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Arboricultural Assessment for:
335 Barrabool Road
Wandana Heights, Victoria 3216

This report has been commissioned by:

Villawood Management (Vic)Pty Ltd

In reference to
Arboricultural Tree Assessment
'Planning'

Date: December 2014

Version 1 (Final)

Let's Talk About Trees

arboricultural consulting

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1.0 Key Objectives

This report has been commissioned by Villawood Management (Vic) P/L in relation to planning for the development of an area referred to as 335 Barrabool Road, Wandana Heights, Victoria 3216.

The report is to look at two rows of trees on a neighbouring allotment to the site. The neighbouring allotment is known as known as Drewan Park, the trees are potentially affected by the planned development.

It will offer comments on current health and any management issues which can be identified through visual inspection, so as the management of trees can be undertaken in a manner which is in keeping with sound arboricultural practices.

The report looks at the tree asset in relation to their health and retention value.

The report does not give permission for tree removal, pruning or management. It is assumed the permissions for removal or pruning if any are required, are sought and approved by other means.

This report is written as guided by AS 4970 – 2009 – Protection of Trees on Development Sites and forms the first step report of the four step procedure as guided by this Australian Standard.

Step 1. Planning
Step 2. Pre-Construction
Step 3. Construction
Step 4. Post Construction

2.0 Methodology

On the 10th of December 2014, the inspection for this report was performed on site, by Matthew Branagh, a Level 5 Consulting Arborist from 'Let's Talk About Trees'.

A ground-based Visual Tree Assessment was performed on the above-ground section of all trees on site, in line with modern Arboricultural Practices and Principles, AS 4970 – 2009 – Protection of Trees on Development Sites and AS 4373 – 2007 – Pruning of Amenity Trees.

All photographs were taken at the time of the inspection and shall be used within this report for referencing or identification purposes.

3.0 Observations

3.1 General Observations

The site is located within the City of Greater Geelong municipal boundary, the development site is known as 335 Barrabool Road, Wandana Heights, Victoria 3216.

The report is based on two groups of trees located on a neighbouring allotment which is known as Drewan Park, Wandana Drive, Wandana Heights, Victoria.

Figure 1. Site Over View

The development site is a private residential allotment. The trees are located on a public open space managed by the City of Greater Geelong.

2 groups of trees are identified on the site.

The trees are identified as *Cupressus macrocarpa – Monterey Cypress*.

They will be identified in this report as group 1 and group 2.

Group 1 is located on the southern boundary of the reserve and group 2 on the western boundary.

All trees are identified as mature specimens in poor to fair condition. Some trees are showing decline with major dieback others have significant deadwood within their canopies. One specimen in group 1 is

greater than 50% dead. The trees are mature declining assets and their useful life expectancy is decreasing.

Both groups of trees show a growth pattern which is restricted in height and spread and not typical for this species. The site is located on top of a hill crest and exposed to high winds, protected only from the SW. As such the trees have developed as stunted, low growing smaller specimens of their species.

All trees are planted specimens and form part of a rural landscape.

No trees have high retention habitat significance.

Applying As4970 – 2009 Protection of Trees on Development Sites to the trees ensures their safe retention or removal during development.

As such tree protection zones have been calculated for planning on the site in section 3.2, Table 1 Field Data.

3.2 Discussion

The following table indicates the individual tree as inspected.

Table 1 Field Data

Group No.	Identification	Est. Age Yrs	ULE	Health	Structure	Significance	Hazzard	Average DBH of the group 'cm'	SRZ m	TPZ m	Comment
1	*Cupressus macrocarpa – Monterey cypress.*	M	M	F	F	L	M	89	3.2	10.7	This group is located on the south boundary of Derwan Park. 14 trees make up the stand. Dead limbs and dying canopies are evident in 5 of the trees and the 11th tree in the row is greater than 50% dead. Between the 11th and 12th tree a tree is obviously missing as a gap is present. In general the trees are stunted in size, and apart from the above mentioned issues are healthy. The trees have a useful life expectancy of greater than 20 years however are all in a declining state and as time progresses will show greater failings. The trees are located approx. 1 metre from the abutting boundary fence, and as such are invasive to the development site in both canopy and root plate. All trees show signs of drought stress.
2	*Cupressus macrocarpa – Monterey cypress.*	M	M	F	F	L	M	102	3.3	12.2	This group is located on the west boundary of Derwan Park. 12 trees make up the stand. This group shows less decline than group 1 however are similar in all other attributes. In general the trees are stunted in size, and are generally healthy in appearance. Canopy thinning is more evident in this group than in group one. This is likely possible due to the incline of the growing site and water run off. The trees have a useful life expectancy of greater than 20 years however are all in a declining state and as time progresses will begin to show failings similar to group 1. The trees are located approx. 1 metre from the abutting boundary fence, and as such are invasive to the development site in both canopy and root plate. All trees show signs of drought stress.

