



Arboricultural Impact Assessment

Site Address: Sutherland Primary School, 38-54 Eton St. Sutherland NSW
Client: NSW Department of Education
Authors Details: Hugh Millington
Email: hugh@hughtheArborist.com.au
Phone: 0426836701
Date Prepared: 23rd January 2025
Revision: B

Table of Contents

1.	INTRODUCTION.....	3
2.	SCOPE OF THE REPORT	3
3.	LIMITATIONS	4
4.	METHODOLOGY.....	5
5.	SITE LOCATION & BRIEF DESCRIPTION OF DEVELOPMENT WORKS ASSESSED	6
6.	OBSERVATIONS AND GENERAL INFORMATION IN RELATION TO PROTECTING TREES ON DEVELOPMENT SITES	7
7.	ASSESSMENT OF CONSTRUCTION IMPACTS	9
8.	CONCLUSIONS.....	11
9.	RECOMMENDATIONS.....	12
10.	ARBORICULTURAL WORK METHOD STATEMENT (AMS) AND TREE PROTECTION REQUIREMENTS.....	15
11.	HOLD POINTS.....	23
12.	BIBLIOGRAPHY/REFERENCES.....	25
13.	LIST OF APPENDICES.....	25

COPYRIGHT

©Hugh The Arborist 2025

The use of any or all sections of this report in any documentation relating to the site is permissible so long as the copyright is noted at the completion of all sections.

Any other use of this report, or any part thereof for any other purpose or in documentation for any other site is strictly prohibited. No part of this report may be reproduced, transmitted, stored in a retrieval system or updated in any form or by any means (electronic, photocopying, recording or otherwise) without written permission of Hugh Millington.

1. INTRODUCTION

- 1.1 Hugh the Arborist Pty Ltd have been instructed by Glenn Francis of Schools Infrastructure NSW on behalf of NSW Department of Education to provide a revised Arboricultural Impact Assessment Report for eleven trees located on the site in relation to a proposed development.
- 1.2 Revision B has been prepared to update the associated impacts from the proposed services on T8.
- 1.3 The site inspection and tree data collection was carried out on 6th July 2024. The weather at the time of the inspection was clear with average visibility. No additional site inspection was carried out for the purpose of this assessment.

Table 1: Documents Reviewed For The Assessment

Title	Author	Date	Reference on document
Demolition Plan	BKA Architecture	17/1/2025	Rev B
Ground Floor Plan	BKA Architecture	17/1/2025	Rev B
Hydraulic Services Plans	ENTEC	11/12/2024	Rev b
Electrical Site Plan	Steensen Varming	17/1/2025	247069SPSH-SV-B001-GF-DR-E-1010 A
Civil and Stormwater Plan	Enstruct	13/12/2024	Rev 01

2. SCOPE OF THE REPORT

- 2.1 This report has been undertaken to meet the following objectives.
- 2.1.1 Conduct a visual assessment from ground level of eleven trees located on the site that may be affected by the development.
- 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 (2009).
- 2.1.4 Provide pragmatic recommendations for the management of trees and mitigation of construction impacts on retained trees.

- 2.1.5 Specify tree protection measures for trees to be retained in accordance with AS 4970-2009.

3. LIMITATIONS

- 3.1 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.
- 3.2 The report reflects the subject tree(s) at the time of the 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 Hugh The Arborist neither guarantees, nor is responsible for, the accuracy of information provided by others that is contained within this report.
- 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 trees at the site.
- 3.6 The ultimate safety of any tree cannot be categorically guaranteed. Even trees apparently free of defects can collapse or partially collapse in extreme weather conditions. Trees are dynamic, biological entities subject to changes in their environment, the presence of pathogens and the effects of ageing. These factors reinforce the need for regular inspections. It is generally accepted that hazards can only be identified from distinct defects or from other failure-prone characteristics of a tree or its locality.
- 3.7 Alteration of this report invalidates the entire report.

4. METHODOLOGY

4.1 The following tree information is included in the report.

- 4.1.1 Tree common name
- 4.1.2 Tree botanical name
- 4.1.3 Tree age class
- 4.1.4 DBH (Trunk/Stem diameter at breast height/1.4m above ground level) - millimetres
- 4.1.5 Estimated height - metres
- 4.1.6 Estimated crown spread (Radius of crown) - metres
- 4.1.7 Health
- 4.1.8 Structural condition
- 4.1.9 Landscape value
- 4.1.10 Estimated remaining contribution years (SULE)¹
- 4.1.11 Notes/comments

4.2 All tree data has been obtained from the existing tree report noted in the scope of this report.

4.3 All DBH measurements, tree protection zones, and structural root zones were calculated in accordance with methods set out in AS4970 Protection of trees on development sites (2009). See appendices for more information.

4.4 Details of how the data in this report have been interpreted are listed in the appendices.

¹ Barrell Tree Consultancy, *SULE: Its use and status into the New Millennium*, TreeAZ/03/2001, <http://www.treeaz.com/>.

5. SITE LOCATION & BRIEF DESCRIPTION OF DEVELOPMENT WORKS ASSESSED

5.1 The site is located within the Sutherland Shire Local Government Area. All trees at the site are managed under the following policy and legislation.

5.1.1 Sutherland Shire Local Environmental Plan (LEP) 2015

5.1.2 Sutherland Shire Development Control Plan (DCP) 2015

5.1.3 Chapter 39 Natural Resources Management (DCP 2015)

5.1.4 State Environmental Planning Policy (Biodiversity and Conservation) 2021

5.2 The site is identified as a heritage item but not listed as containing biodiversity according to the NSW Planning Portal Spatial Viewer, accessed 9/8/2024.

5.3 The proposed works consist of the construction of a new school hall and associated ancillary structures.

Image 1: Site Location²

² <https://maps.six.nsw.gov.au/>



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

- 6.1 **Tree information:** Details of each individual tree assessed can be found in the tree inspection schedule in appendix 2, where the indicative tree protection zone (TPZ) and Structural Root Zone (SRZ) has been calculated for each of the subject trees. The TPZ and SRZ should be measured in radius from the centre of the trunk.

Site Plan: Appendix 1 consists of a site plan where the tree information including canopy spread, TPZ and SRZ have been overlaid onto the proposed site plan.

