
Arboricultural Impact Assessment Report

Site Location:

45-53 Macleay Street Potts Point
NSW

Prepared for: T&P Chimes Development
Pty Ltd

Prepared by: Jack Williams
Urban Arbor Pty Ltd

Reference: 260128_45-53 Macleay_AIA_R2

Date Prepared: 28 January 2026

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1. INTRODUCTION

- 1.1 Urban Arbor have been instructed by T&P Chimes Development Pty Ltd to provide an Arboricultural Impact Assessment Report for trees located within the site and adjoining sites in relation to a proposed development.
- 1.2 Below is a list of all documents and information provided to assist in preparing this report:
- A. Detail and Level Survey, Colliers, Issue 01 - 25 September 2025.
 - B. Architectural Drawings, KHA, Revision A - 12 November 2025.
 - C. Root Investigations Report, Urban Arbor, 29 September 2025.
- 1.3 The site and tree inspections were carried out on 15 August 2025. Access was available to the subject site and adjoining public areas only. All tree data contained in this report was collected during this site inspection.
- 1.4 Record of report revisions;

Revision	Date	Report Reference
Draft	17/10/25	251017_45-53 Macleay_AIA
AIA	17/11/25	251114_45-53 Macleay_AIA
AIA Rev 1	17/11/25	251114_45-53 Macleay_AIA_R1
AIA Rev 2	28/1/26	260128_45-53 Macleay_AIA_R2

2. SCOPE OF THE REPORT

- 2.1 This report has been undertaken to meet the following objectives:
- 2.1.1 Conduct a ground level visual assessment of all significant trees located within 10 metres of development works. For the purpose of this report, a significant tree is a tree with a height equal to or greater than 5 metres.
 - 2.1.2 Determine the trees estimated contribution years and remaining useful life expectancy and award the trees a retention value.
 - 2.1.3 Provide an assessment of the potential impact the proposed development is likely to cause to the condition of the subject trees in accordance with AS4970 'Protection of trees on development sites' (2025).
 - 2.1.4 Specify tree protection measures to conform with AS4970-2025 for any tree to be retained during the development.

3. LIMITATIONS

- 3.1 The observations and recommendations are based on the site inspections identified in section 1 only. The findings of this report are based on the observations and site conditions at the time of inspection.
- 3.2 All of the observations were carried out from ground level. The accuracy of the assessment of the subject trees structural condition and health is limited to the visibility of the tree at the time of inspection.
- 3.3 The tree inspection was visual from ground level only. No soil or tissue testing was carried out as part of the tree inspection. None of the surrounding surfaces adjacent to trees were lifted or removed during the tree inspections.
- 3.4 Root decay can sometimes be present with no visual indication above ground. It is also impossible to know the extent of any root damage caused by mechanical damage such as underground root cutting during the installation of services without undertaking detailed root investigation. Any form of tree failure due to these activities is beyond the scope of this assessment.
- 3.5 While an assessment of the subject trees estimated useful life expectancy is included in this report, no specific tree risk assessment has been undertaken for any of the trees at the site.
- 3.6 The report reflects the subject tree(s) as found on the day of inspection. Any changes to the growing environment of the subject tree, or tree management works beyond those recommended in this report may alter the findings of the report. There is no warranty, expressed or implied, that problems or deficiencies relating to the subject tree, or subject site may not arise in the future.
- 3.7 Tree identification is based on accessible visual characteristics at the time of inspection. As key identifying features are not always available the accuracy of identification is not guaranteed. Where tree species is unknown, it is indicated with an spp.
- 3.8 Urban Arbor neither guarantees, nor is it responsible for, the accuracy of information provided by others that is contained within this report.
- 3.9 All diagrams, plans, and photographs included in this report are visual aids only and are not to scale unless otherwise indicated.
- 3.10 Alteration of this report invalidates the entire report.

4. METHODOLOGY

- 4.1 The following information was collected during the assessment of the subject tree(s):
- Tree common name.
 - Tree botanical name.
 - Tree age class.
 - DSH (Trunk/stem diameter at standard height) - Measured at a height of 1.4 metres or the nearest measurable point in millimetres. Where measurement at a height of 1.4 metres is not possible, another height may be specified.
 - Estimated height – metres.
 - Estimated crown spread (radius of crown) – metres.
 - Health.
 - Structural condition.
 - Amenity value.
 - Estimated remaining contribution years (SULE)¹.
 - Retention value (Tree AZ)².
 - Notes/comments
- 4.2 An assessment of the trees condition was made using the visual tree assessment (VTA) model (Mattheck & Breloer 1994)³
- 4.3 Trunk diameter was measured using a diameter tape or in some cases estimated. The trunk diameter of all trees in adjoining sites has been estimated unless otherwise stated. Tree height and tree canopy spread was measured with a clinometer or in some cases estimated. All other measurements were estimations unless otherwise stated. The other tool used during the assessment was a digital camera.
- 4.4 All tree information was imported into (GIS) PT-Mapper Pro software. This software was used to measure/calculate all encroachment estimates included in this report.
- 4.5 All DSH measurements, notional root zones (NRZ), structural root zones (SRZ) and tree protection zones (TPZ) were calculated in accordance with the methods set out in AS4970 'Protection of trees on development sites' (2025) in a Microsoft Excel spreadsheet.
- 4.6 Details of how the observations in this report have been assessed are listed in the appendices.

¹ Barrell, J. (2001), 'SULE: Its use and status in the new millennium' in *Management of Mature Trees proceedings of the 4th NAAA*

² Barrell Tree Consultancy, *Tree AZ Version 10.10-ANZ*, <http://www.treeaz.com/>.

³ Mattheck, C & Breloer, H., *The body language of trees – A handbook for failure analysis*, The Stationary Office, London, England (1994)

5. SITE LOCATION AND BRIEF DESCRIPTION

- 5.1 The site is located in the City of Sydney Local Government Area (LGA). All trees at the site are subject to protection under the Sydney Local Environmental Plan 2012 (LEP)⁴ and Sydney Development Control Plan 2012 (DCP).⁵
- 5.2 The site is located within a heritage conservation area (Potts Point) in the Heritage Layer of the NSW Planning Portal Spatial Viewer.⁴
- 5.3 Proposed works assessed in this report include the demolition of the ground floor slab only (other demolition works are in accordance with the concept approval) and construction a building and basement only.
- 5.4 Seven trees have been identified and assessed. Four trees are higher value category A trees, including tree 1, 2, 3 and 4. The other three trees are lower value category Z trees, including tree 5, 6 and 7.

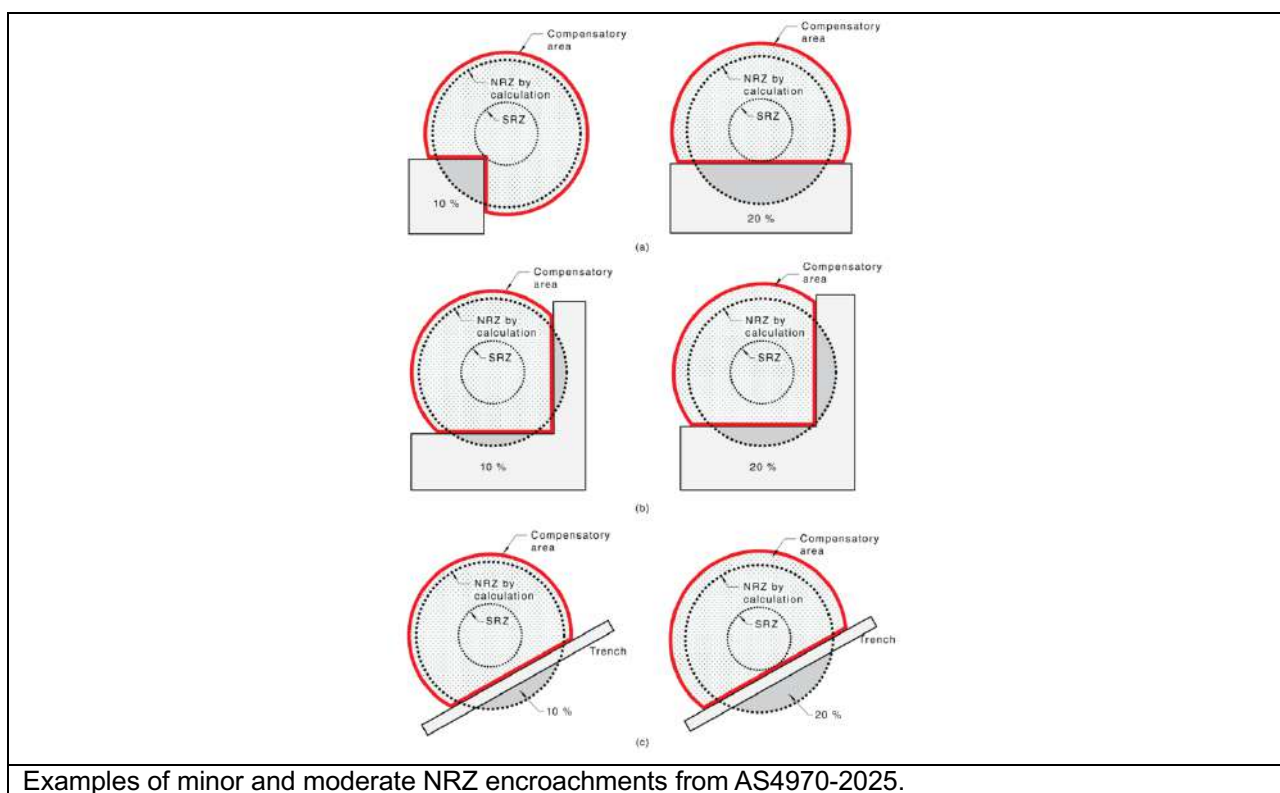
6. GENERAL INFORMATION IN RELATION TO PROTECTING TREES ON DEVELOPMENT SITES

- 6.1 **Notional Root Zone (NRZ):** The NRZ area is the primary trigger for determining when arboricultural assessment and input is required on a development site. The NRZ is calculated by multiplying the DSH by twelve, with the exception of palms, other monocots, cycads, and tree ferns, the NRZ of which have been calculated at one metre outside the crown projection. The NRZ is calculated to assist with assessing the potential impacts of root loss during development. It is commonly observed that tree roots will extent significantly further than the indicative NRZ area, however the NRZ is an area identified in AS4970-2025 to be the area where root loss or disturbance could impact the viability of the tree. The NRZ has a minimum radius of 2 metres and a maximum radius of 15 metres. The NRZ also incorporates the Structural Root Zone (SRZ), see below for more information about the SRZ.
- 6.2 **Structural Root Zone (SRZ):** This is an indicative area around the base of a tree required for the tree's stability in the ground. An area larger than the SRZ always needs to be maintained to preserve a viable tree. The SRZ is calculated using the following formula: $(DAB \times 50)^{0.42} \times 0.64$. The SRZ is a notional/indicative area only calculated in AS4970-2025 to assist with determining where severing roots could potentially impact the trees stability. There are several factors that can vary the SRZ area dimensions, including height, crown area, soil type, and soil moisture. It can also be influenced by other factors such as natural or built structures. Generally, work within the SRZ should be avoided, unless the project arborist can demonstrate that the stability of the tree will not be impacted by severing woody roots. Soil level changes should also generally be avoided inside the SRZ of trees to be retained. Palms, cycads, tree ferns and other monocots, do not have an SRZ.

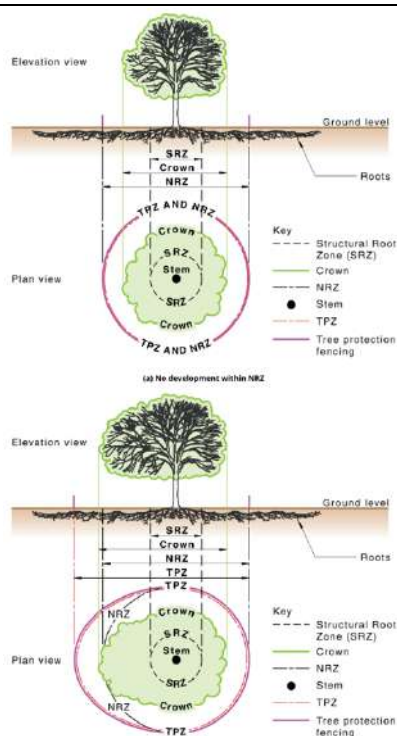
⁴ NSW Planning Portal Spatial Viewer – Property Report, <https://www.planningportal.nsw.gov.au/propertyreports/cf842d65-8727-4b16-801d-0b8e4ee1cab6.pdf>, accessed 16 October 2025.

- 6.3 **Minor Encroachment into the NRZ of 0-10%:** Sometimes encroachment into the NRZ is unavoidable. Encroachment includes but is not limited to activities such as root severance, excavation/cut, compacted fill and machine trenching. Minor encroachment of up to 10% of the overall NRZ area is generally considered acceptable, provided an area equivalent to the encroachment area can be compensated elsewhere within the TPZ, or if the project arborist otherwise demonstrates that the tree will remain viable.
- 6.4 **Moderate Encroachment into the NRZ of 10-20%:** This includes encroachment into the NRZ of between 10-20% of the overall NRZ area and outside the SRZ area. If moderate NRZ encroachment is proposed in the NRZ of a tree proposed to be retained, the project arborist must review the potential impact of the root loss and undertake any necessary investigation to demonstrate that the tree will remain viable. This may include tree sensitive design and construction methods to avoid root loss, or root investigations to determine any potential root loss. Examples include tree sensitive construction methods such as pier and beam footings, suspended slabs, or cantilevered sections, to allow additional encroachment into the NRZ by bridging over roots and minimising root disturbance. To avoid an overall net loss of root area during a moderate NRZ encroachment, an area equivalent to the encroachment area must be compensated for elsewhere within the TPZ, unless the project arborist otherwise demonstrates that the tree will remain viable.
- 6.5 **Major Encroachment into the NRZ of more than 20%:** Where encroachment of more than 20% of the overall NRZ area or encroachment into the SRZ is proposed, the project arborist must explore alternative designs with the design team and/or investigate and demonstrate that the tree will remain in a viable condition. For assessment of major encroachment into the NRZ area, a more detailed investigation is generally required. This can include root investigations, soil analysis, analysis of historical records, research literature or examples of previous projects where similar encroachments have been achieved. To avoid an overall net loss of root area during a major NRZ encroachment, an area equivalent to the encroachment area must be compensated for elsewhere within the TPZ, unless the project arborist otherwise demonstrates that the tree will remain viable.
- 6.6 **Crown/Canopy Impacts:** The impacts of any required crown/canopy pruning to the condition of the tree must also be considered. This includes assessing the impacts of any crown pruning required to accommodate proposed structures, including temporary measures such as scaffolding, hoarding or construction access. All required canopy pruning for proposed development must be assessed and specified in accordance with AS4373 Pruning of amenity trees (2007).
- 6.7 **Non-destructive Root investigations:** This can often assist in determining root impacts from proposed major NRZ encroachment. The root investigations should identify roots greater than 40mm in diameter that are located along the edge of the structure's footprint or in the location of footings. Root investigations must be carried out using non-invasive methods (manual excavations). Manual excavation may include the use of hand tools, a high-pressure air/air knife, or a combination of high-pressure air or water and a vacuum device. The root investigations should be carried out by a qualified arborist (minimum AQF3). Once roots are exposed, a visual assessment can be carried out by a consulting arborist. The consulting arborist should prepare a root map/report, identifying the findings of the investigations, including photographs as supporting evidence in the report.

