rain Tree consulting

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153 BALGOWLAH ROAD

BALGOWLAH, NSW

DA2021/2641

PROPOSED VEHICLE PARKING BAY DEVELOPMENT PROPOSAL

ARBORICULTURAL IMPACT ASSESSMENT REPORT

Ref No- 2822

Prepared for
The Strata SP1173
153 Balgowlah Road
BALGOWLAH, NSW
C/- Studio Oulala
p: 0481 341 417

Prepared by
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INTRODUCTION

This report has been commissioned by The Strata SP1173 C/- Studio Oulala for the purpose of assessing potential impacts that may occur to one (1) significant Council verge tree in relation to a new development proposal. The new development proposal consists of constructing a new vehicle parking bay within 153 Balgowlah Road, BALGOWLAH NSW.

METHODOLOGY

In preparation for this report a site and tree inspection was conducted on Friday 11th March 2022 by the author of this report. Documentation reviewed and/or works conducted to assist in the preparation of this report include:

- Undertaking a limited ground level visual tree inspection adopting components for Mattheck *& Breloer* 'The *Body Language of Trees*'1994. On completion of the inspection the retention value of the tree was summarized utilizing the Tree Assessment Checklist provided within Appendix- B.
- Estimating tree height and measuring trunk diameter(s) to determine the estimated Structural Root Zone (SRZ) *the area required for tree stability*, and Tree Protection Zone (TPZ) radiuses as indicated within Appendix- C.
- Determining age, vitality & condition of the tree to withstand works within the tree protection zone.

Documents reviewed

Studio Oulala, project No. 2108

- Plan of Proposed Carspace Dwg No: 210, Rev C dated 3.3.2022
- Sections Dwg No: 310, Rev C dated 3.3.2022

True North Survey Group

- Survey Plan Dwg No: 2401, Rev 0 dated 6.12.2021

Note: Unless specified otherwise all development offsets within this report are taken from the centre of the tree.

SUMMARY OF ASSESSMENT

General observations

1. One (1) significant Council verge Brush Box tree has been inspected for the purpose of this development proposal. The tree is located within a confined and restrictive narrow roadside verge having likely restricted and modified radial root development by roadside kerb & guttering and boundary wall foundations. The tree appears established in the environment where the root zone has more than likely occupied deep soil areas located within the subject site. Visually the tree displays no significant visual faults and is considered viable for retention. Given the trees location to and within infrastructure both the SRZ & TPZ are likely to be asymmetrical, restricted by surrounding infrastructure and not radial in development. Given a restricted root zone the percentage of development encroachment within tree protection zones are unable to be accurately determined where in this case impacts or disturbances within tree protection zones are discussed as low, moderate to high level disruptions.

The development proposal

2. Proposed works consist of demolition of the existing low front fence brick wall, removal of associated foundations including upgrading the existing public pathway and driveway to make way for a new vehicle parking bay and property access. The proposal requires demolition and excavation cut (leveling) within the notional 3.3m Structural Root Zone (SRZ) and 12m Tree Protection Zone (TPZ) radius. Within a notional TPZ radius TPZ encroachment is considered of Minor (<10%) low-level occupancy and/or disruption with works proposed within the SRZ indicating a likely high level of disturbance within the critical anchoring root zone.

Discussion of development impacts

3. *Front Council verge*: Proposed works within the critical root zone area consists of upgrading the existing driveway crossover and public pathway. Proposed levels range from existing RL9.89 to amended 9.92. 9.87 & 9.82 to the west. The proposal generally replaces existing where it is likely grading cut and compaction will be required to accommodate the design. The proposal is achievable provide further information is provided, reviewed and endorsed by an appointed project arborist prior to obtaining a Construction Certificate (CC). Further information should consist of:
    a) Providing Civil design plans showing the construction methodology required to construct the driveway crossover.
    b) Conducting tree root investigations in areas that requires excavation (leveling) within the SRZ for arborist review and further recommendations. The management of the tree should be based on Civil design plans and the results of tree root investigations where tree sensitive design such as porous pavements & driveway crossover surfaces including pavements placed on top of existing ground level without cut or compaction should suffice in minimizing impacts to underlying tree roots.