- 6.2 **Tree protection zone (TPZ):** The TPZ is the principle means of protecting trees on development sites and is an area required to maintain the viability of trees during development. 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 area where root loss or disturbance will generally 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 is set aside for the tree's root zone, trunk and crown and it is essential for the stability and longevity of the tree. The TPZ also incorporates the SRZ (see below for more information about the SRZ). The TPZ is calculated by multiplying the DBH by twelve, with the exception of palms, other monocots, cycads and tree ferns, the TPZ of which have been calculated at one metre outside the crown projection.
- 6.3 **Structural Root Zone (SRZ):** 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. The SRZ is calculated using the following formula: $(DAB \times 50)^{0.42} \times 0.64$. There are several factors that can vary 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. Soil level changes should also generally be avoided inside the SRZ of trees to be retained. Palms, other monocots, cycads and tree ferns do not have an SRZ. See the appendices for more information about the SRZ.
- 6.4 **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.
- 6.5 **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 size roots, or if it can be demonstrated that significant roots will not be impacted. Root investigations may be required to identify roots that will be impacted during major TPZ encroachment.

7. ASSESSMENT OF CONSTRUCTION IMPACTS

7.1 **Table 2:** In the table below the impact of the proposed development has been assessed.

7.2 **Abbreviations used:** Tree Protection Zone (TPZ) Structural Root Zone (SRZ).

Tree ID	Species	Trees AZ Value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
1	<i>Eucalyptus microcorys</i>	A1	10.3	3.2	Major	According to the demolition plan the existing garden bed containing the tree is proposed to be demolished and the existing footpath reconstructed at a lesser setback to the trunk of the tree. The proposed Ground Floor Plan Identifies proposed levels that are between approximately 40mm and 100mm lower than the existing and notes the work as grading. Beyond the proposed footpath the plans show existing levels to be maintained. While the proposed grading will remove some of the fine root system in the upper layers of the soil the deeper tree roots are more likely to be retained and providing the tree is provided with remediation the fine root system is more likely to redevelop. The services enclosure and structures requiring more significant footings to the north may require root severance however as a standalone component this is unlikely to significantly affect the tree. The total encroachment from the proposed works is up to 28% within the TPZ and the SRZ which is a major encroachment, However, the encroachment is dominated by the footpath which is a lightweight structure and includes the area of TPZ beyond the footpath to the east proposed to be retained as existing. On the provision significant tree roots can be retained below the new footpath via tree sensitive construction methods and the tree is provided remediation the associated impacts are unlikely to have significant long-term impacts to the trees viability. Refer to the recommendations section for specifications.	Retain with tree sensitive construction
2	<i>Eucalyptus microcorys</i>	A1	1.7	1.6	None	No encroachment proposed.	Retain and protect
3	<i>Eucalyptus robusta</i>	A1	6.0	2.6	Major	The proposed access ramp, stairs, services enclosure and associated stormwater pipes will encroach into the TPZ and the SRZ by up to 38%. This is a major encroachment that is likely to affect the viability of the tree.	Remove



HUGH
THE ARBORIST

Tree ID	Species	Trees AZ Value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
4	<i>Melaleuca quinquenervia</i>	A1	4.1	2.3	Major	The proposed access ramp, stairs, services enclosure and associated stormwater pipes will encroach into the TPZ and the SRZ by up to 33%. This is a major encroachment that is likely to affect the viability of the tree.	Remove
5	<i>Brachychiton acerifolius</i>	A1	4.2	2.3	Major	The tree is located within the footprint of the building proposing 100% encroachment. The tree is not retainable under the proposed development.	Remove
6	<i>Leptospermum petersonii</i>	A1	1.5	1.8	Major	The tree is located within the footprint of the covered walkway proposing 100% encroachment. The tree is not retainable under the proposed development.	Remove
7	<i>Leptospermum petersonii</i>	A1	1.5	1.5	Major	The tree is located within the footprint of the covered walkway proposing 100% encroachment. The tree is not retainable under the proposed development.	Remove
8	<i>Lophostemon confertus</i>	A2	11.5	3.3	Major	The proposed extended Cola and covered walkway will encroach into the TPZ but not the SRZ by up to 14%. The proposed electrical services and new pits transect through the SRZ of the tree on two sides and are within close proximity to the trunk of the tree. The combined encroachment from the works is considered to be a major encroachment that is likely to affect the viability of the tree.	Remove
9	<i>Ficus macrocarpa</i> var. <i>hillii</i>	A1	14.4	3.6	None	No encroachment proposed	Retain and protect
9A	<i>Ficus macrocarpa</i> var. <i>hillii</i>	A1	5.6	2.3	None	No encroachment proposed	Retain and protect
9B	<i>Ficus macrocarpa</i> var. <i>hillii</i>	A1	13.2	3.6	None	No encroachment proposed	Retain and protect

Report on trees at: 38-54 Eton St. Sutherland NSW
Client Name: NSW Department of Education
Prepared by: Hugh Millington, hugh@hughtheArborist.com.au
Date prepared: 23rd January 2025
Revision B

8. CONCLUSIONS

8.1 **Table 3:** Summary of the impact to trees during the development.

Impact	Reason	Category			Total
		AA1	A	Z	
Trees to be removed	Building/landscape construction, new surfacing and/or proximity, or trees in poor condition.	-	3,4,5,6,7,8	-	6
Retained trees subject to TPZ encroachment or no encroachment	Removal of existing surfacing/structures and/or installation of new surfacing/structures will not significantly impact the tree	-	2,9,9A,9B	-	4
Trees requiring tree sensitive construction methods	Development impacts that require mitigation to retain trees in a viable condition	-	1	-	1

