Preliminary Arboricultural Impact Assessment
Lot 3 DP732565 - 7 City View Road, Pennant Hills

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Date: 30 November 2021

Proposed Works
The planning proposal seeks to amend Hornsby Council's planning instrument (HELP 2013) to facilitate the future renewal of the site as a mixed-use commercial office and residential redevelopment, incorporation a pocket park, community space in addition to high standards of architectural, landscape and sustainable design. The concept design capitalises on the slope of the site to provide a 7-storey, stepped building, which seeks to retain the existing heavily treed setting particularly along the City View Road and Boundary Road frontages.

The development concept has sought to retain the vast majority of existing trees particularly within the southern and western building setback areas. Whilst a number of these trees are located within the 3m development impact footprint, the proponent seeks to retain these trees wherever possible, and a specific provision will be included in the site-specific Development Control Plan to achieve tree retention and protection in these areas.

The landscaping plan prepared by *Arcadia* shows a number of tree plantings proposed around the perimeter of the site to compensate for losses within the development footprint and to improve site amenity. A further 30 trees close to the building footprint may be retained subject to further investigation at the DA stage. We currently recommend removal of 17 trees of approximately 110 across the site (~15%) that occur within the development footprint or 3m thereof, of whose SULE rating was a 4 (dead, dying, dangerous, etc).

Tree summary
Low significance – four (4) remove \ four (4) further investigation \ two (2) retain
Medium significance – thirteen (13) remove \ twenty-five (25) further investigation \ twenty-two (22) retain
High significance – one (1) retain

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Background
Tree survey and assessment was conducted on site on 26 August 2021, in accordance with Australian Standard *AS4970 (2009)-Amendment 1 (2010).* The subject site covers 6,500m² and is shown in Figure 1. The locations of 71 trees have been mapped in order to determine which trees will be impacted by the proposed development. It should be noted that there are more trees on the site than those presented in this report, however only those in close proximity to the development footprint have been assessed.

The following survey, assessment and measurements were also undertaken with accompanying map figures included in this report:

- Tree condition, height, diameter at breast height (DBH), basal diameter (BD), canopy spread and vigour
- Tree health and risk assessment and useful life expectancy (ULE rating)
- Tree AZ assessment
- Tree protection (TPZ) & structural root zone (SRZ) calculations
- Assessment of the significance of individual trees using STARS
- Tree retention and removal status and plans to identify the trees impacted by the proposed works

Trees with diameter at breast height (DBH) of 150 mm or greater were assessed. A metal tag embossed with the tree number (e.g. T001) was attached to each tree. The location of each tree was plotted using a handheld Trimble GPS unit (subject to GPS accuracy at the time of survey).

Figure 1 – Subject site

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Figure 2 - Site Overview & Zoom Extents

Aerial source: Nearmap

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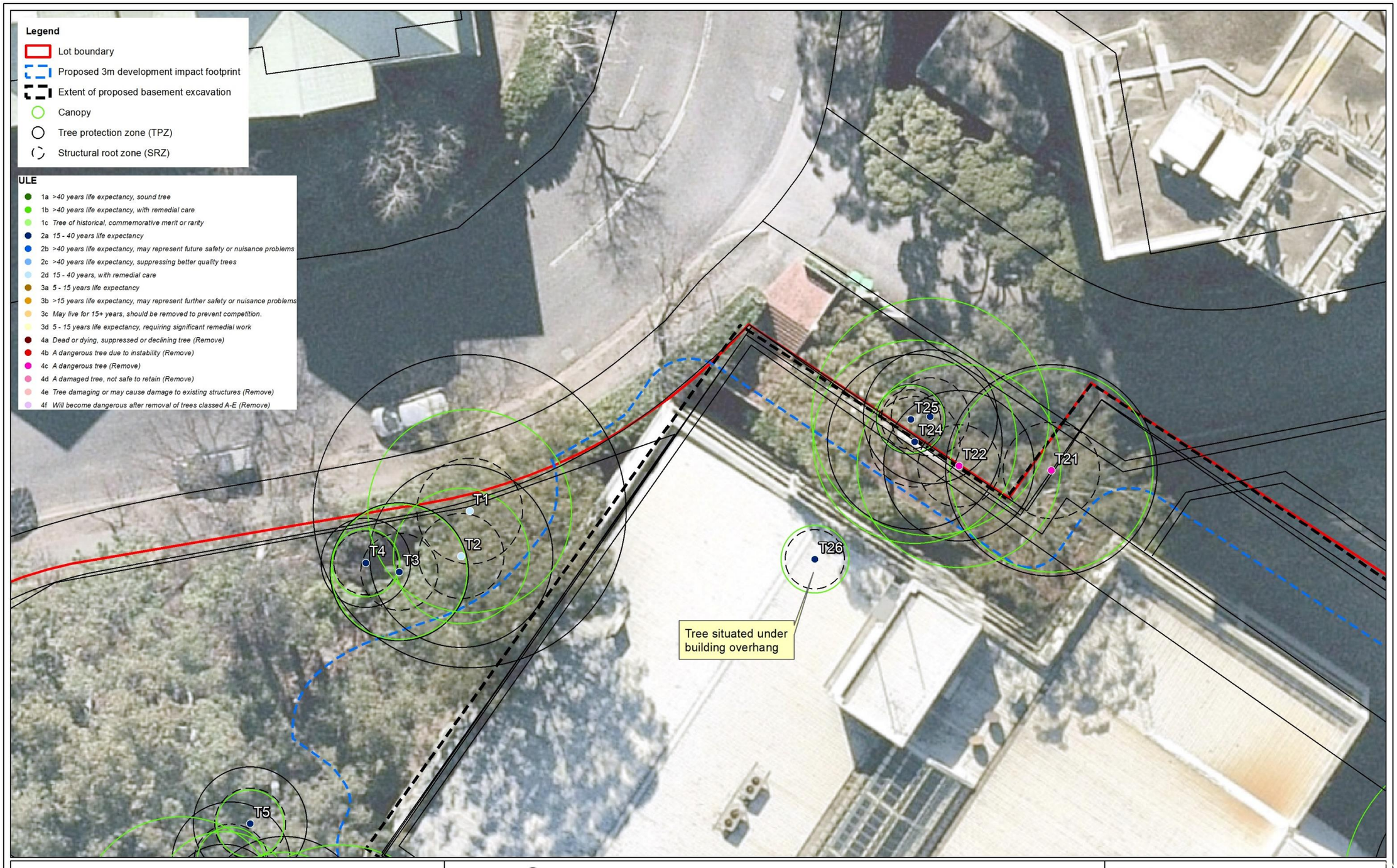

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Figure 3 - ULE Plan (zoom 1)

Aerial source: Nearmap

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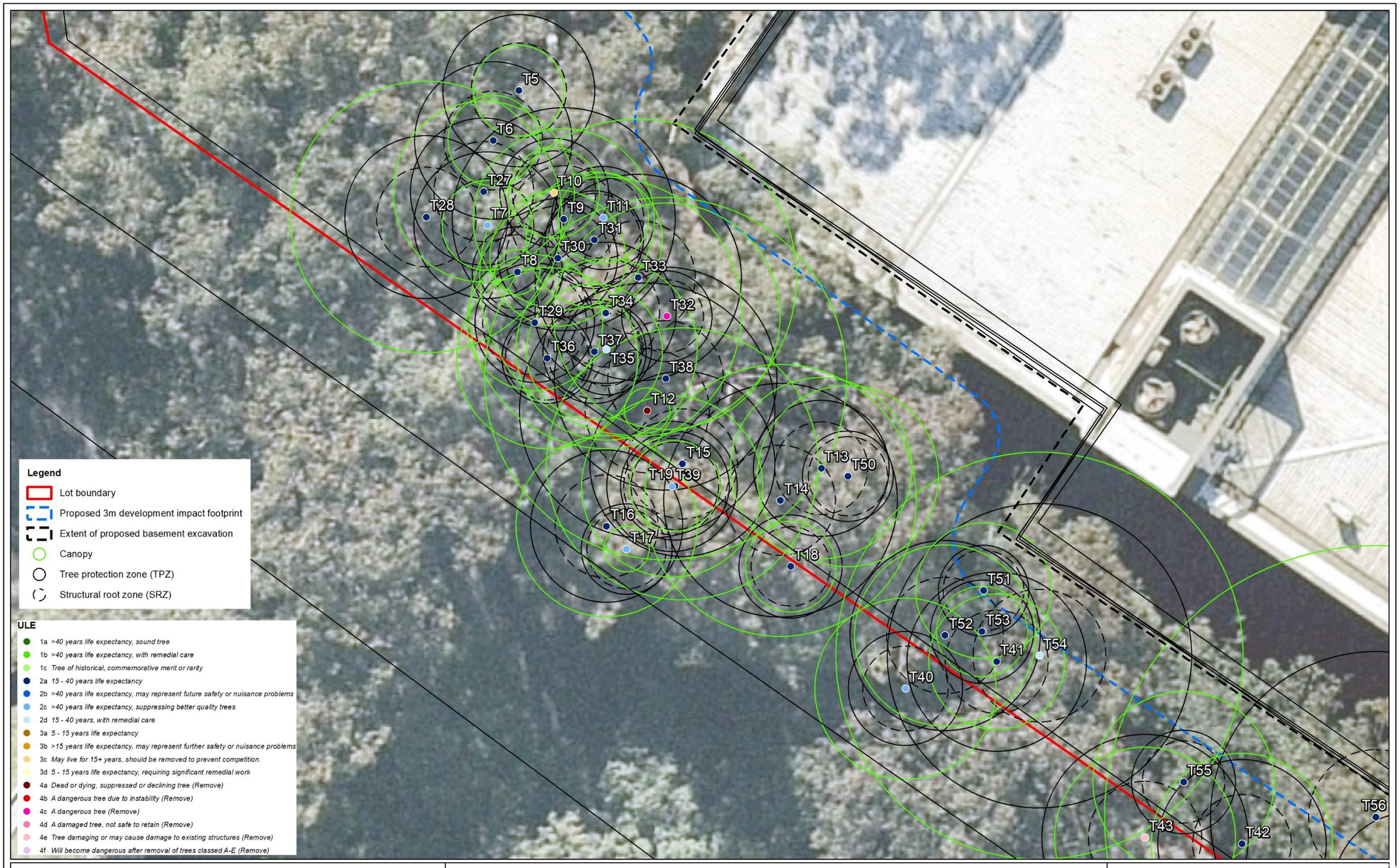

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Figure 4 - ULE Plan (zoom 2)

