer indicated that insufficient information was submitted to demonstrate that the existing OSD will function as designed with the addition of another dwelling and associated hardstand area to the site. The OSD was installed as part of the initial two (2) lot subdivision approved in 2015. The applicant has provided additional information with the application under Review to demonstrate that the existing OSD is adequate to cater for the proposed development. Council's Stormwater Engineer has assessed the Review and is satisfied.

Council's Stormwater Engineer has reviewed the proposal with respect to the provisions of this chapter and has recommended conditions of consent.

CHAPTER E17 PRESERVATION AND MANAGEMENT OF TREES AND VEGETATION

The original DA-2019/1429 proposed retention of Tree 1 and building envelopes/concept plans were provided to demonstrate that the proposal was capable of accommodating a future dwelling-house on each proposed lot. However Council's Landscape Officer was concerned that the proposed subdivision was not compatible with the retention of Tree 1 and insufficient information was submitted to justify its removal.

The application under Review seeks to remove Tree 1 and additional information, Arbortum Assessment and Risk Assessment Report prepared by The Ents Tree Consultancy dated 10 April 2020, has been submitted to justify its removal. Council's Landscape Officer does not support the removal of Tree 1 at this time as advice received in the applicant's submitted Arborist Report states that the testing undertaken at 7m indicates the structural strength of the tree is still within the acceptable range. Therefore Council's Landscape Officer is unable to support the application in its current form.

The original application DA-2019/1429 also sought to remove a further three (3) trees along the eastern boundary due to conflicts with stormwater drainage – see Figure 1. This included an Illawarra Flame tree, Macadamia and Bottle-brush identified as Tree 2, 3 and 4 in the Arborist Report submitted for DA-2019/1429 (prepared by Moore Trees dated December 2019). Council's Landscape Officer did not support removal of the Illawarra Flame tree however had no objection to removal of Tree 3 and 4, (Macadamia and Bottle-brush).

The proposed removal of Trees 1 and 2 is not considered to be consistent with the objectives of this Chapter to protect trees within the Wollongong LGA or to protect and enhance native vegetation for its scenic values and to retain the unique visual identity of the landscape or conserve remnant vegetation. Tree 1 is over 50 years old and is a significant tree in the landscape that contributes to the amenity of the area.

Further, the subdivision design does not ensure that any new development considers and maximises the protection of existing vegetation in the site planning, design, development, construction and operation of the development.

2.3.2 WOLLONGONG CITY WIDE DEVELOPMENT CONTRIBUTIONS PLAN 2019

1. Schedule 1 – City-Wide levy rates

In accordance with clause 25K(1)(a) of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), the rate of the levy for development carried out on land to which this Plan applies (excluding Wollongong City Centre Commercial Core - see Schedule 2) is calculated as follows:

Proposed cost of carrying out development ***(Determined in accordance with Clause 18 of this Plan)***	**Levy Rate**
Up to and including $100,000	Nil
More than $100,000 and up to and including $200,000	0.5%
More than $200,000	1%

2. Schedule 2 - Wollongong City Centre Commercial Core levy rates

In accordance with clause 25K(1)(b) of the EP&A Regulation, the rate of the levy for development carried out on land within the B3 Commercial Core zone in the Wollongong City Centre, as shown at Figure 2, is calculated as follows:

Proposed cost of carrying out development ***(Determined in accordance with Clause 18 of this Plan)***	**Levy Rate**
Up to and including $250,000	Nil
More than $250,000	2%

The estimated cost of works is <$100,000 and a levy would therefore not be applicable under this plan as the threshold value is $100,000.

2.4 SECTION 4.15(1)(A)(IIIA) ANY PLANNING AGREEMENT THAT HAS BEEN ENTERED INTO UNDER SECTION 7.4, OR ANY DRAFT PLANNING AGREEMENT THAT A DEVELOPER HAS OFFERED TO ENTER INTO UNDER SECTION 7.4

There are no planning agreements entered into or any draft agreement offered to enter into under S7.4 which affect the development.

2.5 SECTION 4.15(A)(IV) THE REGULATIONS (TO THE EXTENT THAT THEY PRESCRIBE MATTERS FOR THE PURPOSES OF THIS PARAGRAPH)

There are no prescribed conditions.

2.6 SECTION 4.15(1)(B) THE LIKELY IMPACTS OF DEVELOPMENT

Context and Setting:

Subdivision is permissible on land to which the Wollongong Local Environmental Plan 2009 (WLEP 2009) applies pursuant to Clause 2.6 of WLEP 2009 and the subdivision complies with the minimum lot size pursuant to Clause 4.1 and would normally be considered to be in context with the setting of the low density residential area.

In regard to the matter of context, the planning principle in Project Venture Developments v Pittwater Council [2005] NSWLEC 191 is relevant in that it provides guidance in the assessment of compatibility. The two major aspects of compatibility are physical impact and visual impact. In assessing each of these the following questions should be asked:

- Are the proposals physical impacts on surrounding development acceptable? The physical impacts include constraints on the development potential of surrounding sites.
- Is the proposals appearance in harmony with the buildings around it and the character of the street?

In this circumstance however the non-compliances and issues identified throughout the report indicate that the development as proposed is inappropriate for the subject site. The proposal is not considered to be consistent with the context and setting of the surrounding area.

Access, Transport and Traffic:

Access to the site will be via an approved Right of Carriage Way to Council's formed roadway which adjoins a public road. The development is considered not to result in an adverse impact on the traffic movement and access to the site.

Public Domain:

The proposal is not considered to be conducive to the site and would set an undesirable precedent of development within the local area.

The proposed removal of Tree 1 would remove a significant feature in the local landscape to the detriment of the amenity of the area.

Utilities:

The proposal is not envisaged to place an unreasonable demand on utilities supply. Existing utilities are adequate to service the proposal.

Heritage:

No heritage items will be impacted by the proposal.

Other land resources:

The proposal would not be envisaged to impact upon any valuable land resources.

Water:

The site is presently serviced by Sydney Water, which could be readily extended to meet the requirements of the proposed development.

The proposal would not be envisaged to have unreasonable water consumption.

Soils:

The soil profile could be acceptable for the construction of the proposed development. Council's Geotechnical Officer has assessed the original DA-2019/1429 submission and considered it satisfactory subject to consent conditions.

Air and Microclimate:

The proposal would not be expected to result in negative impact on air or microclimate.

Flora and Fauna:

The application submission was referred to Council's Landscape Officer for comment. Council's Landscape Officer does not support the removal of Tree 1 at this time as advice received in the applicant's submitted Arborist Report prepared by The Ents Tree Consultancy dated 10 April 2020, states that the testing undertaken at 7m indicates the structural strength of the tree is still within the acceptable range.

Waste:

The proposal would not be expected to generate significant waste.

Energy:

The proposal would not be expected to have unreasonable energy consumption.

Noise and vibration:

The proposal is for subdivision only and would not be expected to generate noise.

Natural hazards:

There are no natural hazards affecting the site that would prevent the proposal.

Technological hazards:

There are no technological hazards affecting the site that would prevent the proposal.

Council records list the site as unstable land affected. The original DA-2019/1429 submission was referred to Council's Geotechnical Officer for comments who considered the application conditionally satisfactory.

Safety, Security and Crime Prevention:

The proposal would not be envisaged to result in any opportunities for criminal or antisocial behaviour.

Social Impact:

The proposal would not be envisaged to result in negative social impacts.

Economic Impact:

The proposal would not be envisaged to result in negative economic impacts.

Site Design and Internal Design:

The application does not result in any departures from WLEP 2009 development standards. The application results in a departure from Council's Minimum Lot Depth development control plan as outlined in Section 2.3.1 Wollongong Development Control Plan 2009 of this report. Concerns raised regarding impacts on inherent site constraints in particular significant trees remain outstanding.

Cumulative Impacts:

Considering the matters outlined throughout this report, the proposal is considered likely to result in adverse cumulative impacts.

2.7 SECTION 4.15(1)(C) THE SUITABILITY OF THE SITE FOR THE DEVELOPMENT

Does the proposal fit in the locality?

The proposed subdivision is not considered to have been designed to fit in with the locality. The proposal involves the removal of a significant tree that is a feature in the local landscape that contributes to the amenity of the area.

Are the site attributes conducive to development?

The site is constrained by a significant tree, located approximately centrally within the site, which impacts on the capacity of the site to be further subdivided as future development of the proposed lots would be highly constrained by the location of the tree.

Further, the site dimensions are not conducive to the proposed two lot subdivision as the proposed lots do not comply with minimum 25m lot depth.

For these reasons, the site is not considered to be suitable for the proposed development.

2.8 SECTION 4.15(1)(D) ANY SUBMISSIONS MADE IN ACCORDANCE WITH THIS ACT OR THE REGULATIONS

See Section 1.6.

2.9 SECTION 4.15(1)(E) THE PUBLIC INTEREST

The proposal is not considered to be in the public interest as the proposal is expected to have unreasonable impacts on the environment and amenity of the locality. The proposal is considered inappropriate with consideration to site constraints, contrary to the relevant planning controls and in the current form, approval would not be considered to be in the public interest.

3 CONCLUSION

This application has been assessed as unsatisfactory having regard to the Heads of Consideration under Section S4.15(1) of the Environmental Planning and Assessment Act 1979, the provisions of Wollongong Local Environmental Plan 2009 and all relevant Council DCPs, Codes and Policies.

4 RECOMMENDATION

It is recommended that the development application be refused for the following reasons:

1. Pursuant to the provisions of Section 4.15 (1)(a)(iii) of the Environmental Planning and Assessment Act 1979, it is considered the proposal fails to demonstrate consistency with the provisions of the Wollongong Development Control Plan 2009:
    - Chapter B2: Residential Subdivision;
    - Chapter E6: Landscaping and
    - Chapter E17: Preservation and Management of Trees and Vegetation.
2. Pursuant to the provisions of Section 4.15 (1)(b) of the Environmental Planning and Assessment Act, 1979, it is considered the proposal fails to demonstrate the likely impacts of the development will not be adverse.
3. Pursuant to the provisions of Section 4.15 (1)(c) of the Environmental Planning and Assessment Act, 1979, it is considered the proposal fails to demonstrate that the site is suitable for the development
4. Pursuant to the provisions of Section 4.15 (1)(d) of the Environmental Planning and Assessment Act 1979, it is considered that having regard for public submissions, the development is unsuitable with respect to:

- Tree removal and
- Lot depth variations.

5. Pursuant to the provisions of Section 4.15 (1)(e) of the Environmental Planning and Assessment Act, 1979, it is considered that approval of the development would set an undesirable precedent for similar inappropriate development and is therefore, not in the public interest.

5 ATTACHMENTS

1 Subdivision Plan prepared by Dennis Smith Surveys dated 2 December 2019

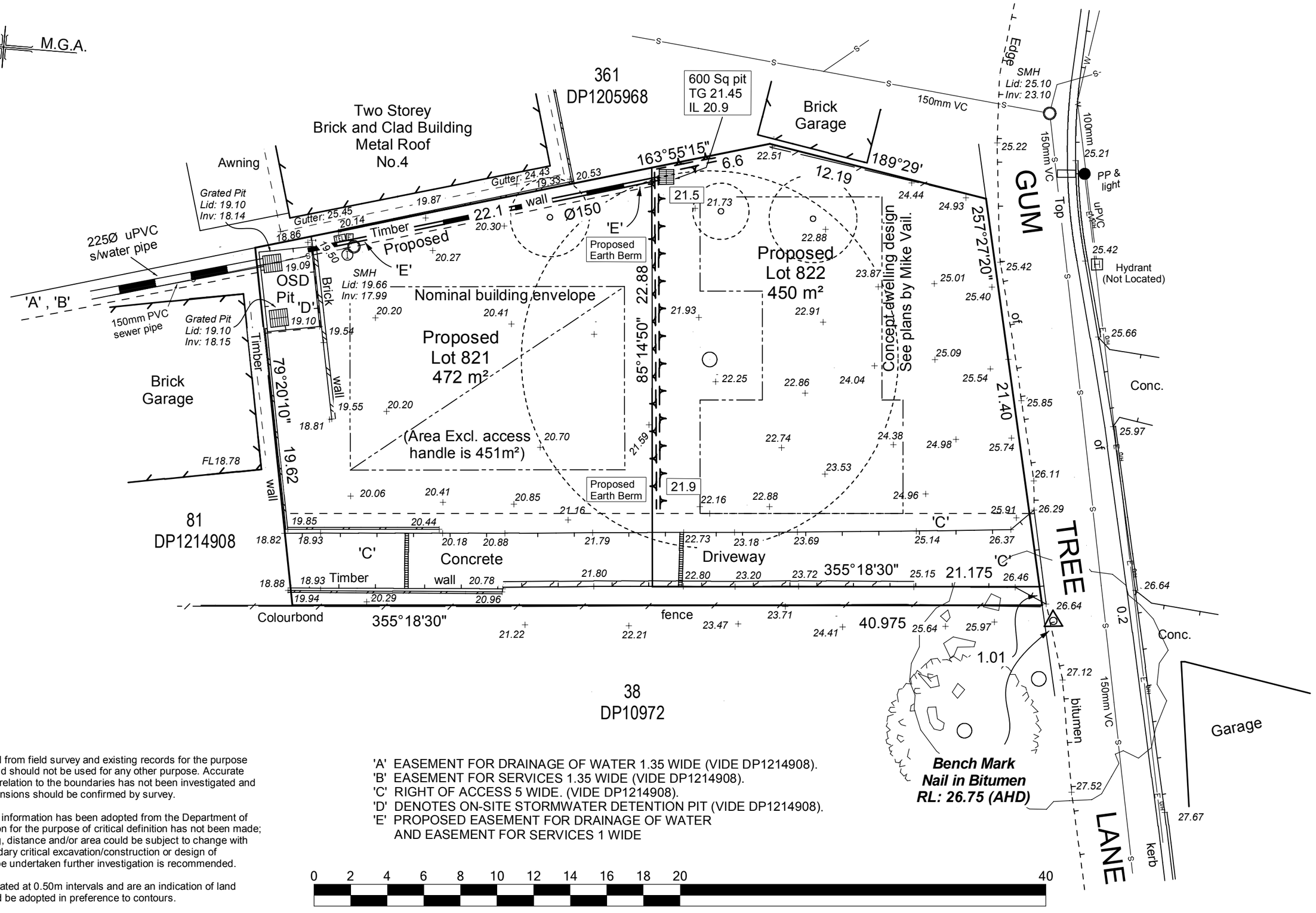
2 Arbortum Assessment and Risk Assessment Report prepared by The Ents Tree Consultancy dated 10 April 2020

3 Arboricultural Development Assessment Report prepared by Moore Trees dated 17 December 2019

4 Variation Statement Lot Depth prepared by Dennis Smith Surveys dated 12 December 2019

M.G.A.

