



Arboricultural Impact Assessment and Management Plan



189 Riverview Road, Avalon Beach.

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Dated: **November, 2021.**



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1.0 INTRODUCTION

1.1 Background

1.1.1 This Arboricultural Impact Assessment and Management Plan has been prepared for Amandio Castanheira at Alchemy Architects, on behalf of the property owners. This report has been requested to document the arboricultural significance of those trees located within the site and make recommendations for their preservation or removal, based on this and their location in relation to the proposed construction.

1.1.2 The existing 1950 residence has been proposed for demolition to allow for the construction of the proposed. This will extend the current building footprint as detailed. The site runs down from the western side of Riverview Road to the Pittwater foreshore. Site topography is significantly influenced by the underlying sandstone bedrock, paths and retaining walls, as well as the existing construction footprint. Site access is via a driveway and walkways to allow access to the residence, located centrally on site.

1.1.3 The purpose of this report is to identify all existing trees, assess both health and condition, determine landscape significance and safe useful life expectancy and make recommendations for preservation, removal or transplantation based on sustainability and suitability within the landscape. This report has assessed the likely impacts of the proposed development will have on the subject trees. An assessment of these impacts has been made in accordance with Australian Standard (AS) 4970 *for the Protection of Trees on Development Sites*. Pruning and removal works will be based on AS4373 *for the Pruning of Amenity trees* wherever applicable.

1.1.3 Extensive non destructive root mapping works were undertaken on this project on the 1st and 2nd November 2021. All trees affected by the proposed works have been root mapped. These trenching works were witnessed by site arborist (George Palmer) engineer (Acor) , builder (Clearview) and owner builder (client). These works have allowed for the preservation of several trees previously marked for removal.

1.2 Methodology

1.2.1 A Visual Tree Assessment (VTA) was performed from ground level and consideration was given to the overall health of each documented tree, percentage of canopy, epicormic growth, deadwood and form for this species. The tree heights and canopy spreads have been estimated and where relevant the orientation of the canopy spread noted. The trunk diameters of each tree has been measured at breast height of 1.4 meters (DBH) and with a diameter tape to calculate Tree Protection Zones (TPZ) and Structural Root Zone (SRZ). The site was inspected by consulting arborist George Palmer most recently on the 2nd November, 2021.

1.2.2 A non destructive excavator (sucker) was used to remove soil from adjacent to the proposed construction footprint. These trenches have been dug without directly affecting the exposed roots and have allowed for a visual assessment of the underlying soil profile and the roots affected by the proposed construction. Locations are detailed in **Figures 1-8**.



2.0 RESULTS

2.1 The Site

2.1.1 The site is a residential block located on the western side of Riverview Road, Avalon Beach. This is part of the Pittwater Spotted Gum Forest.. <https://www.northernbeaches.nsw.gov.au/environment/native-flora/pittwater-spotted-gum-forest>. This site and proposed development requires consideration as part of the the Northern Beaches Council Development Controls and has been identified as an Endangered Ecological Community. . <https://eservices.northernbeaches.nsw.gov.au/ePlanning/live/Pages/Plan/Book.aspx?exhibit=PDCP&hid=11861>

2.1.2 As noted, the site topography is significantly influenced by the underlying sandstone bedrock. This will affect the abiotic development of tree roots and make a practical assessment of the Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) theoretical.. https://en.wikipedia.org/wiki/Abiotic_component.

2.2 The Trees

2.2.1 All trees have been assessed using Visual Tree Assessment (VTA) criteria and notes. This is a requirement of Clause 2.3.2 of the *Australian Standard 4970* (2009) for the *Protection of Trees on Development Sites*, each tree has been allocated a Retention Value based on the tree's Useful Life Expectancy and Landscape Significance with consideration to its health, structure, condition and site suitability.

2.2.2 The Retention Value does not take into account any proposed development. All trees have been allocated 1 of 4 Retention Values;

- **High Value** - Priority for Retention.
- **Moderate Value** - Consider for Retention.
- **Low Value** - Consider for Removal.
- **Remove** - Recommended for Removal Irrespective of works.

