



45-53 MACLEAY STREET, POTTS POINT

ARBORICULTURAL IMPACT ASSESSMENT

PREPARED FOR:

TIME AND PLACE

PREPARED BY:

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<i>date</i>	<i>revision</i>	<i>prepared</i>	<i>checked</i>
18/10/21	Issued Development Application	RC	AS
10/08/23	Revised in response to SOFC	AS	AS
30/01/24	Revised Stormwater	RC	AS
15/02/24	Revised Architectural	RC	AS
14/02/25	Root Mapping & Stormwater	RC	AS

Executive Summary

This report was commissioned by Time and Place initially to accompany a Concept State Significant Development Application (SSDA) for a mixed-use development at 45-53 Macleay Street, Potts Point (the site).

The site within the City of Sydney Local Government Area (LGA). It has an area of 1,289sqm and is legally described as SP 934. The site currently accommodates a 12-storey residential flat building comprising 80 studio apartments, and associated car parking

The aim of this report is to provide an assessment of the impacts of the proposed development on seven (7) trees in accordance with AS4970 – 2009, *Protection of trees on development sites*.

This report collates and presents information collected by Adrian Swain on the 02/08/21 and at a subsequent site inspection on the 30/06/23. The data collected is located at **7. Tree Survey Table** (page 15) also see **8. Tree Survey Table Notes** (page 19) for notes relating to tree survey table.

Generally the site's vegetation was observed to have a majority exotic tree canopy, with an exotic shrub mid storey. The existing surveyed trees are shown at **9. Tree Location Plan** (page 23).

The proposed development will involve the construction of a multi-storey residential building with associated driveway, car parking, gardens, turf, paths, paving and retaining walls. This will involve the demolition of existing structures and regrading site levels through excavation, cutting and filling of soil on site. The extent of site works is also illustrated at **9. Tree Location Plan** (page 23).

The matrix below gives a brief overview summary of tree significance and level of encroachment from the proposed development of numbered trees.

		ENCROACHMENT WITHIN TPZ			
		Numbering of trees as shown on Tree Location Plan			
TREE LANDSCAPE SIGNIFICANCE		No Impact	Minor Encroachment (<10% of TPZ)	Major Encroachment (>10% of TPZ)	Within Development Footprint
	High	1	-	2, 3, 4	-
	Medium	5, 6	-	-	-
	Low	7	-	-	-
	Total Number of trees	4	0	3	0

In consideration of the data collected recommendations are provided for the removal or retention of trees including specific tree protection measures required to reduce the anticipated impacts from the proposed construction on those trees proposed to be retained. This report specifically recommends:

- The retention of Tree Nos 1, 5, 6 and 7. The construction will not impact these trees.

- The retention of Tree No. 2. This tree is of high significance and will require design modification to avoid and minimise impacts from the proposed major encroachment. Specifically:
 - Trunk and branch battening should be provided prior to demolition.
 - Supervision of any and all excavation works within the TPZ should only be undertaken after assessment and with supervision from the project Arborist.
- The retention of Tree Nos. 3 and 4. These trees are of high significance and will require design modification to avoid and minimise impacts from the proposed major encroachment. Specifically:
 - a. Careful demolition of existing structures should be undertaken after the trees are adequately protected.
 - b. Root mapping should be undertaken after demolition, in order to guide the required foundation/basement excavation setback.
 - c. Based on the information gained from root mapping, an appropriate set back (estimated minimum 2m from boundary) should be established for the proposed basement excavation.
 - d. We anticipate works will be required to be setback a minimum of 2m however final setback is to be determined after root mapping investigation.
 - e. Preference would be to raise the Ground Floor FFL to suspend or cantilever the ground floor slab over existing grades thus minimising or avoiding unnecessary root loss.
- Any earthworks within the TPZ of retained trees should be carried out under project arborist supervision by first excavating a narrow trench to the depth required by hand or equivalent. Severing roots by earthmoving equipment is unacceptable.
- A Tree Protection Plan should be prepared to guide i) construction final design and methodology ii) Tree Protection barrier installation and iii) Project Arborist supervision/direction as necessary to protect the trees during construction works. The plan should be prepared following provision of a CMP (Construction Management Plan) and/or TMP (Traffic Management Plan), in liaison with Construction plans and consistent with any conditions of consent and AS4970 (2009), sections 4 & 5.
- Demolition and Construction: Pedestrian and machinery access, material storage and other construction activities which compact the soil should be designated to be outside of TPZs of all retained trees.
- For additional tree protection information see **6. Tree Management Plan** (page 13) and **10. General Tree Protection Notes** (page 28).
- Revision undertaken of any architectural, Civil, landscape, construction and service plans should be carried out in liaison with the Project Arborist. This arboricultural impact assessment (AIA) should be revised immediately following.

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1. Introduction

This report was commissioned by Time and Place to accompany a Concept State Significant Development Application (SSDA) for a mixed-use development at 45-53 Macleay Street, Potts Point (the site).

The project seeks concept approval pursuant to section 4.22 of the EP&A Act for a 13-storey mixed use shop-top housing development comprising three levels of basement car parking, ground floor retail and residential above. The site is within the City of Sydney Local Government Area (LGA).

The aim of this report is to provide an assessment of the impacts of the proposed development on seven (7) trees in accordance with AS4970 – 2009, *Protection of trees on development sites*.

This report collates and presents information collected by Adrian Swain on the 02/08/21. The data collected is located at **7. Tree Survey Table** (page 15) also see **8. Tree Survey Table Notes** (page 19) for notes relating to tree survey table.

2. Methodology

2.1. Limitations

Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible. However Adrian Swain - Consulting Arborist can neither guarantee nor be responsible for the accuracy of information provided by others. Unless stated otherwise:

- Information contained in this report covers only the tree/s examined and reflects the health and structure of the tree at the time of inspection. The documented, observations, results, recommendations and conclusions given may vary after the site visit due to environmental conditions. Liability will not be accepted for damage to person or property as a result of natural processes, unforeseeable actions or occurrences.
- Observations recorded for trees located within adjacent properties have been made without entering that property. Deciduous trees inspected during winter and all trees obscured by other vegetation are not able to be properly assessed. As a result measurements for these trees are estimated. Similarly these trees were not subject to a complete visual inspection and defects or abnormalities may be present but not recorded.
- Defects such as cambial damage, cracks, decay or hollows may be present which are not visible from the ground. This report does not include an aerial survey of the crown.
- Defects such as root damage, cracks or decay may be present under the ground. This report does not include any subterranean survey of the root plate.
- The inspection was limited to visual examination from the base of the subject tree without dissection, excavation, probing or coring (unless specifically noted otherwise).
- There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject tree may not arise in the future.

2.2. Site Inspection

A visual inspection of the tree/s was performed from ground (street) level, and from the Carparking podium within the existing residential building located on the subject site, data collected includes:

- Genus, Species, Common Name;
- Height, Width, DBH (Diameter at Breast Height), DRB (Diameter above Root Buttress);
- Age, Health & Vigour;
- Significance, Amenity and Ecological Value;
- Form and Structural Condition;
- Visible Defects or Evidence of Wounding.

2.3. Measurement

- Tree locations are supplied by client on the survey plan or triangulated using a measuring tape.
- Diameter at breast height (DBH) and Diameter above Root Buttress (DRB) are measured using a diameter tape.
- Height is measured using a clinometer or Nikon Forestry Pro.
- Canopy width is estimated using a measured stride paced out on site.
- Structural Root Zone (SRZ) and Tree Protection Zone (TPZ) radii are calculated (in accordance with AS 4970-2009).
- Development impact/setback is measured from the nearest face of the trunk to the face of the structure in Auto CAD using the perpendicular distance function.

2.4. Recording Data

Data collected is collated in the tree survey table located at **7. Tree Survey Table** (page 15). The tree survey table contains abbreviations for terms describing the tree's characteristics; explanatory notes pertaining to these are located at **8. Tree Survey Table Notes** (page 19).

The physical data for tree locations, crown width and DRB is schematically described in **9. Tree Location Plan** (page 23).

2.5. Reference Documents

The report was written in coordination with:

- Survey Plan prepared by Veris Australia Pty Ltd, Geomap Pty Ltd, Revision 1, dated 23/03/20.
- Architectural Plans prepared by SJB Architects, Revision 1, dated 05/02/25.
- Drainage Plan prepared by Van Der Meer Consulting, Revision D, dated 06/02/25.
- The Australian Standard for the Protection of Trees on Development Sites (AS 4970 – 2009).
- Geotechnical Investigation report prepared by JK Geotechnics 05/02/24
- Root mapping investigation Report prepared by Synertree 26/02/24

2.6. Council Tree Preservation Regulatory Controls

The City of Sydney Council tree preservation controls exclude dead, dying or dangerous trees, noxious weeds or listed nuisance species. The order defines a tree as (whether exotic, endemic or indigenous) as:

- a. Having a height of five (5) metres or more; or
- b. Having a canopy (crown) spread of over five (5) metres; or

- c. Having a trunk circumference of 300mm measured at ground level; or
- d. Is listed in the register of Significant Trees.

