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4 HARVEY ROAD

INGLESIDE, NSW

DEVELOPMENT PROPOSAL

ARBORICULTURAL IMPACT ASSESSMENT (AIA) REPORT

Ref No- 3824

Prepared for
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INTRODUCTION

This report has been commissioned by Lynelle Adams C/- Roost Architecture. The purpose & scope of work is to assess the remaining Useful Life Expectancy (ULE) and potential impacts that may occur to significant trees in relation to a new development proposal. The proposed development consists of constructing a new horse arena with associated site sheds & access within Lot 169 of DP 752046, known as 4 Harvey Road INGLESIDE NSW.

Recommendations for retention or removal of trees is based on the tree's protection status, being prescribed or non-prescribed trees, tree structural condition, estimated remaining Useful Life Expectancy (U.L.E.) and potential impacts to trees by the design proposal.

Development incursions within tree protection zones (TPZ) are based on percentages of incursion noted within Note 2 of Appendix- A and are described as Negligible (0%), Minor (<10%) & Major (>10%) TPZ occupancy having *Low*, *Moderate* to *High* level impacts within the Tree Protection Zone (TPZ).

Where site restrictions within notional root zone radiuses exist development impacts or encroachment disturbances are based on author's experience, observations of site conditions, soil type and topography.

Each assessed within this report tree has been accorded a temporary identification number and is referred to by number throughout this report. For additional trees not plotted in provided documentation their location has been estimated by taking offsets from existing trees and structures.

The trees assessed, their location, development impact and design requirements have been detailed within the Tree Assessment Schedule and Tree Location Plan of Appendices D & E.

Care has been taken to obtain information from reliable sources. All data has been verified as far as possible, however, I can neither guarantee nor be responsible for the accuracy of information provided by others.

DISCLAIMER & LIMITATION ON THE USE OF THIS REPORT

This report is to be utilized 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 copy) is referenced in, and directly to that submission, report or presentation. Unless stated otherwise: Information contained in this report covers only the tree/s that were examined and reflects the condition of the trees at the time of inspection: and the inspection was limited to visual examination of the subject tree without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject tree/s may not arise in the future. Arborist cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specific period of time. Trees are a living entity and change continuously, they can be managed but not controlled and to be associated near one involves some degree of risk.

METHODOLOGY

1. In preparation for this report a site and ground level visual tree inspection was conducted on Wednesday 3rd April and Thursday 2nd May 2024 by the author of this report. The principles of visual tree inspection were primarily adopted from components of Mattheck & Breloer 1994 'The Body Language of Trees' with basic risk values determined by criteria explained within the ISA TRAQ (tree risk) manual 2017. The inspection included observing the overall health and vigour of trees, tree form, structure and structural condition as best as site conditions would allow. On completion of the inspection the retention value of the tree was summarised utilizing the tree inspection Checklist provided within Appendix- C.
2. The inspection was limited to visual observations where no aerial (climbing) inspections, woody tissue testing, or tree root investigation was undertaken. Tree height and canopy spread was estimated and expressed in metres with trunk diameters measured at approximately 1.4 metres above ground level, rounded off to the nearest 50mm and expressed as DBH (Diameter at Breast Height). Where multi stems at or near the base exist the stem group diameter was estimated as a tight clump.
3. This report acknowledges and utilizes the current Australian Standards 'Protection of Trees on Development Sites' AS4970 – 2009 as explained within Notes of Appendix- A.
4. Unless specified otherwise all distances and development offsets within this report are taken from the centre of the tree as indicated within provided survey and/or design documentation.
5. Plans and/or documentation reviewed to assist in preparation of this assessment include:
 - Roost Architecture, design drawings *specific to*:
 - Proposed Site Plan WST & Floor Plan: Dwg No: 100/a dated 9.5.24
 - Proposed Bulk Excavation Plan: Dwg No: 101/a dated 9.5.24
 - Sections & Elevations 1 & 2: Dwg No: 200/a & 201/a dated 9.5.24
 - Broadcrest Consulting Pty Ltd
 - On-Site Wastewater Report ref No: 3573-WW-A-01, Appendix- A Site Layout Plan, Sheet 1 of 1, rev A-01 dated April 12.4.2024
 - DP Surveying
 - Site Survey Sheet 1 of 2 dated 31 August 2023

1. SUMMARY OF ASSESSMENT

1.1 General tree assessment

1.1.1 Twenty-eight (28) trees have been assessed for the purpose of this development proposal. Of the twenty-eight trees two (2) trees contain low retention values and two (2) trees are exempt non-prescribed trees.

1.1.2 Low retention value tree(s) are identified as:

- T7 & 24.

The trees display developing structural faults or have been damaged by past storm activities modifying tree form. Based on tree condition and expected short remaining safe site usefulness the trees should generally not restrict development applications.

1.1.3 Exempt non-prescribed trees are identified as trees:

- T4 & 10.

Of the above trees T4 is under 5m in height and T10 is a dead tree without obvious habitat value.

Being exempt non-prescribed specimens, the above trees are permitted to be managed (pruned, removed or relocated) without Council consent. Should an exempt species require retention further arborist advice and protection methodology as indicated within Section 2.3 *General tree protection requirements* is required prior to works occurring within Tree Protection Zone (TPZ) radiuses.

1.1.4 Based on the inspection conducted, apart from low retention value trees, the trees inspected are considered viable for retention without change in existing site conditions or modification within Tree Protection Zone (TPZ) radiuses as indicated within the SRZ & TPZ distance column Appendix- D.

1.2 The development proposal

1.2.1 The development proposal consists of constructing a new horse arena, site shed and level access area. The design proposal includes stormwater management with bulk earthworks of cut & fill located within Tree Protection Zone (TPZ) radiuses of prescribed (protected) and non-prescribed trees.

1.3 Tree removal to accommodate design

1.3.1 Based on the current design three (3) prescribed trees T7, 13 & 28 and two (2) exempt trees T4 & 10 are proposed for removal to accommodate the design proposal.

1.3.2 The identified development impacts and design requirements have been detailed and require to be reviewed as part of this report within Appendix-D, and are summarized within the following sections.

1.4 Specific discussions

- 1.4.1 Based on the documents reviewed trees T1, 5, 6, 8 & 12 receive *Major* (>10%) TPZ encroachments, of somewhat moderate & manageable impact by excavation. Specific requirements that are recommended to mitigate impacts by excavation should consist of the following guidelines:
- There is to be no excavation within Structural Root Zone (SRZ) setbacks without arborist advice & certification. The SRZ is to remain a development access & activity exclusion zone.
 - Excavation for the horse arena retaining wall, cut & footings are to be supervised and certified by an appointed site arborist.
 - Within the TPZ, excavation to the first 0.5m (500mm) in depth for retaining wall construction should be conducted manually, by hand, under the supervision of an appointed site arborist.
 - Encountered tree roots along the line of cut are to be managed, clean cut & protected as directed or conducted by the arborist in accordance with AS4970 – 2009 Section 4.5.4 *Root protection during works within the TPZ*. All cuts shall be clean cuts made with sharp tools such as secateurs, pruners, handsaws, chainsaws or specialized pruning equipment as per Section 9 *Root pruning of AS4373 Pruning of Amenity Trees 2007*.
 - In areas of deep excavation the cut face is recommended to be protected with geotextile fabric or similar to protect the soil profile and treated roots from exposure.
- 1.4.2 Tree 1 specific: installation of the SW service line should be conducted utilising tree sensitive excavation such as trenchless technology (underboring), soil vacuum or manual (hand) excavation. Critical roots at or >30mm(Ø) are to be retained intact, not damaged by works with services tunneled beneath critical roots to mitigate impacts within the TPZ.
- 1.4.3 Tree 25 specific: Ideally the SW service line should be located at or near the 6m setback as indicated within drawing Plan No: 100/a with Wastewater Management Plan Appendix- A having the service line at or near 3.6m from the tree. At 3.6m similar root management as indicated above for tree T1 should be applied to manage TPZ disturbances.