Aerial source: Nearmap

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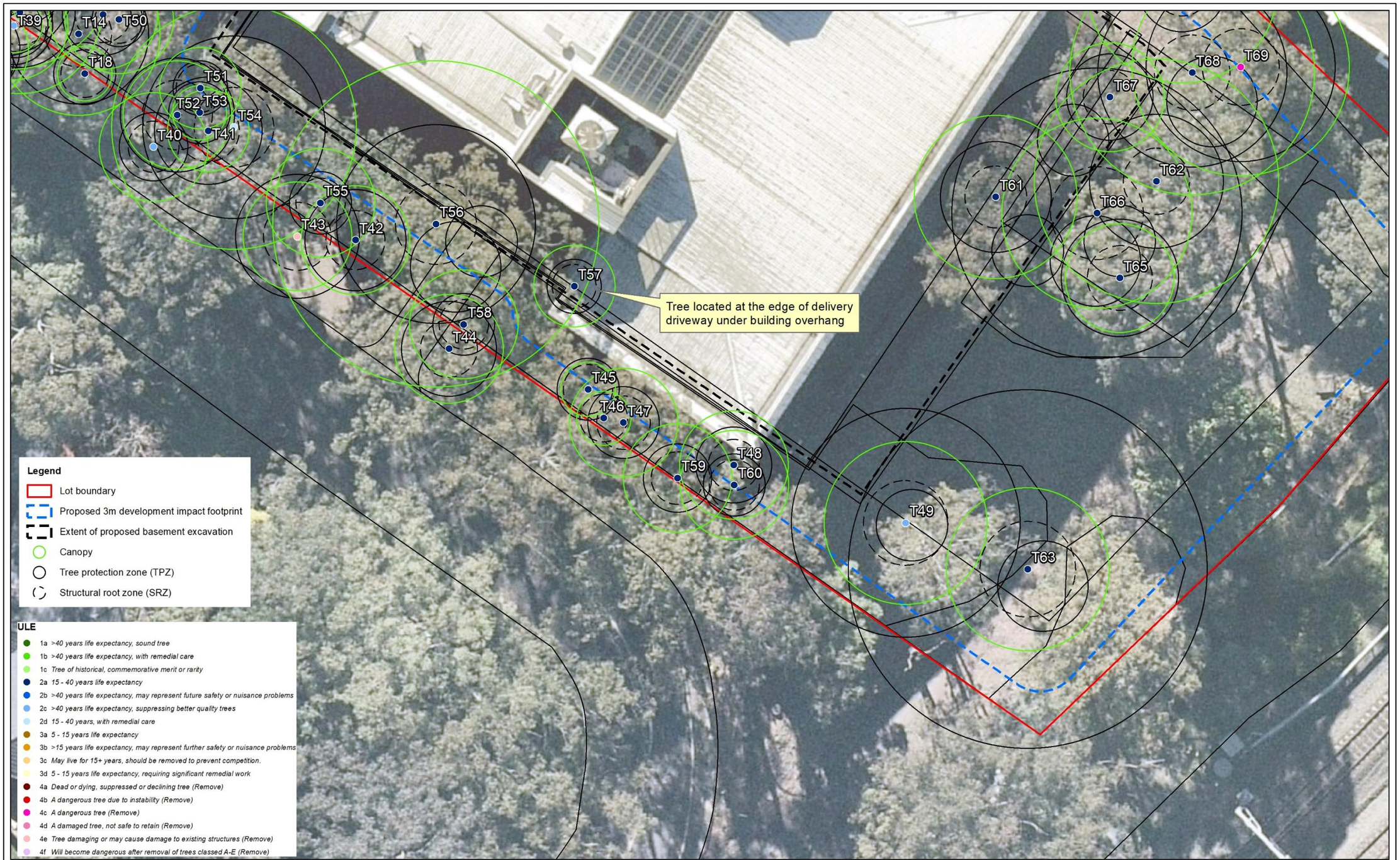

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Figure 5 - ULE Plan (zoom 3)

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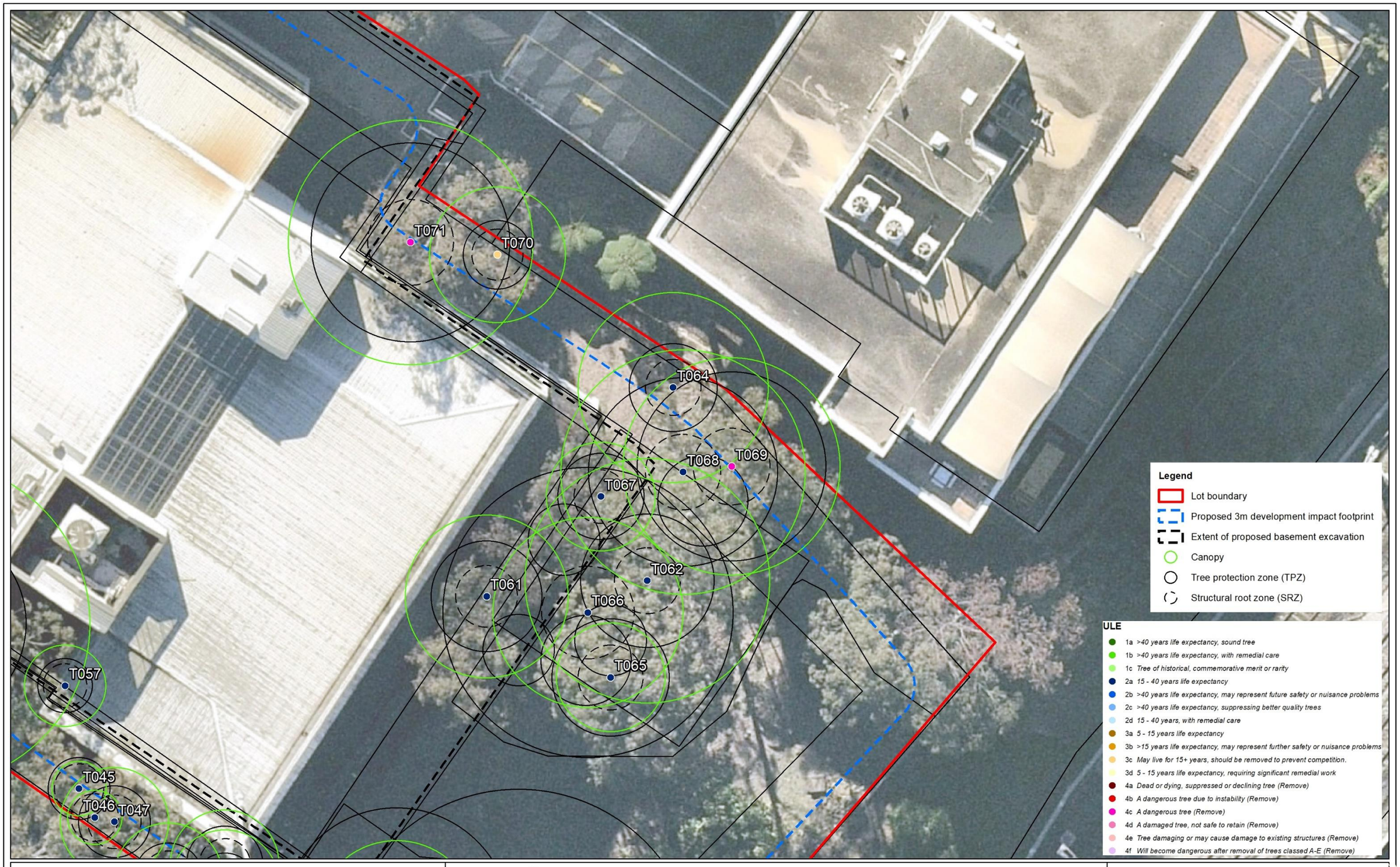

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Figure 6 - ULE Plan (zoom 4)

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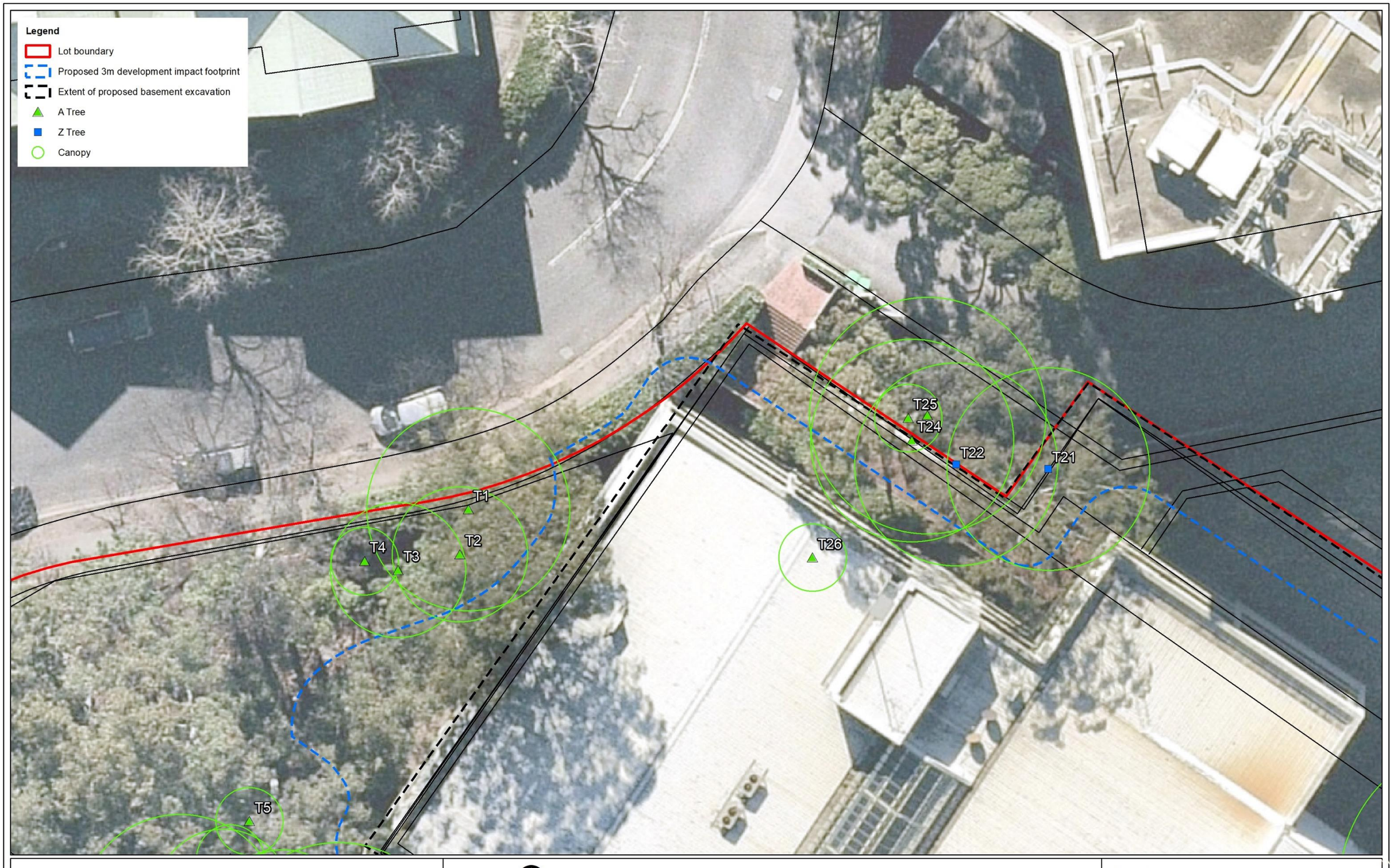

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Figure 7 - AZ Plan (zoom 1)

