



ALL ARBOR SOLUTIONS

Arboricultural Impact Assessment

Prepared for: Studio Haptic Architecture & Design

Site Address: 61 Loombah Street
Bilgola Plateau
NSW
2107

Date: 2 November 2022

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Diploma in Horticulture (Arboriculture) Ryde TAFE 2006

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1.0 Summary

- 1.1 This report has been requested by Studio Haptic Architecture and Design and concerns the impacts of residential development works upon trees located within and adjacent to the property of 61 Loombah Street, Bilgola Plateau.
- 1.2 The proposed development involves the clearing of existing vegetation and construction of a two storey four-bedroom residence. The works have the potential to impact upon thirty trees located within and adjacent to the subject site.
- 1.3 Of the thirty trees, twelve (3, 5, 6, 7, 14, 17, 19, 20, 21, 22, 29, 30) were found to be directly impacted upon requiring their removal. Eighteen trees (1, 2, 4, 8, 9, 10, 11, 12, 13, 15, 16, 18, 23, 24, 25, 26, 27, 28) can be retained and are to be protected throughout the construction phase of the development.
- 1.4 Information relating to the site's trees can be found as **Appendix 1** Tree Assessment Schedule. Development Impacts and tree protection measures are given within **Appendix 2** Development Impacts Schedule. A tree location plan can be found as **Appendix 3**. A tree removal plan can be found as **Appendix 4**. Site specific tree protection measures are shown within **Appendix 5** TPZ Encroachments.

2.0 Introduction

2.1 Background

- 2.1.1 This Arboricultural Impact Assessment was prepared for Studio Haptic Architecture and Design on behalf of the property owners Mr and Mrs Amoyal. It relates to proposed residential development at 61 Loombah Street, Bilgola Plateau (the site). It concerns the impacts of development works on trees located within and adjacent to the property.
- 2.1.2 The proposed works involve the clearing of existing vegetation and construction of a two storey four-bedroom residence.
- 2.1.3 The following documentation was reviewed and assists in the preparation of this report:
- Boundary Identification and Detail & Level Survey Over lot 128 in DP 221639 No61 Loombah Street Bilgola Plateau NS 2107, prepared by CMS Surveyors Pty Ltd, dated 01/04/2022
 - Development Application Plans, prepared by studio Haptic Architecture & Design, issue for consultants dated 20/10/2022
 - Stormwater Plan, prepared by Taylor Consulting, dated 12/10/2022.
- 2.1.4 The conclusions drawn within this report are based on the information provided and data collected during an on-site inspection.
- 2.1.5 This report is to be used 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 original report (or a copy) is referenced to and directly attached to that submission, report or presentation. Information contained in the report covers only the trees that were inspected and reflects the trees condition at the time of the inspection. There is no guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.
- 2.1.6 The author of this report has no pecuniary or non-pecuniary interests in the site or its development.

2.2 Inspection Methodology and Data Collection

- 2.2.1 On 2 May 2022 I attended the site to undertake the tree assessment and collect data.
- 2.2.2 The tree(s) were assessed using the principles of a ground based Visual Tree Assessment (VTA)¹ and methods consistent with modern arboriculture. No aerial (climbing) inspection, tissue sampling or diagnostic testing was undertaken as part of the inspection process unless otherwise stated.
- 2.2.3 Full results of the tree inspection and data collection can be found within the Tree Assessment Schedule (**Appendix 1**).
- 2.2.4 The height, radial canopy spread, trunk Diameter at Breast Height (DBH) and trunk diameter above root buttress was collect for each tree assessed. These physical dimensions were either estimated or measured.
- 2.2.5 Photographs were taken on the day of the inspection and are intended to assist in the correct identification and positioning of trees within and adjacent to the site. Photographs can be found as **Appendix 6**.
- 2.2.6 The vigour, structure and age class of the tree(s) has been assessed and reflects the tree(s) at the time of the inspection. The methodology for determining vigour, structure and age class can be found within the Tree Assessment Criteria (**Appendix 7**).
- 2.2.7 Each tree has been given Useful Life Expectancy (ULE) rating. This rating defines the length of time that the arborist feels an individual tree can be retained with an acceptable level of risk based on the information available at the time of inspection. Methodology used to determine these ratings can be found within the Useful Life Expectancy description and categories (**Appendix 7**).
- 2.2.8 Each tree has been assessed against the Institute of Australian Consulting Arborists (IACA) Significance of a Tree Assessment Rating System (STARS). This provides a dual method of objectively rating the viability and retention value of urban trees on development sites. The STARS assessment criteria and retention matrix table can be found within the Tree Significance Assessment Criteria and Retention Value Matrix (**Appendix 8**).

¹ Mattheck, C. and Breloer, H (2006), *The Body Language of Trees – A Handbook for Failure Analysis*, The Stationary Office. Pages 118-122.

2.3 Trees on Development Sites

- 2.3.1 The Australian Standard 4970-2009 Protection of Trees on Development Sites defines the requirements for assessing trees with respect to development. It provides the guidance on how to decide which trees are appropriate for retention and on the means of protecting them during construction works. It describes the areas and offsets, referred to as the Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) required to be free from development works to maintain tree vitality and stability. This report has been prepared in accordance with the conditions set out within the standard.
- 2.3.2 Tree Protection Zone – The tree protection zone is defined as a specified area above and below ground set aside for the protection of the tree's roots and crown. It is expressed as a radial measurement taken from the centre of the trunk at ground level.
- 2.3.3 Structural Root Zone – The structural root zone is defined as a specified area around the base of a tree required to maintain its stability within the ground. It is expressed as a radial measurement taken from the centre of the trunk at ground level. Excavation and development works are not recommended within the structural root zone unless additional investigation as to root size and location is undertaken.
- 2.3.4 Tree protection zone calculations have been made in accordance with AS4970-2009 and can be found within the Tree Assessment Schedule (**Appendix 1**). Calculation of the Structural Root Zone (SRZ) has been made where required.
- 2.3.5 Under AS4970 development encroachments into the tree protection zone are defined as either minor or major.
- A minor encroachment is less than 10% of the area of the TPZ and is outside of the SRZ. Where this occurs detailed root investigation works should not be required and the loss of root zone compensated for elsewhere and contiguous with the TPZ.
 - A major encroachment is greater than 10% of the area of the TPZ or is inside the SRZ. Where a major encroachment exists the project arborist must demonstrate that the tree will remain viable. The area lost should be compensated for elsewhere and contiguous with the TPZ. Major encroachments may require detailed root investigation works to be undertaken.
- 2.3.6 The tree protection and structural root zone are indicative and do not consider the physical constraints of a site which may influence the architecture, development and spread of a tree's root system. The establishment of tree protection zones to their fullest extent may

not be possible due to environmental or site constraints. Where this occurs, their establishment is to be undertaken under the guidance of the project arborist.

3.0 Findings and Observations

3.1 The site

3.1.1 The proposed site consists of lot 128 within DP 221639. It is a 979 square meter block. The block zoned C4 – Environmental Living and is bordered to the east, and west by residential properties.

3.1.2 Existing site features include:

- Rocky outcrops
- Existing vegetation

3.1.3 The property is not identified as being a heritage item under Schedule 5, Environmental Heritage of the Pittwater Local Environment Plan (PLEP) 2014 nor is it located within a heritage conservation area.

3.2 The Trees

3.2.1 A total of thirty trees were assessed as part of this report. Individual tree details and data captured during the on-site inspection may be found as **Appendix 1** Tree Assessment Schedule. A tree location plan can be found as **Appendix 3**.

