



UPGRADES TO ORANGE GROVE PUBLIC SCHOOL ARBORICULTURAL IMPACT ASSESSMENT - REF

APPROVAL PATHWAY:

**SECTION 5.1 OF THE ENVIRONMENTAL PLANNING AND
ASSESSMENT ACT 1979 (the Act)**

PREPARED FOR:

THE DEPARTMENT OF EDUCATION (DoE)

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16/06/2020	Issued Development Application	AM	AS
21/12/2024	Issued REF – Sub to client comment	AM	AS
01/05/2025	Issued REF – Revision Sewer + Civil SW	AM	AS
20/11/2025	Issued REF – Revision Sewer + Civil SW	AM	AS
17/12/2025	Issued REF – DET Comments	AM	AS
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24/02/26	Issued SINSW STP Comments	AM	AS
09/03/26	Issued SINSW STP Comments	AM	AS

Executive Summary

This Arboricultural Impact Assessment report has been prepared to accompany a Review of Environmental Factors (REF) for an activity proposed by the Department of Education under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP TI).

This document has been prepared in accordance with the Guidelines for Division 5.1 assessments (the Guidelines) by the Department of Planning, Housing and Infrastructure.

This report examines and takes into account the relevant environmental factors in the Guidelines and Environmental Planning and Assessment Regulations 2021 under Section 170, Section 171 and Section 171A of the EP&A Regulation as outlined in Table 1.

Table 1 – Summary of Relevant Section of the Part 5 Guidelines, EP&A Regulation & School Specific Guidelines			
Regulation / Guideline Section	Requirement	Response	Report Section
Section 171(1)(c) - Any environmental impact on the ecosystems of the locality?	(c2) long and short-term impact of: (ii) removed canopy cover. Any one or more of the following: • cutting down, and removing vegetation.	Tree 24 – to be removed	4.3, 4.4, 5
Section 171(1)(c) - Any environmental impact on the ecosystems of the locality?	(c2) long and short-term impact of: (i) loss or harm to trees or other vegetation. Any one or more of the following: • lopping (pruning) vegetation.	Trees 16, 17, 25, 26, 27, 28, 63, 67, 68, 69, 70, 78 will require selective root and/or crown pruning to accommodate works. To be managed in order to optimise sustainability of trees	4.3, 5

The site is within the LGA of the Inner West Council at the site address of 2-8 Perry St, Lilyfield. The aim of this report is to provide an assessment in accordance with AS4970 – 2009 'Protection of trees on development sites' of the potential impacts of the proposed development upon 65 trees. The 65 trees assessed by this report comprise 58 trees within the activity area (see Figure 1 below) and 7 trees outside the activity area but which require an impact assessment as a result of the activity.

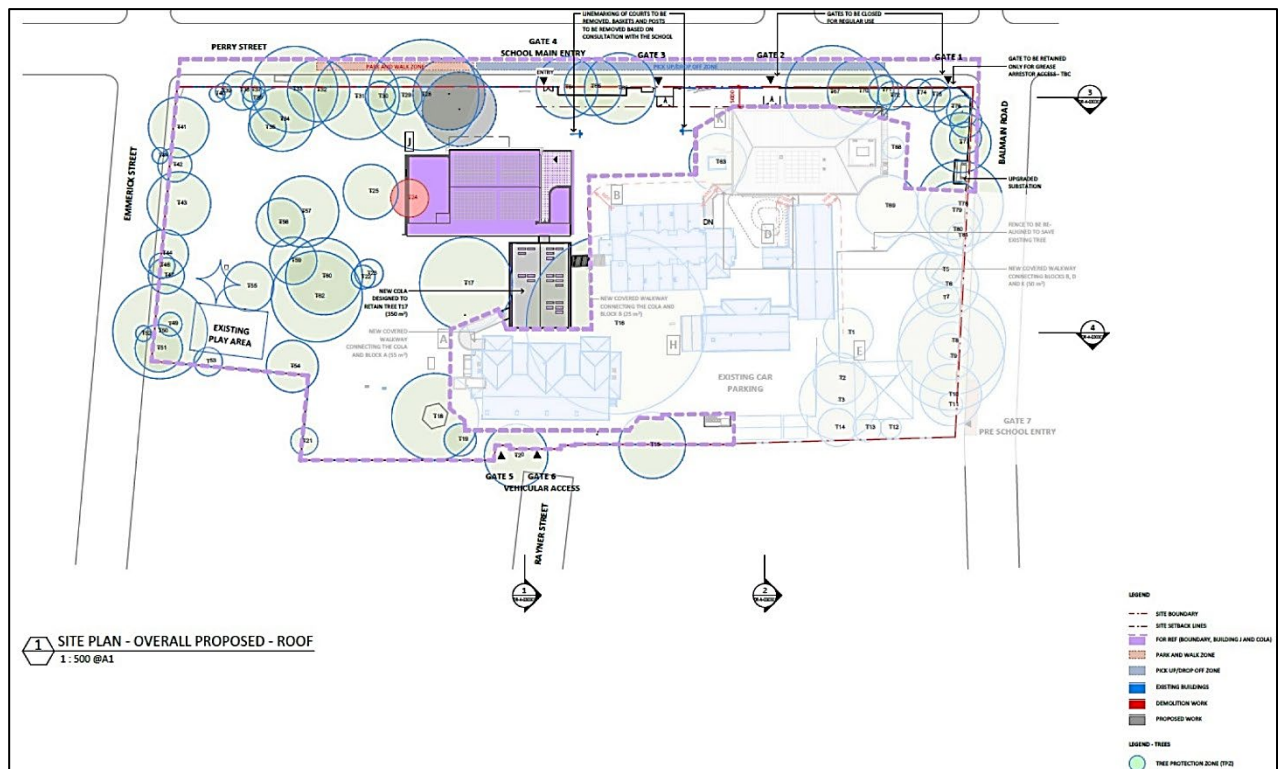


Figure 1 – Extent of REF works assessed in this report are within the dashed mauve line. Refer also to **9 Tree Location Plan** (page 43).

This report collates and presents information collected by Andrew Morrison on the 14/11/19 & 09/08/24. The data collected is located at **7. Tree Survey Table** (page 27) also see **8. Tree Survey Table Notes** (page 37) for notes relating to tree survey table.

Generally the site's vegetation was observed to have a majority native tree canopy, with an exotic shrub midstorey and an exotic turf groundcover layer. The existing surveyed trees are shown at **9. Tree Location Plan** (page 43).

The proposed activity is for upgrades to Orange Grove Public Primary School and comprises the following:

- Demolition of Building C
- Demolition of Building G
- Removal of ancillary structures – paths, fencing along the northern boundary
- Removal of posts on sports courts (to be undertaken in consultation with the school)
- Removal of existing assembly Covered Outdoor Learning Area (COLA) south of Building C
- Removal of portable classroom buildings
- Removal of one (1) tree
- Construction of a three-storey building (Building J)
- Construction of a COLA south of Building J
- Use of a portable buildings for the purpose of a library during construction works
- Associated works including stormwater drainage works, services works including installation of a substation, installation of an onsite detention tank, waste storage facilities, landscaping (including tree planting) and fencing.

An aerial photograph of the site is provided in Figure 2 below.



Figure 2: Aerial Photograph

The existing hours of operation for the site includes the following:

- School: Monday to Friday (during school term), 9am to 3pm;
- Preschool: Monday to Friday (during school term), 9am to 3pm;
- Out of School Hours Care: Monday to Friday (during school term), 7am to 9am and 3pm to 6pm;
- Vacation Care: Monday to Friday (during school holidays), 7am to 6pm; and
- Organic Markets: Saturdays, 8am to 1pm (set up from 7am, pack down to 4pm) and up to 4 special occasions per year not on a Saturday.

The proposed development 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 43).

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	Within Dev. Footprint – Gardens only
	High	#15, 57, 60, 85 (4)	# 16, 84	# 17, 28, 77	#	#78
	Medium	#32, 38, 42, 43, 44, 45, 47, 50, 51, 54, 55, 56, 58, 59, 61, 62, (16)	#18, 20, 25, 31, 33, 34, 41, 64, 65, 66, (10)	# 26, 27, 67, 70, (5)	#	#
	Low	#19, 21, 22, 23, 30, 36, 37, 39, 40, 46, 48, 49, 52, 53, 82, 83 (16)	#29, 35	#	#24	#71, 72, 73, 74, 75, 76
	Total Number of trees	36	14	7	1	7
	TOTAL	65				

In consideration of the data collected the recommendations included in this report are tabulated as follows

1. Mitigation Measures to reduce environmental impact of the proposed works under the EP&A Act 1979 and EP&A Regulations 2021, and
2. Particular recommendations according to AS4970-2009 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.

These are found in **5 Evaluation of Environmental Impacts & Recommendations** (page 21).

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1. Introduction

This Arboricultural Impact Assessment report has been prepared to accompany a Review of Environmental Factors (REF) for an activity proposed by the Department of Education under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP TI).

This document has been prepared in accordance with the Guidelines for Division 5.1 assessments (the Guidelines) by the Department of Planning, Housing and Infrastructure.

This report examines and takes into account the relevant environmental factors in the Guidelines and Environmental Planning and Assessment Regulations 2021 under Section 170, Section 171 and Section 171A of the EP&A Regulation as outlined in Tables 1 & 2.

Table 1 – Summary of Relevant Section of the Part 5 Guidelines, EP&A Regulation & School Specific Guidelines			
Regulation / Guideline Section	Requirement	Response	Report Section
Section 171(1)(c) - Any environmental impact on the ecosystems of the locality?	(c2) long and short-term impact of: (ii) removed canopy cover. Any one or more of the following: • cutting down, and removing vegetation.	Tree 24 – to be removed	4.3, 4.4, 5
Section 171(1)(c) - Any environmental impact on the ecosystems of the locality?	(c2) long and short-term impact of: (i) loss or harm to trees or other vegetation. Any one or more of the following: • lopping (pruning) vegetation.	Trees 16, 17, 25, 26, 27, 28, 63, 67, 68, 69, 70, 78 will require selective root and/or crown pruning to accommodate works. To be managed in order to optimise sustainability of trees	4.3, 5

The site is within the LGA of the Inner West Council at the site address of 2-8 Perry St, Lilyfield. The aim of this report is to provide an assessment in accordance with AS4970 – 2009 'Protection of trees on development sites' of the potential impacts of the proposed development upon 56 trees.