Attachment 1



'A' EASEMENT FOR DRAINAGE OF WATER 1.35 WIDE (VIDE DP1214908).
'B' EASEMENT FOR SERVICES 1.35 WIDE (VIDE DP1214908).
'C' RIGHT OF ACCESS 5 WIDE. (VIDE DP1214908).
'D' DENOTES ON-SITE STORMWATER DETENTION PIT (VIDE DP1214908).
'E' PROPOSED EASEMENT FOR DRAINAGE OF WATER
AND EASEMENT FOR SERVICES 1 WIDE

0 2 4 6 8 10 12 14 16 18 20 40

Notes:

This plan has been prepared from field survey and existing records for the purpose of 1:200 general planning and should not be used for any other purpose. Accurate location of improvements in relation to the boundaries has not been investigated and all critical improvement dimensions should be confirmed by survey.

Although the latest available information has been adopted from the Department of Lands, boundary investigation for the purpose of critical definition has not been made; therefore, any stated bearing, distance and/or area could be subject to change with further investigation. If boundary critical excavation/construction or design of buildings/extensions are to be undertaken further investigation is recommended.

Contours shown are interpolated at 0.50m intervals and are an indication of land form only. Spot levels should be adopted in preference to contours.

Services have been located where possible, underground services are interpreted from the records of the relevant authority unless stated as 'located'. The relevant authority should be contacted and all services accurately located prior to any excavation/construction works or design of buildings/extensions. Please call 1100 or visit www.1100.com.au for 'Dial Before You Dig' service location plans.

Roof profile and tree details are approximate only.

DENNIS SMITH SURVEYS
8 Railway Street Bulli NSW 2516
Ph: 02 4284 9402 Fax: 02 4285 7042
E-mail: info@dssurvey.com.au
Web: www.dssurvey.com.au

PLAN: Proposed 2 lot Subdivision.
ADDRESS: 6 Gum Tree Lane, Thirroul
TITLE: Lot 82 DP1214908
CLIENT: E. WARD

ORIENTATION: Mag Grid of Australia
Origin: DP1214908
DATUM: A.H.D.
Origin: SSM13125

P.R.: 10864-9
SCALE 1:200
DATE: 02/12/2019
SHEET 1 of 1 (A3)
Drawn: A.C. Check: M.S.

Hayden Coulter
The Ents Tree Consultancy
ABN 95 598 933 136

Client	Mr Jason Ward
Location	6 Gumtree Lane Thirroul
Document Type	Arbortom Assessment and Risk Assessment
Date	10th April 2020

The Ents Tree Consultancy

Development Reports | Hazard Assessments | Tree Management

Hayden Coulter
The Ents Tree Consultancy
ABN 95 598 933 136

Client	Mr Jason Ward
Location	6 Gumtree Lane Thirroul
Document Type	Arbortom Assessment and Risk Assessment
Date	10th April 2020

1. Contents

2. Introduction

2.1 Mr Ward engaged The Ents Tree Consultancy to obtain further advice about the condition of the tree nominated to be assessed on site at 6 Gumtree Lane Thirroul. The initial tree assessment of the tree was completed in May 2019 by Moore Trees for an assessment of the risk presented by the tree. No testing was completed for the purpose of the report. The client has stated that tree was nominated to be assessed due to concerns about further failures and the trees risk potential due to the proposed building being placed around the tree. The initial level 1 visual tree inspection (Lonsdale D), revealed that the tree has a series of wounds in its structure with one large wound with decay. The tree appeared to have average overall condition with defects in its branching structure with reasonable vitality. Due to the trees position and the wounds present, specialised diagnostic testing was completed to ascertain the extent of the decay present in the section tested. This methodology of tree assessment is consistent with the best practices of the industry and recognised industry standards.[1]

2.2 On 10th April 2020 the client commissioned The Ents Tree Consultancy to further investigate the tree on site due to an old large failure and to assess the decay in the nominated tree at the wound site. There are fruiting bodies present that have not been identified. The client requested a tree report assessing the condition of the tree, showing the results of the risk assessment combined with the Arbortom test on the tree in the sections nominated to be tested. This report will provide management options for the tree on site and a risk rating based on the TRAQ Risk Assessment Methodology, ISA Publication, Best management Practice, refer to Appendix 6. Consultation was sought with the client about the position and parts of tree to be inspected prior to a survey being completed. The overall health and condition of the tree will be assessed along with the tree's structural integrity. Scaffolding was used to access the wound at 7m above ground level.

2.3 On the day of the initial tree inspection the client was given the opportunity to provide a verbal brief in regard to background information for the tree on site. This tree report will assess the structure of the tree in an unbiased manner. The questioning of the client's or the client's representative is for the purpose of obtaining relevant information in regard to the tree's history, possible contributing factors to the trees present condition and the land use. The purpose of this report is to assess the trees general health and structural integrity of the tree, determining its risk rating. A Useful Life Expectancy (ULE) rating will be assigned to the tree, refer to appendix 4. The report will be completed based on an industry standard visual tree assessment with no root mapping or aerial assessment completed. The advanced assessment was completed at the request of the client and is limited to the sections nominated to be tested with the Arbortom Unit. The information in this report will be based on the information presented by the client at the time of the inspection as well as the site inspection.

2.4 To achieve the objectives of the report, the tree will be assessed noting the species, size, general condition with any significant defects discussed. The Arbortom unit will be used at 7m above ground level on the trunk to provide detailed diagnosis of the trees residual wall thickness and structural strength loss in that area. The purpose of the Arbortom unit is to detect decay and the relative strength loss caused by the defective wood structure. The assessment will also consider residual wall thickness of the tree or the t/R ratio. The residual wall thickness is the remaining sound wood used to support the tree. A study by Mattheck and Breloer revealed that 30% or less sound wood (measured as a linear measurement from the centre of the tree to the bark) is more likely to result in failure. The Arbortom unit also assesses the structural strength loss of the tree refer to Appendix 1. The range that is acceptable is considered to be up to 30% strength loss. After that the structural integrity of the tree is in a range that is considered compromised (30-50%). Strength loss greater than 50% is considered unstable (Smiley & Coder).

2.5 To assess the level of risk the tree poses to the surrounding houses and the land users a Tree Risk Assessment will be completed based on the tree at the time of the assessment and the areas use. The TRAQ Tree Risk Assessment will be completed based on the tree at the time of the assessment and the areas use. The trees Risk Potential was recorded using the TRAQ methodology and criteria from the ISA Publication, Best management Practice, Tree Risk Assessment. Refer to Appendix 6 for the Likelihood Matrix under the risk categorisation section of the QTRA form. The trees Risk Potential was recorded using the criteria from the ISA Publication, Best management Practice, Tree Risk Assessment, Refer to Appendix 6. The trees risk is considered in normal weather conditions over a one-year period. This methodology of tree assessment is consistent with the best practices of the industry and recognised industry standards. Please note that no root mapping and a limited aerial assessment was completed for the purpose of the assessment.

2.6 The trees characteristics and eventual size will be taken into consideration as will the trees position in relation to the existing structures and hard scapes. Recommendations will be outlined in section 5 of the report.

3. Methodology

3.1 The tree was assessed using the standard Visual Tree Assessment technique (VTA). The tree was assessed from the ground for the purpose of this report. VTA is an internationally recognised practice in the visual assessment of trees as formulated by Mattheck & Breloer (1994)[2].

3.2 A Lufkin 6.5m diameter tape was used to obtain the Diameter at breast height (DBH) as recommended at 1.4 metres unless otherwise stated due to variations in the trees form.

3.3 The height of the tree was estimated and the spread of the trees canopy was paced out.

3.4 A Canon 5D mark II Digital camera with a selection of lenses (11-24mm, 24-105mm, 100mm Macro) were used to take all photographs in this report. No digital enhancement of the images provided occurred. Some distortion of images may be seen due to the width of the 11-24mm lens.

3.5 The Arbortom 3D Impulse Tomography is unit was used to assess the internal properties of the tree using the velocity of soundwaves. The Arbortom sensors are hit lightly with a hammer when in position and the stress waves are measured, converted into velocities. The recorded impulse velocities are presented as a line graph, 2D or 3D image depending on the individual trees requirement and reveal the presence of decay. The Arbortom unit does not drill the tree and is relatively non-destructive. Refer to Appendix 1 for results.

3.6 A Bosch Professional DLE 50 hand held laser was used to measure distances on site.

4. Assessment of Tree(s)

Tree #	Species	Height (m)	Trunk Diameter (DBH*)	Canopy Spread (m)	Estimated Age Class	ULE Rating ****	Land Value	STARS Value +	Risk Rating	Observations and comments
1	*Eucalyptus pilularis* Blackbutt	18	.90 DAC 1.1	11	Mature	3	H	H	Low (people) Low (property)	• A mature tree with average health, average vigour and below average form for the species. • The tree has a low level of deadwood, a low level of dieback and a low level of epicormic shoots. The tree has an average level of vitality with little recent expansion growth visible within the callus tissue. • The tree has suffered several previous failures in the past with a series of small wounds to the north of the tree with the largest wound at 7m with white rot evident. • The tree appears to have lost apical dominance at 15m and has no significant wounds or defects present at the base of the tree. • To ascertain the level of decay present in the trunk of the tree, the trunk was tested at 7m above ground level with a sonic tomography unit, refer to Appendix 1.

Explanatory Notes for Table

- *Dbh = Diameter of trunk at breast height.
- ** DAC = Diameter above collar of roots.
- ***TPZ is the recommended TPZ 12x the DBH at 1.4m, SRZ is the trees structural root zone. Refer to AS4970 for details.
- ****ULE Explanation can be found in Appendix 4.
- # The Risk rating criteria can be found in Appendix 6
- + Refer to Appendix 7 for STARS Rating.

3 Discussion

5.1 The tree nominated to be inspected is located site at 6 Gumtree Lane Thirroul. The tree is significant in the immediate landscape and may be considered important in the local areas landscape in terms of amenity and function due to its species, age and size. The tree has been nominated to be assessed due to several previous failures which includes one large failure. The client has stated that the tree has failed multiple times in the past and he is concerned about building under the tree. The tree has had its health and structure assessed with a detailed diagnostic assessment in the section of its trunk which is most likely to have decay or where the defect is likely to have its greatest influence.

5.2 The tree is located on a partially exposed site, receiving some protection from surrounding structures, trees and topography. The soil on site appears to be a clay loam and has been disturbed previously for the construction of the landscapes and buildings. The tree was present for some of the demolition and landscape works, the level of disturbance underground is unknown for the tree on site. No testing has been completed for the trees root zone or the trees crown, only one test was completed at 7m above ground level on the tree's trunk.

5.3 **Tree 1** is a mature tree with average health, average vigour and average form. This tree has a low level of deadwood, a low level of dieback and a low level of epicormic shoots. This tree has reasonable vitality with a moderate level of callus growth around the wounds that are present in the tree's trunk. The tree has a series of wounds on its trunk, with one large previous failure at 7m that has white rot present. The tree has lost its leader at 15m but does not appear to have any significant wounds or defects at its base.

5.4 The test completed at 7m on the tree's trunk revealed that the tree had a moderate level of decay present in the section tested of between 13-25% strength loss. The decay level is approaching the 30% strength loss threshold. This is related to the fact that the decay is off centre in the trunk and the decay column crosses the centre of the tree's trunk. The tree has a moderate amount of decay present in the section tested, with a reading 25% of strength loss (refer to Appendix 1A). Approximately 30 - 50% is a critical amount of strength loss, depending on the position of the decay, tree species and shape of the tree, (Smiley & Coder).

5.5 The decay recorded at 7m in the trees structure is at a moderate level. The level of decay will increase which will increase the risk and when built structures are placed under the tree, the risk will increase. This tree will be an imminent risk of failure in the future as the decay develops. The decay in this tree is likely to continue to advance and is likely to result in another large failure. If the tree fails in the future when the property is developed it is likely to fall onto the client's house. Removal and replacement of this tree appears to be the best long-term landscape management strategy for the site.