In summary of the results above;

The table above is coded and the codes refer to appendix 6.3 Terms of Descriptors.

Each descriptor should be looked at separately the descriptor applied and then adjusted by the comment in the comment box.

Where applicable the tree has a Structural Root Zone (SRZ) and a Tree Protection Zone (TPZ) calculated.

The SRZ should be applied in designing and developing the allotment.

Impact by the development should not have impacted the TPZ greater than 10% without further guidance from a level 5 Arborist, and the SRZ should not be impacted.

Some comments on Impact to trees along the southern and western boundary of Drewan Park.

The health of the trees is established as declining however the trees continue to have a useful life expectancy of greater than 20 years.
This if course, is relevant only to the trees in their present state. Once development is approved and begun the site conditions and impacts to the trees will change.

As such this report must not only look at the trees now; it must also look at the trees during and post site development.

The management of these trees should take on a holistic approach and work with the urbanisation of the site into the future.

The trees to the south and the west will be discussed as a single group. Until this point both groups have been accessed separately as the issues surrounding tree health affect each group independently.

The Tree Protection Zone of both stands extends beyond 10 meters into the development site. Even allowing for encroachment using AS4970 – 2009 Protection of Trees on Development Sites, both stands will be affected structurally post site development. The canopies of both stands also encroach over the boundary by some 6 – 10 metres.

Physical encroachment is normally managed in one of two ways. Both these options exist here and should be considered.

Option 1

Identify the Tree Protection Zones of all trees using AS 4970 – 2009 and allocate in final design of the development, a loss of development space which includes the root and canopy zones of the trees.

This area should be managed to increase tree health of the site with amelioration including site mulching and irrigation.

In adopting this approach it must be considered and recognised the assets are all declining, and post site development will continue to decline. Retention of these assets is short term and possibly opposes the best long term management of the site.

In order that the trees are best managed under this option a further report should be commissioned which discusses the best options for retention and increasing the useful life expectancy of both the groups.

It should be noted any pruning of the trees canopy or impact to the trees root plates is not possible in this location due to the high impact of wind load on these trees canopies. Pruning of the canopies will open them to changed wind patterns and as such will cause limb loss and tree failure.

If the trees are retained there is no scope for tree impact in any manner, and effectively the trees will cause a development land loss in order to manage the invasiveness of both canopies and root plates to the development site.

Option 2

Option two involves the loss of the trees.

It recognises that both stands of trees are invasive declining assets with a limited useful life span.

It also recognises that the site is now subject to development and as in any urbanisation project, the loss of one existing asset, opens the door for the development of many others.

Pruning management of the canopies or root impact management of either group is not possible.

Group 1 shows declining trees with extensive die back in some canopies and tree death has begun with one past loss and another pending complete failure.

History shows that once a wind row of this species begins to decline and trees are lost, the loss is accelerated by changed winds in the canopies of the remaining trees. Loss of windrow plantings of *Cupressus* is often associated to the initial failings within any group, and is often contributed to age, drought, impact to mature trees and initial tree failure.

Drewan Park holds significance in its location, providing views over the city of Geelong. In its current condition the amenity of the park is minimal and improvements could be made to bring it to one of Geelong's premier parks attractive to tourism.

This should be considered when making final decisions re the retention of these two declining tree groups.

4.0 Conclusion

The decision to retain trees on the site post site development should be made with the understanding tree root plates should be managed during development by the use of AS 4970 – 2009 protection of Trees on Development sites and this report.

In understanding this, there is no scope for impact to these trees.

The retention, as described in option 1 should be guided by this report and final landscaping of the site designed by a suitably qualified landscape designer.

Pre development of the site the trees to be retained should be protected using AS4970 Protection of Trees on Development Sites.

However it is also noted that the trees are declining assets and the site has much to offer in development.

With the irreversible declining useful life expectancy of these trees, the current situation of development of the adjoining site, and an opportunity for redevelopment of the park; it is my opinion that high consideration must be given to the removal of these two groups. The trees are invasive to the adjoining allotment, and this cannot be managed without significant impacts to the trees or loss to the development site. The trees are declining and the opportunity for a better asset is available.