This report collates and presents information collected by Andrew Morrison on the 14/11/19 & 09/08/24. The data collected is located at **7. Tree Survey Table** (page 27) also see **8. Tree Survey Table Notes** (page 37) 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 Arboreport 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 trees may not arise in the future.

2.2. Site Inspection

A visual inspection of the tree/s was performed from ground level, 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 II.
- Canopy width is measured with a Leica Disto (laser distometer) OR 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 27). 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 37).

The physical data for tree locations, crown width and DRB is schematically described in **9. Tree Location Plan** (page 43).

2.5. Reference Documents

The report was written with reference to:

- Survey Plan prepared by LTS Lockley File 50696 001DT 04-05-22 Revision F, dated 22/04/22.
- Orange Grove – Adjusted REF Area (preliminary sketch), supplied by DET, client, 11/11/25.
- Orange Grove Primary School Stormwater Catchment Plan, by NDY, Revision T4, dated 27/10/25.
- Orange Grove – Elec Route (preliminary sketch), supplied by DET, client, 11/11/25.
- Architectural Site Plan – Overall Demolition prepared by PTW – File OGPS-PTW-B00K-ZZ-DR-A-200202_PDF_05 Revision 22, dated 25/10/25.
- Architectural Site Plan – Overall Proposed prepared by PTW - File OGPS-PTW-B00K-ZZ-DR-A-202003_PDF_05 Revision 24, dated 26/01/26.
- Orange Grove Public School Hydraulic Drawing Set prepared by NDY, revision T3, dated 28/03/25.
- Orange Grove Public School Civil Layout Plan Set, Sheets 1 & 2 prepared by NDY, revision T2, dated 16/12/24.
- Orange Grove Public School Fire Drawing Set prepared by NDY, revision T2, dated 16/12/24.
- Landscape Plan prepared by PTW Revision 04 dated 13/12/24.
- Australian Standard 4970-2009 'Protection of Trees on Development Sites'.

2.6. Council Tree Preservation Regulatory Controls

The Inner West Council Tree Management Plan defines a tree as:

- i. any tree with a height equal or greater than 4m above ground level (existing) or
- ii. any tree that is under 4 metres in height that has a trunk diameter of more than 150mm at Diameter at Breast Height (DBH at 1.4m) or
- iii. any tree with a canopy spread equal to or greater than 2 metres or any palm tree or tree fern with a clean stem length equal to or greater than 4 metres above ground level (existing).

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

Orange Grove Public School is a co-educational primary school located at 2-8 Perry Street, Lilyfield. The site has street frontage to Perry Street, Balmain Road, Emmerick Street and Rayner Street. The site comprises 15 allotments with a total area of 17,956m² including:

- Lots 21 & 22 Deposited Plan (DP) 3796;
- Lots 1 & 5 DP 114899;
- Lot 1 DP 122488;
- Lot 1 DP 169451;
- Lots 1 – 3 DP 312710;
- Lot 1 DP 449967;
- Lots 1 & 2 DP 925435;
- Lot 1 DP 931891;
- Lot 1 DP 1037366; and
- Lot 102 DP 1160224.

The existing permanent buildings on the site include:

- **Building A:** Two-storey, neo-Georgian, inter-war brick building built in 1928 containing administration and staff areas, along with 7 homebases/classrooms;
- **Building B:** Single storey, pre-WW1 brick structure containing 4 homebases;
- **Building C:** Single storey brick building containing library and music rooms;
- **Building D:** Single storey 'L' shaped building (c. 1894) containing 6 homebases;
- **Building E:** Single storey pre-school building facing Balmain Road;
- **Building G:** Amenities building;
- **Building H:** Canteen; and
- **Building I:** Storage Shed.

Demountable classrooms are located in the north-eastern and north-western corners of the school site. A Covered Outdoor Learning Area (COLA) is located centrally within the site. The COLA links Buildings A, B and C. Playing areas are located on the northern, western and eastern boundaries of the site.

An aerial photograph of the site is provided in **Figure 2** below.

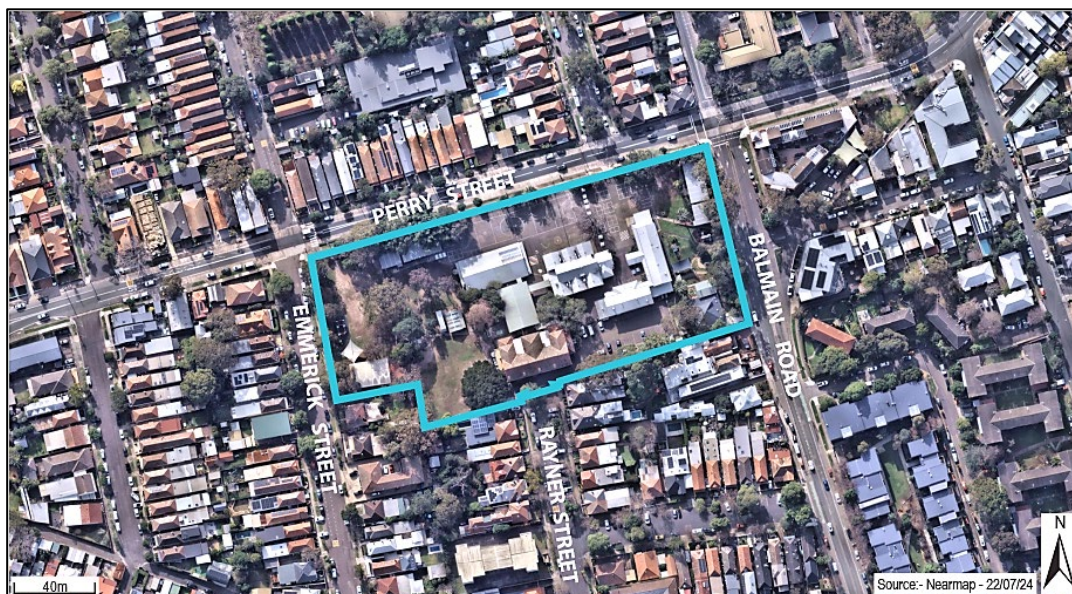


Figure 2: Aerial Photograph

The existing hours of operation for the site includes the following:

- **School:** Monday to Friday (during school term), 9am to 3pm;
- **Preschool:** Monday to Friday (during school term), 9am to 3pm;
- **Out of School Hours Care:** Monday to Friday (during school term), 7am to 9am and 3pm to 6pm;
- **Vacation Care:** Monday to Friday (during school holidays), 7am to 6pm; and
- **Organic Markets:** Saturdays, 8am to 1pm (set up from 7am, pack down to 4pm) and up to 4 special occasions per year not on a Saturday.

3.2. Other Approvals

Any public domain works (if required) will be subject to separate approval from the relevant public authority.

3.3. Soil Landscape Map

The soils in this area are from the Blacktown soil landscape group ³. They are generally shallow to moderately deep <100 cm Red and Brown Podzolic Soils on crests, upper slopes and well-drained areas; deep 150-300 cm Yellow Podzolic Soils and Soloths on lower slopes and in areas of poor drainage.

Generally the landscape is characterised by gently undulating rises on Wianamatta Group shales and Hawkesbury shale. There is local relief to 30 m, and slope gradients usually less than 5%. Additionally there are broad rounded crests and ridges with gently inclined slopes ³.

These soils are generally limited by moderately reactive highly plastic subsoil, low soil fertility, and poor soil drainage. The critical soil characteristics of this soil type for trees growing on this site include poor drainage. ³

3.4. 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.

The original native vegetation is characterised by Sydney Turpentine Ironbark Forest.

The Sydney Turpentine Ironbark Forest (STIF) is an endangered ecological community^{13, 14} and is dominated by *Syncarpia glomulifera* with *E. paniculata* and *E. eugeniodes* occurring less frequently. In areas of higher rainfall (1050 – 1080 mm per annum), *E. saligna* is dominant. *Eucalyptus punctata* occurs occasionally in areas where the shale soils are relatively shallow. ^{13, 14}

A stratum of small trees is usually present and is composed of a mixture of species including *Syncarpia glomulifera*, *Pittosporum undulatum*, *Trema aspera* and *Acacia parramattensis* subsp *parramattensis*. The shrub stratum is usually sparse, and contains predominantly mesic species such as *Pittosporum revolutum*, *Breynia oblongifolia*, *Maytenus sylvestris*, *Polyscias sambucifolia*, *Notelaea longifolia* and *Ozothamnus diosmifolius*^{13, 14}.

The ground stratum consists of a dense mixture of herb and grass species dominated by *Oplismenus aemulus*, *Pseuderanthemum variabile* and *Echinopogon ovatus*. Other frequently recorded species include *Entolasia marginata*, *Pratia purpurascens*, *Dianella longifolia*, *Arthropodium milleflorum* and *Rubus parvifolia*^{13, 14}.

Turpentine Ironbark Forest has been almost entirely cleared and has been listed as an endangered ecological community under the NSW Threatened Species Act (1995). There appears to be species representative of this vegetation community located on this site.

3.5. Summary of site inspection data

Generally the site's vegetation was observed to have a majority native tree canopy, with an exotic shrub midstorey and an exotic turf groundcover layer. The existing surveyed trees are shown at **9. Tree Location Plan** (page 43).