5.6 A tree risk assessment has been completed using the ISA, TRAQ Tree Risk Assessment methodology which is based on the Best Management Practice for Tree Risk Assessment, refer to Appendix 5. Within the target zone of the tree there is the client's yard and the adjoining yards with the streetscape in the fall zone of the tree. There is the driveways and the parking areas. The areas within the fall zone of the tree appeared to be of low use for most of the time and received moderate levels of use for limited times during the week. The areas are used intermittently by people, but the structures are always in the fall zone. The consequence of a tree part failing, will most likely be damage to the surrounding hardscapes and structures. The pedestrian traffic is intermittent and the chances of hitting a person are unlikely with severe consequences.

5.7 Using the risk matrix as shown in appendix 5 the likelihood of failure within the next year is possible from the second / third order branches. A failure from the tree's primary branches or trunk is possible. The chances of hitting a structure unlikely, combined with the consequence of hitting a structure, moderate, (depending on the type of failure). The consequences of the tree part failing and hitting the target are significant. This tree receives a rating of having a low level of risk, for hitting a building / built structure based on the assessment criteria.

5.8 Using the risk matrix as shown in appendix 5 the likelihood of failure within the next year is possible from the second / third order branches. A failure from the tree's primary branches or trunk are possible. The chances of hitting a person is unlikely, combined with the consequence of hitting a person, (severe). The consequences of the tree part failing and hitting the target are low, (this is due to the low use under the most likely target area). This tree receives a rating of having a low level of risk for hitting a person based on the assessment criteria. There are limited options to remediate the trees structure and prevent a large failure. This tree has structural defects and a moderate level of decay. Due to the trees form and the position of decay, options such as reduction pruning, or cabling are not viable. The best option for to reduce the risk of this tree is to remove the tree.

6 Recommendations

6.1 The tree nominated to be assessed is mature and significant in the immediate landscape. The tree has average health and an average structure. The tree has multiple wounds in it structure which are callusing over with decay present at 7m in the tree's trunk. There are fruiting bodies present at 7m that have been identified as a type of white rot. The decay will continue to develop and the trees structure will become compromised given time.

6.2 The testing completed at 7m above ground level on the trunk of the tree has revealed that the tree has 13-25% structural strength loss. This is in the acceptable range by 5%. The test shows that the tree has entered a range of strength loss that is considered moderate. This moderate level of decay with further development of the decay inevitable which will put the trees strength loss into the unacceptable range when it reaches 30% strength loss.

6.3 A tree risk rating has been completed and the tree receives a low level of risk for hardscapes / buildings and a low risk rating for pedestrians, (the allocation of risk is not moderate or high due to the limited usage for pedestrians and there are no houses under it). If the risk level is accepted by the client, the tree could be retained and monitored with a low level of risk for people and a low risk to property. If the client does not accept the level of risk presented by the tree an application should be made to council or appropriate authority to remove the tree. The risk will increase if a house is placed on the land and as the tree ages.

6.4 The removal and replacement of the tree appears to be the best long-term management strategy for the site as the evidence of previous failures indicate that further failures are likely. The tree could be replaced with another tree to replace the canopy cover lost.

Please do not hesitate to call ***0422 265 128*** if you have any questions regarding the contents of this report.

Regards

Hayden Coulter
AQF Level 5 Consulting Arborist
AQF Level 4 Advanced Certificate in Urban Horticulture

Arboriculture Australia™ Member · 2020 Registered Consulting Arborist ·

The Ents Tree Consultancy
Development Reports | Hazard Assessments | Tree Management

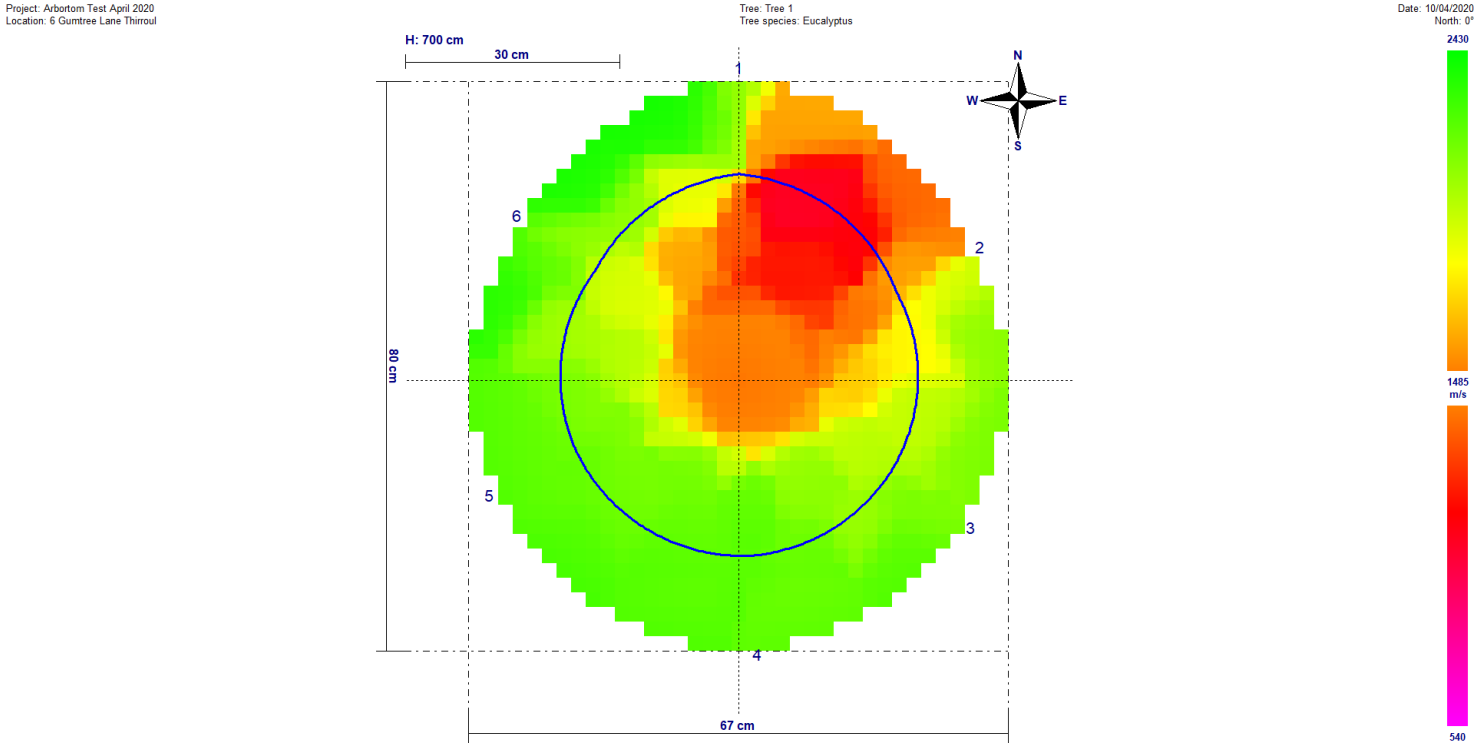
INSTITUTE OF AUSTRALIAN CONSULTING ARBORICULTURISTS
IACA
ACCREDITED MEMBER™

Disclaimer

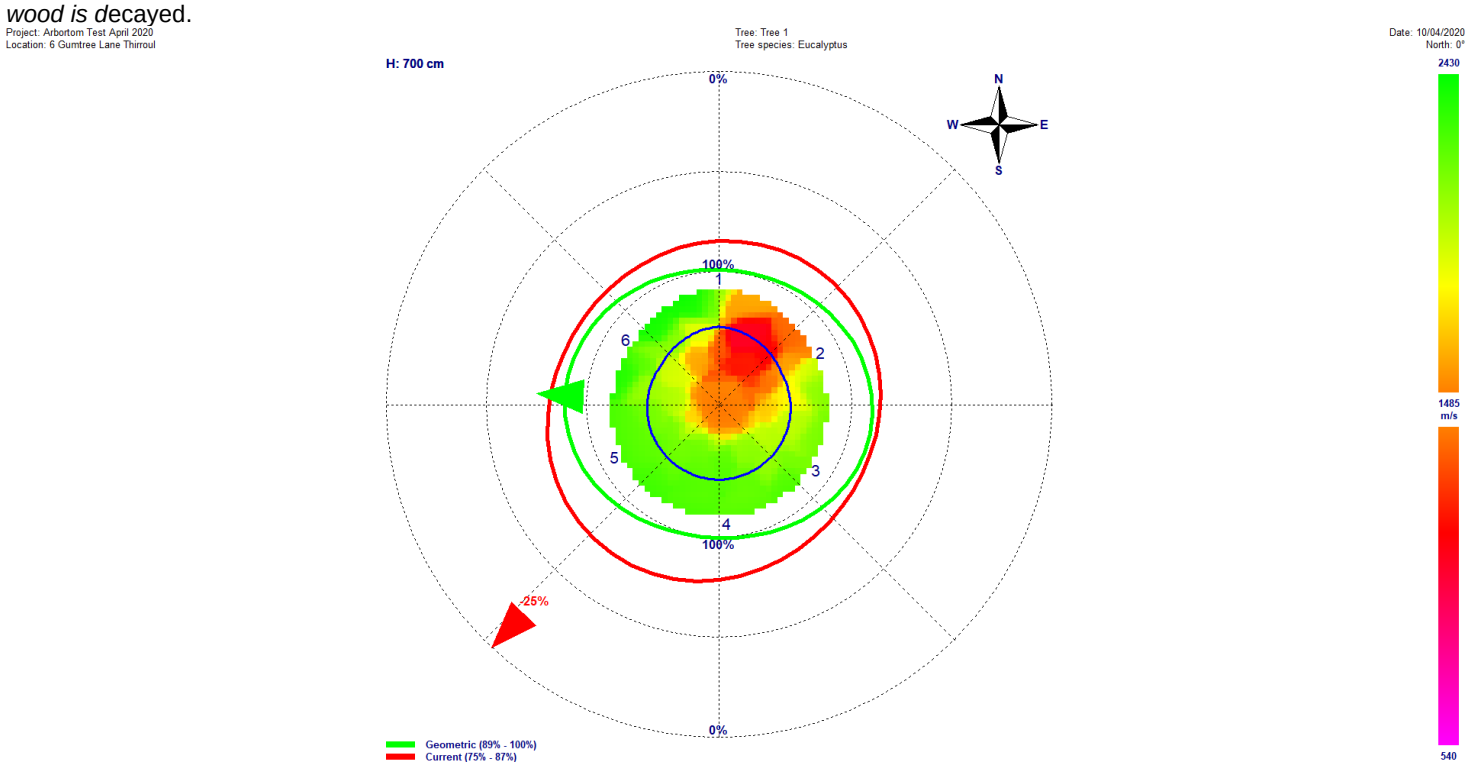
All trees have been assessed based on the information and facts of the site and as presented by the client or relevant parties at the time of inspection. No responsibility can be taken for incorrect or misleading information provided by the client or other parties. The nominated tree/s are assessed for biological requirements and hazard potential with reasonable care. The trees are assessed from the ground and by visual means only unless otherwise stated. All tree protection and tree preservation measures are designed to minimise the damage to the tree/s or to reduce the hazard potential of the tree/s. No responsibility can be taken by the author of this report for future damage to structures by the existing trees or planted trees. Trees are inherently dangerous, therefore will always have a hazard potential. Trees fail in ways that are not predictable or fully understood. There is no guarantee expressed or implied that failure or deficiencies may not arise of the subject trees in the future. No responsibility is accepted for damage to property or injury/death caused by the nominated tree/s.

The Ents Tree Consultancy. ABN: 95 598 933136 theents@bigpond.net.au

Appendix 1 Arbortom Readings



Reading A above shows the decay present in the tree at 7m above ground level.
Reading B Below shows the relative strength loss in the tree at 13 & 25% at 7m above ground southern trunk. NOTE: Sensor 1 is facing North. *Measurements at approximately 35-50% strength loss are at a critical point for failure, refer to Ratio weighted / geometric. The arrows indicate the direction of fall based on the weakest point of the tree. If you view these images from the top of the screen and then the bottom more detail can be seen. Definite color boundaries are not apparent as this is the way the trees wood is d*ecayed.



Appendix 2 Tree Images


Image 1 above left shows tree 1 on the site, scaffolding is pressent to access the test site on the trees trunk at 7m. Image 2 above right shows the cockatoo damage in the trees branch unons and the place where the tree lost apical dominanceand divided into three branches. All images 3-7 show the sensors on the trees trunk at 7m surrounding the wound.





Appendix 3 Site Plan

Appendix 4 ULE Rating

Useful Life Expectancy (ULE): Useful life expectancy refers to an expected period of time the tree can be retained within the landscape before its amenity value declines to a point where it may detract from the appearance of the landscape and/or becomes potentially hazardous to people and/or property. ULE values consider tree species, current age, health, structure and location. ULE values are based on the tree at the time of assessment and do not consider future changes to the tree's location and environment which may influence the ULE value.

Category rating	Category definition in years	Category rating
1	> 40 Years	High
2	15 to 40 Years	Medium
3	5-15 Years	Low
4	0-5 Years	Dead

Appendix 5 References

Harris, R. W; Clark, J.R; & Matheny, N.P (2004).*Arboriculture:* Integrated Management of Landscape Trees, Shrubs & Vines 4th Edition, Prentice Hall, New Jersey

Lonsdale, D (1999) Principles of Tree Hazard Assessment and Management, Forests Commission, The Stationary Office London.

Mattheck, C and Breloer H. (1994) The Body Language of Trees: A handbook for failure analysis. Pg 196 The Stationary Office, London

Schwarze F W M R, et al, (2000) Fungal Strategies of Wood Decay in Trees, Springer-Verlag Berlin Heidelberg New York.