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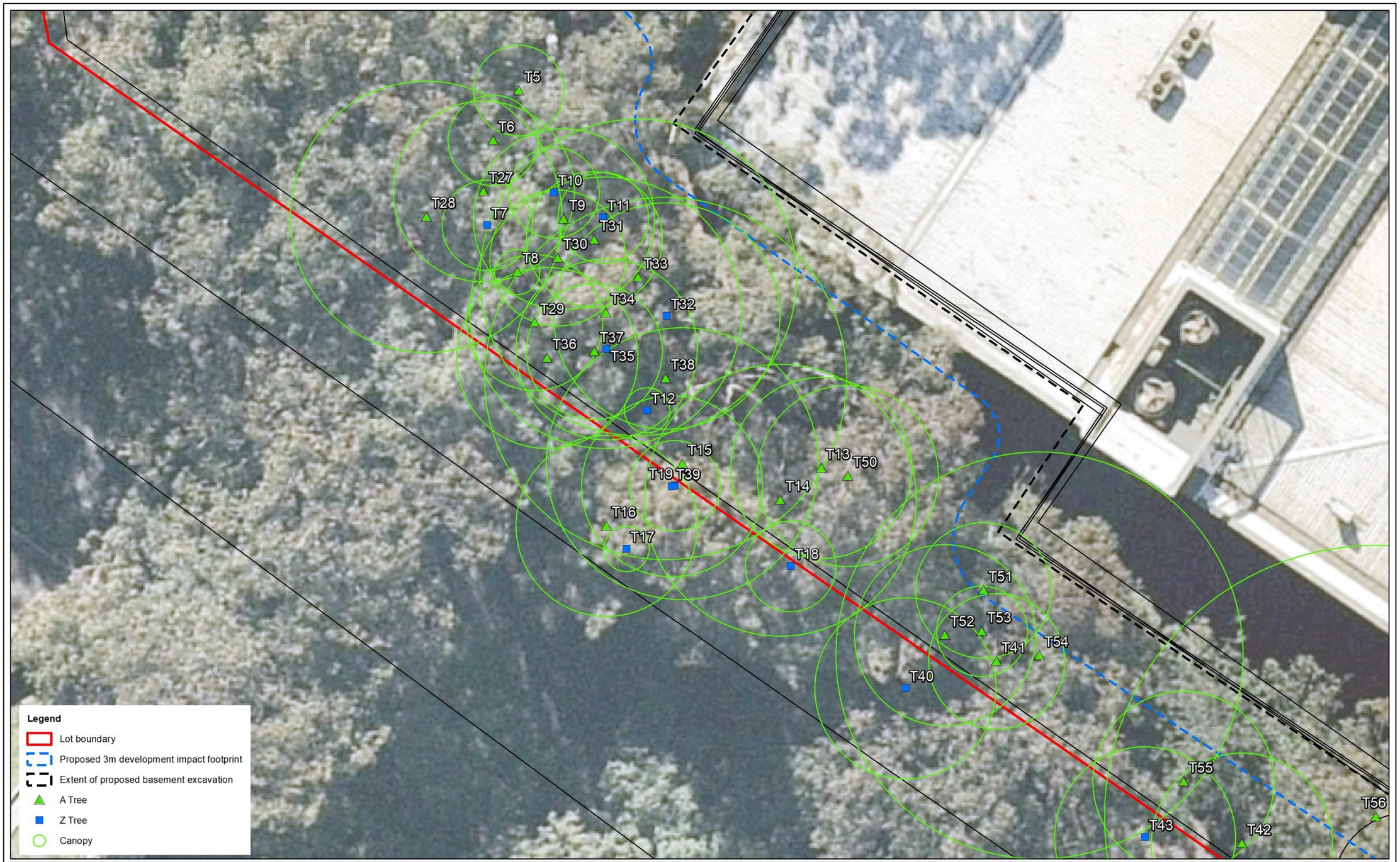

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Figure 8 - AZ Plan (zoom 2)

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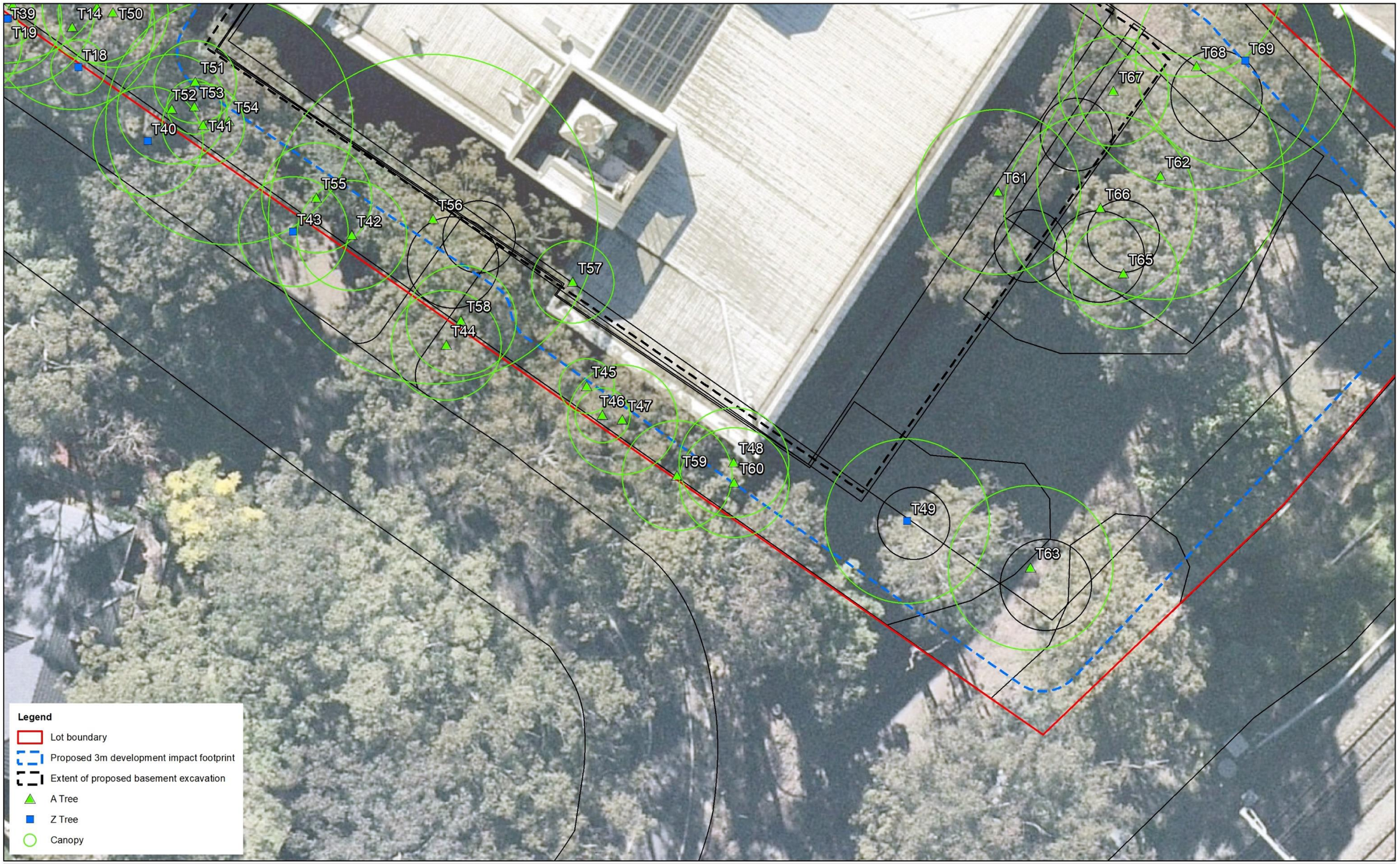

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Figure 9 - AZ Plan (zoom 3)

Aerial source: Nearmap

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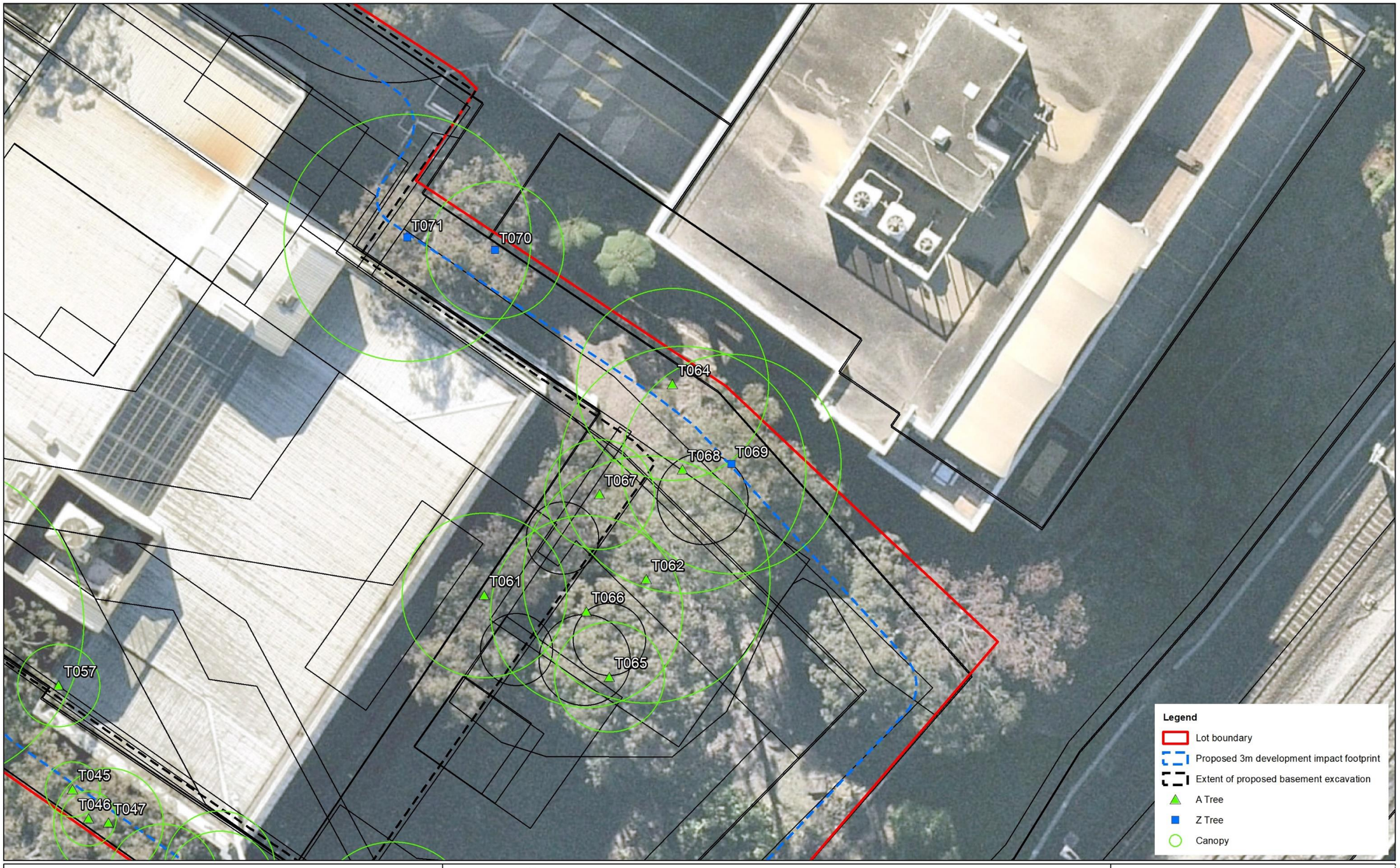

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Figure 10 - AZ Plan (zoom 4)

Aerial source: Nearmap

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TREE CONDITION AND LIFE EXPECTANCY

Condition

The assessment of tree condition is undertaken by visual inspection of the tree and takes into account the condition of the roots, trunk, branches, foliage, previous pruning, pests, disease, nesting hollows, fauna scratch marks, previous damage and the surrounding environment that may influence the condition of the tree.

Useful life expectancy (ULE)

The condition information is used to determine the Useful Life Expectancy (ULE) of each tree and takes into account the age of the tree, the life span of the species, local environmental conditions, recent climactic conditions, estimated life expectancy, the location of the tree and safety of persons and property.

The ULE methodology takes into account whether a tree can be retained with an acceptable level of risk based on the information available at the time of inspection. An ULE assessment is not static as it relates to the tree's health and the surrounding conditions. Whilst it is recognised that changes to the tree's condition will affect the assessment, changes to the surrounding environment may result in changes to the ULE assessment.