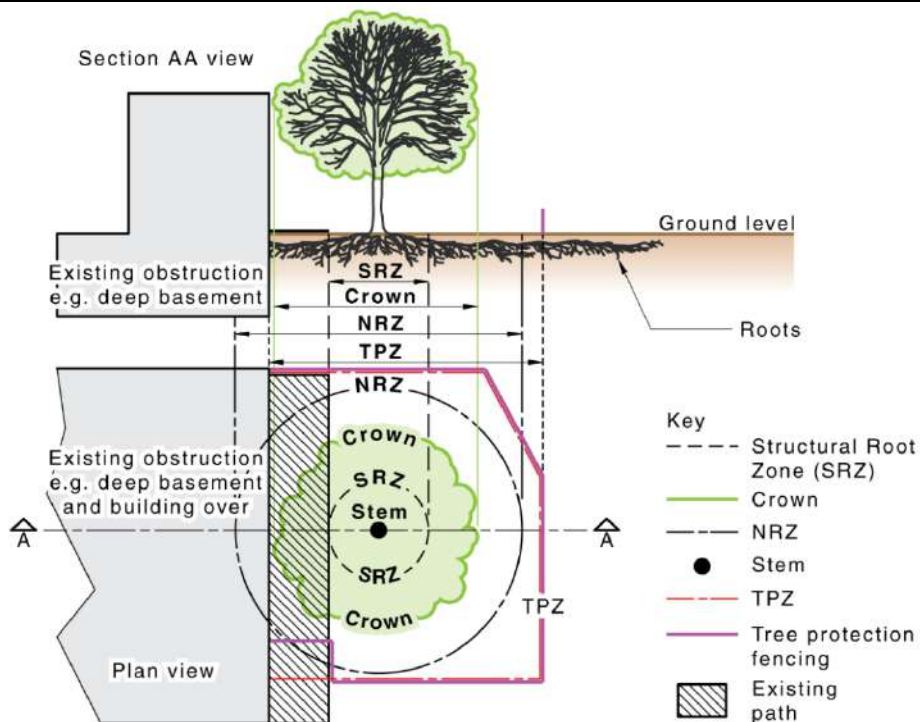
- 6.8 **Tree Protection Zone (TPZ):** The TPZ is the principle means of protecting trees on development sites during the development works. The TPZ is identified as a specified area to prevent damage to trees either above or below ground during a development to maintain the viability of trees during development. The TPZ area is calculated by the project arborist. The TPZ is initially based on the NRZ radius, then modified where required due to a number of factors, including the location and distribution of roots, past and present structures (existing structures or tree form/shape), canopy projection, soil characteristics, tree condition/characteristics, species characteristics and construction methods.



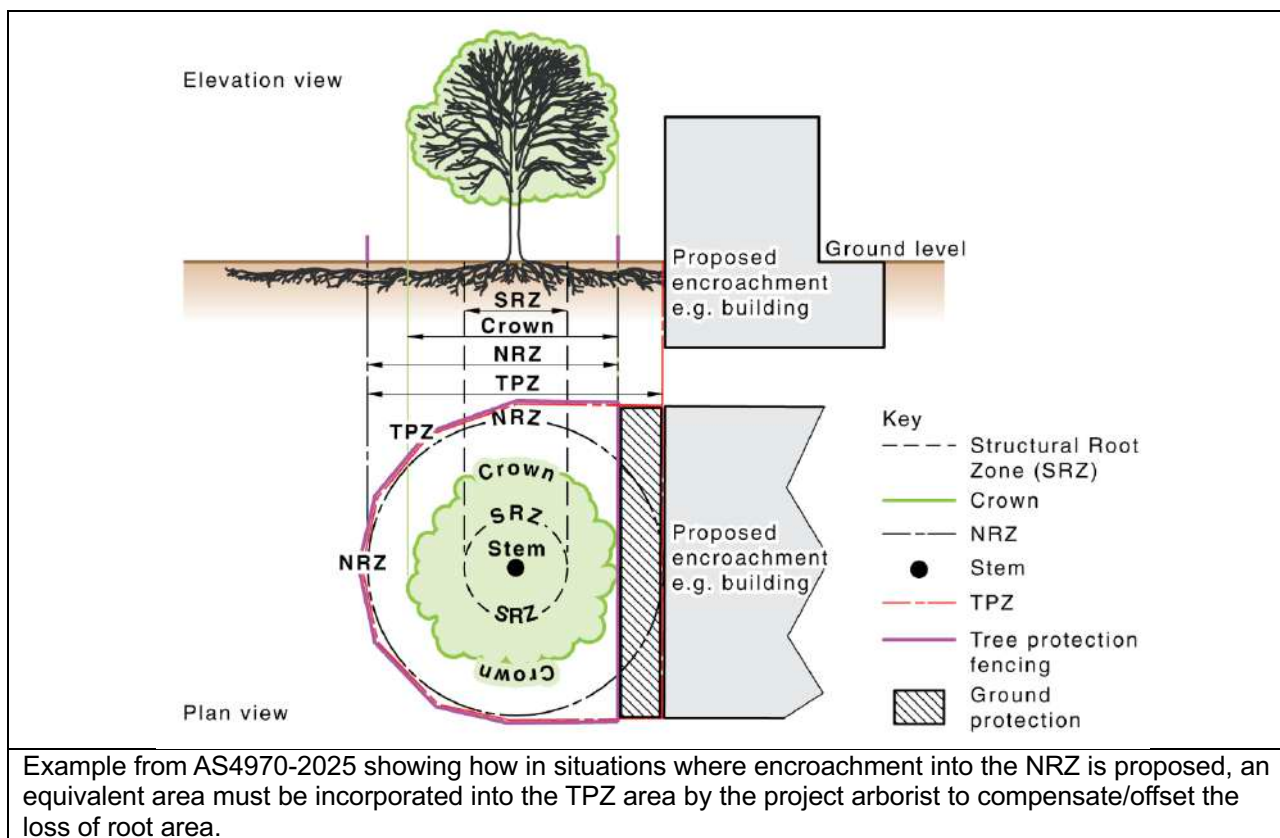
Examples of minor and moderate NRZ encroachments from AS4970-2025.



Examples of the NRZ, SRZ, TPZ and crown areas from AS4970-2025.



Example from AS4970-2025 showing how in situations where existing structures/obstacles are located in the NRZ area, an equivalent area must be incorporated into the TPZ area by the project arborist.



7. OBSERVATIONS

- 7.1 **Tree Information:** Details of each individual tree assessed, including the observations taken during the site inspection, can be found in the Tree Inspection Schedule in Appendix 2, where the NRZ and SRZ has been calculated for each of the subject trees. The NRZ and SRZ should be measured in radius from the centre of the trunk. Each of the subject trees have been awarded a retention value based on the observations using the Tree AZ method. Tree AZ is used to identify higher value trees worthy of being a constraint to development and lower value trees that should generally not be a constraint to the development. The Tree AZ categories sheet (Barrell Tree Consultancy) has been included in Appendix 3 to assist with understanding the retention values. The retention value that has been allocated to the subject trees in this report is not definitive and should only be used as a guideline.
- 7.2 **Site Plan:** In Appendix 1 site plans have been prepared, where the tree information including canopy spread, NRZ, and SRZ have been overlaid onto the site plans. The TPZ for trees recommended to be retained has been identified on the Tree Protection Plan (TPP). The following site plans are included:
- Appendix 1A: Existing Site Plan.
 - Appendix 1B: Proposed Site Plan (Basement).
 - Appendix 1C: Proposed Site Plan (Ground Floor).
 - Appendix 1D: Proposed Site Plan (First Floor).

8. ASSESSMENT OF CONSTRUCTION IMPACTS

- 8.1 **Table 1:** In the table below, the impact of the proposed development has been assessed for all trees included in the report. The assessed NRZ encroachments include proposed structures and hard surfacing only. Proposed soil level changes have not been identified in the information provided and have therefore not been assessed. All soft landscaping should be completed in accordance with section 11.14.

Tree ID	Species	Retention Value	NRZ Radius (m)	NRZ Area (m ²)	SRZ Radius (m)	NRZ Encroachment	Discussion/Conclusion	Recommendation
1	<i>Platanus x acerifolia</i>	A1	12.6	498.8	3.6	None	No proposed encroachment into the NRZ. No canopy pruning is required.	Retain and protect
2	<i>Platanus x acerifolia</i>	A1	7.4	172.0	2.9	Moderate	The proposed building wall will encroach into the NRZ by 5% (9.3m²) but not into the SRZ, which is minor NRZ encroachment and indicates that the tree will not be impacted. The proposed building wall is located within the footprint of an existing wall and will therefore not impact the tree. There is an existing raised planter bed located between the site boundary and existing building/wall in the NRZ, which occupies a further 7% (12.6m²) but not the SRZ. A building entry is proposed in this location. If the existing planter bed is demolished, the encroachment into the NRZ will be 13%, which is moderate NRZ encroachment and could potentially impact the tree. There could potentially be a significant build-up of roots within the existing planter raised bed. Lowering the soil level within the whole of the existing garden bed to accommodate the site entry and severing the roots will potentially impact the condition of the tree. To retain the tree in a viable condition, the design within the footprint of the existing raised planter bed must be tree sensitive to avoid impacting significant roots.	Tree Sensitive Construction

Site Location: 45-53 Macleay St, Potts Point, NSW
 Prepared for: T&P Chimes Development Pty Ltd
 Prepared by: Jack Williams, Urban Arbor Pty Ltd, sales@urbanarbor.com.au, (02) 8004 2802
 Date Prepared: 28 January 2026

Tree ID	Species	Retention Value	NRZ Radius (m)	NRZ Area (m ²)	SRZ Radius (m)	NRZ Encroachment	Discussion/Conclusion	Recommendation
							Preferably the soil grade should not be modified and the garden bed retained to avoid impacting the roots. If modifications to the existing garden bed are proposed, any site entrances through the existing garden bed will need to be carefully aligned in locations of the garden bed where significant roots are not present, with the remaining areas of the garden bed retained to avoid lowering the soil grade and impacting roots. If site entrances are proposed through the existing garden bed and the soil level within the garden bed is to be lowered for the entry, additional root investigations may be required in the location of the excavations to identify if significant roots will be impacted. If significant roots are exposed that will be impacted, the site entry and location of excavations will need to be relocated to avoid adversely impacting the tree. No canopy pruning is required to accommodate the proposed building.	
3	<i>Platanus x acerifolia</i>	A1	7.9	196.1	2.9	Major	The proposed building and basement will encroach into the NRZ by 14% (27.2m²) but not into the SRZ, which is moderate NRZ encroachment. However, there is an existing car park in this location with an existing wall on the alignment closest to the tree. Urban Arbor carried out root investigations (see appendix 5), which indicated that the existing wall footing is founded directly on rock and restricting root growth. The proposed basement will therefore not impact the tree, providing that no excavations (including over excavation for the basement) are carried out closer than the existing wall in the NRZ.	Tree Sensitive Construction

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Tree ID	Species	Retention Value	NRZ Radius (m)	NRZ Area (m ²)	SRZ Radius (m)	NRZ Encroachment	Discussion/Conclusion	Recommendation
							There is an existing raised planter bed located between the site boundary and existing building/wall in the NRZ, which occupies a further 11% (21.8m²) but not into the SRZ (see appendix 5 for images of the planter bed). A building entry is proposed in this location, if the existing planter bed is demolished, the encroachment into the TPZ will be 25%, which is major NRZ encroachment and could potentially impact the tree. Based on the root investigations by Urban Arbor (appendix 5), there is a significant build-up of roots within the existing planter raised bed. Lowering the soil level within the whole of the existing garden bed to accommodate the site entry and severing the roots will potentially impact the condition of the tree. To retain the tree in a viable condition, the design within the footprint of the existing raised planter bed must be tree sensitive to avoid impacting significant roots. Preferably the soil grade should not be modified and the garden bed retained to avoid impacting the roots. If modifications to the existing garden bed are proposed, any site entrances through the existing garden bed will need to be carefully aligned in locations of the garden bed where significant roots are not present, with the remaining areas of the garden bed retained to avoid lowering the soil grade and impacting roots. If site entrances are proposed through the existing garden bed and the soil level within the garden bed is to be lowered for the entry, additional root investigations maybe required in the location of the excavations to identify if significant roots will be impacted. If significant roots are exposed that will be impacted, the site entry and location of	

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Tree ID	Species	Retention Value	NRZ Radius (m)	NRZ Area (m ²)	SRZ Radius (m)	NRZ Encroachment	Discussion/Conclusion	Recommendation
							excavations will need to be relocated to avoid adversely impacting the tree. Canopy pruning is required to accommodate the proposed building, see section 9.3 for specifications.	
4	<i>Platanus x acerifolia</i>	A1	8.2	211.2	3.0	Moderate	The proposed building and basement will encroach into the NRZ by 11% (22.7m ²) but not into the SRZ, which is moderate NRZ encroachment. However, there is an existing building in this location restricting root growth. The proposed basement will therefore not impact the tree, providing that no excavations (including over excavation for the basement) are carried out closer than the existing wall in the NRZ. No canopy pruning is required to accommodate the proposed building.	Retain and protect
5	<i>Pyrus spp</i>	Z1	2.0	12.6	1.6	None	No proposed encroachment into the NRZ. No canopy pruning is required to accommodate the proposed building.	Retain and protect
6	<i>Magnolia grandiflora</i>	Z1	2.2	15.2	1.6	None	No proposed encroachment into the NRZ. No canopy pruning is required to accommodate the proposed building.	Retain and protect
7	<i>Pyrus spp</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the NRZ. No canopy pruning is required to accommodate the proposed building.	Retain and protect

9. CONCLUSIONS

9.1 Table 2: Summary of the impact to trees by the development.

Impact	Reason	Category A	Category Z	Total
		A	Z	
Trees recommended to be removed	Building construction, new surfacing and/or proximity to structures, or trees in poor condition	None	None	0 trees
Trees requiring tree sensitive construction	Removal of existing surfacing/structures and/or installation of new surfacing/structures may impact the viability of the trees	2, 3	None	2 trees
Trees recommended to be retained	Removal of existing surfacing/structures will not impact the viability of the trees	1, 4	5, 6, 7	5 trees

9.2 Canopy Pruning Tree 3: Canopy pruning will be required to accommodate the proposed building. The following pruning is required:

- Prune first order branch to the South at approximately 2 metres above ground level by removing third order branch at approximately 8 metres (image 3, branch 1). The final cut will be approximately 80mm in diameter.
- Prune first order branch to the South at approximately 2 metres above ground level by removing third order branch at approximately 9 metres (image 4, branch 2). The final cut will be approximately 70mm in diameter.
- Prune first order branch to the West at approximately 2.5 metres above ground level by removing second order branch at approximately 10 metres (image 4, branch 3). The final cut will be approximately 110mm in diameter.

The pruning specified above will result in removing approximately 5-10% of the overall live crown area. The pruning will not adversely impact the condition of the tree. The pruning is therefore considered minor and acceptable. All pruning can and must be carried out in accordance with section 7.2.4 of AS4373-2007 for selective pruning.⁵ The final pruning cut must be to the branch collar/union.