1.5 Discussion of development impacts

Tree removal – prescribed trees

Tree(s) located within the design footprint

- 1.5.1 One (1) tree T28 (Bottle Brush) falls directly within the driveway access footprint requiring removal to accommodate design.

Tree(s) identified for removal having Major (>10%) TPZ encroachments

- 1.5.2 Two (2) trees T7 (Water Gum) & T13 (Melaleuca) receive *High to Significant* (>35%) encroachment impacts within the SRZ & TPZ due to excavations required for retaining wall construction. Of these trees T7 has been identified with a structural fault and low retention value.

Tree retention:

Trees receiving negligible to Minor (<10%) impacts by design

1.5.3 Excluding wastewater services, the following trees receive *Negligible* (0%) to *Minor* (<10%) TPZ building footprint encroachments without occupancy within the SRZ.

- T2, 3, 6, 9, 11 & 14 to 27 inclusive.

The trees are considered capable of being appropriately managed in accordance with Section 2.3 *General tree protection requirements*.

Trees receiving low-level & manageable (<15%) TPZ encroachment

1.5.4 Tree(s) receiving manageable encroachments (<15%) TPZ occupancy capable of being managed in accordance with Section 2.3 *General tree protection requirements* are identified as:

- T1, 5 & 12.

Tree specific requirements, protection & management recommendations for these tree(s) are summarized as:

Tree T1:

- a) As indicated within Section 1.4, the location of the wastewater service line is to be conducted utilising tree sensitive installation ensuring tree roots at or >30mm(Ø) are retained and not damaged by works.
- b) The SRZ radius is to remain a development activity and access exclusion zone.
- c) Demolition of the existing site shed within the SRZ & tree protection zone should be conducted carefully, by hand, to mitigate damage to the tree. The removal of all below ground services for demolition (foundations & footings) are to be supervised & certified by an appointed site arborist.
- d) Within the TPZ excavation for retaining wall construction to the first 0.5m (500mm) in depth is recommended to be conducted manually, by hand, under the supervision of an appointed site arborist.
- e) Encountered tree roots along the line of cut are to be managed, clean cut & protected as directed or conducted by the arborist in accordance with AS4970 – 2009 Section 4.5.4 *Root protection during works within the TPZ*. All cuts shall be clean cuts made with sharp tools such as secateurs, pruners, handsaws, chainsaws or specialized pruning equipment as per Section 9 *Root pruning of AS4373 Pruning of Amenity Trees 2007*.

Tree T5 & 12:

- f) As above and specific to arborist supervision for tree root management in accordance with AS4970 – 2009 Section 4.5.4 *Root protection during works within the TPZ*. The face of the exposed soil profile is also recommended to be protected from exposure immediately after excavation.

Trees receiving Moderate to High (20-25%) encroachment impacts

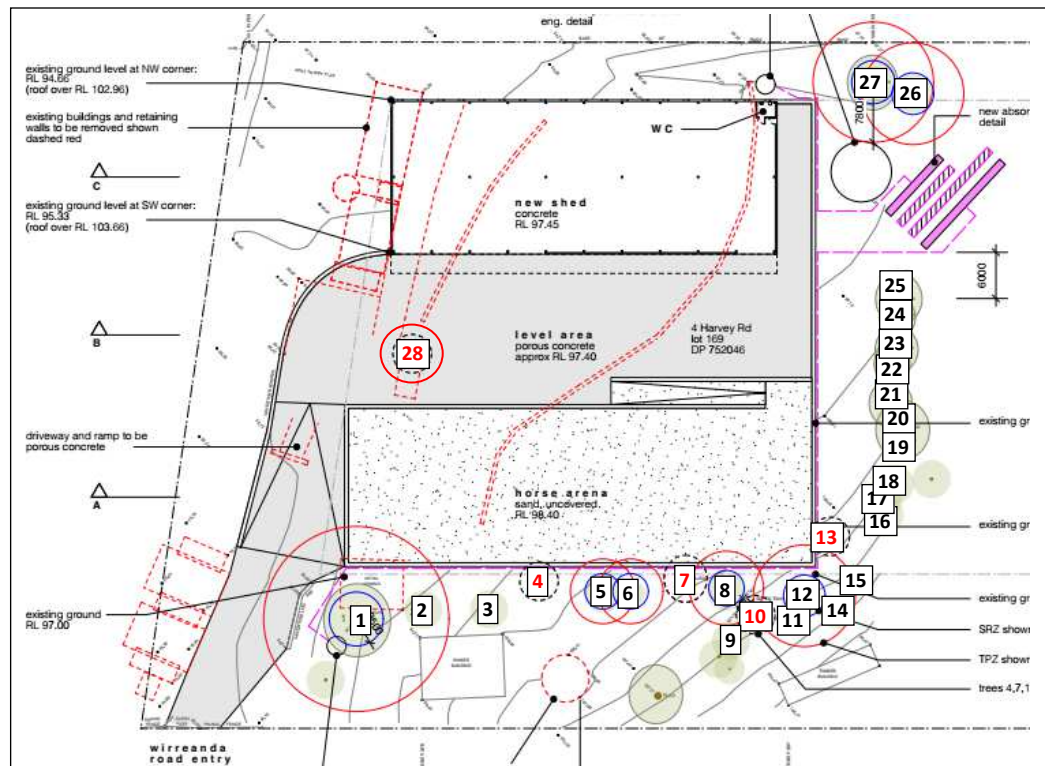
1.5.5 Tree T8 receives a *Moderate to High* TPZ encroachment impact at or near 21.5% with slight SRZ occupancy. Given slight SRZ occupancy and less than 25% encroachment impact the following guidelines are recommended to mitigate impacts by the design proposal.

- a) The line of excavation cut to the first 0.5m (500mm) in depth for retaining wall construction should be conducted manually, by hand, under the supervision of an appointed site arborist.
- b) Encountered tree roots along the line of cut are to be managed, clean cut & protected as directed or conducted by the arborist in accordance with AS4970 – 2009 Section 4.5.4 *Root protection during works within the TPZ*. All cuts shall be clean cuts made with sharp tools such as secateurs, pruners, handsaws, chainsaws or specialized pruning equipment as per Section 9 *Root pruning of AS4373 Pruning of Amenity Trees 2007*.
- c) The face of the deep cut and exposed roots is recommended to be protected with geotextile fabric or similar to mitigate exposure of the soil profile and exposed roots.