Refer to the Tree Table and Tree Assessment Schedule.

2.2.3 Both the upper and lower garden escarpments have been planted out with a number of native and exotic tree and plant species. These have all however been partially suppressed by the endemic *Corymbia maculata*, or Spotted Gums and particularly the emergent and centrally located Spotted Gum (Tree 13).

2.2.4 The dominant tree species here is the *Corymbia maculata*, or Spotted Gum. There are twelve (12) located on site, with an additional five (5) located within neighbouring residences. The largest of these is over 24m in height and is supported on a trunk of over 80cm, with a basal flare over 1m (Tree 13). These mature trees are High Value and the proposed works have been designed to allow for their preservation.



2.2.5 There are a number of smaller *Ligustrum lucidum*, or Broad Leafed Privets that have established adjacent to the front boundary. Trees 1 - 3 have been documented, while the remainder have not been further considered. All have been recommended for removal irrespective of the proposed.

2.2.6 Tree 4 is a well established *Corymbia maculata*, or Spotted Gum located on the front verge. This has grown to over 20m and is supported on a trunk 450mm in diameter. Localised topography and adjacent construction will have affected the abiotic spread and development of roots. High Value. Retain.

2.2.7 The neighbouring Tree 5 is a semi mature to mature *Eucalyptus umbra*, or White Mahogany and part of the site's mid canopy foliage trees. These have been partially suppressed by the dominant Spotted Gums and may have reached relative maturity here, given these environmental constraints. Moderate Value. Retention.

2.2.8 Tree 6 is the largest of a stand of more recently planted *Cupaniopsis anacardioides*, or Tuckeroo trees that have been planted on the upper portion of the neighbouring property. Moderate Value. Retain.

2.2.9 Additional sub dominant, mid canopy endemic tree species include *Allocasuarina torulosa*, or Rose She-oaks (Trees 3b, 10, 11, 20 and 21). These have all been partially suppressed by the more dominant canopies of the surrounding Spotted Gums. Tree 21 has a large section of visible surface decay noted at approximately 4m above ground level following a failure. This is unlikely to compartmentalise given its diameter. All have been affected by borer and termites and have been considered as Low Value due to their health and vigour. Remove.

2.2.10 Tree 9 is a *Stenocarpus sinuatus*, or Queensland Firewheel tree. This is a native species that is part of the more recently installed plantings. Low to Moderate Value. This tree has been considered for transplantation but will require further consideration due to its location within the tree protection zone of Tree 13.

2.2.11 Tree 12 is a mature *Livistona australis*, or Cabbage tree palm located within the neighbouring residence. This is another endemic species that has been considered as High Value and required for Retention.

2.2.12 Tree 14 is a well established *Eucalyptus paniculata*, or Grey Ironbark located adjacent to the site's northern boundary. The tree's canopy is supported on a co-dominant trunk from 5m. Moderate Value. Retain.

2.2.13 Tree 15 is a well established *Toona ciliata*, or Australian Red Cedar located within the neighbouring residence. The tree has established free of the Shoot-borer moth and has been allowed to establish with a strong apical leader. <https://www.planthealthaustralia.com.au/wp-content/uploads/2015/07/Shoot-borer-FS.pdf>. Located within the neighbouring residence. Moderate Value. Retain.

2.2.14 Tree 16 is a juvenile *Pittosporum undulatum*, or Sweet Pittosporum. This is a contentious native tree species that can become an invasive weed in multiple environments. Low Value. Remove.

2.2.15 Tree 18 is a *Eucalyptus umbra*, or White Mahogany located adjacent to the pedestrian walkway. The tree appears to have entered into a cycle of decline with dead wood throughout its upper canopy. An active arboreal termite nest was located in the tree's lower canopy. Low Value. Remove.