⁵ Council of Standards Australia, AS 4373 *Pruning of amenity trees* (2007) page 14.



Image 3: The yellow dashed line indicates the section of branch to be removed.



Image 4: The yellow dashed line indicates the section of branch to be removed.

10. RECOMMENDATIONS

- 10.1 This report assesses the impact of a proposed development at the subject site to all significant trees located within five metres of the development works. Seven trees have been identified and assessed.
- 10.2 In Appendix 1 site plans have been prepared, where the tree information including canopy spread, NRZ, and SRZ have been overlaid onto the site plans. The NRZ for trees recommended to be retained has been identified on the Tree Protection Plan (TPP). The following site plans are included:
- Appendix 1A: Existing Site Plan.
 - Appendix 1B: Proposed Site Plan (Basement).
 - Appendix 1C: Proposed Site Plan (Ground Floor).
 - Appendix 1D: Proposed Site Plan (First Floor).
- 10.3 No trees have been recommended for removal to accommodate the development works.
- 10.4 Two trees have been identified that will potentially be impacted and require root/tree sensitive design and construction to be retained in a viable condition, including tree 2 and 3, see section 8 for more information.
- 10.5 The other trees can be retained in a viable condition, including tree 1, 4, 5, 6 and 7.
- 10.6 All trees to be retained must be protected in accordance with AS4970-2009, details of which are included in section 11.
- 10.7 No landscape plan has been assessed in this report. See section 11.16 for general guidance to minimising the impact of proposed landscaping to retained trees and replacement tree planting.
- 10.8 No services plan has been assessed in this report. All services plans should be subject to review by a consulting Arborist. Where possible, underground services should be located outside the TPZ of trees to be retained. All underground services located inside the TPZ of any tree to be retained, must be installed via tree sensitive techniques with AS4970-2009, see section 11.11 for more information.
- 10.9 No bulk earthworks or soil level modifications drawings have been assessed in this report.
- 10.10 This report does not provide approval for tree removal or pruning works. All recommendations in this report are subject to approval by the relevant authorities and/or tree owners. This report should be submitted as supporting evidence with the development application.

11. TREE PROTECTION SPECIFICATIONS (TPS) AND TREE PROTECTION PLAN (TPP)

- 11.1 **Use of this report:** This section includes Tree Protection Specifications (TPS) to conform with AS4970-2025. The most current version of the TPS and TPP shall be included in the construction documentation. All contractors must be made aware of the Tree Protection Specifications (TPS) prior to commencing works at the site. This section of the report and a copy of the Tree Protection Plan (TPP) drawings must also be made available to any contractor prior to works commencing and during any on site operations.
- 11.2 **Tree Protection Plan (TPP):** This is a scaled drawing that shows trees to be retained, the location of the TPZ areas and any tree protection specified in this section of the report. A copy of the TPP must form part of the development plans prior to the commencement of development works at the site. The location of the TPZ areas and the specified tree protection devices shown on the TPP should also be shown on other documents such as demolition, bulk earthworks, construction and landscape plans.
- 11.3 **Project Arborist:** Prior to any works commencing at the site, a Project arborist should be appointed. The Project arborist should be qualified to a minimum of AQF Level 5 and/or equivalent qualifications and experience and should assist with any development issues relating to trees that may arise. If at any time it is not feasible to carryout works in accordance with this, an alternative must be agreed in writing with the Project arborist.
- 11.4 **Tree Work:** All tree work should be carried out by a qualified and experienced Arborist with a minimum of AQF Level 3 in Arboriculture, in accordance with NSW Work Cover Code of Practice for the Amenity Tree Industry (1998) and AS4373 Pruning of amenity trees (2007).
- 11.5 **Initial Site Meeting/On-going Regular Inspections:** The Project arborist is to hold a pre-construction site meeting with the principal contractor to discuss methods and importance of tree protection measures and resolve any issues in relation to tree protection that may arise. To conform with AS4970-2025, the Project arborist should carry out regular site inspections to ensure works are carried out in accordance with this document throughout the development process. Site inspections are recommended on a monthly frequency throughout the development.
- 11.6 **Installation of Tree Protection Measures:** It is the responsibility of the principal contractor to install tree protection prior to works commencing at the site (prior to demolition works) and to ensure that the tree protection remains in an adequate condition for the duration of the development. The tree protection must not be moved without prior agreement of the Project arborist. The Project arborist must inspect that the tree protection has been installed in accordance with this document and AS4970-2025 prior to works commencing.

- 11.8 Site Specific Tree Protection Recommendations:** See section 11.8 for requirements of tree protection. The location of all tree protection measures specified below should be shown on the TPP drawings (see section 11.2 for more information).

Tree ID	Tree Species	TPZ Radius (m)	SRZ Radius (m)	Recommendations
1	<i>Platanus x acerifolia</i>	12.6	3.6	Trunk protection only.
2	<i>Platanus x acerifolia</i>	7.4	2.9	Trunk protection. If the existing garden bed in the TPZ, located between the site boundary and existing car park, is to be demolished, temporary ground protection will be required for this area.
3	<i>Platanus x acerifolia</i>	7.9	2.9	Trunk protection. If the existing garden bed in the TPZ, located between the site boundary and existing car park, is to be demolished, temporary ground protection will be required for this area.
4	<i>Platanus x acerifolia</i>	8.2	3.0	Trunk protection only.
5	<i>Pyrus spp</i>	2.0	1.6	Trunk protection only.
6	<i>Magnolia grandiflora</i>	2.2	1.6	Trunk protection only.
7	<i>Pyrus spp</i>	2.0	1.5	Trunk protection only.

11.9 Tree Protection Specifications:

11.9.1 Trunk and Branch Protection: The trunk must be protected by wrapped hessian or similar material to limit damage. Timber planks (50mm x 100mm x 1800mm or similar) should then be placed around tree trunk. The timber planks should be spaced at 100mm intervals and must be fixed against the trunk with tie wire or strapping and connections finished or covered to protect pedestrians from injury. The hessian and timber planks must not be fixed to the tree in any instance. The trunk and branch protection shall be installed prior to any work commencing on site and shall be maintained in good condition for the entire development period.

11.9.2 Protective fencing: The protective fencing must be constructed of 1.8 metre 'cyclone chainmesh fence'. The fencing should only be removed for the landscaping phase, and this should be approved by the project arborist. Where it is not feasible to install fencing at the specified location due to factors such as restricting access to areas of the site or for constructing new structures, an alternative location and protection specification must be agreed with the project arborist. Any modifications to the fencing locations must be approved by the project arborist.

- AS4687.2 specifies applicable requirements where temporary fence panels are used. Where semi-permanent fences are used, the posts should be driven into the soil 600 mm (1000 mm in sand) and top rails should be used as required.
- Existing perimeter fences and other structures may be used as part of the protective fence if suitable.

11.9.3 TPZ signage: Tree protection signage is to be attached to the protective fencing, displayed in a prominent position and the sign repeated at 10 metres intervals or

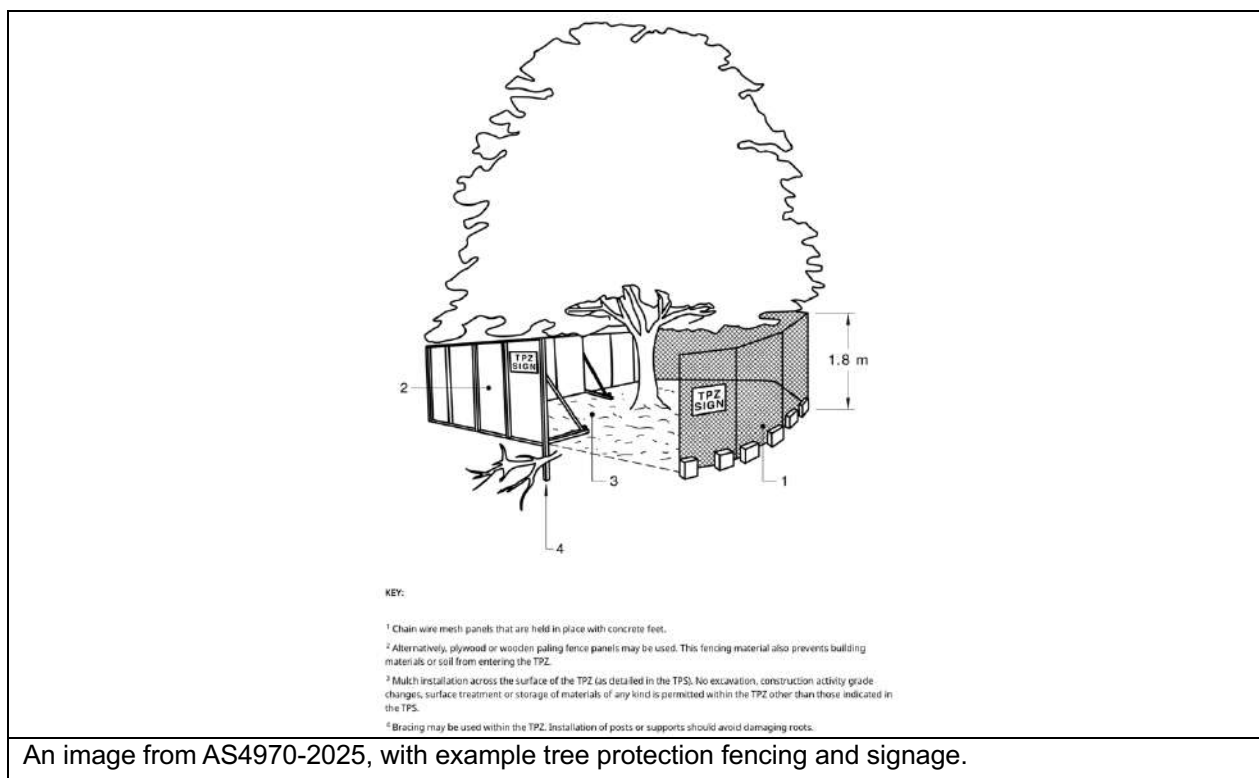
closer where the fence changes direction. The lettering on the sign should conform to AS1319. Each sign shall contain in a clearly legible form, the following information:

- Tree protection zone/No access.
- This fence has been installed to prevent damage to the tree/s and their growing environment both above and below ground. Do not move fencing or enter TPZ without the agreement of the project arborist.
- The name, address, and telephone number of the developer/builder and project arborist.

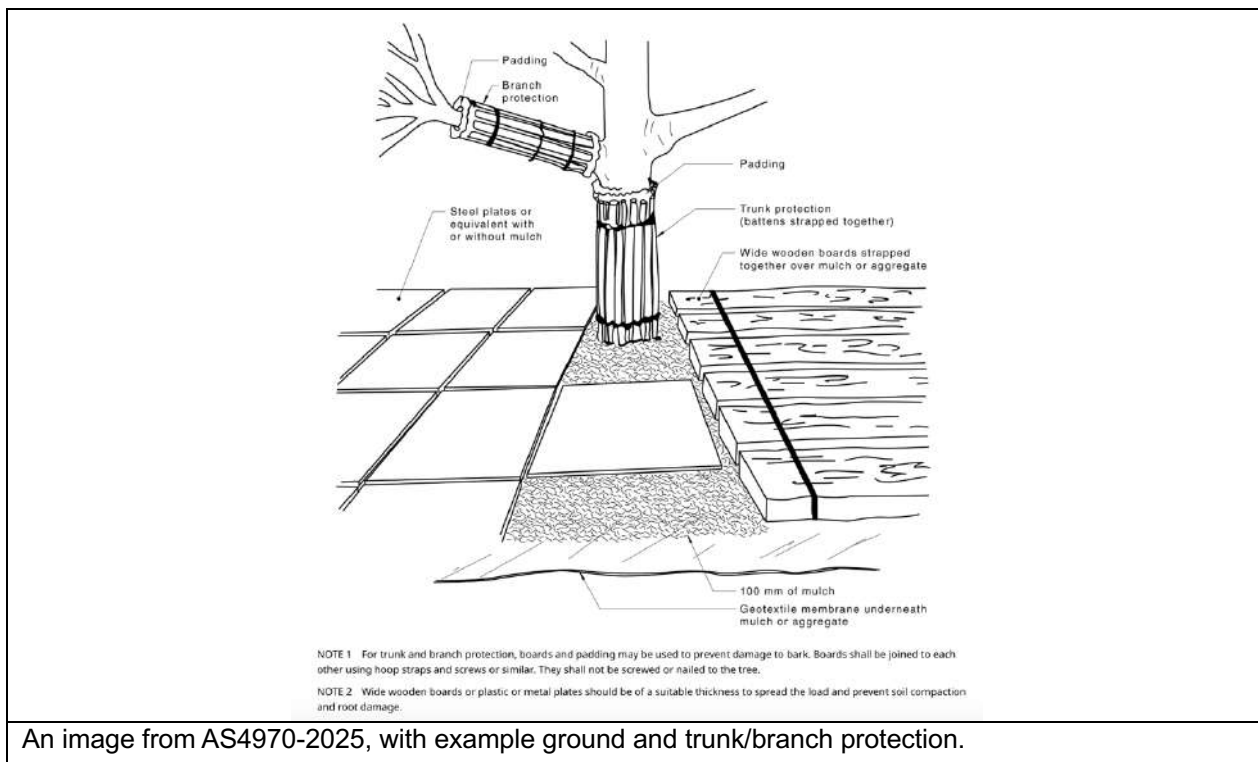
11.9.4 **Mulch:** Any areas of the TPZ located inside the subject site that are not covered by existing structures/hard surfacing may require mulching if specified in the site-specific tree protection specifications. These areas should be mulched with good quality mulch to a uniform depth of 75 mm. Mulch must not be built up around the trunks of the trees, as this can cause collar rot.

11.9.5 **Ground Protection:** Ground protection is required to protect the underlying soil structure and root system in areas where it is not practical to restrict access to whole TPZ, while allowing space for construction. Ground protection must consist of good quality composted wood chip/leaf mulch to a depth of between 150-300mm, laid on top of geo textile fabric, with boards overlaid to spread the weight and avoid load points. If vehicles are to be using the area, additional protection will be required such as rumble boards or track mats to spread the weight of the vehicle and avoid load points. Existing hard surfacing, such as driveways and hard surfacing, can provide adequate ground protection if retained. Ground protection is to be specified and approved by the project arborist as required.

11.9.6 **Temporary Irrigation:** Temporary irrigation should distribute water evenly throughout the area of the TPZ. The irrigation should be used for at minimum one hour daily throughout all stages of the development.