With this said, in retention the trees must be protected using AS4970 – 2009 Protection of trees on Development Sites. The following diagram indicates TPZ application.

The following diagram indicates how the dimensions of the Structural Root Zone and the Tree Protection Zone are applied.

Diagram 2 Applying the Structural Root Zone and Tree Protection Zone.

= TREE PROTECTION ZONE = Structural Root Zone

A = SRZ
B = TPZ

- The tree protection zone is duplicated external to the property boundary.
- NO works should be undertaken inside the Tree Protection Zone unless guided by an Arborist and AS4970-2009 Protection of Trees on Development Sites
- NO works should be undertaken in the Structural Root Zone under any circumstances.

5.0 Recommendations

It is the recommendations of this report that;

1. Stand 1 and 2 should be highly considered for removal to allow for new development of the area. The development of the adjoining allotment should also involve the redevelopment of Drewan Park. The resultant will be better sounder arboricultural assets.

2. Should retention be the desired outcome, the trees on the southern boundary should be dead wooded to manage dead branch failures.

3. The 50% dead tree should be removed.

4. The TPZ of all retained trees should be mulched to a depth of around 10cm and irrigation should be made available to manage the health of these trees moving forward.

5. The trees retained on site should be fenced for protection during site development as guided by this report and AS4070 – 2009 Protection of Trees on Development Sites.

6. Where development plans impact trees to be retained they should be reassessed in order to remove tree impact. Where this is not possible designs should be modified to eliminate impact, or trees reconsidered in regards to retention.

7. Final site amelioration and landscaping should be undertaken in a manner which promotes the long term retention of trees retained on this site post site development.

8. Tree Protection Zones should be established using temporary fencing to protect the tree, its root plate and canopy. This should be undertaken as guided by this report and AS4970 – 2009 Protection of Trees on Development Sites.

9. The process of managing trees on construction sites is clearly out lined by AS4970 – 2009 Protection of Trees on Development Sites, and further reports may be required to protect and guide the retention of trees throughout the process of development of this site.

10. A full understanding of the Australian Standard 4970 – 2009 Protection of Trees on Development Sites is required to fully manage this site. In order that this is carried out, a Level 5 Project arborist should be commissioned for the projects entirety to manage all retained trees.

6.0 Appendices

6.1 Photographs - Appendix One.

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6.2 Site Plan

6.3 Terms of Descriptor's

Definitions Descriptor's used for throughout this report.

AGE

Category	Description
Young	Juvenile or recently planted approximately 1-7 years.
Semi Mature	Tree actively growing.
Mature	Tree has reached expected size in situation.
Senescent	Tree is over mature and has started to decline.

HEALTH

Good	Foliage of tree is entire, with good colour, very little sign of pathogens and of good density. Growth indicators are good ie. Extension growth of twigs and wound wood development. Minimal or no canopy die back (deadwood).
Fair	Tree is showing one or more of the following symptoms; < 25% dead wood, minor canopy die back, foliage generally with good colour though some imperfections may be present. Minor pathogen damage present, with growth indicators such as leaf size, canopy density and twig extension growth typical for the species in this location.
Poor	Tree is showing one or more of the following symptoms of tree decline; > 25% deadwood, canopy die back is observable, discoloured or distorted leaves. Pathogens present, stress symptoms are observable as reduced leaf size, extension growth and canopy density.
Dead or dying	Tree is in severe decline; > 55% deadwood, very little foliage, possibly epicormic shoots, minimal extension growth.

STRUCTURE

Good	Trunk and scaffold branches show good taper and attachment with minor or no structural defects. Tree is a good example of the species with a well-developed form showing no obvious root problems or pests and diseases.
Fair	Tree shows some minor structural defects or minor damage to trunk eg. bark missing, there could be cavities present. Minimal damage to structural roots. Tree could be seen as typical for this species.
Poor	There are major structural defects, damage to trunk or bark missing. Co-dominant stems could be present or poor structure with likely points of failure. Girdling or damaged roots obvious. Tree is structurally problematic.
Hazardous	Tree is an immediate hazard with potential to fail, this should be rectified as soon as possible.

HAZARD

Hazard is rated into three levels; **LOW, MEDIUM,** and **HIGH**.