3.6. Summary of Proposed Development

The proposed activity is for upgrades to Orange Grove Public Primary School and comprises the following:

- Demolition of Building C
- Demolition of Building G
- Removal of ancillary structures – paths, fencing along the northern boundary
- Removal of posts on sports courts (to be undertaken in consultation with the school)
- Removal of existing assembly Covered Outdoor Learning Area (COLA) south of Building C
- Removal of portable classroom buildings
- Removal of one (1) tree
- Construction of a three-storey building (Building J)
- Construction of a COLA south of Building J
- Use of a portable buildings for the purpose of a library during construction works
- Associated works including stormwater drainage works, services works including installation of a substation, installation of an onsite detention tank, waste storage facilities, landscaping (including tree planting) and fencing.

The proposed development 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 43).

3.7. 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	Within Dev. Footprint – Gardens only
	High	#15, 57, 60, 85 (4)	# 16, 84	# 17, 28, 77	#	#78
	Medium	#32, 38, 42, 43, 44, 45, 47, 50, 51, 54, 55, 56, 58, 59, 61, 62, (16)	#18, 20, 25, 31, 33, 34, 41, 64, 65, 66, (10)	# 26, 27, 67, 70, (5)	#	#
	Low	#19, 21, 22, 23, 30, 36, 37, 39, 40, 46, 48, 49, 52, 53, 82, 83 (16)	#29, 35	#	#24	#71, 72, 73, 74, 75, 76
	Total Number of trees	36	14	7	1	7
	TOTAL	65				

4. Discussion

4.1. Trees Not Impacted by the Proposal

- **High Significance Trees:** 15, 57, 60, 85
- **Medium Significance Trees:** 32, 38, 42, 43, 44, 45, 47, 50, 51, 54, 55, 56, 58, 59, 61, 62
- **Low Significance Trees:** 19, 21, 22, 23, 30, 36, 37, 39, 40, 46, 48, 49, 52, 53, 82, 83.

4.2. Trees with a Minor TPZ Encroachment

(Where the proposed construction encroaches within the TPZ by 10% or less). It will provide a low and sustainable impact on the tree.

- **Tree 16** is located 10.3m from proposed new replacement roof for COLA providing 4% encroachment within TPZ. The proposed roof is outside the crown however there is unconfirmed requirements for EWP clearance for roof removal and replacement operations.

This tree is a late mature Moreton Bay Fig (*Ficus macrophylla*). Photos in the document Orange Grove Public School—Historic Cultural Landscape Heritage Assessment—October 2023 indicate this tree is likely to be over 100 years old (p22) and has been rated as of 'high' Heritage landscape significance in (p37). It is the oldest tree on the property. Late mature trees are highly sensitive to environmental changes within the TPZ. It has had recent pruning of major (150-300mm diameter) branches. Further pruning of crown or roots will be a high impact on the tree.

Construction requirements should be planned to avoid further pruning of crown or roots. There appears to be a clearance of 4m between the roof gutter and the underside of the crown. This should allow the proposed works to proceed without pruning.

- **Tree 18** is located 7.8m from the proposed elevator shaft, Building A, and timber edging providing 3% encroachment within the TPZ. This tree is considered to be of medium-high significance and should be retained and protected.

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.

- **Tree 20** is located 5.13m from the proposed garden planting providing 6% encroachment within the TPZ. This tree is considered to be of medium significance and is suitable for retention.

For discussion of garden refurbishment, see discussion as discussed for Trees 4, 71, 72, 73, 74, 75, 76 & 77, 79, 80 & 81 at **4.5 Trees within the development footprint – garden only** (page 20).

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.

- **Tree 25** is located 6.7m from proposed sewer trenching to the north of the tree providing 2% encroachment within the TPZ and encroachment within the SRZ. This tree is considered to be of medium significance and is suitable for retention.

The client has worked with Arboreport to relocate previously proposed stormwater and sewer layouts in order to reduce total impact to a low and sustainable level.

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.

- **Trees 29, 31, 33 & 34** have existing demountable building located within their TPZ. There disassembling and removal may provide an impact through over excavation of pier mountings or compaction by machinery.

These trees are of Low, Medium and Medium Significance respectively. They are located along the Terry Street frontage and should be retained and protected. Heavy trunks and cranes should be located outside the TPZ. If this cannot be achieved, the ground under the travel pathways and resting locations should be covered by rumble boards or similar to prevent soil compaction and root damage. Slewing pathways should avoid crown, large branches and trunks.

- **Trees 35 & 41** are 3.2m and 6.56m from proposed stormwater discharge pipe providing 10% and 2% encroachment within TPZ respectively. These trees are considered to be of medium significance and suitable for retention.

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.

- **Trees 64, 65 & 66** have proposed benches within TPZ, at the TPZ margin providing spot encroachment within TPZ. These trees are considered to be of medium significance and suitable for retention.

This will be a very low impact on the trees.

Tree **64** is located 1.99m from the proposed pavement refurbishment, providing 2% encroachment within the TPZ.

This minor encroachment provides a low impact to the tree, provided no excavation for construction operations or associated services is required within the TPZ. Compensatory soil volume elsewhere should be available for root growth.

- **Tree 84** is located 8.8m from proposed new slab for waste storage/collection providing 2% encroachment within the TPZ. This tree is considered to be of medium significance and is suitable for retention. This is a high significance tree located in a neighbouring property and must be retained and protected.

This minor encroachment provides a low impact to the tree, provided no excavation for construction operations or associated services is required within the TPZ. Compensatory soil volume elsewhere should be available for root growth.

4.3. Trees with a Major TPZ Encroachment

(Where the proposed construction encroaches within the TPZ by more than 10% or is within the SRZ).

- **Tree 17** will have several impacts from the proposed development which provide a major encroachment within the TPZ and SRZ. These will provide a potentially unsustainable cumulative impact without careful design and implementation. Therefore, final construction designs, layout and methodology is essential to retain and protect this tree.

This tree is a mature Dawn Redwood (*Metasequoia glyptostroboides*). When in adequate health, this species is somewhat tolerant of construction impacts, however, mature trees generally are sensitive to environmental changes within the TPZ.

Landscape Design – Decking, Ramp + Permeable Paving

The tree is currently surrounded by a raised garden bed retained with a 1-2 course high 'Keystone' block wall. It contains woody shrubs to 4-5m height. The garden bed is surrounded by asphalt surface having some fall and minor undulation.

The proposed landscaping is comprised of i) a raised metal mesh D1 decking 0.38m higher than existing garden bed (36% encroachment) which surrounds the tree entirely – in an oval shape; ii) a retaining wall and accessibility ramp to deck located 4.4m from the tree providing 20% cut encroachment (within existing retaining wall and asphalt hard stand); iii) a proposed accessible ramp to Building A located 9.08m from the tree providing 3% encroachment; and iv) proposed concrete stairs surrounding deck located 5.24m from providing 31% including anticipated P3 permeable pavement installation and transitions between existing paved surfaces and proposed areas. Landscape plans note that final design is to be determined in liaison with the Project Arborist.

The potential impacts to this tree are i) damage to trunk and buttresses during anticipated pruning works to existing shrubs; ii) damage to roots, including desiccation due to exposure on demolition of existing garden retaining wall and lifting of surrounding asphalt and exposure of the currently shaded soil surface to direct sunlight and heat; iii) damage to and severance of major roots during digging of footings for deck posts and new access ramp retaining wall and iv) excavation to provide depth for new permeable paving and permeable base profile.

Landscape Design – Demolition, garden beds, retaining walls & permeable paving

The potential impacts to this tree are i) damage to buttresses and structural roots during removal of existing plants; damage to same, including desiccation due to exposure on demolition of existing garden retaining wall and lifting of surrounding asphalt. Damage to and severance of major roots during digging of footings for new garden retaining wall and excavation to provide depth for new permeable paving and permeable base profile.

To mitigate impacts to this tree, the final design should provide the following in accordance with the Australian Standard AS4970-2009 *Protection of trees on development sites*:

- i) Levels of new garden to be similar to the existing garden. This may involve the grading of added soil levels outside the existing footprint to new wall – to limit excessive fill in these areas.
- ii) Levels of new permeable paving and combined profile of paving material + base to provide no excavation deeper than the underside of the existing asphalt, pending investigation of existing root distribution. Sub-base under paving should not be overly compacted; it should be 'consolidated'. Base used should be of gap-graded crushed rock in preference to recycled concrete; and substances added to promote and optimise tree growth as advised by the project arborist (refer to item 8, below).
- iii) Discontinuous ('pier' or 'spot') footings to be used for retaining walls, not continuous strip footings. The placement of footings is to avoid major roots.
- iv) The excavation and placement of subsoil garden drainage is to avoid major roots.
- v) A design which provides for flexibility to be adjusted to live, timely feedback from 'found' tree and tree root data during pre-demolition root investigation, demolition and construction stages.
- vi) Where root pruning cannot be avoided, timing and methods to prevent root desiccation should be implemented (covering/wrapping roots with damp sand, potting mix or hessian) between demolition/pavement lifting and construction. Records of roots retained and removed and/or damaged are to be made by the project arborist.
- vii) Planting and mulching of the new garden should be as discussed for Trees 71, 72, 73, 74, 75, 76, 77 & 80 at **4.5 Trees within the development footprint – garden only** (page 20).
- viii) Monitoring and maintenance of soil moisture levels to achieve during works and for a minimum period of 6 months after conclusion of works. Optimal range of soil moisture levels are considered to be in the range of -2kPa to -100kPa as measured by a tensiometer.
- ix) Application of Biological stimulants, humic acids, beneficial microbes ('probiotics'), suitable food ('prebiotics') and other ameliorants should be included in paving base and garden bed media, as advised by the Project Arborist. To be applied during works and for a minimum period of 6 months after conclusion of works.

If all the above is carried out this should be a low-moderate and sustainable impact upon the tree.

Additional items are listed below:

- x) The proposed raised RPF/metal mesh decking will provide a low impact. the supporting posts nearest the tree should be located to avoid large woody roots. If sufficiently achieved, this should provide a low to moderate impact on the tree.
- xi) Construction of surrounding concrete steps/stairs should be supported by piers and shallow slab footings to require discontinuous deep footings and shallowest possible requirement for scraping/excavation for continuous concrete slab. This will be a moderate and sustainable impact on the tree.