2.2.16 Tree 19 is a small *Ceratopetalum gummiferum*, or Christmas bush. The tree has grown to less than 4m in height and has not been considered as a material constraint. Low Value. Transplant.



2.2.17 Tree 22 is another semi mature *C. maculata*, or Spotted Gum tree located adjacent to the existing construction footprint (walkway and stairs). This construction is likely to have affected the spread and development of tree roots. Moderate Value. Retain.

2.2.18 Trees 23, 24 and 25 are all part of a stand of *Corymbia maculata*, or Spotted Gums located within the neighbouring residence. These are High Value and required for Retention.

2.2.19 Tree 26 is a semi mature *Syzygium australe*, or Creek Lilly-pilly located within the neighbouring residence and adjacent to the site's northern boundary. This is a native tree species that is likely to have been planted here to provide screening between these residences. Moderate Value. Retain.

2.2.20 Tree 27 is a well established *Eucalyptus paniculata*, or Grey Ironbark located adjacent to the site's northern boundary. The tree has grown to a height of over 24m and is supported on a trunk of almost 80cm. High Value. Retain.

2.2.21 Tree 28 is another semi mature *C. maculata*, or Spotted Gum located centrally within this upper portion of the site. The tree has poor canopy development as a result of suppression and possible early construction impacts associated with the construction of the retaining walls within 1m of its base. This construction will have affected the abiotic development of the tree's roots, while the neighbouring Oleander and Jacaranda will have also affected its abiotic root development. These limiting factors have affected vigour and health. Low Value. Remove.

2.2.22 Tree 30 is a more recently installed *Howea forsteriana*, or Kentia palm located in the foreshore garden. This is a non endemic native species of limited value here given context. Retain.

2.2.23 Trees 31, 33, 34, 35, 36, 38 and 39 are all well established *C. maculata*, or Spotted Gum trees located throughout the foreshore landscape. These provide a High Value amenity for the site and are visible from a broad area. Retain.

Retention Value 1 High		Retention Value 2 Moderate		Retention Value 3 Low		Retention Value 4 Remove	
Retain	Remove	Retain	Remove	Retain	Remove	Retain	Remove
12, 13, 15, 17, 22, 23, 24, 25, 33, 34, 36		4, 5, 6, 7, 8, 14, 22, 26, 27, 31, 32, 35, 38, 39	10, 11, 18, 20, 21, 28, 37	19, 29, 30, 9, 16	3b,		1, 2, 3
Total: 11	Total: 0	Total: 14	Total: 7	Total: 5	Total: 1	Total: 0	Total: 3



3.0 ARBORICULTURAL IMPACT ASSESSMENT

3.1 The existing residence has been constructed centrally within the block. The construction of this, the vehicular access driveway and pedestrian walkways are likely to have been built on slab footings sitting directly on the underlying bedrock. This will have affected the abiotic spread and development of all neighbouring tree roots. https://en.wikipedia.org/wiki/Abiotic_component.

3.2 Site topography has been significantly affected by both the exposed and underlying sandstone bedrock. This is often characterised by “floating” blocks that will continue to move and erode. This will limit surface soil volumes and result in the asymmetrical development of tree roots around and throughout these “floaters”. This will have a practical affect on the spread and development of tree roots throughout the site and make all TPZ and SRZ calculations theoretical only.

3.3 The planting and establishment of additional vegetation will also have affected the development of endemic tree roots. These factors will have shaped the location, size and health of all trees on site. This is particularly relevant in relation to the *Allocasuarina torulosa*, or Rose She-oaks. (Trees 3b, 10, 11, 20 and 21) All of which are in fair health only. All have active termites present and dead wood throughout their upper canopies.

3.4 The non destructive excavations undertaken to enable a visual assessment of the underlying tree roots located a limited number of larger diameter roots. Much of the underlying soil profile has been affected by construction material and imported fill. As noted, previous construction will have directly impacted on (removed) roots as well as affected the abiotic development of compensatory roots.

