# "GROWING MY WAY"

## Tree Consultancy

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EXCELLENCE in ALL ASPECTS OF TREE MANAGEMENT

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# *Construction Impact & Management Statement for soon to be Lodged Development Application*

## September 2019

| | |
|---|---|
| **Site:** | **Lot 3 in DP 116**<br>**15A Mons Avenue**<br>**NORTH BALGOWLAH, NSW** |
| **Client:** | **Marcus & Nora Waugh**<br>**c/- Jamie King**<br>**84 Palmgrove Road**<br>**AVALON BEACH, NSW**<br>**Phone: 61 421 517 991**<br>**Email: Jamie@jamieking.com.au** |
| **Author:** | Kyle A Hill<br>Registered (Arb Aus #1884) Practising & Consulting Arborist<br>Post Graduate Certificate in Arboriculture, Uni of Melb<br>Diploma of Horticulture–Arboriculture TAFE, Grow SA<br>Certificate of Horticulture, TAFE<br>Certificate Advanced Tree Care TAFE<br>Founder -Growing My Way Tree Services (1977)<br>Member of International Society of Arboriculture<br>Member of Arboriculture Australia |

# 1 Summary

Marcus & Nora Waugh (Property Owners) commissioned the Growing My Way Tree Consultancy (GMW) via Jamie King Landscape Architect to prepare a *Construction Impact & Plan of Management Statement* to be linked to the soon to be lodged *Development Application (DA) relative to tree management* for: *an inground swimming pool & a new landscape concept*.

The subject site is known as 15A Mons Avenue, North Balgowlah (*the subject site from herein*).

As briefed (by Marcus Waugh), the *Development Application* relative to tree management requires *Northern Beaches Council* (from herein *NBC*) protected trees greater than five (5.00m) meters tall within the subject site & adjoining sites to be discussed if closer than five (5.00m) to any proposed disturbance to the existing ground levels. Two (2) trees are determined as being required to be discussed.

The discussed trees are confirmed as being within five meters (5.00m) of proposed works. The discussed trees are both locally indigenous species. The discussed trees likely to be naturally occurring as opposed to being planted or bird sown. One (1) discussed tree is within the rear yard of the subject site. One (1) discussed tree is within the rear yard of the adjoining property known as 19 Mons Avenue.

The subject site & the three (3) common boundary sites are developed to contain residential dwellings.

Motor vehicle & pedestrian access is solely via a common 'right of way' linked to Mons Avenue.

The sole consent authority is the *NBC*.

Information related to the discussed tree was gathered by onsite data collection with cross referencing to:

- *Site Survey by Aspect Development & Survey Pty Ltd, dated 21 August 2019*;
- *Plans, Sections & Elevations, by Jamie King, Landscape Architect, Sht_201, Sht_102, Sht_103 & Sht_201 Issue D, dated 23 September 2019*;
- *NBC "Tree Management Provisions"*;
- *SEPP 'Vegetation in Non–Rural Areas' (25 August 2017) &*
- *NBC Heritage Conservation Area & Land Zoning LEP Maps.*

The aim of this report is:

1. *To confirm the viability of the discussed trees, relating to individual health, vigour & condition taking into account any impact foreseen by the proposed development.*
2. *Provide Site Specific 'Tree Plan of Management'.*

This document supports (relative to tree management) the proposal for development: as per the information provided by *Jamie King, Landscape Architect*.

Kyle A Hill (AQF level 5 & 8 *Practicing/Consulting Arborist* has prepared this report based on "*Visual Tree Assessment" (VTA)* undertaken on Thursday, 26 September, 2019.

# Table of Contents

# 2 Introduction

This report contains observations & recommendations intended to assist in the management of the two (2) trees confirmed as necessary to be discussed.

This document only relates to the proposed development as per information provided to the documents author by *Jamie King, Landscape Architect*. Only the two (2) discussed trees are within five (5.00m) of the proposed works. Each tree is discussed as an individual specimen taking into consideration its calculated *Tree Protection Zone* (from herein *TPZ*) & *Structural Root Zone* (from herein *SRZ*) radial distances relative to the works proposed as well as Health & Condition with respect each tree's Useful Life expectancy. One (1) discussed tree is within the subject site, one (1) discussed tree is within the rearyard of the adjoining property, 19 Mons Avenue.

We acknowledge & confirm to be familiar with the *NBC "Tree Management Provisions"*, specifically the *old* document; *Warringah Shire Council "Development Control Plan 2011", Part E, section E1 & SEPP "Vegetation in Non-Rural Areas, 25 August 2017".*

The sole consent authority is *NBC.*

The site is Land Zoned '*R2' Low Density Residential*'.

The site is NOT within a *NBC* designated "*Heritage Conservation Area*". It is acknowledged to be near a listed "*Heritage Item*" (I 14).

The discussed trees *are not within a recognised "wildlife corridor" nor are they known to be listed on any known "significant tree register*".

Information related to the discussed trees was gathered by onsite data collection with cross referencing to:

- *Site Survey by Aspect Development & Survey Pty Ltd, dated 21 August 2019;*
- *Plans, Sections & Elevations, by Jamie King, Landscape Architect, Sht_201, Sht_102, Sht_103 & Sht_201 Issue D, dated 23 September 2019;*
- *NBC "Tree Management Provisions";*
- *SEPP 'Vegetation in Non–Rural Areas' (25 August 2017) &*
- *NBC Heritage Conservation Area & Land Zoning LEP Maps.*

This document includes a *Site Specific "Tree Plan of Management".*

# 3 Methodology

Assessment of the trees has been from ground level by eye, using *Visual Tree Assessment* * *(VTA)* techniques developed by Claus Mattheck. The principles of *VTA* are explained in his widely-used reference book *"The Body Language of Trees (1994)"*.

Assessment includes:

- Trees were measured at 1.40m above ground level & again at the top of their individual trunk base root plates
- Tree's current condition & likely future health. Species tolerance to root disturbance &/or development
- Likely future hazard potential to persons & property
- Tree's amenity value, such as significance, screening & habitat.