4. *Driveway access & parking space*: Proposed works occur within both the SRZ & TPZ with excavation cut (leveling) required to accommodate construction. The amount of excavation or site modification could be considered a low-level disruption and impact within a notional 12m tree protection zone, however, SRZ disruptions occur by demolition and excavation by the proposed design. Given that the tree is established in the environment and there is a potential for root encroachment within the site determining impacts within the greater 3.3m SRZ requires further information by tree root investigations. Tree management and further information to determine modification impacts within the SRZ & TPZ should consist of the following:
    a) Review of proposed Civil design plans showing the construction methodology required to construct the driveway proposal. Engineered Civil design plans should show at a minimum a cross section of depth of driveway slab, subsurface preparation and any area that requires compaction to support the proposal.
    b) Alternative design for the parking space should consider tree sensitive design such as porous pavement materials suitable for vehicle parking bays within tree protection zone.
    c) As shown below and within Figure 2 as grading cut will likely be required to accommodate the design footprint tree root investigations along the inner and potentially outer fence line including existing line of driveway should be conducted to identify the location, distribution and impact on underlying tree roots. The management of the tree should then be based on the results of the investigation.

Figure 1, Showing area of recommended tree root investigation

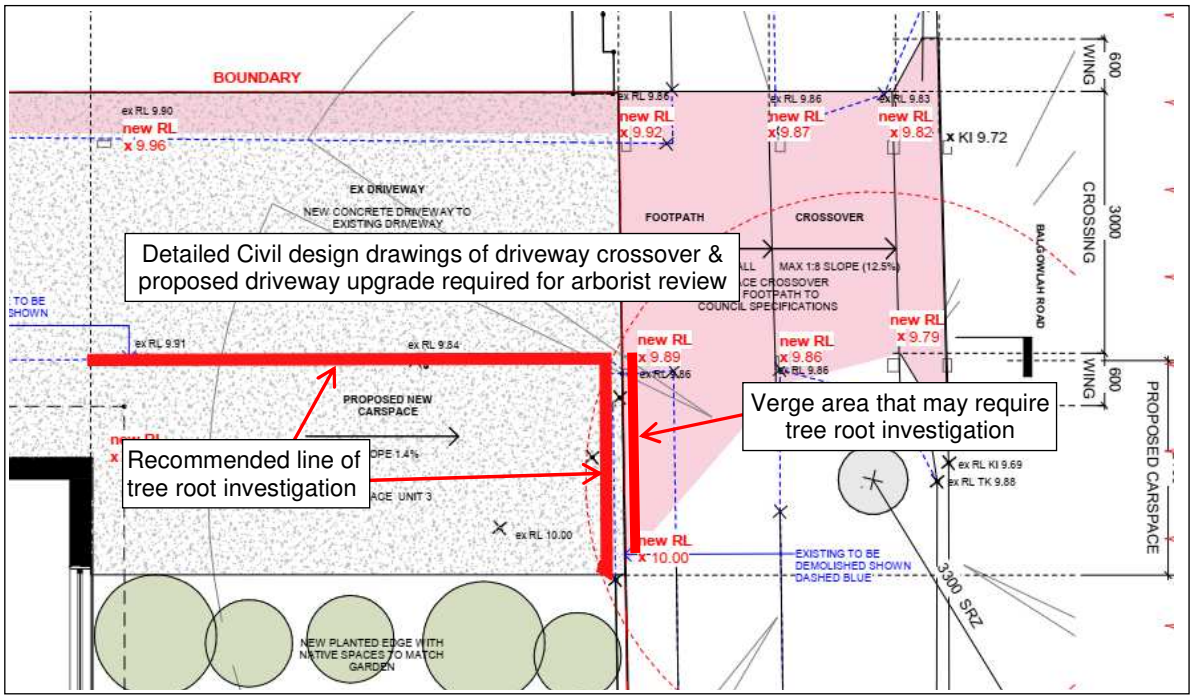
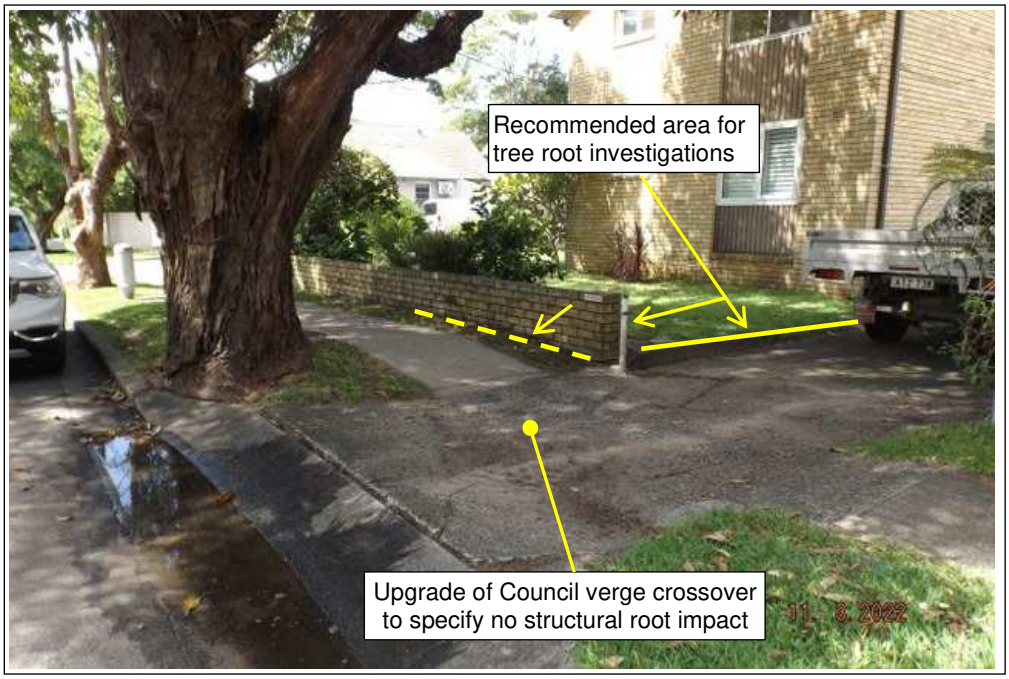