3.5 The existing residence no longer meets the domestic living requirements of the current owners, with a growing family. The opportunity to better utilise the site’s unique location and foreshore amenity has been addressed with the proposed. These works have been designed to preserve the site’s most important trees. Excavation to allow for construction has been set back and elevated to limit the impacts on underlying tree roots and preserve existing topography. Direct construction impacts will be limited to the installation of a series of piers to provide support for overhead construction. Indirect impacts will include the reduction in permeable surface areas.

3.6 Compensatory irrigation will form an integral role in the preservation of soil moisture requirements throughout the site. All impermeable surface areas will provide a catchment for water storage and irrigation. Soil conditioning and mulching will ensure mycorrhizal associations are maintained. <https://en.wikipedia.org/wiki/Mycorrhiza>. The proposed design follows existing topography where possible, limiting the requirement for significant excavation. This will limit the impacts on soil hydrology and availability of soil moisture.

4.0 DISCUSSION

4.1 The site’s current amenity predominantly comes from the more mature Spotted Gums. These are the species that characterises this setting and should be seen as being of Moderate to High Value required for consideration for retention, wherever possible.



4.2 The proposed works will however require the removal of trees 1, 2, 3, 3b, 10, 11, 18, 20, 21, 28 and 37. The *Ligustrum lucidum*, or Broad Leafed Privets documented as Trees 1, 2 and 3 will have been recommended for removal irrespective of the proposed development. Trees 3b, 9, 10, 11, 16, 18, 19, 21, 22 and 28 are all of Low to Moderate value and have not been seen as a material constraint to the proposed development.

4.3 As noted, the direct impacts of the proposed construction have been assessed following the excavation of a series of trenches and holes. These have been detailed in **Figures 1-8** and show that the excavation to allow for construction will not directly impact on any of the documented trees. Incursions into both SRZ and TPZs will not require the removal of any larger diameter (20mm +) roots.

4.4 Hole 1 has been dug to a depth of 1.7m before locating the underlying bedrock. This excavation is over 400mm in diameter and represents the location of the proposed support pier required for the carport slab. This structure will be elevated above existing ground levels. See **Figure 1**.

4.5 Trenches A and B have been excavated within the TPZ of both Trees 13 and 22. These trenches were both excavated to bedrock and did not expose any larger diameter Spotted Gum roots. This portion of the construction footprint represents the location of the proposed lift. See **Figures 2 + 3**.

4.6 Trench C is the largest of the excavations. This exposed a number of feeder roots less than 10mm in diameter. These were not identified as being of any single species. Their smaller diameter will represent more recent growth. The exposed soil also contained building material indicating that it will have been altered and raised as part of historical construction.

4.7 Trench D is within 3m of the neighbouring Spotted Gum documented as Tree 17. Excavation again went to the underlying bedrock and uncovered a number of smaller diameter surface roots as well as indications of imported fill. No larger diameter or structural roots were uncovered.

4.8 Trench E was dug within the existing construction footprint. This portion of the site is supported by a retaining wall and all exposed soil dominated by construction fill. This trench was dug to approximately 900mm and did not get to the underlying bedrock. Excavation to allow for the construction is less than 500mm with the remaining structure cantilevered.

4.9 Trench F was again excavated within the existing construction footprint and the exposed soil profile dominated by fill. The larger diameter root exposed and detailed in **Figure 7** comes from a neighbouring Jacaranda.

5.0 CONCLUSIONS

5.1 The impacts associated with the documented works will be limited. The excavation to allow for the construction will not require the removal of any larger diameter roots and will not affect the structural integrity of any of the documented trees. Incursions into both SRZ and TPZ will be theoretical only.



5.2 The indirect impacts of the construction are however accumulative and will require consideration both in the engineering and design stages as well as throughout the construction process. The impact that any excavation has on soil hydrology will need to be addressed. Irrigation will be required to maintain soil moisture levels and compensate for any loss off ground water infiltration. One of the first stages of the construction process will involve the installation of the elevated carport. This will allow site access and loading facilities as well the installation of an irrigation water tank.