Trees receiving Significant to High-level encroachment impacts

1.5.6 Tree 13 receives a *High-level* encroachment impacts where excavation encroachment within the SRZ would likely compromise tree stability. Tree canopy mass lean would also contribute to increasing the risk of tree failure where excavation is required within the structural root zone.

Figure 1: showing design footprint & tree removal plan



2. CONCLUSIONS & RECOMMENDATIONS

2.1 Tree Removal

- 2.1.1 With Council review & consent the following three (3) prescribed trees are required or recommended for removal to accommodate the design proposal: **T7, 13 & 28**.
- 2.1.2 Exempt non-prescribed trees specified for removal to accommodate the design proposal are identified as trees: **T4 & 10**.

2.2 Specific tree management recommendations

- 2.2.1 In addition to the recommendations provided within this report the following summary or additional recommendations are provided as a guide for tree management due to the design proposal:

Bulk earthwork & over excavation

- a) To mitigate additional impacts within tree protection zones the extent of over excavation is recommended to be limited to the excavation identified within Bulk Excavation Plan No: 101/a.

Wastewater management

- b) Adjacent T1, specific on-site arborist supervision & tree management for service installation is required to ensure critical roots are not damaged or disrupted by works. Underboring trenchless technology, manual hand excavation or soil vacuum excavation should be undertaken to mitigate disturbances to tree roots at or >30mm(Ø).
- c) Adjacent T25, ideally the Wastewater plan should position the service line at a 6m setback as shown within Plan 100/a, opposed to the 3.6m setback shown within Appendix- A of the Wastewater Report. Where at or near the 3.6m setback is required tree sensitive installation as indicated above for tree 1 applies.

- 2.2.2 A specific tree protection area (TPA) has been detailed within Appendix- F the Tree Management (Area) Plan where key milestone point of arborist certifications are required for the following:

- Certification that all trees have been adequately protected with tree protection fencing or timber beam trunk protection in accordance with Australian Standard AS4970 Protection of Trees on Development Sites– 2009.
- Supervision certification for below ground demolition of the site shed adjacent T1.
- Supervision certification for the installation of SW service line adjacent T1.
- Supervision and certification for all excavation and tree root management within tree protection zones for construction of retaining wall, foundations and footings and stormwater services.

2.3 General tree protection requirements

- a) Prior to site works, including demolition, Tree Protection Fencing (TPF) and/or zones as identified within this report or Appendix- B are recommended to be located under the guidance of an appointed site arborist. Unless specified otherwise the location of tree protection fencing is to be positioned to allow for adequate work access and/or be located at the extremity of the TPZ radius as indicated within the SRZ & TPZ distance column Appendix- D.

Where design & construction access may be restrictive by tree protection fencing timber beam trunk protection is recommended to be installed with ground protection mats provided to protect underlying tree roots within tree protection zones or designated tree protection areas (TPA).

- b) Unless approved otherwise activities to be excluded within TPZ radius or specified tree protection areas (TPA's) include:
- Machine access & excavation.
 - Minor works including trenching & installation of utility services.
 - Storage & work preparation including wash down areas.
 - Soil level change and physical damage to trees.

Activities that minimize the impact of TPZ disturbances include:

- Within the TPZ radius, TPA or extending 2m outside the canopy dripline installation of native leaf mulch not greater than 80mm in depth with routine irrigation based on arborist advice is recommended.
- c) In accordance with AS4970 - 2009 (1.4.4) during works a Project or Site Arborist is to be engaged to monitor, supervise excavation within TPZ setbacks, advise and provide certification of protection works conducted. The project arborist is recommended to hold a minimum Australian Qualification Framework (AQF) Level 5 certification and be competent in methodology of protecting trees on development sites.
- d) The project arborist is to provide final certification outlining tree protection measures with photographic evidence of ongoing works retained for certification purposes (AS4970 S/5.5.2 *Final certification*).
- e) The project arborist is to be familiar with protection measures specific to Australian Standard AS4970 'Protection of Trees on Development Sites' – 2009 requirements with any modification in Tree Protection Fencing (TPF) or Zones (Z) to be compliant with AS4970 Section 4.5 *Other Tree Protection Measures*.
- f) Approved excavation within TPZ setbacks; there shall be no over excavation beyond the line of cut as shown within construction drawings without arborist advice. Should over excavation be required the extent of excavation should be detailed within approved drawings or a construction management plan for arborist review and endorsement.

- g) Unless specified otherwise during approved excavation within TPZ setbacks excavation is to be conducted manually (by hand) under the supervision of an appointed site arborist. Where approved by the arborist the pruning of roots at or <30mm(Ø) is to be conducted in accordance with AS4970 – 2009 Section 4.5.4 *Root protection during works within the TPZ*, such that tree roots are not damaged or ripped beyond the point of excavation by site machinery.

Where larger roots have been encountered, they are to be referred to an independent Level 5 arborist for further advice. For deep excavations exposed roots at the excavated cut face are to be protected with jute mesh, geotextile fabric or similar being secured in place to avoid drying of roots and the exposed soil profile.

- h) *Additional inground services* which may include landscape works, fencing, sewer, stormwater, water and electrical services, final design and impact to trees shall be reviewed and endorsed by the project arborist prior to their installment. Where landscaping (excavation) is required within the SRZ further advice from an appointed project arborist is recommended.

- i) *Tree sensitive construction measures* such as pier and beam bridging over critical roots, suspended slabs, cantilevered building sections, screw piles and contiguous piling can minimise the impact of encroachment (AS4970).

Where Bushfire BAL conflicts exist with tree management advice the appointed project arborist shall be consulted to advise on an appropriate design outcome.

- j) *Canopy pruning / tree removal*: where required tree removal and canopy reductions are to be approved by the Local Government Authority. Works are to be conducted by a suitably qualified AQF Level 3 certified arborist in accordance with AS4373 Pruning Standards, and specifically be conducted in accordance with Safe Work Australia – Guide to managing risks of tree trimming and removal works 2016 (www.swa.gov.au).

- k) *Hold points*: specific to no works are to commence without arborist advice, inspections & certifications:

- 1) Prior to works arboricultural certification is to be provided ensuring that all trees have been adequately protected in accordance with this report, or as indicated within Australian Standard AS 4970 Protection of Trees on Development Sites– 2009.
- 2) No works (including landscaping) shall occur within the SRZ of any tree without prior arborist advice and certification. Where excavation may be required prior exploratory tree root investigation are to identify the location, distribution and impact to underlying tree roots.