Table 1 – Useful Life Expectancy (ULE) (Barrell, 2009)

Category	Description
1	Long - life span greater than 40 years
2	Medium - life span from 15 to 40 years
3	Short - life span from 5 to 15 years
4	Remove - should be removed within 5 years

TREE SIGNIFICANCE

Environmental significance

Trees need to be considered with regard to the overall environment and are subject to specific legislation such as:

- *Biodiversity Conservation Act* (NSW) 2016
- *Environmental Protection and Biodiversity Conservation Act* (Commonwealth) 1999
- *Biosecurity Act* (NSW) 2015
- *Environmental Pest Species*

<u>*Biodiversity Conservation Act* (NSW) 2016 (*BC Act*)</u>

The Schedules of the *BC Act* list a number of species, populations and ecological communities that are classified as critically endangered, endangered or vulnerable. Where a site is not biodiversity certified, the proposal will need to be assessed by a biodiversity development assessment report (BDAR) to accompany a development proposal. The proposal may require offsetting through the Biodiversity Offset Scheme if a) the proposal impacts biodiversity lands mapped by DPIE, b) the proposal impacts above nominated threshold areas, or c) a test of significance identifies a significant impact. The subject site is not biodiversity certified.

<u>*Environmental Protection and Biodiversity Conservation Act* (Commonwealth) 1999</u>

The Schedules of the *EPBC Act* list a number of species and ecological communities that are classified as critically endangered, endangered or vulnerable. The *EPBC Act* requires the preparation of an impact assessment if an activity or development is likely to have an effect on species or ecological communities listed in the schedules of the *EPBC Act*.

<u>*Biosecurity Act* (NSW) 2015</u>

There are a number of pest or exotic species that are listed within specific regions within the NSW *Biosecurity Act*. These listings contain detailed descriptions of each listed species, their habitat and reproductive attributes and the recommended control or eradication methods as well as actions required with regard to reporting, transport or sale of each species.

<u>Environmental Pest Species</u>

There are a number of environmental pest species that are not listed in the *BC Act* (2016), the *EPBC Act* (1999), or the *Biosecurity Act* (2015). These species commonly cause problems within or adjacent to developed or urban areas. These species can have aggressive, fast growing or fast reproduction attributes which replaces other species. They can have destructive root systems which cause damage to pipes, structures, foundations and services. Some environmental pest species can be undesirable within natural bushland areas by degrading and / or dominating habitats and reducing natural biodiversity. Environmental pest species are not classified as noxious but are recognised by Councils and other authorities as pest species and in many cases are exempt from protection under Council's Tree Preservation Orders.

Habitat tree assessment

A habitat tree assessment was not undertaken for this site. In general, if any hollows are observed in specific trees during the arboricultural impact assessment, they are noted in the tree health data table (see Attachment 1). Hollow-bearing trees are typically given a rating with regard to the numbers and sizes of tree hollows present. Habitat Trees are given a classification as follows:

Category 1: Significant habitat trees (high): Large hollow/s suitable for cockatoos or large forest owls >30cm and/or Trees containing two (2) or more good quality medium hollows 10-30cm and/or >8 small hollows.

Category 2: Significant habitat trees (moderate) Trees containing one medium hollow 10-30cm and/or 3-8 small hollows.

Category 3: Remaining hollow bearing trees generally containing small or low numbers of hollows.

Landscape significance

The Institute of Australian Consulting Arboriculturalists (IACA) have established a Significance of a Tree, Assessment Rating System (STARS) to assess the landscape significance of a tree. The rating system utilises structured qualitative criteria to assist in determining the retention value for a tree. There are two phases to the STARS Assessment. The first is an assessment of tree attributes with respect to High, Medium and Low Significance. Subsequently, the Tree Retention Value matrix shown on Attachment 3 is used to determine the priority for removal and retention.

The significance of a tree with regard to the landscape is generally assessed as one of the following:

- Significant – Prominent from a broad landscape perspective
- High – Prominent from a neighbourhood perspective
- Medium – prominent from adjacent areas surrounding the site
- Low – prominent from a site perspective only

Once the landscape significance of an individual tree has been assessed, the retention value can be determined. A breakdown of the tree significance and retention values are provided in Attachment 2.

Visual significance

Visually significant trees are assessed with respect to the average attribute values of other trees in the wider locality. A tree with well above average height, girth or spread is considered to be 'of Visual Significance'. The visual significance of a specific tree can also consider other parameters such as girth, canopy spread, health, aesthetic appearance or location (e.g., on a hilltop, or as the centrepiece of a formal garden) of the tree.

Visual Significance ratings for a tall open forest averaging 22 metres tall (typical of the coastal areas of NSW between Wollongong and Port Stephens) are as follows:

V1 High significance typically >25m height/ >20m spread / >600mm DBH - Large emergent tree
V2 Moderate significance generally 15-25m height/ >10m spread / >600mm DBH – Prominent tree typically with a large spread
V3 Low significance >10m height / >10m spread / >600mm DBH – Typically a visually attractive low tree with large spread and DBH

DEVELOPMENT PLANNING AND TREE PROTECTION ZONES

Tree protection setbacks

Development footprints which impact on more than 10% of a Tree Protection Zone (TPZ) will usually require the removal of that tree. Development footprints shall be located away from retained trees such that adequate clearances are provided for the Tree Protection Zone (TPZ).

Disturbance within the TPZ can be detrimental to the tree's root system and in turn affect the stability, health and condition of the tree.

<u>**Major encroachments into tree protection zones**</u>
Where the proposed development activity is greater than the 10% loss of TPZ area (m^2), the activity is considered to be a major encroachment into the TPZ.

Where major encroachments are to occur within the TPZ of trees intended to be retained, it must be demonstrated that the works or activities will not have any significant impact upon the health and condition of the tree. To demonstrate this, detailed root mapping investigation by non-invasive methods may be necessary. Other factors such as age class, health, vigour, trunk lean, disturbance tolerance of the species, and building design may need to be taken into account in the arboricultural assessment.

Where major encroachments are proposed to occur into the TPZ then the Structural Root Zone (SRZ) of the tree will also be taken into account and avoided if possible.

Where trees have multiple trunks, an assessment needs to consider the number and diameter of each trunk. Based upon the *Australian Standard for Protection of Trees on Development Sites*, AS 4970-2009, the Diameter at Breast Height (DBH) of multi-trunk trees is calculated by:

$$DBH = \checkmark\overline{(DBH_1)^2+(DBH_2)^2+(DBH_3)^2}$$

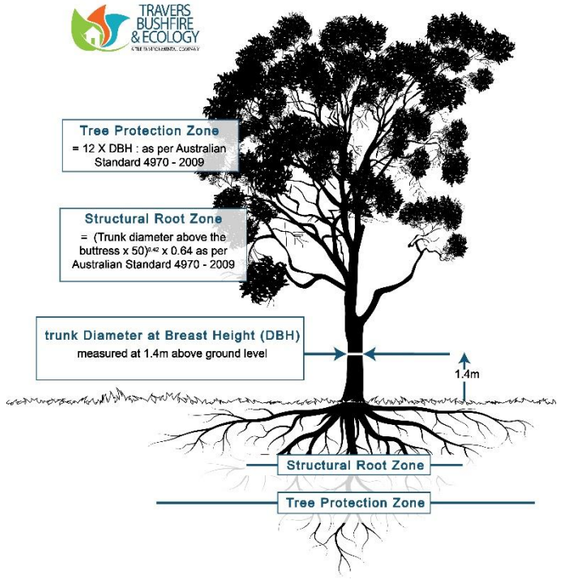


Figure 11 - Typical diagram of a tree protection zone and structural root zone of a tree
(Source: AS7970-2009)

Development design and tree protection zones

Where trees are proposed for retention, the development footprint must avoid the TPZ around trees. This TPZ is set aside for the protection of the tree (or group of trees) as it is essential for the stability and longevity of the tree/s. Existing soil levels should be retained within the TPZ. The TPZ is often delineated by a temporary fence during the construction phase of the project.

Based upon the *Australian Standard for Protection of Trees on Development Sites* (AS4970-2009), the radius of the TPZ for a single tree is calculated as: TPZ = 12 x DBH.

Developments within the tree protection zone

<u>**Minor encroachments into tree protection zones**</u>
Based upon AS4970-2009 some minor development encroachments can occur within the calculated TPZ provided that:

- No more than 10% of the area (m^2) of the TPZ is removed
- The area to be removed is outside the SRZ, and
- The area (m^2) to be removed or disturbed is compensated by increasing the TPZ radius in other directions so that there is no net loss in area (m^2) of the original calculated Tree Protection Zone (TPZ).

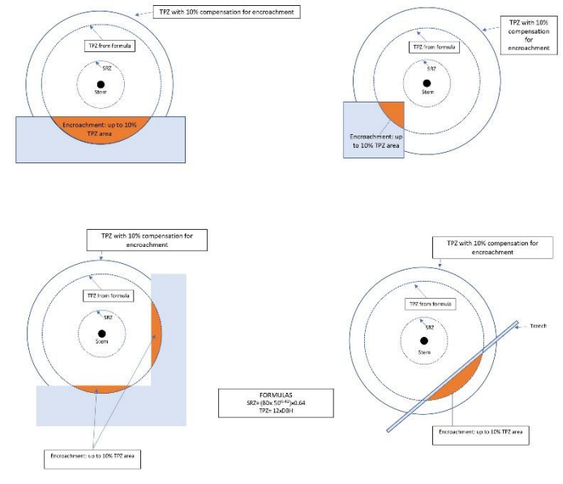


Figure 12 - Minor encroachment on TPZ and 10% compensation for encroachment
(Source AS 4970-2009)

TREE PROTECTION MEASURES

To determine the SRZ and TPZ, the following is applied in accordance with Australian Standard *AS 4970 – 2009 – Amendment 1-2010.*

The tree protection zone (TPZ) radius is measured by the DBH x 12 (Australian Standard *AS 4970* – 2009), where the DBH is the trunk diameter measured at 1.4m above the ground. A TPZ should not be less than 2m or greater than 15m (except where crown protection is required). Clause 3.3 covers variations to the TPZ. The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1m outside the crown projection.

The structural root zone (SRZ) is the area which is required to maintain a tree's stability. The SRZ is measured as:

SRZ radius = $(BD \times 50)^{0.42} \times 0.64$ where BD is the basal trunk diameter, in metres, measured above the root buttress. If BD is 50cm, then the SRZ would be 2.47m.

During the survey, DBH was measured for each tree to allow for TPZ to be calculated should the tree be retained as part of the future landscaping.

The SRZ and TPZ calculated for each of the trees assessed within the study area are provided in Attachment 1.

When working in close proximity of any tree to be retained or the nominated TPZ located within or adjacent to potential development areas, the following general management principles should be adopted:

- earthworks around subject trees are to be undertaken in the presence of an AQ5-certified arborist who may provide additional on-site advice
- machine digging within the root mass of the subject tree (or trees) is to be minimised and, where possible, replaced by hand digging
- any exposed roots of the subject tree should be wrapped and protected during exposure and be replaced in a similar position prior to disturbance
- inspection of retained trees by an AQ5-certified arborist should be conducted annually to 3 years after development completion.

