rain Tree consulting

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28 March 2019

74 NARRABEEN PARK PARADE

WARRIEWOOD, NSW

PROPOSED HOME OFFICE

ARBORICULTURAL ASSESSMENT & DEVELOPMENT IMPACT REPORT

Report Ref No- RTC-4719

Prepared for

Mr. & Mrs. Harley
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INTRODUCTION

This report has been commissioned by Mr. & Mrs. Harley 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 development proposal consists of constructing a new home office facility within the property formally identified as Lot 16 of DP 23008 known as 74 Narrabeen Park Parade, WARRIEWOOD NSW 2102.

Recommendations for retention or removal of trees is based on the trees condition, accorded ULE category, current design and potential impacts to trees under this development application.

Development encroachments within this report are referred to as No impact (0%) incursion, Low impact (<10%) of minor consequence, Medium impact (<20%) incursion where the project arborist is to demonstrate the tree/s remain viable by tree sensitive construction techniques, and High level impact (>20%) where design changes or further information is required to manage tree vitality, refer section 2.3 Design impact mitigation works – *general advice.*

Each tree has been accorded a temporary identification number and is referred to by number throughout this report. For additional trees not plotted on provided documentation their location has been estimated by taking offsets from existing trees and structures. The subject trees may be referenced within the Tree Assessment Schedule and Tree Location Plan Appendices C and D.

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.

METHODOLOGY

i In preparation for this report a site and limited ground level Visual Tree Assessment (VTA) was conducted on Friday 15th March 2019 by the author of this report. The principles of VTA 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 manual 2013. The inspection included assessment of the overall health and vigour of the trees, tree form, structure and structural condition commencing from near the lower trunk to the upper first order branch division as best as site conditions would allow. On completion of the VTA the retention value of the tree was summarized utilizing the tree assessment Checklist, Appendix- B.

ii The inspection was limited to visual assessment from within the subject site where the retention value, condition and diameters of neighbouring trees was estimated. No aerial (climbing) inspections, woody tissue testing or tree root investigation was undertaken as part of this tree assessment. 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).

iii This report acknowledges the current Australian Standards 'Protection of Trees on Development Sites' AS 4970 – 2009 as explained within Notes of Appendix- A. Unless specified otherwise all distances and development offsets within this report are taken from the centre of the tree.

To retain specific trees and ensure their viability development must take into consideration protection of the Tree Protection Zone (TPZ) radius as identified within Appendix- A Notes: *acceptable incursions*, where a greater area is required to retain a significant tree. As a guide to determining impacts the Structural Root Zone (SRZ) & Tree Protection Zone (TPZ) setbacks have been provided within Appendix- C the SRZ & TPZ distance column.

iv Documentation received to assist in preparation of this assessment include:

Gartner Trovato Architects project No. 1437

- Site Plan / Landscape Plan Dwg No. DA.01 issue A dated 8/2/2019
- Home Office Floor Plan Dwg No. DA.09 issue A dated 8/2/2019
- Home Office Elevations Dwg No. DA.10 issue A dated 8/2/2019
- Home Office Section Dwg No. DA.11 issue A dated 8/2/2019
- Elevations Dwg No. DA.05 & 6 rev A dated 11/3/2019
- Section Dwg No. DA.07 rev A dated 11/3/2019

Stutchbury Jaques Pty Ltd

- Survey Plan ref No: 8754 / 14 dated 19/9/2014

1. SUMMARY OF ASSESSMENT

1.1 General tree assessment

1.1.1 Five (5) trees have been assessed under this development proposal which consist of four (4) neighbouring trees. Tree 1 located on site has been determined as containing a low retention value. The tree is structurally defective containing a large and degrading mid trunk to ground level seam wound. Given the trees low retention value and likely short remaining safe useful life expectancy the tree is considered a tree which should not restrict this development proposal.

Neighbouring trees are identified as trees 2, 3, 4 & 5.

Tree 2 will likely require large extending limb reduction pruning to clear the proposed home office roofline.