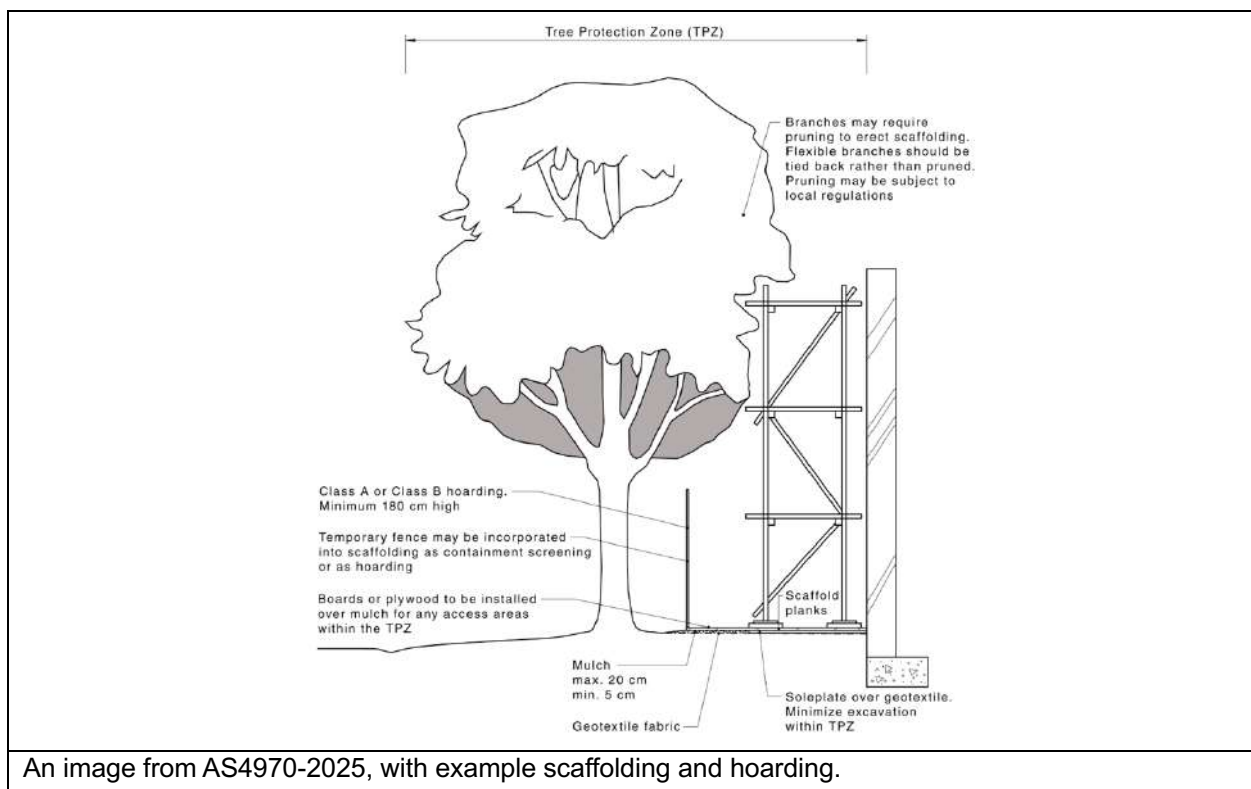


Site Location: 45-53 Macleay St, Potts Point, NSW
Prepared for: T&P Chimes Development Pty Ltd
Prepared by: Jack Williams, Urban Arbor Pty Ltd, sales@urbanarbor.com.au, (02) 8004 2802
Date Prepared: 28 January 2026



11.10 Installation of Scaffolding and Hoarding: Where practical these should be located outside the TPZ area. When it is not practical, they should be aligned to minimise crown impacts and pruning. Any required crown pruning must be assessed, specified and carried out in accordance with AS4373 Pruning of amenity trees (2007) and is subject to approval by the relevant authorities.

- The ground below the scaffolding should be protected by boarding (e.g. scaffold board or plywood sheeting), to collect falling contaminants such as mortar and render. Where access is required below the scaffolding, ground protection should be installed to minimise soil compaction. The ground protection should be left in place until the scaffolding is removed; see above for details of ground protection measures. Excavation for sole plates or footings of the scaffold should be minimised or otherwise specified by the project arborist when within the NRZ.



11.11 Restricted Activities inside the TPZ: The following activities must be avoided inside the TPZ of all trees to be retained unless approved by the Project arborist. If at any time these activities cannot be avoided an alternative must be agreed in writing with the Project arborist to minimise the impact to the trees/

- A) Machine excavation.
- B) Ripping or cultivating of soil.
- C) Storage of spoil, soil, or any such materials.
- D) Preparation of chemicals, including preparation of cement products.
- E) Dumping of waste.
- F) Wash down and cleaning of equipment.
- G) Placement of fill.
- H) Lighting of fires.
- I) Soil level changes.
- J) Any physical damage to the crown trunk, or root system.
- K) Parking of vehicles.

11.12 Demolition: The demolition of any existing structures inside or directly adjacent to the TPZ of trees to be retained must be undertaken in consultation with the Project arborist. Any machinery is to work from inside the footprint of the existing structures or outside the TPZ, reaching in to minimise soil disturbance and compaction. If it is not feasible to locate demolition machinery outside the TPZ of trees to be retained, ground protection will be required. The demolition should be undertaken inwards into the footprint of the existing structures, sometimes referred to as the 'top down, pull back' method.

11.13 Excavations: The Project arborist must supervise and certify that all excavations conform to AS4970-2025. For continuous strip footings, first manual excavation is

required along the edge of the structures closest to the subject trees. Manual excavation should be completed to a depth of 1 metre (or to unfavourable root growth conditions such as bed rock or heavy clay, if agreed by the Project arborist). Next roots must be pruned back in accordance with AS4373-2007. After all root pruning is completed, machine excavation is permitted within the footprint of the structure. For tree sensitive footings, such as pier and beam, all excavations inside the TPZ must be manual. Manual excavation may include the use of pneumatic and hydraulic tools, high-pressure air or a combination of high-pressure water and a vacuum device.

- 11.14 **Root Pruning:** The project arborist must supervise and certify that all root pruning conforms to AS4373-2007. No pruning of roots greater than 40mm in diameter is to be carried out without approval of the project arborist. All pruning of roots greater than 40mm in diameter must be carried out by a qualified Arborist/Horticulturalist with a minimum AQF Level 3. Root pruning is to be a clean cut with a sharp tool in accordance with AS4373 Pruning of amenity trees (2007).⁶ The tree root is to be pruned back to a branch root if possible. Make a clean cut and leave as small a wound as possible.
- 11.15 **Landscaping:** All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with a consulting Arborist to minimise the impact to trees. General guidance is provided below to minimise the impact of new landscaping to trees to be retained.
- All excavations for landscaping works should be manual and in accordance with section 11.12.
 - Replacement planting for all trees recommended for removal should be incorporated into the landscape plan. It is recommended that at minimum one tree for each tree proposed to be removed are planted to maintain/increase overall canopy cover at the site when mature. Any replacement tree must be selected in accordance with AS2303-2018 Tree stock for landscape use.
 - The location of new plantings inside the TPZ of trees to be retained should be flexible to avoid unnecessary damage to tree roots greater than 40mm in diameter.
 - Level changes should be minimised. The existing ground levels within the landscape areas should not be lowered by more than 50mm or increased by more 100mm without assessment by a consulting Arborist.
 - New retaining walls should be avoided. Where new retaining walls are proposed inside the TPZ of trees to be retained, they should be constructed from tree sensitive material, such as timber sleepers, that require minimal footings/excavations. If brick retaining walls are proposed inside the TPZ, consider pier and beam type footings to bridge significant roots that are critical to the trees condition. Retaining walls must be located outside the SRZ and sleepers/beams located above existing soil grades.
 - New footpaths and hard surfaces should be minimised, as they can limit the availability of water, nutrients and air to the tree's root system. Where they are proposed, they should be constructed on or above existing soil grades to minimise root disturbance and consider using a permeable surface. Footpaths should be located outside the SRZ.

⁶ Council Of Standards Australia, AS 4373 *Pruning of amenity trees* (2007) page 18

- Where fill/sub-base is used inside the TPZ, fill material should be a coarse granular material that does not restrict the flow of water and air to the root system below. This type of material will also reduce the impact of soil compaction during construction.
- Any new fencing in the TPZ of trees should be constructed carefully to avoid impacting significant roots. The location of fence posts should be flexible to allow for the retention of roots greater than 40mm in diameter. The base of fence panels should be located above existing soil grades.

- 11.16 **Underground Services:** Where possible underground services should be located outside the TPZ of trees to be retained. All underground services located inside the TPZ of any tree to be retained must be installed via tree sensitive techniques. This should include either directional drilling methods or manual excavations to minimise the impact to trees identified for retention. No roots greater than 40mm in diameter should be severed during the installation of services unless approved in writing by the project arborist.
- 11.17 **Sediment and Contamination:** All contamination run off from the development such as but not limited to concrete, sediment and toxic wastes must be prevented from entering the TPZ at all times.
- 11.18 **Tree Wounding/Injury:** Any wounding or injury that occurs to a tree during the construction process will require the project arborist to be contacted for an assessment of the injury and provide mitigation/remediation advice. It is generally accepted that trees may take many years to decline and eventually die from root damage. All repair work is to be carried out by the project arborist, at the contractor's expense.
- 11.19 **Completion of Development Works:** After all construction works are complete the project arborist should assess that the subject trees have been retained in the same condition and vigour. If changes to condition are identified the project arborist should provide recommendations for remediation.

12. CONSTRUCTION HOLD POINTS FOR TREE PROTECTION

- 12.1 Hold Points: Below is a sequence of hold points requiring Project arborist certification throughout the development process. It provides a list of holds points that must be check and certified. All certification must be provided in written format upon completion of the development. The final certification must include details of any instructions for remediation undertaken during the development. The principal contractor should be responsible for implementing all tree protection measures.

Hold Point	Stage	Date Completed and Signature of Project Arborist Responsible
Project arborist to hold pre-construction site meeting with principal contractor to discuss methods and importance of tree protection measures and resolve any issues in relation to feasibility of tree protection requirements that may arise.	Prior to development work commencing	
Project arborist to assess and certify that tree protection has been installed prior to works commencing at site.	Prior to development work commencing.	
The project arborist should carryout regular site inspections to ensure works are carried out in accordance with the recommendations. Site inspections are recommended on a monthly frequency. Project arborist to assess and certify that tree protection has been adequately maintained to conform to AS4970-2025 and specify additional measures where required.	On-going throughout the development	
The removal of existing structures inside the TPZ of any tree to be retained, such as the existing buildings and hard surfaces must be supervised by the project arborist.	Demolition	
Project arborist to supervise all manual excavations and root pruning inside the TPZ of any tree to be retained. Project arborist to approve all pruning of roots greater than 40mm inside TPZ. All root pruning of roots greater than 40mm in diameter must be carried out by a qualified Arborist/Horticulturalist with a minimum AQF level 3.	Construction	
Project arborist to certify that all underground services including storm water inside TPZ of any tree to be retained conform to AS4970-2025.	Construction	
Project arborist to approve relocation of tree protection for landscaping. All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with the project arborist to minimise the impact to trees.	Construction/ Landscape	
After all demolition, construction and landscaping works are complete the project arborist should assess that the subject trees have been retained in the same condition and vigour. If changes to condition are identified the project arborist should provide recommendations for remediation.	Upon completion of development	

13. BIBLIOGRAPHY/REFERENCES

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14. LIST OF APPENDICES

The following are included in the appendices:

- Appendix 1: Site Plans
- Appendix 2: Tree Inspection Schedule
- Appendix 3: Further Information of Methodology
- Appendix 4: Glossary of Terms
- Appendix 5: Root Investigations Report

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INDICATIVE OUTLINE OF EXTERIOR FACE OF SHOTCRETE WALL AT BASEMENT LEVEL 1, ALIGNS WITH EXISTING BUILDING EDGE.

SANDSTONE CUT FACE, ALIGNED WITH INTERIOR FACE OF 300mm SHOTCRETE WALL AT BASEMENT LEVEL 1

SPOON DRAIN

BLOCKWORK WALL

19 RESIDENTIAL PARKING BAYS

COLD WATER PUMP ROOM

RAINWATER FILTRATION AND PUMP ROOM

IN-GROUND SEWER PUMP-OUT

IN-GROUND SEWER PUMP-OUT

DEEP PLANTING ZONE 209 SQM, APPROX. 16.3% OF TOTAL SITE AREA (1,289SQM)

FINAL DEEP PLANTING ZONE TO BE CONFIRMED BY DRS ON BASIS OF GROUND LEVEL LANDSCAPE DESIGN.

3 MOTORBIKE SPACES

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STAIRCASE

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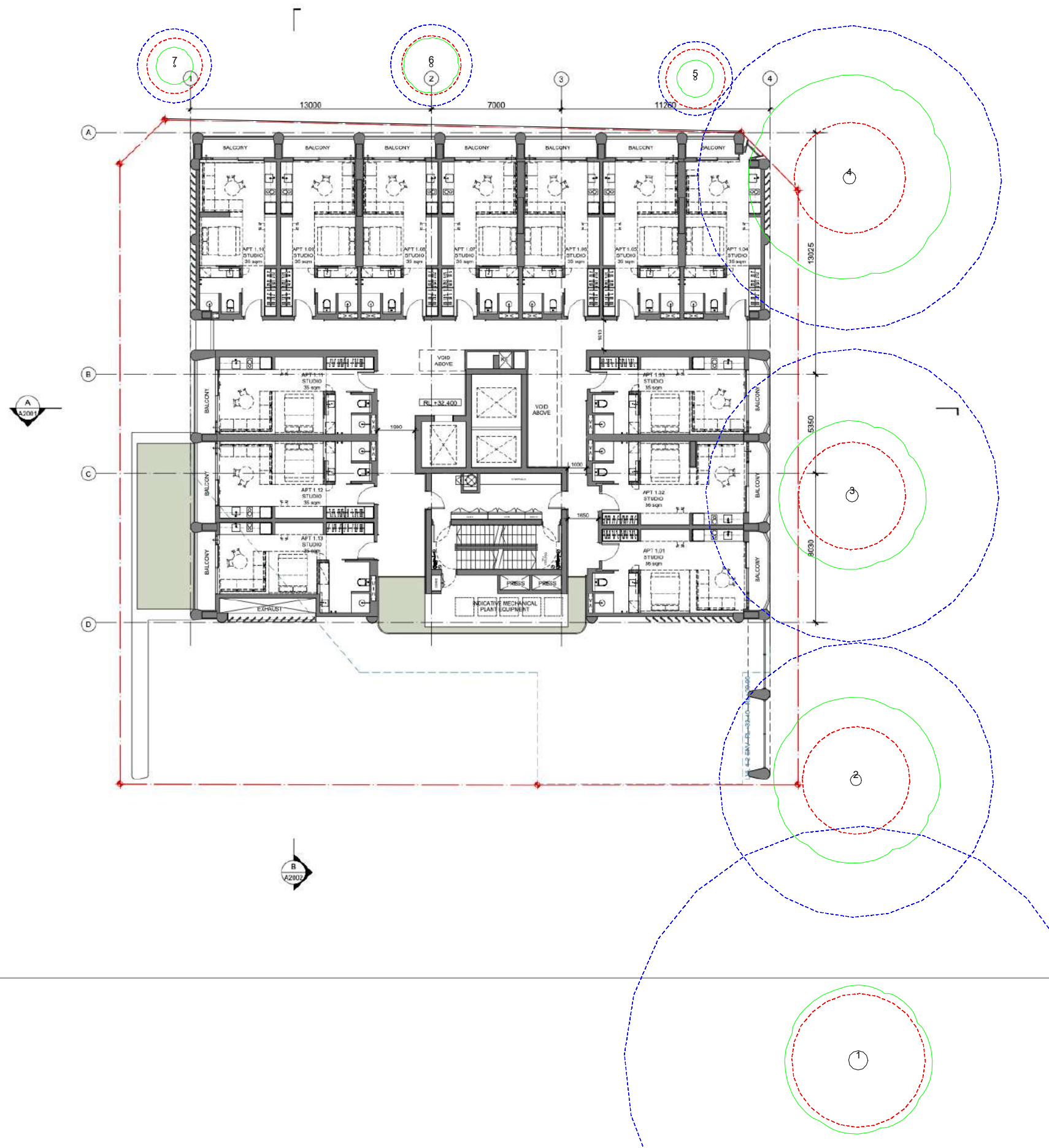
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A horizontal number line with a starting point labeled '0' on the left and an ending point labeled '20m' on the right. The line is divided into four equal segments by three tick marks. The first segment is shaded black, and the second segment is shaded light blue.