3.2.2 The assessed trees are protected under the conditions of the Pittwater Development Control Plan, Part B4.22 Preservation of Trees and Bushland Vegetation.

3.2.3 Tree 2 is a council owned street tree located within the road reserve area in front of the property. Trees 4 and 15 are located adjacent the western boundary within the neighbouring property of 59 Loombah Street. Trees 1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29 and 30 are located wholly within the subject site.

3.2.4 Trees 5, 6, 7, 8, 16 and 23 were found to be in poor condition and low vigour. Trees 11, 17, 19, 20, and 21 were found to show good health but fair or declining condition. These trees have been assessed as having short useful life expectancy of 5 to 15 years. Trees 1, 2, 3, 4, 9, 10, 12, 13, 14, 15, 18, 22, 24, 25, 26, 27, 28, 29 and 30 were found to be in good health and condition. These trees are expected to have useful life expectancies commensurate to their species type.

4.0 Impacts of the Proposed Works

4.1 General

- 4.1.1 A development Impact's schedule can be found as **Appendix 2**. This schedule identifies the specific protection zone encroachments for each individual tree. A tree retention and removal plan can be found as **Appendix 4**. Development encroachments into the protection zones of retained trees have been plotted over an extract from the provided Site Plan and can be found as **Appendix 5**.
- 4.1.2 Trees 3, 5, 6 and 7 are positioned within the footprint of the off street car parking bay and cannot be retained under the current design. Tree 29 is positioned its limits and shall require removal to enable practical construction activities and establishment of formwork.
- 4.1.3 Trees 17, 19, 20, 21, and 30 are positioned within the footprint of the dwelling and cannot be retained under the current design. Trees 14 and 22 are positioned on the limits of the dwelling works and shall require removal to accommodate practical construction activities.
- 4.1.4 The proposed works pose major encroachments into the indicative protection zones of trees 1, 2, 4, 8, 9, 10, 11, 12, 13, 18 and 28. However, given existing site conditions, features and levels these encroachments are not expected to result in significant impacts upon the trees allowing for their retention.
- 4.1.5 The indicative protection zones of trees 16 and 23 incur only minor encroachments allowing for their retention.
- 4.1.6 The protection zones of trees 15, 24, 25, 26 and 27 are clear of the proposed works.
- 4.1.7 A review of the proposed stormwater management plan has been undertaken. Stormwater pits, pipes and rain tanks are essentially aligned within the footprint of the proposed design and have minimal impact upon retained trees. Some excavation is required within the TPZ of tree 18 to install an inlet pit and pipework. These works are not expected to significantly impact upon the tree.
- 4.1.8 Design plans show the car parking bay and dwelling are to be constructed upon individual piers (refer **Appendix 5** for pier locations). Piers aligned within the protection zone of any tree are to be excavated to a minimum depth of 600mm to ensure the potential for root damage is minimised. There is to be enough scope within the design to relocate piers in the event that significant roots are encountered.

- 4.1.9 It is understood that excavation to attain working levels for the driveway and crossover concrete slabs are minimal. In order to minimise the impacts of these works all excavation is to be undertaken using methods that do not damage roots under the guidance of the project arborist.

4.2 Trees to be removed

- 4.2.1 Under the current design trees 3, 5, 6, 7, 14, 17, 19, 20, 21, 22, 29 and 30 cannot be retained and shall require removal.

4.3 Trees to be retained

- 4.3.1 Trees 1, 2, 4, 8, 9, 10, 11, 12, 13, 15, 16, 18, 23, 24, 25, 26, 27 and 28 are to be retained and protected throughout the construction process.

4.4 Tree pruning works

- 4.4.1 No tree pruning works are required to be undertaken as part of the proposed works.

5.0 Conclusions

- 5.1 A total of thirty trees were assessed with respects to the proposed residential development. Of these, twelve trees (3, 5, 6, 7, 14, 17, 19, 20, 21, 22, 29, 30) shall require removal as they are located within or directly adjacent to the design footprint. Design encroachments into the protection zone of thirteen trees (1, 2, 4, 8, 9, 10, 11, 12, 13, 16, 18, 23, 28) are considered to be manageable allowing for their retention. The design does not encroach within the footprint of five trees (15, 24, 25, 26, 27).
- 5.2 Prior to the commencement of any construction works a project arborist is to be appointed. The role and responsibility of the project arborist is to provide on-going advice for works within identified sensitive areas and is to include at a minimum:
- Participation in the pre-clearing site walk-through, including confirmation of trees to be retained (1, 2, 4, 8, 9, 10, 11, 12, 13, 15, 16, 18, 23, 24, 25, 26, 27, 28) and the setup of tree protection measures
 - Inspect the setup of tree protection zones prior to the commencement of construction works
 - Ensure tree protection measures meet the requirements of *AS4970(2009) Protection of Trees on Development Sites*.
 - Provide advice on methods to minimise the extent of encroachment within the protection zones of trees
 - Provide advice for long-term tree health such as watering regimes, fertiliser application and mulching
 - Provide advice on non-destructive digging technics within tree protection zones (1, 4, 8, 9, 10, 11, 12, 13, 15, 18, 23)
 - Provide advice on when to stop works within a tree protection zone and make recommendations on refinements to the work methodology
 - Review adequacy of site training and induction material regarding tree protection zones
 - Assess and report on any significant roots that require removal prior to their removal. If structural roots are encountered and need to be cut, they shall provide advice on the position and method of removal to minimise potential impacts
 - Assess and report on the need for any further tree removals required within the project area

- Undertake regular monitoring / site inspections during construction to monitor tree health and recommend additional tree care if there are signs of stress

- 5.3 Existing conditions and level changes across the site restrict the ability to establish defined tree protection zones. As such, the use of trunk protection battens and ground protection is recommended. Trunk protection battens have been prescribed for trees 1, 2, 4, 8, 9, 10, 11, 12, 15, 16 and 18. Point 5.7 of this report details trunk protection measures. Tree protection fencing may be established on the flatter ground to delineate a TPZ around trees 23, 24, 25, 26 and 27.
- 5.4 The initial positioning of tree protection measures is shown within **Appendix 5**. It is recommended that the protection measures are established under consultation between the property owner, building contractor and project arborist prior to works commencing on-site.
- 5.5 Tree protection fencing is to be installed at the limits of the TPZ or as determined by the project arborist. Fencing shall consist of 1.8m high interlocking chain link or plywood fencing panels. The fencing shall be erected in such a way as to prevent building materials, soil and unauthorised personnel entering the TPZ. The use of temporary fencing panels is considered to be an acceptable form of tree protection fencing. Further details regarding tree erection of tree protection fencing can be found as Figure 1.