9. RECOMMENDATIONS

- 9.1 This report assesses the impact of a proposed development at the site to eleven individual trees in accordance with Australian Standard 4970 Protection of Trees on Development Sites (2009).
- 9.2 Six category A trees are proposed to be removed as part of the development.
- 9.3 An additional four category A trees can be retained under acceptable levels or no impact from the proposed works.
- 9.4 One tree (T1) will require tree sensitive construction methods to reduce the associated impacts to enable its retention and be provided with remediation to encourage new root development. Refer to the paragraphs below for specifications.
 - 9.4.1 **Mulch (T1)** applied to the Tree protection Zone prior to the commencement of any works will enrich the soil by improving aeration, promote healthy Mycorrhizal (Fungal) associations and provide consistent organic matter as the mulch breaks down. The layer also acts as a barrier from the wind and the sun reducing the evaporation of ground water, all of which promote the development of tree roots and healthy soils.
 - 9.4.2 **Irrigation (T1)** can be installed within or on top of the mulch. A moisture probe and an automatic timer with a drip/soaker hose can provide consistent and accurate irrigation for mature trees during the development phase and minimise risks of waterlogged or hydrophobic soils. This, in combination with mulch, tree protection and a nutrient rich soil conditioner will provide favourable growing conditions for trees to offset the impacts of major incursions to the TPZ area that are associated with root loss.
 - 9.4.3 **Tree Sensitive Hard Surfacing Construction (T1):** Hard surfacing within the TPZ of retained trees should be constructed in a tree sensitive method. The hard surfacing should be constructed above existing grades in the TPZ of the trees. The diagram below (Image C) gives an example of a no-excavation method for constructing hard surfacing close to trees. The location of retaining pegs should be flexible, avoiding damage to structural roots. If excavations are essential, they must not exceed 100mm below the existing grades. The excavations should be supervised by a project Arborist with a minimum AQF level 5 qualification. All excavations for the hard surfacing should be carried out manually to avoid impacting retained tree roots. All tree roots greater than 40mm in diameter should be retained unless the project arborist has assessed and advised that the pruning/severing of the root will not impact the condition or stability of the tree. 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. Where tree roots greater than 40mm are encountered that must be retained, the hard surfacing should be elevated over the individual tree

root to allow for its retention. Examples of methods that can be used to bridge individual tree roots have been included below (Image D and E). Using pier and beam bridges as per image E is the recommended/preferred method, as it will allow for future growth of the tree roots, reducing future damage to the surfacing from the roots.

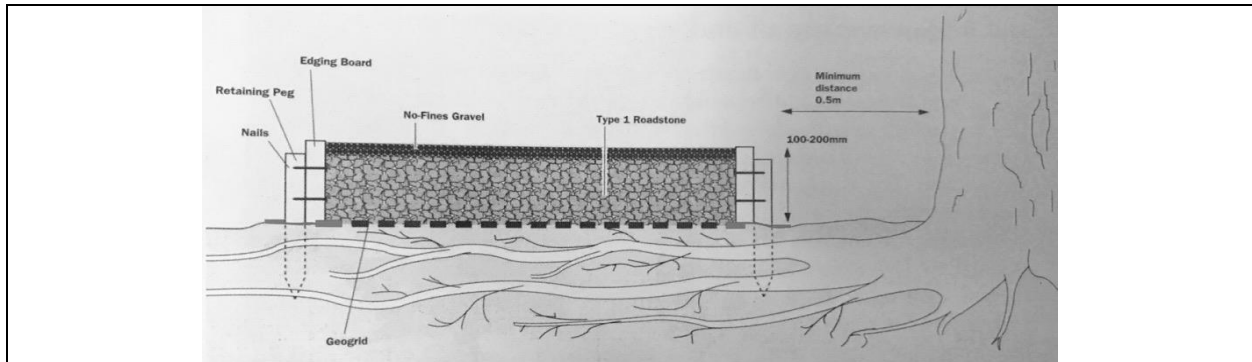


Image C: An image from 'Tree Roots in the Built Environment'³, showing how to construct hard surfacing above a trees root system without excavation. Type 1 Roadstones are an example of blue metal or crushed sandstone.

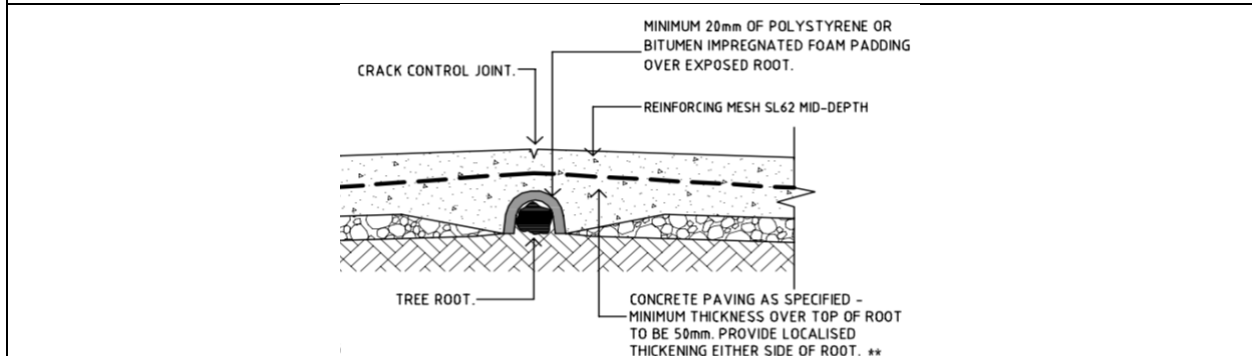
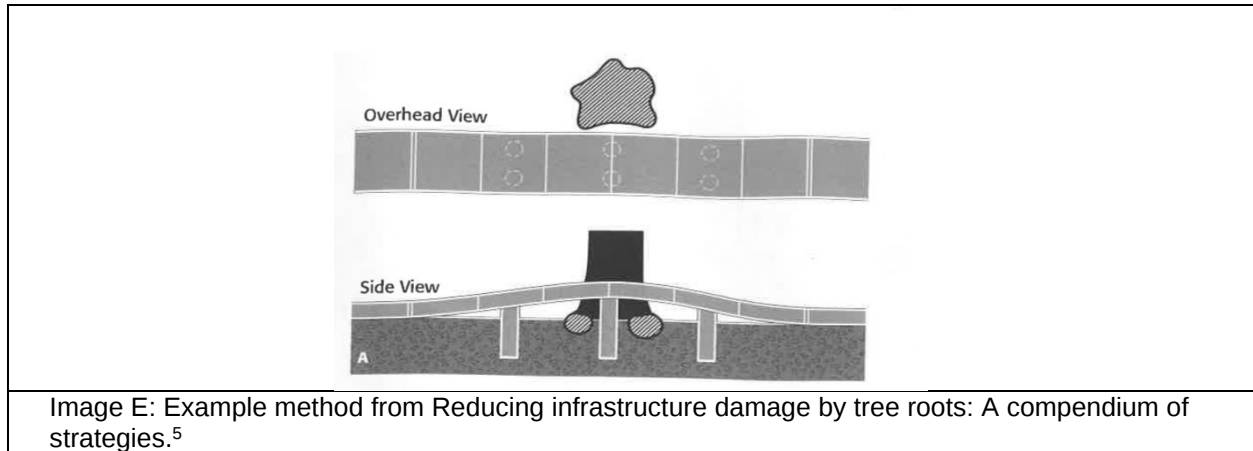


Image D: Example method for bridging concrete surfacing over tree roots provided in the Canterbury Bankstown Council standard drawings.⁴

³ Roberts, J., Jackson, N., & Smith, M., *Tree Roots in the Built Environment*, The Stationary Office, London, England (2006). Page 305 & 306.