No root analysis, soil testing, 'Resistograph'® drilling or aerial canopy inspection was undertaken. See the following Appendices for further information:

- Appendix A Glossary of Common Arboreal terms
- Appendix B Site Survey with discussed tree locations confirmed
- Appendix C Tree Management & Protection Prior to & During Construction

*** *VTA*–Visual Tree Assessment,** as referenced is a systematic inspection of a tree for indicators of structural defects that may pose a risk due to failure. Stage 1 is made from ground level (i.e. no aerial inspection is undertaken). An aerial inspection (Stage 2) is undertaken when there are easily identified visual indicators that suggest such an inspection is merited. Visual indicators are outlined within *The Body Language of Trees (Mattheck & Breloer, 1994). VTA* is a broadly used relatively standardised approach. More complex (can be invasive) diagnostic fault detection equipment may be recommended once visual indicators of potential defects are confirmed.

# 4 Observations

## *4.1 The Site*

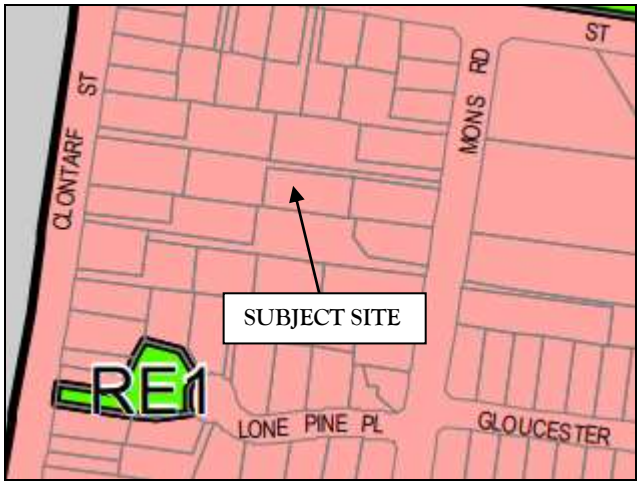
The report discusses one (1) tree within the southern property (6 Beverley Place) adjoining the subject site. The subject site is 968.90m$^2$ (as per site survey) in size. The site is linked to one (1) public road & three (3) residential lots.

No Geotechnical issues are known to exist.

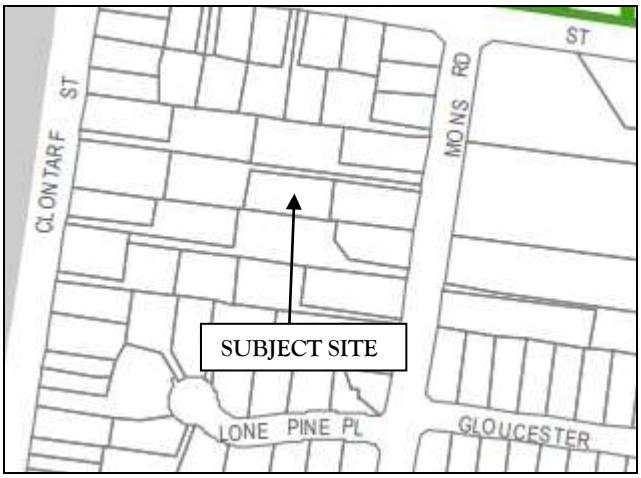
All surrounding & adjacent properties are developed & contain dwelling residences.


**Map/Aerial Photograph NBC (web site tool).**

The subject site is Zoned R2 Low Density Residential. See page 7.


The site is NOT within a MC designated "*Heritage Conservation Area*". Nor is it a *"Listed Heritage Item"*. See below.