Smiley Thomas E, Kim D Coder, The Structure & Mechanics Conference Proceedings, Comparing formulas that assess strength loss due to decay in trees, pg 71-85 (2001), The International Society of Arboriculture.

Smiley Thomas E, Matheny Nelda, and Lilly Sharon, (2011), Best Management Practices Tree Risk Assessment, Martin Graphics, Champaign, Illinois.

Standards Australia (2007), Pruning of Amenity Trees AS4373.

Weber K, Mattheck C, Manual of Wood Decays (2003), p89, The Arboricultural Association, Ampfield House, Ampfield, Romsey, Hampshire.

Appendix 6 TRAQ ISA Risk Assessment

This Tree Risk Assessment is the Likelihood Matrix from the risk categorization section of the TRAQ form for Tree Risk Assessment Qualified Arborists 2013. This TRAQ form has been based on the Best Management Practice for Tree Risk Assessment, E. T Smiley, Nelda Matheny, Sharon Lily, published by the ISA 2011.

The Tree Risk Categorization in this case is a qualitative risk assessment used by qualified tree assessors in combination with a matrix to assign risk. The assessor considers possible targets, the target zone, occupancy rates, site specific factors, Tree species, noted defects and environmental factors within a specified period.

The tree assessor uses this information to Categorize risk for the Likelihood of failure, combined with the Likelihood of impacting a target. These two categories make up the first table (table 1) in the Tree Risk Matrix. The second table assesses the Tree Risk rating by combing the Likelihood of failure and impact in table 1 with the Consequences of the branch or tree failing, refer to table 2. The end result is a risk rating of low, moderate, high or severe.

The Likelihood of failure options,

- **Improbable**- the tree or branch is not likely to fail in normal weather conditions within the specified time period.
- **Possible**- Failure of the tree or branch could occur in normal weather conditions within the specified time period.
- **Probable**- the tree or branch may be expected to fail in normal weather conditions within the specified time period.
- **Imminent**- the tree or branch failure has started and is likely to occur in the near future, even without significant wind or load. This is a rare occurrence for the risk assessor to encounter and immediate action must be taken to prevent harm to people or property.

The Likelihood of impacting a target options,

- **Very low-** The chance of the failed tree or branch hitting a target is remote. This would be the case in a site with no targets or a rarely used site or a site that is protected by from impact by other structures.
- **Low-** It is not likely that the failed tree or branch will impact the target. This would be the case in a site which is fully exposed to the tree but is used occasionally, a frequently used area that is partially exposed to the assessed tree.
- **Medium-** The failed tree or branch may or may not hit the target with nearly equal likelihood. This would be the case in a frequently used area that is fully exposed on one side to the assessed tree, or a constantly occupied area that is partially protected for the assessed tree.
- **High-** The failed tree or branch will most likely impact the target. This would be the case when a fixed target is fully exposed to the assessed tree or near a high use road or walkway with an adjacent street tree.

.

Table 1. The matrix used to estimate the likelihood of a tree failure impacting a specified target.

Likelihood of failure	Likelihood of Impacting Target			
	Very Low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Categorizing Consequences of failure

- **Negligible**- consequences are those that involve low value property damage or disruption that can be replaced or repaired and does not involve personal injury.
- **Minor**- consequences are those that involve low – moderate property damage, disruptions in traffic or disruption in communications or minor personal injury.
- **Significant**- consequences that involve property damage of a moderate to high value, considerable disruption or personal injury.
- **Severe**- consequences that could involve serious personal injury or death, damage to high value property or disruption of important activities.

Table 2. Risk rating matrix showing the level of risk as the combination of likelihood of a tree or part failing and impacting a target and severity of the associated consequences.

Likelihood of failure and impact	Consequences			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

The four levels of risk as used in the table are defined below and should be used in making recommendations.

- **Extreme**- The extreme risk category applies in situations in which failure is *imminent* and there is a high likelihood of impacting the target with severe consequences. The tree risk assessor should recommend mitigation measures to be taken as soon as possible. This may involve immediately restricting the target zone.

- **High**- High risk situations are those for which consequences are *significant* and likelihood is *very likely* or *likely* or consequences are *severe* and likelihood is *likely*. This combination of likelihood and consequences indicates that the tree risk assessor should recommend mitigation measures. The decision for mitigation and timing of treatment depends upon the risk tolerance of the tree owner or risk manager.

- **Moderate**- Moderate risk situations are those in which consequences are *minor* and likelihood is *very likely* or *likely* or likelihood is somewhat likely and consequences are *significant* or *severe*. The tree risk assessor should recommend mitigation and or retaining the tree with monitoring. The decision for mitigation and timing depends upon the risk tolerance of the tree owner or manager.

- **Low-** The low risk category applies when consequences are *negligible* and likelihood is *unlikely* or consequences are *minor* and likelihood is *somewhat likely*. Some trees with this level of risk may benefit from mitigation or maintenance measures, but immediate action is not usually required. Tree risk assessors may recommend retaining and monitoring these trees as well as mitigation that does not include tree removal.

Appendix 7 STARS Rating System

IACA Significance of a Tree, **Assessment Rating System (STARS) © (IACA 2010)©**

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined.

Tree Significance - Assessment Criteria

1. High Significance in landscape

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils Significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

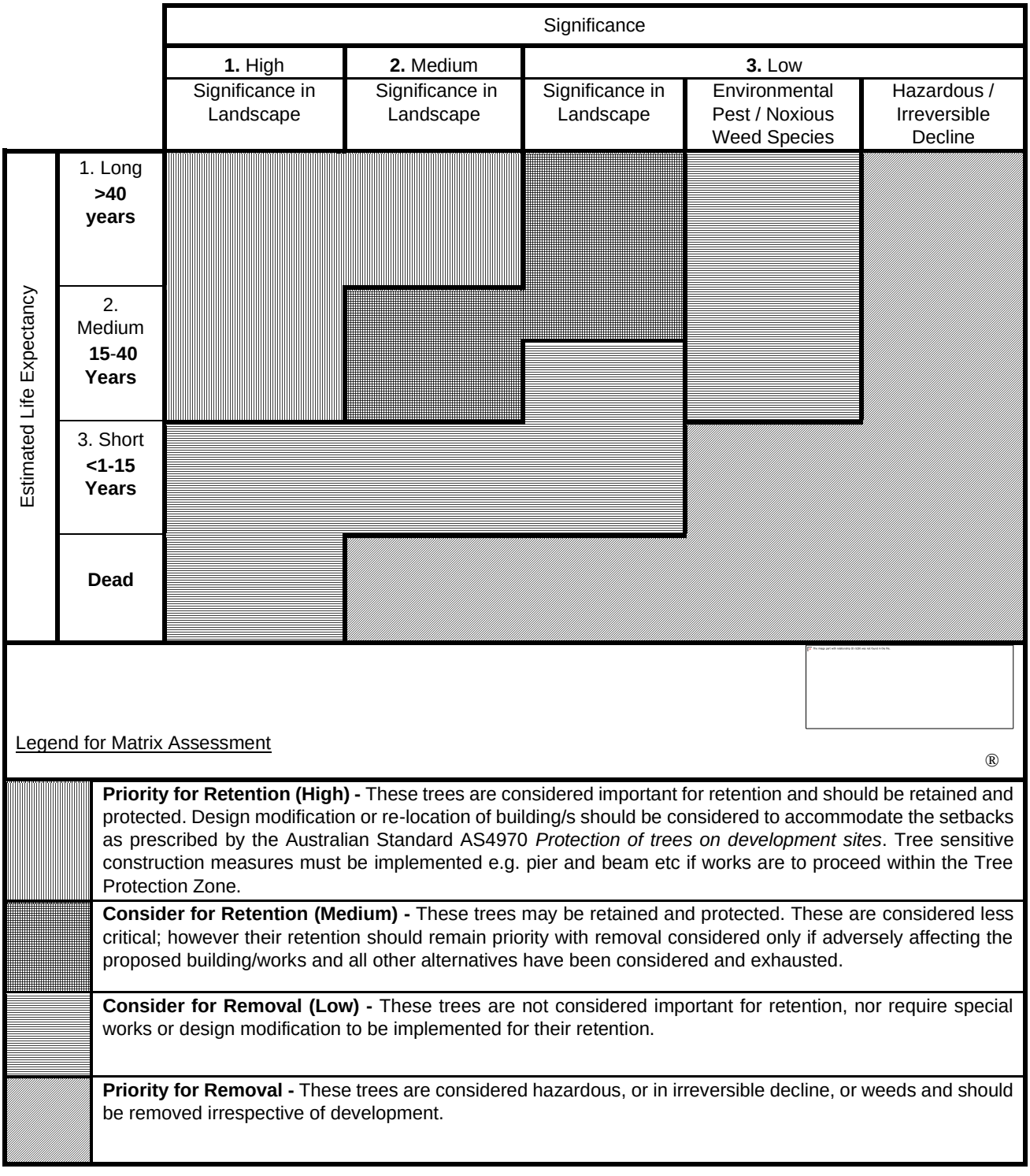
Hazardous/Irreversible Decline

- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.

Table 1.0 Tree Retention Value - Priority Matrix.



REFERENCES

Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia

Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au

Appendix 8 Glossary of Terms

Abiotic	Nonliving
Anthracnose	a fungal disease causing dead areas on the leaves, buds, stems.
Arboriculture	The science and art of caring for trees, shrubs and other woody plants in landscape settings.
Barrier Zone	Protective boundary formed in new wood in response to wounding or other injury.
Biotic	Alive, pertaining to living organisms.
Bracket	A fruiting body of a fungal pathogen.
Branch attachment	The structural union of a lateral branch.
Callus	Undifferentiated tissue produced in response to wounding.
Canker	A dead spot or necrotic lesion that is caused by a bark inhabiting organism/pathogen.
Cavity	an open wound characterized by the presence of decay resulting in a hollow.
Collar	the ring of tissue that surrounds the lateral branch at its point of attachment.
Compartmentalization	A physiological process that creates the chemical and physical boundaries that act to limit the spread of disease and decay organisms.
Compression wood	A type of reaction wood that forms on the underside of branches which tends to maintain a branch angle of growth.
Crown	The above ground parts of the tree, including the trunk.
DBH	The diameter of a trees trunk measured at 1.4m.
Decay	Process of degradation of woody tissues by fungi and bacteria through the decomposition of cellulose and lignin.
Decline	Progressive decrease in health of organs or the entire plant usually caused by a series of interacting factors.
Drip line	The width of the crown, as measured by the lateral extent of the foliage.
Epicormic shoot	a shoot that arises from latent or adventitious buds that occur on stems, branches or the bases of trees.
Failure	(tree failure), breakage of stem, branch, roots or loss of mechanical support in the root system.
Hazard	situation or condition that is likely to lead to a loss, personal injury, property damage or disruption of activities, a likely source of harm.
Included bark	Pattern of development at branch junctions where bark is turned inward, rather than pushed out; contrast with the branch nark ridge.
Mitigation	The process of reducing risk.
Mortality Spiral	The sequence of events describing a change in the trees health from vigorous to declining to death.
Photosynthesis	The transformation in the presence of chlorophyll and light, of carbon dioxide from (the air) and water (primarily from soil) into a simple carbohydrate and oxygen.
Pruning	systematic removal of branches of a plant usually a woody perennial.
Reaction wood	Specialized secondary xylem that develops in response to a lean or similar mechanical stress to restore the stem to vertical.
Risk	The combination of the likelihood of an event and the severity of the potential consequences
Structural defect	feature, condition or deformity of a tree that indicates a weak structure or instability that could contribute to failure.
Taper	The change in diameter over the length of trunks and branches. Important to mechanical support.
Target	people property or activities that could be injured or disrupted by a tree.
Tension wood	A type of reaction wood that trees form on the upper side of branches and stems and roots.
VTA	Visual Tree Assessment is a method of evaluating structural defects and stability in trees.
Wound	Any injury that induces a compartmentalization response.

Appendix 9 Curriculum Vitae

Education and Qualifications

- 2019, Graduate Certificate in Arboriculture (Level 8), University of Melbourne, 1st Class Honours.
- Arboriculture Australia 3 Day Tree Anatomy Workshop 2015
- QTRA basic certificate 2014, QTRA Advanced Certificate 2016
- TRAQ Qualification 2014
- 2005 Diploma of Arboriculture (AQF Cert 5), Ryde TAFE. Distinction Pass.
- Barrell Tree Care Workshop- Trees on Construction Sites (Brisbane 2005)
- Tree Logic seminar- Urban Tree Risk Management (Sydney 2005)
- Tree Pathology and Wood Decay Seminar Sydney (2004)
- Excelsior Training Claus Mattheck (Sydney 2001)
- 2000 Tree Climbing Course (AQF Cert 2), Ryde TAFE.
- 1999 Advanced Certificate in Urban Horticulture, (AQF Cert 4), Ryde TAFE. Distinction Pass.
- 1995 Greenkeepers Trade Certificate (AQF 3) Ryde TAFE. Credit Pass.
- 1991 Higher School Certificate.