⁴ Canterbury Bankstown Council standard drawing S-209 Existing street tree treatments, <https://www.cbcity.nsw.gov.au/development/planning-control-policies/council-standard-drawings>, accessed 3 October 2019.



- 9.5 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 any tree removal/pruning or development application.
- 9.6 **Underground Services:** AS4970 Protection of trees on development sites (2009) recommends that all underground services located inside the TPZ of any tree to be retained should 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. If directional drilling is proposed, section 4.5.5 of AS4970-2009 says that 'The directional drilling bore should be at least 600 mm deep. The project Arborist should assess the likely impacts of boring and bore pits on retained trees'.⁶

If manual excavations are proposed, all excavations for the services should be carried out manually under the supervision of the project Arborist (minimum qualification AQF 5). 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. All roots greater than 40mm in diameter should be retained in the service trench. The service pipe should then be threaded below the retained roots where practical. Roots greater than 40mm within the alignment of the service pipe should only be severed/pruned under the approval of the project Arborist. All root pruning should be in accordance with AS4373 Pruning of amenity trees (2007).

⁵ Costello, L. R., & Jones, K. S, *Reducing infrastructure damage by tree roots: A compendium of strategies*, Western Chapter of the International Society of Arboriculture, 31883 Success Valley Drive, Porterville, CA (2003), page 27.

⁶ Council Of Standards Australia, *AS 4970 Protection of trees on development sites* (2009) page 18.

Open trenching in the SRZ of trees can be impractical without impacting significant roots, as often dense root growth is present in the SRZ. Open trenching should therefore be avoided in the SRZ. It is recommended that any section of pipe that is located in the SRZ of trees to be retained is installed via sub-surface boring/directional drilling methods only. The feasibility of sub-surface boring/directional drilling will need to be investigated by a sub-surface boring/directional drilling specialist. The project Arborist should provide advice and supervise excavations for bore pits, which must be carried out manually if located within the TPZ. The top of the pipe must be at least 600mm below the existing soil grade. The location of bore pits should be flexible in the TPZ to avoid significant roots, the project Arborist should assess and advise in writing the impact of any significant root severance to the condition of the tree.

10. ARBORICULTURAL WORK METHOD STATEMENT (AMS) AND TREE PROTECTION REQUIREMENTS

- 10.1 **Use of this report:** All contractors must be made aware of the tree protection requirements prior to commencing works at the site and be provided a copy of this report.
- 10.2 **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 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.
- 10.3 **Tree work:** All tree work must 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).
- 10.4 **Initial site meeting/on-going regular inspections:** The project Arborist is to hold a pre-construction site meeting with principal contractor to discuss methods and importance of tree protection measures and resolve any issues in relation to tree protection that may arise. In accordance with AS4970-2009, the project Arborist should carryout regular site inspections to ensure works are carried out in accordance with this document throughout the development process. I recommend regular site inspections on a frequency based on the longevity of the project; this is to be agreed in the initial meeting.

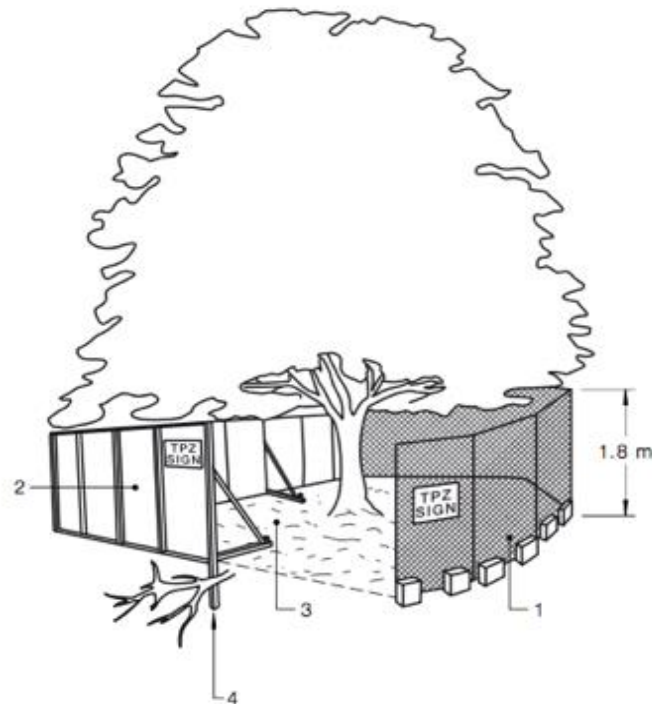
10.5 Site Specific Tree Protection Recommendations:

Table 4: Protection Requirements: See appendix 1 for indicative fencing location. See section 10 for general specifications of tree protection.

Tree Number	Protection Specification
1 and 2	- Fencing around the existing remaining garden bed to isolate the trees.
3,4,5,6,7,8	- Proposed removals.
9, 9A, 9B	- Trees are sufficiently set back from the proposed works not to require protection.

- 10.6 Tree protection Specifications:** See section 10.5 for site/tree specific requirements. 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 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 AS4970-2009 prior to works commencing.
- 10.7 Protective fencing:** 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. Where the installation of fencing is unfeasible due to restrictions on space, trunk and branch protection will be required (see below). The protective fencing must be constructed of 1.8 metre 'cyclone chainmesh fence'. The fencing must only be removed for the landscaping phase and must be authorised by the project Arborist. Any modifications to the fencing locations must be approved by the project Arborist.
- 10.8 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. 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

- 10.9 **Trunk and Branch Protection:** The trunk must be protected by wrapped hessian or similar material to limit damage. Timber planks (50mm x 100mm 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.
- 10.10 **Mulch:** Any areas of the TPZ located inside the subject site (only trees to be retained directly adjacent to site works) must be mulched to a depth of 75mm with good quality composted wood chip/leaf mulch.
- 10.11 **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, overlaid with durable timber boards/plywood. 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. Ground protection is to be specified by the project Arborist as required.