If the items are carried out as advised the cumulative impact is anticipated to be a low-moderate impact and sustainable impact

Building Design – 3 Storey Building to the north

The tree is located 12m to the south of the proposed 3 storey Admin Building, Building J. The building will be around 11.8m high and provide shading to the crown ranging from an estimated 5% in mid-summer to 23% in mid-winter.

This tree is deciduous in winter.

This is considered to be a low and sustainable impact on the tree, as the highest amount of shading will be during the winter after the annual shedding of leaves and the tree has less need of sunlight.

Services – Stormwater

The tree is located 9.88m from the stormwater strip drain. The impact from trenching is immediate root removal, discussed at T63, below. This provides a small encroachment within the overall concrete stair encroachment as is a very low impact on the tree.

Cumulatively, the impacts will be a moderate but sustainable impact provided that Project Arborist advice, supervision and monitoring is provided.

- **Trees 26, 27 & 28** are located within (T26) and 1.63m and 5.9m from P3 permeable paving (T27 & T28 respectively). There is encroachment within the SRZ of Trees 26 & 27. There are also beds of mass planting within the TPZ of all these trees and additional paving from the proposed staff area within the TPZ of T26 & T28.

These trees are mature Broad-leaved Paperbark (T26), Camphor Laurel (T27) and Hills Weeping Fig (T28). These species are very tolerant of construction impacts when in adequate health and vigour.

The potential impacts and mitigations are similar to those outlined in discussion of Tree 16, above, items 1, 2, 4, 5, 6, 7, 8 & 9.

If the mitigations are carried out as described to avoid compaction and excavation of soil containing roots immediately beneath the existing hardstand, the proposed development will provide a low-moderate and sustainable impact on these trees.

- **Tree 67** – Mature Camphor Laurel -is Located 1.85m from proposed indicative trenching of approximately 22m long, minimum 600mm deep for electrical conduit. Assuming an open trench having a width of 450mm the area of open trench is 4% of TPZ, however this provides an encroachment which would potentially result a loss of 41% of connected root mass if non-selective machine excavation is carried out (known as the 'shadow effect') and encroachment within the SRZ. It is located within a garden which will be refurbished.

Service – Electricity – Trenching Impacts

Services plans show trenching to be located within the TPZ for electrical conduit installation 2.3m from proposed indicative trenching providing a potential 41% trenching encroachment including 'shadow effect' and encroachment within the SRZ.

The impact from trenching is immediate root removal causing at least temporary moisture stress to the tree by altering the *root:shoot* balance. Carbohydrates and lipids which are stored in tree parts are expended to support compromised functions and initiate root growth near root cuts. Following trenching and backfill, the roots regrow through the trench backfill, the *root:shoot* balance is restored, and the tree will recover if it has enough resources to sustain it. Late mature trees have a reduced ability to access these resources. Large diameter roots found within the SRZ (e.g. >100mm dia) do not initiate new roots as readily, whilst the large surface area of the cutting wound face can be a site more likely to develop internal decay. Therefore trenching within the SRZ of mature trees is inadvisable.

The final trenching layout of these should therefore be located as far from the base of the tree as possible. I understand the general location of the trenching close to the south of the tree cannot be altered.

If the layout cannot be substantially altered to reduce encroachment to <15% of the TPZ, methodology to prevent the cutting or damaging of major structural or connecting roots (that is roots >30mm). Final plans should include the following.

- i) Conduit layout
 - a. Where possible, pipes could be located within existing building footprints rather than trenching outside the buildings.
 - b. If not, the path of the conduit trench should be deflected to be under the paved covered area of the building proposed in a separate application (Building K).
- ii) Excavation Methodology
 - a. Directional, thrust or other trenchless methods at a depth of greater than 800mm within the TPZ should be considered to avoid root damage.
 - b. If not, the conduit should be located as far away as possible from the tree (in the case of Tree 67, as close as possible to building K) and as shallow as possible using non-destructive excavation i.e. air spade to avoid cutting roots. **Air spade is preferable to water lance** as it is less likely to damage or strip root bark.
 - c. Timing and methods to prevent root desiccation (covering/wrapping roots with damp sand, potting mix or hessian) between trench excavation and backfill.
 - d. All works to be directed on site and supervised by a AQF Level 5 project arborist.
 - e. Backfill suitable for root growth should be used – e.g sand with some ameliorants, not recycled concrete.
 - f. Soil moisture monitoring and irrigation, application of biological stimulants as outlined below in
- iii) The pipes for any future services should be installed as close as possible to this conduit.

Landscape Design – Garden beds

The garden will be refurbished in the area of the existing garden footprint. I understand this will chiefly involve the application of mulch, possible shrub removal and the planting of new plant stock. The potential impacts to this tree are i) damage to buttresses and structural roots during removal and planting of plants and desiccation due to exposure from any soil replacement or level change.

To mitigate impacts to this tree, the final design should provide the following in accordance with the Australian Standard AS4970-2009 *Protection of trees on development sites*:

I note that the areas of garden surrounding Trees 67 & 70 are the main available areas of uncovered soil within the TPZ where management of soil moisture and health can be carried out effectively.

- iv) Levels of new garden to be similar to the existing garden. This may involve the grading of added soil levels outside the existing footprint to new wall – to limit excessive fill in these areas.
- v) Where root pruning cannot be avoided, timing and methods to prevent root desiccation should be implemented (covering/wrapping roots with damp sand, potting mix or hessian) between demolition/pavement lifting and construction. Records of roots retained and removed and/or damaged are to be made by the project arborist.
- vi) Planting and mulching of the new garden should be as discussed for Trees 71, 72, 73, 74, 75, 76, 77 & 80 at **4.5 Trees within the development footprint – garden only** (page 20).
- vii) Monitoring and maintenance of soil moisture levels to achieve during works and for a minimum period of 6 months after conclusion of works. Optimal range of soil moisture levels are considered to be in the range of -2kPa to -100kPa as measured by a tensiometer.
- viii) Application of Biological stimulants, humic acids, beneficial microbes ('probiotics'), suitable food ('prebiotics') and other ameliorants should be included in paving base and garden bed media, as advised by the Project Arborist. To be applied during works and for a minimum period of 6 months after conclusion of works.

- **Tree 70** is located 2.04m from proposed indicative trenching for electrical conduit providing a potential 32% trenching encroachment including 'shadow effect' and encroachment within the SRZ. It is located within a garden which will be refurbished.

This tree is a mature Peppercorn (*Schinus molle var areira*) in average health, located on the Perry Street boundary. When in adequate health and vigour, this species is somewhat tolerant of construction impacts (root pruning and crown pruning), however, mature trees generally are sensitive to environmental changes within the TPZ and generally require management (attention to soil health and moisture and selective pruning) to support their recovery from root and crown loss.

The discussion for Tree 67 applies to the impacts of the proposed works, trenching and garden refurbishment. Refer to items i) to viii) for that tree above.

- **Tree 77** is located 4.94m from proposed new electrical substation and associated trenching providing 12% encroachment of TPZ, including 'shadow effect'. It is also located within proposed mass planted garden bed. This may/may not include garden edging. It is located within a garden which will be refurbished.

This tree is a mature Lemon Scented Gum (*Corymbia citriodora*) in average-good health and structural condition, located near the Balmain Road boundary. When in adequate health and vigour, this species is somewhat tolerant of construction impacts (root pruning and crown pruning), however, mature trees generally are sensitive to environmental changes within the TPZ and generally require management (attention to soil health and moisture and selective pruning) to support their recovery from root and crown loss.

The discussion for Tree 67 applies to the impacts of the proposed works, trenching and garden refurbishment. Refer to items i) to viii) for that tree, above.

4.4. Trees within the development footprint

- **Tree 24** is located within the proposed development footprint of Building J. This tree is considered to be of low- medium significance and suitable for retention, however extensive redesign of the proposed building would be required to retain this tree. It cannot be retained.

4.5. Trees within the development footprint – garden only

- **Trees 71, 72, 73, 74, 75, 76 & 78, 79, 80 & 81** are located within existing garden beds which will be re-mulched and replanted with ground covers without adjusting surface levels. Trees 71, 72, 73, 74, 75, 76 & 81 are considered to be of low significance however are intended for retention. Trees 79 & 80 are of medium significance and are intended for retention. Tree 77, is located in this area (see separate above) is of high significance and should be retained and protected.

These trees can be easily retained and protected by ensuring that landscape and pruning works are carried out with care by including the following detail in landscape construction plans:

- a) Trunk protection is to be installed prior to commencement of landscape works.
- b) No skid-steer, back-hoes or heavy materials-handling equipment is permitted outside the existing hardstand area within the Tree Protection Zone: All landscaping works within the TPZ of these trees is to be undertaken with hand tools and light material handling equipment only (e.g. wheelbarrows, trugs, wheelie-bins etc).
- c) Garden edging should be carefully installed at grade without excavation.
- d) Ground preparation should involve minimal soil disturbance such as rotary hoeing, ripping, excavation and soil replacement. It should be localised around the individual planting and organic composts and mulches confined to the surface of the soil profile.
- e) Mulch should be a coarse, porous, largely woody material; mulch depth should not exceed 75mm and not be laid against tree trunks. To enhance and maintain organic matter, gaseous exchange, nutrient cycling and water holding capacity.
- f) Understorey planting arrangements should be not too dense – maximum 2 plants per square metre, and not within the SRZ of trees (refer to Tree Data Table). To provide the least root damage in short term and not excessive competition in the medium to long term.
- g) Plant stock should be a small size – preferably 75mm diameter or 'forestry tubestock' and no larger than 150mm diameter pots.