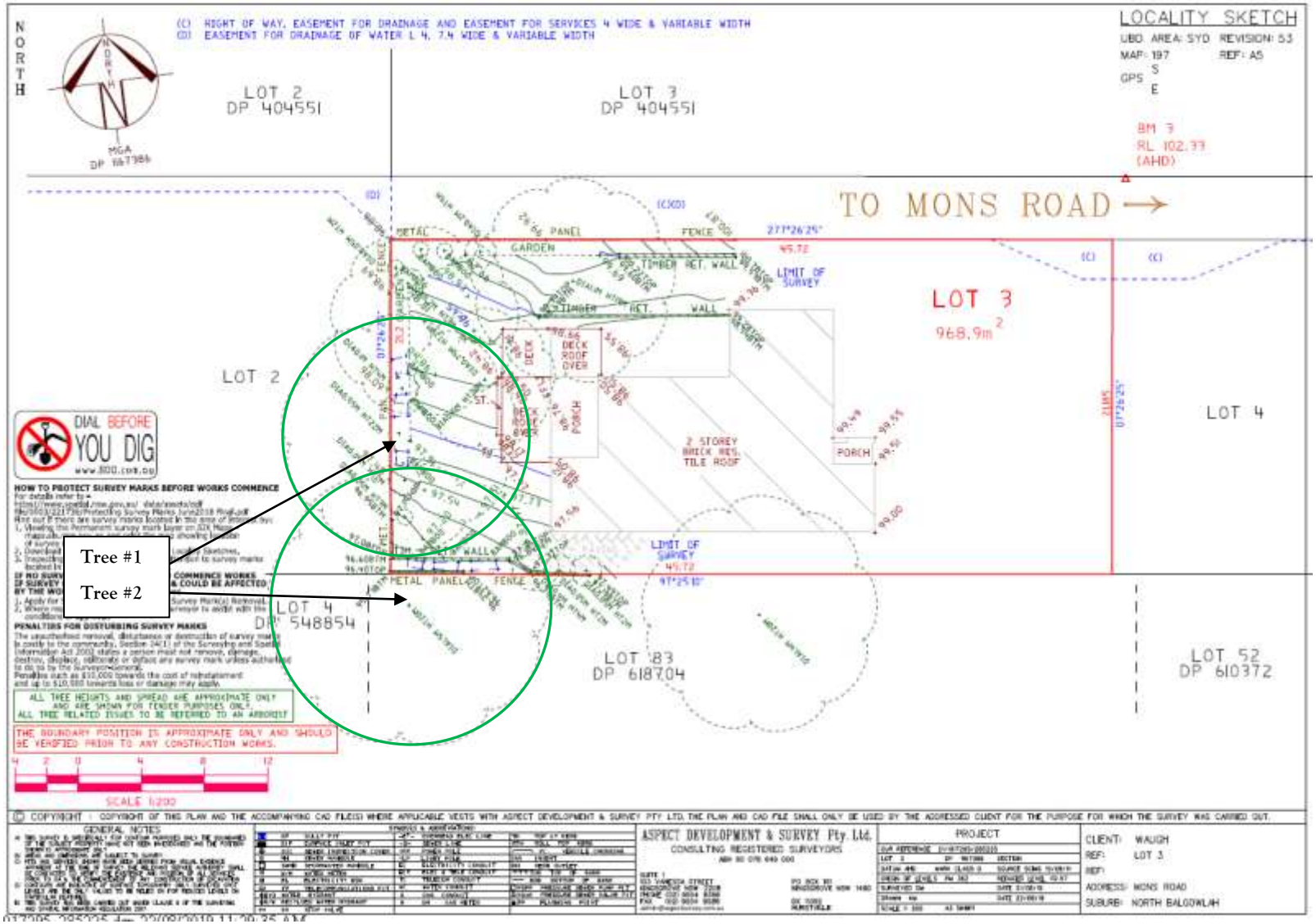
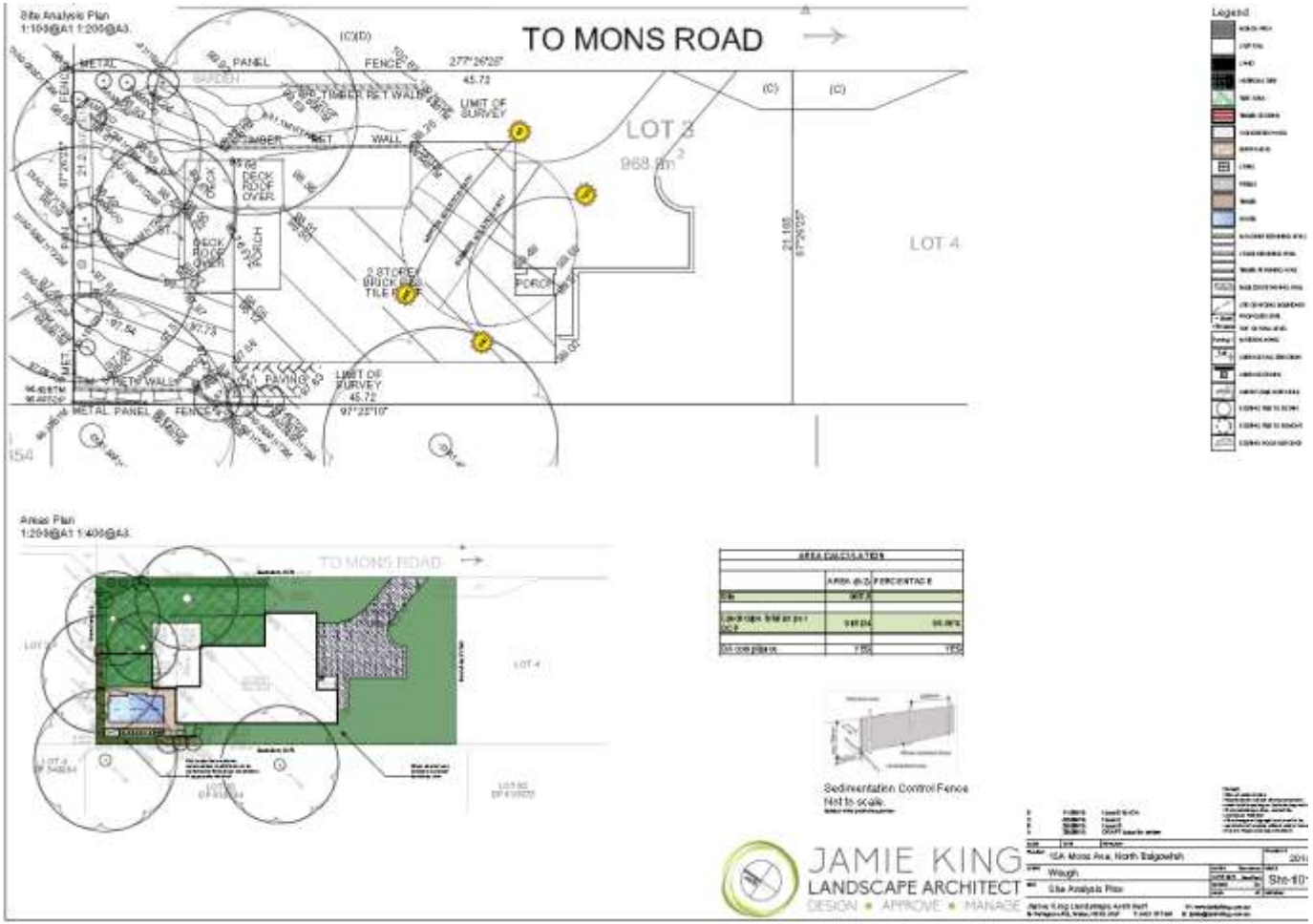