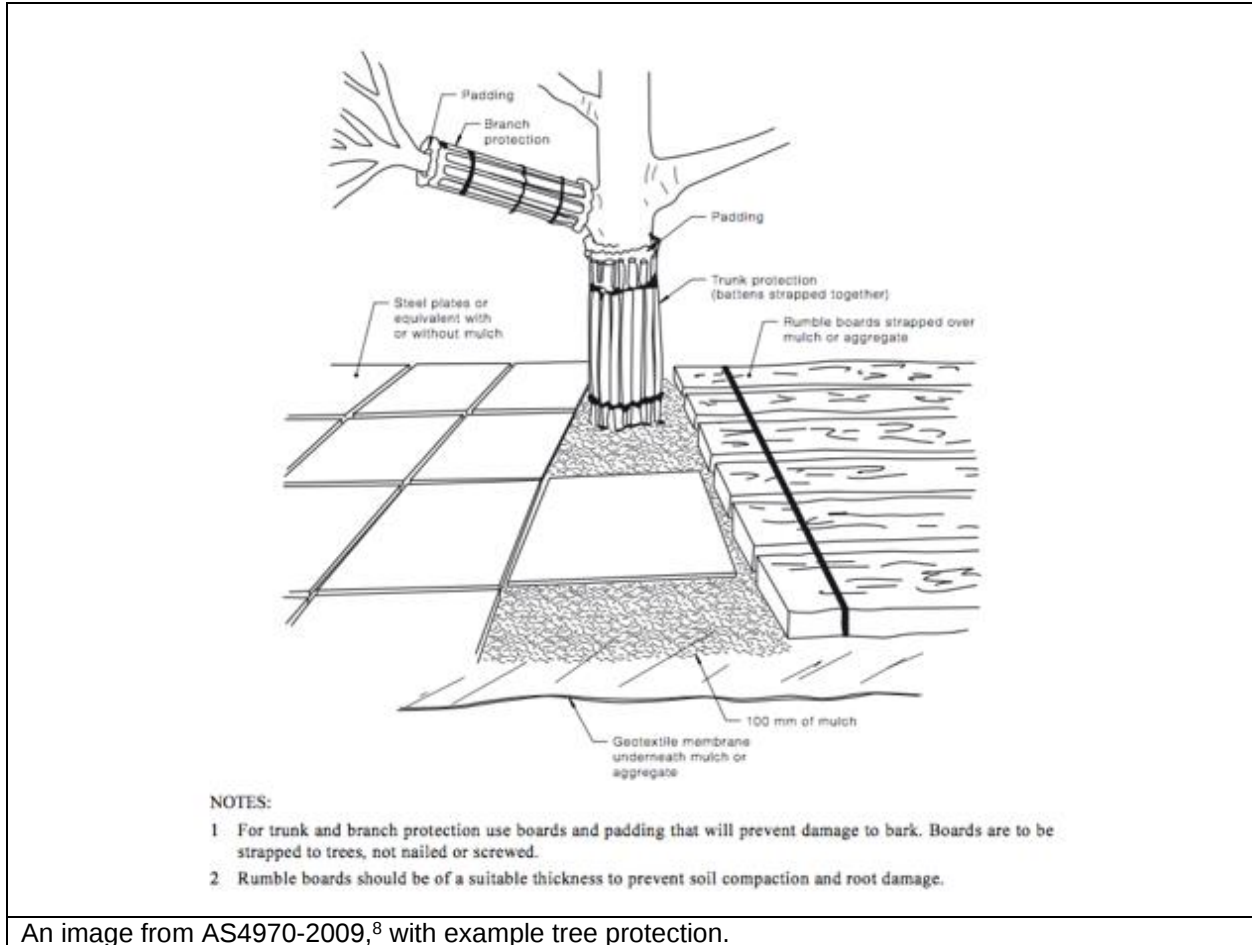


LEGEND:

- 1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
- 2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
- 3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
- 4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

An image from AS4970-2009,⁷ with example tree protection.

⁷ Council of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 16.



An image from AS4970-2009,⁸ with example tree protection.

10.12 Restricted activities inside 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 tree.

- A) Machine excavation.
- B) Ripping or cultivation of soil.
- C) Storage of spoil, soil or any such materials
- D) Preparation of chemicals, including preparation of cement products.
- E) Refueling.
- F) Dumping of waste.

⁸ Council of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 17.

- G) Wash down and cleaning of equipment.
- H) Placement of fill.
- I) Lighting of fires.
- J) Soil level changes.
- K) Any physical damage to the crown, trunk, or root system.
- L) Parking of vehicles.

10.13 **Demolition:** The demolition of all 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.

10.14 **Excavations:** The project Arborist must supervise and certify that all excavations and root pruning are in accordance with AS4373-2007 and AS4970-2009. For continuous strip footings, first manual excavation is required along the edge of the structures closest to the subject trees. Manual excavation should be a depth of 1 metre (or to unfavourable root growth conditions such as bed rock or heavy clay, if agreed by 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. No pruning of roots greater 40mm in diameter is to be carried out without approval of the project arborist. All pruning of roots greater than 10mm 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).⁹ 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.

⁹ Council of Standards Australia, AS 4373 *Pruning of amenity trees* (2007) page 18

10.15 Root investigation method. In the event non-destructive excavations are to be carried out along the outer edge of proposed or existing structures within the TPZ (excavation methods include the use of pneumatic and hydraulic tools, high-pressure air or a combination of high-pressure water and a vacuum device). Excavations generally consist of a trench to a depth dictated by the location of significant roots, bedrock, unfavourable conditions for root growth, or the required depth for footings up to 1 metre. The investigation is to be carried out by AQF5 consulting Arborist who is to record all roots greater than 40 millimetres in diameter and produce a report discussing the significance of the findings. No roots 40 millimetres in diameter are to be frayed or damaged during excavation and the trench is to be backfilled as soon as possible to reduce the risk of roots drying out. In the event roots must be left exposed they are to be wrapped in hessian sack and regularly irrigated for the duration of exposure.

10.16 Underground Services: AS4970 Protection of trees on development sites (2009) recommends that all underground services located inside the TPZ of any tree to be retained should 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.