Any retained tree on site will require protection both during and after development construction, applying the following tree protection guidelines:

The following guidelines are proposed in relation to any trees that may be retained within or adjacent to the proposed works area:

i. Installation of a TPZ will be required surrounding any retained tree or group of trees. This TPZ can generally be provided by preserving an area equivalent to that shown in Schedule 1. A SRZ will apply to all retained trees in close proximity to work areas. No more than 10% of the TPZ should be impacted by earthworks with no infiltration into the SRZ. The TPZ is to be compensated elsewhere on the impacted tree to compensate for the loss of small areas of the TPZ. This is achieved by increasing the TPZ to an equivalent area to the area of impacted TPZ (Figure 11).
ii. Trees to be retained, and in close proximity to any works, are to be protected by temporary fencing. Such temporary fencing can be constructed from plastic mesh, post and wire or temporary chain link fence panels. All fence posts and supports are to be located clear of the roots and have sufficient strength to support the fence without bending or collapsing. TPZs in close proximity to proposed works are to be marked and sign-posted. The protection fencing is not to be removed or altered without the approval an appointed arborist. TPZ fencing is to be inspected on a regular basis and maintained in good condition.
iii. All trees nominated for removal are to be removed only after the temporary fencing of the trees to be retained has been completed and prior to any construction activity or bulk earthworks. Approved tree removal operations in the vicinity of retained trees are to be undertaken in a manner that avoids canopy or root damage and / or soil compaction to any TPZ associated with any retained tree. Such works should be supervised by a qualified arborist.
iv. Stumps are to be ground not dozed or dug out unless they impact on the installation of services, roads or building works.
v. All excavation including but not limited to trenches, footings and major earth movement are to be avoided within TPZs.
vi. Stockpiling materials and soils within TPZs is to be avoided.
vii. All machinery and vehicles are to be excluded from TPZs during all operations.
viii. Where the proposed works are likely to cause excessive dust generation, the tree is to be protected with shade cloth on the tree protection fence to minimise dust collection on the leaves.
ix. The following activities prohibited within TPZs includes but is not limited to:
    - machine excavation (including trenching)
    - excavation for silt fencing
    - cultivation
    - storage
    - preparation of chemicals, including cement products
    - parking of vehicles or plant
    - refuelling
    - dumping of waste
    - refuelling
      wash down or cleaning of equipment
    - placement of fill
    - lighting of fires
    - soil level changes
    - temporary or permanent installation of signs
    - Physical damage to trees.
x. Any works undertaken within TPZs are to be supervised and certified (photographed and documented) by a qualified arborist.
xi. Where advised by the arborist, trunk and branch protection (Figure 12) is to be installed to a minimum height of 2m using materials and positioning as advised by an appointed arborist.
xii. Where advised by the arborist, other temporary root protection measures (Figure 12) such as thick mulch (50-100mm deep) or crushed rock below rumble boards, are to be installed to prevent root damage and soil compaction within the TPZ.
xiii. Scaffolding is to be erected outside of the TPZ, where unavoidable, protection measures are to be specified by the appointed arborist.
xiv. All services are to be routed outside of the TPZ. Where not possible the arborist will specify directional drilling (at least 600mm deep) or manual excavation to avoid impacted on the in-situ roots subject to the works and potential root damage.
xv. If pruning is required it is to be undertaken by an arborist in accordance with *AS4373* to prevent structural damage, disease and poor form.

General tree protection measures during construction

Prior to earthworks or construction, the removal of the trees identified for removal should be undertaken with particular attention given to ensure that no damage occurs to any part of the retained trees such as canopy foliage, branches, trunk or SRZ.

Prior to demolition or earthworks, secure protective fencing is to be erected around individual trees or groups of trees that have been identified as being retained. This fencing shall be located no closer than the extent of the TPZ of each retained tree (refer to the Tree Retention and Removal Plan). Where the structure to be demolished is within the TPZ the protective fencing shall be aligned to be a maximum of 0.5m away from the structure to be demolished.

Where the approved construction footprints encroach into the TPZ, protective fencing must be aligned no further than 0.5 metre away from the proposed structure or footprint.

The purpose of the fencing is to protect the tree roots, trunk and branches, and to minimise detrimental impacts on the trees during demolition and construction. Fencing shall be 1.8m high chain mesh material securely fixed to steel supporting posts with top and bottom strainer top or steel pipe rails. Chain-link fencing panels are acceptable but must have connectors top and bottom to each adjoining panel.

The site supervisor shall ensure that at all times during site works that no activities, stockpiles, storage, disposal of materials, vehicle access or vehicle and machinery parking shall take place within the areas encompassed by the tree protection fencing. The site supervisor shall also ensure that the protective fences remain secure throughout the development work period.

Construction scaffolding can be erected within the tree protection fencing provided that each of the weight distribution points are spread over a minimum of $2m^2$ and these points are over existing soil levels to avoid soil compaction.

Trees shall be inspected at regular intervals by the project arborist or at critical stages during the demolition and construction stages to identify signs of stress and recommend remedial action such as mulching and irrigation.

Specific excavation for services that require critical fall (e.g. sewer, stormwater) may be undertaken within the tree protection fencing provided that trenching is dug using hand tools, thrust or directional boring or vacuum excavation, and tree roots are not severed unless they spatially conflict with the installed pipes. This work within the tree protection fencing must be carried out under the instructions from an experienced and suitably qualified project arborist.

All access within the tree protection fencing for temporary and permanent works must be carried out under the instruction of an experienced and suitably qualified project arborist.

Tree protection fencing must remain in a functional condition throughout the demolition and construction works and can only be removed to allow for works identified in the landscape plan.

Landscape works in the vicinity of retained trees must be sympathetic to tree retention and existing ground levels within the TPZ. The natural ground contours and depth within TPZs located outside of the construction or earthworks footprint must remain unchanged.

Any tree damage that occurs to trees or tree roots during site works is to be treated by an experienced and suitably qualified arborist. Where branch pruning works are required, all pruning works including the removal of deadwood are to be undertaken in accordance with Australian Standard *AS 4373-1996 – Pruning of Amenity Trees* and the work is to be undertaken by an experienced and suitably qualified arborist

Tree protection fencing

Temporary tree protection fencing should be erected before any machinery or materials are brought onto the site and before the commencement of works (including demolition and bulk earthworks). Once erected, protective fencing must not be removed or altered without approval by the project arborist. The fencing is to be fully secured to restrict access onto the protected root zone.

AS4687 specifies applicable fencing requirements. Installed construction fencing on the recommended alignment of the TPZ fencing can be installed as part of the protective fencing.

For construction crews, signage identifying the TPZ shall be placed at 10m intervals along the TPZ barrier fencing. These signs will face towards the development site and shall have lettering that complies with *AS 1319*. These signs will also specify the severe penalties for harming the TPZ in any way.

TPZ barrier fencing is to be inspected on a regular basis and maintained in good condition. Any works within the mapped TPZs is to be supervised (for excavation works) or under the direction of an AQ5 qualified arborist to limit damage to root zones and to install additional root, trunk and branch protection measures.

CONCLUSIONS

This report has been prepared to assess the condition and significance of a number of trees on the property known as Lot 3 DP732565, 7 City View Rd, Pennant Hills, and to assess the potential impact of the proposed development on the identified trees. The assessments carried out in this report are based on the Australian Standard *AS4970-2009 – Protection of Trees on Development Sites.* The terminology used in this report is also consistent with that used in the AS 4970-2009.

This report has been commissioned by *EG Group Australia Pty Ltd* and site drawings and plans have been provided by *Fender Katsalidis Architects*. *Arcadia* has prepared the landscape plans

Provided that the tree protection measures in this report are implemented and works are carried out in a sensitive manner it is considered that the proposed development will not have a significant impact on long-term health of the retained trees.

Of the 71 trees assessed on-site and based upon the proposed development this report has determined the following:

- Twenty-four (24) trees are able to be retained
- Thirty (30) are recommended for further investigation
- Seventeen (17) are recommended for removal

There is approximately 30-40 tree further on site that have not been assessed, largely near the corner of Boundary Rd and City View Rd, as well as a few individuals along the railway corridor boundary, bringing the total number of trees estimated on site to 110.

Trees subject to further investigation are those typically located in close proximity to the proposed development footprint that may have an SRZ or TPZ partially compromised. In addition, exotic species are included that may not necessarily require removal if in moderate-good condition. It is recommended that further investigation is undertaken upon thirty (30) of the assessed trees when final plans are submitted for DA approval. For selected trees of good health in close proximity to the building, tree root mapping or branch mapping may be undertaken to justify the retention or removal status.

Table 2 - Summary of the 24 trees for retention (# of trees)

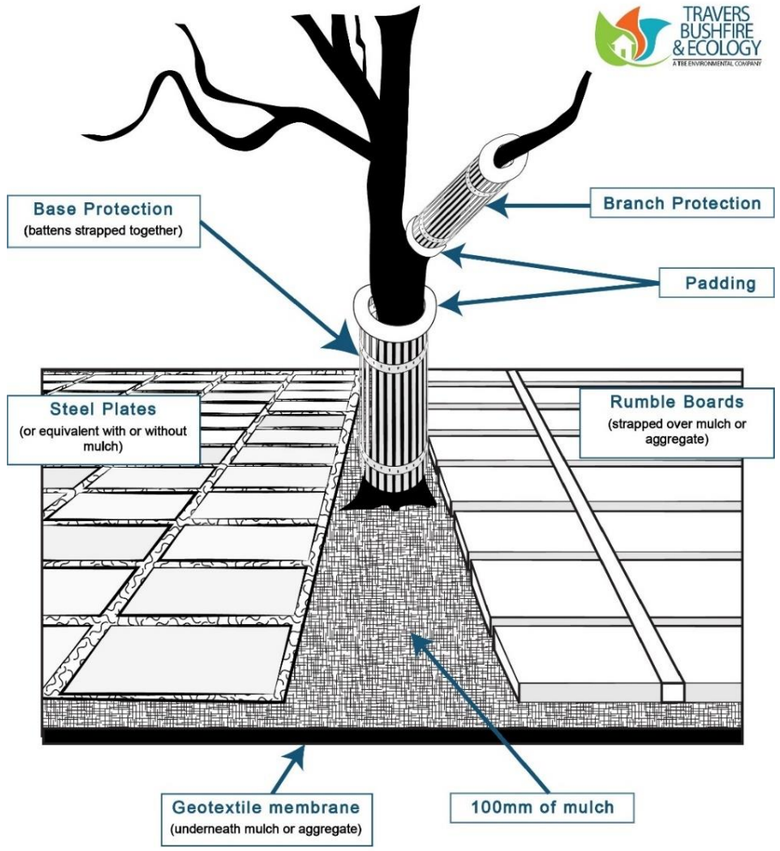
		Listed in Biodiversity Cons. Act	Env Pest (Exempt from TPO)	Low Landscape Signif.	Medium Landscape Signif.	High Landscape Signif.
Condition	SULE 1					
	SULE 2			1	21	
	SULE 3			1		
	SULE 4					

Table 3 - Summary of the 17 trees for removal (# of trees)

		Listed in Biodiversity Cons. Act	Env Pest (Exempt from TPO)	Low Landscape Signif.	Medium Landscape Signif.	High Landscape Signif.
Condition	SULE 1					
	SULE 2				10	
	SULE 3					
	SULE 4			4	3	