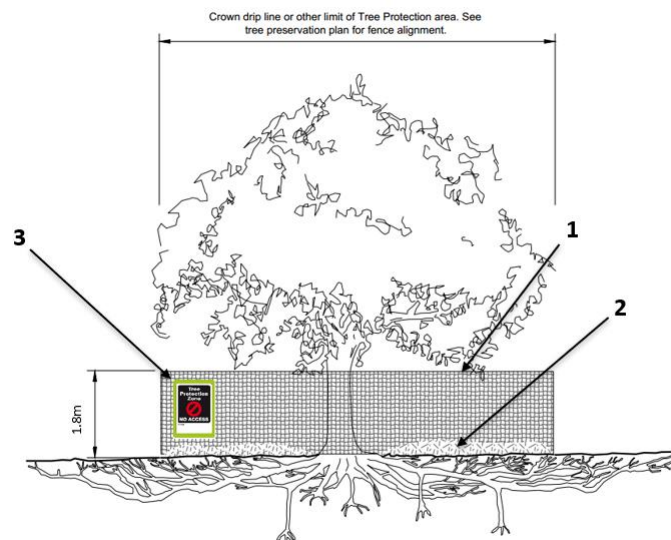


Figure 1: Tree protection zone detail. **1.** Tree Protection Fencing- To consist of chain wire mesh panels with shade cloth (if required) held in place with concrete feet or plywood or wooden fence panels. Fence to be a minimum height of 1.8m and to be established to the extent of the TPZ as directed by the project arborist. AS4687 specifies applicable fencing requirements. **2.** Mulching – If deemed applicable by the project arborist - the area within the TPZ is to be mulched. Mulch is to comply with AS4454 and maintained to a depth of 100-150mm. **3.** Signage – Signs identifying the TPZ should be placed around the edge of the TPZ and identifiable from within the development site. Lettering on the sign should comply with AS1319.

- 5.6 Signs identifying the TPZ shall be attached to the tree protection fencing and clearly visible from within the development site. The contact details of either the site manager or project arborist shall be displayed on the sign.

Figure 2 below illustrates indicative tree protection zone signage.



Figure 2: Example of TPZ signage.

- 5.7 Where the establishment of a TPZ is deemed not possible trunk and ground protection measures are to be employed. Trunk protection is installed by first wrapping the stem of the tree in hessian or like material then strapping timber battens over the top. It is recommended that timber battens with the dimensions of length 2000mm, width 75mm and depth 50mm are used. The battens are not to be directly screwed or nailed into the tree.

Where necessary branch protection may be required. Branch protection is installed in the same fashion as the trunk protection mentioned above but cut to suit the shape of the branch. Refer figure 3.

Further details regarding trunk and branch protection can be found as Figure 3.

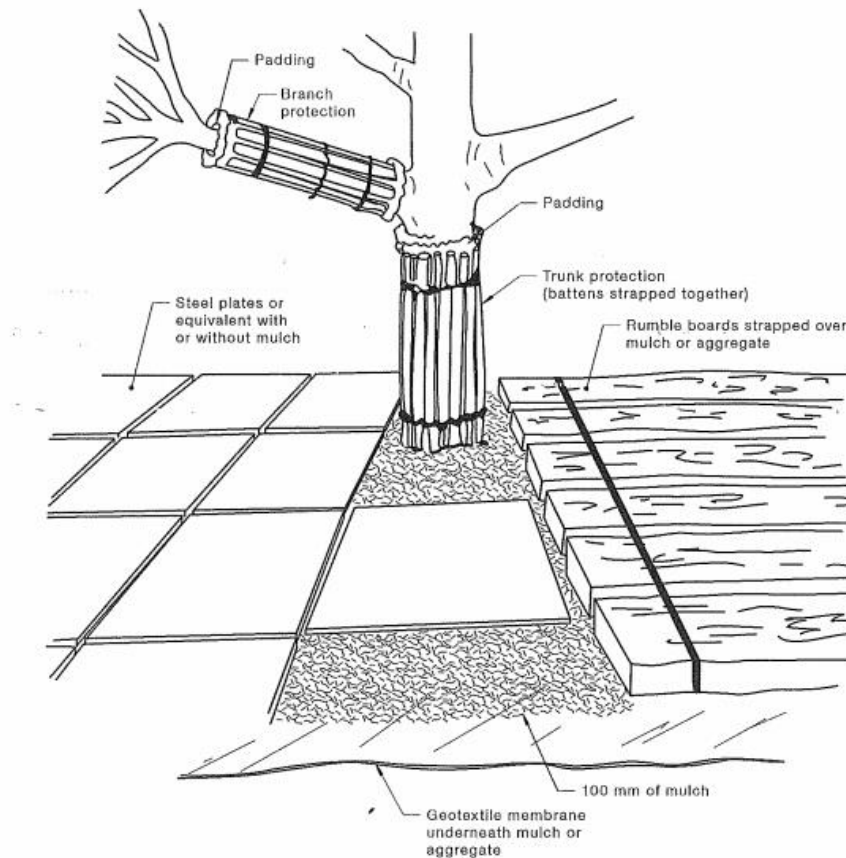


Figure 3: Trunk and branch protection shall be installed as shown in the attached diagram. The materials and positioning of protection are to be specified by the project arborist. A minimum height of 2m is recommended. No temporary power lines, stays, guys and the like are to be attached to any part of the tree. Do not drive nails into the trunks or branches. If temporary access for machinery is required within the TPZ ground protection measures will be required. Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards.

5.8 Where temporary access or encroachment into or through a TPZ is required ground protection measures are to be implemented. The purpose of ground protection measures is to avoid damage to tree roots and compaction of the soils within the TPZ. Suitable ground protection measures for pedestrian and/or vehicle and machinery include:

Pedestrian access	Heavy duty plywood boards or truck/bog mats over 75mm mulch layer. The plywood boards or truck/bog mats are to be secured in place to avoid movement Raised scaffolding walkways or ply boards fixed to wooden pallets to suspend footpath over existing grade
Light vehicle and/or machinery traffic <3T	Geo-textile fabric covered with a 150mm deep layer of mulch overlaid with rumble boards or road plates. Refer Figure 4. Truck/bog mats may be used if suitable for the applied loads.
Heavy traffic >3T	Geo-textile fabric covered with a 300mm layer of compacted road base or railway ballast. Truck/bog mats or steel road plates may be used if suitable for the applied loads and use on site. Their installation is to be advised by the project arborist.

	Temporary load bearing surfaces and products such as Geo Cell may be used if appropriately engineered to the applied loads.
Material laydown areas	Heavy duty plywood boards, truck/bog mats or timber supports/battens are to be used beneath materials temporarily stored within a TPZ. The ply boards, truck/bog mats or timber supports are to be suitable for the load being placed upon them. Materials or timber supports are not to penetrate the existing soil profile.

- 5.9 The use of truck mats or Geo Cell type product within a TPZ is permissible if appropriate for the weight of the traffic being used.
- 5.10 Ground protection measures are to be installed after clearing and grubbing activities and prior to site works commencing and maintained in good order throughout the construction process. Ground protection within a TPZ is only to be removed when deemed necessary and under consultation with the project arborist. Care is to be undertaken when removing ground protection measures to avoid disturbance or damage to the underlying soil profile. The use of excavators to remove ground protection measures within a TPZ is to be supervised by the project arborist. Where the project arborist deems the use of excavators inappropriate within a TPZ temporary ground covers are to be manually removed using hand tools.
- 5.11 When operating heavy machinery and/or plant within an area of ground protection defined access and egress routes are to be used. Machinery movement is to be minimised during working operations. The slewing, turning and rotation of heavy tracked equipment is to be minimised within a TPZ. Further details regarding the establishment of ground protection can be found as Figure 3.
- 5.12 Non-destructive digging is to be utilised where excavation is required within the limits of the tree protection zone (1, 4, 8, 9, 10, 11, 12, 13, 15, 18, 23). Non-destructive digging is to be undertaken to a minimum depth of 600mm (unless otherwise advised by the project arborist) under the direct supervision of the project arborist. Roots exposed by the excavation are to be assessed and managed in accordance with the project arborists recommendations. In the event that significant supporting roots are exposed and it is thought that root pruning will compromise the stability of the tree a recommendation to remove the tree shall be given. In order to reduce the risks of tree failure tree removal shall need to be undertaken prior to the pruning of significant roots.