Figure 2, Showing existing site conditions



CONCLUSIONS & RECOMMENDATIONS

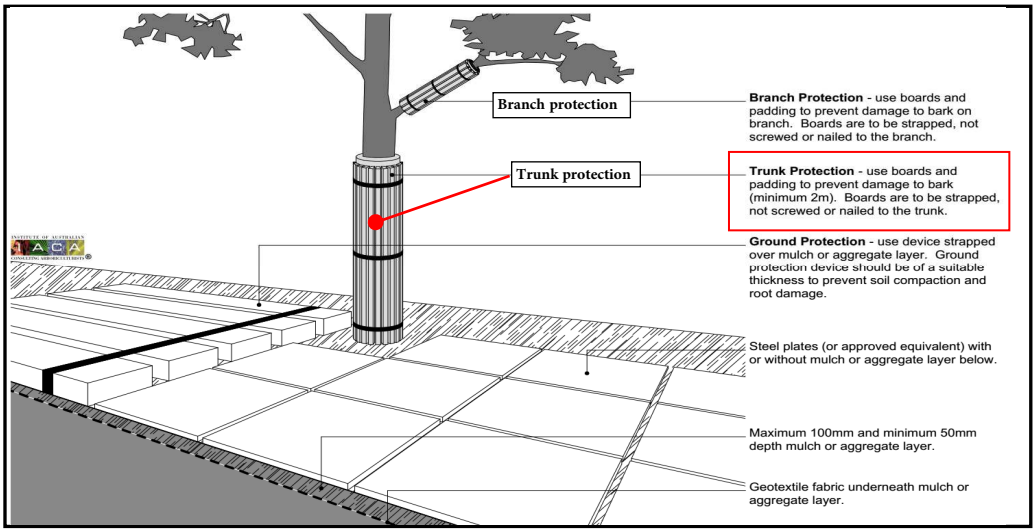
5. Based on a notional tree protection zone radius TPZ coverage or the design footprint proposes a Minor (<10%) TPZ occupancy of low-level impact, with proposed works located within the SRZ significantly increasing the likelihood of encountering critical structural roots. Based on the design proposal the following general guidelines are provided to mitigate impacts by design:

   a) Tree root investigations are required where excavation cut is proposed within the greater Structural Root Zone (SRZ) radius. The root investigation should be conducted to a depth just below Civil driveway design plan base levels at required finished RL's, or at a minimum of 400mm below natural ground level. The management of the tree should be based on the results of the investigation with tree sensitive design such as porous pavements recommended for the separate parking space.

   b) Prior to construction detailed Engineered Civil driveway design plans are to be provided for arborist review and endorsement. At a minimum plans should detail the amount of cut and compaction required within the SRZ & TPZ, with sectional plans showing proposed construction methodology at and below existing ground level.

   c) Prior to demolition and for the extent of construction activities the trunk of the tree shall be protected with 1.8m high timber beam trunk protection as indicated within Figure 3.