2.7. Determining a tree's significance

The significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. When determining a tree's significance within the landscape context, the following questions are asked of each tree. Significance may be expressed in increments of High, Medium or Low. For a High rating the majority (≥ 4) of the answers will be yes; For a Medium-High rating 3.5 of the answers will be yes; for a Medium rating half ($=3$) of the answers will be yes; for a Low-Medium rating 2.5 of the answers will be yes; and for the Low rating the minority of answers will be yes (≤ 2).

1. Is the tree of botanical interest; Is it included in a significant tree register or listed as a heritage item under the Federal State or Local Regulations?
2. Is the tree visually prominent in the locality?
3. Is the tree well structured?
4. Is the tree in good health and/or does it display signs of good vigour?
5. Is the tree typically formed for the species?
6. Is the tree currently located in a position that will accommodate future growth?

3. Observations

3.1. Site Description

The site is located at 45-53 Macleay Street, Potts Point. It has an area of 1,289sqm and is legally described as SP 934. The site currently accommodates a 12-storey residential flat building comprising 80 studio apartments, and associated car parking

3.2. Soil Landscape Map

The soils in this area are from the Gynea soil landscape group³. They are generally shallow to moderately deep 30-100 cm yellow earths and earthy sands on crests and inside of benches; shallow <20 cm siliceous sands on leading edges of benches; localised gleyed podzolic soils and yellow podzolic soils on shale lenses; shallow to moderately deep <100 cm siliceous sands and leached sands along drainage lines.

Generally the landscape is characterised by undulating to rolling rises and low hills on Hawkesbury Sandstone. There is local relief between 20m and 80 m with slope gradients of 10-25% and rock outcrop less than 25%. Additionally there are broad convex crests, moderately inclined side slopes with wide benches, and localised rock outcrops on low broken scarps³.

These soils are limited by localised steep slopes, high soil erosion hazard, rock outcrops, shallow highly permeable soil and very low soil fertility.

The critical soil characteristics of this soil type for trees growing on this site include shallow soil depth.³

3.3. Native Vegetation Map

This area is mapped as *cleared and modified lands*. These areas are mostly suburban development. Small remnants of vegetation too small to map may occur here.

3.4. Summary of site inspection data

Generally the site's vegetation was observed to have a majority exotic tree canopy, with an exotic shrub mid storey. The existing surveyed trees are shown at **9. Tree Location Plan** (page 23).

3.5. Summary of Proposed Development

The proposed development will involve the construction of a multi-storey residential building with associated driveways, car parking, gardens, turf, paths, paving and retaining walls. This will involve the demolition of existing structures and regrading site levels through excavation, cutting and filling of soil on site. The extent of site works is also illustrated at **9. Tree Location Plan** (page 23).

We reviewed and assessed separately, the proposed encroachments from the Basement, Ground Floor (incl 1st 2nd & 3rd Floors) and the Upper Floors (4th to 10th).

3.5.1 Basement: The Basement is setback from the eastern boundary by approximately 2m to the outside of basement wall. There is 2 pieces of stormwater drainage proposed outside the basement one being an outlet to a kerb inlet pit and a grated surface strip drain at the building entry.

Tree 2 – Cumulative encroachment of 14.8% comprising of 3.2% from basement excavation and 11.6% from grated drain installation.

Tree 3 – Encroachment of 16.4% from basement excavation

Tree 4 - Cumulative encroachment of 16.2% comprising of 11.5% from basement excavation and 4.7% from stormwater outlet installation.

3.5.2 Ground Floor: The Ground 1st 2nd & 3rd floors have a similar footprint. The Ground floor has an awning that extends outside the eastern boundary by 1.55m. The ground floor is setback from the eastern boundary by 1.5m.

Tree 2 - At the interface of the ground floor building entry and Tree 2 the existing pavement RL is approximately 28.68 which will require a ramp up to a proposed FFL 29.1.

Tree 3 - At the interface of the retail space on the ground floor and Tree 3 the existing pavement RL is approximately 28.15 which will require excavation for the ground floor to achieve an FFL of 27.90.

Tree 4 – At the interface of the ground floor retail space and Tree 4 the existing pavement RL is approximately 27.76 which will require excavation for the ground floor to achieve an FFL of 27.90.

3.5.2 Upper Floors: A greater setback to trees 3 and 4 is provided by the upper floor achieving 5.5 and 6m respectively providing respective 10.5% and 3.9% encroachments into the crowns.

3.6. Tree significance and encroachment matrix

The matrix below gives a brief overview summary of tree significance and level of encroachment from the proposed development of numbered trees.

		ENCROACHMENT WITHIN TPZ			
		Numbering of trees as shown on Tree Location Plan			
TREE LANDSCAPE SIGNIFICANCE		No Impact	Minor Encroachment (<10% of TPZ)	Major Encroachment (>10% of TPZ)	Within Development Footprint
	High	1	-	2, 3, 4	-
	Medium	5, 6	-	-	-
	Low	7	-	-	-
	Total Number of trees	4	0	3	0

4. Discussion

4.1. Trees in adjacent properties

- **Tree No. 2** is located within the road reserve. The proposed basement is located 4.8m away from the base of the tree, providing encroachment of 3.2%. Additionally a ramp and stormwater drainage extend to the eastern boundary into the TPZ making up a cumulative encroachment of 11.4% (including stormwater encroachment) within the TPZ.

The proposed ground floor is located 2.8m from the tree, providing encroachment of 11.4% within the TPZ. The proposed Finished Floor Level (FFL) for this ground floor is proposed ramp down to meet existing pavement grades at the building entry at existing pavement levels of RL 28.68 and RL 28.36.

Assuming the basement is setback from the boundary, to build the ground floor slab this would assumedly require a degree of excavation to accommodate a slab depth of between 150 and 180mm plus any additional subgrade preparation.

Currently the basement and extent of "at grade" entry is proposed to be to the boundary line, hence encroachment is measured at the boundary.

This assessment has not specifically considered any hoarding or scaffold that may be required during construction.

Minimal if any, branch pruning will be required to accommodate the proposed development. Potentially 2 x 100mm branches may be required to be pruned both approximately 11m above ground.

These encroachments are considered to be major but sustainable providing suitable care is taken to protect the tree prior to and during construction. Trunk battening should be provided prior to demolition. Supervision of any and all excavation works within the TPZ is

required and should only be undertaken after assessment and with supervision from the Project Arborist.

- **Tree No. 3** is located within the road reserve. The proposed basement is located 4.3m away from the base of the tree, providing encroachment of 16.4% within the TPZ.

The proposed ground floor is located 4.0m from the base of the tree, providing an encroachment of 19.2% within the TPZ. The proposed Finished Floor Level (FFL) for this ground floor retail area is RL 27.9 and the existing pavement level at boundary adjacent to this tree is at RL 28.68.

The ground floor slab would assumedly require a degree of excavation to accommodate a slab depth of between 150 and 180mm plus any additional subgrade preparation.

Preference would be to raise the Ground Floor FFL to suspend or cantilever the ground floor slab over existing grades thus minimising or avoiding unnecessary root loss.

The proposed ground floor awning is located 1.0m from the tree, providing an encroachment of approximately 41% within the TPZ. This encroachment will not require root removal or branch removal and is considered sustainable by this tree.

The existing canopy of this tree will require branch pruning to accommodate the proposed upper levels of this development. Potentially the following branches may be required to be pruned:

- 1 x 75mm west facing 2nd order branch (located on the eastern bifurcation)
- 1 x 150mm west facing 1st order branch (located 10m from ground level)
- 1 x 175mm west facing 1st order branch (located 12m from ground level)
- 2 x 100mm west facing 2nd order branches (located 12m from ground level)
- 1 x 50mm west facing branch in the upper crown.

This level of impact is considered high and unsustainable by this tree without design modification as follows:

1. Raise the proposed FFL to ensure excavation will not require the removal of woody roots
2. Specifically, careful demolition of existing structures should be undertaken after the trees are adequately protected.
3. Root mapping should be undertaken after demolition, in order to guide the required foundation/basement excavation setback.
4. Based on the information gained from root mapping, an appropriate set back (estimated minimum 2m from boundary) should be established for the proposed basement excavation.
5. We anticipate works will be required to be setback a minimum of 2m however final setback is to be determined after root mapping investigation.

- **Tree No. 4** is located within the road reserve. The proposed basement is located 4.3m away from the base of the tree, and also 5.8m from a proposed stormwater outlet providing a cumulative encroachment of 16.2% within the TPZ.

The proposed ground floor is located 3.9m from the tree, providing encroachment of 13.1% within the. The proposed Finished Floor Level (FFL) for this ground floor retail area is RL 27.9 and the existing pavement level at boundary adjacent to this tree is at RL 27.76.

Assuming the basement is setback from the boundary to minimise impacts to the TPZ, the ground floor slab would assumedly require a degree of excavation to accommodate a slab depth of between 150 and 180mm plus any additional subgrade preparation.

Preference would be to raise the Ground Floor FFL to suspend or cantilever the ground floor slab over existing grades thus minimising or avoiding unnecessary root loss.

The proposed first floor awning is located 1.5m from the tree, providing encroachment 26.2% within the TPZ. This encroachment will not require root removal or branch removal and is considered sustainable by this tree.

Minimal if any, branch pruning will be required to accommodate the development. The existing crown has been pruned to accommodate the existing residential tower and as such from observations sufficient clearances are already provided.