- 5.13 Sedimentation fencing pegs are not to be driven or hammered into the ground within a TPZ. Peg holes are to be hand excavated to avoid damaging tree roots. There is to be enough flexibility in the silt fencing design to relocate pegs where roots >25mm in diameter are found. A minimum clearance of 100mm is to be given between tree roots and silt fencing pegs. No contiguous trenching to establish silt fencing is to be undertaken within a tree protection zone.

Appendix 1: Tree Assessment Schedule

Tree No	Botanical Name Common Name	Height (m)	Canopy Spread (m)	DBH (mm)	DAB (mm)	Age Class	Vigour	Condition	ULE	Landscape Significance	Retention Value	TPZ (m)	SRZ (m)	Comments
1	<i>Angophora costata</i> (Smooth-barked Apple)	20-25	10x10	840	940	M	N	G	L	M	H	10.08	3.22	Significant specimen. Deadwood to 180mm dia. and epicormics observed within canopy. Slight swelling in base of trunk may indicate internal decay conditions.
2	<i>Livistona</i> sp (Cabbage Palm)	1-5	2x2	300	400	Y	N	G	L	M	H	3.60	2.25	Council owned tree within road reserve.
3	<i>Angophora costata</i> (Smooth-barked Apple)	10-15	3x3	330	430	M	N	G	M	M	M	3.96	2.32	Tree has developed a lean due to suppression from adjacent taller specimens. Root zone restricted to the west due to level drop associated with neighbour's driveway.
4	<i>Angophora costata</i> (Smooth-barked Apple)	10-15	4x4	360	450	M	N	G	M	M	H	4.32	2.37	Tree has developed a lean due to suppression from adjacent taller specimens. Root zone restricted to the west due to level drop associated with neighbour's driveway.
5	<i>Allocasuarina toralosa</i> (Forest Sheoak)	5-10	3x3	400	300	M	N-L	P	S	L	L	4.80	2.00	Codominant stems develop at 1m. Ivy found to be growing over tree. Tree in a state of declining health and condition.
6	<i>Corymbia gummifera</i> (Red Bloodwood)	20-25	8x8	450	500	M	N-L	P	S	L	L	5.40	2.47	Tree in advanced state of decline, half of canopy dead. Ivy found to be growing over tree. Deadwood and epicormics within canopy.
7	<i>Allocasuarina toralosa</i> (Forest Sheoak)	5-10	3x3	300	400	M	L	P	S	L	L	3.60	2.25	Tree is near dead. Possible decay column within trunk. Epicormics and deadwood within canopy.
8	<i>Corymbia gummifera</i> (Red Bloodwood)	20-25	4x4	350	450	M	L	P	S	M	L	4.20	2.37	Termite nest observed within branch junction. Canopy consists of epicormic shoots. Tree in an advanced state of decline.
9	<i>Eucalyptus</i> sp (Eucalypt)	15-21	6x7	600	700	M	N	G	L	M	H	7.20	2.85	Termite tracking observed on trunk. Deadwood and epicormics observed within canopy.
10	<i>Angophora costata</i> (Smooth-barked Apple)	20-25	6x6	400	500	M	N	G	L	M	H	4.80	2.47	Deadwood and epicormics observed within canopy.
11	<i>Pittosporum undulatum</i> (Sweet Pittosporum)	5-10	4x4	100	200	M	L	F	S	L	L	2.00	1.68	Failed top. Canopy density is sparse. Twin stems develop at base of tree. Deadwood observed.
12	<i>Corymbia gummifera</i> (Red Bloodwood)	15-20	5x5	350	450	M	N	G	L	M	H	4.20	2.37	Suppressed specimen, canopy has developed offset from trunk position.
13	<i>Angophora costata</i> (Smooth-barked Apple)	10-15	3x3	300	400	M	N	G	L	M	H	3.60	2.25	Suppressed specimen.
14	<i>Banksia serrata</i> (Old Man Banksia)	10-15	3x3	300	300	M	N	G	M	M	M	3.60	2.00	Dieback observed within top of canopy.
15	<i>Angophora costata</i> (Smooth-barked Apple)	15-20	7x7	400	500	M	N	G	L	M	H	4.80	2.47	Tree located on neighbour's [property].
16	<i>Allocasuarina toralosa</i> (Forest Sheoak)	5-10	2x2	200	300	M	L	P	S	L	L	2.40	2.00	Tree in declining health and condition. Suppressed specimen. Epicormics observed within canopy.

Tree No	Botanical Name Common Name	Height (m)	Canopy Spread (m)	DBH (mm)	DAB (mm)	Age Class	Vigour	Condition	ULE	Landscape Significance	Retention Value	TPZ (m)	SRZ (m)	Comments
17	<i>Allocasuarina toralosa</i> (Forest Sheoak)	10-15	5x5	350	450	M	N	G-F	S	M	L	4.20	2.37	Tree has poor form and has multiple failed and broken branches. Trunk exhibits a slight lean to the north.
18	<i>Angophora costata</i> (Smooth-barked Apple)	20-25	10x10	900	1000	M	N	G	L	M	H	10.80	3.31	Significant tree located adjacent edge of rocky outcrop. Deadwood and epicormics observed within canopy.
19	<i>Allocasuarina toralosa</i> (Forest Sheoak)	10-15	3x3	300	400	M	N	F	S	M	L	3.60	2.25	Tree has poor form and dead stem. Epicormics observed within canopy. Branch failure points seen in canopy.
20	<i>Allocasuarina toralosa</i> (Forest Sheoak)	15-20	3x3	300	450	M	N	F	S	M	L	3.60	2.37	Dieback in top of tree. Deadwood and epicormics.
21	<i>Allocasuarina toralosa</i> (Forest Sheoak)	5-10	3x3	300	400	M	N	G-F	S	L	L	3.60	2.25	Epicormics and twiggy deadwood.
22	<i>Ceratopetalum</i> sp (Christmas Bush)	10-15	2x2	180	200	M	N	G	S	M	L	2.16	1.68	Base of trunk has developed a kink.
23	<i>Allocasuarina toralosa</i> (Forest Sheoak)	10-15	1x1	200	300	M	L	P	S	M	L	2.40	2.00	Tree is near dead. Top of tree has failed. Canopy consists of epicormic growth.
24	<i>Corymbia gummifera</i> (Red Bloodwood)	10-15	3x3	200	300	M	N	G	M	M	M	2.40	2.00	Suppressed specimen. Canopy is offset from trunk position due to suppression.
25	<i>Banksia serrata</i> (Old Man Banksia)	5-10	3x3	400	500	M	N	G	S	M	L	4.80	2.47	Tree is growing out of cliff face.
26	<i>Angophora costata</i> (Smooth-barked Apple)	20-25	10x10	900	1200	M	N	G	L	M	H	10.80	3.57	Significant specimen tree. Deadwood and epicormics throughout canopy. Over mature specimen.
27	<i>Allocasuarina toralosa</i> (Forest Sheoak)	5-10	4x4	250	350	M	N	G	S	L	L	3.00	2.13	Twin stems at base of trunk. Canopy density is sparse. Broken branches observed.
28	Unidentified	5-10	4x4	210	350	M	N	G	S	M	L	2.52	2.13	DBH: 150mm, 150mm. Split trunk to 2m. Growing at base of T1.
29	Unidentified	5-10	3x3	200	250	M	N	G	S	M	L	2.40	1.85	Growing at base of T1.
30	<i>Allocasuarina toralosa</i> (Forest Sheoak)	10-15	3x3	200	250	M	N-L	F	S	L	L	2.40	1.85	Deadwood and epicormics. Cavity running up trunk. Vine growing into canopy.