5. Evaluation of Environmental Impacts & Recommendations

In consideration of the data collected the recommendations include 1. Mitigation Measures to reduce environmental impact of the proposed works under the EP&A Act 1979 and EP&A Regulations 2021, and 2. Other recommendations according to AS4970-2009 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:

I. Mitigation Measures

ID	Mitigation Measure	Timing
E1	Tree Protection – Trees not approved to be pruned or removed are to be protected and maintained in accordance with AS 4970-2009 <i>Protection of Trees on Development Sites</i>. Tree protection must be approved by a Consulting Arborist AQF Level 5. Protections are to remain in place until the completion of all construction work in the vicinity of the protected trees. I. The retention and protection of the following trees as construction will not impact them: a. High Significance Trees: 15, 57, 60, 85 b. Medium Significance Trees: 32, 38, 42, 43, 44, 45, 47, 50, 51, 54, 55, 56, 58, 59, 61, 62. c. Low Significance Trees: 19, 21, 22, 23, 30, 36, 37, 39, 40, 46, 48, 49, 52, 53, 82, 83. II. The retention and protection of Tree No.'s 16, 18, 20, 25, 29, 31, 33, 34, 35, 41, 64, 65, 66 & 84. The construction will provide a minor encroachment into the tree protection zone. <u>The activity is to be undertaken generally in accordance with the particular recommendations set out in the Arboricultural Impact Assessment, prepared by Arboreport, dated 17/12/25</u>	Construction
E7*	Sewer, Stormwater & Electrical trenching Layout (Trees 17, 25, 67, 70 & 77) I. The retention and protection of Tree No.'s 67, 70 & 77 – by the following tree-sensitive Stormwater, water, sewer pipe & electrical conduit layout and installation: a. Conduit layout i. Where possible, pipes could be located within existing building footprints rather than trenching outside the buildings. ii. If not, the path of the conduit trench should be deflected to be under the paved covered area of the building proposed in a separate application (Building K). b. Excavation Methodology	Design

ID	Mitigation Measure	Timing
	i. Directional, thrust or other trenchless methods at a depth of greater than 800mm within the TPZ should be considered to avoid root damage. ii. If not, the conduit should be located as close as possible to building K and as shallow as possible using non-destructive excavation i.e. air spade to avoid cutting roots. Air spade is preferable to water lance as it is less likely to damage or strip root bark. iii. Timing and methods to prevent root desiccation (covering/wrapping roots with damp sand, potting mix or hessian) between trench excavation and backfill. iv. All works to be directed on site and supervised by a AQF Level 5 project arborist. v. Backfill suitable for root growth should be used – e.g sand with some ameliorants, not recycled concrete. vi. Soil moisture monitoring and irrigation, application of biological stimulants as recommended by the Project Arborist. vii. The pipes for any future services should be installed as close as possible to this conduit. II. T25 - Sewer line located at a minimum of 5.1m from north face of trunk. This assumes a 1.5m trench width and closest cut no closer than 4.4m to face of trunk. If the trench must be wider, the location of the pipe should be further from the face of trunk at a distance to achieve the 4.4m minimum from trenchworks, and III. T25 - Stormwater line located so that closest line of trenching cut is outside the TPZ, i.e. a minimum of 7.0m from east face of trunk- i.e. as close to Building J footprint as possible.	
E8*	Decking, Retaining wall, permeable paving & garden design – I. Design documents around Tree 17 should be co-ordinated to protect roots, trunk and crown of Tree No. 17 as follows: a. Levels of new garden to be similar to the existing garden. This may involve the grading of added soil levels outside the existing footprint to new wall – to limit excessive fill in these areas. b. Levels of new permeable paving and combined profile of paving material + base to provide no excavation deeper than the underside of the existing asphalt, pending investigation of existing root distribution. Sub-base under paving should not be overly compacted; it should be 'consolidated'. Base used should be of gap-graded crushed rock in	Design

ID	Mitigation Measure	Timing
	preference to recycled concrete; and substances added to promote and optimise tree growth as advised by the project arborist (refer to item 8, below). c. Discontinuous ('pier' or 'spot') footings to be used for retaining walls, not continuous strip footings. The placement of footings is to avoid major roots. d. The placement and excavation of garden drainage is to avoid major roots. e. A design which provides for flexibility to be adjusted to live, timely feedback from 'found' tree and tree root data during pre-demolition root investigation, demolition and construction stages. f. Where root pruning cannot be avoided, timing and methods to prevent root desiccation should be implemented (covering/wrapping roots with damp sand, potting mix or hessian) between demolition/pavement lifting and construction. Records of roots retained and removed and/or damaged are to be made by the project arborist. g. Planting and mulching of the new garden should be as per E10: a)-g) to minimise root damage. h. Monitoring and maintenance of soil moisture levels to achieve during works and for a minimum period of 6 months after conclusion of works. Optimal range of soil moisture levels are considered to be in the range of -2kPa to -100kPa as measured by a tensiometer. i. Application of Biological stimulants, humic acids, beneficial microbes ('probiotics'), suitable food ('prebiotics') and other ameliorants should be included in paving base and garden bed media, as advised by the Project Arborist. To be applied during works and for a minimum period of 6 months after conclusion of works. j. The bearer and/or joist framing supporting the proposed raised RPF/metal mesh decking shall be designed to provide an air gap between existing garden surface levels and underside of bearers, with no excavation, especially within the SRZ. k. A minimum of 300mm air gap should be provided under decking. l. Supporting posts for the proposed raised RPF/metal mesh decking nearest the tree should be located to avoid large woody roots. Initial exploratory excavations should be carried out by hand under Project Arborist supervision and direction. m. Final support post locations to follow root location (mapping) under project arborist supervision. n. Construction of surrounding concrete steps/stairs should be supported by piers and shallow slab footings to require discontinuous deep footings and	

ID	Mitigation Measure	Timing
	shallowest possible requirement for scraping/excavation for continuous concrete slab. II. Paving design documents should be co-ordinated to protect roots, trunk and crown around Trees 26, 27 & 28 as follows: a. Levels of new permeable paving and combined profile of paving material + base to provide no excavation deeper than the underside of the existing asphalt, pending investigation of existing root distribution. Sub-base under paving should not be overly compacted; it should be 'consolidated'. Base used should be of gap-graded crushed rock in preference to recycled concrete; and substances added to promote and optimise tree growth as advised by the project arborist (refer to item 8, below).	
E9*	Construction Methodology (Trees 16, 17, 26, 27, 28, 64, 67, 70 & 77) - No soil compaction and careful, non-destructive excavation of soil containing roots within the TPZ (especially the SRZ).	Design
E10*	Garden Bed Design (Trees 71, 72, 73, 74, 75, 76, 77 & 78) – Protect these trees from landscape impacts by the following barriers, design and methodologies: a. Trunk protection is to be installed prior to commencement of landscape works. b. No skid-steer, back-hoes or heavy materials-handling equipment is permitted outside the existing hardstand area within the Tree Protection Zone: All landscaping works within the TPZ of these trees is to be undertaken with hand tools and light material handling equipment only (e.g. wheelbarrows, trugs, wheelie-bins etc). c. Garden edging should be carefully installed at grade without excavation. d. Ground preparation should involve minimal soil disturbance such as rotary hoeing, ripping, excavation and soil replacement. It should be localised around the individual planting and organic composts and mulches confined to the surface of the soil profile. e. Mulch should be a coarse, porous, largely woody material; mulch depth should not exceed 75mm and not be laid against tree trunks. To enhance and maintain organic matter, gaseous exchange, nutrient cycling and water holding capacity. f. Understorey planting arrangements should be not too dense – maximum 2 plants per square metre, and not within the SRZ of trees (refer to Tree Data Table). To provide the least root damage in short term and not excessive competition in the medium to long term.	Design

ID	Mitigation Measure	Timing
	g. Plant stock should be a small size – preferably 75mm diameter or ‘forestry tubestock’ and no larger than 150mm diameter pots. Generally, the replacement planting of 1 or more canopy tree shall be installed in 25L pot size to offset the loss of canopy from removal of Tree 24. Adequate soil volume and quality should be specified to allow the tree(s) to attain their full size and provide maximum possible ecosystem services.	
E11*	Construction Methodology (Tree 16) – The retention and protection of Tree No. 16 (Heritage Tree, high significance). I. Roof replacement demolition and construction operations should be planned that no interaction with branches and foliage (crown) occurs. No pruning of this tree should be carried out. II. Finalise detailed construction design and methodology so that deployment of Elevating Work Platform (EWP) (or similar) or roofing material will not touch branches or leaves of Tree 16.	Design
E12*	Project Arborist - A Project Arborist be appointed to oversee, regularly inspect, and provide on-site advice plus reportage for all works in proximity to trees. I. A site specific Tree Protection Plan should be prepared to guide: (A) construction final design and methodology; (B) Tree Protection barrier installation, and; (C) the 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, sections 4 & 5. II. Root Mapping to verify major roots in areas of post support footings for decking or retaining walls in or close to the SRZ, under project arborist supervision prior to finalisation of detailed design and construct drawings as the proposed works will constitute a major encroachment within the TPZ. III. 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. IV. If revision is undertaken of any architectural, Civil, landscape, construction and service plans, liaison should be made with the Project Arborist. This arboricultural impact assessment (AIA) should be revised immediately following such.	Construction

ID	Mitigation Measure	Timing
	V. This arboricultural assessment should be reviewed upon the preparation of stormwater, landscape, revised architectural, civil, hydraulic or service plans. VI. 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.	

Table 2 – Mitigation Measures

** denotes bespoke mitigation measure.*

II. Other Recommendations

- i) The removal of the following trees if the development proceeds in its current form as there is an unsustainable major encroachment into the tree protection zone.
 - a. T24 (within building J footprint),
- ii) For additional tree protection information see **6. Tree Management Plan** (page 26) and **10. General Tree Protection Notes** (page 48).

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 at Practical Completion.	Principal Contractor	Project Arborist	Following the removal of tree protection measures from HP 4
8	Final Inspection of trees by Project Arborist at Final Completion.	Principal Contractor	Project Arborist	Prior to issue of occupation certificate.

7. Tree Survey Table

(Following page).