This level of impact is considered moderate to high and unsustainable by this tree without design modification as follows:

1. Raise the proposed FFL to ensure excavation will not require the removal of woody roots
 2. Specifically, careful demolition of existing structures should be undertaken after the trees are adequately protected.
 3. Root mapping should be undertaken after demolition, in order to guide the required foundation/basement excavation setback.
 4. Based on the information gained from root mapping, an appropriate set back (estimated minimum 2m from boundary) should be established for the proposed basement excavation.
 5. We anticipate works will be required to be setback a minimum of 2m however final setback is to be determined after root mapping investigation.
- **General discussion for Trees 2, 3 & 4** These trees (Trees 2, 3 & 4) are all mature London Plane Trees in good health. They are located within the road reserve and are considered to be of high significance and should be retained and protected.

This species is considered moderately tolerant of construction impacts.

It is considered that the presence of the existing building foundations may significantly reduce the likelihood of roots below the footprint of the existing building, however until the building is demolished it is not possible to undertake a root mapping investigation.

Geotechnical investigations closest to these trees specifically Borehole 3 indicate a slab on sandstone foundation. We do not know the exact structural design of the existing

building however with a reasonable level of confidence we can safely assume minimal root growth will have extended beneath the foot print of the existing building.

The impact to the trees will depend on what roots are found post demolition as part of root mapping, specifically the number, size and condition of roots requiring pruning to accommodate proposed works.

The proposed development may provide a significant and unsustainable impact to Trees 3 and 4, if sufficient roots are found during the post demolition root mapping investigation.

If an unsustainable number of roots are found during the root investigation the design would be required to be amended to allow these trees to be retained.

Trees 2 and 4 have crowns that will require minor pruning if any at all, to give clearance for scaffolding required for construction and the building itself.

Tree 3 will require more substantial pruning to accommodate the proposed development. The extent of crown modification pruning required would be in alignment with the clearance pruning already provided to the remaining street trees of the same species found along Macleay Street. We consider this to be a sustainable impact.

However, if pruning for clearance to scaffolding is required, the trees should be inspected by the Project Arborist to verify that no more than 10% of the crown requires removal following commencement of above ground building works.

4.2. Other Tree Comments

- **Tree Nos 1, 5, 6 and 7** are located in positions that will allow their retention without impact from the proposed development.
- **The Council requested Root mapping** : the root mapping undertaken prior to the demolition confirms what we reasonably have assumed. That is urban trees growing in a restrictive urban environment have concentrated / massed roots within the closest garden bed.

The undertaken root mapping in my opinion could not be reasonably be used to deduce there are significant roots located beneath the existing building. In fact the geotechnical bore hole 3 would indicate that conditions to restrict root growth are present making it less likely for roots to be extending under the existing building.

5. Recommendations

In consideration of the data collected recommendations are provided for the removal or retention of trees including specific tree protection measures required to reduce the anticipated impacts from the proposed construction on those trees proposed to be retained. This report specifically recommends:

- The retention of Tree Nos 1, 5, 6 and 7. The construction will not impact these trees.
- The retention of Tree No. 2. This tree is of high significance and will require design modification to avoid and minimise impacts from the proposed major encroachment. Specifically:
 - Trunk and branch battening should be provided prior to demolition.
 - Supervision of any and all excavation works within the TPZ should only be undertaken after assessment and with supervision from the project Arborist.

- The retention of Tree Nos. 3 and 4. These trees are of high significance and will require design modification to avoid and minimise impacts from the proposed major encroachment. Specifically:
 - a. Raise the proposed ground floor FFL to ensure excavation will not require the removal of woody roots
 - b. Careful demolition of existing structures should be undertaken after the trees are adequately protected.
 - c. Root mapping should be undertaken after demolition, in order to guide the required foundation/basement excavation setback.
 - d. Based on the information gained from root mapping, an appropriate set back (estimated minimum 2m from boundary) should be established for the proposed basement excavation.
 - e. We anticipate works will be required to be setback a minimum of 2m however final setback is to be determined after root mapping investigation.
 - f. Preference would be to raise the Ground Floor FFL to suspend or cantilever the ground floor slab over existing grades thus minimising or avoiding unnecessary root loss.
- Any earthworks within the TPZ of retained trees should be carried out under project arborist supervision by first excavating a narrow trench to the depth required by hand or equivalent. Severing roots by earthmoving equipment is unacceptable.
- A Tree Protection Plan should be prepared to guide i) construction final design and methodology ii) Tree Protection barrier installation and iii) Project Arborist supervision/direction as necessary to protect the trees during construction works. The plan should be prepared following provision of a CMP (Construction Management Plan) and/or TMP (Traffic Management Plan), in liaison with Construction plans and consistent with any conditions of consent and AS4970 (2009), sections 4 & 5.
- Demolition and Construction: Pedestrian and machinery access, material storage and other construction activities which compact the soil should be designated to be outside of TPZs of all retained trees.
- For additional tree protection information see **6. Tree Management Plan** (page 13) and **10. General Tree Protection Notes** (page 28).
- Revision undertaken of any architectural, Civil, landscape, construction and service plans should be carried out in liaison with the Project Arborist. This arboricultural impact assessment (AIA) should be revised immediately following.

6. Tree Management Plan

6.1. Management Objectives:

The prioritisation of the following objectives is integral for the successful management of site trees:

1. Protection of the TPZ of retained trees;
2. Protection of the trunk and branches of retained trees;
3. Reduction of stress on retained trees from construction;
4. To ensure the viability of retained trees after practical completion.

6.2. Tree Management Actions:

The above general tree management objectives are achieved by:

- Appointment of a Level 5 AQF Project Arborist experienced in managing trees on construction sites to prepare and certify a Tree Management Plan.

- The installation of a Tree Protection Fence to enclose and protect the TPZ.
- Installation of additional root, trunk and branch protection as required to protect retained trees where minor encroachments within the TPZ are anticipated.
- Supervision, monitoring, inspections and certification of tree protection as outlined in the Tree Management Plan.

6.3. Schedule of Hold Points, Inspections and Certification

To ensure this plan is implemented, hold points (**HP**) have been specified in the schedule of works (below). Once each stage is reached the work will be inspected and certified by the Project Arborist and the next stage may commence.

Alterations to this schedule may be required due to necessity however this shall be through consultation with the Project Arborist only.

Hold Point	Task	Responsibility	Certification	Timing of Inspection
1	Undertake Root Mapping for trees with major encroachment.	Principal Contractor	Project Arborist	Prior to completion of foundation design
2	Complete foundation design so to avoid woody roots greater than 40mm	Principal Contractor	Project Arborist	Prior to construction certificate application
3	Indicate clearly (with spray paint on trunks) trees approved for removal only	Principal Contractor	Project Arborist	Prior to demolition and site establishment.
4	Install TPF and additional root, trunk and/or branch protection	Principal Contractor	Project Arborist	Prior to demolition and site establishment.
5	Supervise all excavation works proposed within the TPZ	Principal Contractor	Project Arborist	As required prior to the works proceeding adjacent to tree
6	Inspection of trees by Project Arborist	Principal Contractor	Project Arborist	Quarterly during construction period
7	Inspection of trees by Project Arborist	Principal Contractor	Project Arborist	Following the removal of tree protection measures from HP 1
8	Final Inspection of trees by Project Arborist	Principal Contractor	Project Arborist	Prior to issue of occupation certificate.

7. Tree Survey Table

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	Trunk Dia 2	Trunk Dia 3	Trunk Dia 4	DBH	SRZ	DRB	TPZ	Age	Health	Crown	Signifi- cance	Am	Eco	Form	Development Setback and Encroachment		Comments
1	Platanus	platanus x acerifolia	London Plane	27	11	1040	1040	1100	3445	12480	M	G	G	M	G	G	H	H	L	D	No impact	Located on road reserve. Canopy 12m to north, 10m to south, 6m to east, 8m to west.	
2	Platanus	platanus x acerifolia	London Plane	24	16	560	560	600	2670	6720	M	G	G	M	G	G	H	H	L	D	Located 4.6m from proposed basement & 2.4m from proposed graded drain - total 11.4% encroachment within TPZ. 3.2% from basement	Located on road reserve. Canopy 8m north, 8m south, 7m east, 8m west. New pavements and kerb. Trunk obscured by tree protection bafflers. Extensive pruning for building clearance West side. Recent kerb replacement. Girdled roots.	
3	Platanus	platanus x acerifolia	London Plane	23	18	670	730	730	2900	8760	M	G	AV	M	G	AV	H	H	L	D	Located 4.3m from proposed basement 16.4% encroachment within TPZ	Located on road reserve. Canopy 10m north, 8m south, 9m east, 9m west. New pavements and kerb. Trunk obscured by tree protection bafflers. Extensive pruning for building clearance West side. Recent kerb replacement. Girdled roots.	
4	Platanus	platanus x acerifolia	London Plane	24	10	700	700	740	2916	8400	M	G	G	M	G	G	H	H	L	D	Located 4.3m from proposed basement (11.5%) and 5.8m from stormwater outlet (4.7%) - total 16.2% encroachment within TPZ	Located on road reserve. Canopy 13m north, 9m south, 8m east, 7m west. Some mechanical damage @ 3m. East side. Large pruned branch. East side @ 5m. Some clearance pruning to building.	
5	Pyrus	sp.	Ornamental Pear	6	4	110	110	130	1500	2000	SM	G	G	SM	G	G	M	L	L	D	No impact	Located on road reserve. Small amount of mechanical damage to crown. Not on Survey.	
6	Magnolia	grandiflora 'Little Gem'	Dwarf Magnolia	5	4	150	150	175	1592	2000	SM	AV	F	SM	AV	F	M	L	L	US	No impact	Located on road reserve. Small amount of crown dieback. Past pruning. Crown lift, crown thin, crown reduced.	
7	Pyrus	sp.	Ornamental Pear	4.5	1	90	90	100	1500	2000	SM	G	G	SM	G	G	L	L	L	U	No impact	Located on road reserve.	