Appendix 2: Development Impacts Schedule

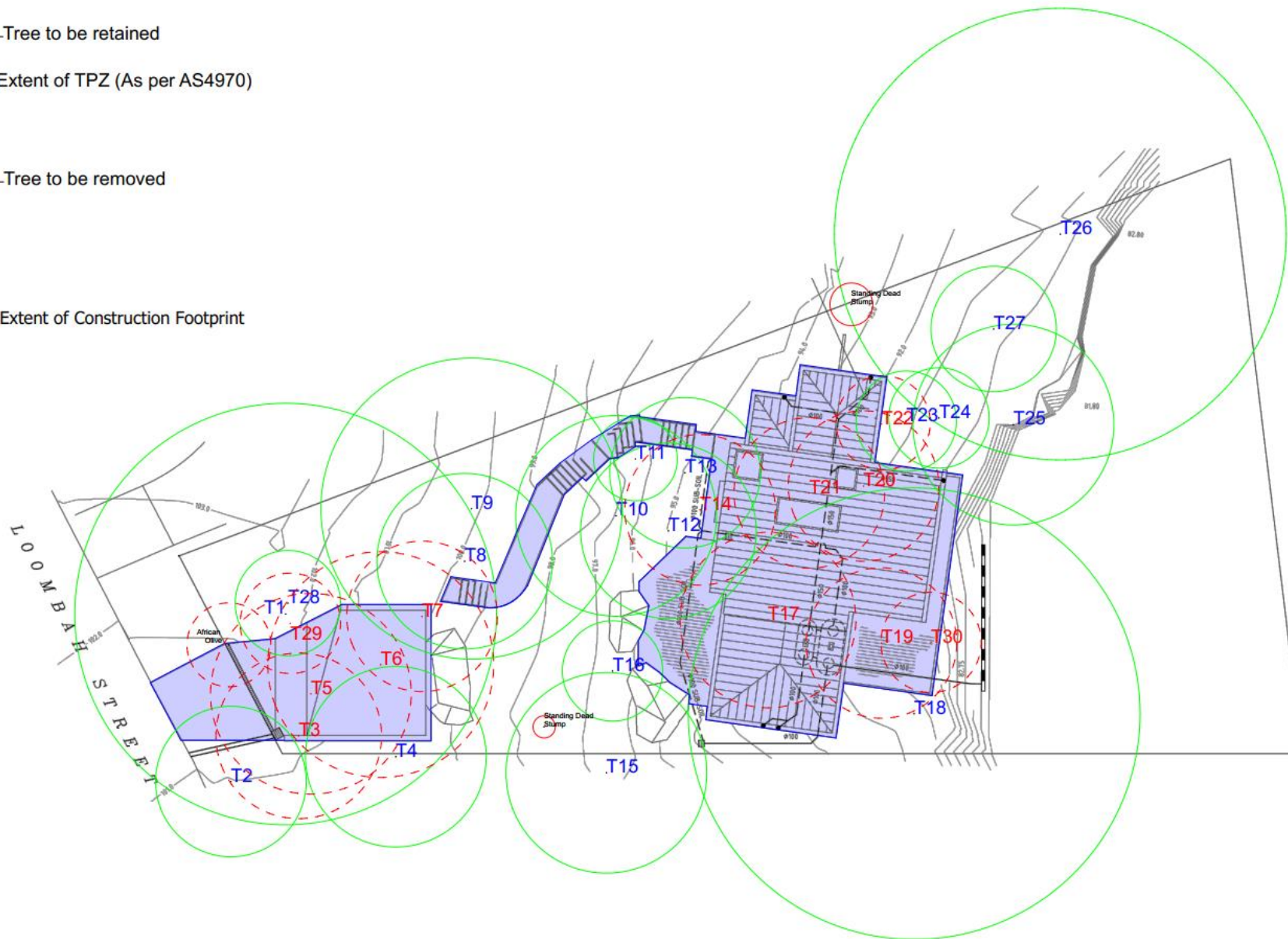
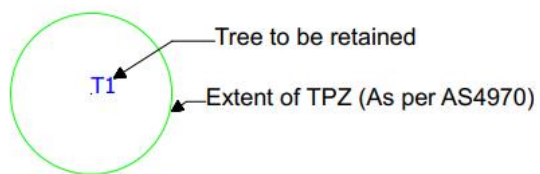
Tree No	Tree name	Development Impacts	Controls	Retain or Remove Tree
1	<i>Angophora costata</i> (Smooth-barked Apple)	The alignment of piers associated with the off street car parking bay pose minor encroachments into the protection zone of the tree. As do the entry stairs and footpath. Site access requirements during construction pose a significant encroachment through the TPZ. Excavation to attain working levels for the driveway crossover occupy approximately 10% of the TPZ and are thought to be limited to the minimal depth required for the driveway slab.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. All excavation, associated with the driveway crossover, entry stairs and car parking bay piers shall be undertaken using methods that do not damage tree roots under the supervision of the project arborist. The car parking bay piers are to be manually excavated to a minimum depth of 600mm. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
2	<i>Livistona sp</i> (Cabbage Palm)	The off street car parking bay and driveway crossover pose a 19% encroachment through the protection zone of the tree. This encroachment is not considered to pose a significant impact upon the tree due to the architecture and morphology of palm tree root systems. Excavation for stormwater pipe connection to gutter considered minimal.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Any excavation within the TPZ, associated with the driveway crossover and stormwater pipe to the gutter, shall be undertaken using methods that do not damage tree roots under the supervision of the project arborist. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
3	<i>Angophora costata</i> (Smooth-barked Apple)	Design plans show the tree is located within the footprint of the off street car parking bay. Under the current design the tree cannot be retained.	Nil	Remove
4	<i>Angophora costata</i> (Smooth-barked Apple)	Design plans show the location of pier footings for the off street car parking bay with respects to the SRZ. The car parking bay and positioning of piers is considered to pose only minor impacts upon the tree.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Excavation of piers within the TPZ and SRZ shall be undertaken using methods that do not damage tree roots under the supervision of the project arborist. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
5	<i>Allocasuarina toralosa</i> (Forest Sheoak)	Design plans show the tree is located within the footprint of the off street car parking bay. Under the current design the tree cannot be retained.	Nil	Remove
6	<i>Corymbia gummifera</i> (Red Bloodwood)	Design plans show the tree is located within the footprint of the off street car parking bay. Under the current design the tree cannot be retained.	Nil	Remove
7	<i>Allocasuarina toralosa</i> (Forest Sheoak)	Design plans show the tree is located within the footprint of the off street car parking bay. Under the current design the tree cannot be retained.	Nil	Remove