If directional drilling is proposed, section 4.5.5 of AS4970-2009 says that 'The directional drilling bore should be at least 600 mm deep. The project Arborist should assess the likely impacts of boring and bore pits on retained trees'.¹⁰

If manual excavations are proposed, all excavations for the services should be carried out manually under the supervision of the project Arborist (minimum qualification AQF 5). 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. All roots greater than 40mm in diameter should be retained in the service trench. The service pipe should then be threaded below the retained roots where practical. Roots greater than 40mm within the alignment of the service pipe should only be severed/pruned under the approval of the project Arborist. All root pruning should be in accordance with AS4373 Pruning of amenity trees (2007). Open trenching in the SRZ of trees can be impractical without impacting significant roots, as often dense root growth is present in the SRZ. Open trenching should therefore be avoided in the SRZ. It is recommended that any section of pipe that is located in the SRZ of trees to be retained is installed via sub-surface boring/directional drilling methods only. The feasibility of sub-surface boring/directional drilling will need to be investigated by a sub-surface boring/directional drilling specialist. The project Arborist should provide advice and

¹⁰ Council Of Standards Australia, AS 4970 Protection of trees on development sites (2009) page 18.

supervise excavations for bore pits, which must be carried out manually if located within the TPZ. The top of the pipe must be at least 600mm below the existing soil grade. The location of bore pits should be flexible in the TPZ to avoid significant roots, the project Arborist should assess and advise in writing the impact of any significant root severance to the condition of the tree.

10.17 Landscaping: All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with a consulting Arborist to minimize the impact to trees. General guidance is provided below to minimise the impact of new landscaping to trees to be retained.

- 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 200mm 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, considerer 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 trees 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. Footpath should be located outside the SRZ.
- 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.
- 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 30mm in diameter.

- 10.18 **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.
- 10.19 **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.
- 10.20 **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.

11. HOLD POINTS

- 11.1 **Hold Points:** Below is a sequence of hold points requiring project Arborist certification throughout the development process. It provides a list of hold points that must be checked and certified. All certifications 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.

Hold Point	Stage	Responsibility	Certification	Complete Y/N and date
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 work commencing.	Principle contractor	Project Arborist	
Project Arborist to assess and certify that tree protection has been installed in accordance with section 10 and AS4970-2009 prior to works commencing at site.	Prior to development work commencing.	Principle contractor	Project Arborist	
In accordance with AS4970-2009 the project arborist should carry out regular site inspections to ensure works are carried out in accordance with the recommendations. I recommend site inspections on a monthly frequency.	Ongoing throughout the development	Principle contractor	Project Arborist	
Project Arborist to supervise all manual excavations and demolition inside the TPZ of any tree to be retained.	Construction	Principle contractor	Project Arborist	

Hold Point	Stage	Responsibility	Certification	Complete Y/N and date
Project Arborist to certify that all pruning of roots greater than 40mm in diameter has been carried out in accordance with AS4373-2007. All root pruning must be carried out by a qualified Arborist/Horticulturalist with a minimum AQF level 3.	Construction	Principle contractor	Project Arborist	
Project Arborist to certify that all underground services including storm water inside TPZ of any tree to be retained have been installed in accordance with AS4970-2009.	Construction	Principle contractor	Project Arborist	
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 minimize the impact to trees.	Landscape	Principle contractor	Project Arborist	
After all construction works are complete the project Arborist should assess that the subject trees have been retained in the same condition and vigor and authorize the removal of protective fencing. If changes to condition are identified the project Arborist should provide recommendations for remediation.	Upon completion of construction	Principle contractor	Project Arborist	
Any wounding or injury that occurs to a tree during the demolition/construction process will require the project arborist to be contacted for an assessment of the injury and provide mitigation/remediation advice. All remediation work is to be carried out by the project arborist, at the contractor's expense.	Ongoing throughout the development	Principle contractor	Project Arborist	

12. BIBLIOGRAPHY/REFERENCES

- Council of Standards Australia, *AS4970 Protection of trees on development sites* (2009).
- Council of Standards Australia, *AS4373 Pruning of amenity trees* (2007).
- Mattheck, C. & Breloer, H., *The body language of trees - A handbook for failure analysis*, The Stationary Office, London, England (1994).
- Barrell, J. (2001), '*SULE: Its use and status in the new millennium*' in *Management of Mature Trees proceedings of the 4th NAAA Workshop, Sydney, 2001*. Barrell
- Sutherland Shire Local Environmental Plan (LEP) 2015
- Sutherland Shire Development Control Plan (DCP) 2015
- Chapter 39 Natural Resources Management (DCP 2015)

13. LIST OF APPENDICES

The following are included in the appendices:

Appendix 1 - Proposed Plan and Tree Protection Plan

Appendix 2 - Tree inspection schedule

Appendix 3 – Health

Appendix 4 – Landscape Value

Appendix 5 – Age Class

Appendix 6 – Structural Condition

Appendix 7 – SULE Categories

Appendix 8 – Trees AZ Field Sheet

Appendix 9 – TPZ Encroachment Examples

Hugh Millington



Diploma of Arboriculture (AQF5)
NC Forestry and Arboriculture III (UK)
RFS Tech. Cert. II (UK)
QTRA Registered User
ISA Tree Risk Assessment Qualification
MAA, MISA