Urban Arbor Pty Ltd

PO Box 450 Turrumurra NSW 2074
02 8004 2802, sales@urbanarbor.com.au

Site Location: 45-53 Macleay St
Potts Point NSW

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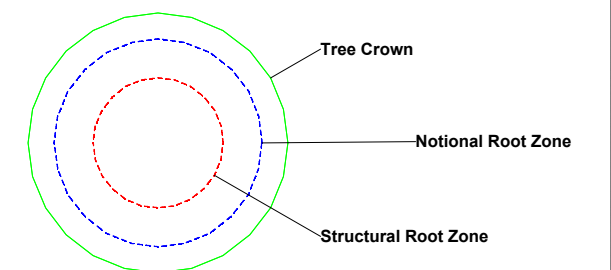
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17/10/2025

URBAN ARBOR
The Trusted Name in Tree Management

Plan Title: Appendix 1D

Prepared by: Jack Williams

Map Legend



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Appendix 2 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Age Class	Height (m)	Canopy Spread Radius (m)	Stem 1	Stem 2	Stem 3	Stem 4	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
1	London Plane	<i>Platanus x acerifolia</i>	Mature	16	4	1050				1050	1190	Good	Fair	High	1. Long	A1	12.6	3.6	Asymmetric crown shape, pruned away from existing building.
2	London Plane	<i>Platanus x acerifolia</i>	Mature	16	4.5	620				620	740	Good	Good	High	1. Long	A1	7.4	2.9	None.
3	London Plane	<i>Platanus x acerifolia</i>	Mature	15	4	660				660	750	Good	Good	High	1. Long	A1	7.9	2.9	None.
4	London Plane	<i>Platanus x acerifolia</i>	Mature	17	5.5	680				680	790	Good	Fair	High	1. Long	A1	8.2	3.0	Asymmetric crown shape, pruned away from existing building.
5	Ornamental Pear	<i>Pyrus spp</i>	Semi-mature	4	1	150				150	170	Good	Fair	Low	5. Small/Young	Z1	2.0	1.6	Asymmetric crown shape.
6	Southern Magnolia	<i>Magnolia grandiflora</i>	Semi-mature	3.5	1.5	180				180	190	Good	Good	Low	5. Small/Young	Z1	2.2	1.6	None.
7	Ornamental Pear	<i>Pyrus spp</i>	Semi-mature	3.5	1	130				130	150	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.

Explanatory Notes

Tree Species - Where species is unknown it is indicated with an 'spp'.

Age Class - Over mature (OM), Mature (M), Early mature (EM), Semi mature (SM), Young (Y).

Diameter at Breast Height (DBH) - Measured with a DBH tape or estimated at approximately 1.4m above ground level.

Diameter Above root Buttresses (DAB): Measured with a DBH tape or estimated above root buttresses (DAB) for calculating the SRZ.

Height - Height from ground level to top of crown. All heights are estimated unless otherwise indicated.

Spread - Radius of crown at widest section. All tree spreads are estimated unless otherwise indicated.

Tree Protection Zone (TPZ) - DBH x 12. Measured in radius from the centre of the trunk. Rounded to nearest 0.1m. For monocots, the TPZ is set at 1 metre outside the crown projection.

Structural Root Zone (SRZ) - $(DAB \times 50)^{0.42} \times 0.64$. Measured in radius from the centre of the trunk. Rounded up to nearest 0.1m.

Health - Good/Fair/Poor/Dead

Structure - Good/Fair/Poor

Safe Useful Life Expectancy (SULE) - 1. Long (40+years), 2. Medium (15 - 40 years), 3. Short (5 - 15 years), 4. Remove (under 5 years), 5. Small/young.

Amenity Value - Very High/High/Medium/Low/Very Low.

Retention Value: Tree AZ, see appendix 3 for categories.

Appendix 3: Further Information of Methodology

1. **Tree Age Class:** It can be difficult to determine the age of a tree without carrying out invasive tests that may damage the tree, so we have categorised their likely age class which is defined below:

- Young/newly planted – Young or recently planted tree.
- Semi-mature – Up to 20% of the usual life expectancy for the species.
- Mature – Between 20% - 80% of the usual life expectancy for the species.
- Over-mature – Over 80% of the usual life expectancy for the species.
- Dead – Tree is dead or almost dead.

2. **Health and Physiological Condition:** Below are example conditions used when assigning a category for tree health.

<u>Category</u>	<u>Example condition</u>	<u>Summary</u>
Good	• Crown has good foliage density for species. • Tree shows no or minimal signs of pathogens that are unlikely to have an effect on the health of the tree. • Tree is displaying good vigour and response growth development. • Trees that have a life expectancy 40 or more years.	• The tree is in above average health and condition and no remedial works are required.
Fair	• The tree may be starting to dieback or have up to 25% deadwood. • Tree may have slightly reduced crown density or thinning. • There may be some discolouration of foliage. • Average response growth development. • There may be signs of infection pathogens which may further deteriorate the health of the tree. • There may be epicormic growth indicating increased levels of stress within the tree. • Trees that may only live between 15 and 40 more years	• The tree is in below average health and vigour and may require remedial works to improve the trees health.
Poor	• The tree may be in decline, have extensive dieback or have over 25% deadwood. • The canopy may be sparse or the leaves may be unusually small for species. • Pathogens or pests are having a significant detrimental effect on the tree health. • Trees that have useful life expectancy of less than 5 years.	• The tree is displaying low levels of health and remedial action will not be sufficient to improve the health of the tree.
Dead	• The tree is dead or almost dead.	• The tree should generally be removed.

3. Structural Condition: Below are example conditions used when assigning a category for structural condition.

<u>Category</u>	<u>Example condition</u>	<u>Summary</u>
Good	• Branch unions appear to be strong with no sign of defects. • There are no significant cavities. • The tree is unlikely to fail in usual conditions. • The tree has a balanced crown shape and form. • Trees that have a life expectancy 40 or more years.	• The tree is considered structurally good with well developed form.
Fair	• The tree may have structural defects. • The identified defects could potentially develop into more significant defects. • The tree may have a cavity that is currently unlikely to fail but may deteriorate in the future. • The tree is an unbalanced shape or leans significantly. • The tree may have minor damage to its roots. • The root plate may have moved in the past but the tree has now compensated for this. • Branches may be rubbing or crossing. • The tree may have suppressed form. • Trees that may only live between 15 and 40 more years	• The identified defects are unlikely cause major failure. • Some branch failure may occur in usual conditions. • Remedial works can be undertaken to alleviate potential defects.
Poor	• The tree has significant structural defects that cannot be alleviated. • Branch unions may be poor or weak. • The tree may have a cavity or cavities with excessive levels of decay that could cause catastrophic failure. • The tree may have root damage or is displaying signs of recent movement. • The tree crown may have poor weight distribution which could cause failure. • Trees that have useful life expectancy of less than 5 years.	• The identified defects are likely to cause either partial or whole failure of the tree and cannot be alleviated.

4. Amenity Value: To determine the amenity value of a tree, we assess a number of different factors, which include but are not limited to the information below:

- The visibility of the tree to adjacent sites.
- The relationship between the tree and the site.
- Whether the tree is protected by any statutory conditions.
- The habitat value of the tree.
- Whether the tree is considered a noxious weed species.

The amenity value is then rated using one of the following categories:

- Very High
- High
- Moderate
- Low
- Very Low

- 5. Safe Useful Life Expectancy – SULE, (Barrel, 2001):** A tree's safe useful life expectancy is determined by assessing a number of different factors including the health and vitality, estimated age in relation to expected life expectancy for the species, structural defects, and remedial works that could allow for retention in the existing situation.

Category	Description
1. Long – Over 40 years	a) Structurally sound trees located in positions that accommodate future growth. b) Trees that could be made suitable for retention in the long term by remedial tree care. c) Trees of special significance for historical, commemorative, or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.
2. Medium – 15 to 40 years	a) Trees that may only live between 15 and 40 more years. b) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons. c) Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new plantings. d) Trees that could be made suitable for retention in the medium term by remedial tree care.
3. Short – 5 to 15 years	a) Trees that may only live between 5 and 15 more years. b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons. c) Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. d) Trees that require substantial remedial tree care and are only suitable for retention in the short-term.
4. Remove – Under 5 years	a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions. b) Dangerous trees because of instability or recent loss of adjacent trees. c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form. d) Damaged trees that are clearly not safe to retain. e) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. f) Trees that are damaging or may cause damage to existing structures within 5 years. g) Trees that will become dangerous after removal of other trees for the reasons given in a) to f). h) Trees in categories a) to g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.
5. Small/Young	a) Small trees less than 5 metres in height. b) Young trees less than 15 years old but over 5 metres in height. c) Formal hedges and trees intended for regular pruning to artificially control growth.

6. **Retention Value:** The system used to award the retention value is Tree AZ. Tree AZ is used to identify higher value trees worthy of being a constraint to development and lower value trees that should generally not be a constraint to the development. The table below provides a brief description of each category.

TreeAZ Categories Field Sheet (Version 10.04-ANZ)

CAUTION: TreeAZ assessments must be carried out by a competent person qualified and experienced in arboriculture. The following category descriptions are designed to be a brief field reference and are not intended to be self-explanatory. They must be read in conjunction with the most current explanations published at www.TreeAZ.com.

Category Z: Unimportant trees not worthy of being a material constraint

Local policy exemptions: Trees that are unsuitable for legal protection for local policy reasons including size, proximity and species

Z1	Young or insignificant small trees, i.e. below the local size threshold for legal protection, etc
Z2	Too close to a building, i.e. exempt from legal protection because of proximity, etc
Z3	Species that cannot be protected for other reasons, i.e. scheduled noxious weeds, out of character in a setting of acknowledged importance, etc
High risk of death or failure: Trees that are likely to be removed within 10 years because of acute health issues or severe structural failure	
Z4	Dead, dying, diseased or declining
Z5	Severe damage and/or structural defects where a high risk of failure <u>cannot</u> be satisfactorily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, overgrown and vulnerable to adverse weather conditions, etc
Z6	Instability, i.e. poor anchorage, increased exposure, etc
Excessive nuisance: Trees that are likely to be removed within 10 years because of unacceptable impact on people	
Z7	Excessive, severe and intolerable inconvenience to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. dominance, debris, interference, etc
Z8	Excessive, severe and intolerable damage to property to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. severe structural damage to surfacing and buildings, etc
Good management: Trees that are likely to be removed within 10 years through responsible management of the tree population	
Z9	Severe damage and/or structural defects where a high risk of failure can be <u>temporarily</u> reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, vulnerable to adverse weather conditions, etc
Z10	Poor condition or location with a low potential for recovery or improvement, i.e. dominated by adjacent trees or buildings, poor architectural framework, etc
Z11	Removal would benefit better adjacent trees, i.e. relieve physical interference, suppression, etc
Z12	Unacceptably expensive to retain, i.e. severe defects requiring excessive levels of maintenance, etc

NOTE: Z trees with a high risk of death/failure (Z4, Z5 & Z6) or causing severe inconvenience (Z7 & Z8) at the time of assessment and need an urgent risk assessment can be designated as ZZ. ZZ trees are likely to be unsuitable for retention and at the bottom of the categorization hierarchy. In contrast, although Z trees are not worthy of influencing new designs, urgent removal is not essential and they could be retained in the short term, if appropriate.

Category A: Important trees suitable for retention for more than 10 years and worthy of being a material constraint

A1	No significant defects and could be retained with minimal remedial care
A2	Minor defects that could be addressed by remedial care and/or work to adjacent trees
A3	Special significance for historical, cultural, commemorative or rarity reasons that would warrant extraordinary efforts to retain for more than 10 years
A4	Trees that may be worthy of legal protection for ecological reasons (Advisory requiring specialist assessment)

NOTE: Category A1 trees that are already large and exceptional, or have the potential to become so with minimal maintenance, can be designated as AA at the discretion of the assessor. Although all A and AA trees are sufficiently important to be material constraints, AA trees are at the top of the categorization hierarchy and should be given the most weight in any selection process.

TreeAZ is designed by Barrell Tree Consultancy (www.barrelltreecare.co.uk) and is reproduced with their permission

Appendix 4: Glossary of Terms

Abiotic - Pertaining to non-living agents; e.g. environmental factors

Adventitious shoots - Shoots that develop other than from apical, axillary or dormant buds; see also 'epicormic'

Anchorage - The system whereby a tree is fixed within the soil, involving cohesion between roots and soil and the development of a branched system of roots which withstands wind and gravitational forces transmitted from the aerial parts of the tree

Bark - A term usually applied to all the tissues of a woody plant lying outside the vascular cambium, thus including the phloem, cortex and periderm; occasionally applied only to the periderm or the phellem

Branch:

- **Primary**. A first order branch arising from a stem
- **Lateral**. A second order branch, subordinate to a primary branch or stem and bearing sub-lateral branches
- **Sub-lateral**. A third order branch, subordinate to a lateral or primary branch, or stem and usually bearing only twigs

Branch collar - A visible swelling formed at the base of a branch whose diameter growth has been disproportionately slow compared to that of the parent stem; a term sometimes applied also to the pattern of growth of the cells of the parent stem around the branch base

Brown-rot - A type of wood decay in which cellulose is degraded, while lignin is only modified

Buckling - An irreversible deformation of a structure subjected to a bending load

Buttress zone - The region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper side of the junctions

Cambium - Layer of dividing cells producing xylem (woody) tissue internally and phloem (bark) tissue externally

Canker - A persistent lesion formed by the death of bark and cambium due to colonisation by fungi or bacteria

Compartmentalisation - The confinement of disease, decay or other dysfunction within an anatomically discrete region of plant tissue, due to passive and/or active defences operating at the boundaries of the affected region

Compressive loading - Mechanical loading which exerts a positive pressure; the opposite to tensile loading

Condition - An indication of the physiological condition of the tree. Where the term 'condition' is used in a report, it should not be taken as an indication of the stability of the tree

Crown/Canopy - The main foliage bearing section of the tree

Crown lifting - The removal of limbs and small branches to a specified height above ground level

Crown thinning - The removal of a proportion of secondary branch growth throughout the crown to produce an even density of foliage around a well-balanced branch structure

Crown reduction/shaping - A specified reduction in crown size whilst preserving, as far as possible, the natural tree shape

DAB (Diameter Above Buttress) - Trunk diameter measured above the root buttress

Defect - In relation to tree hazards, any feature of a tree which detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment

Dieback - The death of parts of a woody plant, starting at shoot-tips or root-tips

Disease - A malfunction in or destruction of tissues within a living organism, usually excluding mechanical damage; in trees, usually caused by pathogenic micro-organisms