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No impact
Minor encroachment
Major encroachment
Within development footprint

NO#	Genus	Species	Common Name	Height	Spread	Trunk			TPZ	Age	Health	Crown	Signifi- cance	Am	Eco	Form	Development Setback and Encroachment	Comments
						Dia	Dia 2	Dia 3										
1	Platanus	platanus x acerifolia	London Plane	27	11	1040	1040	1100	3445	12480	M	G	G	H	H	L	D	Located on road reserve. Canopy 12m to north, 10m to south, 6m to east, 8m to west.
2	Platanus	platanus x acerifolia	London Plane	24	16	560	560	600	2670	6720	M	G	G	H	H	L	D	Located on road reserve. Canopy 8m north, 8m south, 7m east, 8m west. New pavements and kerb. Trunk obscured by tree protection bafflers. Extensive pruning for building clearance West side. Recent kerb replacement. Girdled roots.
3	Platanus	platanus x acerifolia	London Plane	23	18	670	730	730	2900	8760	M	G	Av	H	H	L	D	Located on road reserve. Canopy 10m north, 8m south, 9m east, 9m west. New pavements and kerb. Trunk obscured by tree protection bafflers. Extensive pruning for building clearance West side. Recent kerb replacement. Girdled roots.
4	Platanus	platanus x acerifolia	London Plane	24	10	700	700	740	2916	8400	M	G	G	H	H	L	D	Located on road reserve. Canopy 13m north, 9m south, 8m east, 7m west. Some mechanical damage @ 3m. East side. Large pruned branch. East side @ 5m. Some clearance pruning to building.
5	Pyrus	sp.	Ornamental Pear	6	4	110	110	130	1500	2000	SM	G	G	M	L	L	D	Located on road reserve. Small amount of mechanical damage to crown. Not on Survey.
6	Magnolia	grandiflora 'Little Gem'	Dwarf Magnolia	5	4	150	150	175	1592	2000	SM	Av	F	M	L	L	US	Located on road reserve. Small amount of crown dieback. Past pruning. Crown lift, crown thin, crown reduced.
7	Pyrus	sp.	Ornamental Pear	4.5	1	90	90	100	1500	2000	SM	G	G	L	L	L	U	Located on road reserve.

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No impact
Minor encroachment
Major encroachment
Within development footprint

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia		DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi- cance	Am	Eco	Form	Development Setback and Encroachment	Comments
						Dia 2	Dia 3													
1	Platanus	platanus x acerifolia	London Plane	27	11	1040	1040	1100	3445	12480	M	G	G	G	H	H	L	D	No impact	Located on road reserve. Canopy 12m to north, 10m to south, 6m to east, 8m to west.
2	Platanus	platanus x acerifolia	London Plane	24	16	560	560	600	2670	6720	M	G	G	G	H	H	L	D	No impact	Located on road reserve. Canopy 8m north, 8m south, 7m east, 8m west. New pavements and kerb. Trunk obscured by tree protection bafflers. Extensive pruning for building clearance West side. Recent kerb replacement. Girdled roots.
3	Platanus	platanus x acerifolia	London Plane	23	18	670	730	730	2900	8760	M	G	Av	G	H	H	L	D	Located 5.5m from proposed building - 10.5% encroachment within TPZ. 1.0m setback to awning	Located on road reserve. Canopy 10m north, 8m south, 9m east, 9m west. New pavements and kerb. Trunk obscured by tree protection bafflers. Extensive pruning for building clearance West side. Recent kerb replacement. Girdled roots.
4	Platanus	platanus x acerifolia	London Plane	24	10	700	700	740	2916	8400	M	G	G	G	H	H	L	D	Located 6m from proposed building - 3.9% encroachment within TPZ. 1.5m setback to awning	Located on road reserve. Canopy 13m north, 9m south, 8m east, 7m west. Some mechanical damage @ 3m. East side. Large pruned branch. East side @ 5m. Some clearnace pruning to building.
5	Pyrus	sp.	Ornamental Pear	6	4	110	110	130	1500	2000	SM	G	G	G	M	L	L	D	No impact	Located on road reserve. Small amount of mechanical damage to crown. Not on Survey.
6	Magnolia	grandiflora 'Little Gem'	Dwarf Magnolia	5	4	150	150	175	1592	2000	SM	Av	F	M	L	L	US	No impact	Located on road reserve. Small amount of crown dieback. Past pruning. Crown lift, crown thin, crown reduced.	
7	Pyrus	sp.	Ornamental Pear	4.5	1	90	90	100	1500	2000	SM	G	G	G	L	L	L	U	No impact	Located on road reserve.

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No impact
Minor encroachment
Major encroachment
Within development footprint

8. Tree Survey Table Notes

8.1. Genus, Species and Common Name

The botanical and common name of each tree is identified and recorded. Occasionally the exact species name is unknown; sp. is recorded to indicate this.

8.2. Height (m), Spread (m), Trunk Dia, DBH and DRB (mm)

- The tree's height and spread (diameter) is recorded in metres.
- The tree **DBH** is recorded in millimetres. DBH is an abbreviation of Diameter (of the trunk) measured at Breast Height (or 1.2m from the base of the trunk). If more than one trunk is present the DBH is calculated in accordance with AS4970-2009 Protection of Trees on Development Sites.
- If the tree has multiple trunks multiple trunks each trunk DBH (**Trunk Dia**) will be recorded individually.
- The tree **DRB** is recorded in millimetres. DRB is an abbreviation of Diameter (of the trunk) measured above the Root Buttress. It is required to calculate the SRZ in accordance with AS4970-2009 Protection of Trees on Development Sites when there is major encroachment within the TPZ, ie. greater than 10% is encroached upon or if there is an encroachment within the SRZ.

8.3. Age

The age class of each tree is estimated as either:

- **J** – Juvenile, a young sapling, easily replaced from nursery stock.
- **SM** - Semi Mature, a tree that has not grown to mature size.
- **M** - Mature, a tree that has reached mature size and will slowly increase in size over time.
- **OM** - Over Mature, a tree that has been mature for a long period and is beginning to display signs of decline, e.g. large dead branches.
- **S** - Senescent, an over mature tree that is now in decline.

8.4. Health and Vigour

The trees health and vigour is recorded as a measurement of:

- **G** - Good - the tree does not appear stressed with no excessive dieback, insect infestation, decay, dead wood or epicormic shoots.
- **Avg** - Average Health - the tree appears stressed and have some crown dieback, and/or a few epicormic shoots, and/or some dead wood in the crown and some new growth at branch tips. These trees may benefit from remediation of the growing environment to reduce stress and return it to good health.
- **F** - Fair - the tree may have areas of crown dieback, and/or epicormic shoots, and/or areas of decay, and/or reduced new growth at branch tips. These trees have been stressed for a short period of time, remediation of the growing environment may improve the trees health.
- **P** - Poor - the tree may have large areas of crown dieback, and/or many epicormic shoots, and/or reduced new growth at branch tips. These trees have been stressed for a long time, remediation of the growing environment would not return the tree to good health.

- **D** – Dead the tree is dead

8.5. Structural Condition (Crown)

The structural condition of each tree is assessed and recorded as either:

- **G** - Good Condition: the tree appears to have no visible indication of inherent structural defects.
- **Avg** - Average Condition: the tree has minor structural defects which may be corrected with remedial works or pruning, allowing the tree to return to Good Condition.
- **F** - Fair Condition: the tree has visible structural defects such as (but not limited to) dead branches, and/or an unbalanced crown, and/or leaning trunk and/or areas of decay. These trees do not demonstrate the typical form of their species, or have been damaged or have begun to deteriorate. Remedial works or pruning may return the tree to Average Condition.
- **P** - Poor Condition: the tree has significant structural defects such as (but not limited to) very large dead branches, and/or extremely unbalanced crown, and/or subsiding trunk and/or large areas of decay. These trees do not demonstrate the typical form of their species, or have been severely damaged or have deteriorated significantly. Remedial pruning would not return the tree to Fair Condition.

8.6. Significance

Measured as High, Medium or Low, see **2.7 Determining a tree's significance** (page 7). Significance may be expressed in increments of High, Medium or Low. For a High rating the majority (≥ 4) of the answers will be yes; For a Medium-High rating 3.5 of the answers will be yes; for a Medium rating half ($=3$) of the answers will be yes; for a Low-Medium rating 2.5 of the answers will be yes; and for the Low rating the minority of answers will be yes (≤ 2).