- 3) No excavation shall occur within tree protection zones without prior project arborist notification and/or site supervision.
 - 4) No access, work activity or storage is permitted within fenced or designated tree protection areas (TPA's) or Tree Protection Zone (TPZ) radiuses without arborist advice and certification.
- l) To ensure tree(s) are appropriately protected the development site superintendent is recommended to be familiar with all tree protection and ongoing certification requirements.
The superintendent is responsible for informing all subcontractors of the responsibilities and requirements of tree protection prior to their engagement.
- m) Should there be any uncertainty with tree protection requirements the site superintendent shall contact the appointed project arborist for advice prior to works occurring within tree protection zones (TPZ) or specified tree protection areas (TPA).
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Should you require further liaisons in this matter please contact me direct on 0419 250 248

Yours sincerely



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AQF Level 5 consulting arborist

Diploma of Hort/Arboriculture (AQF5), Associate Diploma Parks Management (AQF4)
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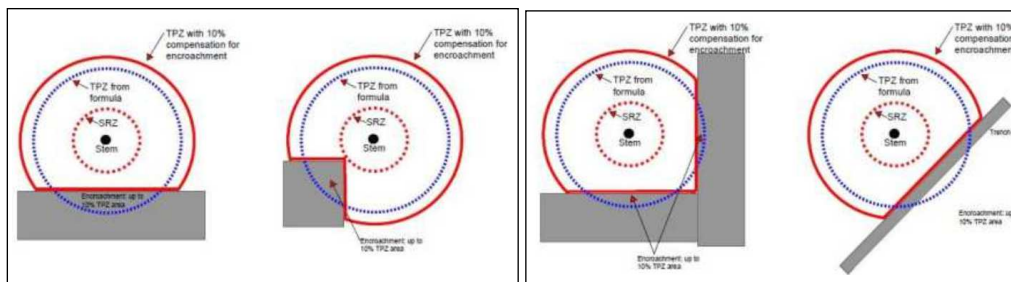
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APPENDIX- A: Terminology, notes & references

Acceptable Risk: Exposure to or reject risk of varying degrees. The acceptable risk is defined as 'The person who accepts some degree of risk in return for a benefit being exposed to some risk of varying degree. **Age classes:** (I) Immature refers to a well established but juvenile tree. (ESM) refers to an early semi mature tree not of juvenile appearance. (SM) Semi-mature refers to a tree at growth stages advancing into maturity and full size. (LSM) Late Semi- Mature, refers to a tree between semi-mature and close to mature. (EM) refers to a tree at the first stages of maturity. (M) Mature refers to a full size tree with some capacity for future growth. **Health:** Refers to a trees vigor exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and the degree of dieback. **Condition:** Refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils) and the state of the scaffold (i.e. Trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk / branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition. **Decay:** (N) – an area of wood that is undergoing decomposition. (V) – decomposition of an area of wood by fungi or bacteria. **Decline:** Is the response of a tree to a reduction of energy levels resulting from stress. Recovery from decline is difficult and slow; is usually irreversible. **Defect:** A identifiable fault in a tree. **Epicormic Shoots:** Shoots that arise from latent or adventitious buds that occur on stems and branches and on suckers produced from the base of the tree. A symptom / result of stress related factors. **Footprint:** The area occupied by site structures, including the dwelling driveways and hard surfaces. **Included Bark:** (Inclusion) a genetic weak fault, pattern of development at branch junctions where the bark is turned inwards rather than pushed out, can pose a potential hazard. **Order of branches:** First order being those that are the first to extend from the main trunk or codominant limbs, second order branches extend from the first order and third order branches extend from the second order. **Probability:** The likelihood of some event happening. **Risk:** Is the probability of something adverse happening. **Suppression:** Restrained growth pattern from competition of other trees or structures. **Wound:** Damage inflicted upon a tree through injury to its living cells, may continue to develop further weakening of the structure compromising structural integrity. **NOTE 1:** This report acknowledges the current **Australian Standards 'Protection of Trees on Development Sites'** AS 4970 – 2009 with reference to the Tree Protection Zone (TPZ): being a combination of the root and crown area requiring protection. The TPZ takes into consideration the Structural Root Zone (SRZ): The area required for tree stability. Determined by AS4970 - 2009 Figure 1, Table of determining the SRZ, section 3.3.5 of the standards. The standard states where a greater than 10% encroachment occurs the arborist is to take into consideration the schedule of determining impacts as set within AS4970 s. 3.3.4. Encroachments are referred to within this report as major or minor encroachments (AS4970 s. 3.3.2 & 3.3.3). Below is the terminology used for estimated percentage of development incursion used within this report. To retain specific trees and ensure their viability development must take into consideration protection of the TPZ radius. **NOTE 2: The extent of inclusion within the TPZ radius has been categorised as follows:** *Low impact* 0 - 10% of minor consequence. *Low to Moderate* 10 – 15% incursion where the project arborist is to demonstrate the tree(s) remain viable. *Moderate* 15 – 20% incursion where the project arborist is to demonstrate the tree(s) remain viable by tree sensitive construction techniques. *Moderate to high* 20 – 25% incursion requiring specific protection methodology to retain. *High impact* 25 – 35% incursion where design changes or further information is required to manage tree vitality which includes *Significant* >35% incursion. **WBF** = located within design or building footprint where design necessitates tree removal.

NOTE-3: Showing acceptable 10% incursion within TPZ radiuses (AS4970)



SELECTED REFERENCES:

Barrell J. 1993, 'Preplanning Tree Surveys: Safe useful Life expectancy (SULE) is the Natural Progression', *Arbicultural Journal* 17: 1, February 1993, pp. 33-46.

International Society of Arboriculture (ISA) 2013, Tree Risk Assessment Manual, Martin Graphics, Champaign Illinois U.S.

Mattheck, C. & Breloer, H.(1994) *The Body Language of Trees*. Research for Amenity Trees No.4 the Stationary Office, London.

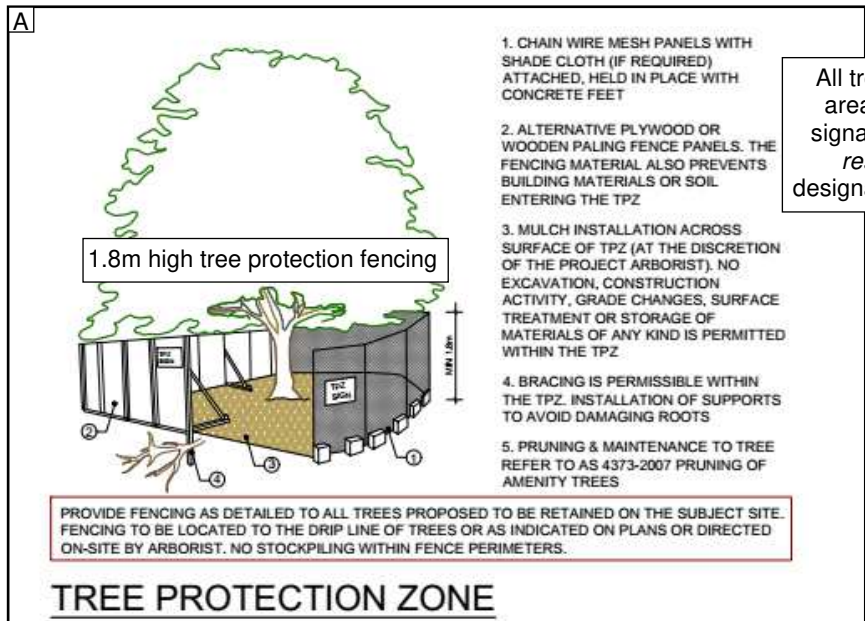
Matheny N. & Clark J. 1998, *Trees & Development 'A Technical Guide to Preservation of Trees During Land Development'* International Society of Arboriculture, Champaign USA.