Dominance - In trees, the tendency for a leading shoot to grow faster or more vigorously than the lateral shoots; also the tendency of a tree to maintain a taller crown than its neighbours

Dormant bud - An axial bud which does not develop into a shoot until after the formation of two or more annual wood increments; many such buds persist through the life of a tree and develop only if stimulated to do so

Dysfunction - In woody tissues, the loss of physiological function, especially water conduction, in sapwood

DSH (Diameter at Standard Height) - Stem diameter measured at a height of 1.4 metres or the nearest measurable point. Where measurement at a height of 1.4 metres is not possible, another height may be specified

Deadwood - Branch or stem wood bearing no live tissues. Retention of deadwood provides valuable habitat for a wide range of species and seldom represents a threat to the health of the tree. Removal of deadwood can result in the ingress of decay to otherwise sound tissues and climbing operations to access deadwood can cause significant damage to a tree. Removal of deadwood is generally recommended only where it represents an unacceptable level of hazard

Epicormic shoot - A shoot having developed from a dormant or adventitious bud and not having developed from a first-year shoot

Flush-cut - A pruning cut which removes part of the branch bark ridge and or branch-collar

Girdling root - A root which circles and constricts the stem or roots possibly causing death of phloem and/or cambial tissue

Habit - The overall growth characteristics, shape of the tree and branch structure

Hazard beam - An upwardly curved part of a tree in which strong internal stresses may occur without being reduced by adaptive growth; prone to longitudinal splitting

Heartwood/false-heartwood - The dead central wood that has become dysfunctional as part of the aging processes and being distinct from the sapwood

Heave - A term mainly applicable to a shrinkable clay soil which expands due to re-wetting after the felling of a tree which was previously extracting moisture from the deeper layers; also the lifting of pavements and other structures by root diameter expansion; also the lifting of one side of a wind-rocked root-plate

Included bark (ingrown bark) - Bark of adjacent parts of a tree (usually forks, acutely joined branches or basal flutes) which is in face-to-face contact

Lever arm - A mechanical term denoting the length of the lever represented by a structure that is free to move at one end, such as a tree or an individual branch

Lignin - The hard, cement-like constituent of wood cells; deposition of lignin within the matrix of cellulose microfibrils in the cell wall is termed Lignification

Lions tailing - A term applied to a branch of a tree that has few if any side-branches except at its end, and is thus liable to snap due to end-loading

Loading - A mechanical term describing the force acting on a structure from a particular source; e.g. the weight of the structure itself or wind pressure

Mycelium - The body of a fungus, consisting of branched filaments (hyphae)

Notional Root Zone (NRZ) - The NRZ area is the primary trigger for determining when arboricultural assessment and input is required on a development site and is calculated to assist with assessing the potential impacts of root loss during development.

Occlusion - The process whereby a wound is progressively closed by the formation of new wood and bark around it

Pathogen - A micro-organism which causes disease in another organism

Photosynthesis - The process whereby plants use light energy to split hydrogen from water molecules, and combine it with carbon dioxide to form the molecular building blocks for synthesizing carbohydrates and other biochemical products

Probability - A statistical measure of the likelihood that a particular event might occur

Pruning - The removal or cutting back of twigs or branches, sometimes applied to twigs or small branches only, but often used to describe most activities involving the cutting of trees or shrubs

Radial - In the plane or direction of the radius of a circular object such as a tree stem

Reactive Growth/Reaction Wood - Production of woody tissue in response to altered mechanical loading; often in response to internal defect or decay and associated strength loss (cf. adaptive growth)

Ring-barking - The removal of a ring of bark and phloem around the circumference of a stem or branch, normally resulting in an inability to transport photosynthetic assimilates below the area of damage. Almost inevitably results in the eventual death of the affected stem or branch above the damage

Root-collar - The transitional area between the

stem/s and roots

Sapwood - Living xylem tissues

Soft-rot - A kind of wood decay in which a fungus degrades cellulose within the cell walls, without any general degradation of the wall as a whole

Stem/s - Principle above-ground structural component(s) of a tree that supports its branches

Stress - In plant physiology, a condition under which one or more physiological functions are not operating within their optimum range, for example due to lack of water, inadequate nutrition or extremes of temperature

SRZ (Structural Root Zone) - The area around the base of the tree required for the tree's stability in the ground

Subsidence - In relation to soil or structures resting in or on soil, a sinking due to shrinkage when certain types of clay soil dry out, sometimes due to extraction of moisture by tree roots

Taper - In stems and branches, the degree of change in girth along a given length

Targets - In tree risk assessment (with slight misuse of normal meaning) persons or property or other things of value which might be harmed by mechanical failure of the tree or by objects falling from it

Topping - In arboriculture, the removal of the crown of a tree, or of a major proportion of it

Transpiration - The evaporation of moisture from the surface of a plant, especially via the stomata of leaves; it exerts a suction which draws water up from the roots and through the intervening xylem cells

TPZ (Tree Protection Zone) - A specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development

Understory - This layer consists of younger individuals of the dominant trees, together with smaller trees and shrubs which are adapted to grow under lower light conditions

Veteran tree - Tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned. These characteristics might typically include a large girth, signs of crown retrenchment and hollowing of the stem

Vigour - The expression of carbohydrate expenditure to growth (in trees)

White-rot - A range of kinds of wood decay in which lignin, usually together with cellulose and other wood constituents, is degraded

Wind exposure - The degree to which a tree or other object is exposed to wind, both in terms of duration and velocity

Wind pressure - The force exerted by a wind on a particular object

Windthrow - The blowing over of a tree at its roots

Arboricultural Root Investigation Report

Site Location: 45-53 Macleay
Street Potts Point NSW

Prepared for: T&P Chimes Development
Pty Ltd

Prepared by: Jack Williams
Urban Arbor Pty Ltd

Reference: 250929_45-53 Macleay_RI

Date Prepared: 29 September 2025

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1. INTRODUCTION

- 1.1 Urban Arbor have been instructed by T&P Chimes Development Pty Ltd to carry out root investigations to determine if significant roots are located within the area of the proposed works adjacent to one tree (tree 3) located at the site.
- 1.2 Below is a list of all documents and information provided to assist in preparing this report:
 - A) Detail and Level Survey, Colliers, Issue 01 – 25 September 2025.
 - B) Arboricultural Impact Assessment Report (AIA), Arboreport, 14 February 2025
- 1.3 The tree numbers used within this report have been duplicated from the AIA Report referenced above. The root investigations were completed on 19 September 2025. Access was available to the subject site and adjoining public areas only.

2. SCOPE OF THE REPORT

- 2.1 This report has been undertaken to meet the following objectives:
 - 2.1.1 Conduct root investigations to identify if significant woody roots are present between the site boundary and existing building footings within the Tree Protection Zone (TPZ) of tree 3
 - 2.1.2 For the purpose of the investigations, a significant root is a root with a diameter equal to or greater than 25mm.

3. LIMITATIONS

- 3.1 The observations and recommendations are based on one site inspection. The findings of this report are based on the observations and site conditions at the time of the inspection.
- 3.2 The report reflects the subject tree as found on the day of inspection. Any changes to the growing environment of the subject tree, or tree management works beyond those recommended in this report may alter the findings of the report. There is no warranty, expressed or implied, that problems or deficiencies relating to the subject tree, or subject site, may not arise in the future.
- 3.3 All diagrams, plans, and photographs included in this report are visual aids only, and are not to scale unless otherwise indicated.
- 3.4 No specific tree risk assessment has been undertaken for the trees at the site.
- 3.5 Alteration of this report invalidates the entire report.

4. METHODOLOGY

- 4.1 The following information was collected during the assessment and root investigations of the subject tree(s):
 - Tree common name
 - Tree botanical name
 - DSH – trunk/stem diameter at breast height/1.4m above ground level (millimetres)
 - DAB – trunk diameter directly above the root buttress (millimetres)
 - Location of roots
 - Diameter of roots
 - Notes/comments
- 4.2 Tree diameter was measured using a DSH tape or in some cases estimated. All DSH measurements, tree protection zones, and structural root zones were calculated in accordance with the methods set out in AS4970 Protection of trees on development sites (2025)¹ and in some cases estimated.
- 4.3 Non-destructive root investigations were undertaken by the means of hand excavation, using digging shovels, small trowels, and a digging knife. Root investigations took place in one area of proposed works within the TPZ of tree 1 and 2 (see Appendix 1 for a site plan).
- 4.4 Tree root diameter was measured using a DSH tape. The other tools used during the assessment were a nylon mallet, compass, camera, steel tape, wheel tape, and a steel probe.

¹ Council Of Standards Australia, AS4970 Protection of trees on development sites (2009).

5. TREE INFORMATION

5.1 Tree 3 Information – London Plane

- Tree 3 is a mature London Plane (*Platanus x acerifolia*) that has a Tree Protection Zone (TPZ) of 7.9m and a Structural Root Zone (SRZ) of 2.9m, both measured in radius from the centre of the trunk.

6. TRENCH 1 OBSERVATIONS

6.1 Trench 1 Information: Trench 1 was excavated along the alignment of the existing masonry wall between two external columns. Trench 1 was 4.5 metres long and was excavated to a depth of 700mm below the existing soil level and the strip footing for of the building was located at this depth. The trench was excavated 350mm wide and was located 4.22 metres from the centre of tree 3 at its closest point.

6.2 Trench 1 Root Observations:

- Five significant roots greater than 25mm in diameter were located within the trench. All of the roots appeared to be emanating from tree 3 and had bark consistent with that of tree 3.

Table 1: All roots identified in trench 1 have been listed in the table below (see Section 6.4 Trench 1 Photographs for root images and locations).

Root No.	Diameter (mm)	Depth of root (mm)	Emanating from Tree	TPZ/SRZ	Distance from Centre of Trunk	Location along Trench (m)	Notes/comments
1	40	80	Tree 3	TPZ	5.21	0.56	Contacts wall and diverts in a Southeasterly direction.
2	85	100	Tree 3	TPZ	4.82	1.26	Contacts wall and diverts in a Southeasterly direction.
3	90	200	Tree 3	TPZ	4.58	1.63	Contacts wall and diverts in a Southeasterly direction. Appears to fuse with root 4 as it progresses along the wall.
4	100	300	Tree 3	TPZ	4.58	1.63	Contacts wall and diverts in a Southeasterly direction.
5	25	30	Tree 3	TPZ	4.22	2.61	Small root emanating from a cluster of fused roots.

Notes:

- Root diameter was measured adjacent to the side of the trench closest to the tree.
- Depth of the root was measured from the top of the root to the existing soil grade within the garden bed.
- Distance along trench measured from the Northwestern end of the trench

6.3 Additionally, one pier hole was excavated closer to the trunk of tree 3 adjacent to trench 1. Pier 1 was excavated to a depth of 1.05 metres below existing grade and bedrock was located. Pier 1 was located 2.2 metres along trench 1 from the Northwestern end of the trench and was setback from the existing wall by 570mm.

Pier 1 was also 4.08 metres from the centre of trunk of tree 3. No significant roots greater than 25mm in diameter were located within pier 1.

6.4 Trench 1 Photographs



Image 1: Showing the location of trench 1 and 2 either side of the existing columns.

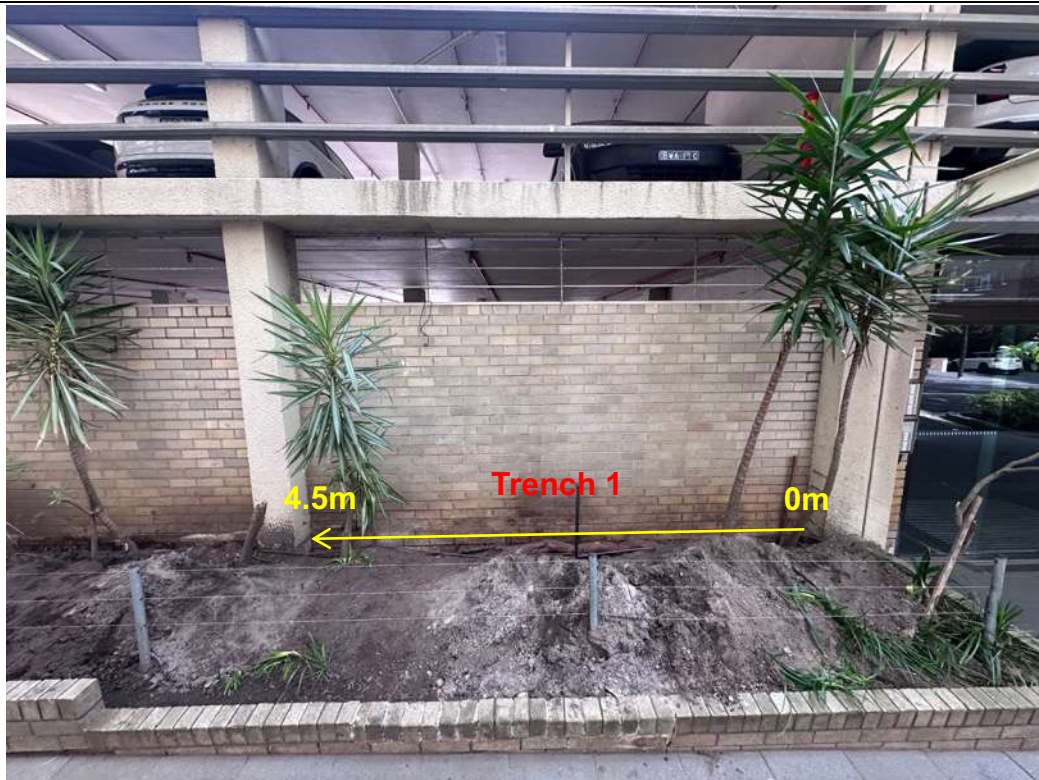


Image 2: The location of trench 1.



Image 3: Showing the whole of trench 1, the location of pier 1 and the exposed roots in relation to the trunk of tree 3.



Image 4: Root 1.



Image 5: Root 2, 3, 4 and 5 and pier 1.



Image 6: Root 2-5, which grow in a bundle adjacent to the existing building footing.



Image 7: Pier 1.

7. TRENCH 2 OBSERVATIONS

7.1 Trench 2 Information: Trench 2 was excavated along the alignment of the existing masonry wall between two external columns. Trench 2 was 4.55 metres long and was excavated to a depth of 400mm below the existing soil level and the strip footing for of the building was located at this depth. The trench was excavated 350mm wide and was located 4.55 metres from the centre of tree 1 at its closest point.

7.2 Trench 2 Root Observations:

- One significant root greater than 25mm in diameter was located within the trench. The root appeared to be emanating from tree 3 and had bark consistent with that of tree 3.

Table 1: All roots identified in trench 2 have been listed in the table below (see Section 7.4 Trench 2 Photographs for root images and locations).

Root No.	Diameter (mm)	Depth of root (mm)	Emanating from Tree	TPZ/SRZ	Distance from Centre of Trunk	Location along Trench (m)	Notes/comments
6	45	260	Tree 3	TPZ	6.52	4.25	Located in pier 4 closer to the tree and continues into trench 2.