8.7. Amenity Value

Amenity value is a subjective measurement based on the tree's contribution to the landscape, it may be based on the tree's visual form, however it also includes non visual attributes such as provision of shade for a seat, screening of poor views or for privacy, or if it has historical significance. The amenity value is recorded as:

- **H** - High, the trees form is an excellent example of its species and it makes a great specimen and/or it has other attributes such screening, or is historical significance. These trees are visually prominent and valuable to the community or public domain.
- **M** - Medium, the tree may have an altered form and/or it has attributes that provides amenity to local residents only.
- **L** - Low, the tree is not a good specimen and it does not provide substantial benefit to local residents or the community.

8.8. Ecological Value

Ecological value is a measurement of the tree's contribution to the environment. It is determined by the tree's area of origin, its potential to provide habitat to native fauna and its potential to become an environmental pest. The ecological value is recorded as:

- **H** - High, the tree is locally native or remnant and/or it has habitat value for native fauna.
- **M** - Medium the tree is native but not locally native.

- **L** - Low, the tree is not native and/or it may be a listed nuisance or weed species.
- **Ha** – Habitat, is the tree valued by fauna for food (ie. foliage fruit or sap) or shelter (ie. nesting, roosting, dray or hollow).

8.9. Form

The form, structure or shape of each tree is assessed and recorded as either one or a combination of several of the below terms; **(U)** Upright, **(B)** Broad, **(C)** Conical, **(Sh)** Shrub, **(BC)** Bias Crown **(CS)** Crown Shy (also referenced is the adjacent dominant tree canopy ie. **T4**), **(V)** Vase, **(D)** Dome, **(P)** Palm, **(S)** Spreading, **(L)** Leaning or **(BM)** Basal Multi Trunked.

Crown form may also be assessed in accordance with the relationship with the neighbouring tree and recorded as either: **S** - Suppressed, the crown is located beneath another larger crown and is leaning away (Crown Shy); **CD** - Codominant, the crown is adjacent to another crown of similar size, their crown areas may appear joined; **D** - Dominant, the crown is above other lower crowns; **E** - Emergent, the crown emerges from a lower canopy formed by other dominant or codominant crowns.

8.10. Defects

The presence of one or a combination of several defects is recorded **(W)** Wound, **(D)** Decay, **(F)** Fungus, **(B)** Bulge, **(FB)** Fibre Buckling, **(C)** Cracks, **(S)** Split, **(H)** Hollow, **(DB)** Die Back, **(E)** Epicormic shoots, **(DW)** Dead Wood, **(I)** Inclusion, **(CA)** Cavities, **(PF)** Previous Failure, **(R)** Root Damage, **(P)** Pruning wound, **(PD)** Pests and diseases, **(ST)** Storm Damage.

8.11. SRZ (Structural Root Zone) – Radius (mm)

The SRZ is a radial area extending outwards from the centre of the trunk. This area contains the majority of the structural woody roots. This area is responsible primarily for stability. Root damage or root loss within this zone greatly increases the opportunity for decay fungi to ingress into the heartwood, causing internal decay in addition to destabilising the tree's structural integrity. The SRZ is calculated as follows (This calculation is derived from the Australian Standard 4970 – 2009 Protection of Trees on Development Sites):

$$\text{SRZ (Radius)} = (D \times 50)^{0.42} \times 0.64$$

8.12. TPZ (Tree Protection Zone) – Radius (mm)

The TPZ is a circular area with a radius measured by multiplying the DBH by twelve (12), or a circular area the size of the tree's drip line whichever is greater. This area contains the majority of the essential structural and feeder roots responsible for stability, gaseous exchange and water and nutrient uptake. Excavation, back filling, compaction or other disturbance should not occur in this area.

The TPZ is used to identify the minimum area required for the safe retention of a given tree. This calculation is derived from the Australian Standard 4970 – 2009 Protection of Trees on Development Sites. An incursion to 10% within the TPZ is potentially acceptable if no other option is available. A major encroachment (in excess of 10%) is required to be clearly justified by the project Arborist and compensated for elsewhere. Justification methodology may vary depending on site or the individual tree's health, vigour and ability to withstand disturbance and may require root investigation.

8.13. Development Setback / Impact

The successful retention of trees on construction sites is dependent on the adequate allocation and management of the space above, below and around trees to be retained.

The trunk and canopy of trees to be retained must be protected to ensure the trunk and branches are not damaged during construction. The removal of bark and / or branches allows the potential ingress of micro-organisms which may cause decay. Similarly the removal of bark restricts the tree's ability to distribute water, mineral ions and glucose.

It is essential to prevent the disturbance of the soil beneath the drip line of each tree, because this is the area where oxygen, water and mineral ions are absorbed by tree roots. Oxygen, water and mineral ions are essential for healthy plant growth. If soil becomes compacted, the ability of roots to function correctly is greatly reduced. Similarly the removal or damage of roots will reduce the ability of roots to function correctly. Woody roots provide stability for the tree and they also transport nutrients to the leaves.

The potential implications of removing or damaging roots are threefold:

- 1.** The risk of whole tree failure is increased, as tree roots anchor and stabilise the tree. Woody roots are developed to assist in the support of the tree in prevailing wind, with these roots removed wind throw may occur, which would result in the mass failure of the tree.
- 2.** The ability of the tree to absorb and transfer the essential nutrients, oxygen and water from the soil to the leaves is greatly affected. This will place the tree under stress and reduce the tree's ability to photosynthesise, and in turn cause the tree to use up stored energy reserves. These energy reserves are used to fight infection and insect attack, for new growth, maintenance of existing tissues and also for healing wounds. Once energy reserves become depleted a tree is much more susceptible to drought, disease and pest attack.
- 3.** Open wounds are sites by which decay-causing pathogens can enter the tree. The severance or damage of woody roots creates sites where pathogens may gain ingress. Whilst the effect of decay may not be immediately apparent, the long term health and structure of the tree will be compromised.

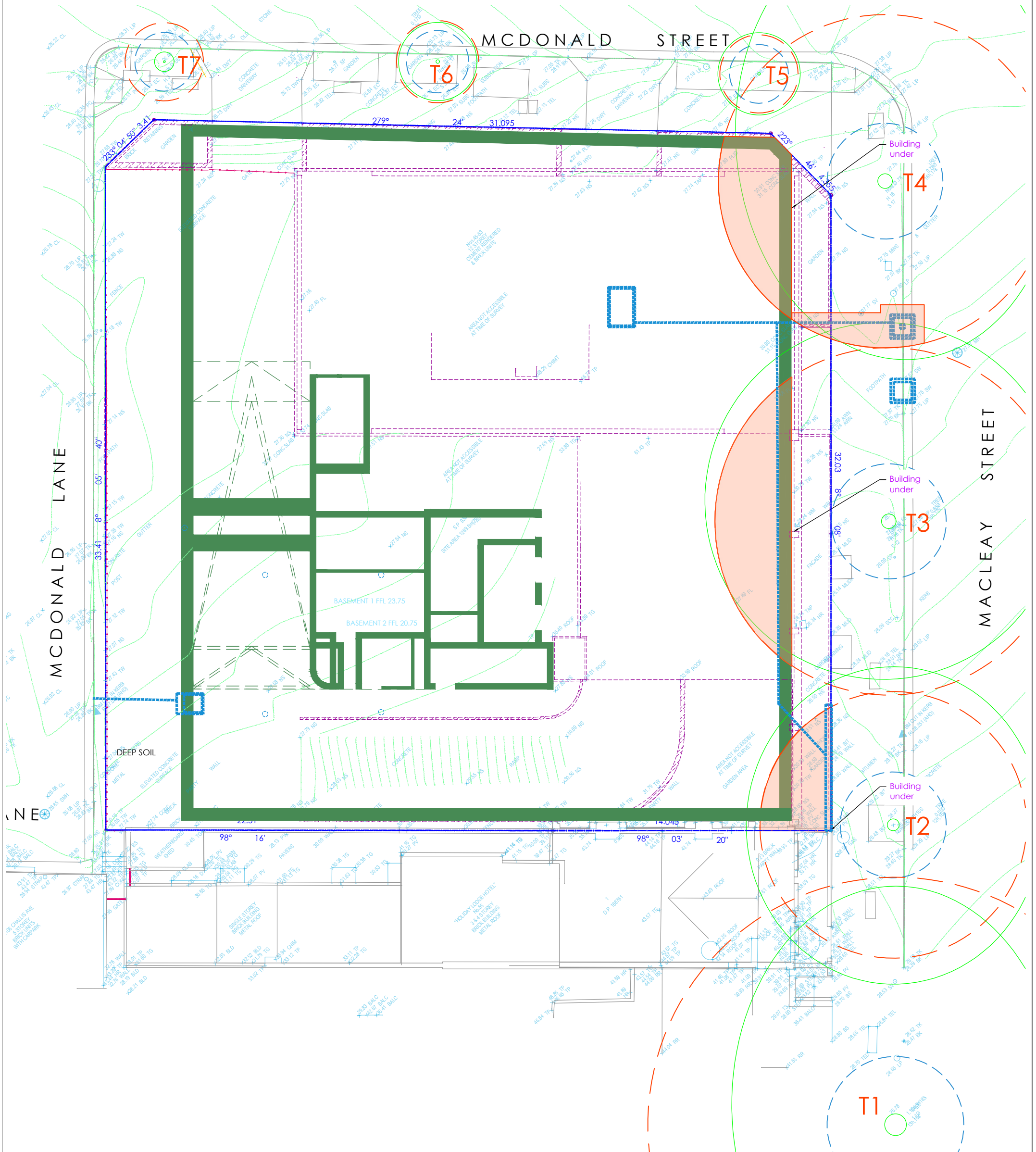
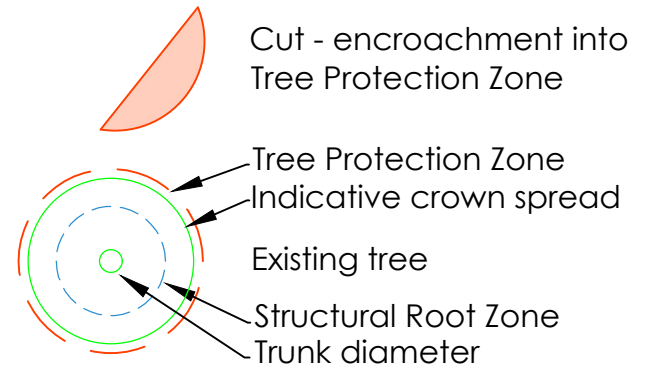
8.14. Comments

Comments generally relate to the suitability for retention. The comments allow for a brief notation of other factors relevant to the assessment of the tree.