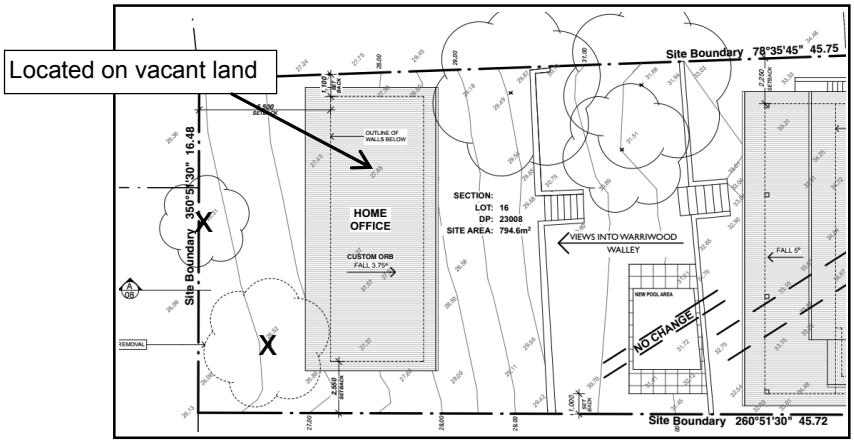
Tree T4 contains large surface roots within the lower site indicating care for excavation is required within the trees 9m tree protection zone (TPZ).

1.1.2 The prescribed trees identified within this report are mostly considered viable for retention without change in existing site conditions or modification within their Tree Protection Zone (TPZ) radiuses, refer Appendix- C, the SRZ & TPZ distance column.

1.2 The development proposal

1.2.1 The development proposal consist of constructing a new home office facility supported above ground by single post footings under pier and beam construction techniques. Given the sloping nature of the land excavation cut is required to construct a minor retaining wall with finished structure floor level of RL28.400.

Figure 1, showing proposed home office footprint



1.3 Tree removal to accommodate design

1.3.1 No prescribed trees require removal under the current development proposal. Provided within the following sections discussions relating to development impacts and mitigation activities for tree protection have been provided.

1.4 Discussion of development impacts

1.4.1 Tree 1 – proposed retaining wall and excavation cut is located outside of the trees 2.4m Structural Root Zone (SRZ) radius, at or near 3m from the tree. The overall incursion within the 4.8m Tree Protection Zone (TPZ) is considered Minor (<10%) occupancy where given correct tree management a negligible impact by design can be achieved. The following guidelines for the minimising of impacts by excavation should be adopted to ensure the vitality (vigour) of the tree is not disrupted:

1. There is to be no excavation cut or disturbance within the trees 2.4m SRZ. The SRZ is to be considered a development exclusion area and be protected by tree protection fencing, or timber beam trunk and ground protection.
2. To avoid additional encroachment within the TPZ there is to be no over excavation beyond the line of the proposed retaining wall footprint as shown within construction drawings. The initial excavation within the TPZ shall be supervised by an appointed project arborist protecting and managing encountered tree roots in accordance with AS4970 Section 4.5.4 *Root protection during works within the TPZ*, see section 2.2.1 (6).
3. All in ground services including hydraulics (e.g. sewer / stormwater (SW)) are recommended to be situated towards the southern side of the home office to avoid conflicts with underlying tree roots extending from trees 1, 2 & 3.

1.4.2 Tree 2 – works are proposed within the estimated 2.6m SRZ by excavation cut to accommodate the small north side extension of the proposed retaining wall. TPZ encroachment by design is considered at a medium level (at or near 20%) coverage within a notional 6m tree protection zone. In accordance with AS4970 tree root investigations are required to identify the location, distribution and potential impacts to the tree and critical roots within the SRZ. However, given that only a small section of the SRZ radius is affected, management of the tree is recommended to consist of the following activities:

1. An appointed project arborist shall supervise manual (hand) excavation of the proposed cut within the north-eastern corner to the required footing depth, at or near 0.5m (500mm).
2. Should tree roots be encountered that can be appropriately pruned that will not disrupt tree vitality, the appointed project arborist shall treat and protect the encountered roots. Should a large proportion of significant tree roots >50mmØ be located, redesign to suit the retention of critical roots is to be adopted.
3. *Canopy reduction pruning*. One (1) large low bowing structural limb at or near 230mmØ will require reduction pruning to clear the northern elevation. The extent of pruning to AS4373 pruning standards will likely result in a major canopy loss, and poor remaining form given the trees suppressed growth habit.