Notes:

- Root diameter was measured adjacent to the side of the trench closest to the tree.
- Depth of the root was measured from the top of the root to the existing soil grade within the garden bed.
- Distance along trench measured from the Northwestern end of the trench

7.3 Additionally, three pier holes were excavated closer to the trunk of tree 3 adjacent to trench 2:

- Pier 2 was excavated to a depth of 400mm below existing grade and bedrock was located. Pier 2 was located 550mm along trench 2 from the Northwestern end of trench 2 and was setback from the existing wall by 600mm. Pier 2 was also 4.08 metres from the centre of trunk of tree 3. No significant roots greater than 25mm in diameter were located within pier 2.
- Pier 3 was excavated to a depth of 700mm below existing grade and bedrock was located. Pier 3 was located 2.25 metres along trench 2 from the Northwestern end of the trench and was setback from the existing wall by 470mm. Pier 3 was also 4.08 metres from the centre of trunk of tree 3. No significant roots greater than 25mm in diameter were located within pier 3.
- Pier 4 was excavated to a depth of 700mm below existing grade and bedrock was located. Pier 4 was located 3.9 metres along trench 2 from the Northwestern end of the trench and was setback from the existing wall by 470mm. Pier 4 was also 4.08 metres from the centre of trunk of tree 3. One significant root greater than 25mm in diameter was located within pier 4.

7.4 Trench 2 Photographs

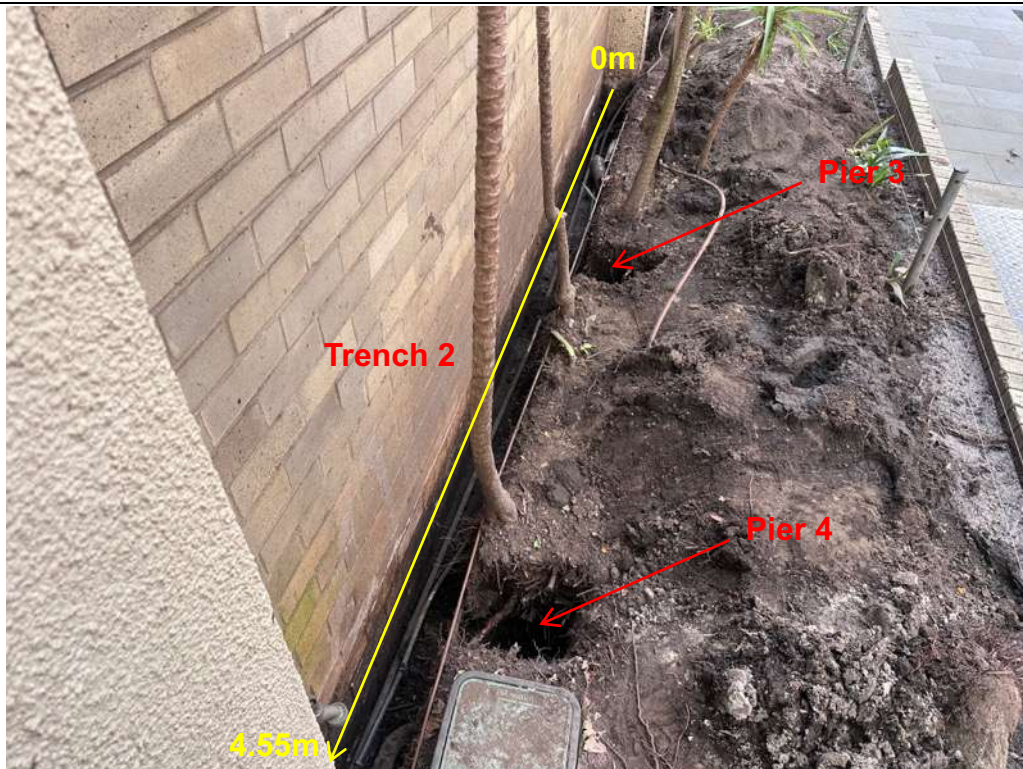


Image 8: The South end of trench 2 and pier 3 & 4.



Image 9: The North end of trench 2 and pier 2.



Image 10: Root 6 near South end of trench.



Image 11: Pier 2.



Image 12: Pier 3.



Image 13: Pier 4 and root 6, which extends into trench 2 adjacent to the building footings.

8. TRENCH 1 AND 2 DISCUSSION AND CONCLUSIONS

- 8.1 The root investigations were carried out within the raised garden bed adjacent to the footings of the existing building in the TPZ of tree 3.
- 8.2 During the excavations, it was determined that rock is present below the existing garden bed, adjacent and below the footings of the existing building. The footing of the existing building was exposed at 700mm depth in trench 1 and 400mm depth in trench 2. Rock was exposed at the bottom of four exploratory piers holes excavated near to trench 1 and 2.
- 8.3 Based on the root investigations and excavations, the external wall of the existing building appears to have an existing strip footing located directly on the rock. The strip footing of the existing building are restricting root growth into the footprint of the existing building and car park in the TPZ. Any proposed excavations or structures within the footprint of the existing building and carpark will therefore not impact the root system of the tree.
- 8.4 The excavations have identified that there is significant root build-up adjacent to the existing footings within the existing garden bed. To avoid impacting the roots and tree, excavations should be avoided any closer to the tree than the existing building footings in the TPZ.
- 8.5 The roots of the tree have deflected to the North/South adjacent to the footings within the garden bed in trench 1, causing a build-up of significant roots within/below the garden bed, between the site boundary and existing building footings. To retain the tree in a viable condition, the proposed design will need to accommodate the majority of the significant roots within this location.

9. BIBLIOGRAPHY/REFERENCES

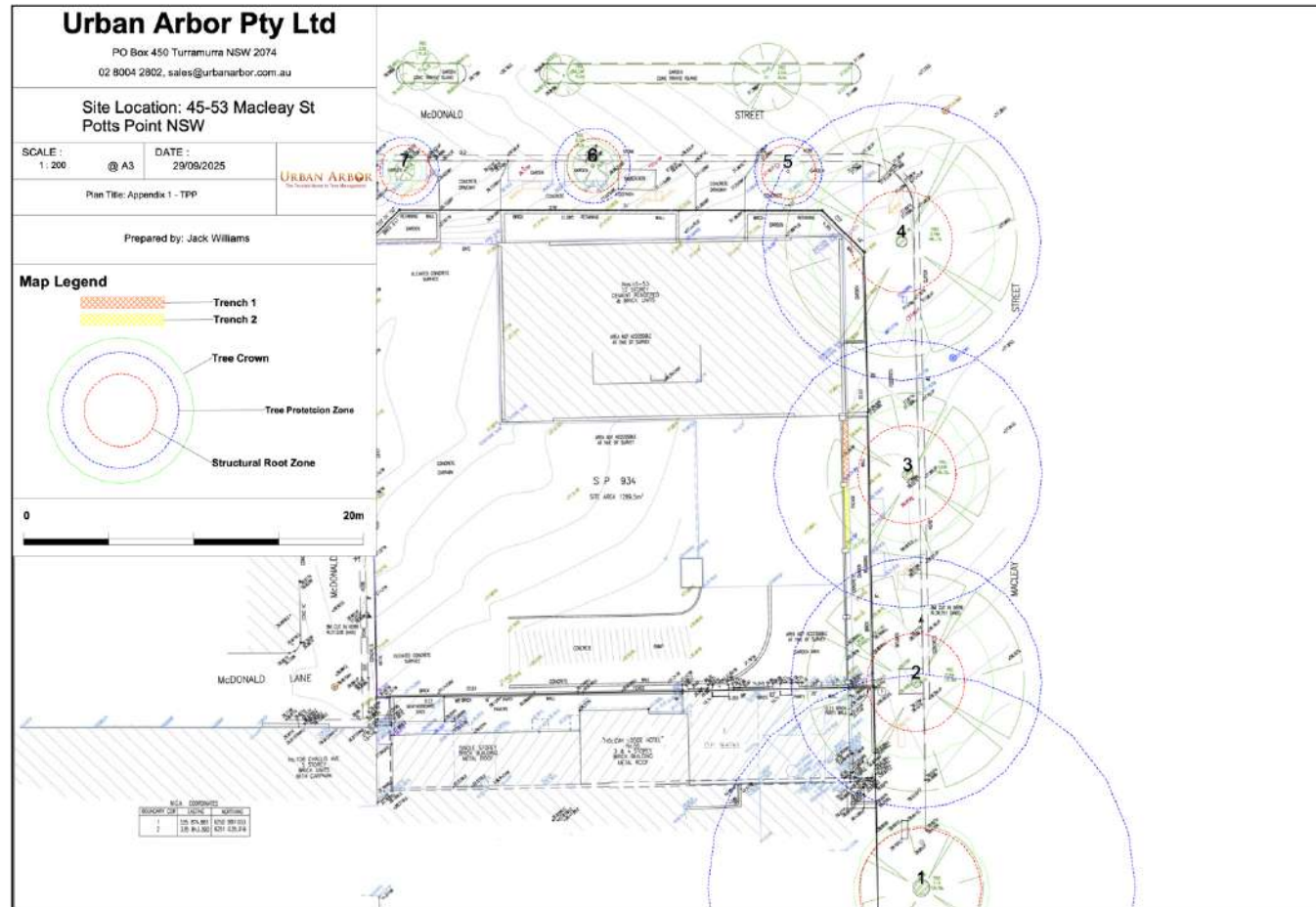
- Council of Standards Australia, AS4970 Protection of trees on development sites (2025).

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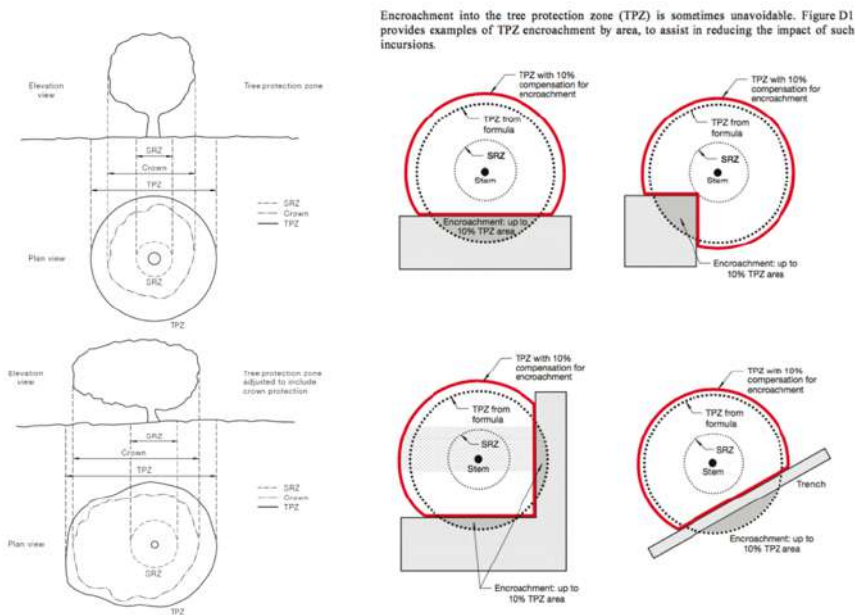
Appendix 1: Proposed Site Plan with Root Investigations



Site Location: 45-53 Macleay Street Potts Point NSW
 Prepared for: T&P Chimes Development Pty Ltd
 Prepared by: Jack Williams, Urban Arbor Pty Ltd, sales@urbanarbor.com.au, (02) 8004 2802
 Date Prepared: 29 September 2025

Appendix 2: Further Information of Methodology

- 1. Tree Protection Zone:** The tree protection zone (TPZ) is the principle means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable. The radius of the TPZ is calculated for each tree by multiplying its DBH by twelve. The derived value is measured in radius from the centre of the stem/trunk at ground level. A TPZ should not be less than 2.0 metres nor greater than 15 metres, except where crown protection is required. It is commonly observed that tree roots will extend significantly further than the indicative TPZ, however the TPZ is an area identified in AS4970-2009 to be the extent where root loss or disturbance will generally not impact the viability of the tree. The TPZ is identified as a restricted area to prevent damage to trees either above or below ground during a development. Where trees are intended to be retained, proposed developments must provide an adequate TPZ around trees. The TPZ set aside for the tree's root zone, trunk, and crown, and it is essential for the stability and longevity of the tree. The tree protection also incorporates the SRZ (see below for more information about the SRZ). I have calculated the TPZ of palms, other monocots, cycads, and tree ferns at one metre outside of the crown projection.
- 2. Minor Encroachment into TPZ:** Sometimes encroachment into the TPZ is unavoidable. Encroachment includes but is not limited to activities such as excavation, compacted fill, and machine trenching. Minor encroachment of up to 10% of the overall TPZ area is normally considered acceptable, providing there is space adjacent to the TPZ for the tree to compensate and the tree is displaying adequate vigour/health to tolerate changes to its growing environment.
- 3. Major encroachment into TPZ:** Where encroachment of more than 10% of the overall TPZ area is proposed, the Project Arborist must investigate and demonstrate that the tree will remain in a viable condition. In some cases, tree sensitive construction methods such as pier and beam footings, suspended slabs, or cantilevered sections can be utilised to allow additional encroachment into the TPZ by bridging over roots and minimising root disturbance. Major encroachment is only possible if it can be undertaken without severing significant sized roots, or if it can be demonstrated that significant roots will not be impacted.



- 4. Structural Root Zone:** This is the area around the base of a tree required for the tree's stability in the ground. An area larger than the SRZ always needs to be maintained to preserve a viable tree as it will only have a minor effect on the tree's vigour and health. There are several factors that determine the SRZ which include height, crown area, soil type, and soil moisture. It can also be influenced by other factors such as natural or built structures. Generally work within the SRZ should be avoided.

An indicative SRZ can be determined from the diameter of the trunk measured immediately above the root buttresses. Root investigations could provide more information about the extent of the SRZ. The following formula should be used to calculate the SRZ:

- $SRZ \text{ Radius} = (D \times 50)^{0.42} \times 0.64$, where D = diameter above root buttress.

- 5. Tree Age Class:** It can be difficult to determine the age of a tree without carrying out invasive tests that may damage the tree, so we have categorised their likely age class which is defined below:

- Young/newly planted – Young or recently planted tree.
- Semi-mature – Up to 20% of the usual life expectancy for the species.
- Mature – Between 20% - 80% of the usual life expectancy for the species.
- Over-mature – Over 80% of the usual life expectancy for the species.
- Dead – Tree is dead or almost dead.

- 6. Health and Physiological Condition:** Below are example conditions used when assigning a category for tree health.

Category	Example Condition	Summary
Good	• Crown has good foliage density for species. • Tree shows no or minimal signs of pathogens that are likely to have an effect on the health of the tree.	• The tree is in above average health and condition and no remedial works are required.

	Tree is displaying good vigour and reactive growth development.	
Fair	- The tree may be starting to dieback or have over 25% deadwood. - Tree may have slightly reduced crown density or thinning. - There may be some discolouration of foliage. - Average reaction growth/development. - There may be early signs of pathogens which may further deteriorate the health of the tree. - There may be epicormic growth indicating increased levels of stress within the tree.	The tree is in below average health and condition and may require remedial works to improve the tree's health.
Poor	- The tree may be in decline, have extensive dieback, or have over 30% deadwood. - The canopy may be sparse or the leaves may be unusually small for the species. - Pathogens or pests are having a significant detrimental effect on the tree's health.	The tree is displaying low levels of health and removal or remedial works may be required.
Dead	The tree is dead or almost dead.	The tree should generally be removed.