REVISED TREE DATA OR ADDITIONAL TREE ON 12/11/25

TREE LOCATED IN ADJOINING PROPERTY ADJACENT TO REF AREA

No impact

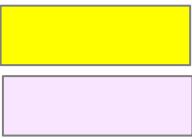
Minor encroachment

Major encroachment

Within development footprint

Within development footprint - garden only

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	Trunk Dia 2	Trunk Dia 3	Trunk Dia 4	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi- cance	Am	Eco	Form	Ret/ Rem	Development Setback and Encroachment	Comments
15	Corymbia	citriodora	Lemon Scented Gum	25	19	800	350			874	900	3166	10488	M	Av	Av	M-H	M-H	M	D,B	Ret.	No impact	Located in adjoining property near Tree 15, adjacent to REF area. Trunk base not accessible. Crown somewhat sparse. Recent renovations within the TPZ in adjacent property. Crown: N9, S-, E6, W14. Other nearby trees on the property assessed on 12/11/25 - Refer to Tree No.'s 82, 83, 84 & 85.
16	Ficus	macrophylla	Moreton Bay Fig	14	22	1900				1900	1900	4333	15000	M	G	Av	M-H	M-H	M	D,S	Ret.	Located 10.3m from proposed new replacement roof for COLA providing 4% encroachment within TPZ. The proposed roof is outside the crown however there is unknown scaffolding requirements for construction operations.	Late mature, showing some signs of retrenchment. Located in raised bed. 6x6m DBH 2,100 NS; 1700EW. Measured at 0.900m above garden surface. Recently reduction pruned - crown reduction. In fruit. Low FOB prune wounds with seasoned exposed hardwood, no signs of decay. Crown: N11, S13, E12, W11.6. Underside of STH crown 3.5m above existing COLA roof gutter.
17	Metasequoia	glyptostroboides	Dawn Redwood	17	13	970				970	1030	3351	11640	M	G	G	H	H	L	D,B	Ret.	Located within proposed raised RPF/metal mesh decking 0.38m higher than existing garden bed (36% encroachment). Located 4.4m from retaining wall and accessibility ramp to deck providing 20% cut encroachment (within existing retaining wall and asphalt hard stand). Located 9.08m from the proposed accessible ramp to Building A providing 3% encroachment. Located 5.24m from proposed concrete stairs surrounding deck providing 31% including anticipated permeable pavement installation and transitions between existing paved surfaces and proposed areas.	Tagged #62, previously. Less 5% DW to 80mm dia. Symmetrical canopy. Co-dom scaffold w wide angled attachment at 3m, W. Existing RL at base of tree is 33.97
18	Ficus	macrophylla	Moreton Bay Fig	9	20	820				820	820	3045	9840	SM	G	G	M-H	M-H	M	D,B	Ret.	Located 7.8m from the proposed elevator shaft, Building A, and timber edging providing 3% encroachment within the TPZ.	Surrounded by raised timber deck and seating. DBH taken at 0.9m above grade (a.g.). Crown: N10, S9, E10, W10. Existing RL at base of tree is 34.29



REVISED TREE DATA OR ADDITIONAL TREE ON 12/11/25



TREE LOCATED IN ADJOINING PROPERTY ADJACENT TO REF AREA



No impact



Minor encroachment



Major encroachment



Within development footprint



Within development footprint - garden only

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	Trunk Dia 2	Trunk Dia 3	Trunk Dia 4	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi- cance	Am	Eco	Form	Ret/ Rem	Development Setback and Encroachment	Comments
19	Pinus	halepensis	Aleppo pine	8	7	340				340	410	2276	4080	SM	F	Av	L	L	L	CD,U ,Co	Ref.	No impact	-
20	Lophostemon	confertus	Brush Box	11	11	670				670	750	2933	8040	M	F-Av	Av	M	M	M	D,B	Ref.	Located 5.13m from the proposed garden planting providing 6%	Located in road reserve adjacent to REF area. Crown somewhat sparse in upper east.
21	Feijoa	sellowiana	pineapple guava	5	7	140	250			287	350	2129	3444	M	G	Av	L	M	L		Ref.	No impact	-
22	Banksia	integrifolia	Coast Banksia	7	4	250				250	300	1996	3000	SM	G	G	L	L	M	CD,U	Ref.	No impact	-
23	Banksia	integrifolia	Coast Banksia	7	4	300				300	450	2366	3600	SM	G	G	L	L	M	CD,U	Ref.	No impact	-
24	Eucalyptus	sideroxylon	Mugga Ironbark	16	11	400				400	460	2388	4800	M	F	F-Av	L-M	M	M	CD,L	Rem.	Within development footprint - Building J	Moderate lean to SE. DW to 70mm dia. Wound at 0.6-1.5, 100mm wide, margins occuding with good vigour. Canker wound at 5m, W, with swellings (bulge) and response growth. Crown somewhat sparse with new growth evident, well mulched. Tagged #68
25	Eucalyptus	sideroxylon	Mugga Ironbark	16	14	580				580	660	2779	6960	M	G	Av	M	M-H	M	CD,B	Ref.	Located 6.7m from proposed sewer trenching providing 2% encroachment within the TPZ.	Tagged previously #69. FOB N @ 6m occluding with good vigour. Pruning wound.
26	Melaleuca	quinquenervia	Broad-leaved Paperbark	16	9	725				725	800	3013	8700	M	G	F-Av	L-M	L-M	M	CD,L, M	Ref.	Located within permeable paving providing encroachment within the SRZ and potentially 100% of the TPZ if excavation and compaction is required to install these items. Located 3.25m from mass planted garden bed providing 10% encroachment, and 4.89m from staff area, providing 15% encroachment within the TPZ.	Lean to SE. 350mm dia. FOB removed at 2m, E. 3 stems co-dominant at 2.5m, W, included bark. Crown: N3, S7, E7, W2.



REVISED TREE DATA OR ADDITIONAL TREE ON 12/11/25



TREE LOCATED IN ADJOINING PROPERTY ADJACENT TO REF AREA



No impact



Minor encroachment



Major encroachment

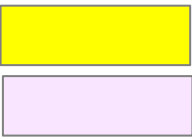


Within development footprint



Within development footprint - garden only

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	Trunk Dia 2	Trunk Dia 3	Trunk Dia 4	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi- cance	Am	Eco	Form	Ret/ Rem	Development Setback and Encroachment	Comments
27	Cinnamomum	camphora	Camphor Laurel	16	8.5	760				760	810	3029	9120	M	Av-G	Av	M	M	L	CD, CS	Ref.	Located 1.63m from P3 Pavement providing up to 20% encroachment within the TPZ and encroachment within the SRZ, if excavation and compaction is required to install these items. Located 3.86m from proposed Mass Planted beds providing 8% encroachment.	Less 5% DW to 50mm dia. Crown skewed to N. Prev pruned for clearance to OHPL. Crown: N7, S4, E11, W3.
28	Ficus	microcarpa var. hillii	Hills weeping Fig	17	18	1080				1080	1080	3418	12960	M	G	Av-G	M-H	M-H	M	D,B, M	Ref.	Located 5.9m from and P3 Pavement providing 15% encroachment within the TPZ. Located 10.1m from proposed Mass Planted beds providing 2% encroachment.	DBH measured at 0.9m. Trunk bifurcation at 1.2 n+S, both 750mm dia. Which both bifurcated @ 2.2m (around 550 mm ea). Crown: N10, S10, E4, W9.
29	Cinnamomum	camphora	Camphor Laurel	4.5	6	400				400	390	2228	4800	SM	P-F	Av	L	L	L	Su	Ref.	Low - Demolition only: Removal of Demountables	DBH measured at 1.0m.
30	Cinnamomum	camphora	Camphor Laurel	7	6	320				320	390	2228	3840	SM	P-F	Av	L	L	L	Su	Ref.	No impact	Bulge at 0.6m
31	Cinnamomum	camphora	Camphor Laurel	17	15	870				870	910	3181	10440	M	Av	Av	M	M	L	CD,B ,M	Ref.	Low - Demolition only: Removal of Demountables	DBH measured at 0.9m. Encircling root at base. DBH at 1.0m. 4.5mm H ? 3m to W. Pruned for OHPL (overhead power line) clearance. Crown: N8, S6, E7, W4.
32	Harpephyllum	caffrum	Kaffir Plum	15	11	660				660	730	2900	7920	M	G	Av	M	M	L	CD,B	Ref.	No impact	
33	Corymbia	citriodora	Lemon Scented Gum	18	18	510	700			867	1060	3391	10404	M	Av	Av	M	M	M	D,B	Ref.	Low - Demolition only: Removal of Demountables	Crown somewhat sparse. Root buttress benching on public path. Crown: N9, S9, E5, W3.
34	Eucalyptus	sideroxylon	Mugga Ironbark	15	10	425	530			680	725	2891	8160	M	G	Av	M	M	M	CD,B	Ref.	Low - Demolition only: Removal of Demountables	DBH at 1.5m. Twin trunks at 1.1m (wide crotch) Recently pruned. 25% epi growth. Crown: N4, S9, E7, W2.
35	Jacaranda	mimosifolia	Jacaranda	10	8	400				400	450	2366	4800	SM	Av	Av	L-M	L	L	CD, CS	Ref.	Located 3.2m from proposed stormwater discharge pipe providing 10% encroachment within TPZ.	Previously topped at 6m. Exposed root buttress. Crown skewed W. Crown: N5, S3, E1, W7.