9. Tree Location Plan

LEGEND

- +101.45 Existing levels
- + RL 101.55 Proposed levels
- + TOW 101.55 Proposed Top Of Wall levels
- Boundary
- To be removed / demolished
- Hydraulic lines - SW
- Building under



REVISION	DESCRIPTION	DRAWN	CHECK	DATE
A	SUBMITTED TO CLIENT FOR COMMENT	RC	AS	17-08-21
B	SUBMITTED TO CLIENT FOR COMMENT	RC	AS	18-10-21
C	SUBMITTED TO CLIENT FOR COMMENT	RC	AS	31-07-23
D	SUBMITTED TO CLIENT FOR COMMENT - ARCHITECTURAL AMENDMENT - BASEMENT	RC	AS	12-09-23
E	SUBMITTED TO CLIENT FOR COMMENT - AMENDED ENVELOPE	RC	AS	30-01-24
F	AMENDED STORMWATER & ROOT MAPPING	RC	AS	13-02-25

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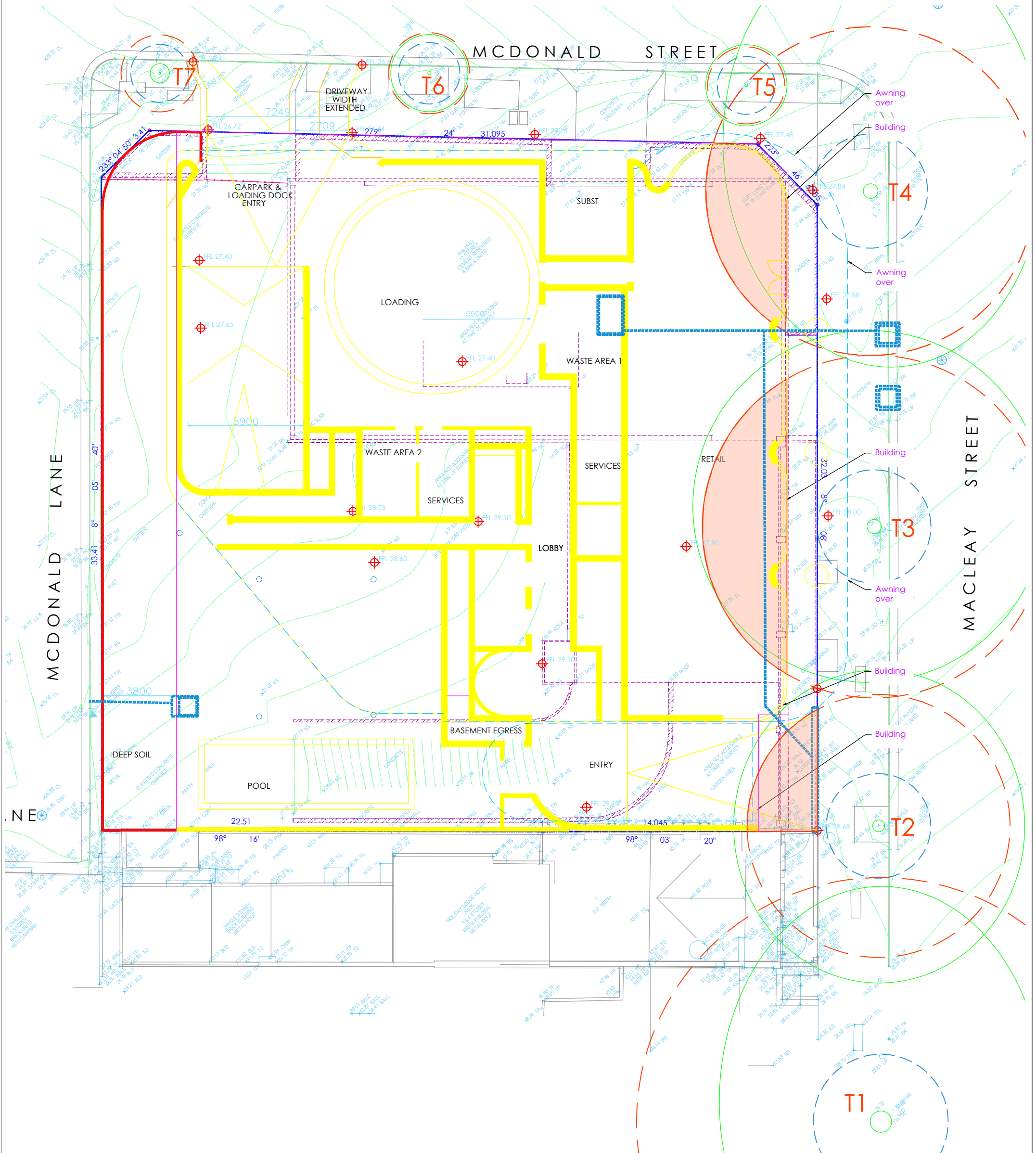
45-53 MACLEAY STREET, POTTS POINT

TIME AND PLACE

PROJECT: MULTI-STOREY RESIDENTIAL			
DRAWING: TREE LOCATION PLAN - BASEMENT LEVELS			
SCALE: N.T.S. @ A3	DATE: DA	SHEET: T-01	
DRAWN: RC	CHECK: AS	DATE: 13-02-25	REVISION: F

LEGEND

- +101.45 Existing levels
- + RL 101.55 Proposed levels
- + TOW 101.55 Proposed Top Of Wall levels
- Boundary
- To be removed / demolished
- Hydraulic lines - SW
- Building
- / Cut - encroachment into Tree Protection Zone
- Tree Protection Zone
- Indicative crown spread
- Existing tree
- Structural Root Zone
- Trunk diameter



REVISION	DESCRIPTION	DRAWN	CHECK	DATE
A	SUBMITTED TO CLIENT FOR COMMENT	RC	AS	17-08-21
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C	SUBMITTED TO CLIENT FOR COMMENT	RC	AS	31-07-23
D	SUBMITTED TO CLIENT FOR COMMENT - ARCHITECTURAL AMENDMENT - BASEMENT	RC	AS	12-09-23
E	SUBMITTED TO CLIENT FOR COMMENT - AMENDED ENVELOPE	RC	AS	30-01-24
F	SUBMITTED TO CLIENT FOR COMMENT - AMENDED STORMWATER	RC	AS	13-02-25

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PROJECT: **45-53 MACLEAY STREET, POTTS POINT**