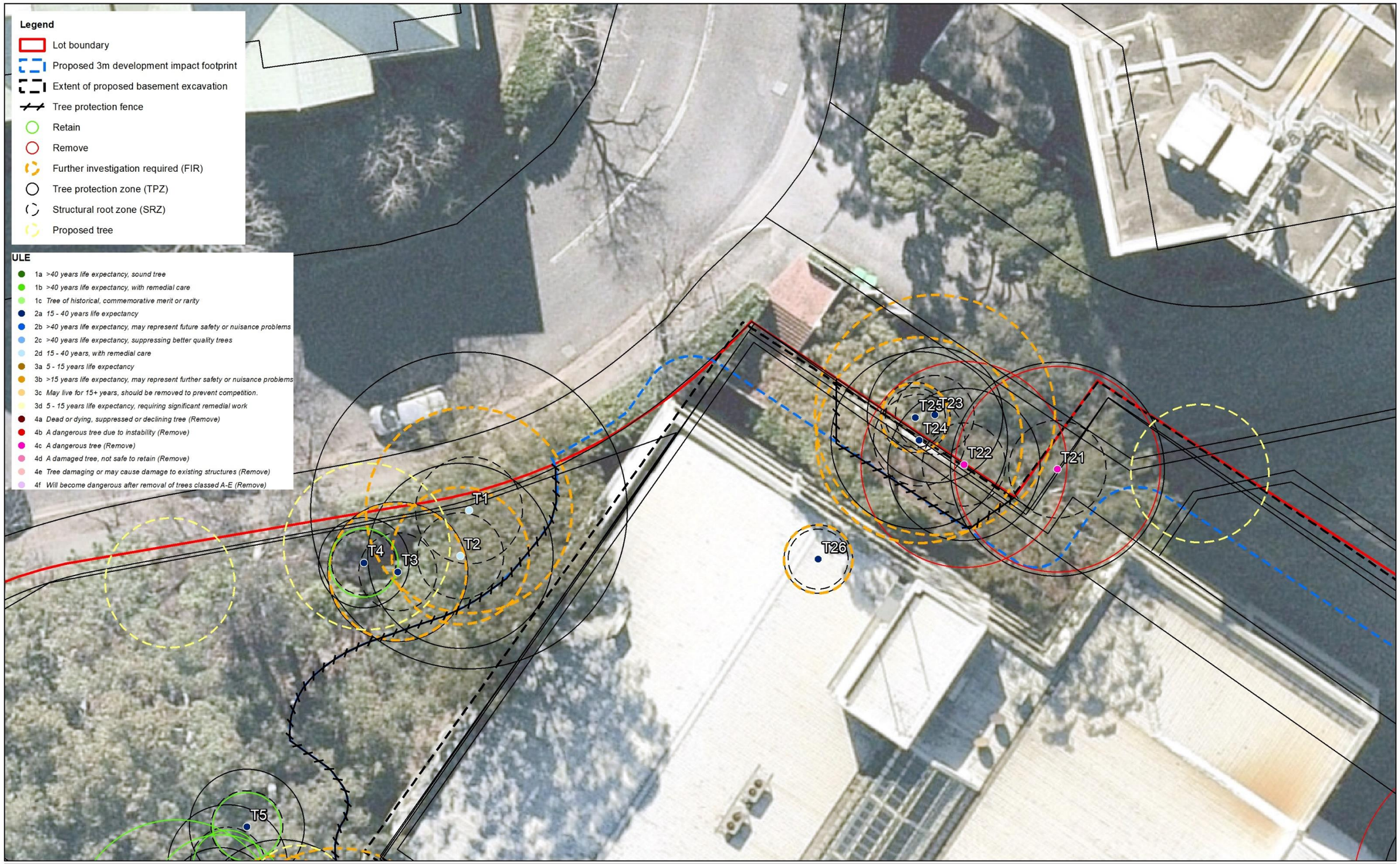
Table 4 - Summary of the 30 trees for further investigation (# of trees)

		Listed in Biodiversity Cons. Act	Env Pest (Exempt from TPO)	Low Landscape Signif.	Medium Landscape Signif.	High Landscape Signif.
Condition	SULE 1					
	SULE 2			4	24	1
	SULE 3				1	
	SULE 4					



Notes:
1) For trunk and branch protection, use boards and padding that will prevent famage to bark. Boards are to be strapped to trees, not nails or screwed.
2) Rumble boards should be of a suitable thickness to prevent soils compaction and root damage.

Figure 13 - Examples of trunk, branch and ground protection as per *AS4970-2009*



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Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

Scale at A3
1:200
GDA 1994 MGA Zone 56
dwg no.
210831
AW

TBE Figure.
18EG22_T004a

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Figure 14 - Tree Retention & Removal Plan (zoom 1)

Aerial source: Nearmap

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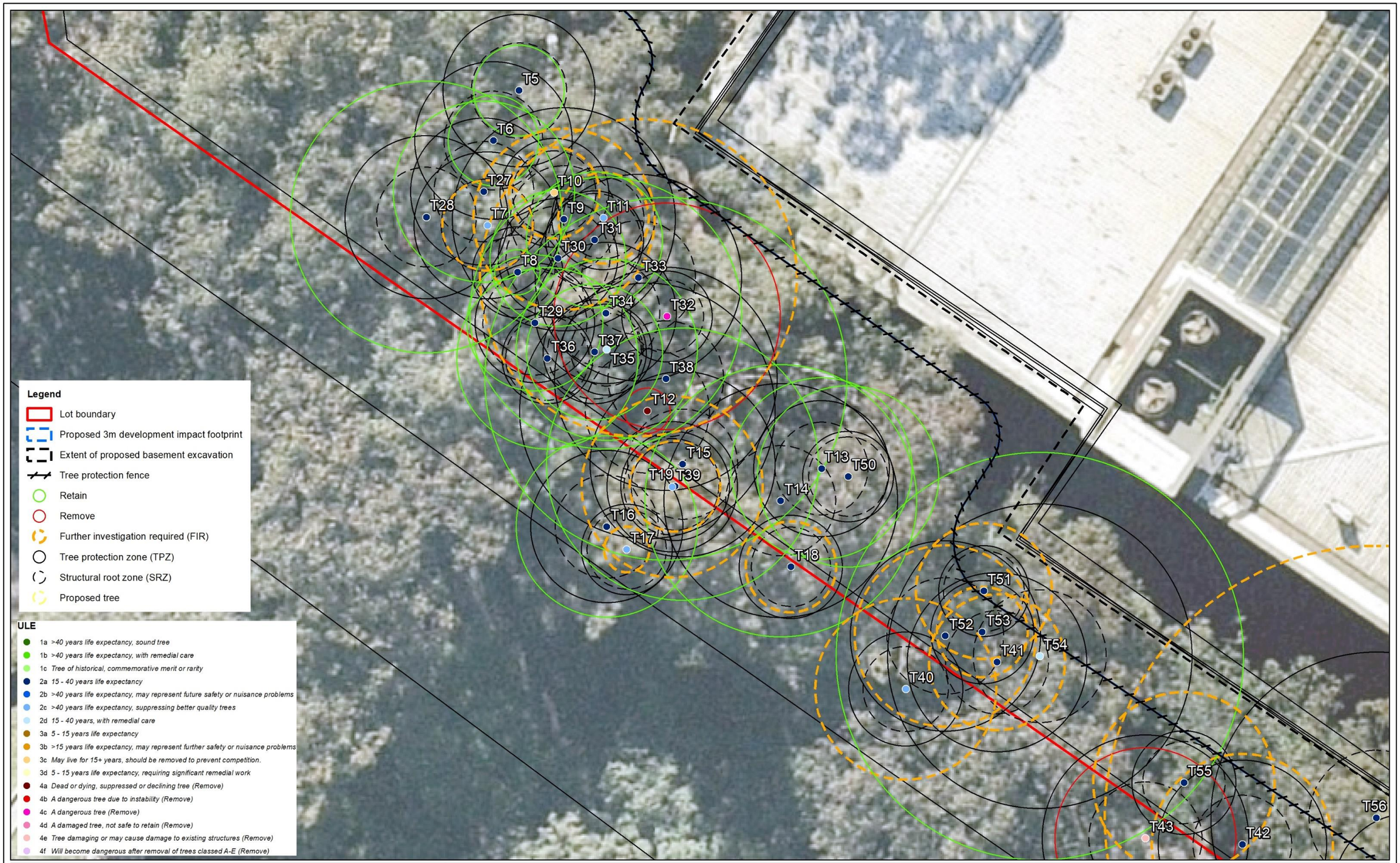

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Figure 15 - Tree Retention & Removal Plan (zoom 2)

Aerial source: Nearmap

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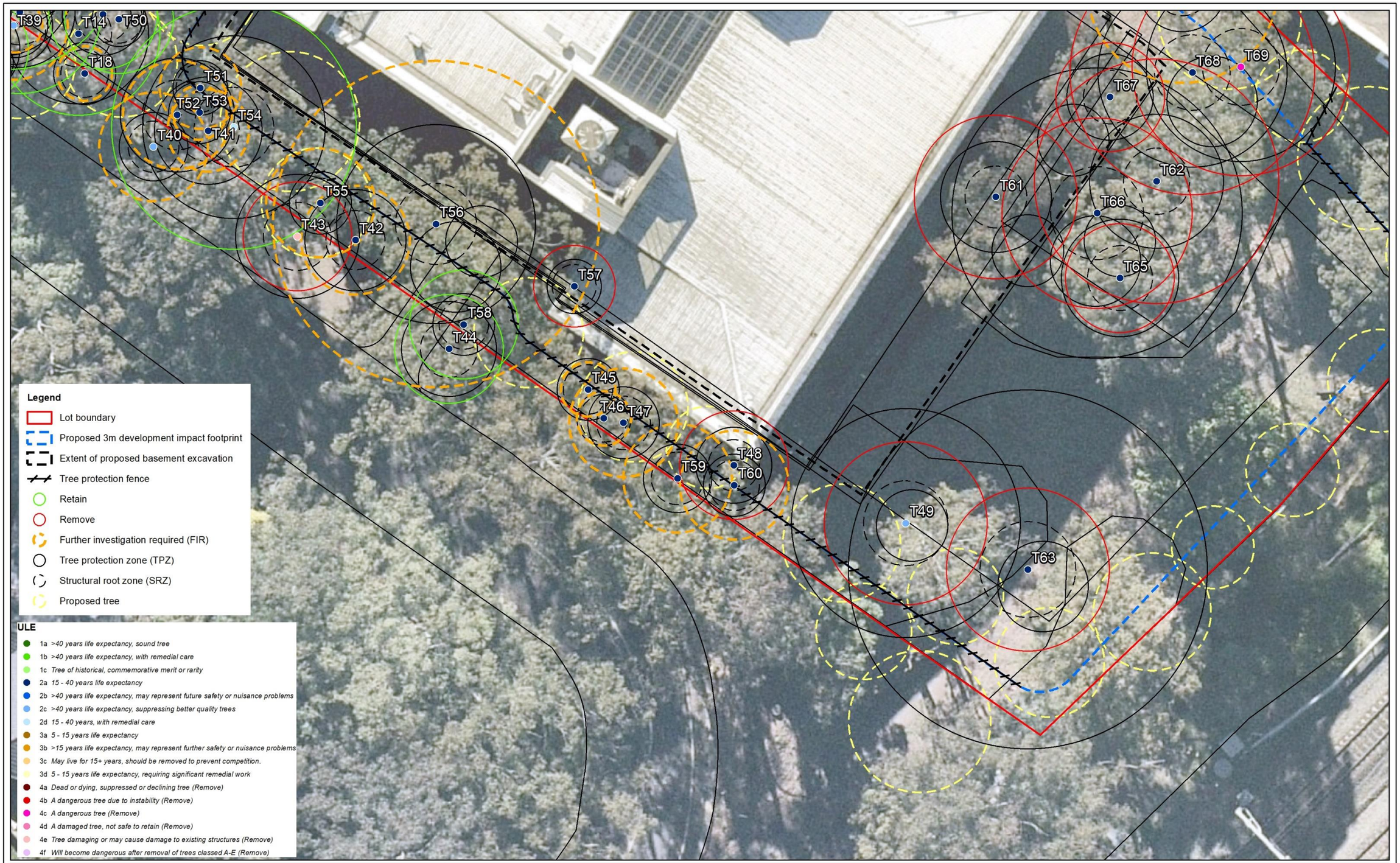