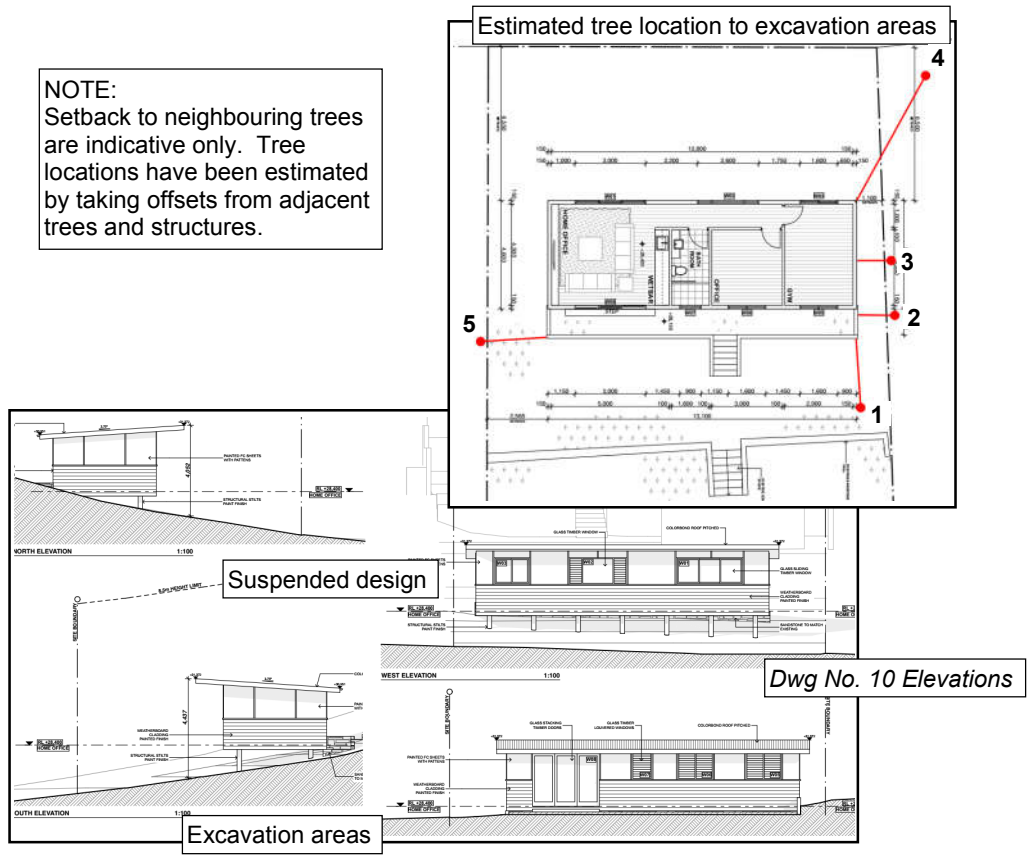
1.4.3 Tree 3 – given the suspended structure above ground level a minor to negligible impact by design occurs. As the structure is located above ground level the spanning over the SRZ & TPZ is considered a tree sensitive design technique, providing minimal impact by the footing placement.

1.4.4 Tree 4 – the location of the tree to the suspended structure indicates a negligible impact by design. Visually evident large surface roots exist towards the western boundary where care is required to ensure large roots at or >50mm(Ø) are not damaged by works.

1.4.5 Tree 5 – proposed retaining wall and excavation cut is located outside of the trees 2.5m SRZ, at or near 2.8m from the tree. The overall incursion within the 5.4m TPZ is considered Minor (at or near 10%) occupancy having a low level of impact by design. The management of the tree should adopt the principles outlined for tree 1 within section 1.4.1. This should include:

- No over excavation beyond the line of the retaining wall footprint.
- Manual (hand) excavation within the TPZ setback under the direct supervision of an appointed site arborist.
- All tree roots encountered are to be correctly managed in accordance with section 2.2.1 (6).