Conference Attendance/presentation of Scientific Papers

- Barrell Tree Care Workshop- Trees on Construction Sites (Brisbane 2005)
- Tree Logic seminar- Urban Tree Risk Management (Sydney 2005)
- Tree Pathology and Wood Decay Seminar Sydney (2004)
- Excelsior Training Claus Mattheck (Sydney 2001)
- Managing Mature Trees NAAA (Sydney 2000), Presented a Paper “Habitat Value of Mature Trees”

Professional Membership Accreditation

- Institute of Australian Consulting Arborists ACM 0482014
- Arboriculture Australia Member number 2527

Presentation of Scientific Papers

- Managing Mature Trees NAAA (Sydney 2000), Presented a Paper “Habitat Value of Mature Trees”

Industry Experience

- **2004 to Date, Sole Trader, The Ents Tree Consultancy.** Writing of tree reports for development applications, master plans, hazard evaluations, tree management plans and expert witness reports. Hazard assessments, tree surveys and consultations. Clients include The Royal Botanic Gardens Sydney, UNSW Master Planning Works including SIRF building, Tyree Building, DP sports field redevelopment, Sydney University Mays Green Precinct, Taronga Zoo Coastline Precinct, Capital Insight, Campbelltown Hospital Redevelopment, Parramatta Park Trust multiple jobs, Woollahra Council multiple jobs and many other jobs.
- **2003 to 2008, Arborist University of New South Wales**. Survey all trees on site, developed a Tree Management Database. Minimise hazard potential of all trees on site through evaluation and works. Generate and prioritise works and tree assessment-based areas usage, tree conditions and staff required. Development of UNSW Tree Protection Guidelines for master planning works. Acting Supervisor December 2006 to May 2007.
- **2003 Tree management Officer Randwick Council**. Liaise with public to explain and enforce the councils Tree Preservation order. Management of internal staff and contractors. Project management and co-ordination of street tree planting and maintenance.
- **1999 to 2003 Animal Food Production Manager and Arborist.** Management of Koala Food Plantation, Management of animal food supply registry for herbivores/omnivores. Coordination of staff contractors and volunteers. Maintain and manage tree management database, complete tree works within zoo grounds and at zoo owned plantations. Acting supervisor 6-month period 2002 for grounds dept and asset management trade team.
- **1998 to 1999 Sole Trader Techniques Lawn & Garden Consultancy.** Lawn, garden and Tree care. Garden design and maintenance. Tree works and tree removal. Installation of irrigation equipment.
- **1997 to 1998 Greenkeeper / Horticulturist Muirfield Golf Course.** General grounds duties, machinery maintenance, horticultural works, tree works
- **1992 to 1997 Greenkeeper / Horticulturist Ashlar Golf Course.** General grounds duties, machinery maintenance, horticultural works, tree works

Attachment 3

Moore Trees
Arboricultural Services

ABN 90887347745

Arboricultural Development Assessment Report

6 Gum Tree Lane
Thirroul NSW 2515
Lot 82 DP 1214908
December 2019
FINAL

Prepared for: Jason Ward
34 The Grove
Austinmer NSW 2515

Prepared by: Paul Vezgoff
Consulting Arborist
ISA, AA
Arboriculture Australia
Registered Consultant

Registered Consultant

PO Box 3114 Austinmer NSW 2515
Ph: 0242 680 425
Mob: 0411 712 887
Email: enquiries@mooretrees.com.au
Web: www.mooretrees.com.au

Summary

This report has been compiled for Jason Ward of 34 The Grove, Austinmer NSW 2515. The report concerns a proposed Development Application for 6 Gum Tree Lane, Thirroul NSW 2515. This arborist report refers to four (4) trees.

With regards to the Tree Protection Zone (TPZ) for Tree 1, the Australian Standard *Protection of trees on development sites,* (AS 4970) recommends no more than 10% encroachment unless the TPZ can be compensated elsewhere and contiguous with the TPZ. If the section of the design (shown as hand dig area in the Tree Protection Plan) can show a portion of footings across the root zone can be bridged via the use of pier and beam construction, this would allow the development to comply with AS4970. The proposed plans show an approximate 20% encroachment of the TPZ however this is not excavations of the 20% area. It should be possible to bridge most of the floor area of the dwelling, with the exception of the pier holes, over the TPZ of Tree 1. There should be an allowance for pier holes to be moved should any large roots greater than one hundred (100) millimetres be encountered.

Wollongong City Council also requires signage is used for tree protection areas and attached to the surrounding TPZ fencing for the duration of the works. A sample tree protection sign has been included in Appendix 6.

Trees 2, 3, 4 are proposed to be removed for the purpose of the development.

Table of Contents

VERSION CONTROL

Date of Issue	Details
9 December 2019	Draft 1 issued
10 December 2019	Final Version issued
17 December 2019	Updated final version

1 INTRODUCTION

1.1 This report has been conducted to assess the health and condition of four (4) trees located at 6 Gum Tree Lane, Thirroul NSW 2515. This report has been prepared for Jason Ward of 34 The Grove, Austinmer NSW 2515 as required for a Development Application with Wollongong City Council at this site.

The purpose of this report is to collect the appropriate tree related data on the subject trees and to provide advice and recommendations to the design and possible construction alternatives to aid against any adverse impacts on the health of the subject tree(s) to be retained.

The subject trees were assessed for their health and condition. Also included in this report, are tree protection measures that will help retain and ensure that the long term health of the trees to be retained are not adversely affected by the proposed development in the future.

As specified in the Wollongong City Council Development Application guidelines the following data was collected for each tree:

1) A site plan locating all trees over three (3) metres in height, including all street trees.
2) All trees were assessed for Safe Useful Life Expectancy (SULE), health and amenity value.
3) Genus and species of each tree.
4) Impact of the proposed development on each tree.
5) The Tree Protection Zone (TPZ) calculated for each tree to be retained.
6) Any branch or root pruning that may be required for trees.

Also noted for the purpose of this report were:

- Health and Vigour; using foliage colour and size, extension growth, presence of deadwood, dieback and epicormic growth throughout the tree.
- Structural condition using visible evidence of bulges, cracks, leans and previous pruning.
- The suitability of the tree taking into consideration the proposed development.
- Age rating; Over-mature (>80% life expectancy), Mature (20-80% life expectancy), Young, Sapling (<20% life expectancy).

1.2 Documents and information provided: For this Arborist Report I was given subdivision concept plans for the site, undertaken by Michael Vail Design marked project # 17-333 dated October 2019 SK01 and SK02. The plans showed the location of a proposed pole style home. A building envelope was also shown. I have not been provided any plans for, engineering specifications or service diagrams for the site.

1.3 Location: The proposed development site is located at 6 Gum Tree Lane, Thirroul NSW 2515, known as Lot 82 DP 1214908. The proposed development site from herein will be referred to as "the Site".

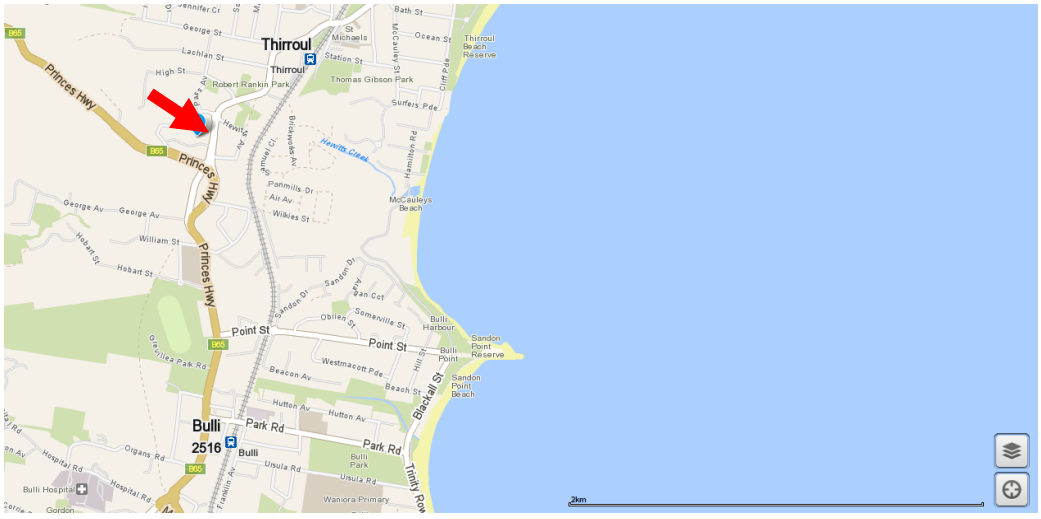


Diagram 1: Location of subject site, 6 Gum Tree Lane, Thirroul NSW 2515 (Red arrow) (whereis.com.au)

2 METHODOLOGY

2.1 To record the health and condition of the subject trees, a Visual Tree Assessment (VTA) was undertaken on 17th May 2019. This method of tree evaluation is adapted from Matheny and Clark, 1994 and is recognised by The International Society of Arboriculture. Individual tree assessments are listed in Appendix 2 of this report. All inspections were undertaken from the ground. No diagnostic devices were used on the trees.

2.2 This report is only concerned with trees on the site that come under the Tree management permit policy that is part of the Wollongong City Council Development Control Plan, 2009 (Chapter E17 Preservation and management of Trees and vegetation). Under this Chapter (E17), a person must not ringbark, cut down, top, lop, remove, injure or wilfully destroy any prescribed tree or other vegetation, without development consent or a permit being granted by Council. Refer to Part 3 (Chapter E17) Definitions for the meaning of 'prescribed tree' and 'prescribed other vegetation'. Two application processes have been established to deal with the assessment and approval for prescribed trees:

a) Tree Management Permit (generally for individual/small scale tree removal and pruning in urban areas) - refer to Council's website for the Tree Management Permit Policy;

b) Development consent via either Complying Development or Development Application. This Chapter of the DCP should be read in conjunction with clauses 5.9 Preservation of trees or vegetation, 5.10 Heritage conservation, 5.11 Bush fire hazard reduction work and 7.2 Natural resource sensitivity – biodiversity of Wollongong Local Environmental Plan 2009.

This Report is required as per clause (b) via a Development Application for the site. This report takes no account of any tree or shrub under three (3) metres in height.

This report is only concerned with trees on the site that come under the Wollongong Council Tree Management Control Plan, 2009 (TMCP)**.**

2.3 **Height:** The heights and distances within this report have been measured with a Bosch DLE 50 laser measure.

2.4 **Tree Protection Zones (TPZ):** The Tree Protection Zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable. The TPZ for Tree 1 has been calculated in order to assess project impacts. The TPZ calculation is based on the Australian Standard *Protection of trees on development sites,* AS 4970, 2009. The Tree Protection Zone for Tree 1 is shown in the Tree Protection Plan (Appendix 1).

2.5 **Structural Root Zone (SRZ)**: The SRZ is a specified distance measured from the trunk that is set aside for the protection of tree roots, both structural and fibrous. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. SRZ area is shown in the Tree Protection Plan (Appendix 1). The TPZ and SRZ are measured as a radial measurement from the trunk. No roots should be severed within this area. A detailed methodology on the TPZ and SRZ calculations can be found in Appendix 4.

2.6 **SULE**: The subject trees were assessed for a Safe Useful Life Expectancy (SULE). The SULE rating for the subject trees can be seen the Tree Assessment Schedule (Appendix 2). A detailed explanation of SULE can be found in Appendix 3.

2.7 **Plans provided**: Concept plans by Michael Vail Design marked project # 17-333 dated October 2019 SK01 and SK02.

2.8 Impact Assessment: An impact assessment was conducted on the site trees. This was conducted by assessing the site survey provided by Jason Ward. The plans provided were assessed for the following:

- Reduced Level (R.L.) at base of tree.
- Incursions into the Tree Protection Zone (TPZ).
- Assessment of the likely impact of the works.

3 RELEVANT BACKGROUND INFORMATION

3.1 The site is located along a north-south axis and is accessed from Gum Tree Lane. The proposed works entail subdivision of the site and construction of a pole home with access from Gum Tree Lane.

3.2 The site would be considered highly disturbed and having undergone heavy clearing in the late 1800's. Soil mapping of Illawarra area by Hazelton and Tille (1990) indicates the occurrence of the Gwynneville Soil Landscape Group over the site. Soils of the Gwynneville Group are derived from Illawarra Coal Measures. Present are resistant interbedded quartz-lithic sandstone, grey siltstone and claystone, carbonaceous claystone, clay and laminate. Characterised by Undulating to steep hills that include broad to moderate ridges, steeply inclined to moderately inclined foot slopes and isolated rises on the coastal plain. The soil landscape is characterised by localised structural benches up to 80 metres wide, localised bedrock outcrops and deep colluvial deposits (Hazelton and Tille 1990).

3.3 **Environmental Significance**: A Tree Management Control Plan (TMCP) applies to the whole of the Wollongong Local Government Area and is part of the Wollongong City Council Development Control Plan, 2009. This TMCP protects all trees above three (3) metres in height with a girth of twenty (20) centimetres or more, measured at a distance of one hundred (100) centimetres above the ground. As Council is the consent authority regarding the site trees, Council may not agree with the views expressed in this report and condition that certain trees are to be retained. This may entail redesign or minor alterations of the project. In this instance, the Architect or Draftsperson should refer to the TPZ and SRZ measurements to enable adequate distances to be maintained between the tree and any proposed works.

3.4 **Illegal tree removal:** Damaging or removing trees can result in heavy fines. Local Government does have the authority to issue on the spot fines known as penalty infringement notices (PINS) starting from $3,000 or can elect to have a potential tree damaging incident addressed in the Local Court. Recent cases, for example, include two (2) mature trees removed for development (Sutherland Shire Council (SSC) v Palamara, 2008) costing $4,500 in fines and $5,000 in court costs. SSC v El-Hage, 2010 concerning illegal tree removal of a single tree costing $31,500 in fines and $5,000 in costs. Poisoning trees can also incur substantial fines (SSC v Hill) resulted in a single tree fine that totalled $14,000 plus a $10,000 bond for a replacement tree. All of the above cases resulted in a criminal conviction for the guilty parties.