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TBE Figure.
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Figure 16 - Tree Retention & Removal Plan (zoom 3)

Aerial source: Nearmap

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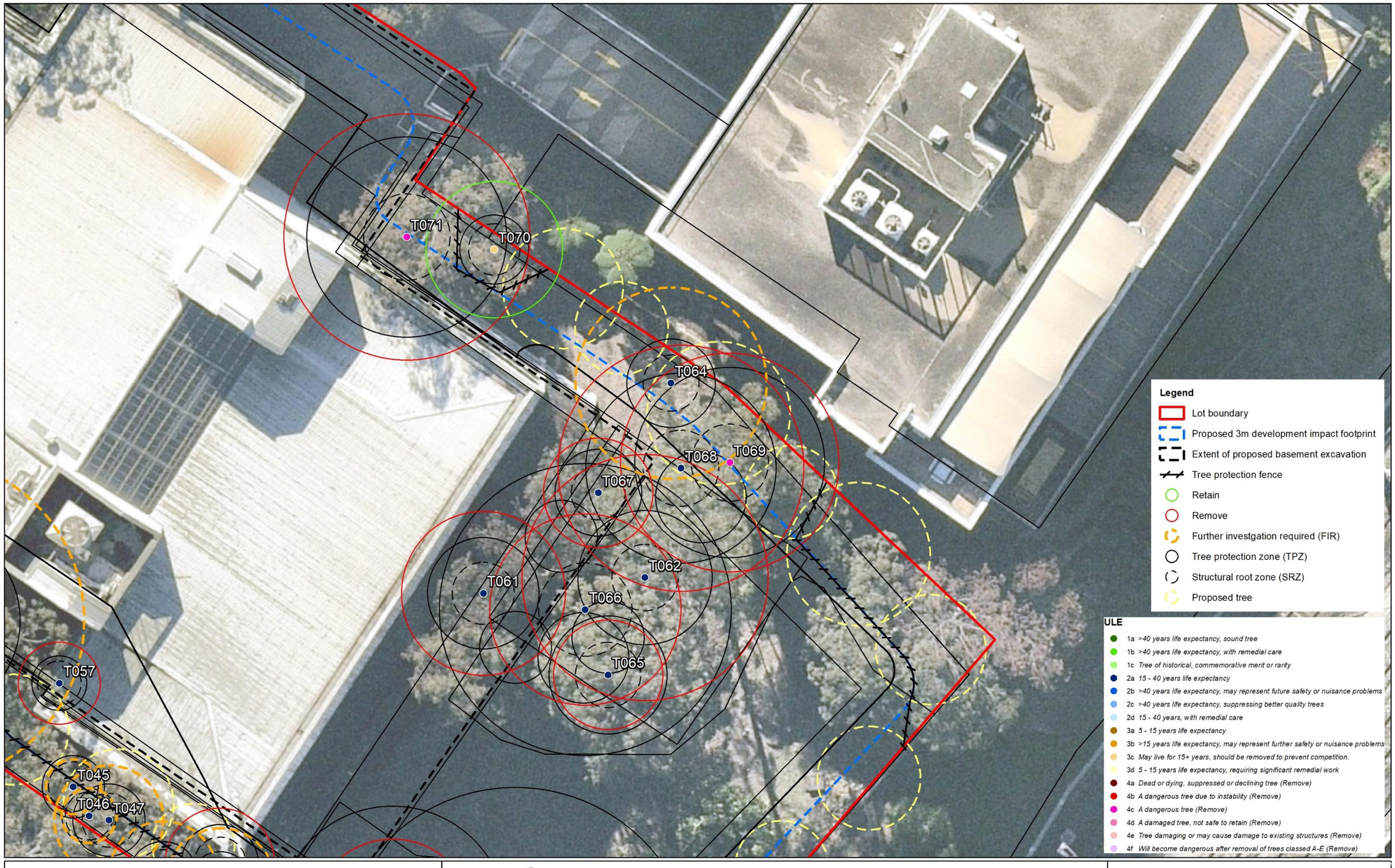

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TBE Figure.
18EG22_T004d

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Figure 17 - Tree Retention & Removal Plan (zoom 4)

Aerial source: Nearmap

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ATTACHMENT 1 – TREE ASSESSMENT DATA TABLE

Tag No.	Common Name	Scientific Name	DBH (cm)	Calc DBH (cm)	BD (cm)	Height (m)	Spread (m)	Vigour %	ULE	AZ	STARS Life Expect.	STARS signif.	STARS retain value	TPZ Radius	SRZ Radius	Retain \ Remove \ Further Investigation Required (FIR)	Reason for Removal	Comment
T001	Blackbutt	*Eucalyptus pilularis*	77	77	87	20	11	80	2d	A2	15-40yrs	Medium	Medium	9.24	3.12	FIR		Exotic vines causing damp on trunk. healthy tree otherwise
T002	Blackbutt	*Eucalyptus pilularis*	45	45	52	20	7	90	2d	A2	15-40yrs	Medium	Medium	5.40	2.51	FIR		Exotic vines causing damp, rot on trunk, crowding adjacent Grevillia
T003	Silky Oak	*Grevillea robusta*	34	34	41	14	8	95	2a	A1	15-40yrs	Medium	Medium	4.08	2.28	FIR		Other unknown vine
T004	Silky Oak	*Grevillea robusta*	22	22	26	15	5	90	2a	A1	15-40yrs	Medium	Medium	2.64	1.88	Retain		Few dead branches
T005	Spotted Gum	*Corymbia maculata*	28	28	34	18	4	95	2a	A1	15-40yrs	Medium	Medium	3.36	2.10	Retain		Nice tall straight tree
T006	Blackbutt	*Eucalyptus pilularis*	29	29	37	20	4	95	2a	A1	15-40yrs	Medium	Medium	3.48	2.18	Retain		Nice straight tree
T007	Blackbutt	*Eucalyptus pilularis*	27	27	32	21	4	95	2c	Z10	15-40yrs	Medium	Medium	3.24	2.05	FIR		45 deg bend in trunk at 8m otherwise tall and straight
T008	Spotted Gum	*Corymbia maculata*	15	15	19	16	2	95	2a	A1	15-40yrs	Medium	Medium	2.00	1.65	Retain		On slope approx. 10deg lean, tall
T009	Blackbutt	*Eucalyptus pilularis*	41	41	45	27	8	95	2a	A1	15-40yrs	Medium	Medium	4.92	2.37	FIR		Bracket fungus at 5m
T010	Sweet Pittosporum	*Pittosporum undulatum*	20	20	25	10	3	95	3c	Z10	15-40yrs	Medium	Medium	2.40	1.85	FIR		Crown broken, dead branches, poor canopy
T011	Turpentine	*Syncarpia glomulifera*	19	19	23	14	5	85	2c	Z10	15-40yrs	Medium	Low	2.28	1.79	FIR		Poor crown, crowded, canopy off centre
T012	Dead stag	*Dead stag*	47	47	64	23	2	0	4a	Z4	<5yrs	Low	Very low	5.64	2.74	Remove	Health	
T013	Silky Oak	*Grevillea robusta*	25	25	32	14	7	90	2a	A1	15-40yrs	Medium	Medium	3.00	2.05	Retain		Exposed roots, on slope, tall and straight

Tag No.	Common Name	Scientific Name	DBH (cm)	Calc DBH (cm)	BD (cm)	Height (m)	Spread (m)	Vigour %	ULE	AZ	STARS Life Expect.	STARS signif.	STARS retain value	TPZ Radius	SRZ Radius	Retain \ Remove \ Further Investigation Required (FIR)	Reason for Removal	Comment
T014	Spotted Gum	*Corymbia maculata*	43	43	48	27	13	95	2a	A1	15-40yrs	Medium	Medium	5.16	2.43	Retain		Large tree, good form, straight
T015	Spotted Gum	*Corymbia maculata*	34	34	48	25	13	95	2a	A1	15-40yrs	Medium	Medium	4.08	2.43	Retain		Canopy off centre, otherwise health tree
T016	Swamp Oak	*Casuarina glauca*	28	28	41	15	9	95	2a	A1	15-40yrs	Medium	Medium	3.36	2.28	Retain		Some dead lower branches, canopy off centre
T017	Swamp Oak	*Casuarina glauca*	16	16	22	14	2	85	2c	Z11	15-40yrs	Medium	Medium	2.00	1.75	FIR		Crowded
T018	Swamp Oak	*Casuarina glauca*	19	19	22	15	3	90	2a	Z11	15-40yrs	Medium	Medium	2.28	1.75	FIR		Tall and spindly
T019	Swamp Oak	*Casuarina glauca*	20	20	28	17	3	90	2a	Z11	15-40yrs	Medium	Medium	2.40	1.94	FIR		Tall and spindly
T020	Lilly Pilly	*Acmena smithii*	11,17	20	26	9	8	80	2a	A1	15-40yrs	Medium	Medium	2.43	1.88	Retain		
T021	Sydney Blue Gum	*Eucalyptus saligna*	52	52	70	22	13	60	4c	Z5	5-15yrs	Low	Low	6.24	2.85	Remove	Health	Exposed wood 0-3m, borers in trunk
T022	Sydney Blue Gum	*Eucalyptus saligna*	37	37	48	23	11	75	4c	Z5	5-15yrs	Medium	Low	4.44	2.43	Remove	Health	Exposed wood at 4m, bracket fungus attack
T023	Spotted Gum	*Corymbia maculata*	33	33	42	19	14	85	2a	A1	15-40yrs	Medium	Medium	3.96	2.30	FIR		Crowded by existing development
T024	Sydney Blue Gum	*Eucalyptus saligna*	43	43	60	24	13	90	2a	A1	15-40yrs	Medium	Medium	5.16	2.67	FIR		
T025	Chinese Hackberry	*Celtis sinensis*	17	17	22	6	4	80	2a	A1	15-40yrs	Low	Low	2.04	1.75	FIR		Planted exotic sp., crowded by surrounding development
T026	Chinese Hackberry	*Celtis sinensis*	16	16	22	6	4	80	2a	A1	15-40yrs	Low	Low	2.00	1.75	FIR		Planted exotic sp., crowded by surrounding development
T027	Swamp Oak	*Casuarina glauca*	27	27	38	23	8	90	2a	A1	15-40yrs	Medium	Medium	3.24	2.20	Retain		
T028	Sydney Blue Gum	*Eucalyptus saligna*	30	30	38	23	12	90	2a	A1	15-40yrs	Medium	Medium	3.60	2.20	Retain		