Tree No	Tree name	Development Impacts	Controls	Retain or Remove Tree
8	<i>Corymbia gummifera</i> (Red Bloodwood)	The entry footpath overlays the protection zone of the tree by 17% and is aligned within the SRZ. This encroachment is not considered to pose significant impacts upon the tree and can be managed through arboricultural intervention.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Any excavation, associated with the stairs, within the TPZ shall be undertaken using methods that do not damage tree roots under the supervision of the project arborist. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
9	<i>Eucalyptus</i> sp (Eucalypt)	The entry footpath overlays the protection zone of the tree by 10% and is aligned within the SRZ. This encroachment is not considered to pose significant impacts upon the tree and can be managed through arboricultural intervention.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Any excavation, associated with the stairs, within the TPZ shall be undertaken using methods that do not damage tree roots under the supervision of the project arborist. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
10	<i>Angophora costata</i> (Smooth-barked Apple)	The entry footpath and decking area overlays the protection zone of the tree by 29% and is aligned on the limits of the SRZ. Due to existing level changes within the TPZ this encroachment is not considered to pose significant impact upon the tree and can be managed through arboricultural intervention.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Any excavation, associated with the stairs, within the TPZ shall be undertaken using methods that do not damage tree roots under the supervision of the project arborist. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
11	<i>Pittosporum undulatum</i> (Sweet Pittosporum)	The entry footpath overlays the protection zone of the tree by 38% and is aligned within the SRZ. This encroachment is not considered to pose significant impacts upon the tree and can be managed through arboricultural intervention.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Any excavation, associated with the stairs, within the TPZ shall be undertaken using methods that do not damage tree roots under the supervision of the project arborist. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain

Tree No	Tree name	Development Impacts	Controls	Retain or Remove Tree
12	<i>Corymbia gummifera</i> (Red Bloodwood)	The entry footpath, decking and dwelling pose an indicative encroachment of 42% into the TPZ. This encroachment is significantly reduced through the use of piers (two of which are positioned within the TPZ). The encroachment is manageable with arboricultural intervention.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Any excavation, associated with the stairs and piers shall be undertaken using methods that do not damage tree roots under the supervision of the project arborist. The dwelling's piers are to be manually excavated to a minimum depth of 600mm. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
13	<i>Angophora costata</i> (Smooth-barked Apple)	The entry footpath, decking and dwelling pose an indicative encroachment of 42% into the TPZ. This encroachment is significantly reduced through the use of piers (two of which are positioned within the TPZ). The encroachment is manageable with arboricultural intervention.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Any excavation, associated with the stairs and piers shall be undertaken using methods that do not damage tree roots under the supervision of the project arborist. The dwelling's piers are to be manually excavated to a minimum depth of 600mm. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
14	<i>Banksia serrata</i> (Old Man Banksia)	Tree is located approx. 200mm off the alignment of the Lower-Level floor (Porch decking) and is within the wider works area required to undertake practical construction. The removal of the tree shall be required to undertake construction.	Nil	Remove
15	<i>Angophora costata</i> (Smooth-barked Apple)	The alignment of the dwelling is clear of the TPZ. Stormwater pit and pipes are aligned on the limits of the TPZ and pose negligible impacts upon the tree. Wider area of the TPZ potentially encroached upon by site access requirements. This encroachment can be managed with arboricultural intervention.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. All excavation, associated with the stormwater system shall be undertaken using methods that do not damage tree roots under the supervision of the project arborist. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
16	<i>Allocasuarina toralosa</i> (Forest Sheoak)	Lower-level decking area poses an 8% encroachment into the TPZ. Existing level changes within the TPZ likely reduce the impacts of this encroachment.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
17	<i>Allocasuarina toralosa</i> (Forest Sheoak)	Design plans show the tree is located within the footprint of the proposed residential dwelling. Under the current design the tree cannot be retained.	Nil	Remove

Tree No	Tree name	Development Impacts	Controls	Retain or Remove Tree
18	<i>Angophora costata</i> (Smooth-barked Apple)	The alignment of the dwelling poses an indicative encroachment of 32% of the TPZ. Existing level changes within the TPZ likely reduce the impacts of this encroachment. Ten piers are aligned within the TPZ and are not expected to have a significant impact upon the tree. Wider area of the TPZ potentially encroached upon by site access requirements. The encroachment can be managed with arboricultural intervention.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Any excavation, associated with the piers shall be undertaken to a minimum depth of 600mm, using methods that do not damage tree roots, under the supervision of the project arborist. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
19	<i>Allocasuarina toralosa</i> (Forest Sheoak)	Design plans show the tree is located within the footprint of the proposed residential dwelling. Under the current design the tree cannot be retained.	Nil	Remove
20	<i>Allocasuarina toralosa</i> (Forest Sheoak)	Design plans show the tree is located within the footprint of the proposed residential dwelling. Under the current design the tree cannot be retained.	Nil	Remove
21	<i>Allocasuarina toralosa</i> (Forest Sheoak)	Design plans show the tree is located within the footprint of the proposed residential dwelling. Under the current design the tree cannot be retained.	Nil	Remove
22	<i>Ceratopetalum</i> sp (Christmas Bush)	Tree is located approx. 200mm off the alignment of the Lower-Level floor (Guest/Playroom) and is within the wider works area required to undertake practical construction. The removal of the tree shall be required to undertake construction.	Nil	Remove
23	<i>Allocasuarina toralosa</i> (Forest Sheoak)	The dwelling poses an indicative encroachment of 21% into the TPZ. This encroachment is significantly reduced through the use of piers (two of which are positioned within the TPZ). The encroachment is manageable with arboricultural intervention.	Establishment a tree protection zone under guidance of the project arborist in consultation with the construction manager and property owners. Tree protection measures are to be implemented in accordance with section 5.4 and Appendix 5. Any excavation, associated with the piers shall be undertaken to a minimum depth of 600mm, using methods that do not damage tree roots, under the supervision of the project arborist. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
24	<i>Corymbia gummifera</i> (Red Bloodwood)	TPZ is clear of the proposed works allowing for the retention of the tree. Encroachment into the TPZ to allow for practical construction is manageable with arboricultural intervention.	Establishment a tree protection zone under guidance of the project arborist in consultation with the construction manager and property owners. Tree protection measures are to be implemented in accordance with section 5.4 and Appendix 5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
25	<i>Banksia serrata</i> (Old Man Banksia)	The protection zone of the tree is clear of the proposed works allowing for its retention. Potential for significant TPZ encroachment to enable practical construction activities. This encroachment is with arboricultural intervention.	Establishment a tree protection zone under guidance of the project arborist in consultation with the construction manager and property owners. Tree protection measures are to be implemented in accordance with section 5.4 and Appendix 5. Ground protection measures are to be implemented in accordance with section 5.7. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain

Tree No	Tree name	Development Impacts	Controls	Retain or Remove Tree
26	<i>Angophora costata</i> (Smooth-barked Apple)	The protection zone of the tree is clear of the proposed works allowing for its retention. Potential for significant TPZ encroachment to enable practical construction activities. This encroachment is with arboricultural intervention.	Establishment a tree protection zone under guidance of the project arborist in consultation with the construction manager and property owners. Tree protection measures are to be implemented in accordance with section 5.4 and Appendix 5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
27	<i>Allocasuarina toralosa</i> (Forest Sheoak)	The protection zone of the tree is clear of the proposed works allowing for its retention. Potential for significant TPZ encroachment to enable practical construction activities. This encroachment is with arboricultural intervention.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
28	Unknown	The off street car parking bay poses an indicative encroachment into the protection zone by 11%. Excavation required to attain working levels within this encroachment area is considered to be minor and is not expected to have a significant impact upon the tree.	The trunk of the tree is to be protected through the attachment of wooden battens. Battens are to be installed in accordance with section 5.5. All excavation, associated with the driveway and car parking bay within the TPZ shall be undertaken using methods that do not damage tree roots under the supervision of the project arborist. Roots exposed by excavations are to be managed in accordance with the project arborists recommendations. Ground protection measures are to be installed under guidance of the project arborist in consultation with the construction manager and property owners. Ground protection measures are to be implemented in accordance with section 5.7. Monitor the health and condition of the tree throughout the construction phase of the project.	Retain
29	Unknown	Tree is located approx. 300mm off the alignment of the off street car parking bay and is within the wider works area required to undertake practical construction. The removal of the tree shall be required to undertake construction.	Nil	Remove
30	<i>Allocasuarina toralosa</i> (Forest Sheoak)	Tree is located within the alignment of the Lower-Level decking area and cannot be retained under the current design.	Nil	Remove