5.3 Excavation to allow for the installation of the lift is within 3m of Tree 13. This is within the tree's theoretical SRZ and cannot involve the removal of any larger diameter roots. As noted the excavation here uncovered bedrock at less than 200mm below the soil surface and no larger diameter *Corymbia* roots were located. The construction of the adjacent walkway is likely to have been built on this underlying bedrock and will have affected the spread and development of roots. The trenching exposed a number of smaller diameter (10mm) feeder roots that are likely to be from surrounding vegetation.

5.4 Additional excavation within the TPZ of Tree 13 is represented by Trench C. As noted, this exposed a number of smaller diameter, compensatory feeder roots as well as imported fill. No larger diameter *Corymbia* roots were found. The development of tree roots in this area is likely to have been affected by the construction of both the concrete path and the importation of fill.

5.5 The impacts associated with the extension of the construction footprint to the north east will push it to within the theoretical TPZ of the neighbouring Spotted Gum documented as Tree 17. This area has again been affected by historical works that will have involved direct impacts on this tree's roots system and the importation of fill. A more recently established *Pittosporum undulatum*, or Sweet Pittosporum will have also affected the biotic development of the neighbouring Spotted Gum's root development.

5.6 The most significant theoretical construction incursion is associated with the works adjacent to the mature *Eucalyptus paniculata*, or Grey Ironbark documented as Tree 27. As noted, this western portion of the development is within the existing construction footprint. Excavated material from Trench E was all imported and disturbed fill. This area has also been raised and retained following the construction of a sandstone wall that forms the existing residences western edge. This area also holds the site's septic tank. Exploratory trenching works went to a depth of over 900mm and did not locate a single large diameter root. The proposed construction here will involve excavation to less than 500mm with the remaining construction cantilevered over existing topography.

5.7 Excavation adjacent to Tree 23 is similarly within the theoretical SRZ of the neighbouring Spotted gum documented as tree 23. Again the works here are within the existing construction footprint and will not directly affect this tree. The larger diameter root noted in Figure X tapers towards the Spotted Gum and has been identified as belonging to a previously (partially) removed Jacaranda that will have been planted here following the completion of this retaining wall.

5.8 The proposed works will greatly improve both the functionality and aesthetic appeal of the residence as well as its surrounding gardens. All works have focused on the retention of the site's largest and more significant trees. Tree 13 is the largest of these and the proposed development has been designed around it. The construction will preserve ground levels and existing site topography throughout all tree protection zones. This extends to the both boundaries, and to the edge of the existing construction footprint. As detailed, it is not anticipated that any larger diameter roots will be directly affected by any portion of the works. Indirect



construction impacts will however include a disruption to permeable surface water infiltration. This will be compensated for with the installation of irrigation, soil improvement works and the establishment of landscaped gardens throughout this area.

5.2 The removal of competing plant material will allow for the ongoing development of remaining trees, free of competition. As noted there are multiple Privet and exotic low value trees throughout this area that have been proposed for removal.

5.3 The preservation of the more significant trees on site will be done with the implementation of the following list of tree preservation recommendations. These have been made to represent both site conditions and current industry standards, regardless of construction.

6.0 RECOMMENDATIONS

6.1 It will be recommended that all significant trees are retained and protected throughout the construction process. Construction impacts must be limited to those detailed. All works will need to be completed from within the existing or proposed construction footprints.

6.2 The demolition and excavation portions of the construction process will require the establishment of an excavator onto site. This will require the traversing of the north eastern portion of the site. This is with the theoretical SRZ and TPZ of a number of important trees and will need to consider the impacts of compaction on the underlying soil profiles. Rumble boards will be required to limit compaction and soil disturbances here. See **Figure 8**.

6.3 The construction of the carport will allow materials to be stored on site. This structure will be set above the existing structure and will allow site access and storage without directly affecting surrounding trees.