3.5 **The Rural Fire Service (RFS)** 10/50 Vegetation Clearing Code of Practice (The Code) has been prepared in accordance with section 100Q of the Rural Fires Amendment (Vegetation Clearing) Act 2014. The online assessment tool ("Tool") is provided by the NSW Rural Fire Service ("the NSW RFS") to help assess whether the 10/50 Code will allow you to clear vegetation on your property. A search of the site address does not show that the property is a designated 10/50 vegetation entitlement clearing area.

3.6 **The Site Trees:** The site was inspected on 17th May 2019. Tree 1 is a large Blackbutt *(Eucalyptus pilularis)* that is approximately 50 years old. The Blackbutt (*Eucalyptus pilularis)* is one of the most widespread Eucalypts in the Wollongong area. The Blackbutt can grow to a large tree over twenty (20) metres tall. The bark of this tree will turn grey prior to shedding in January (Fuller, 1995). Tree 1 has suffered a lateral branch failure at approximately eight (8) metres from ground level (Plate 2). There is some bird damage of the sapwood within one of the first order branch unions. Old pruning wounds are showing good occlusion, a sign that the tree is photosynthesizing effectively. New extension growth was noted with leaf colour showing good vitality. The tree would be considered to have a 95% live canopy. The basal area and woody root zone were free of any ground heaving, or lifting.

3.7 The TPZ for Tree 1 is ten (10) metres (radial measurement from trunk) and the SRZ is 3.2 metres. These TPZ and SRZ distances can be seen in the Tree Protection Plan (Appendix 1).

Plate 1: Tree 1 looking north. P. Vezgoff.

Plate 2: Image showing the old limb failure point (Red arrow). P. Vezgoff.

3.8 Located on the eastern boundary is Tree 2 is an Illawarra flame tree *(Brachychiton acerifolius)*in good health and condition (Plate 3). It is ten (10) metres in height with a three (3) metre spread. Tree 3 is a Macadamia *(Macadamia integrifolia)* and Tree 4 is a Willow Bottle brush *(Callistemon salignus)* both six (6) metres in height with 2.5 metre spread (Plate 4). Tree 4 has codominant stems. It is located four hundred (400) millimetres off the boundary fence. Trees 2, 3 and 4 are free of cracks, splits and fruiting bodies.

Plate 3: Image showing Tree 2. P. Vezgoff.

Plate 4: Image showing Trees 3 and 4. P. Vezgoff.

3.9 **Impacts:** It would be possible to construct the proposed design so that it complies with AS 4970. There are no works proposed within the SRZ distance of 3.2 metres. AS 4970 does not allow for calculating the impacts of pole home construction across a TPZ. Poles can be inserted into the ground without the need for strip footings. This in turn means that there is no "major" incursion into the TPZ area. Depending on the final construction drawing, pole holes could be as close as 1.8 metres apart as a minimum or several metres based on the bearer material used.

3.10 Through mulching and planting of the TPZ area below Tree 1, will help with the overall tree health with the improvement of soil condition. The proposed design in terms of a lightweight style of construction and minimal breaches to the TPZ, will help this project comply with AS 4970. Also to consider and make the client aware, that it should be remembered that trees shed limbs from time to time, that is how they grow and building close to any tree obviously increases the "Target area" below it, so the risk of a branch hitting the new dwelling from time to time should be expected. Regular biannual inspections of this tree by a qualified arborist (AQF Level) will help reduce the likelihood of limb failure.

3.11 No canopy pruning of Tree 1 is required due to the height of the first order limbs.

3.12 Trees 2, 3 and 4 are required to be removed for purposes of development due to the drainage line required on the eastern boundary of Lot 821.

4 RECOMMENDATIONS

4.1 A Project Arborist should be appointed to oversee the arboricultural related works for the project. The Project Arborist should be used for arboricultural certification services and also used as a point of contact should any questions arise during the project. As specified in AS 4970, 2009, a Project Arborist is a person with a minimum Australian Qualification Framework (AQF) level 5 Diploma of Arboriculture or Horticulture qualification.

4.2 With regards to the TPZ for Tree 1, the Australian Standard *Protection of trees on development sites,* (AS 4970) recommends no more than 10% encroachment unless the TPZ can be compensated elsewhere and contiguous with the TPZ. If the section of the design (shown as hand dig area in the Tree Protection Plan) can show a portion of footings across the root zone can be bridged via the use of pier and beam construction, this would allow the development to comply with AS4970. The proposed plans show an approximate 20% encroachment of the TPZ however this is not excavations of the 20% area. It should be possible to bridge most of the floor area of the dwelling, with the exception of the pier holes, over the TPZ of Tree 1. There should be an allowance for pier holes to be moved should any large roots greater than one hundred (100) millimetres be encountered.

4.3 Bridging of individual roots can also occur however all pier holes within the TPZ distance across the driveway shall be hand excavated to the depth of five hundred (500) millimetres to reveal any roots. Holes shall be moved to accommodate roots accordingly. Hydro excavation could be a good alternative rather than hand excavation. Water pressure should be adjusted so as not to strip roots of bark (See 4.7).

4.4 The location of the stormwater pipes should all be located outside the TPZ area. As the proposed dwelling is raised, it should be possible to suspend all storm water pipes under the dwelling and then direct them below ground level outside the TPZ area.

4.5 Tree 1 will require trunk protection as specified in Section 5.4 of this report. This trunk protection will be required due to the proximity of heavy equipment operating near this tree. It is important to protect the bark on trees. Bark is a very effective barrier that helps to protect trees from pest, disease and decay pathogens. Due to the small working area a TPZ fence will not be possible to install.

4.6 As there will be no TPZ fence to protect the ground portion of the TPZ, the TPZ will still require protection from compaction. Compaction of the root zone reduces oxygen and moisture exchange of the roots. This will lead to premature death of the tree. To reduce compaction of the root zone, mulch is recommended to be spread around the base of the tree to the extent of the TPZ. This area for mulching can be seen in the Tree Protection Plan.

4.7 All post hole excavation should be supervised by the Project Arborist to ensure woody roots are not damaged or severed.

5 TREE PROTECTION

5.1 Trees to be protected: Tree 1 is to be retained and protected prior to and throughout the construction period.

5.2 Implementation of Tree Protection Zone: The TPZ area will be mulched as classified as the area to be protected from construction disturbance. Tree 1 will require trunk protection as specified in Section 5.3 of this report. This trunk protection will be required due to the proximity of heavy equipment operating near these trees. It is important to protect the bark on trees. Bark is a very effective barrier that helps to protect trees from pest, disease and decay pathogens.

5.3 Individual trunk protection: Trunk protection is achieved by attaching lengths of timber (75mm x 50mm x 2000mm) fastened around the trunk. Geotextile fabric or carpet underlay shall be wrapped around the trunk prior to the timbers being attached. These timbers are to be fastened with hoop iron strapping and not attached directly into the bark of the tree. These timbers are only to be removed when all construction is complete. See Plate 5 for an example of trunk protection.

Plate 5: Example of trunk protection with sign attached, recommended for Tree 1.
P. Vezgoff.

5.4 The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ): The TPZ is implemented to ensure the protection of the trunk and branches of the subject tree. The TPZ is based on the Diameter at Breast Height (DBH) of the tree. The SRZ is also a radial measurement from the trunk used to protect and restrict damage to the roots of the tree.

The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) have been measured from the centre of the trunk. The following activities shall be avoided within the TPZ and SRZ of Tree 1;

- Erecting site sheds or portable toilets.
- Trenching, ripping or cultivation of soil (with the exception of approved foundations and underground services).
- Soil level changes or fill material (pier and beam or suspended slab construction are acceptable).
- Storage of building materials.
- Disposal of waste materials, solid or liquid.

Tree	TPZ (mm)	SRZ (mm)
1	10000	3200

Table 1: TPZ and SRZ distances

5.5 Tree Damage: If the retained tree is damaged a qualified Arborist should be contacted as soon as possible. The Arborist will recommend remedial action so as to reduce any long term adverse effect on the tree's health.

5.6 Signage: Wollongong City Council requires TPZ signage is attached to the tree protection fencing. A sample sign has been attached in Appendix 6. This sign may be copied and laminated then attached to any TPZ fencing.

5.7 **Root Pruning:** If excavations are required within a TPZ this excavation shall be done by hand to expose any roots. Any roots under fifty (50) millimetres in diameter may be pruned cleanly with a sharp saw. Tree root systems are essential for the health and stability of the tree.

5.8 **Arborist Certification:** Wollongong City Council requires that the developer to supply Council or the Principal Certifying Authority with certification three (3) times during the construction phase of the development (as outlined in Council's Development Control Plan, 2009), in order to verify that retained trees have been correctly retained and protected as per the conditions of consent and Arborist's recommendations. The certification is to be conducted by a Qualified Consulting Arborist with AQF level 5 qualifications that has current membership with either Arboriculture Australia (AA) or Institute of Australian Consulting Arboriculturists (IACA). Arborist Certification is recommended:

(1) Before the commencement of demolition or construction to confirm the correct installation of TPZ fencing;

(2) At mid point of the construction phase;

(3) At completion of the construction phase.

If you have any questions in relation to this report please contact me.

Paul Vezgoff
Consulting Arborist
Dip Arb (Dist), Arb III, Hort cert, AA, ISA
13 December 2019

www.mooretrees.com.au

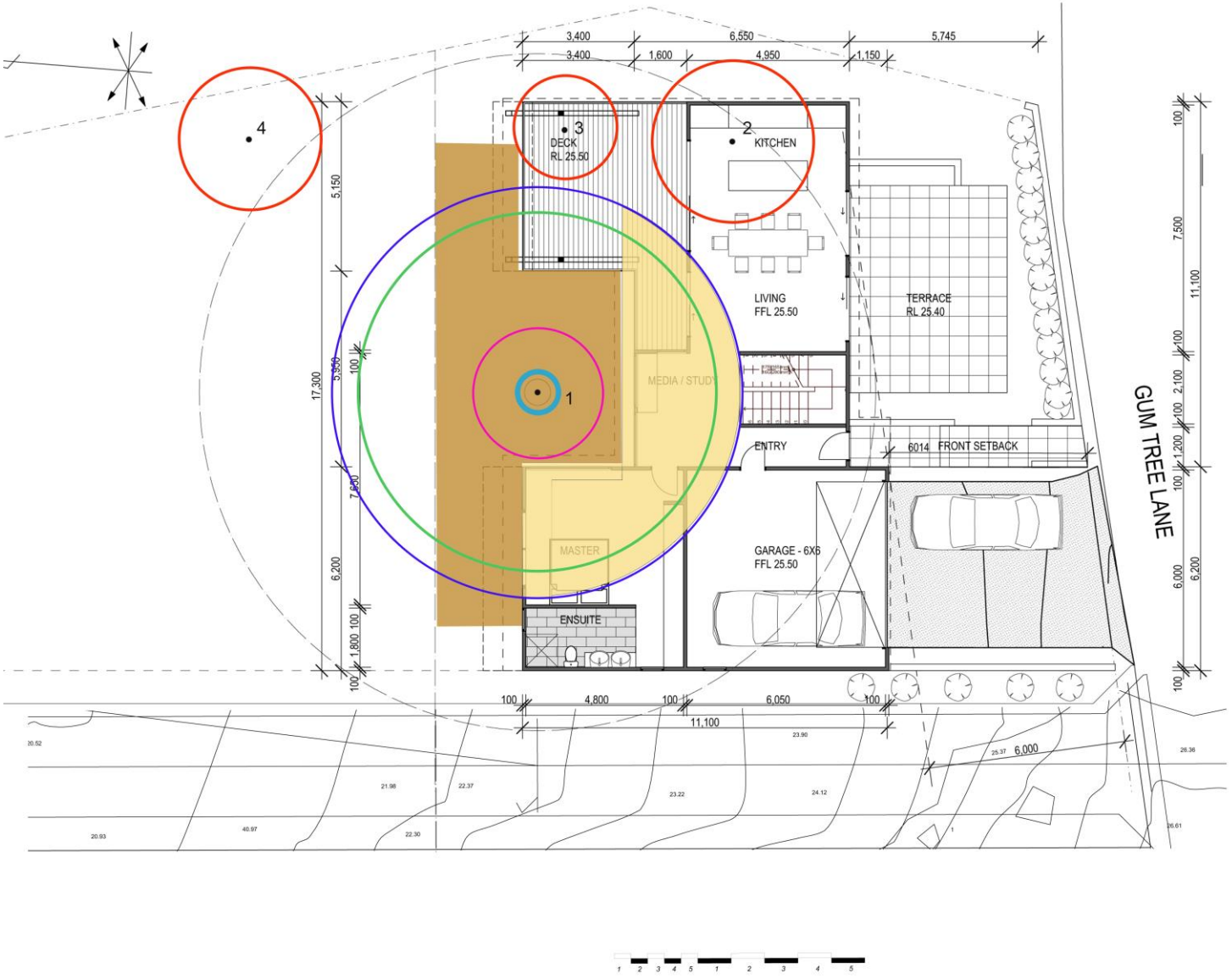
Appendix 1

Plan 1

Tree Protection Plan

Tree protection plan

Moore Trees



Tree to be retained

Tree to be removed

Structural Root Zone (SRZ) . No roots over 50mm in diameter to be severed within this area. The area within this circle is also known as the Tree Protection Zone.

Tree Protection Zone (TPZ). TPZ area based on AS 4970. See *Recommendations* and *Tree Protection* section of Arborist Report.

Mulching. Area recommended for mulching. Prior to any demolition or construction work mulch shall be applied to a depth of 100mm to this area for the duration of the construction period. Once construction is complete the mulch shall be reduced to a depth of no greater than 70mm.