Figure 2, showing design encroachment areas



2. CONCLUSIONS & RECOMMENDATION

2.1 Tree Removal

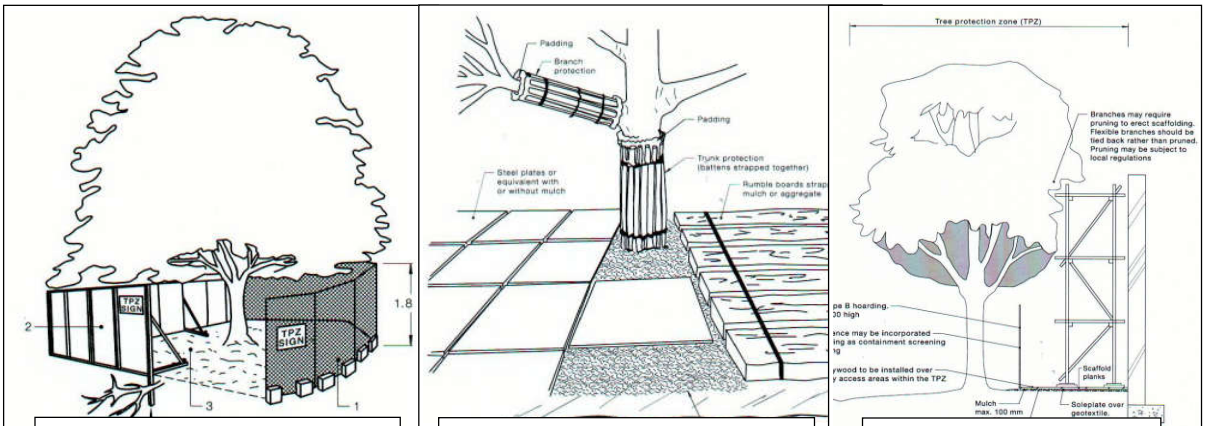
2.1.1 No prescribed tree require removal under the current design proposal.

2.2 Tree management & protection principles

2.2.1 In addition to the recommendations provided within this report the following summary or additional tree protection advice is provided as a guide for the management of trees within development sites:

1. *Specific* – Trees 1, 2, 3 & 4. Direct on site arborist supervision and appropriate treatment of tree roots is required during excavation activities. Tree protection and management activities should consider the following recommendations.
    - T1 – installation of tree protection fencing, or timber beam trunk and ground protection covering the 2.4m SRZ.
    - T1, 2 & 5 – direct onsite project arborist supervision during manual excavation within TPZ setbacks to protect and manage encountered tree roots.
    - Ensure no over excavation occurs beyond the line of the proposed retaining wall footprint as shown within construction drawings.
2. *General requirements*. Tree protection fencing and/or zones are to be installed prior to development works occurring. Unless specified otherwise within this report the extent of tree protection fencing is to be located at the extremity of Tree Protection Zone (TPZ) radiuses, or constructed under the guidance and certification of an appointed project arborist. Where design constraints exists other tree protection measure such as ground and timber beam trunk protection may be incorporated forming part of tree protection areas.
    - Specific: The storage of materials, fill and wash down areas within tree protection zone setbacks is to be avoided.
3. Unless specified otherwise within this report in accordance with AS4970 - 2009 (1.4.4) a Project 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 be suitably qualified having a minimum Australian Qualification Framework (AQF) Level 4 certification and be competent in methodology of protecting trees on development sites. 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*).
4. The selected 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.*

Figure 3: tree protection fencing, ground and trunk protection detail



1.8m high tree protection fencing | Trunk, branch & ground protection | Scaffolding within the TPZ

All tree protection requires appropriate signage clearly stating *a TPZ restriction area* being a designated Tree Protection Zone.

5. ***Hold points***: Hold points specific to *no works are to commence without arborist advice, inspections & certifications*. It is the responsibility of the principle contractor to complete each task identified within Table 1 and hold point items for Principal Certifying Authority (PCA) compliance purposes.

Table 1, certification requirements & hold points

1	Pre-construction works	Engage & consult with an appointed project arborist for supervision activities
		Install tree protection fencing or zones around trees to be retained for arborist certification
2	During construction	Schedule project arborist for supervision during excavation within TPZ setbacks
		Obtain arborist certification of works conducted
3	Post construction	Prior to handover project arborist to provide final inspection & certification of tree health & vitality

5a ***Hold point 1 specific***. No construction works are to commence without tree protection fencing and/or zones being in place being certified by the project arborist. The designated tree protection zone is to be consider a development activity exclusion area.