Hugh The Arborist Pty Ltd

hugh@hughthearborist.com.au
www.hughthearborist.com.au

Sutherland Public School
38-54 Eton St. Sutherland NSW

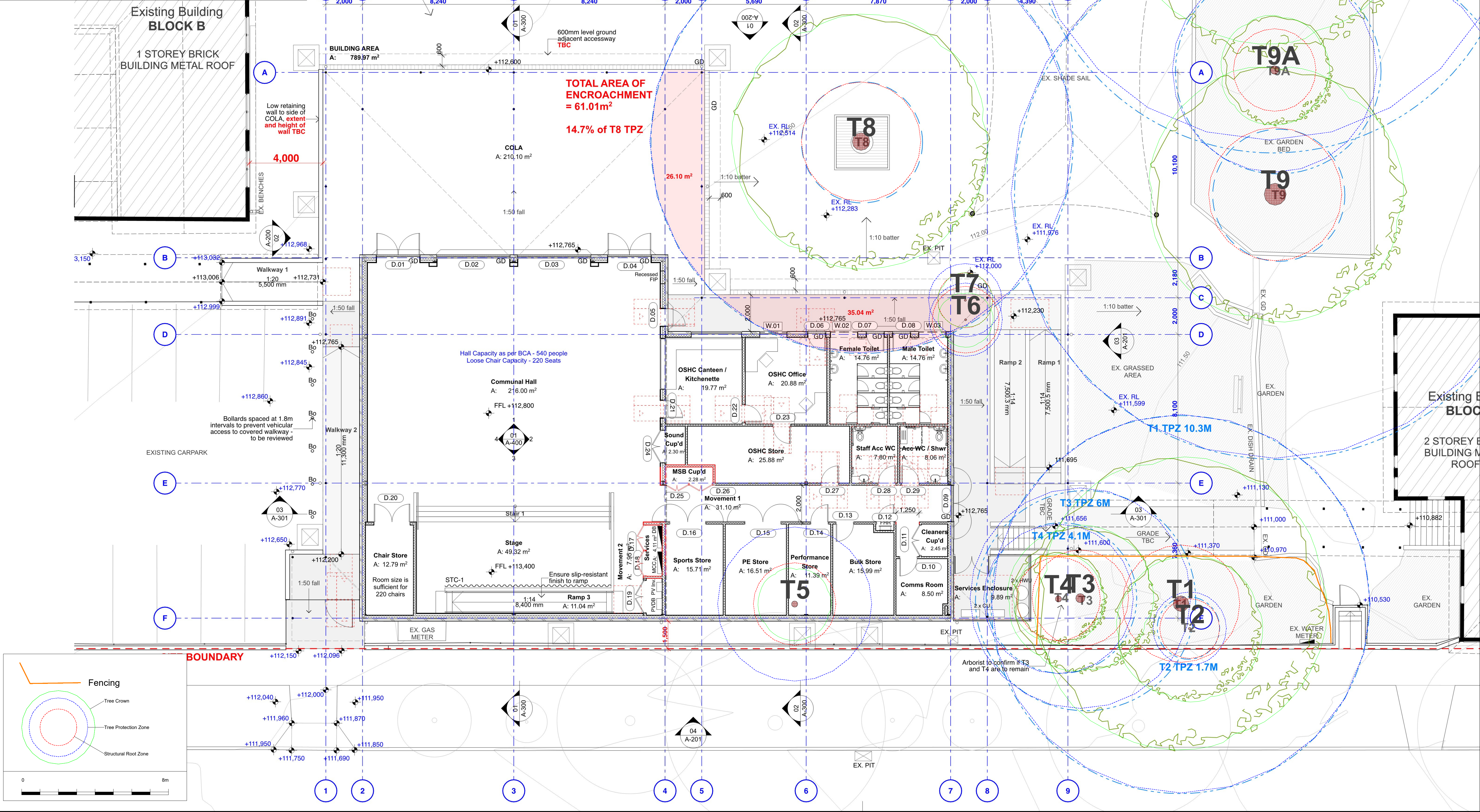
SCALE :
1 : 100 @ A1

DATE :
15/12/2024

MAP FILENAME
Appendix 1 - Proposed Plan and
Tree Protection Plan



Prepared by Hugh Millington



Appendix 2 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Age Class	Height (m)	Canopy Spread Radius (m)	Stem 1 (mm)	Stem 2 (mm)	Stem 3	Stem 4	Stem 5	Stem 6	DBH (mm)	DAB (mm)	Health	Structure	Landscape Value	SULE	Trees AZ Value	TPZ Radius (m)	SRZ Radius (m)	Notes
1	Tallowood	<i>Eucalyptus microcorys</i>	Mature	18	8	860						860	920	Good	Good	Very High	1. Long	A1	10.3	3.2	
2	Tallowood	<i>Eucalyptus microcorys</i>	semi-mature	6	4	145						145	185	Good	Good	Medium	1. Long	A1	1.7	1.6	
3	Swamp Mahogany	<i>Eucalyptus robusta</i>	Mature	15	4	501						501	580	Good	Good	High	1. Long	A1	6.0	2.6	
4	Broad Leaved Paperbark	<i>Melaleuca quinquenervia</i>	Semi-mature	11	2.5	340						340	410	Good	Good	High	1. Long	A1	4.1	2.3	
5	Illawara Flame	<i>Brachychiton acerifolius</i>	Semi-mature	7	2	350						350	400	Good	Good	High	1. Long	A1	4.2	2.3	
6	Lemon Scented Tea Tree	<i>Leptospermum petersonii</i>	Mature	5	1.5	80	90					122	240	Good	Good	High	1. Long	A1	1.5	1.8	
7	Lemon Scented Tea Tree	<i>Leptospermum petersonii</i>	Mature	5	1.5	90	90					127	140	Good	Good	High	1. Long	A1	1.5	1.5	
8	Queensland Brushbox	<i>Lophostemon confertus</i>	Mature	10	7	960						960	960	Fair	Good	Very High	2.medium	A2	11.5	3.3	Tree looks slightly dry and thin, possibly seasonal
9	Hills Weeping Fig	<i>Ficus macrocarpa</i> var. <i>hillii</i>	Mature	14	7	1200						1200	1250	Good	Good	High	1. Long	A1	14.4	3.6	
9A	Hills Weeping Fig	<i>Ficus macrocarpa</i> var. <i>hillii</i>	Semi-mature	7	3	330	290	150				464	400	Good	Good	High	1. Long	A1	5.6	2.3	
9B	Hills Weeping Fig	<i>Ficus macrocarpa</i> var. <i>hillii</i>	Mature	16	8	1100						1100	1200	Good	Good	High	1. Long	A1	13.2	3.6	

Explanatory Notes

Tree Species - Botanical name followed by common name in brackets. 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), Dead (D).

Diameter at Breast Height (DBH) - Measured with a DBH tape or estimated at approximately 1.4m above ground level. Where DBH has been estimated it is indicated with an ‘est’.

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 x 50)^{0.42} x 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.

(x) Indicates the measurement taken for the diameter at tree base above the buttress roots.

(E) Indicates estimated measurements.

Appendix 3 – Assessment of 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 reactive growth development.	• 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 over 25% deadwood. • Tree may have slightly reduced crown density or thinning. • There may be some discolouration of foliage. • Average reactive 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 trees health.
Poor	• The 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 species. • Pathogens or pests are having a significant detrimental effect on the tree 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.