7. Structural Condition: Below are example conditions used when assigning a category for structural condition.

Category	Example Condition	Summary
Good	• Branch unions appear to be strong with no sign of defects. • There are no significant cavities. • The tree is unlikely to fail in usual conditions. • The tree has a balanced crown, shape, and form.	• The tree is considered structurally good with well-developed form.
Fair	• The tree may have minor structural defects within the structure of the crown that could potentially develop into more significant defects. • The tree may have a cavity that is currently unlikely to fail but may deteriorate in the future. • The tree is an unbalanced shape or leans significantly. • The tree may have minor damage to its roots. • The root plate may have moved in the past but the tree has now compensated for this. • Branches may be rubbing or crossing.	• The identified defects are unlikely to cause major failure. • Some branch failure may occur in usual conditions. • Remedial works can be undertaken to alleviate potential defects.
Poor	• The tree has significant structural defects. • Branch unions may be poor or weak. • The tree may have a cavity or cavities with excessive levels of decay that could cause catastrophic failure. • The tree may have root damage or is displaying signs of recent movement. • The tree crown may have poor weight distribution which could cause failure.	• The identified defects are likely to cause either partial or whole tree failure.

8. Amenity Value: To determine the amenity value of a tree, we assess a number of different factors, which include but are not limited to the information below:

- The visibility of the tree to adjacent sites.
- The relationship between the tree and the site.
- Whether the tree is protected by any statutory conditions.
- The habitat value of the tree.
- Whether the tree is considered a noxious weed species.

The amenity value is then rated using one of the following categories:

- Very High
- High
- Moderate
- Low
- Very Low

9. Safe Useful Life Expectancy – SULE, (Barrel, 2001): A tree's safe useful life expectancy is determined by assessing a number of different factors including the health and vitality, estimated age in relation to expected life expectancy for the species, structural defects, and remedial works that could allow for retention in the existing situation.

Category	Description
1. Long – Over 40 years	a) Structurally sound trees located in positions that accommodate future growth. b) Trees that could be made suitable for retention in the long term by remedial tree care. c) Trees of special significance for historical, commemorative, or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.
2. Medium – 15 to 40 years	a) Trees that may only live between 15 and 40 more years. b) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons. c) Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new plantings. d) Trees that could be made suitable for retention in the medium term by remedial tree care.
3. Short – 5 to 15 years	a) Trees that may only live between 5 and 15 more years. b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons. c) Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. d) Trees that require substantial remedial tree care and are only suitable for retention in the short-term.
4. Remove – Under 5 years	a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions. b) Dangerous trees because of instability or recent loss of adjacent trees. c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form. d) Damaged trees that are clearly not safe to retain. e) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. f) Trees that are damaging or may cause damage to existing structures within 5 years. g) Trees that will become dangerous after removal of other trees for the reasons given in a) to f). h) Trees in categories a) to g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.
5. Small/Young	a) Small trees less than 5 metres in height. b) Young trees less than 15 years old but over 5 metres in height. c) Formal hedges and trees intended for regular pruning to artificially control growth.

10. Root Investigations: The root investigations should identify roots greater than 30mm in diameter that are located along the edge of the structure's footprint, or in the location of footings. Root investigations must be carried out using non-invasive methods (manual excavations). Any excavations for the root investigations must be carried out manually to avoid damaging the roots during excavations. Manual excavation may include the use of a high-pressure air/air knife, or a combination of high-pressure water and a vacuum device. When hand excavating carefully work around roots retaining as many as possible. Take care to not fray, wound, or cause damage to any roots during excavations as this may cause decay or infection from pathogens. It is essential that exposed roots are kept moist, and the excavation back filled as soon as possible. The root investigations should be carried out by a qualified Arborist with a minimum AQF Level 3. Once roots are exposed, a visual assessment can be carried out by a consulting Arborist to evaluate the potential impact of the proposed root loss on the health and stability of the tree. A root map/report should be prepared, identifying the findings of the investigation, including photographs as supporting evidence in the report.

11. Retention Value: The system I have used to award the retention value is Tree AZ. Tree AZ is used to identify higher value trees worthy of being a constraint to development and lower value trees that should generally not be a constraint to the development. The table below provides a brief description of each category.

TreeAZ Categories Field Sheet (Version 10.04-ANZ)

CAUTION: TreeAZ assessments must be carried out by a competent person qualified and experienced in arboriculture. The following category descriptions are designed to be a brief field reference and are not intended to be self-explanatory. They must be read in conjunction with the most current explanations published at www.TreeAZ.com.

Category Z: Unimportant trees not worthy of being a material constraint

Local policy exemptions: Trees that are unsuitable for legal protection for local policy reasons including size, proximity and species

- Z1** Young or insignificant small trees, i.e. below the local size threshold for legal protection, etc
- Z2** Too close to a building, i.e. exempt from legal protection because of proximity, etc
- Z3** Species that cannot be protected for other reasons, i.e. scheduled noxious weeds, out of character in a setting of acknowledged importance, etc

High risk of death or failure: Trees that are likely to be removed within 10 years because of acute health issues or severe structural failure

- Z4** Dead, dying, diseased or declining
- Z5** Severe damage and/or structural defects where a high risk of failure cannot be satisfactorily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, overgrown and vulnerable to adverse weather conditions, etc
- Z6** Instability, i.e. poor anchorage, increased exposure, etc

Excessive nuisance: Trees that are likely to be removed within 10 years because of unacceptable impact on people

- Z7** Excessive, severe and intolerable inconvenience to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. dominance, debris, interference, etc
- Z8** Excessive, severe and intolerable damage to property to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. severe structural damage to surfacing and buildings, etc

Good management: Trees that are likely to be removed within 10 years through responsible management of the tree population

- Z9** Severe damage and/or structural defects where a high risk of failure can be temporarily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, vulnerable to adverse weather conditions, etc
- Z10** Poor condition or location with a low potential for recovery or improvement, i.e. dominated by adjacent trees or buildings, poor architectural framework, etc
- Z11** Removal would benefit better adjacent trees, i.e. relieve physical interference, suppression, etc
- Z12** Unacceptably expensive to retain, i.e. severe defects requiring excessive levels of maintenance, etc

NOTE: Z trees with a high risk of death/failure (Z4, Z5 & Z6) or causing severe inconvenience (Z7 & Z8) at the time of assessment and need an urgent risk assessment can be designated as ZZ. ZZ trees are likely to be unsuitable for retention and at the bottom of the categorization hierarchy. In contrast, although Z trees are not worthy of influencing new designs, urgent removal is not essential and they could be retained in the short term, if appropriate.

Category A: Important trees suitable for retention for more than 10 years and worthy of being a material constraint

- A1** No significant defects and could be retained with minimal remedial care
- A2** Minor defects that could be addressed by remedial care and/or work to adjacent trees
- A3** Special significance for historical, cultural, commemorative or rarity reasons that would warrant extraordinary efforts to retain for more than 10 years
- A4** Trees that may be worthy of legal protection for ecological reasons (Advisory requiring specialist assessment)

NOTE: Category A1 trees that are already large and exceptional, or have the potential to become so with minimal maintenance, can be designated as AA at the discretion of the assessor. Although all A and AA trees are sufficiently important to be material constraints, AA trees are at the top of the categorization hierarchy and should be given the most weight in any selection process.

TreeAZ is designed by Barrell Tree Consultancy (www.barrelltreecare.co.uk) and is reproduced with their permission

Appendix 3: Glossary of Terms

Abiotic² – Pertaining to non-living agents e.g. environmental factors.

Adventitious shoots – Shoots that develop other than from apical, axillary, or dormant buds; see also 'epicormic'.

Anchorage – The system whereby a tree is fixed within the soil, involving cohesion between roots and soil and the development of a branched system of roots which withstands wind and gravitational forces transmitted from the aerial parts of the tree.

Bark – A term usually applied to all the tissues of a woody plant lying outside the vascular cambium, thus including the phloem, cortex, and periderm. Occasionally applied only to the periderm or the phellem.

Branch:

- **Primary** - A first order branch arising from a stem
- **Lateral** - A second order branch, subordinate to a primary branch or stem and bearing sub-lateral branches.
- **Sub-lateral** – A third order branch, subordinate to a lateral of primary branch or stem, and usually bearing only twigs.

Branch Collar – A visible swelling formed at the base of a branch whose diameter growth has been disproportionately slow compared to that of the parent stem. A term sometimes applied also to the pattern of growth of the cells of the parent stem around the branch base.

Brown Rot – A type of wood decay in which cellulose is degraded, while lignin is only modified.

Buckling- An irreversible deformation of a structure subjected to a bending load.

Buttress Zone- The region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper side of the junctions.

Cambium – Layer of dividing cells producing xylem (woody) tissue internally and phloem (bark) tissue externally.

Canker – A persistent lesion formed by the death of bark and cambium due to colonisation by fungi or bacteria.

Compartmentalisation – The confinement of disease, decay or other dysfunction within an anatomically discrete region of plant tissue, due to

passive and/or active defences operating at the boundaries of the affected region.

Compressive Loading – Mechanical loading which exerts a positive pressure, the opposite to tensile loading.

Condition – An indication of the physiological condition of the tree. Where the term 'condition' is used in a report, it should not be taken as an indication of the stability of the tree.

Crown/Canopy – The main foliage bearing section of the tree.

Crown Lifting – The removal of limbs and small branches to a specified height above ground level.

Crown Thinning – The removal of a proportion of secondary branch growth throughout the crown to produce an even density of foliage around a well-balanced branch structure.

Crown Reduction/Shaping – A specified reduction in crown size whilst preserving the natural tree shape as far as possible.

Diameter Above Buttress (DAB) – Trunk diameter measured above the root buttress.

Defect – In relation to tree hazards, any feature of a tree which detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment.

Dieback – The death of parts of a woody plant, starting at shoot-tips or root-tips.

Disease – A malfunction in or destruction of tissues within a living organism, usually excluding mechanical damage. In trees, this is usually caused by pathogenic micro-organisms.

Dominance – In tree, the tendency for a leading shoot to grow faster or more vigorously than the lateral shoots. Also, the tendency of a tree to maintain a taller crown than its neighbours.

Dormant Bud – An axial bud which does not develop into a shoot until after the formation of two or more annual wood increments. Many such buds persist through the life of a tree and develop only if stimulated to do so.

Dysfunction – In woody tissues, this is the loss of physiological function, especially water conduction in sapwood.

Diameter at Breast Height (DBH) – Stem diameter measured at a height of 1.4 metres or the nearest measurable point. Where measurement at a height of 1.4 metres is not possible, another height may be specified.

² Incorporating extracts from Lonsdale, D. 1999. *Principles of Tree Hazard Assessment*. Her Majesty's Stationary Office,

Deadwood – A branch or stem bearing no live tissues. Retention of deadwood provides valuable habitat for a wide range of species and seldom represents a threat to the health of the tree. Removal of deadwood can result in the ingress of decay to otherwise sound tissues and climbing operations to access deadwood can cause significant damage to a tree. Removal of deadwood is generally recommended only where it represents an unacceptable level of hazard.

Epicormic Shoot – A shoot having developed from a dormant or adventitious bud and not having developed from a first-year shoot.

Flush Cut – A pruning cut which removes part of the bark branch ridge and or branch collar.

Girdling Root – A root which circles and constricts the stem or roots possibly causing death of phloem and/or cambial tissue.

Habitat – The overall growth characteristics and shape of the tree and branch structure.

Hazard Beam – An upwardly curved part of a tree in which strong internal stresses may occur without being reduced by adaptive growth. Prone to longitudinal splitting.

Heartwood/False-heartwood – The dead central wood that become dysfunctional as part of the aging processes and being distinct from the sapwood.

Heave – A term mainly applicable to a shrinkable clay soil which expands due to re-wetting after the felling of a tree which was previously extracting moisture from the deeper layers. Also, the lifting of pavements and other structures by root diameter expansion. Also, the lifting of one side of a wind-rocked root-plate.

Included Bark (ingrown bark) – Bark of adjacent parts of a tree (usually forks, acutely joined branches, or basal flutes) which is in face-to-face contact.

Lever Arm – A mechanical term denoting the length of the lever represented by a structure that is free to move at one end, such as a tree or an individual branch.

Lignin – The hard, cement-like constituent of wood cells. Deposition of lignin within the matrix of cellulose microfibrils in the cell wall is termed 'lignification'.

Lions Tailing – A term applied to a branch of a tree that has few if any side-branches at its end and is thus liable to snap due to end-loading.

Loading – A mechanical term describing the force acting on a structure from a particular source e.g. the weight of the structure itself or wind pressure.

Mycelium – The body of a fungus, consisting of branched filaments (hyphae).

Occlusion – The process whereby a wound is progressively closed by the formation of new wood and bark around it.

Pathogen – A micro-organism which causes disease in another organism.

Photosynthesis – The process whereby plants use light energy to split hydrogen from water molecules and combine it with carbon dioxide to form the molecular building blocks for synthesising carbohydrates and other biochemical products.

Probability – A statistical measure of the likelihood that a particular event might occur.

Pruning – The removal or cutting back of twigs or branches, sometimes applied to twigs or small branches only, but often used to describe most activities involving the cutting of trees or shrubs.

Radial – In the plan or direction of the radius of a circular object such as a tree stem.

Reactive Growth/Reaction Wood – Production of woody tissue in response to altered mechanical loading. Often occurs in response to an internal defect or decay and associated strength loss (cf. adaptive growth).

Ring-Barking – The removal of a ring of bark and phloem around the circumference of a stem or branch, normally resulting in an inability to transport photosynthetic assimilates below the area of damage. Almost inevitably results in the eventual death of the affected stem or branch above the damage.

Root Collar – The transitional area between the stem/s and roots.

Sapwood – Living xylem tissues.

Soft Rot – A kind of wood decay in which a fungus degrades cellulose within the cell walls, without any general degradation of the wall as a whole.

Stem/s – Principle above-ground structural component(s) of a tree that supports its branches.

Stress – In plant physiology, a condition under which one or more physiological functions are not operating within their optimum range, e.g. a lack of water, inadequate nutrition, or extreme of temperature.

Structural Root Zone (SRZ) – the area around the base of the tree required for tree's stability in the ground.

Subsidence – In relation to soil or structures resting in or on soil, a sinking due to shrinkage

when certain types of clay soil dry out, sometimes due to the extraction of moisture by tree roots.

Taper – In stems and branches, the degree of change in girth along a given length.

Targets – In tree risk assessment (with slight misuse of normal meaning) persons or property or other things of value which might be harmed by mechanical failure of the tree or by objects falling from it.

Topping – In arboriculture, the removal of the crown of a tree or a major portion of it.

Transpiration – The evaporation of moisture from the surface of a plant, especially via the stomata of leaves. It exerts a suction which draws water up from the roots and through the intervening xylem cells.

Tree Protection Zone (TPZ) – A specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

Understory – This layer consists of younger individuals of the dominant trees, together with smaller trees and shrubs which are adapted to grown under lower light conditions.

Veteran Tree – Tree that, by recognised criteria, shows features of biological, cultural, or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned. These characteristics might typically include a large girth, signs of crown retrenchment, and hollowing of the stem. -

White Rot – A range of kinds of wood decay in which lignin together with cellulose and other wood constituent is degraded.

Wind Exposure – The degree to which a tree or other object is exposed to wind, both in terms of duration and velocity.

Wind Pressure – The force exerted by a wind on a particular object.

Windthrow - The blowing over of a tree at its roots.