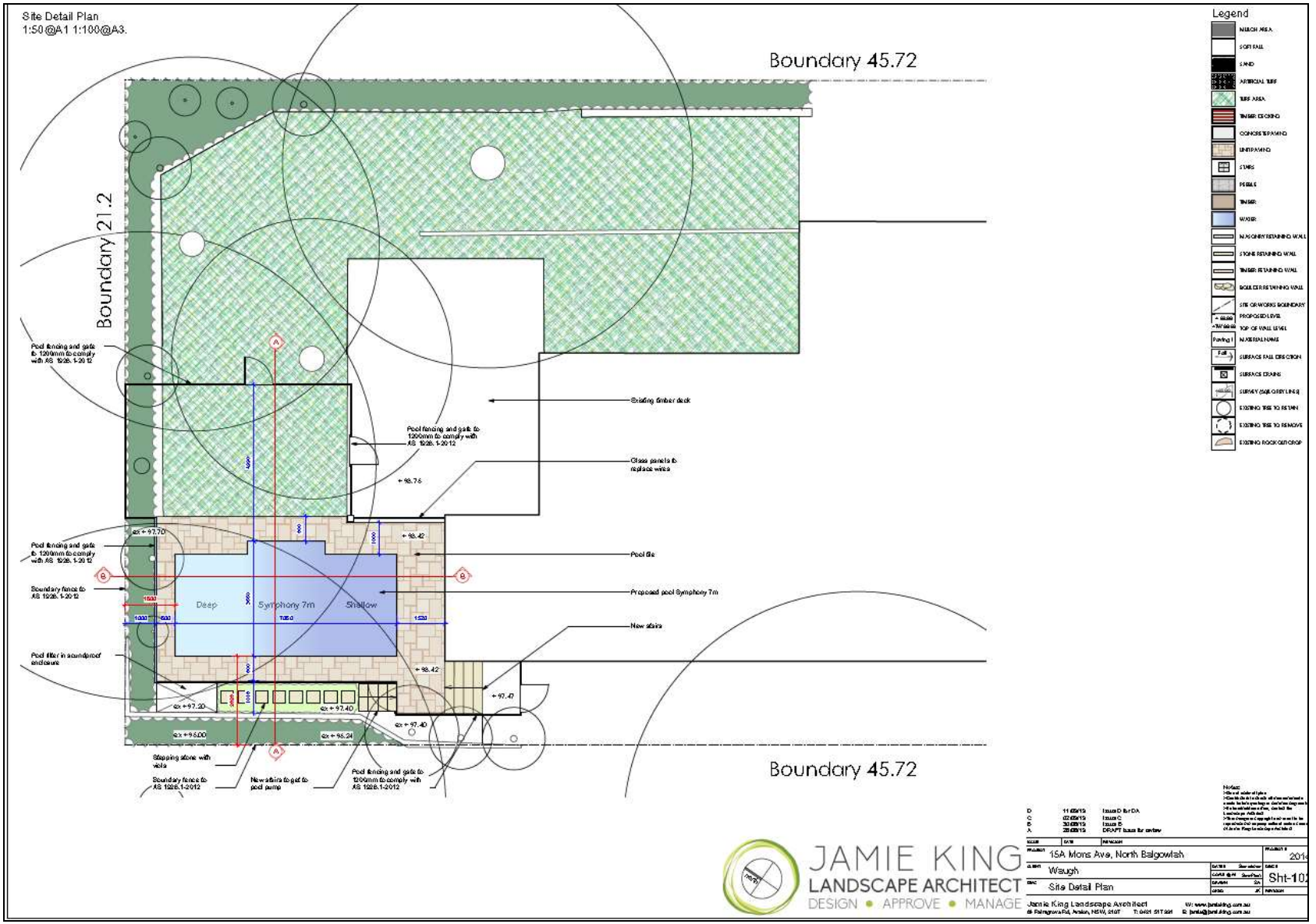

**Figure 1: Site Survey with the discussed tree locations highlighted in green.**

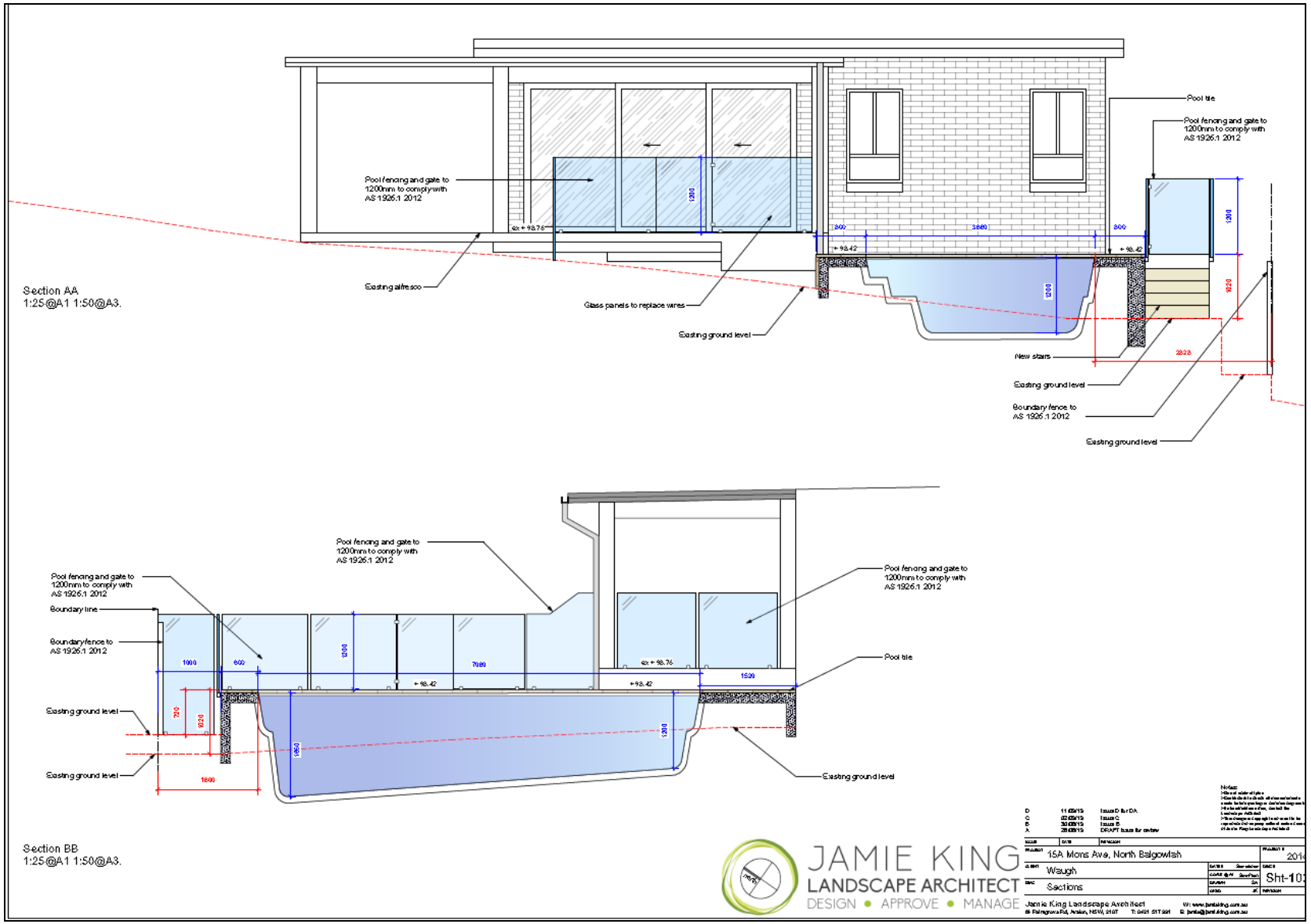
## *4.2 The Proposal*

The soon to be lodged *Development Application (DA) relative to tree management* is for: *Alterations/Additions to an existing dwelling residence, including an inground swimming pool & a new landscape concept.*

Two (2) *NBC* protected trees are confirmed to be within five (5.00m) metres of the proposed works.