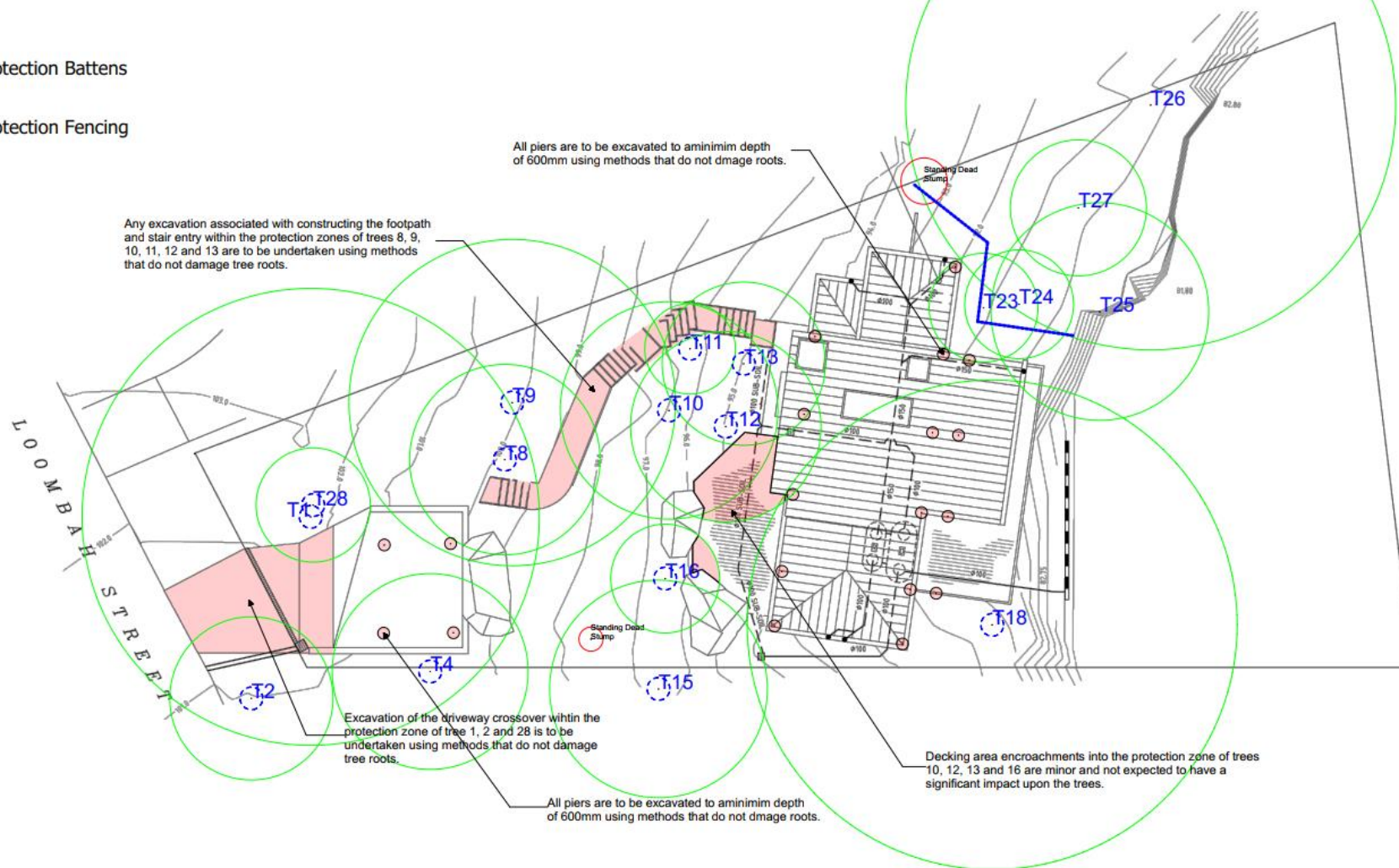
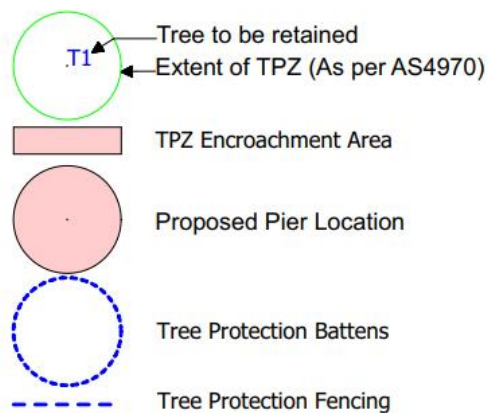


Extract from Stormwater Management Plan showing trees to be retained and trees to be removed.

DRAWN	OT
DATE	26/10/2022
SCALE	1:200 @ A 2

TITLE/DWG NO.

Appendix 4: Tree Retention & Removal Plan



Extract from stormwater Management Plan showing TPZ encroachment areas and protection methods for individual trees. Tree protection is to be implemented under the guidance of the project arborist.

DRAWN	OT	TITLE/DWG NO.
DATE	01/11/2022	
SCALE	1:200 @ A 2	

Appendix 5: TPZ Encroachments

Appendix 6: Site Photographs

Photograph 1: Trees 1, 28 and 29 as seen from the front of the property.



Photograph 2: Trees 3, 4, 5 and 6 as seen from the front of the property.



Photograph 3: Trees 8 and 9 as seen looking along the eastern boundary.



Photograph 4: Looking west from eastern boundary at trees 10, 12 and 14.



Photograph 5: Tree 15 located on the western boundary.



Photograph 6: Looking south from western boundary at trees 17, 18 and 30.



Photograph 7: Looking west from the eastern boundary at trees 20, 22, 23 and 24.



Photograph 8: Looking south from the eastern boundary at trees 25, 26 and 27.



Appendix 7: Tree Inspection criteria

Tree number: Identifying number given to individual (or group of) trees.

Botanical Name: Latin name for tree showing genus and species.

Common Name: The common name given to the tree.

Tree Dimensions: The physical dimensions of the tree.

- **Height:** Estimated or measured height of tree in meters.
- **Spread:** Estimated or measured radial canopy spread of tree in meters.
- **Diameter at Breast Height (DBH):** The estimated or measured diameter of trunk in given in millimetres measured at 1.4m from ground.

Age Class: An estimation of how old the tree is in relation to its life expectancy.

- **Young** – Age less than 20% of life expectancy of tree in situ
- **Mature** – Age 20% - 80% of life expectancy of tree in situ
- **Old** – Age greater than 80% of life expectancy of tree in situ
- **Dead** – Tree is dead

Vigour: Ability of a tree to sustain its life processes. This is independent of the condition of a tree but may impact upon it. Vigour can appear to alter rapidly with change of seasons (seasonality) e.g., dormant, deciduous or semi-deciduous trees. Vigour can be categorised as Dormant, Low, Normal and High.