1. **LOW;** Tree appears to be structurally sound, is healthy with no signs of pests or disease, has good vigour and is clear of any hazards.
2. **MEDIUM;** Tree displays signs of structural problems, evidence of pests or disease, signs of low vigour, deadwood, decay, may be growing into an area that could create a hazard.
3. **HIGH;** Tree is an immediate hazard with the potential to fail, this should be rectified as soon as possible.

USEFUL LIFE EXPEECTANCY – ULE

LONG ULE; Trees that appears to be retainable with an acceptable level of risk for more than 40 years.

1. Structurally sound trees located in positions that can accommodate future growth.
2. Storm damaged or defective trees that could be made suitable for retention in the long term by remedial tree surgery.
3. Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.

MEDIUM ULE; Trees that appear to be retainable with an acceptable level of risk for 15 to 40 years.

1. Trees that may only live between 15 and 40 years.
2. Trees that may live for more than 40 years but would be removed to allow the safe development of more suitable individuals.
3. Trees that may live for more than 40 years but would be removed during the course of normal management for safety and nuisance reasons.
4. Storm damage or defective trees that can be made suitable for retention in the medium term by remedial work.

SHORT ULE; Trees that appear to be retainable with an acceptable level of risk for 5 to 15 years.

1. Trees that may live for 5 to 15 years.
2. Trees that may live for more than 15 years but would be removed to allow the safe development of more suitable individuals.
3. Trees that may live for more than 15 years but would be removed during the course of normal management for safety and nuisance reasons.
4. Storm damaged or defective trees that require substantial remedial work to make safe and are only suitable for retention in the short term.

REMOVE; Trees with a high level of risk that would need removal within the next 5 years.

1. Dead trees.
2. Dying or suppressed and declining trees through disease or inhospitable conditions.
3. Dangerous trees through instability or recent loss of adjacent trees.
4. Dangerous trees through structural defects including cavities, decay, included bark, wounds or poor form.
5. Damaged trees that are considered unsafe to retain.
6. Trees that will become dangerous after removal of other trees for the above reasons.

SIGNIFICANCE / RETENTION VALUE

Significance is rated into three levels; **LOW, MEDIUM, HIGH**.

LOW; Trees that offer little in terms of contributing to the future landscape for the reasons of poor health or structural condition, species suitability in relation to unacceptable growth habit, noxious, poisonous or weed species or ULE, or a combination of these characteristics. Should be considered for removal.

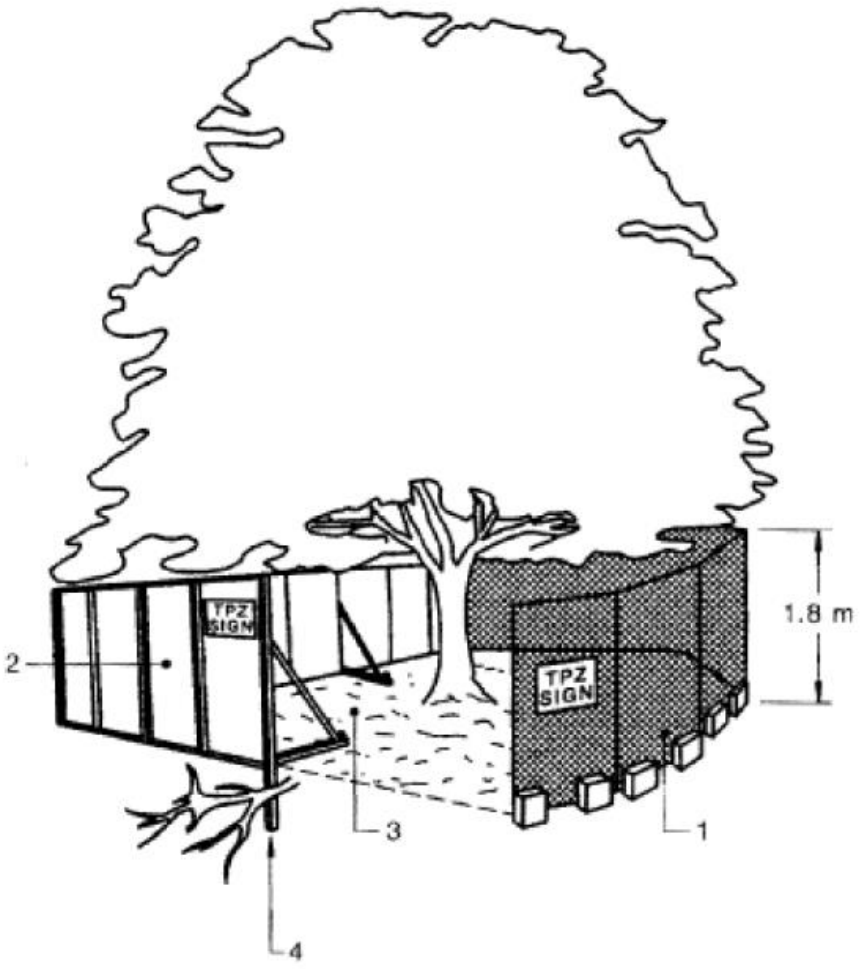
MODERATE; Trees with some beneficial attributes that may benefit the site in relation to botanical, horticultural, historical or local significance but may be limited to some degree by their future growth potential at the site by maintenance requirements now or in the future. These trees should be considered for retention if possible within the development design, they may be modified to allow for construction. (eg. pruning, etc;)