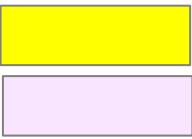
REVISED TREE DATA OR ADDITIONAL TREE ON 12/11/25



TREE LOCATED IN ADJOINING PROPERTY ADJACENT TO REF AREA



NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	Trunk Dia 2	Trunk Dia 3	Trunk Dia 4	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi- cance	Am	Eco	Form	Ret/ Rem	Development Setback and Encroachment	Comments
36	Camellia	sasanqua		4	3	250				250	250	1849	3000	SM	F	F	L	L	L	CD, M,U	Ref.	No impact	DBH at grade (@g or ag) 40% LCR
37	Brachychiton	acerifolius	Illawarra Flame Tree	6	6	250				250	290	1968	3000	SM	Av	Av	L	L	M	CD,U ,B	Ref.	No impact	-
38	Syzygium	luehmannii	Small-leaved Lilly Pilli	7	7	160	180	230	240	411	610	2689	4932	M	G	Av	L-M	L-M	M	CD, M,B	Ref.	No impact	Co-dominant at base, included bark attachments.
39	Cotoneaster	pannosus	silverleaf cotoneaster	5	3	170				170	250	1849	2040	M	P	P	L	L	L	CD,L	Ref.	No impact	Epis (epicormics) at base.
40	Camellia	sasanqua		3	2	70	100	100		158	350	2129	2000	M	Av	Av	L	L	L	M	Ref.	No impact	30% LCR
41	Eucalyptus	populnea	Poplar Box	18	13	590				590	660	2779	7080	M	G	Av	M	M	M	D,B	Ref.	Located 6.56m from proposed stormwater discharge pipe providing 2% encroachment within TPZ.	Basal wound, N to 2m, 90mm wide. Previously tagged #94. Crown: N8, S5, E6, W7.
42	Eucalyptus	populnea	Poplar Box	9	8	350				350	410	2276	4200	SM	Av	Av	L-M	L-M	M	CD,B	Ref.	No impact	Previously tagged #93. Crown: N3, S5, E5, W-.
43	Eucalyptus	populnea	Poplar Box	13	9	550				550	580	2633	6600	M	G	Av	M	M	M	CD,B	Ref.	No impact	Previously tagged #97
44	Eucalyptus	scoparia	Wallangarra White Gum	17	7	350	370			510	550	2575	6120	M	Av	Av	M	M	M	CD, M	Ref.	No impact	Upper crown somewhat sparse. Recent pruning in lower crown & associated epi shoots to less 1.0m. Previously tagged #90
45	Lophostemon	confertus	Brush Box	5	5	150				150	190	1647	2000	J	J	Av	L-M	L-M	L-M	CD,B	Ref.	No impact	Located in road reserve adjacent to REF area.
46	Banksia	integrifolia	Coast Banksia	6	4	200				200	350	2129	2400	SM	G	F-Av	L	L	M-H	CD,L	Ref.	No impact	Lean to E. AKA #89
47	Eucalyptus	scoparia	Wallangarra White Gum	11	5	380				380	410	2276	4560	SM	F	F-Av	L-M	L	M	CD,L	Ref.	No impact	Lean to N from 2m. AKA #88
48	Eucalyptus	sideroxylon	Mugga Ironbark	7	6	200				200	230	1785	2400	SM	F	F	L	L	M	CD,L	Ref.	No impact	Sprawly habit. AKA #87
49	Lophostemon	confertus	Brush Box	8	7	220				220	280	1939	2640	J	G	G	L	L	M	CD,B	Ref.	No impact	Will grow through crown of T50 in the mid future 5-10 years. AKA #85
50	Eucalyptus	scoparia	Wallangarra White Gum	19	21	930				930	1000	3309	11160	M	Av	Av	M	M	M	D,B CD,	Ref.	No impact	Wound with associated fungal fruiting body (FFB) from 1.5m to 3.00. 180mm @ widest. FFB 180mm wide. FFB located at 2.5m, subtending and old branch stub. Hammer sounding, sounded drummy for 300 mm width, either side of wound AKA #84
51	Eucalyptus	scoparia	Wallangarra White Gum	10	7	500				500	580	2633	6000	SM	G	Av	L-M	M	M	CS	Ref.	No impact	Crown bias to S. DW less 5% to 50mm
52	Lophostemon	confertus	Brush Box	4	4	120				120	140	1500	2000	J	G	G	L	L	M	CD,B	Ref.	No impact	-
53	Banksia	integrifolia	Coast Banksia	6	2	300				300	350	2129	3600	SM	P-F	F-Av	L	L	M	D,U	Ref.	No impact	Wound N @ 0.8m



REVISED TREE DATA OR ADDITIONAL TREE ON 12/11/25



TREE LOCATED IN ADJOINING PROPERTY ADJACENT TO REF AREA



NO#	Genus	Species	Common Name	Height	Spread	Trunk				DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi- cance	Development Setback and Encroachment				Ret/ Rem	Comments
						Dia	Dia 2	Dia 3	Dia 4									Am	Eco	Form			
54	Eucalyptus	sideroxylon	Mugga Ironbark	15	14	550				550	600	2670	6600	M	F	Av	M	M	D,B	Ret.	No impact	Upper crown sparse. Prev tagged #81. Slit/crack at junction of lowest W FOB, 250-300mm x6m over fenced off area. Trunk obscured by 6m Tuckeroo growing 1m S.	
55	Eucalyptus	sideroxylon	Mugga Ironbark Lemon Scented	14	10	500				500	530	2535	6000	M	Av-G	Av	M	M	CD,B	Ret.	No impact	Prev tagged #95. Crown: N6, S5, E6, W3.	
56	Corymbia	citriodora	Gum	21	13	460				460	540	2555	5520	M	Av	Av	M	M	CD,B	Ret.	No impact	Crown lifted to 8m. Crown: N7, S8, E4, W6.	
57	Corymbia	citriodora	Lemon Scented Gum	20	20	620				620	730	2900	7440	M	Av	Av	H	H	M	CD,B	Ret.	No impact	DBH measured at 2.0m, due to elongated buttress flares. Prev tagged #72. Lowest FOB, 5m S. Timber branch against trunk. Adjust seat to provide min 100mm clearance to trunk. Crown: N10, S9, E10, W12.
58	Eucalyptus	longifolia	Woollybutt	14	9	480				480	500	2474	5760	M	Av	Av	M	M	CD, M	Ret.	No impact	Prev tagged #74. FOB at 3m, E pruned, wound is occluding W vigour. DBH at 1.0m. Twin trunks @1.7m. Crown: N6, S3, E8, W2.	
59	Ulmus	parvifolia	Chinese Elm	9	13	500				500	500	2474	6000	M	G	F-Av	M	M	CD,L, CS	Ret.	No impact	Heavy crown skewed to NW. DBH at 0.7m. Heavy phototropic lean to N. Crown: N9, S3, E3, W10.	
60	Lophostemon	confertus	Brush Box	15	11	800				800	850	3091	9600	M	Av	Av	M-H	M-H	M	CD,B	Ret.	No impact	Symmetric crown.
61	Cinnamomum	camphora	Camphor Laurel	14	21	490	590			767	650	2762	9204	M	G	Av	M	M	CD, M,L	Ret.	No impact	Two separate trunks. N trunk has light lean to W. Crown: N3, S5, E11, W10.	
62	Cinnamomum	camphora	Camphor Laurel	12	17	940				940	940	3224	11280	M	G	Av	M	M	CD, CS,M	Ret.	No impact	DBH at 1.0m, same as DRB. Prev tagged #80. 3 stems at 1.8m. Crown: N2, S10, E11, W10.	
64	Phoenix	canariensis	Canary Island Date Palm	7	6	650				650	700	2849	7800	SM	Av	G	M	M	L	CD,P a	Ret.	Located 1.99m from the proposed pavement refurbishment, providing 2% encroachment within the TPZ and encroachment within the SRZ. Proposed benches within TPZ providing spot encroachment within TPZ.	-

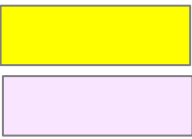


REV S

ORANGE GROVE PS TREE SURVEY DATA - REF ONLY

DATE OF REVIEW [OPTION 8A] 19/01/26 - REF

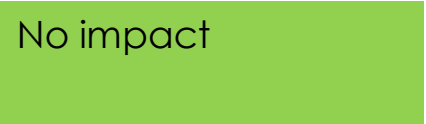
DATES TREES ASSESSED: 14/11/19; 24/09/24; 07/04/25; 12/11/25



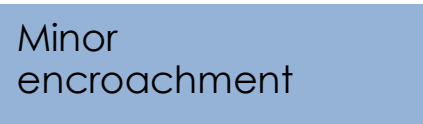
REVISED TREE DATA OR ADDITIONAL TREE ON 12/11/25



TREE LOCATED IN ADJOINING PROPERTY ADJACENT TO REF AREA



No impact



Minor encroachment



Major encroachment



Within development footprint



Within development footprint - garden only

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	Trunk Dia 2	Trunk Dia 3	Trunk Dia 4	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi- cance	Am	Eco	Form	Ret/ Rem	Development Setback and Encroachment	Comments
65	Phoenix	canariensis	Canary Island Date Palm	6	6	600				600	650	2762	7200	SM	Av	G	M	M	L	CD,P a	Ret.	Proposed benches within TPZ providing spot encroachment within TPZ.	-
66	Phoenix	canariensis	Canary Island Date Palm	7	6	750				750	800	3013	9000	SM	Av	G	M	M	L	CD,P a	Ret.	Proposed benches within TPZ providing spot encroachment within TPZ.	-
67	Cinnamomum	camphora	Camphor Laurel	16	18	900				900	900	3166	10800	M	G	Av	M	M	L	CD, M,B	Ret.	Located 1.85m from proposed indicative trenching for electrical conduit providing a potential 41% trenching encroachment including 'shadow effect' and encroachment within the SRZ.	DBH @1.0m. 4 major scaffolds @ 1.8. Crown: N10, S10, E7, W10.
70	Schinus	molle var. areira	Peppercorn	8	7	700				700	750	2933	8400	M	Av	Av	M	M	L	CD, M	Ret.	Located 2.04m from proposed indicative trenching for electrical conduit providing a potential 32% trenching encroachment including 'shadow effect' and encroachment within the SRZ.	Late mature
71	Banksia	integrifolia	Coast Banksia	9	5	200	240			313	600	2670	3756	SM	G	F	L	L	M-H	CD, M,B	Ret.	Within proposed mass planted garden bed. This may/may not include garden edging.	Twin stems @0.4. S stem has torsional crack. Probable failure of 200mm dia 4m into frequently occupied space.