6.4 All permeable soil surface areas should be treated as being part of a Tree Protection Zone and allocated appropriate protection. Access will need to follow existing walkways and remain within the current construction footprint. All construction on site will require consideration for the preservation of topography outside the construction footprint.

6.5 Tree Protection Fencing design and locations have been detailed and should be installed prior to the commencement of site works.

6.6 All construction will require the preservation of larger diameter (30mm +) roots associated with preserved trees. All roots within the SRZ of a preserved tree will require preservation where possible. Pier and beam based construction method will limit the direct impacts of the construction to those detailed.

6.7 The remainder of the indirect construction impacts should be mitigated with the implementation of the following:



6.8 Appointment of Site Arborist

A site arborist shall be appointed prior to the commencement of work on site. The Site Arborist shall clearly mark out all trees to be removed and ensure that all trees documented for retention are preserved with the implementation of the following tree protection measures. The Site Arborist shall have a minimum qualification equivalent to a NSW TAFE Certificate Level 5 or above in Arboriculture.

6.9 Inspection Points

Give 5 working days notice to allow inspections to be undertaken at the following stages;

Inspection Point	Inspection Personnel
Installation of Tree Protection Zones including Tree Protection Fencing, Silt Fencing and Signage	Site Arborist
Modification of the Tree Protection Zone	Site Arborist
Works within the Tree Protection Zone	Site Arborist
Completion of Construction Works	Site Arborist Site Supervisor.

6.10 Education

Contractors and site workers shall receive a copy of these specifications prior to the commencement of work. Contractors and site workers undertaking any works within a TPZ shall sign the site log to confirm that they have read and understand these specifications prior to their undertaking.

6.11 Tree Protection Zones

Where applicable, all trees to be retained through the construction process shall be protected from mechanical damage and the indirect impacts of the construction process with the installation of Tree Protection Zones. Unless otherwise stated, the following activities must not be carried out within a TPZ;

- modification of existing soil levels
- excavation or trenching
- cultivation of soil
- mechanical removal of vegetation
- movement of natural rock
- storage of materials, plant or equipment
- erection of site sheds
- affixing signage or hoarding to trees
- disposal of chemical waste or construction material
- any activity that may directly or indirectly affect the health of these or surrounding trees.



Note: If access to a TPZ is required as part of the approved development, prior authorisation is required by the Site Arborist.

6.12 Tree Protection Fencing

Tree Protection Fencing shall be installed at the perimeter of the TPZ. As a minimum the Tree Protection Fencing shall be 1.8 meters high temporary chain supported by steel stakes. This shall be fastened and supported to prevent sideways movement. The trees woody roots shall not be damaged during the installation of this Tree Protection Fencing.

This Tree Protection Fencing shall be erected prior to the commencement of works on site and shall be maintained for the duration of the construction process.

6.13 Signage

Tree Protection Signage shall be attached the the PTZ and displayed in a prominent location. These signs shall be repeated in 10m intervals or closer where the fence changes direction. These shall be a minimum of a 72 font size and each sign at-least 600 x 500mm.

6.14 Mulching

The area within the TPZ shall be mulched and maintained with 80mm of leaf litter mulch for the duration of the construction process. This mulch shall be spread by hand to limit the impact on underlying roots and shall be installed prior to the commencement of works on site.

6.15 Site Arborist

The Site Arborist shall inspect and approve the TPZ including mulching, signage, Tree Protection Fencing, Silt fencing and Signage prior to the commencement of works on site.

6.16 Site Management

Materials and waste storage, site sheds and temporary services shall not be located within the TPZ unless specified. Storage points shall be covered when not in use and be no greater than 2m in height.

6.13 Works Within the TPZ

The TPZ may need to be modified during the works to allow access between the protected tree and the proposed construction. The TPZ shall remain as specified and only those works detailed in the proposed construction undertaken.