ProSafe: TPZ encroachment calculator https://proofsafe.com.au/tpz_incursion_calculator.html Standards

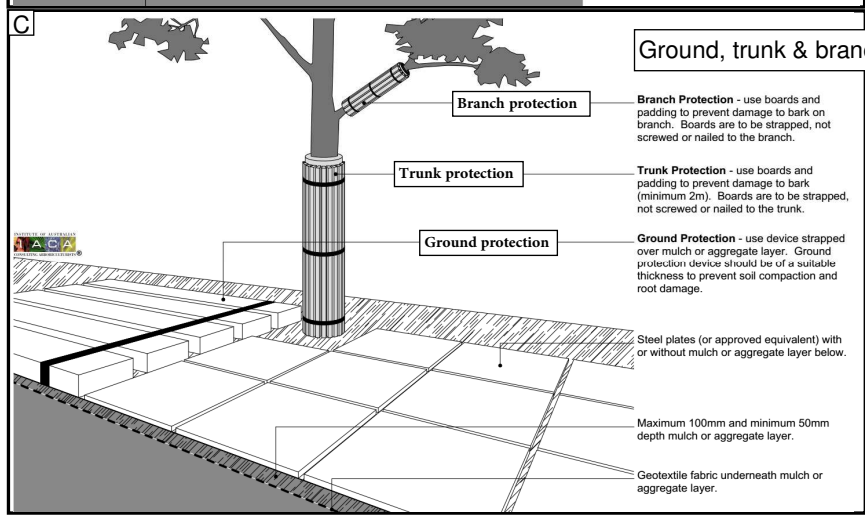
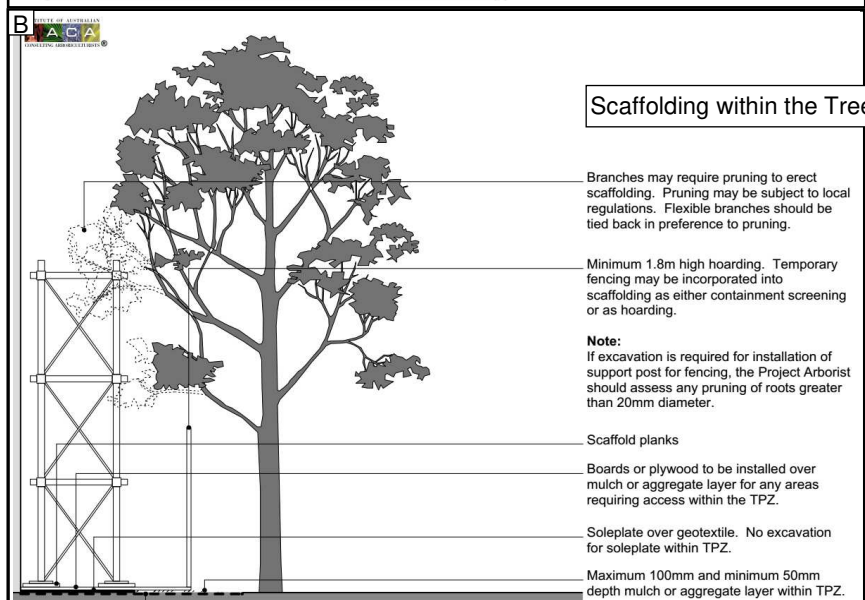
Australia 2009, *Australian Standards 4970 Protection of Trees on Development Sites* - Standards Australia, Sydney, Australia.

Northern Beaches Council DCP <https://www.northernbeaches.nsw.gov.au/planning-and-development/building-and-renovations/planning-controls>

APPENDIX- B: Tree protection fencing, ground and trunk protection detail



All tree protection fencing or areas requires appropriate signage clearly stating a *TPZ restriction zone* being a designated Tree Protection Area



APPENDIX- C: Tree Retention Value Check list @rainTree consulting

i) Landscape Significance (LS): The significance of a tree in the landscape is a combination of its amenity, environmental and heritage values. Values may be subjective however, offer a visual understanding of the relative importance of the tree to the environment. The Landscape Significance of a tree is described in seven categories to assist in determining the retention value of trees.

1	Significant	2	Very High	3	High	4	Moderate	5	Low	6	Very Low	7	Insignificant
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ii) Visual Tree Assessment (VTA)

0	If appropriate to VTA - *exempt trees from Local Government Authority (LGA) Tree Management or Preservation Orders (TPO)	2E	Tree location likely to be affected by infrastructure restricting root growth potential, or tree has potential to cause infrastructure damage where risk mitigation or rectification works may compromise tree anchorage. Tree(s) may be contained by sloid structures with restricted anchoring root(s)
0A	Noxious or invasive weed species located within heritage conservation areas		
1	Trees that are dead, significantly declining >75% volume or obviously hazardous	3	This rating incorporates trees that may require further investigation of defects such as cavities or symptoms indicating internal decay to an extent that cannot be quantified under visual examination. Further inspections may be in the way of arborist climbing inspection within the canopy, root crown investigation and/or drill penetrating or Picus Sonic Tomograph ultrasound testing procedures to determine percentage of internal decay.
2	Trees that are structurally damaged. Have poor structure or weak & detrimental large stem inclusions capable of failure opposed to 2B. Tree also may be affected by extensive borer damage, fungal pathogens (wood rot) or viruses. Some symptoms may be reversible, remediated or controlled give appropriate management.		
2A	Tree damage specific to basal and/or root plate damage, or very shallow soils, or steep topography resulting in poor anchorage where condition may become problematic in near future / may include trees with included bark splits to ground level	4	Trees which appear specifically environmentally stressed by drought, poor soil or site conditions. Symptoms may be reversible given appropriate management
2B	Defect specific to stem inclusions development (weak branch attachments) where the condition may not be immediately detrimental however, require annual to biannual monitoring with control to prevent stem failure by installing slings, cable or bracing. Tree may also contain multi stems or codominant twin stems	5	Trees that have become exposed or are subject to wind loading, or have tall forest form where exposure may result in windthrow or limb snap
		5A	Screen trees or shrubs that are routinely hedged, pruned or managed for height control
2C	Tree may contain minor wounds, pest or minor pathogen activity, altered from storm damaged to an extent that is not considered immediately detrimental - may also display average form. Likely to require close annual monitoring or minor corrective pruning	6	Trees may be typical for species type, of good form and visual condition for age class. May have suppressed one sided canopy, or are low risk trees
2D	Trees significantly altered by recent storm or over pruning events which may reduce retention values due to average form- or tree extensively pruned for power line clearance	7	VTA restricted by canopy or plant material vine or ivy covering tree parts, or site conditions which do not allow access- fences to neighbouring sites

iii) Retention Value (RV): Determined by [1] tree free of visual defects and viable for retention, [2] viable for retention with minor faults which may reduce ULE, [3] trees containing faults that are likely to become problematic in the future, [4] trees to be considered for removal due to poor or average condition.