Trunk protection. Lengths of timber (75mm x 50mm x 2000) shall be fastened to the trunk or overhead branches that are greater than 80mm in diameter. These timbers are to be fastened with hoop iron strapping and not fixed directly onto the trunk of the tree.

Location of possible root pruning. This area is to be excavated by hand to a depth of 400mm to expose any roots. If roots under 50mm are encountered they can be severed cleanly with a sharp saw. If roots over 50mm are encountered then a qualified arborist should be consulted for further advice.

Date:	17.12.19
Drawn:	P.Vezgoff
Site Address:	6 Gum Tree Lane Thirroul NSW 2515

Appendix 2

Tree health & condition assessment schedule

TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE – 6 Gum Tree Lane, Thirroul NSW 2515

Tree	Species	Height (m)	Spread (m)	DBH (mm)	Live canopy %	Defects	SULE	Condition	Age	Comments	TPZ (mm)	SRZ (mm)
1	Blackbutt (Eucalyptus pilularis)	20	8	858	92	Storm damage	2a May only live for 15-40 years	Good	Mature	Previous failure at 8m north side from inclusion.	10000	3200
2	Illawarra flame tree (Brachychiton acerifolius)	10	3	250	95	No visual defects	1a >40 years	Good	Mature		2400	1000
3	Macadamia (Macadamia integrifolia)	6	2.5	120	95	No visual defects	2a May only live for 15-40 years	Good	Mature		1536	1000
4	Willow Bottle brush (Callistemon salignus)	6	2.5	180	95	No visual defects	2a May only live for 15-40 years	Good	Mature		2160	1000

KEY

Tree No: Relates to the number allocated to each tree for the Tree Protection Plan.

Height: Height of the tree to the nearest metre.

Spread: The average spread of the canopy measured from the trunk.

DBH: Diameter at breast height. An industry standard for measuring trees at 1.4 metres above ground level, this measurement is used to help calculate Tree Protection Zones.

Live Crown Ratio: Percentage of foliage cover for a particular species.

Age Class:	Young:	Recently planted tree	Semi-mature:< 20% of life expectancy
	Mature:	20-90% of life expectancy	Over-mature:>90% of life expectancy

SULE: See SULE methodology in the Appendix 3

Tree Protection Zone (TPZ): The minimum area set aside for the protection of the trees trunk, canopy and root system throughout the construction process. Breaches of the TPZ will be specified in the recommendations section of the report.

Structural Root Zone (SRZ): The SRZ is a specified distance measured from the trunk that is set aside for the protection of the tree's roots both structural and fibrous.

Appendix 3

SULE categories (after Barrell, 2001)[1]

SULE Category	Description
Long	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.
1a	Structurally sound trees located in positions that can accommodate for future growth
1b	Trees that could be made suitable for retention in the long term by remedial tree care.
1c	Trees of special significance that would warrant extraordinary efforts to secure their long term retention.
Medium	Trees that appeared to be retainable at the time of assessment for 15-40 years with an acceptable level of risk.
2a	Trees that may only live for 15-40 years
2b	Trees that could live for more than 40 years but may be removed for safety or nuisance reasons
2c	Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide for new planting.
2d	Trees that could be made suitable for retention in the medium term by remedial tree care.
Short	Trees that appeared to be retainable at the time of assessment for 5-15 years with an acceptable level of risk.
3a	Trees that may only live for another 5-15 years
3b	Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
3c	Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide for a new planting.
3d	Trees that require substantial remedial tree care and are only suitable for retention in the short term.
Remove	Trees that should be removed within the next five years.
4a	Dead, dying, suppressed or declining trees.
4b	Dangerous trees because of instability or loss of adjacent trees
4c	Dangerous trees because of structural defects
4d	Damaged trees not safe to retain.
4e	Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide for a new planting.
4f	Trees that are damaging or may cause damage to existing structures within 5 years.
Small	Small or young trees that can be reliably moved or replaced.
5a	Small trees less than 5m in height.
5b	Young trees less than 15 years old but over 5m in height.

1 (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.

Appendix 4

TPZ and SRZ methodology

Determining the Tree Protection Zone (TPZ)

The radium of the TPZ is calculated for each tree by multiplying its DBH x 12.

TPZ = DBH x 12

Where

DBH = trunk diameter measured at 1.4 metres above ground

Radius is measured from the centre of the stem at ground level.

A TPZ should not be less than 2 metres no greater than 15 metres (except where crown protection is required.). Some instances may require variations to the TPZ.

The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1 metre outside the crown projection.

Determining the Structural Root Zone (SRZ)

The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree.

The SRZ only needs to be calculated when major encroachment into a TPZ is proposed.

There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural or built structures, such as rocks and footings. An indicative SRZ radius can be determined from the trunk diameter measured immediately above the root buttress using the following formula or Figure 1. Root investigation may provide more information on the extent of these roots.

SRZ radius = $(D \times 50)^{0.42} \times 0.64$

Where

D = trunk diameter, in m, measured above the root buttress

NOTE: The SRZ for trees with trunk diameters less than 0.15m will be 1.5m (see Figure 1).

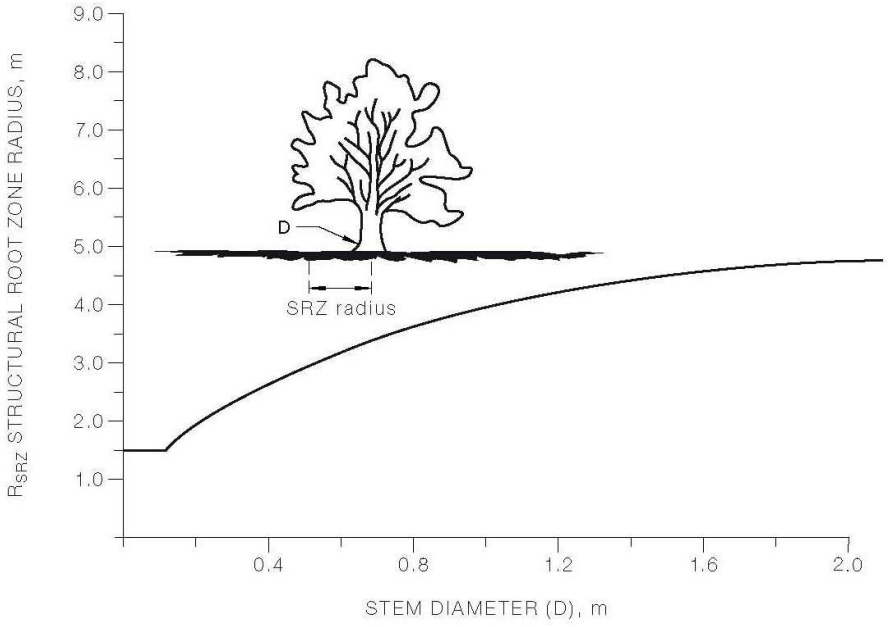


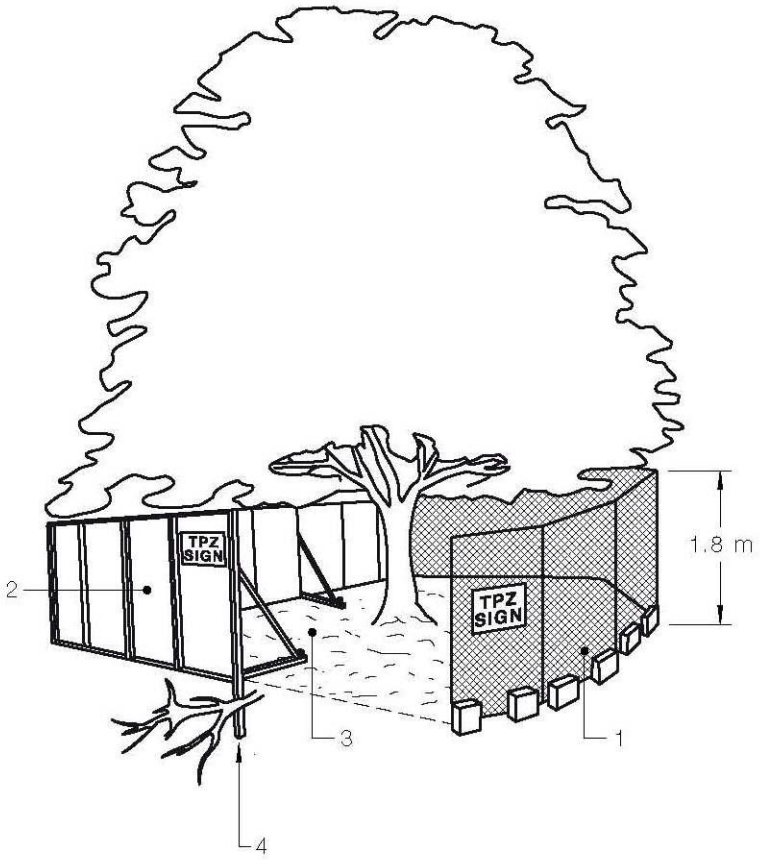
FIGURE 1 - STRUCTURAL ROOT ZONE

Notes:

1 R_{SRZ} is the structural root zone radius.
2 *D* is the stem diameter measured immediately above root buttress.
3 The SRZ for trees less than o.15 metres diameter is 1.5 metres.
4 The SRZ formula and graph do not apply to palms, other monocots, cycads and tree ferns.
5 This does not apply to trees with an asymmetrical root plate.

Appendix 5

Tree protection fencing specifications



LEGEND:

1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

Figure 1: Protective fencing as specified in AS 4970, 2009.

Appendix 6

Tree protection sign

sign sample

Moore Trees
Tree Consultancy
0411 712 887

Tree Protection Zone

Fence not to be moved without approval from Arborist

Within this fence there is to be

NO

Storage of materials

Trenching or excavation

Washing of tools or equipment

Moore Trees

Tree Consultancy
0411 712 887

Tree Trunk Protection

Protection not to be removed until all construction works completed.

Around the base of this tree there is to be

NO

Storage of materials

Trenching or excavation

Washing of tools or equipment

Appendix 7

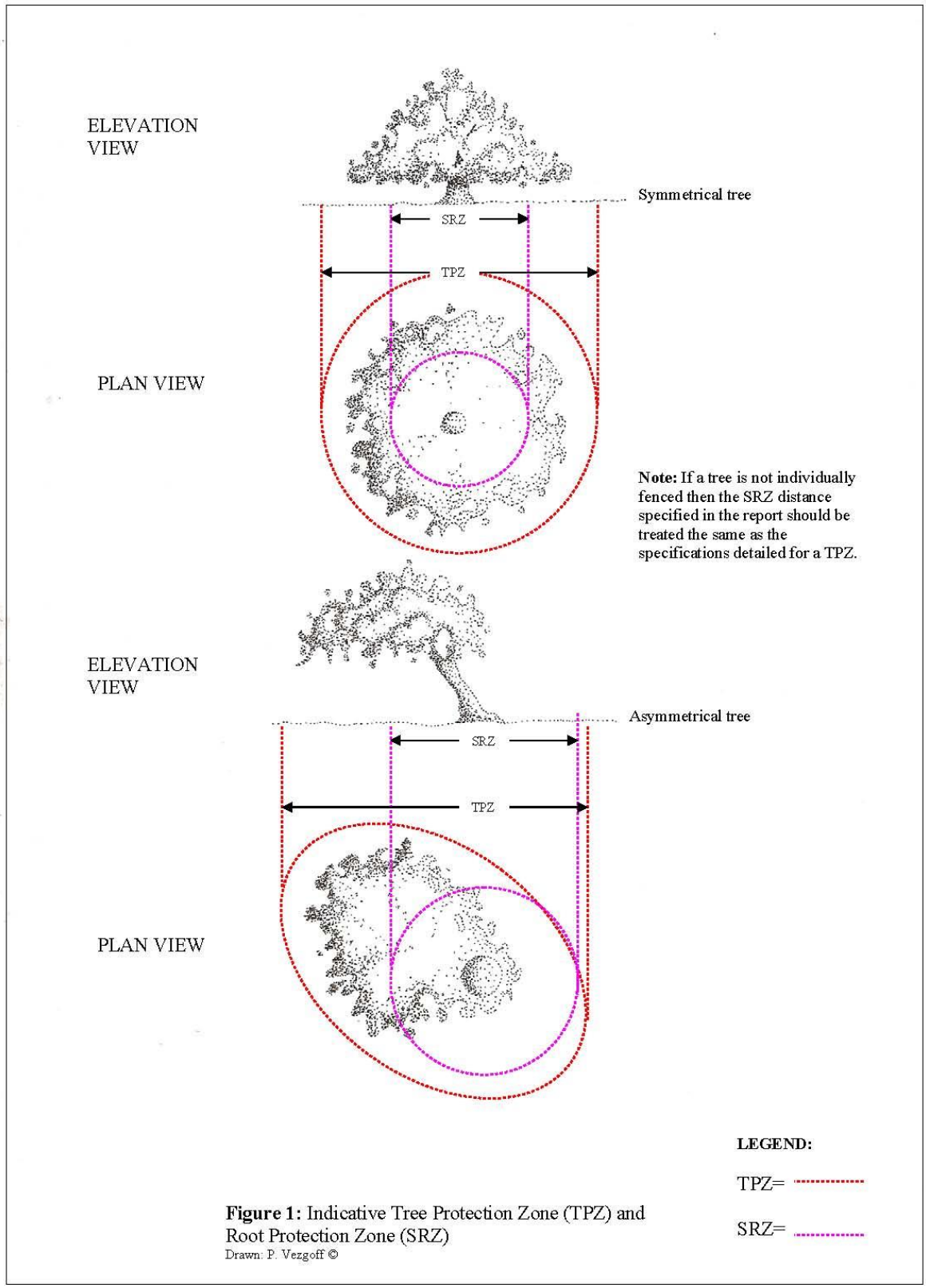


Figure 1: Indicative Tree Protection Zone (TPZ) and Root Protection Zone (SRZ)
Drawn: P. Vezgoff ©