Site Detail Plan
1:50@A1 1:100@A3.
Boundary 45.72
Boundary 21.2
Boundary 45.72
Legend
Deep
Symphony 7m
Shallow
Existing timber deck
Pool fencing and gate to 1200mm to comply with AS 1926.1-2012
Glass panels to replace wires
Pool tile
Proposed pool Symphony 7m
New stairs
Boundary fence to AS 1926.1-2012
Stepping stone with viola
New stairs to get to pool pump
JAMIE KING
LANDSCAPE ARCHITECT
DESIGN • APPROVE • MANAGE
15A Mons Ave, North Balgowlah
Waugh
Site Detail Plan
Sht-10


Section AA
1:25@A1 1:50@A3.
Pool fencing and gate to 1200mm to comply with AS 1926.1 2012
Existing alfresco
Glass panels to replace wires
Existing ground level
Pool tile
Pool fencing and gate to 1200mm to comply with AS 1926.1 2012
New stairs
Existing ground level
Boundary fence to AS 1926.1 2012
Existing ground level
Section BB
1:25@A1 1:50@A3.
Pool fencing and gate to 1200mm to comply with AS 1926.1 2012
Pool fencing and gate to 1200mm to comply with AS 1926.1 2012
Boundary line
Boundary fence to AS 1926.1 2012
Pool fencing and gate to 1200mm to comply with AS 1926.1 2012
Pool tile
Existing ground level
Existing ground level
Existing ground level
JAMIE KING
LANDSCAPE ARCHITECT
DESIGN • APPROVE • MANAGE
15A Mons Ave, North Balgowlah
Waugh
Sections
Sht-10

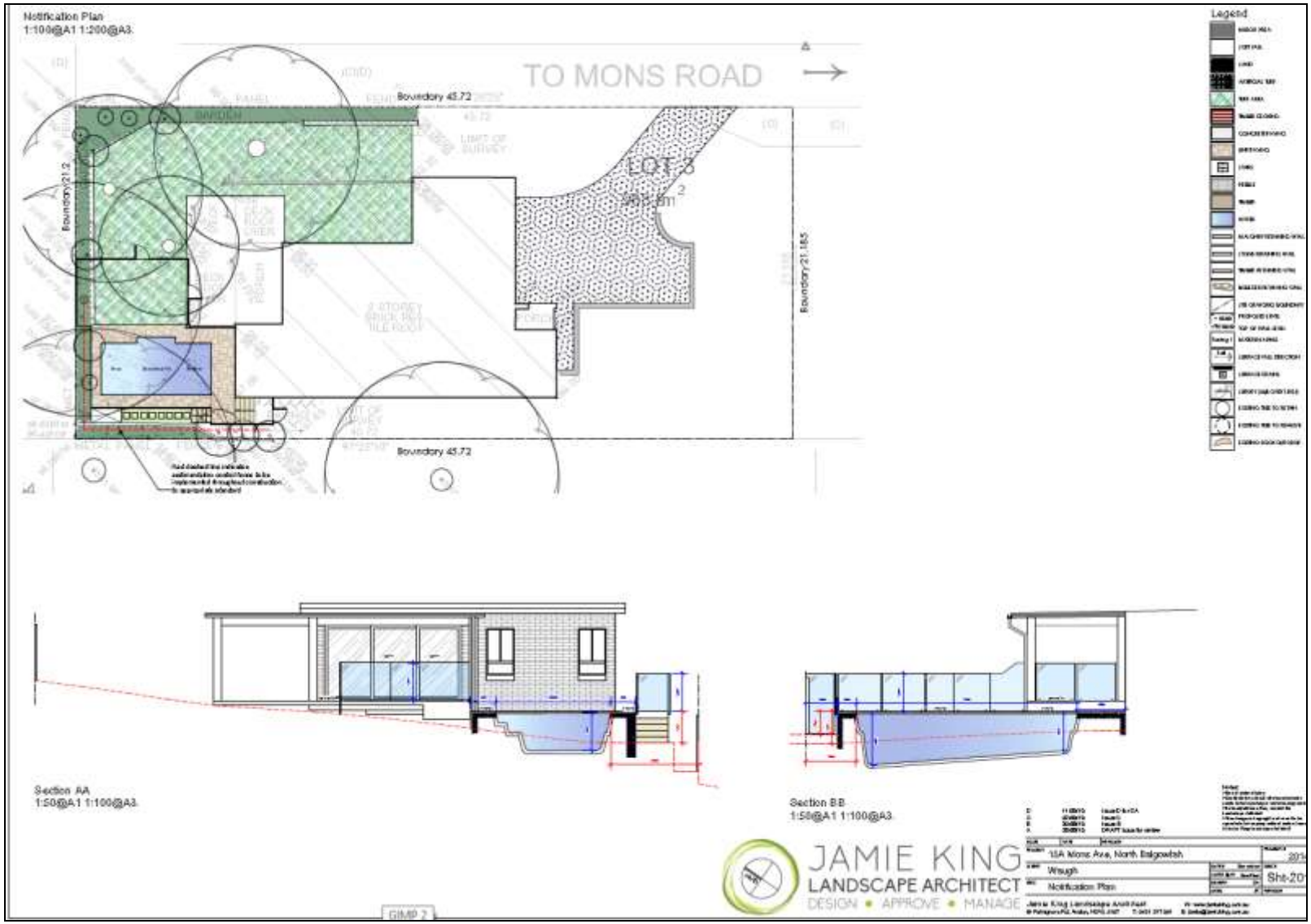



**Figure 2: Pages 9 thru 12 illustrates the proposed works.**

## *4.3 Tree Location & Site Images*


**Figure 3: Illustrates location of the discussed Tree #1.**


**Figure 4: Illustrates the location of the discussed Tree #2.**


**Figure 5: Yellow area is proposed inground swimming pool location.**

## *4.4 The Tree – Summary Table*

Read this table in conjunction with Appendix A–Common Arboreal Terms

| | |
|---|---|
| Trees Recommended for removal | Trees Recommended for retention |
| Exempt species | Trees retainable but of low amenity |

| | Identification | Height (m) | Crown (m) | DBH (m) | TPZ (m) | SRZ (m) | Age | Health/ Vigour | Retention/ Significance Values | Form/Habit | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ***Angophora costata*** *Sydney Red Gum* | <18.50 | <13.00 | 0.58 | 6.96 | 2.85 | Long term established | Good & Good | High/ High | Typical | **Retain, Protect & Manage: Tree is specified to have installed a 'Tree Trunk Guard' with rumble boards for excavation machinery area within its TPZ radial distance of 6.96m within the subject site.** |
| | ***Eucalyptus piperita*** *Sydney Peppermint Gum* | <19.50 | <16.50 | 1.01 | 12.12 | 3.48 | Long term established | Good & Good | High/ High | Typical | **Retain, Protect & Manage: Tree is specified to have installed a 'Tree Trunk Guard' with rumble boards for excavation machinery area within its TPZ radial distance of 12.12m within the subject site. Provided no works are required within the site where this tree is growing no TPZ protection measures are required within that site.** |

# 5 Discussion

The discussed trees are confirmed to be located within the subject site & the adjoining rear yard of 19 Mons Avenue. See below Sunday, 1 September 2019 'aerial photograph', courtesy of the NearMap® (webtool).