1	High retention	2	Medium retention	3	Low retention	4	Consider removal
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iv) U.L.E. categories Useful Life Expectancy (after Barrell 1996, modified by the author). A trees U.L.E. category is the life expectancy of the tree modified first by its age, health, condition, safety and location. U.L.E. assessments are not static but may be modified as dictated by changes in trees health and environment.

1. Long U.L.E. - Appear retainable at the time of assessment for over 40 years with an acceptable degree of risk assuming reasonable maintenance.
2. Medium U.L.E. - Appear to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk assuming reasonable maintenance.
3. Short U.L.E. - Trees appear to be retainable at the time of assessment for 5 to 15 years with an acceptable degree of risk assuming reasonable maintenance.
4. Very short - Removal- Trees which should be scheduled for removal within the very short term or as specified within this report.
5. Small, young or regularly pruned – Trees under 5m in height that can be easily moved or replaced, includes screen plantings or hedge lines.

APPENDIX- D: Tree Assessment Schedule

Refer Appendix- C Tree retention value Checklist

Consider tree removal due to dead or high-risk condition - subject to Local Government Authority notification						Trees with low retention values: senescence, are significantly environmentally stressed, have developing defects or being *exempt non-prescribed trees within the LGA						
Tree No	Botanical Name COMMON NAME	Height x spread (m)	DBH (mm)	SRZ TPZ (m)	Age	Vigour (health)	Condition (structure)	LS	VTA	RV	ULE	Comments
1	<i>Casuarina cunninghamiana</i> River Oak	22 x 16	1000	3.4 12	M	Good	Fair / Good	3	6	1	2	Tree with no significant visual faults
<p><i>Design impact summary: Proposed design footprint at RL98.4 by uncovered open horse arena is located outside the SRZ, where excluding the existing hard surface driveway, with the part new additional driveway fill design proposes a manageable Moderate (10-15%) TPZ incursion at or near 15.7%. Based on the design footprint excluding SW service impact the tree is capable of being managed in accordance with manageable impacts within Section 2.3 General tree protection requirements, specific to: SW service management by underboring or soil vacuum to ensure tree roots at or >30mm(Ø) are retained and not damaged. Excavation for horse arena footprint to be supervised and certified by appointed site arborist managing all roots, review & approval of civil retaining wall & any over excavation, manual demolition (by hand) all above ground shed parts with arborist supervision & certification for removal of below ground structures (foundations & footings).</i></p>												
2	<i>Syzygium luehmannii</i> Small leaved Lillypilly	9 x 9	300, 250	2.6 6.6	EM	Good	Fair / Good	3	2C	2	2	Twin stems at near ground level, root buttressing STH, with no significant visual faults
<p><i>Design impact summary: Proposed building footprint at or near 5.2m from tree & outside the SRZ having an overall Minor (<10%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to: hydraulics to retain & tunnel beneath tree roots >30mm(Ø).</i></p>												
3	<i>Backhousia myrtifolia</i> Myrtle	8 x 4	250at base	1.8 3	SM	Good	Fair	3	2B/C	2	2	Twin stems at 1m with stem inclusion development & past pruning cuts in lower branch scaffolds
<p><i>Design impact summary: Proposed building footprint outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to: no excavation within SRZ & TPZ without arborist advice.</i></p>												
*4	<i>Banksia robur</i> Swamp banksia	3 x 3	250at base	1.8 3	M	Good	Good	4/3	0/6	1	2	Exempt tree species height class <5m, with no significant visual faults
<p><i>Design impact summary: Proposed removal to accommodate design footprint with design located within the SRZ at or near 1.3m from tree having a High-level of both canopy & root encroachment impact.</i></p>												
5	<i>Backhousia citriodora</i> Lemon Scented Myrtle	8 x 4	350	2.3 4.2	M	Good	Fair / Good	3	2B	2	2	Multi stems at 1.4m with minor stem inclusion development
<p><i>Design impact summary: Proposed excavation for arena footprint is located outside the SRZ with TPZ excavation & occupancy to accommodate RL98.4 of manageable Moderate-to Low (10-15%) TPZ incursion at or near 10.6% occupancy. Being located outside the SRZ tree capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to no over excavation beyond that which is shown within documentation, with site arborist supervision during excavation to manage roots in accordance with AS4970 – 2009 Section 4.5.4 Root protection during works within the TPZ, being pruned & protected by appointed site arborist such that tree roots are not damaged or ripped beyond the point of excavation by site machinery, with hydraulics to retain & tunnel beneath tree roots >30mm(Ø).</i></p>												

Refer Appendix- C Tree retention value Checklist

Consider tree removal due to dead or high-risk condition - subject to Local Government Authority notification				Trees with low retention values: senescence, are significantly environmentally stressed, have developing defects or being *exempt non-prescribed trees within the LGA								
Tree No	Botanical Name COMMON NAME	Height x spread (m)	DBH (mm)	SRZ	Age	Vigour (health)	Condition (structure)	LS	VTA	RV	ULE	Comments CV = Council verge tree NT = Neighbouring tree
				TPZ (m)								
6	<i>Buckinghamia celsissima?</i> Ivory Curl Tree	5 x 3.5	350	2.3	M	Good	Fair / Good	3	2B	2	2	Benefit from flower & fruit for correct identification. Multi stems at 0.7m with very minor stem inclusion development
<p><i>Design impact summary: Proposed excavation for arena footprint is located outside the SRZ with TPZ excavation & occupancy to accommodate RL98.4 of manageable <10% Low level occupancy at or near 9.5%. Being located outside the SRZ tree capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to no over excavation beyond that which is shown within documentation, with site arborist supervision during excavation to manage roots in accordance with AS4970 – 2009 Section 4.5.4 Root protection during works within the TPZ, being pruned & protected by appointed site arborist such that tree roots are not damaged or ripped beyond the point of excavation by site machinery, with hydraulics to retain & tunnel beneath tree roots >30mm(Ø).</i></p>												
7	<i>Tristaniopsis laurina</i> Water Gum	11 x 8	450	2.5	M	Good	Fair	3	2	2	3	Twin main stems at 1.6m with defined stem inclusion development at 3m SE side= condition is likely to become problematic in the future = low retention value
<p><i>Design impact summary: Proposed tree removal to accommodate design. Design footprint and excavation proposes a Significant (>35%) SRZ & TPZ occupancy, at or near 37.7% indicating a high level of encroachment where excavation cut requires tree removal to accommodate works.</i></p>												
8	<i>Melaleuca lineariifolia</i> Melaleuca	8 x 5	x3= 400	2.3	M	Good	Fair / Good	3	2B	2	2	Multi stems at near ground level with minor stem inclusion development
<p><i>Design impact summary: Proposed excavation for arena at RL98.4 is just within the SRZ with TPZ coverage of Moderate-high (20-25%) TPZ incursion at or near 21.5% occupancy of just over Moderate impact. Given proposed excavation is just within or at the SRZ tree requires specific on-site arborist supervision and management during excavation for root management & protection ensuring roots are not damaged or ripped beyond the point of excavation by site machinery. Hydraulics, where possible are to retain & tunnel beneath tree roots >30mm(Ø) with tree generally managed under Section 2.3 General tree protection requirements.</i></p>												
9	<i>Eucalyptus punctata</i> Grey Gum	18 x 14	600	2.8	SM	Good	Fair	3	2C	2	2	Tree with slight lean NTH, lower trunk abnormalities to 3m by past wounding, likely pest activity, growing on rock
<p><i>Design impact summary: Proposed building footprint outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i></p>												
*10	<i>Hakea salicifolia</i> Hakea	6 x 5	400	2.4	-	-	-	6	1	4	4	Dead tree
<p><i>Design impact summary: Dead tree, manage in accordance with design intent</i></p>												