Figure 3, showing trunk & ground protection detail



6. *General tree protection requirements*: Prior to obtaining a Construction Certificate (CC) and in accordance with AS4970 - 2009 (1.4.4) 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 4 certification and be competent in methodology of protecting trees on development sites.

7. There shall be no excavation, disturbance or landscape modification within the Structural Root Zone (SRZ) without prior arborist advice and certification. The SRZ is to remain a development activity exclusion zone. Where works are approved within the SRZ direct project arborist supervision is required to provide on site and ongoing tree management advice.

8. Unless specified otherwise during approved excavation within the tree protection zone excavation is to be conducted manually (by hand) under the supervision of an appointed project 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.

9. *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.

10. To ensure tree(s) are appropriately protected the development site superintendent is recommended to be familiar with all tree protection requirements as outlined within this report or Council approved Development Conditions of Consent.

    The superintendent is responsible for informing all subcontractors of the responsibilities and requirements of tree protection prior to their engagement and be responsible for obtaining appropriate certifications.

11. As a minimum proposed tree protection compliance and arborist certifications requirements should consist of the following:

Prior to works install trunk or tree protection fencing	*Project arborist certification required*
Demolition & excavation within the SRZ & TPZ	*Project arborist supervision and certification required for compliance providing any remediation advice*
Final inspection of tree condition	*Project arborist certification required*

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 6/2024
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APPENDIX- A: Terminology, notes & references

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** – the state of being strong & active, capacity for survival or for the continuation of a meaningful or purposeful existence which includes ***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*****:** referring 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. **Footprint:** The area occupied by site structures, including the dwelling driveways and hard surfaces. **Hazard:** When a tree failure hazard is present when a tree has potential to cause harm to people or property. (A source of potential harm). **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. **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). Given the existing site conditions both the SRZ & TPZ cannot be accurately determined
Development encroachments are referred to as No impact (0%) incursion, **Minor** <10% incursion to >10 or <15% = **low** to moderate level of incursion. >15 - <20% = **moderate** level of incursion to >20 - <25% - moderate to **high** level of incursion. >25 - <35% where design changes or further information is required to manage tree vitality and >35% - significant inclusion within the TPZ

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.

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.
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.
Lane Cove Council: http://www.lanecove.nsw.gov.au/Environment/TreeManagement/Pages/PrivateTreesPreservationOrder.aspx

APPENDIX- B: Visual Tree Inspection Checklist

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, are based after IACA Sustainable Retention Index Value (SRVI) which offer a visual understanding of the relative importance of the tree to the environment. The Landscape Significance for this assessment 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 compromise tree anchorage. Tree(s) may be contained by sloid structures with restricted anchoring root potential
0A	Noxious or invasive species located within heritage or biodiversity 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 faults & defects such as pathogen ID, cavities or symptoms indicating internal decay to an extent that cannot be quantified under visual examination. Further inspections may be in the way of Plant Disease Diagnostic Unit (PDDU) pathogen testing, 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 may also be affected by extensive borer damage, fungal pathogens (wood rot) or viruses. Some symptoms may be reversible, remediated or controlled give appropriate management & diagnosis.		
2A	Tree defect or 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 the 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, are subject to wind loading pressure, or have tall forest form where exposure may result in windthrow or limb snap
		5A	Screen trees, and/or shrubs that are routinely hedged or pruned 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 canopies or are visually low risk trees noted under a limited inspection only
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): [1] Low risk - tree fee of visual defects & viable for retention, [2] Medium – low risk - viable for retention with minor faults which may reduce ULE, [3] Medium risk - trees which containing issues or faults that are likely to become problematic in the near future, [4] M/High risk - trees to be considered for removal due to poor 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. The five categories of U.L.E. are as follows:

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 to15 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

Tree Assessment Schedule *Refer VTA Checklist Appendix- B*

Tree No:	Species	Height x Span	DBH mm	SRZ / TPZ	Age	Tree vitality	Significance	VTA	RV	ULE	Comments
1	*Lophostemon confertus* Brush Box	15 x 14	1000	3.3m / 12	M	Good	3- High	6/2E	2	2	Located in confined area of council verge with no decline in canopy evident, adjacent verge infrastructure slightly displaced within SRZ

Tree location plan