6.14 Completion of Works within Specified TPZ

Upon the completion of works within a TPZ the protective fencing shall be reinstated as specified. Where the construction of new structures does not allow for the reinstallation of fencing the TPZ shall be modified by the Site Arborist.



Figure 1 Shows Hole 1.



Figure 2 Shows Trench A.





Figure 3 Shows exposed bedrock at Trench B and the base of Tree 13.



Figure 4 Shows Trench C and the existing construction footprint.



Figure 5 Shows
Trench D and the
neighbouring Spotted
Gum (Tree 17)

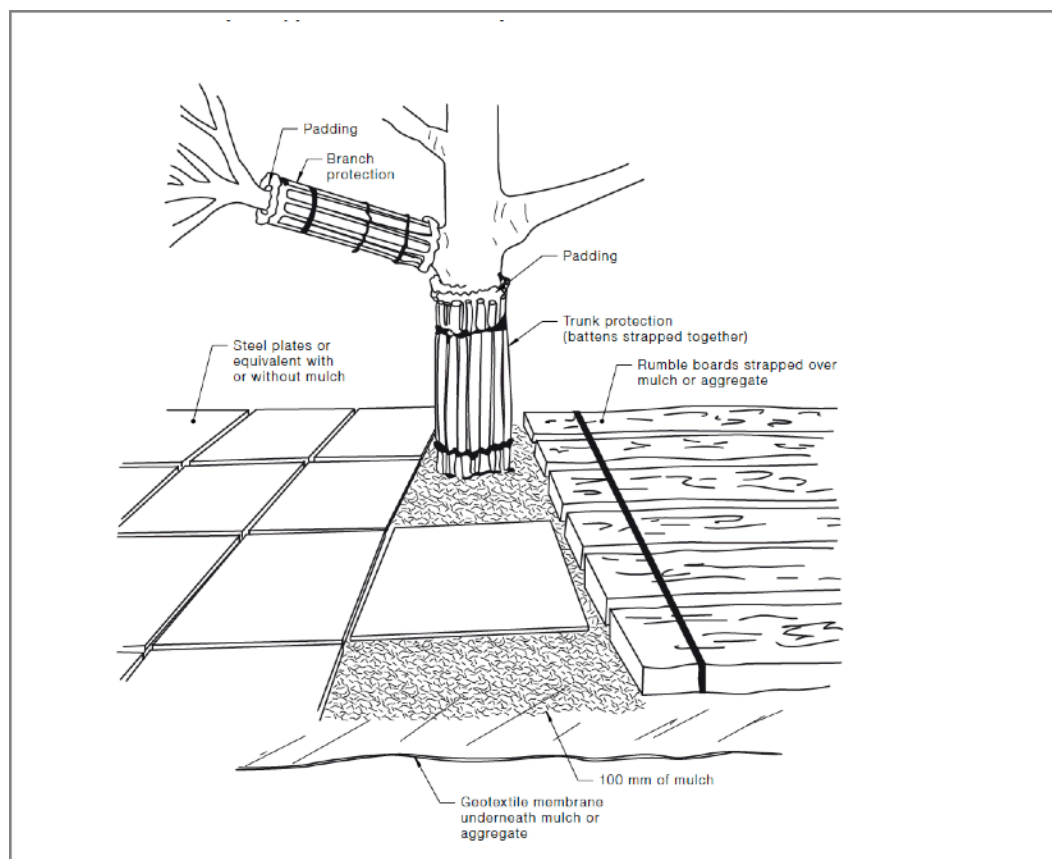
Figure 6 Shows Trench E and the adjacent
sewage pit.





Figure 7 Shows the final Trench F.

Figure 8 Shows AS4970 Ground Protection, including rumble boards, branch protection and mulching.





8.0 GLOSSARY

COMMON NAME/GENUS SPECIES CULTIVAR – Common names can vary with selected texts. Where species is unknown, “sp.” indicated after genus. Where cultivar is unknown “cv” indicated after species. The number in brackets e.g. (x9) after the species indicates the number of trees in this tree group.