HIGH; Trees with the potential to positively contribute to the site due to their botanical, horticultural, historical or local significance in combination with good characteristics of structure, health and future development. Should be considered for inclusion within development plans.

6.4 Tree Protection Signage

4.4 SIGNS

Signs identifying the TPZ should be placed around the edge of the TPZ and be visible from within the development site (refer Figure 3). The lettering on the sign should comply with AS 1319. Appendix C provides an example of a suitable TPZ sign.



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 3 PROTECTIVE FENCING

(Extract from AS4970 – 2009 Protection of trees on Development sites)

6.5 Tree Protection Zone (TPZ) Example

APPENDIX C

TREE PROTECTION ZONE SIGN EXAMPLE

(Informative)

A TPZ sign provides clear and readily accessible information to indicate that a TPZ has been established. Figure C1 provides an example of a suitable sign.

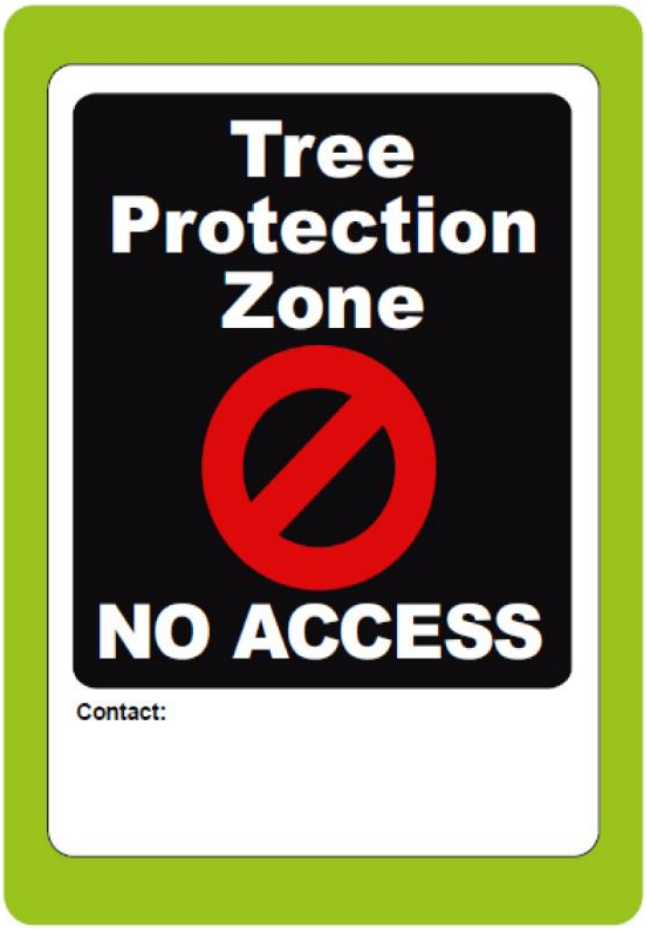


FIGURE C1 TREE PROTECTION ZONE SIGN

(Extract from AS4970 – 2009 Protection of trees on Development sites)