Tag No.	Common Name	Scientific Name	DBH (cm)	Calc DBH (cm)	BD (cm)	Height (m)	Spread (m)	Vigour %	ULE	AZ	STARS Life Expect.	STARS signif.	STARS retain value	TPZ Radius	SRZ Radius	Retain \ Remove \ Further Investigation Required (FIR)	Reason for Removal	Comment
T029	Swamp Oak	*Casuarina glauca*	22	22	42	22	6	85	2a	A1	15-40yrs	Medium	Medium	2.64	2.30	Retain		
T030	Swamp Oak	*Casuarina glauca*	22	22	42	23	6	85	2a	A1	15-40yrs	Medium	Medium	2.64	2.30	Retain		Slightly crowded
T031	Swamp Oak	*Casuarina glauca*	18	18	32	23	6	85	2a	A1	15-40yrs	Medium	Medium	2.16	2.05	Retain		Slightly crowded
T032	Turpentine	*Syncarpia glomulifera*	15	15	18	8	10	40	4c	Z5	5-15yrs	Low	Low	2.00	1.61	Remove	Health	Leaning >30deg, canopy off centre, poor form
T033	Sydney Blue Gum	*Eucalyptus saligna*	38	38	52	25	14	90	2a	A1	15-40yrs	Medium	Medium	4.56	2.51	FIR		
T034	Swamp Oak	*Casuarina glauca*	26	26	46	23	12	90	2a	A1	15-40yrs	Medium	Medium	3.12	2.39	Retain		Slightly crowded
T035	Turpentine	*Syncarpia glomulifera*	15	15	18	11	7	80	2d	Z1	15-40yrs	Low	Low	2.00	1.61	Retain		Crowded
T036	Swamp Oak	*Casuarina glauca*	16	16	25	19	7	80	2a	A1	15-40yrs	Medium	Low	2.00	1.85	Retain		Slightly crowded
T037	Swamp Oak	*Casuarina glauca*	19	19	33	20	6	85	2a	A1	15-40yrs	Medium	Medium	2.28	2.08	Retain		Slightly crowded
T038	Blackbutt	*Eucalyptus pilularis*	41	41	54	24	15	90	2a	A1	15-40yrs	Medium	Medium	4.92	2.55	Retain		
T039	Swamp Oak	*Casuarina glauca*	24	24	35	17	8	75	2c	Z11	5-15yrs	Medium	Low	2.88	2.13	FIR		Crowded, canopy off centre
T040	Turpentine	*Syncarpia glomulifera*	21	21	26	11	7	90	2c	Z11	15-40yrs	Medium	Medium	2.52	1.88	FIR		At bottom of slope, suppressed, dead lower branches
T041	Spotted Gum	*Corymbia maculata*	33	33	41	20	6	95	2a	A1	15-40yrs	Medium	Medium	3.96	2.28	FIR		Healthy, good form, canopy slightly off centre
T042	Silky Oak	*Grevillea robusta*	31	31	37	26	8	95	2a	A1	15-40yrs	Medium	Medium	3.72	2.18	FIR		Good form, straight, tall
T043	Swamp Mahogany	*Eucalyptus robusta*	38	38	51	17	9	95	4e	Z8	15-40yrs	Medium	Medium	4.56	2.49	Remove	Health	Dangerous lean toward building

Tag No.	Common Name	Scientific Name	DBH (cm)	Calc DBH (cm)	BD (cm)	Height (m)	Spread (m)	Vigour %	ULE	AZ	STARS Life Expect.	STARS signif.	STARS retain value	TPZ Radius	SRZ Radius	Retain \ Remove \ Further Investigation Required (FIR)	Reason for Removal	Comment
T044	Lilly Pilly	*Acmena smithii*	22,19	29	34	13	8	95	2a	A1	15-40yrs	Medium	Medium	3.49	2.10	Retain		Good canopy tree
T045	Lilly Pilly	*Acmena smithii*	19	19	24	12	4	95	2a	A1	15-40yrs	Medium	Medium	2.28	1.82	FIR		Healthy
T046	Chinese Hackberry	*Celtis sinensis*	15	15	22	8	4	50	2a	A1	15-40yrs	Low	Very low	2.00	1.75	FIR		Dormant, starting to bud
T047	Syzygium sp	*Syzygium sp*	22	22	29	13	7	95	2a	A1	15-40yrs	Medium	Medium	2.64	1.97	FIR		
T048	Syzygium sp	*Syzygium sp*	12,20	23	26	9	7	95	2a	A1	15-40yrs	Medium	Medium	2.80	1.88	Remove	Development	Exotic vines
T049	Blackbutt	*Eucalyptus pilularis*	59,38	70	87	25	12	85	2c	Z10	15-40yrs	Medium	Medium	8.42	3.12	Remove	Development	
T050	Swamp Oak	*Casuarina glauca*	15	15	22	15	8	85	2a	A1	15-40yrs	Medium	Low	2.00	1.75	Retain		Slightly crowded
T051	Swamp Oak	*Casuarina glauca*	16	16	23	19	6	80	2a	A1	15-40yrs	Medium	Low	2.00	1.79	FIR		Slightly crowded
T052	Swamp Oak	*Casuarina glauca*	35	35	55	23	8	85	2a	A1	15-40yrs	Medium	Medium	4.20	2.57	FIR		Slightly crowded
T053	Swamp Oak	*Casuarina glauca*	19	19	30	22	5	85	2a	A1	15-40yrs	Medium	Medium	2.28	2.00	FIR		Slightly crowded
T054	Sydney Blue Gum	*Eucalyptus saligna*	56	56	75	25	18	85	2d	A2	15-40yrs	Medium	Medium	6.72	2.93	Retain		Small & medium deadwood
T055	Lilly Pilly	*Acmena smithii*	14,13	19	24	17	8	85	2a	A1	15-40yrs	Medium	Low	2.29	1.82	FIR		
T056	Blackbutt	*Eucalyptus pilularis*	61	61	78	28	25	90	2a	A1	15-40yrs	High	High	7.32	2.98	FIR		
T057	Lilly Pilly	*Acmena smithii*	15	15	18	13	6	90	2a	A1	15-40yrs	Medium	Medium	2.00	1.61	Remove	Development	Crowded
T058	Lilly Pilly	*Acmena smithii*	19	19	24	18	9	80	2a	A1	15-40yrs	Medium	Medium	2.28	1.82	Retain		

Tag No.	Common Name	Scientific Name	DBH (cm)	Calc DBH (cm)	BD (cm)	Height (m)	Spread (m)	Vigour %	ULE	AZ	STARS Life Expect.	STARS signif.	STARS retain value	TPZ Radius	SRZ Radius	Retain \ Remove \ Further Investigation Required (FIR)	Reason for Removal	Comment
T059	Syzygium sp	*Syzygium sp*	21	21	28	13	7	85	2a	A1	15-40yrs	Medium	Medium	2.52	1.94	FIR		
T060	Syzygium sp	*Syzygium sp*	19	19	25	18	8	80	2a	A1	15-40yrs	Medium	Medium	2.28	1.85	FIR		
T061	Grey Ironbark	*Eucalyptus paniculata*	34	34	41	23	13	90	2a	A1	15-40yrs	Medium	Medium	4.08	2.28	Remove	Development	
T062	Blackbutt	*Eucalyptus pilularis*	41	41	48	23	18	85	2a	A1	15-40yrs	Medium	Medium	4.92	2.43	Remove	Development	
T063	Blackbutt	*Eucalyptus pilularis*	110	110	116	27	13	95	2a	A1	15-40yrs	Medium	Medium	13.20	3.52	Remove	Development	Canopy a bit off centre and leaning toward rail line
T064	Blackbutt	*Eucalyptus pilularis*	27	27	32	22	14	90	2a	A1	15-40yrs	Medium	Medium	3.24	2.05	FIR		
T065	Blackbutt	*Eucalyptus pilularis*	36	36	46	20	9	95	2a	A1	15-40yrs	Medium	Medium	4.32	2.39	Remove	Development	
T066	Blackbutt	*Eucalyptus pilularis*	89	89	108	25	14	95	2a	A1	15-40yrs	Medium	Medium	10.68	3.42	Remove	Development	Large tree, good form
T067	Sweet Pittosporum	*Pittosporum undulatum*	18,16,11	26	29	8	7	90	2a	A1	15-40yrs	Medium	Low	3.18	1.97	Remove	Development	
T068	Blackbutt	*Eucalyptus pilularis*	58	58	66	25	18	85	2a	A2	15-40yrs	Medium	Medium	6.96	2.78	Remove	Development	Small deadwood
T069	Sydney Blue Gum	*Eucalyptus saligna*	58	58	69	27	17	75	4c	Z5	5-15yrs	Medium	Medium	6.96	2.83	Remove	Health	Large bark wound, scar and borers
T070	Sweet Pittosporum	*Pittosporum undulatum*	21	21	26	17	10	75	3c	Z10	5-15yrs	Low	Low	2.52	1.88	Retain		Crowded, suppressed, stressed, lots of small deadwood
T071	Sydney Blue Gum	*Eucalyptus saligna*	61	61	90	25	18	65	4c	Z5	5-15yrs	Low	Low	7.32	3.17	Remove	Health	Bark damage at base 0-1.8m, exposed wood, borers in base

ATTACHMENT 2 – TREE SIGNIFICANCE CRITERIA

Tree Significance - Assessment Criteria

1. High Significance in landscape

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

2. Medium Significance in landscape

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

3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

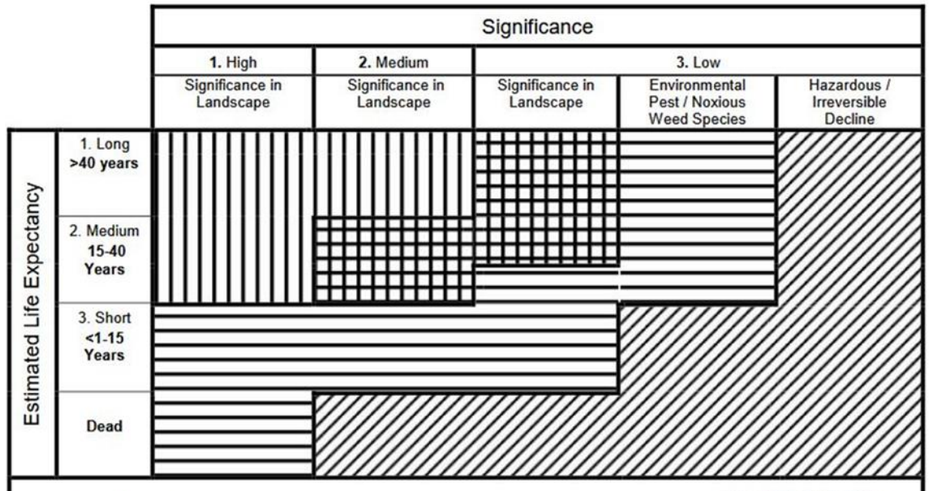
Hazardous/Irreversible Decline

- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

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

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

ATTACHMENT 3 – TREE RETENTION VALUE – PRIORITY MATRIX



Legend for Matrix Assessment

Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 *Protection of trees on development sites*. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.

Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.

Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.

Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

ATTACHMENT 4 - TREE AZ CATEGORIES

ATTACHMENT 5 – USEFUL LIFE EXPECTANCY (ULE)

(Source: Jeremy Barrell 2009 www.Barrelltreecare.co.uk)

	1 – Long	2 – Medium	3 – Short	4 – Removal	5 – Moved or Replaced
A	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk	Trees that appeared to be retainable at the time of assessment for 15 – 40 years with an acceptable level of risk	Trees that appeared to be retainable at the time of assessment for 5 – 15 years with an acceptable level of risk	Trees that should be removed within the next 5 years	Trees which can be reliably removed or replaced
B	Structurally sound trees located in positions that can accommodate future growth	Trees that may only live between 15 and 40 years	Trees that may only live between 5 and 15 years	Dead, dying, suppressed or declining trees through disease or inhospitable conditions	Small trees less than 5m in height
C	Trees that could be made suitable for retention in the long term by remedial care	Trees that may live for more than 40 years but would be removed for safety or nuisance reasons	Trees that may live for more than 15 years but would be removed for safety or nuisance reasons	Damaged trees through structural defects including cavities, decay, included bark, wounds or poor form	Trees that have been pruned to artificially control growth
D		Trees that could be made suitable for retention in the medium term by remedial care	Trees that require substantial remedial tree care and are only suitable for retention in the short term	Damaged trees that are clearly not safe to retain	
E				Trees that may live for more than 5 years but should be removed to prevent interference with more suitable individuals or to provide space for new plantings	
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 reasons given in (A) to (F)	

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.