- **Dormant Vigour** – Determined by the existing turgidity in the lower order branches in the outer extremity of the crown, with good bud set and formation, and where the last extension growth is distinct from those most recently preceding it, evident by bud scale scars. Normal vigour during dormancy is achieved when such growth is evident on a majority of branches throughout the crown.
- **Low Vigour** – Reduced ability of a tree to sustain its life processes. This may be evident by the atypical growth of leaves, reduced crown cover and reduced crown density, branches, roots and trunk, and a deterioration of their functions with reduced resistance to predation. This is independent of the condition of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.
- **Normal Vigour** – Ability of a tree to maintain and sustain its life processes. This may be evident by the typical growth of leaves, crown cover and crown density, branches, roots and trunk and resistance to predation. This is independent of the condition of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.
- **High Vigour** – Accelerated growth of a tree due to incidental or deliberate artificial changes to its growing environment that are seemingly beneficial, but may result in premature aging or failure if the favourable conditions cease, or promote prolonged senescence if the favourable conditions remain, e.g. water from a leaking pipe, water and nutrients from a leaking or disrupted sewer pipe, nutrients from animal waste, a tree growing next to a chicken coop, or a stock feed lot, or a regularly used stockyard, a tree subject to stringent watering and fertilisation program, or some trees may achieve an extended lifespan from continuous pollarding practices over the life of the tree.

Condition: A tree's crown form and growth habit, as modified by its environment (aspect, suppression by other trees, soils) the stability and viability of the root plate, trunk and structural branches (first (1st) and possibly (2nd) order branches), including structural defects such as wounds, cavities or hollows, crooked trunk or weak trunk/branch junctions and the effects of predation by pests and diseases. These may not be directly connected with vigour and it is possible for a tree to be of normal vigour but in poor condition. Condition can be categorised as Dead, Poor, Fair and Good.

- **Dead Condition** – Tree is no longer capable of performing any of the following processes or is exhibiting any of the following symptoms; Photosynthesis via its foliage crown (as indicated by the presence of moist, green or other coloured leaves), Osmosis (the ability of the roots system to take up water), Turgidity (the ability of the plant to sustain moisture pressure in its cells), Epicormic shoots or epicormic strands in Eucalypts (the production of new shoots as a response to stress, generated from latent or adventitious buds or from a lignotuber), Permanent leaf loss, Permanent leaf wilting (the loss of turgidity which is marked by desiccation of stems leaves and roots), Abscission of the epidermis (bark desiccates and peels off to the beginning of the sap wood).
- **Poor Condition** - Tree is of good habit or misshapen, a form that may be severely restricted for space and light, exhibits symptoms of advanced and irreversible decline such as fungal, or bacterial infestation, major die-back in the branch and foliage crown, structural deterioration from insect damage e.g. termite infestation, or storm damage or lightning strike, ring barking from borer activity in the trunk, root damage or instability of the tree, or damage from physical wounding impacts or abrasion, or from altered local environmental conditions and has been unable to adapt to such changes and may decline further to death regardless of remedial works or other modifications to the local environment that would normally be sufficient to provide for its basic survival if in good to fair condition. Deterioration physically, often characterised by a gradual and continuous reduction in vigour but may be independent of a change in vigour, but characterised by a proportionate increase in susceptibility to, and

predation by pests and diseases against which the tree cannot be sustained. Such conditions may also be evident in trees of advanced senescence due to normal phenological processes, without modifications to the growing environment or physical damage having been inflicted upon the tree. This may be independent from, or contributed to by vigour.

- **Fair Condition** - Tree is of good habit or misshapen, a form not severely restricted for space and light, has some physical indication of decline due to the early effects of predation by pests and diseases, fungal, bacterial, or insect infestation, or has suffered physical injury to itself that may be contributing to instability or structural weaknesses, or is faltering due to the modification of the environment essential for its basic survival. Such a tree may recover with remedial works where appropriate, or without intervention may stabilise or improve over time, or in response to the implementation of beneficial changes to its local environment. This may be independent from, or contributed to by vigour.
- **Good Condition** - Tree is of good habit, with crown form not severely restricted for space and light, physically free from the adverse effects of predation by pests and diseases, obvious instability or structural weaknesses, fungal, bacterial or insect infestation and is expected to continue to live in much the same condition as at the time of inspection provided conditions around it for its basic survival do not alter greatly. This may be independent from, or contributed to by vigour.

Useful Life Expectancy (ULE) is the length of time that the arborist assesses an individual tree can be retained with an acceptable level of risk based on the information available at the time of inspection. It is a snapshot in time of the potential an individual tree has for survival in the eyes of the assessor. ULE is not static – it is closely related to tree health and the surrounding conditions. Alterations in these variables may result in changes to the ULE assessment. Consequently, the reliability all ULE assessments have will decrease as time passes from the initial assessment and the potential for changes in variables increases. ULE can be categorised as Long, Medium, Short, Remove, Young or Small.

- **Long (L):** Trees that appear to be retainable at the time of the assessment for more than 40 years with an acceptable level of risk.
- **Medium (M):** Trees that appear to be retainable at the time of the assessment for 15-40 years with an acceptable level of risk.
- **Short (S):** Trees that appear to be retainable at the time of the assessment for 5-15 years with an acceptable level of risk.
- **Remove (R):** Trees that should be removed within the next 5 years.
- **Young or Small Trees (Y):** Trees that can be reliably moved or replaced.

Appendix 8: Tree Significance Assessment Criteria & Retention Value Matrix

IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010) ©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2010.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured quantitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree significance – Assessment Criteria* and *Tree Retention Value – Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of High, Medium and Low significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined.

Tree Significance – Assessment Criteria

1. High significance in landscape

- The tree is in good condition and good vigour
- The tree has a form typical for the species
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age
- The tree is listed as a heritage item, threatened species or part of an endangered ecological community or listed on council's significant tree register
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ – tree is appropriate to the site conditions

2. Medium significance in landscape

- The tree is in fair-good condition and good or low vigour
- The tree has form typical or atypical of the species
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street
- The tree provides a fair contribution to the visual character and amenity of the local area
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ

3. Low significance in landscape

- The tree is in fair-poor condition and good or low vigour
- The tree has form atypical of the species
- The tree is not visible or is partly visible from the surrounding properties as obstructed by other vegetation or buildings
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area
- The tree is a young specimen which may or may not have reached dimensions to be protected by local Tree Preservation Orders or similar protection mechanisms and can easily be replaced with a suitable specimen
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa in situ – tree is inappropriate to the site conditions
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms
- The tree has a wound or defect that has the potential to become structurally unsound
- **Environmental Pest / Noxious Weed Species**
 - The tree is an environmental pest species due to its invasiveness or poisonous/allergenic properties.
 - The tree is a declared noxious weed by legislation
- **Hazardous / Irreversible Decline**
 - The tree is structurally unsound and/or unstable and is considered potentially dangerous
 - The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or in part in the immediate to short term

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a monoculture stand in its entirety e.g., hedge.

Table 1.0 Tree Retention Value – Priority Matrix

	Tree Significance					
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape		
Useful Life Expectancy					Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
	Long >40 years					
	Medium 15-40 years					
	Short <1-15 years					
	Dead or Young & Small					

Legend for Matrix Assessment

	Priority for retention (High): These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 <i>Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented e.g., pier and beam etc if works are to proceed within the Tree Protection Zone.
	Consider for retention (Medium): These trees may be retained and protected. These are considered less critical; however, their retention should remain priority with the removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
	Consider for removal (Low): These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	Remove (R): These trees are considered hazardous, in irreversible decline or weeds and should be removed irrespective of development.

References

Australia ICOMOS Inc. 1999, The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance, International Council of Monuments and Sites, www.icomos.org/australia
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 Footprint Green Pty Ltd 2001, Footprint Green Tree Significance & Retention Value Matrix, Avalon, NSW Australia, www.footprintgreen.com.au