6.6 Indicative Stages in Development and the Tree Management Process

Stage in Development	Tree Management Process	
	Matters for Consideration	**Actions and Certificates**
Planning (Sections 2 and 3)		
Site acquisition	Legal constraints	
Detail surveys	Council plans and policies Planning instruments and controls Heritage Threatened species	Existing trees accurately plotted on survey plan.
Preliminary tree assessment	Hazard/risks Tree retention value	Evaluate trees suitable for retention and mark on plan Provide preliminary arboricultural report and indicative TPZs to guide development layout.
Preliminary development design	Condition of trees Proximity to buildings Location of services Roads Level changes Building operations space Long-term management	Planning selection of trees for retention Design review by proponent Design modifications to minimise impact to trees.
Development submission	Identify trees for retention through comprehensive arboricultural impact assessment of proposed construction. Determine tree protection measures. Landscape design.	Provide arboricultural impact assessment including tree protection plan (drawing) and specification.
Development approval	Development controls Conditions of consent	Review consent conditions relating to trees.
Pre-construction (Sections 4 and 5)		
Initial site preparation	State based OHS requirements for tree work Approved retention/removal Refer to AS 4373 for the requirements on the pruning of amenity trees Specifications for tree protection measures.	Compliance with conditions of consent. Tree removal/tree retention/transplanting Tree pruning Certification of tree removal and pruning. Establish/delineate TPZ Install protective measures Certification of tree protection measures.

Stage in Development	Tree Management Process	
	Matters for Consideration	**Actions and Certificates**
Construction (Sections 4 and 5)		
Site establishment	Temporary infrastructure Demolition, bulk earthworks, hydrology	Locate temporary infrastructure to minimise impact on related trees. Maintain protective measures Certification of tree protection measures.
Construction work	Liaison with site manager, compliance Deviation from approved plan	Maintain or amend protective measures Supervision and monitoring
Implement hard and soft landscape works	Installation of irrigation services Control of compaction work Installation of pavement and retaining walls	Remove selected protective measures as necessary Remedial tree works Supervision and monitoring
Practical completion	Tree vigour and structure	Remove all remaining tree protection measures Certification of tree protection
Post Construction (Section 5)		
Defects liability / maintenance period	Tree vigour and structure	Maintenance and monitoring Final remedial tree works Final certification of tree condition

NOTES:
1. Owing to variations in planning legislation, this Table is a general indication of the process only
2. Certification of tree protection and condition should be carried out by the project Arborist.

Extract from Australian Standard 4970 – 2009 – Protection of Trees on Development Sites.

The above Table shows clearly the process of tree protection on development sites as set out in the Australian Standard.

This Table should be followed in the management of all trees on development sites.

Depending on the stage of the project you are undertaking, the type of project you are undertaking and specific other requirements of various planning departments, in some instances additional reports may be required.

The above Table serves as an indicative guide to the process of managing and protecting trees.

7.0 References

1. **Victoria's Native Vegetation Management Framework (Draft)** – DSE Victoria
2. Australian Standard® ***AS4970-2009, Protection of trees on development sites,*** *2009, Sydney*
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13. Surf Coast Shire, **Indigenous Planting Guide** – Rural, 2003 Australia
14. Surf Coast Shire, **Indigenous Planting Guide** – Urban, 2003 Australia
15. Surf Coast Shire, **Environmental Weeds – Invaders of our Surf Coast**

Writings within the report are of the author's personal knowledge and belief. The information and knowledge released in the report when referenced should be referenced to

Matt Branagh, Dip.App.Scl – Horticulture/Arboriculture – *Let's Talk About Trees.*

8.0 Terms and Limitations of the Report

- Any legal information in the report has been provided to *Let's Talks About Trees* by an external source and it is assumed to be correct. All references to property title and/or control or ownership of land are assumed to be correct as *Let's Talk About Trees* has been advised.

- Great care has been taken in sourcing information for this report so as it is correct. *Let's Talk About Trees* cannot be responsible for information provided which is not directly under control of its staff.

- No *Let's Talk About Trees* employee shall be required to give testimony or attend court for any matter in relation to this report, unless further contractual arrangements have been made.

- This report must not be altered in any shape or form. It has been written as a whole document and is intended for use as a whole document. Any changes or modifications to this report not undertaken *Let's Talk About Trees* by shall render this report invalid in its entirety.

- In no way is this report biased or weighted. The content of the report is written in the full, honest opinion of the *Let's Talk About Trees* Consulting Arborist.

- No diagrams, pictures, graphs or other reference material in this report is said to be to scale or value unless stipulated. All measurements and values are made to the best of the author's ability at the time of reporting and should be checked before using as final measurements for whatever reason.

- This report is developed around the information provided by our client in the project brief. Only issues covered by the project brief are discussed in this report.

- All details, information and advice contained in this report have been researched and referenced. Where no reference is included, it is the author's learned opinion, experience and observations.