Refer Appendix- C Tree retention value Checklist

		Consider tree removal due to dead or high-risk condition - subject to Local Government Authority notification				Trees with low retention values: senescence, are significantly environmentally stressed, have developing defects or being *exempt non-prescribed trees within the LGA						
Tree No	Botanical Name COMMON NAME	Height x spread (m)	DBH (mm)	SRZ TPZ (m)	Age	Vigour (health)	Condition (structure)	LS	VTA	RV	ULE	Comments
11	<i>Melaleuca bracteata</i> Tea tree	9 x 4	200	1.8 2.4	M	Good	Good	3	6/5	1	1	CV = Council verge tree NT = Neighbouring tree Tree of tall forest form with no significant visual faults
<i>Design impact summary: Proposed building footprint outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i>												
12	<i>Melaleuca quinquenervia</i> Paperbark	17 x 6	550	2.7 6.6	ESM	Good	Fair / Good	3	2B	2	1	
<i>Design impact summary: Proposed arena footprint at RL98.4 is located outside the SRZ with TPZ occupancy of Moderate-Low (10-15%) TPZ incursion at or near 13.3%, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to: excavation to be supervised by appointed site arborist managing roots in accordance with AS4970 – 2009 Section 4.5.4 Root protection during works within the TPZ, being pruned & protected such that tree roots are not damaged or ripped beyond the point of excavation by site machinery. No works, excavation or access within the SRZ is recommended with a fenced tree protection area (TPA) installed & certified by an appointed site arborist prior to demolition. Hydraulics to retain & tunnel beneath tree roots >30mm(Ø) with no over excavation beyond that which is shown within Bulk Earthwork Plan 101/a.</i>												
13	<i>Melaleuca lineariifolia</i> Melaleuca	6 x 4	x3= 400	2.3 4.8	SM	Good	Fair / Good	3	2B	2	2	Multi stems at near ground level with minor stem inclusion development within upper branch scaffolds only
<i>Design impact summary: Proposed tree removal to accommodate design having a High level (25 - 30%) SRZ & TPZ incursion at or near 30% occupancy. Given proposed excavation is within the SRZ & tree canopy mass extends below the proposed deep cut a risk of tree collapse by the deep cut is possible.</i>												
14	<i>Hymenosporum Flavum</i> Native Frangipani	7 x 4.5	300at base	2 3.6	SM	Good	Fair / Good	3	2C	2	2	Estimated species type, located on rock with no decline in canopy
<i>Design impact summary: Proposed building footprint outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i>												
15	<i>Acacia sp</i> Wattle	5 x 3.5	250at base	1.8 3	SM	Good	Fair / Good	3	2B	2	<2	Estimated species type, multi stemmed at base, with minor stem inclusion development
<i>Design impact summary: Proposed building footprint outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i>												

Refer Appendix- C Tree retention value Checklist

Consider tree removal due to dead or high-risk condition - subject to Local Government Authority notification				Trees with low retention values: senescence, are significantly environmentally stressed, have developing defects or being *exempt non-prescribed trees within the LGA								
Tree No	Botanical Name COMMON NAME	Height x spread (m)	DBH (mm)	SRZ TPZ (m)	Age	Vigour (health)	Condition (structure)	LS	VTA	RV	ULE	Comments
16	<i>Angophora costata</i> Angophora	16 x 13	500	2.6 6.6	ESM	Fair / Good	Fair / Good	3	4	2	2	Environmentally stressed with large diameter deadwood & decline in canopy
<i>Design impact summary: Proposed building footprint & SW service line outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i>												
17	<i>Eucalyptus punctata</i> Grey Gum	15 x 4	250	2 3	ESM	Fair	Fair	3	4/5	2	2	Tree of tall forest form, environmental stress evident with decline in canopy
<i>Design impact summary: Proposed building footprint & SW service line outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i>												
18	<i>Eucalyptus punctata</i> Grey Gum	14 x 6	350	2.3 4.2	ESM	Fair	Fair	3	4	2	2	Environmentally stressed with decline in canopy & fine tip dieback, lower trunk skewed to 5m
<i>Design impact summary: Proposed building footprint & SW service line outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i>												
19	<i>Eucalyptus umbra</i> White Mahogany	12 x 3.5	250	2 3	ESM	Good	Fair / Good	3	2A	2	2	Past works within SRZ, minor basal disturbance with suppressed canopy form & slight lean N
<i>Design impact summary: Proposed building footprint & SW service line outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i>												
20	<i>Eucalyptus robusta</i> Swamp Mahogany	22 x 13	600	2.8 7.2	SM	Good	Good?	3	7	2	2	Restricted VTA vegetation vine to 8m, above ground visual parts appear in good order
<i>Design impact summary: Proposed building footprint & SW service line outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i>												
21	<i>Eucalyptus umbra</i> White Mahogany	10 x 3	300	2.1 3.6	ESM	Fair / Good	Fair / Good	3	4	2	2	Environmentally stressed with low foliage volume, epicormic shoots on lower trunk to lower branch scaffolds
<i>Design impact summary: Proposed building footprint & SW service line outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i>												