Appendix 8

Tree structure information diagram

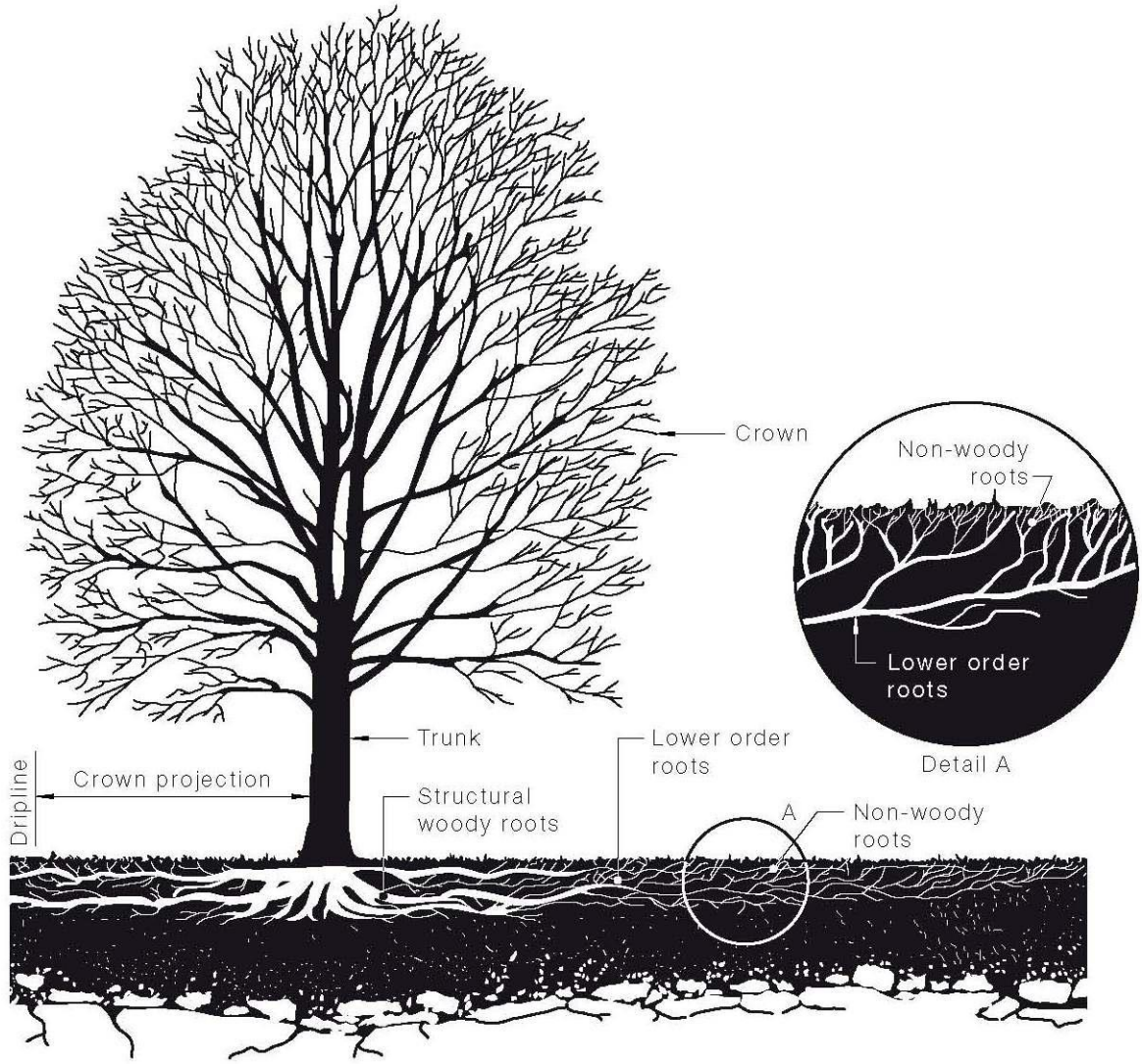


Figure 2: Structure of a tree in a normal growing environment (AS 4970, 2009.).

Appendix 9

Explanatory Notes

- **Mathematical abbreviations:** > = Greater than; < = Less than.

- **Measurements/estimates:** All dimensions are estimates unless otherwise indicated. Less reliable estimated dimensions are indicated with a '?'.

- **Species:** The species identification is based on visual observations and the common English name of what the tree appeared to be is listed first, with the botanical name after in brackets. In some instances, it may be difficult to quickly and accurately identify a particular tree without further detailed investigations. Where there is some doubt of the precise species of tree, it is indicated with a '?' after the name in order to avoid delay in the production of the report. The botanical name is followed by the abbreviation sp if only the genus is known. The species listed for groups and hedges represent the main component and there may be other minor species not listed.

- **Height:** Height is estimated to the nearest metre.

- **Spread:** The maximum crown spread is visually estimated to the nearest metre from the centre of the trunk to the tips of the live lateral branches.

- **Diameter:** These figures relate to 1.4m above ground level and are recorded in centimetres. If appropriate, diameter is measure with a diameter tape. 'M' indicates trees or shrubs with multiple stems.

- **Estimated Age:** Age is estimated from visual indicators and it should only be taken as a provisional guide. Age estimates often need to be modified based on further information such as historical records or local knowledge.

- **Distance to Structures:** This is estimated to the nearest metre and intended as an indication rather than a precise measurement.

Appendix 10

Bibliography

Draper D B & Richards P A (2009) *Dictionary for managing trees in urban environments*
CSIRO Publishing
Collingwood, Vic

Fuller, Leon (2011) *Wollongong's native trees* Third addition
Kingsclear Books
Alexandria, Sydney.

Harris R.W, Clark J.R, Matheny N.P (1999). *Arboriculture.* Third edition.
Prentice Hall
New Jersey.

Matheny N.P & Clark J.R. (1994) *Evaluation of hazard trees in Urban areas*
Second edition, International Society of Arboriculture
Illinois.

Mattheck C & Breloer H (2003) *The Body Language of Trees: A handbook for failure analysis.* Research for Amenity Trees No. 4,
Seventh edition, The Stationary Office, London.

Shigo A.L. (2002) *A New Tree Biology.*
Shigo and Trees, Associates, Durham, New Hampshire.

Schwarze, F.W.M.R, Engels, J. Mattheck. C (2000) *Fungal strategies of wood decay in trees*
Springer-Verlag Berlin Heidelberg
Germany

Standards Australia, 2007, *Pruning of amenity trees* AS 4373, 2007
Standards Australia Ltd
Sydney

Standards Australia, 2009. *Protection of trees on development sites,* AS 4970, 2009
Standards Australia Ltd
Sydney

Hazelton, P.A. and Tille, P.J. 1990. *Soil Landscapes of the Wollongong-Port Hacking 1:100 000 Sheet and Map.*
Soil Conservation Service of NSW
Sydney

Curriculum Vitae

PAUL VEZGOFF - MOORE TREES P O Box 3114, Austinmer NSW 2515
P 0242 680 425 M 0411 712 887 E enquiries@mooretrees.com.au W www.mooretrees.com.au

EDUCATION and QUALIFICATIONS

- 2007 – Diploma of Arboriculture (AQF Cert V) Ryde TAFE. (Distinction)
- 1997 – Completed Certificate in Crane and Plant Electrical Safety
- 1996 – Attained Tree Surgeon Certificate (AQF Cert II) at Ryde TAFE
- 1990 – Completed two month intensive course on garden design at the Inchbald School of Design, London, United Kingdom
- 1990 – Completed patio, window box and balcony garden design course at Brighton College of Technology, United Kingdom
- 1989 – Awarded the Big Brother Movement Award for Horticulture (a grant by Lady Peggy Pagan to enable horticulture training in the United Kingdom)
- 1989 – Attained Certificate of Horticulture (AQF Cert IV) at Wollongong TAFE

INDUSTRY EXPERIENCE

Moore Trees Arboricultural Services **January 2006 to date**

Tree Consultancy and tree ultrasound. Tree hazard and risk assessment, Arborist development application reports
Tree management plans.

Woollahra Municipal Council **Oct 1995 to February 2008**

ARBORICULTURE TECHNICAL OFFICER
August 2005 – February 2008
Tree asset management, programmed inspection, inventory and condition surveys of council trees, hazard and risk appraisal, Tree root damage investigation and reporting, assessment of impacts of capital works projects on council trees.
ACTING COORDINATOR OF TREES MAINTENANCE
June – July 2005, 2006
Responsible for all duties concerning park and street trees. Prioritising work duties, delegation of work and staff supervision.
TEAM LEADER
January 2003 – June 2005
TEAM LEADER
September 2000 – January 2003
HORTICULTURALIST
October 1995 – September 2000

Northern Landscape Services **July to Oct 1995**

Tradesman for Landscape Construction business

Paul Vezgoff Garden Maintenance (London, UK) **Sept 1991 to April 1995**

CONFERENCES AND WORKSHOPS ATTENDED

- International Society of Arboriculture Conference (Brisbane 2008)
- Tree related hazards: recognition and assessment by Dr David Londsdale (Brisbane 2008)
- Tree risk management: requirements for a defensible system by Dr David Londsdale (Brisbane 2008)
- Tree dynamics and wind forces by Ken James (Brisbane 2008)
- Wood decay and fungal strategies by Dr F.W.M.R. Schwarze (Brisbane 2008)
- Tree Disputes in the Land & Environment Court – The Law Society (Sydney 2007)
- Barrell Tree Care Workshop- Trees on construction sites (Sydney 2005).
- Tree Logic Seminar- Urban tree risk management (Sydney 2005)
- Tree Pathology and Wood Decay Seminar presented by Dr F.W.M.R. Schwarze (Sydney 2004)
- Inaugural National Arborist Association of Australia (NAAA) tree management workshop- Assessing hazardous trees and their Safe Useful Life Expectancy (SULE) (Sydney 1997).

DENNIS SMITH SURVEYS

Phone (02) 4284 9402
Address: 8 Railway Street
BULLI N.S.W. 2516.
Our Ref: 10864
12 December 2019

VARIATION TO DEVELOPMENT STANDARDS

Proposed Subdivision of Lot 82 D.P.1214908.
No 6 Gum Tree Lane THIRROUL.

1. Development Standard within Wollongong DCP 2009

The development standard (control) that is being sought to be varied for the proposed development at this site is Subclause 8.2.3 of Chapter B2 : Residential Subdivision contained within DCP 2009. This control is *'The minimum depth for a residential allotment should be at least 25 metres.'*

Proposed Lot 821 will only have a depth of 20 to 21.5 metres for the main body of the lot. As such it does not meet Subclause 8.2.3.

Proposed Lot 822 will have only have a depth of 18.5 to 21.2 metres and as such it does not meet Subclause 8.2.3.

2. Objectives of Clause 8 - Lot Width & Depth requirements.

8.1 Objectives

(a) To ensure residential lots are designed to provide sufficient lot width & depth, to cater for a suitable range of dwelling styles having regard to any site constraints or environmental qualities of that land.
(b) *To ensure residential lots in low density residential areas provide sufficient site area to cater for detached dwelling-houses with sufficient rear private open space which gains appropriate sunlight access during mid-winter.*

3. Objectives of zone – LEP 2009

Zone R2 Low Density Residential

1 Objectives of zone

- To provide for the housing needs of the community within a low density residential environment.

- To enable other land uses that provide facilities or services to meet the day to day needs of residents.

4. Variation justification.

A nominal building envelope is shown on the proposed Subdivision Layout Plan for Lot 821 to show how a standard building development would fit on this lot. Mike Vail Design has prepared a Concept Dwelling Design for Proposed Lot 822 to demonstrate how a modest dwelling can be accommodated on this lot.

Lot 821

Factors that are considered to support a reduced lot depth for proposed Lot 821 include:

- The width of proposed lots 821 is greater than 20m, which is some 33% wider than the minimum width under the DCP;
- To the rear of Lot 821 there are no overshadowing building or trees that would hinder the sunlight access in mid-winter;
- With 2 metres of fall in level on Lot 821, a split level or 2 storey section of building will be suited to this lot which would enhance sunlight access in mid-winter.

It is therefore requested that strict compliance with the development standard (control) Clause 8.2.3 of Chapter B2: Residential Subdivision of DCP 2009 with respect to Lot 821 is unnecessary in this instance based on the above justification.

Lot 821

Factors that are considered to support a reduced lot depth for proposed Lot 822 include:

- The width of proposed lots 822 is greater than 20m, which is some 33% wider than the minimum width under the DCP;
- a future dwelling orientated lengthways east-west (as shown on the Subdivision Layout plan) will enable maximum sunlight access into the dwelling in mid-winter;
- the ground levels within Lot 822 compared to Lot 821 would indicate a future dwelling upon Lot 822 would have its windows about 1.2 metres above those in Lot 821. Therefore improving sunlight access in mid-winter.

It is therefore requested that strict compliance with the development standard (control) Clause 8.2.3 of Chapter B2: Residential Subdivision of DCP 2009 with respect to Lot 822 is unnecessary in this instance based on the above justification.

Sincerely

Murray Smith