CLIENT: **TIME AND PLACE**


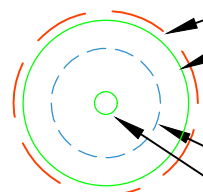
PROJECT: **MULTI-STOREY RESIDENTIAL**

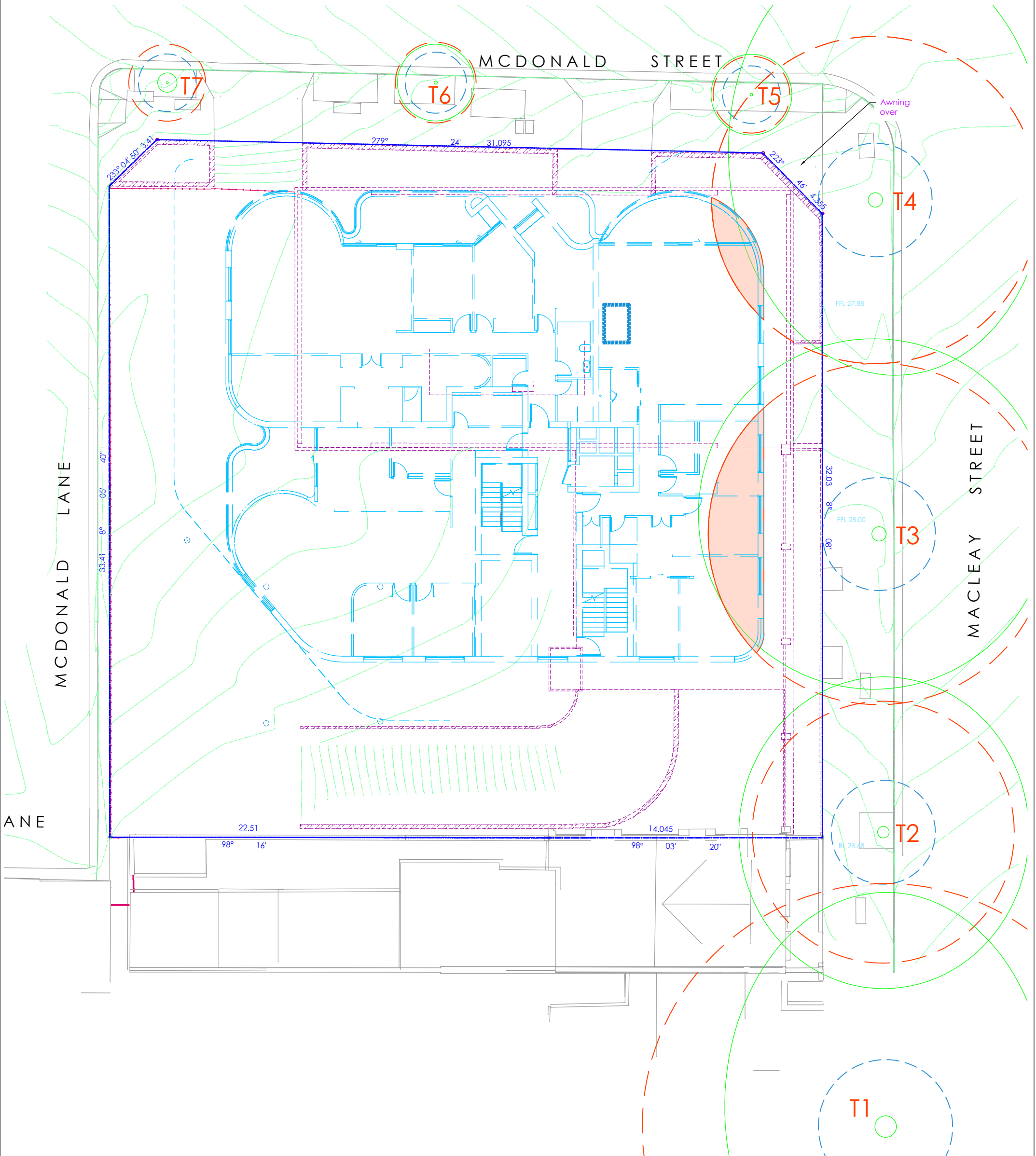
DRAWING: **TREE LOCATION PLAN - GROUND LEVEL**

SCALE: **N.T.S. @ A3** | ISSUE: **DA** | SHEET: **T-02**

DRAWN: **RC** | CHECK: **AS** | DATE: **13-02-25** | REVISION: **F**

LEGEND

- +101.45 Existing levels
- + RL 101.55 Proposed levels
- + TOW 101.55 Proposed Top Of Wall levels
- Boundary
- To be removed / demolished
- Hydraulic lines - SW
- Building over
-  Cut - encroachment into Tree Protection Zone
-  Tree Protection Zone
Indicative crown spread
Existing tree
Structural Root Zone
Trunk diameter



REVISION	DESCRIPTION	DRAWN	CHECK	DATE
A	SUBMITTED TO CLIENT FOR COMMENT	RC	AS	17-08-21
B	SUBMITTED TO CLIENT FOR COMMENT	RC	AS	18-10-21
C	SUBMITTED TO CLIENT FOR COMMENT	RC	AS	31-07-23
D	SUBMITTED TO CLIENT FOR COMMENT - ARCHITECTURAL AMENDMENT - BASEMENT	RC	AS	12-09-23
E	SUBMITTED TO CLIENT FOR COMMENT - AMENDED ENVELOPE	RC	AS	30-01-24
F	SUBMITTED TO CLIENT FOR COMMENT - AMENDED STORMWATER	RC	AS	13-02-25

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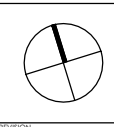
CLIENT: **TIME AND PLACE**

PROJECT: **MULTI-STOREY RESIDENTIAL**

DRAWING: **TREE LOCATION PLAN - BUILDING OVER**

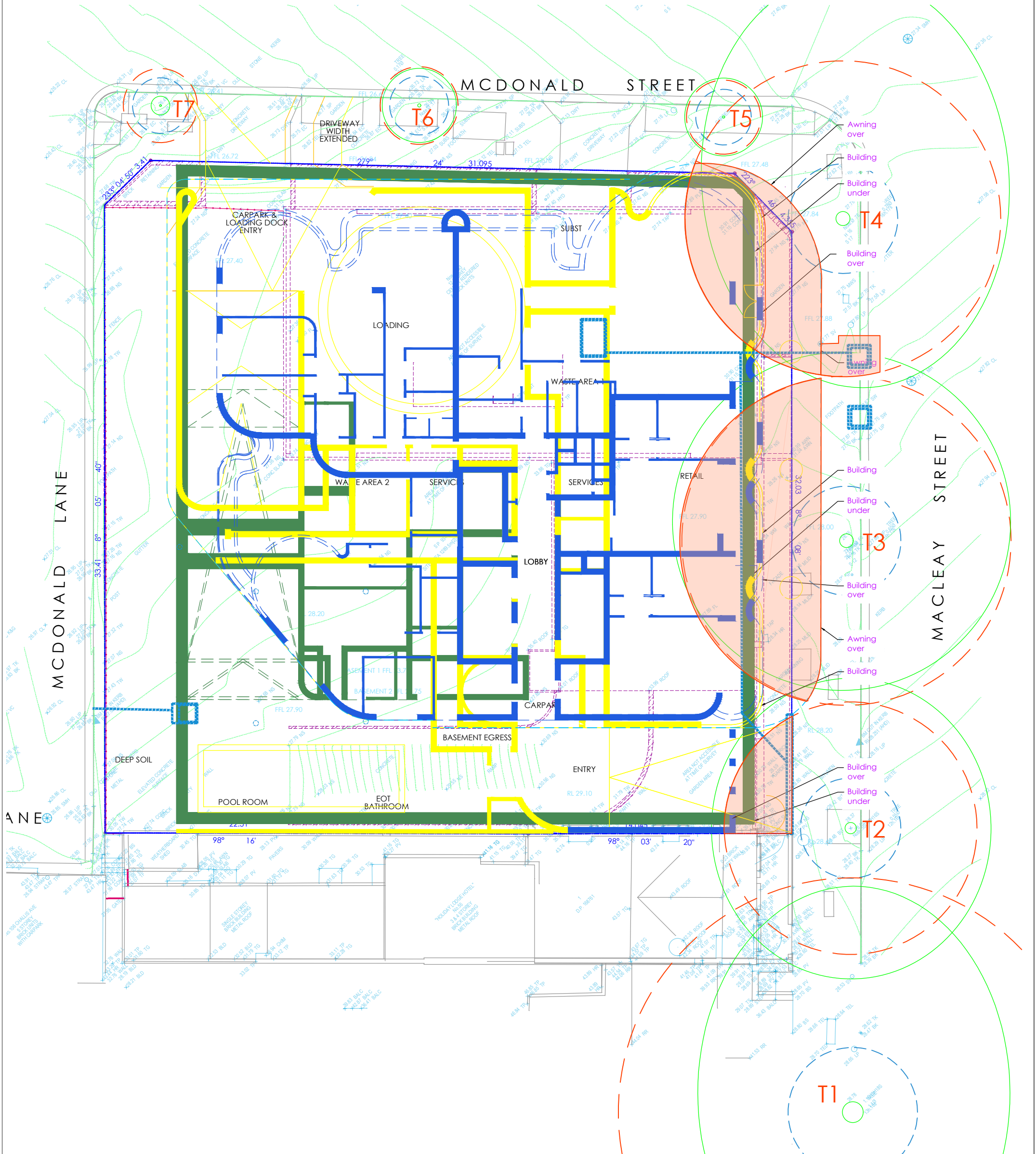
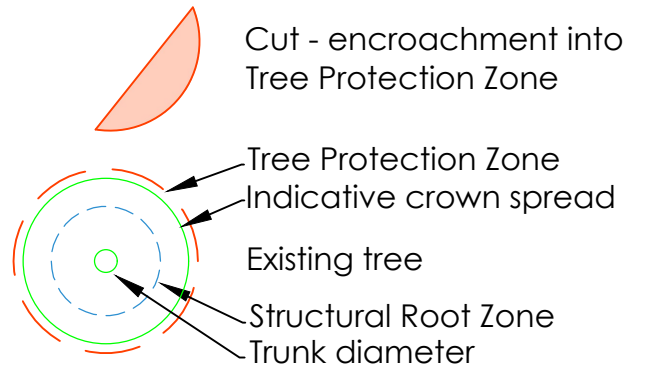
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DRAWN: **RC** CHECK: **AS** DATE: **13-02-25** REVISION: **F**



LEGEND

- +101.45 Existing levels
- + RL 101.55 Proposed levels
- + TOW 101.55 Proposed Top Of Wall levels
- Boundary
- To be removed / demolished
- Hydraulic lines - SW
- Building over
- Building
- Building under