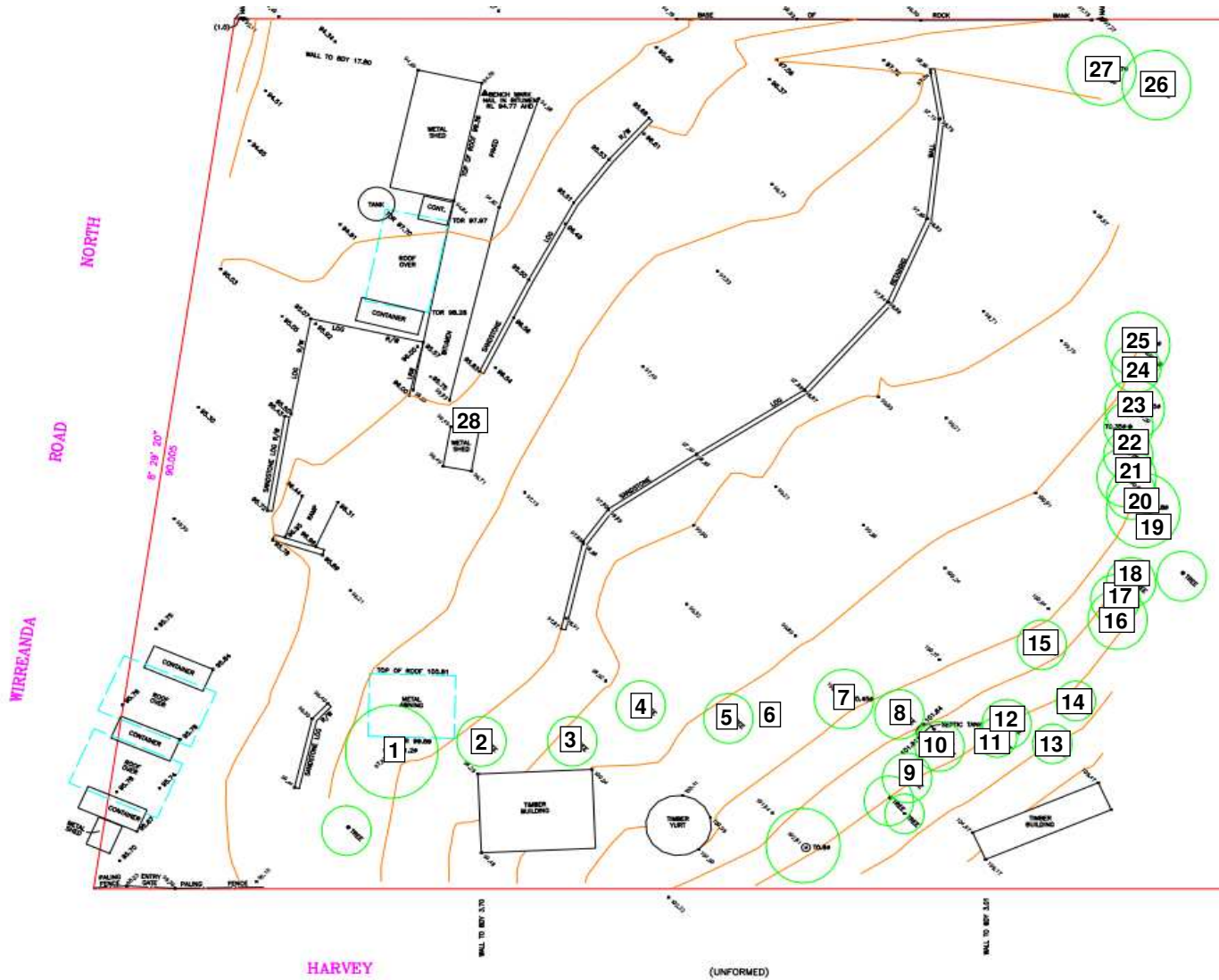
Refer Appendix- C Tree retention value Checklist

		Consider tree removal due to dead or high-risk condition - subject to Local Government Authority notification				Trees with low retention values: senescence, are significantly environmentally stressed, have developing defects or being *exempt non-prescribed trees within the LGA						
Tree No	Botanical Name COMMON NAME	Height x spread (m)	DBH (mm)	SRZ TPZ (m)	Age	Vigour (health)	Condition (structure)	LS	VTA	RV	ULE	Comments
22	<i>Lophostemon confertus</i> Brush Box	14 x 6	300	2.1 3.6	ESM	Good	Good	3	4	2	1	CV = Council verge tree NT = Neighbouring tree Canopy slightly environmentally stressed with no significant visual faults
<i>Design impact summary: Proposed building footprint & SW service line outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i>												
23	<i>Eucalyptus fibrosa</i> Iron Bark	23 x 15	750	3 9	SM	Good	Good	3	4	2	1	Canopy slightly environmentally stressed, with no significant visual faults
<i>Design impact summary: Proposed building footprint & SW service line outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i>												
24	<i>Angophora floribunda</i> Rough Barked Apple	6 x 8.5	400	2.4 4.8	SM	Good	Fair / Poor	3	2/7	3	3	Restricted VTA vegetation, past storm damaged apical stem reducing height & modifying form= low retention value
<i>Design impact summary: Proposed building footprint & SW service line outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements.</i>												
25	<i>Eucalyptus racemosa</i> Scribbly Gum	20 x 16	650	2.8 7.8	SM	Good	Fair / Good	3	2B	2	1	Contains minor stem inclusion development at 3m NTH
<i>Design impact summary: Proposed building design footprint outside the TPZ having Negligible (0%) TPZ encroachment with SW service line at or near 3.6m from tree with absorption trenches outside the TPZ . Ideally SW line should be located at a or near 6m setback to mitigate impacts by excavation. Alternatively; underboring, trenchless technology, soil vacuum or manual excavation should be conducted to retain without damage & tunnel under tree roots at or >30mm(Ø) under the supervision of appointed site arborist. Based on the building design footprint tree capable of being managed in accordance with Section 2.3 General tree protection requirements</i>												
26	<i>Eucalyptus umbra</i> White Mahogany	18 x 14	550	2.7 6.6	SM	Good	Fair / Good	3	2B	2	2	Contains minor stem inclusion development at 7m
<i>Design impact summary: Proposed building design footprint outside the TPZ having Negligible (0%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to: no excavation or access within the SRZ.</i>												
27	<i>Eucalyptus punctata</i> Grey Gum	14 x 11	650	2.8 7.8	SM	Fair / Good	Good	3	4	2	1	Canopy slightly environmentally stressed, with no significant visual faults
<i>Design impact summary: Proposed building footprint outside the SRZ having almost negligible to very Minor (<10%) TPZ encroachment, indicating tree capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to: no excavation or access within the SRZ.</i>												

Refer Appendix- C Tree retention value Checklist

		Consider tree removal due to dead or high-risk condition - subject to Local Government Authority notification					Trees with low retention values: senescence, are significantly environmentally stressed, have developing defects or being *exempt non-prescribed trees within the LGA					
Tree No	Botanical Name COMMON NAME	Height x spread (m)	DBH (mm)	SRZ	Age	Vigour (health)	Condition (structure)	LS	VTA	RV	ULE	Comments CV = Council verge tree NT = Neighbouring tree
				TPZ (m)								
28	<i>Callistemon viminalis</i> Bottle Brush	7 x 8	750at base	2.8 9	M	Good	Fair / Good	3	2B	2	2	Multi stemmed at base, main stems with minor stem inclusion development
Design impact summary: Proposed tree removal, within building or excavation footprint for concrete driveway access.												

APPENDIX- E: Tree Location Plan



APPENDIX- F: Tree Protection (Area) Plan

YELLOW = tree protection area (TPA) specified for trees, 1, 5, 6, 8, 12, 25 & 27

1) Arborist site supervision & certification for excavation within the YELLOW Tree Protection Area (TPA).

2) No excavation to occur within the TPA without arborist advice.

--- Location of proposed tree protection fencing

3) appointed site arborist to certify appropriate tree protection prior to works.

4) No excavation or access to occur within the SRZ without arborist advice