5b ***Hold point 2***. Unless specified otherwise - there is to be no access, excavation or soil disturbance within SRZ setbacks (the area required for tree stability AS4970) without prior project arborist advice and/or root investigations, refer SRZ & TPZ setback distance column Appendix- C.

5c ***Hold point 3***. No additional open trench excavation for in ground services are permitted within Tree Protection Zones (TPZ) without obtaining prior arborist advice and approval.

6. *During approved excavation activities* within TPZ setbacks the pruning of minor roots is to be conducted by an appointed arborist 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. Where larger roots >40mm(Ø) have been encountered they are to be referred to a Level 5 project arborist for further advice. Where deep excavation occurs 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 the root mass and soil profile.

7. *Boundary fences and/or structures* are recommended to be suspended above ground level supported by pier and beam construction to avoid disturbance to underlying tree roots.
8. *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 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).
9. *Additional inground services within TPZ's* which may include 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.
10. To ensure trees are appropriately protected the development site superintendent is recommended to be familiar with all tree protection requirements as outlined within this report. The superintendent is responsible for informing all subcontractors of the responsibilities and requirements of tree protection prior to their engagement.
11. Should there be any uncertainty in tree protection requirements the appointed arborist is to be consulted prior to work activities commencing.

2.3 Design impact & mitigation measure – *general advice*

2.3.1 In addition to criterial set within Australian Standard AS 4970 – 2009 Protection of Trees on Development Sites section 4 *Tree Protection measures* the following recommendations are provided when considering design for minimising impacts adjacent trees.

- *Low level (10%) development incursions*: Development requires Tree Protection Fencing (TPF) to be provided with mulching and irrigation of the TPZ installed under the discretion of the project arborist.
- *Medium level (<20%) incursions*: In addition to the above relocated design (hard surfaces, pathways, hydraulics, excavation, cut & fill) outside of tree protection zones to reduce incursion impacts. Tree sensitive design works such as porous pavements, suspending slabs above ground level, manual excavation to retain significant roots with underboring for inground services may be endorsed as acceptable practices within the tree protection zone. All works within tree protection zones are to be approved by an appointed project arborist prior to commencement. Note - any TPZ area lost by the design proposal is to be compensated elsewhere, and be continuous with the existing tree protection zone (AS4970).

- *High level (>20%) incursions*: As above with design not recommended to encroach greater than 20% of tree protection zone radiuses. High level of impacts are likely to result in tree decline or failure where further advice from project arborist is recommended to ensure trees remain viable. Any area lost by the proposal is to be compensated elsewhere and be continuous with existing tree protection zones.

  Where both Medium & High level impacts are unable to be mitigated a redesign may be required to ensure a tree remains viable.

- Approved excavation within TPZ setbacks are to be conducted manually for the first 0.5m (500mm) under the supervision of a project arborist with significant tree roots retained, not damaged or frayed by works. Unless specified otherwise open trench excavation for in ground services is not recommended within the TPZ. Directional drilling or under boring at a depth no less than 600mm should be conducted to avoid damage to underlying roots. Services should tunnel and be placed beneath critical roots to ensure the vitality of the tree is not disrupted.

- *Landscape development* within the TPZ. Unless approved within this report no grade changes being cut or fill is to occur within 10% of the TPZ radius. Greater than ten percent (10%) of the TPZ may be achieved given prior arborist consultation and appropriate tree management advice. Maintaining the existing soil levels, moisture and aeration is the key to significant tree preservation. All efforts are to be made in maintaining the TPZ, soil moisture content and soil microorganism activity essential for maintaining good tree vigour. This should include the installation of leaf mulch and irrigation within tree protection zones.

Should you require further liaisons in this matter please contact me direct on 0419 250 248

Yours sincerely

Mark A Kokot

AQF Level 5 consulting arborist

Diploma of Hort/Arboriculture (AQF5), Associate Diploma Parks Management (AQF4)
Certified Arborist / Tree Surgeon (AQF3), ISA Tree Risk Assessment Qualified 6/2014
Member: Arboriculture Australia & IACA, Working With Children No: WWC0144637E

APPENDICES

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APPENDIX- A: Terminology & references