REVISION	DESCRIPTION	DRAWN	CHECK	DATE
A	SUBMITTED TO CLIENT FOR COMMENT	RC	AS	17-08-21
B	SUBMITTED TO CLIENT FOR COMMENT	RC	AS	18-10-21
C	SUBMITTED TO CLIENT FOR COMMENT	RC	AS	31-07-23
D	SUBMITTED TO CLIENT FOR COMMENT - ARCHITECTURAL AMENDMENT - BASEMENT	RC	AS	12-09-23
E	SUBMITTED TO CLIENT FOR COMMENT - AMENDED ENVELOPE	RC	AS	30-01-24
F	SUBMITTED TO CLIENT FOR COMMENT - AMENDED STORMWATER	RC	AS	13-02-25

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ADDRESS: **45-53 MACLEAY STREET, POTTS POINT**

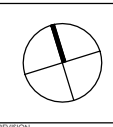
CLIENT: **TIME AND PLACE**

PROJECT: **MULTI-STOREY RESIDENTIAL**

DRAWING: **TREE LOCATION PLAN - LEVELS COMBINED**

SCALE: **N.T.S. @ A3** | ISSUE: **DA** | SHEET: **T-04**

DRAWN: **RC** | CHECK: **AS** | DATE: **13-02-25** | REVISION: **F**



10. General Tree Protection Notes

10.1. Structural Root Zone (SRZ)

The SRZ is a radial area extending outwards from the centre of the trunk calculated as follows:

$$\text{SRZ (Radius)} = (D \times 50)^{0.42} \times 0.64$$

10.2. Tree Protection Zone (TPZ)

The TPZ is a radial area extending outwards from the centre of the trunk equal to the DBH x 12. This area shall be protected by a TPF (see below). For all trees to be retained a TPZ is to be created and maintained.

The TPZ function is primarily to protect the root zone by restricting access however the canopy of the tree shall also be protected from damage or injury. The Project Arborist shall approve the extent of the TPZ.

The TPZ shall be mulched to a depth of 75mm with an approved organic mulch. Supplementary watering shall be provided in dry periods to reduce water or construction stress, particularly to those trees which may have incurred root disturbance.

An area equivalent to the encroachment is required to be provided (additional to and contiguous with the remaining TPZ) to offset against the encroachment. This additional area is to be protected during construction.

In the TPZ the following activities shall be excluded:

- Excavation, compaction or disturbance of the existing soil.
- The movement or storage of materials, waste or fill.
- Movement or storage of plant, machinery, equipment or vehicles.
- Any activity likely to damage the trunk, crown or root system.
- Scaffolding.

10.3. Tree Protection Fencing (TPF)

Prior to site establishment, tree protection fencing shall be installed to establish the TPZ for trees to be retained. Tree protection fencing shall be maintained entire for the duration of the construction program.

Tree protection fencing shall be:

- To enclose as much of the TPZ as can reasonably be enclosed, allowing for pedestrian access and 1m offset around construction footprint and scaffolding.
- Cyclone chain link wire fence or similar, with lockable access gates.
- Certified and Inspected by the Project Arborist
- Installed prior to the commencement of the works.
- Prominently signposted with 300mm x 450mm boards stating **"NO ACCESS TO THIS AREA - TREE PROTECTION ZONE CONTACT PROJECT ARBORIST 0407 006 852"**.

10.4. Trunk, Lower Branches and Root Zone Protection

Other measures may be required in addition to tree protection fencing. These specific protection measures will be installed as directed by the Project Arborist to protect the canopy, trunk or branches from the risk of damage.

Trunk and lower branch protection may be required to alleviate mechanical damage to a height of 3m. The minimum trunk protection shall consist of an initial padding layer beneath and battens consistent with *The Australian Standard for the Protection of Trees on Development Sites (AS 4970 – 2009), Section 4 and paragraph 4.5.2 and Figure 4*. The battens shall consist of lengths of 100 x 50mm (or varied to accommodate risk and tree structure) timber boards secured side by side, spaced 50mm apart with galvanised steel banding for the full circumference of the trunk without driving nails or screws into the trunk or branches. Trunk protection should be installed prior to any site works, maintained throughout the construction program and removed post construction.

Root protection may be required if site access and construction activities will not be able to be excluded from the entire TPZ as the installation of the tree protection fence is not reasonably practicable. Installation of root protection prior to the commencement of works to prevent the damage to roots such as i) Rumble boards as per section 4.5.3 - Ground protection and Figure 4 of AS4970 Protection of trees on development sites; or ii) construction of the above ground driveway.

The Project Arborist shall be consulted if there is risk of damage to a retained tree. The Project Arborist may require:

- A 75mm layer of approved mulch to be installed to the TPZ.
- A temporary drip irrigation system to be installed to the TPZ.

10.5. Tree Damage

In the event of damage to a tree or the TPZ of a tree to be retained the Project Arborist shall be engaged to inspect and provide advice on remedial action. This should be implemented as soon as practicable and certified by the Project Arborist.

10.6. Excavation within the TPZ

Excavation within the TPZ shall be avoided. All care shall be undertaken to preserve tree root systems. Excavation within the TPZ shall subject to the approval and supervision of the Project Arborist.

Excavation shall be executed by hand to avoid damage to roots by first excavating a narrow trench to the depth required. This will allow the location of woody structural roots greater than 40mm which can then be retained intact as necessary or pruned cleanly by and AQF level 3 Arborist or Horticulturalist. Final cut of roots should result in a clean cut, using appropriate tools as prescribed by the Australian Standard *AS4970-2009 Protection of trees on development sites*.

If excavation within the TPZ is required other than that anticipated in this report the Project Arborist shall be notified. A root mapping exercise may be required and should be certified by the Project Arborist. Root mapping shall be undertaken by either ground penetrating radar (GPR), air spade, water laser or by hand excavation. The purpose shall be to locate woody structural roots greater than 40mm in diameter.

Where roots 40mm dia. or greater are encountered, alternative construction method shall be considered to ensure roots are not severed. Adequate allowance must also be made for future radial root growth. In paved areas, consideration should be given to raising the proposed pavement level and using a porous fill material in preference to excavation.

If there is no avoiding placing services through the TPZ excavate outside the TPZ and underbore below the root ball of the tree as directed by the Arborist.

10.7. Fill

All fill material to be placed within the TPZ should be approved by Arborist and equal to 5-7mm Round River Pea Gravel to provide aeration and percolation to the root zone. Otherwise no fill should be placed within the TPZ of trees to be retained.

10.8. Pavements

Proposed paved areas within the TPZ should be placed on or above grade to minimise excavation, and avoid root severance and/or damage. Pavements should be permeable or avoided otherwise.

10.9. Pruning

All pruning work required (including root pruning) should be in accordance with Australian Standard No 4373 -2007 - *Pruning of Amenity Trees*. A Pruning Specification Report may be required if pruning works are proposed.

Roots should be severed with clean sharp implement flush with the face of the excavation and maintained in a moist condition. Severing roots by earthmoving equipment is unacceptable as this results in tearing damage to roots, putting the tree at greater risk of root decay and/or structural instability. Root pruning shall be performed under the supervision of the Project Arborist.

If required, branch reduction should be made to internal lateral branches or stems which are at least 1/3rd of the diameter of the branch being cut – or – removed at the branch collar, consistent with AS 4373 -2007; Sections 6.4 a) & b) and 7.3. Deadwooding should be carried out as required.

Whilst work is being carried out by climbing arborists (AQF Level 3) an aerial inspection of stems, branches and their attachments should be made. If minor additional works are needed to remove or correct defects it should be done at that time. If significant defects are found requiring heavy pruning or whole tree removal, photos should be taken and an AQF Level 5 Arborist be consulted prior to work being done.

10.10. Tree Removal

Tree removal work shall be carried out by an experienced Level 3 Arborist in accordance with the NSW Work Cover Code of Practice for the Amenity Tree Industry (1998).

Care shall be taken to avoid damage to trees during the felling operation. Stumps shall be grubbed-out using a mechanical stump grinder to a minimum depth of 300mm without damage to other retained root systems.

10.11. Post Construction Maintenance

In the event of any tree deteriorating in health after the construction period, the Project Arborist shall be engaged to provide advice on any remedial action. Remedial action shall be implemented as soon as practicable and certified by the Project Arborist.

Tree protection fencing with additional trunk and root protection shall be removed following completion of construction. The mulch layer in the TPZ shall be retained and replenished where required to maintain a 75mm thickness.

11. References

1. **AS 4970 - 2009 Protection of Trees on Development Sites**; Standards Australia.
2. **AS 4373 - 2007 Pruning of Amenity Trees**; Standards Australia.
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4. Fairley, A., Moore, P.; **Native Plants of the Sydney District an Identification Guide**; New Holland; Sydney; 2002.
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6. Benson, D., & Howell, J.; **Natural Vegetation of the Sydney Area -1:100,000 Map**; Royal Botanic Gardens Sydney; 1994.
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13. Robinson, L.; **Field Guide to the Native Plants of Sydney**; Kangaroo Press; Sydney; 1994.
14. Shigo, A. L.; **Modern Arboriculture Touch Trees**; Shigo and Trees Associates; New Hampshire; 2003.
15. Wrigley, J. W., Fagg, M. A.; **Australian Native Plants Cultivation, Use in Landscaping and Propagation**; Kangaroo Press; Sydney; 2003.
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