Appendix 4 Landscape Value

RATING	HERITAGE VALUE	ECOLOGICAL VALUE	AMENITY VALUE
1. SIGNIFICANT	The subject tree is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance or is listed on Council's Significant Tree Register	The subject tree is scheduled as a Threatened Species as defined under the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999	The subject tree has a very large live crown size exceeding 300m ² with normal to dense foliage cover, is located in a visually prominent position in the landscape, exhibits very good form and habit typical of the species
	The subject tree forms part of the curtilage of a Heritage Item (building /structure /artefact as defined under the LEP) and has a known or documented association with that item	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species	The subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity
	The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to Commemorate an important historical event	The subject tree is a Remnant Tree, being a tree in existence prior to development of the area	The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance
2. VERY HIGH	The tree has a strong historical association with a heritage item (building/structure/artefact/garden etc) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally-indigenous species, representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown size exceeding 200m ² ; a crown density exceeding 70% (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area
3. HIGH	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence	The tree is a locally-indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link / Wildlife Corridor or has known wildlife habitat value	The subject tree has a large live crown size exceeding 100m ² ; The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. crown distortion/suppression) with a crown density of at least 70% normal); The subject tree is visible from the street and surrounding properties and makes a positive contribution to the visual character and the amenity of the area
4. MODERATE	The tree has no known or suspected historical association, but does not detract or diminish the value of the item and is sympathetic to the original era of planting.	The subject tree is a non-local native or exotic species that is protected under the provisions of this DCP.	The subject tree has a medium live crown size exceeding 40m ² ; The tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crowndensity of more than 50% (thinning to normal); and The tree is visible from surrounding properties, but is not visually prominent – view may be partially obscured by other vegetation or built forms. The tree makes a fair contribution to the visual character and amenity of the area.
5. LOW	The subject tree detracts from heritage values or diminishes the value of a heritage item	The subject tree is scheduled as exempt (not protected) under the provisions of this DCP due to its species, nuisance or position relative to buildings or other structures.	The subject tree has a small live crown size of less than 40m ² and can be replaced within the short term (5-10 years) with new tree planting
6. VERY LOW	The subject tree is causing significant damage to a heritage Item.	The subject tree is listed as an Environment Weed Species in the Local Government Area, being invasive, or is a known nuisance species.	The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% (sparse).
7. INSIGNIFICANT	The tree is completely dead and has no visible habitat value	The tree is a declared Noxious Weed under the Noxious Weeds Act (NSW) 1993 within the relevant Local Government Area.	The tree is completely dead and represents a potential hazard.

Appendix 5 - Age class

Determining the exact age of a tree is difficult without carrying out potentially invasive testing. The age class of the subject tree has been estimated using the definitions below.

<u>Category</u>	<u>Description</u>
Young/Newly planted	• Young or recently planted tree.
Semi Mature	• Up to 20% of the usual life expectancy for the species.
Early mature/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.

Appendix 6 - 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.	• 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 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 failure of the tree.

Appendix 7 - 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 retention in the existing situation.

Category	Description
1. Long	Useful life expectancy over 40 years
2. Medium	Useful life expectancy 15 to 40 years
3. Short	Useful life expectancy 5 to 15 years
4. Remove	Useful life expectancy under 5 years
5. Small/Young	Trees that could be transplanted or replaced with similar specimen.
6. Unstable	Tree has become hazardous or structurally unstable.

TreeAZ Categories (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.

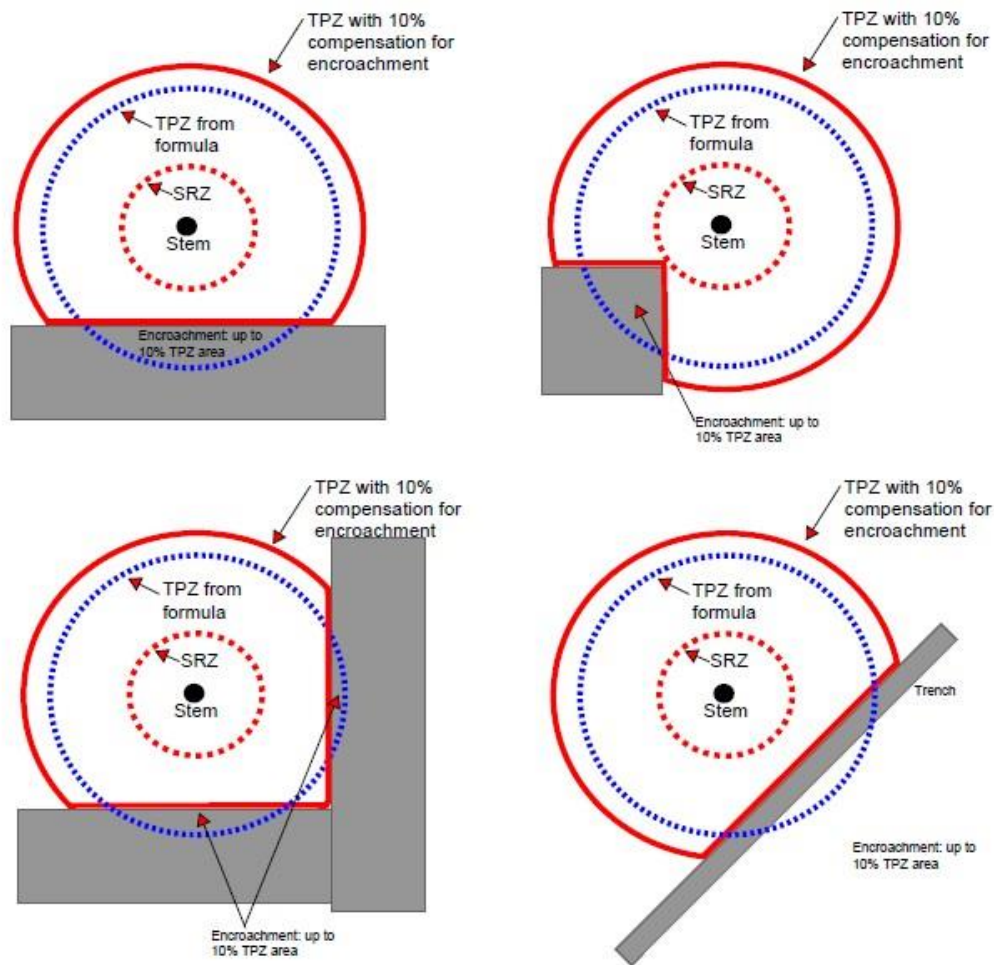
Category A: Important trees suitable for retention for more than 10 years and worthy of being a material constraint

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.

Appendix 9 – Examples of TPZ Encroachment

Encroachment into the Tree Protection Zone is sometimes unavoidable. The following diagram shows examples of acceptable levels of encroachment and how they may be compensated for by providing additional space contiguous to the TPZ area.



Note: Less than 10% TPZ area and outside SRZ. Any loss of TPZ compensated for elsewhere.