**Figure 6: Above, illustrates the subject site & adjoining properties.**

**(Sunday, 1 September 2019, courtesy of NearMap®).**

The discussed trees based on 'communal landscape amenity value' have been given HIGH retention & HIGH significance values.

The proposed works create by definitions within the *Australian Standard (AS4970-2009 Protection of trees on development sites, (see Chapters 3, 4 & 5)* 'Major Encroachments' of total TPZ surface area (i.e. a breach of between 10% &20%.

Tree #1 has a TPZ total surface area of approximately 152.18m$^2$. The maximum impacted upon TPZ surface area is approximately 17.00 m$^2$ (11.2%). Depending on the determined approval & taking into account excavation can be reduced by 'cantilevering' the swimming pool surrounds edges closest to the tree trunk centre the breach can be reduced to the lower end of a 'Major Encroachment'. This would equate to a breach of total TPZ surface of less than 17.00m$^2$. (These numbers are conditional upon the existing ground levels with the TPZ radial distance not being changed in any manner.)

On the basis the proposed inground swimming pool & surrounds are on the downhill side of the tree trunk, gravitational & hydroscopic water within the soil is less impacted upon than if the proposal was uphill of the tree trunk.

Tree #2 has a TPZ total surface area of approximately 461.48m$^2$. The maximum impacted upon TPZ total surface area is approximately 35.00m$^2$ (7.8%). Depending on the determined approval & taking into account excavation required will be reduced by 'cantilevering' the swimming pool surrounds edges closest to the tree trunk centre the breach can be defined a 'Minor Encroachment'. This would equate to a breach of total

TPZ surface of less than 35.00m$^2$. (These numbers are conditional upon the existing ground levels with the TPZ radial distance not being changed in any manner.)

Considering the proposed inground swimming pool & surrounds are partially on the uphill side of the tree trunk, gravitational & hydroscopic water within the soil is not considered to be majorly impacted upon as the slope of the ground within the property where the tree is located slopes from the front of the site downhill to where the tree is located. Simply, this reduces any concern relative to gravitational & hydroscopic water within the soil than if the proposal was totally uphill of the tree trunk.

Excavation will be specified to be completed using very lightweight equipment. As the existing ground level within the subject site is noted to not be natural a focus on soil below the imported soil is specified to be taken into consideration as this is where any significant diameter 'live roots' would be expected t be located.

Tree #1 will be specified to have a 'Tree Trunk Guard' installed around its trunk to a minimum height od 2.50m so as to isolate the tree trunk from any excavation equipment. Additionally, 'rumble boards', (TrakMats® or similar) are specified to be placed on the ground that is within the tree's TPZ radial distance of 6.96m. Once the excavation process has been completed the 'rumble boards' are to be replaced with a 'native mulch' within the TPZ radial distance. The 'native mulch' is to be maintained at a thickness of between 50 & 100mm for the duration of the pool construction phases.

No builders' materials of any description (including soil stockpiled for backfilling) can be stored within the Tree #1 TPZ radial distance of 6.96m.

Tree #2 is very efficiently isolated from the proposed works by the common boundary fence. As such, only the installation of a 'native mulch' within the subject site between the common boundary fence & the line of excavation is specified as a measure to protect/preserve any 'live tree roots' from Tree #2 within the subject site. The 'native mulch' is to be maintained at a thickness of between 50 & 100mm for the duration of the pool construction phases.

No builders' materials of any description (including soil stockpiled for backfilling) can be stored within the Tree #1 TPZ radial distance of 6.96m.

Should any significant diameter 'live tree root' defined in this situ as being greater than 50mm in diameter be exposed by the excavation process the sites retained Practicing/Consulting Arborist must be the person that creates/oversees & documents the least destructive method of managing the 'live tree root'.

Any exposed 'live tree root' less than 50mm in diameter can be cleanly severed by construction site persons without any input from the sites retained Practicing/Consulting Arborist. It is essential the completed inground swimming pool excavation is documented with supporting photographic evidence of where if any significant diameter 'live roots' were exposed.

Before commencement of works & post completion of works photographs of the Tree #1 & Tree #2 canopies is recommended as this will provide an indicator of any impact form the construction phases that may be required to be managed post completion of works. Both discussed trees should be professionally assessed at least annually for two (2) years post completion of works.

# 6 Site Specific "Tree Plan of Management"

- **Protected Tree #1 is to be Retained, Managed & Protected.**

  ***For Australian Standard*** *(AS4970–2009 Protection of trees on development sites)* **compliance an '*exclusion zone' is to be created by installation of a 'Tree Trunk Guard' & 'Rumble Boards'*** (TrakMats® or similar) ***within the TPZ radial distance of 6.96m.***

  ***Once excavation is completed the 'Rumble Boards' are to be removed & replaced with a 'native mulch', installed & maintained to a thickness of between 50mm & 75mm. This must be instated prior to the commencement of works & maintained throughout the inground swimming pool & surrounds construction phases.*** **(See Appendix C.)**

  **Any excavation within this tree's calculated *TPZ* radial distance must be completed by lightweight excavation equipment (as discussed on the previous page).**

  **Any '*live tree roots*' less than 50mm in diameter can be cleanly severed by construction staff without any professional supervision (by the sites retained Practicing & Consulting Arborist).**

  **Any *'live tree roots'* greater than 50mm in diameter must be managed by the sites retained Practicing & Consulting Arborist. (The individual tree root strategy applied must be documented in writing with supporting photographic evidence only by the sites retained Practicing & Consulting Arborist.)**

  **No building materials of any description can legally be stored within the calculated TPZ radial distance.**

  **See the document** *AS4970–2009, Section 4, clauses 4.1 thru 4.6 & Section 5, clauses 5.1 thru 5.5 (pages 15 thru 23) for exact specifications/definitions required to be addressed.*