DBH – Diameter at Breast Height. Tree trunk diameter measured at breast height (1.4 metres above ground level). Fabric diameter tape is used which assumes a circular cross section. Multiple measurements indicate multiple trunks. More than three trunks are indicated as “multi”. Where DBH measurement cannot be taken at 1.4m the height at which it has been taken is indicated in the Comments column.

CANOPY SPREAD RADIUS – Average canopy radius (widest + narrowest 2). Circular canopy depictions on Tree Plan/Survey are indicative only. Where canopy spread was significantly skewed, all four cardinal point measurements were recorded.

AGE CLASS – Immature (IM), Semi-mature (SM), Mature (M), Over-mature (OM). Assessment of the tree’s current Age. A Mature (M) tree has reached a near stable size (biomass) above and below ground. Trees can have a Mature age class for >90% of life span. Over-mature (OM) trees show symptoms of irreversible decline and decreasing biomass.

VIGOUR–Good(G),Fair(F)orPoor(P). The general appearance of the canopy/foilage of the tree at the time of inspection. Vigour can vary with the season and rainfall frequency. A tree can have Good vigour but be hazardous due to Poor condition. A tree in Good vigour has the ability to sustain its life processes. Vigour is synonymous with health.

CONDITION – Good (G), Fair (F) or Poor (P). The general form and structure of the trunk/s and branching. Trunk lean, trunk/branch structural defects, canopy skewness or other hazard features are considered.

SRZ RADIUS – Structural Root Zone. The area around a tree required for tree stability. Earthworks should be prohibited within the SRZ.. The area is calculated from the formula and graph at Figure 1 of AS4970-2009. The SRZ graph has been adapted from the work of Claus Mattheck (1994). DBH has been used instead of stem diameter above root buttress in the calculation of SRZ. 0.1m has been added to SRZ to allow for minor increases in stem diameter.

TPZ RADIUS – Tree Protection Zone. Radial offset (m) of twelve times (12X) trunk DBH measured from centre of trunk (for trees less than 0.3 metre DBH minimum TPZ is 2.0 metres). To satisfactorily retain the tree construction activity (both soil cut and fill) must be restricted within this offset. TPZ offsets are rounded to the nearest 0.1 metre. Existing constraints to root spread can vary TPZ. Generally an area equivalent to the TPZ should be available to the tree post development. Encroachment occupying up to 10% of the TPZ area is acceptable without detailed root zone assessment. Encroachments greater than 10% require specific arboricultural assessment.

SULE – Safe Useful Life Expectancy. A systematic pre-development tree assessment procedure developed by Jeremy Barrell, Hampshire, England. The SULE method used in this assessment has been adapted for simplified use within the field. It gives a length of time that the Arborist feels a particular tree can be retained with an acceptable level of risk based on the information available at the time of the inspection. SULE ratings are Long (retainable for 40 years or more with an acceptable level of risk), Medium (retainable for 16-39 years), Short (retainable for 5-15 years) and Removal (tree requiring immediate removal due to imminent hazard or absolute unsuitability).

RECOMMENDATIONS – Retain (R), Retain Plus (R+), Transplant (T) or Remove (Rm).

COMMENTS – Comments relating to the location, surroundings and hazard potential of the trees at the time of inspection and where applicable the reason for removal.



9.0 BIBLIOGRAPHY & REFERENCES

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All care has been taken to assess potential hazards, but trees are inherently dangerous. This assessment was carried out from the ground, and covers what was reasonable to be assessed at the time of inspection. No aerial or underground inspections were carried out. Liability is accepted for damage or injury caused by trees and no responsibility is accepted if the recommendations in this report are not adhered to. Limitations on the use of this report: This report is to be utilised in its entirety only. Any written or verbal submission that includes statements taken from this report may only be used where the whole report is referenced. Assumptions: Care has been taken to obtain accurate information from reliable sources. Botanics can neither guarantee nor be responsible for the accuracy of information provided by others.