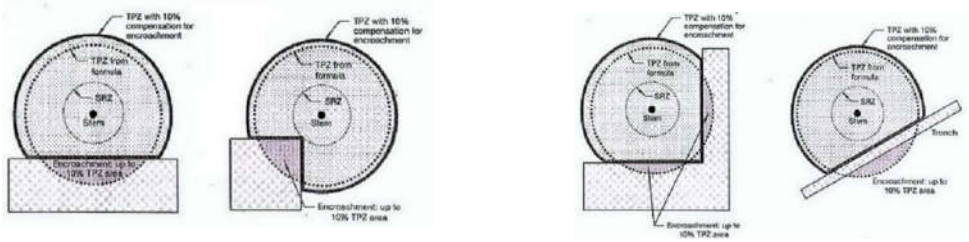
Acceptable Risk: Exposure to or reject risk of varying degrees. The acceptable risk is defined as '*The person who accepts some degree of risk in return for a benefit being exposed to some risk of varying degree*.
Age classes: (I) Immature refers to a well established but juvenile tree. (ESM) refers 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. **Vitality = 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 week 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.

NOTES:

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.

Development encroachments are referred to as No impact (0%) incursion, Low impact (<10%) of minor consequence, Medium impact (<20%) incursion where the project arborist is to demonstrate the tree/s remain viable by tree sensitive construction techniques, and High level impact (>20%) where design changes or further information is required to manage tree vitality.

Showing acceptable incursion within the TPZ (AS4970)



SELECTED REFERENCES:

Barrell J. 1993, 'Preplanning Tree Surveys: Safe useful Life expectancy (SULE) is the Natural Progression", Arboricultural 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.
Standards Australia 2009, *Australian Standards 4970 Protection of Trees on Development Sites* - Standards Australia, Sydney, Australia.
Standards Australia 2007, *Australian Standards 4373 Pruning of Amenity Trees* - Standards Australia, Sydney, Australia.

APPENDIX- B: Tree Retention Value *Check list* ©rainTree consulting

VTA 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

ii) Visual Tree Assessment (VTA)

0	If appropriate to VTA - **exempt* trees from Local Government Authority (LGA) Tree Management or Preservation Orders (TPO)	2E	Trees 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 likely compromise tree
0A	Noxious or invasive species located within heritage conservation area		
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 or 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, 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 would benefit from crown maintenance pruning as identified within the Australian Standards AS 4373 – 2007 Pruning of Amenity Trees
		5A	Trees that require little or no maintenance at time of inspection other than close monitoring
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 canopies 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 fee of visual defects and viable for retention, [2] viable for retention with minor faults which may reduce ULE, [3] trees which should not restrict development applications containing faults that are likely to become problematic in the short term, [4] trees to be considered for removal due to average condition.

1	High retention	2	Medium retention	3	Low retention	4	Consider removal

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- C: Tree Assessment Schedule

	Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification		Trees with low retention values: senescence, developing defects or being *exempt trees from the LGA Tree Preservation Order (TPO)

Tree No	***Botanical Name*** **COMMON NAME**	**Height x spread (m)**	**DBH (mm)**	**SRZ** / **TPZ**	**Age**	**Health**	**Condition**	**Signifi-cance**	**VTA**	**RV**	**U. L.E.**	**Comments** CV = Council verge tree NT= Neighbouring tree
1	*Casuarina glauca* She Oak	13 x 6	400	2.4m / 4.8	ESM	Good	Fair / Poor	3	2	3	3	Structurally defective lower main trunk with large open seam wound and part decay on STH/WST side = low retention value
2 NT	*Eucalyptus Botryoides* Southern Mahogany	11 x 11	500	2.6 / 6	ESM	Fair / Good	Good	3	4	2	2	Pat environmentally stressed with minor decline in canopy
3 NT	*Banksia integrifolia* Costal Banksia	8 x 3	250	2 / 3	ESM	Good	Good	3	6	1	2	Tree with no significant defects noted from subject site
4 NT	*Araucaria heterphylla* Norfolk Island Pine	20 x 10	750	3 / 9	ESM	Fair / Good	Good	4/3	4	2	2	Slightly low foliage volume, large surface roots to 6m within site close to western boundary
5 NT	*Casuarina glauca* She Oak	16 x 7	450	2.5 / 5.4	ESM	Good	Fair	3	2B	2	2	Restricted VTA lower trunk, tree contains minor stem inclusion development at 6m = may become problematic in the future

APPENDIX- D: Tree Location Plan, *not to scale*