- **Protected Tree #2 is to be Retained, Managed & Protected.**

  ***For Australian Standard*** *(AS4970–2009 Protection of trees on development sites)* **compliance an '*exclusion zone' already exists by virtue of the common boundary dividing fence***

  ***A 'native mulch', installed & maintained to a thickness of between 50mm & 75mm is specified to be instated within the subject site & the required line of excavation. This must be instated prior to the commencement of works & maintained throughout the inground swimming pool & surrounds construction phases.*** **(See Appendix C.)**

  **Any excavation within this tree's calculated *TPZ* radial distance must be completed by lightweight excavation equipment (as discussed on the previous page).**

  **Any '*live tree roots*' less than 50mm in diameter can be cleanly severed by construction staff without any professional supervision (by the sites retained Practicing & Consulting Arborist).**

**Any *'live tree roots'* greater than 50mm in diameter must be managed by the sites retained Practicing & Consulting Arborist. (The individual tree root strategy applied must be documented in writing with supporting photographic evidence only by the sites retained Practicing & Consulting Arborist.)**

**No building materials of any description can legally be stored within the calculated TPZ radial distance.**

**See the document** *AS4970–2009, Section 4, clauses 4.1 thru 4.6 & Section 5, clauses 5.1 thru 5.5 (pages 15 thru 23) for exact specifications/definitions required to be addressed.*

# 7 Recommendations

- **Relative to the** *DA* **information as presented the** *GMW Consultancy Practice* **recommends the** *DA* **be lodged for determination as has been presented in documentation supplied by Jamie King (Landscape Architect).**

If you have any questions relating to this report or implementation of recommendations, please contact Kyle Hill on 0412-221-962.

Yours faithfully,

Kyle A. Hill

[AQF level 5 & AQF level 8 Registered with Arboriculture Australia (Reg #1884) Practicing & Consulting Arborist]

# 8 Limitations on the use of this report

This report is to be utilised in its entirety only. Any written or verbal submission, report or presentation that includes statements taken from the findings, discussions, conclusions or recommendations made in this report, may only be used where the whole of the original report (or a copy) is referenced in, & directly attached to that submission, report or presentation.

# 9 Assumptions

Care has been taken to obtain information from reliable resources. All data has been verified insofar as possible; however, Growing My Way Tree Services, can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

Information contained in this report covers only the trees that were examined & reflects the condition of the trees at the time of inspection.

The inspection was limited to visual examination of the subject trees without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

# 10 Recommended References

Barrell, J. 1993. '*Preplanning Tree Surveys: Safe Useful Life Expectancy (SULE) is the Natural Progression*', Arboricultural Journal 17:1, February 1993, pp.

Barrell, J. 1995, '*Pre-development Tree Assessments*', in Trees & Building Sites, Proceedings of n International Conference Held in the Interest of Developing a Scientific Basis for Managing Trees in Proximity to Buildings, International Society of Arboriculture, Illinois

Dr. G. Watson & Dr. D. Neely, '*Trees & Building Sites*', LSA Illinois USA 1995

Dr. N. Matheny & Dr. J.R. Clark, '*Trees & Development*', ISA Illinois USA 1998

Phillip J. Craul, '*Urban Soil in Landscape Design*', J. Wiley & Sons, New York USA 1992

# 11 Selected Bibliography

Hitchmough, J.D. 1994. '*Urban Landscape Management*', Inkata Press, Sydney.

Mattheck, C. & Breloar, H. 1994 '*Body Language of Trees*', The Stationery Office, London.

AS 4373:2007, '*Pruning of Amenity Trees*', Standards Australia.

AS 4970:2009, 'Protection of Trees on Development Sites", Standards Australia.

BS 5837:2005, '*Guide for Trees in Relation to Construction*', Standards Board, UK.

# Appendix A – Glossary

## Glossary of common Arboreal terms

**Age:** **I** *Immature* refers to a refers to a well-established but juvenile tree

**SM** *Semi-mature* refers to a tree at growth stages between immaturity & full size

**M** *Mature* refers to a full sized tree with some capacity for further growth

**LM** *Late Mature* refers to a full sized tree with little capacity for growth that is not yet about to enter decline

**OM** *Over-mature* refers to a tree about to enter decline or already declining

**LS** *Live Stag* refers to a tree in a significant state of decline. This is the last life stage of a tree prior to death

**Hth & Vig** Health & Vigour

**Health** refers to the tree's form & growth habit, as modified by its environment (aspect, suppression by other tree, soils) & the state of the scaffold (ie. trunk & major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health & it is possible for a tree to be healthy but in poor condition/vigour. **Classes are:**

Excellent (E), V. Good (VG), Good (G), Fair (F), Declining (D), Poor (P), Very Poor (VP)

**Vigour** refers to the tree's growth rate/condition as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion & the degree of dieback. **Classes are:**

Excellent (E), V. Good (VG), Good (G), Fair (F), Declining (D), Poor (P), Very Poor (VP)

**Useful Life Expectancy (ULE)** refers to any individual tree specimen's potential life

expectancy (viability) based on VTA assessment, three groups are described,

**Short = Less than Fifteen years**

**Medium = Fifteen – Twenty-five years**

**Long = more than Twenty-five years**

**Significant diameter roots** are defined as those being greater than 0.05m/50mm in diameter.

**Diameter at Breast Height (DBH)** refers to the tree trunk diameter at breast height (1.4 metres above ground level)

**Structural Root Zone (SRZ)** refers to a radial offset which relates to tree stability. This zone is presumed to be main location of the tree's structural support roots. It is calculated using the formula *SRZ radius= (D x 50)$^{0.42}$ x 0.64.*

**Primary Root Zone (PRZ)** refers to a radial offset of ten (10) times the trunk DBH measured from the centre of the trunk. This zone often contains a significant amount of (but by no means all of a tree's) fine, non-woody roots required for uptake of nutrients, oxygen & water.

**Tree Protection Zone (TPZ)** is ideally a "No Go Zone" surrounding a tree to aid in its ability to cope with disturbances associated with construction works. **TPZ = DBH x 12**. Tree protection involves minimising root damage that is caused by activities such as construction. Tree protection also reduces the chance of a tree's decline in health or death & the possibly damage to structural stability of the tree from root damage.

To limit damage to the tree, protection within a specified distance of the tree's trunk must be maintained throughout the proposed development works. No excavation, stockpiling of building materials or the use of machinery is permitted within the TPZ.

A TPZ is required for each tree or group of trees within five metres (unless otherwise specified) of building envelopes.

**Stem/bark inclusion** refers to a genetic fault in the tree's structure. This fault is located at the point where the stems/branches meet. In the case of an inclusion this point of attachment is potentially weak due to bark obstructing healthy tissue from joining together to strengthen the joint.

**Decay** refers to the break down tissues within the tree. There are numerous types of decay that affect different types of tissues, spread at different rates & have different affect on both the tree's health & structural integrity.

**Point of Attachment** refers to the point at which a stem/branch etc join.

**Dead wood** refers to any whole limb that no longer contains living tissues (eg live leaves &/or bark). Some dead wood is common in a number of tree species.

**Die back** refers to the death of growth tips/shoots & partial limbs. Die back is often an indicator of stress & tree health.

**One dimensional crown** refers to branching habits & leaves that extend/grow in One direction only. There are many causes for this growth habit such as competition & pruning.

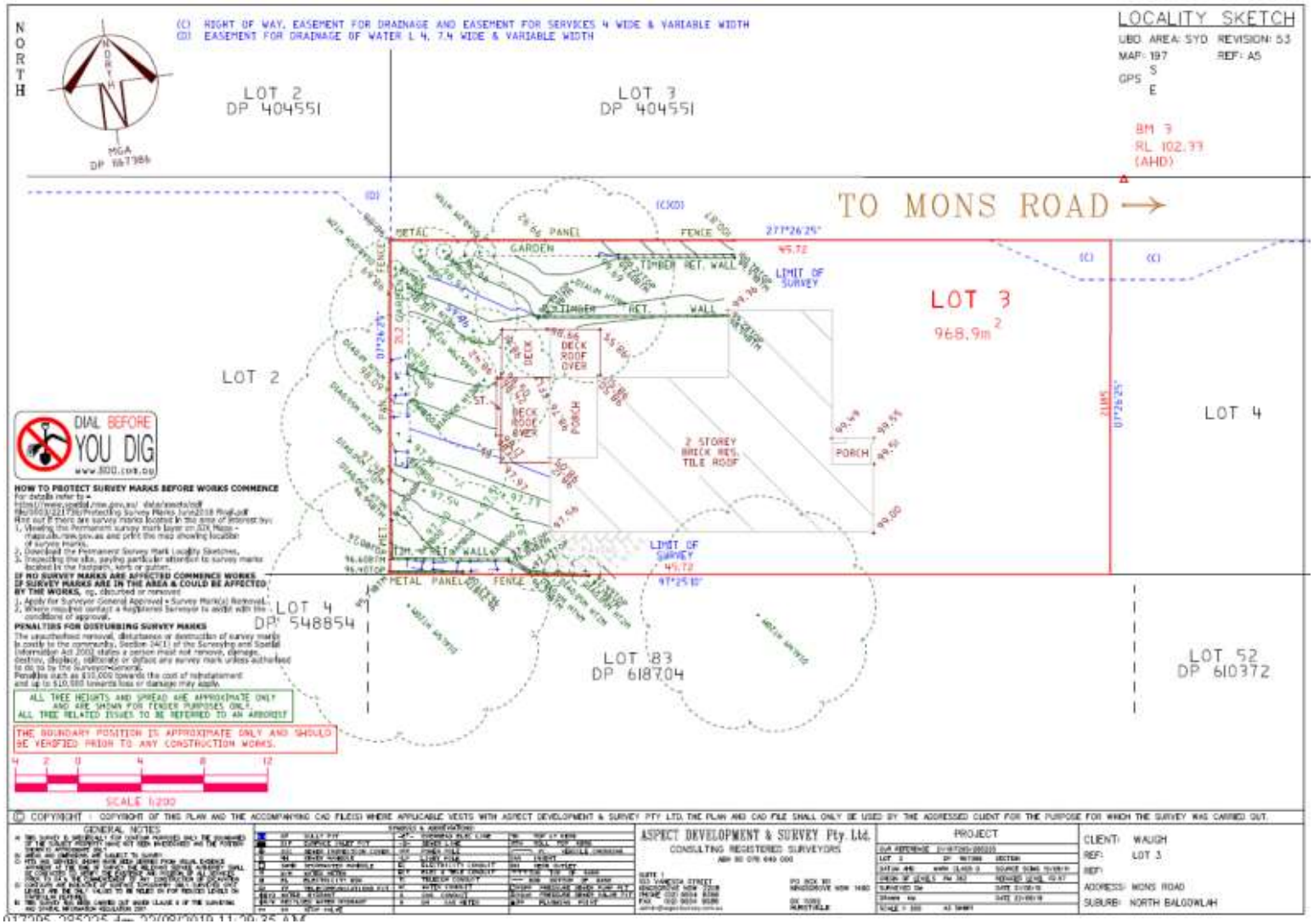
**Crown Foliage Density of Potential (CFDP)** refers to the density of a tree's crown in relation to the expected density of a healthy specimen of the same species. CFDP is measured as a percentage.

**Epicormic growth/shoots** refers to growth/shoots that are/have sprouted from axillary buds within the bark. Epicormic growth/shoots are a survival mechanism that often indicates the presence of a current or past stress even such as fire, pruning, drought etc.

**Over Head Powerlines (OHP)** Over head electricity wiring.

| | |
|---|---|
| **LVOHP** | Low Voltage Over head Powerlines |
| **HVOHP** | High Voltage Over head Powerlines |
| **ABC** | Aerial Bundled Cable |

# Appendix B – Site Survey



# Appendix C – Tree Protection/Management Prior to & During Construction

The installation of Tree Protection Zone (TPZ) fencing is to be carried out prior to commencement of all works. The most suitable fencing material is 1.8m tall chain link mesh with 50mm metal pole supports, see **detail 1: tree protection fencing**.

A mulch layer of composted leaf & woodchip to a depth of 75mm is required within the TPZ to aid in retention of soil moisture & to protect soil from contaminants. Water is to be applied by hand held or soaker/leaky hose within TPZ as required & in Accordance with Stage 3 Water Restrictions. Watering is to be carried out by either an Arborist or is to form part of the Builder's/Contractor's contract, with recommended monthly checks by an Arborist.

There is to be no stock piling of building material (including waste), machinery or any other item within TPZ of any retained tree. Access to personnel & machinery, & storage of fuel, chemicals, cement or site sheds is prohibited

Regular monitoring of protected trees during development works for unforeseen changes or decline, will aid in the success & longevity of the retained trees.