REV S

ORANGE GROVE PS TREE SURVEY DATA - REF ONLY

DATE OF REVIEW [OPTION 8A] 19/01/26 - REF

DATES TREES ASSESSED: 14/11/19; 24/09/24; 07/04/25; 12/11/25

REVISED TREE DATA OR ADDITIONAL TREE ON 12/11/25
TREE LOCATED IN ADJOINING PROPERTY ADJACENT TO REF AREA

No impact

Minor encroachment

Major encroachment

Within development footprint

Within development footprint - garden only

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	Trunk Dia 2	Trunk Dia 3	Trunk Dia 4	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi- cance	Am	Eco	Form	Ret/ Rem	Development Setback and Encroachment	Comments
72	Banksia	integrifolia	Coast Banksia	8	5	300				300	450	2366	3600	SM	Av	Av	L	L	M-H	CD,L	Ref.	Within proposed mass planted garden bed. This may/may not include garden edging.	Lean from 1.5m to E. Crown skew to E.
73	Banksia	integrifolia	Coast Banksia	6	6	140	220			261	350	2129	3132	SM	G	F-Av	L	L	M-H	CD,L	Ref.	Within proposed mass planted garden bed. This may/may not include garden edging.	Heavy lean to S.
74	Banksia	integrifolia	Coast Banksia	9	5	300				300	370	2180	3600	SM	G	G	L	L	M-H	CD,U	Ref.	Within proposed mass planted garden bed. This may/may not include garden edging.	-
75	Eucalyptus	sp.	Eucalyptus	7	4	350				350	390	2228	4200	SM	P	F	L	L	M	CD,L	Ref.	Within proposed mass planted garden bed. This may/may not include garden edging.	-
76	Lophostemon	confertus	Brush Box	8	8	180	330			376	460	2388	4512	SM	F-Av	Av	L	L	M	CD,B	Ref.	Within proposed mass planted garden bed. This may/may not include garden edging.	Upper crown is sparse.
77	Corymbia	citriodora	Lemon Scented Gum	25	13	250	550			605	720	2883	7260	M	Av-G	Av-G	M-H	M-H	M	D,B	Ref.	Located 4.94m from proposed new electrical substation and associated trenching providing 12% encroachment of TPZ. Within proposed mass planted garden bed. This may/may not include garden edging.	-



REV S

ORANGE GROVE PS TREE SURVEY DATA - REF ONLY

DATE OF REVIEW [OPTION 8A] 19/01/26 - REF

DATES TREES ASSESSED: 14/11/19; 24/09/24; 07/04/25; 12/11/25

REVISED TREE DATA OR ADDITIONAL TREE ON 12/11/25

TREE LOCATED IN ADJOINING PROPERTY ADJACENT TO REF AREA

No impact

Minor encroachment

Major encroachment

Within development footprint

Within development footprint - garden only

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	Trunk Dia 2	Trunk Dia 3	Trunk Dia 4	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi-cance	Am	Eco	Form	Ret/ Rem	Development Setback and Encroachment	Comments
78	Corymbia	citriodora	Lemon Scented Gum	25	14	880				880	930	3210	10560	M	G	G	M-H	M-H	M	CD,B	Ret.	Within proposed mass planted garden bed. This may/may not include garden edging. Very low impact (<1% electricity trenching encroachment)	-
82	Syagrus	romanzffianum	Cocos Palm	10	6	230				230	300	1996	2760	M	Av	Av	L	L	L	P	Ret.	No impact	Located in adjoining property near Tree 15 adjacent to REF area. Trunk base not accessible.
83	Syagrus	romanzffianum	Cocos Palm	10	6	230				230	300	1996	2760	M	Av	Av	L	L	L	P	Ret.	No impact	Located in adjoining property near Tree 15 adjacent to REF area. Trunk base not accessible.
84	Eucalyptus	saligna	Sydney Blue Gum	30	22	900				900	950	3239	10800	M	G	Av	H	H	M	D,B	Ret.	Located 8.8m from proposed new slab for waste storage/collection providing 2% encroachment within the TPZ.	Located in adjoining property near Tree 15 adjacent to REF area. Trunk base not accessible. Several FoBs removed previously at 9m, N. Recent FoB,W, lopped for sewer sink pipe clearance. Lowest FoB at 4m. Must be retained and protected.

REVISED TREE DATA OR ADDITIONAL TREE ON 12/11/25

TREE LOCATED IN ADJOINING PROPERTY ADJACENT TO REF AREA

No impact

Minor encroachment

Major encroachment

Within development footprint

Within development footprint - garden only

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	Trunk Dia 2	Trunk Dia 3	Trunk Dia 4	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi-cance	Am	Eco	Form	Ret/Rem	Development Setback and Encroachment	Comments
85	Eucalyptus	microcorys	Tallowwood	25	19	750				750	800	3013	9000	M	G	Av	H	H	M	D,B	Ret.	No impact	Located in adjoining property near Tree 15 adjacent to REF area. Trunk base not accessible. Typical form for species.lowest FOB , 4m. Light lean to W, against fence. In flower.
	Count of 65 Trees assigned numbers																						

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, i.e.. greater than 10% is encroached upon or if there is an encroachment within the SRZ.

8.3. Age (Maturity)

The age class of each tree is estimated as either:

- **Y = Young**; a well-established but juvenile tree.
- **SM = Semi-mature**; a tree at growth stages between immaturity and full size.
- **EM = Early-mature**; a tree that is more-or-less of mature dimensions yet still vigorously growing.
- **M = Mature**; a full-sized tree with some capacity for further, expansive crown growth.
- **LM = Late Mature**; a tree of full, mature dimensions with little capacity for expansive growth, many years away from decline.
- **OM = Over-mature**; a tree of old age in a phase of slow decline.

8.4. Health and Vigour

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

- **G** - Good - the tree presents as being in robust good health with no dieback, insect infestation, decay, dead wood or epicormic shoots.
- **Avg** - Average Health - the tree presents as being in acceptable health with no crown dieback, few if any stress-induced epicormic shoots, and an average volume of crown dead wood for the species & age, with normal extension growth at branch tips. These trees may benefit from remediation of the growing environment to maintain 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 **0 The Inner West Council** Tree Management Plan defines a tree as:

- iv. any tree with a height equal or greater than 4m above ground level (existing) or
- v. any tree that is under 4 metres in height that has a trunk diameter of more than 150mm at Diameter at Breast Height (DBH at 1.4m) or
- vi. any tree with a canopy spread equal to or greater than 2 metres or any palm tree or tree fern with a clean stem length equal to or greater than 4 metres above ground level (existing).

Determining a tree's significance (page 9). 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
- **Ha** – Habitat, is the tree valued by fauna for food (i.e.. foliage fruit or sap) or shelter (i.e.. nesting, roosting, dray or hollow).
- **Wd** – tree is a weed or invasive species.

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:

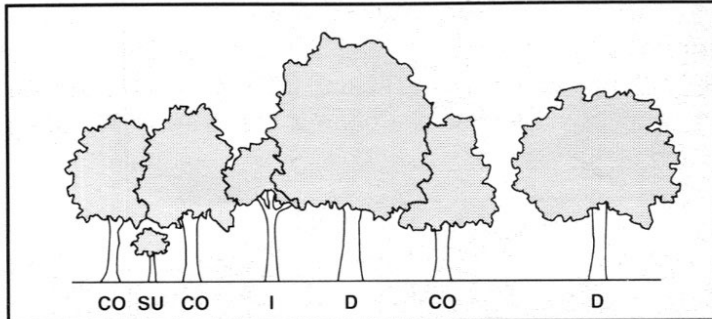
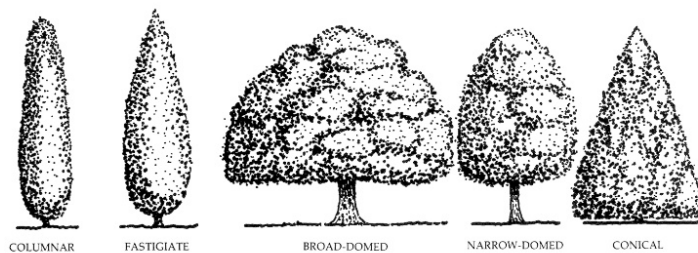
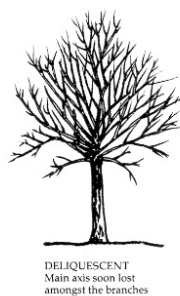
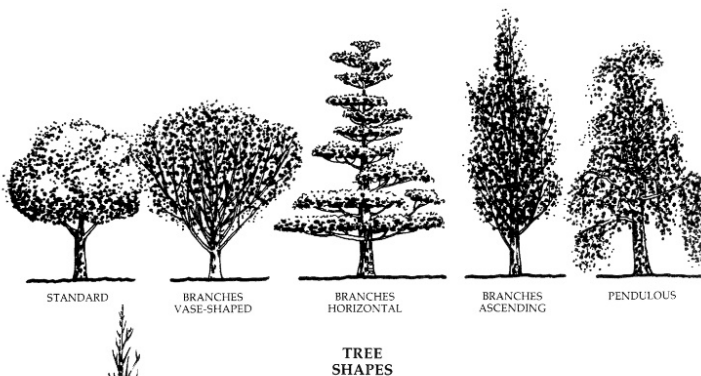


Figure 13. Crown Class is a description of the overall form of the tree as dominant (D), codominant (CO), intermediate (I) or suppressed (SU). Crown class is influenced by the proximity of the tree to other trees. (Adapted from The Hazard Tree Assessment Program, Recreation and Park Dept., City and County of San Francisco)

Forest forms (F) ²⁰: Dominant; Codominant; Intermediate; Suppressed. For sites that contain remnant native vegetation.



Urban Tree forms (U) ²⁹: Columnar; Fastigate; Broad-domed; Narrow-domed; Conical; Standard; Branches Vase-shaped; Branches Horizontal; Branches Ascending; Pendulous' Excurrent; Shrub-like; Deliquescent. For sites that mainly contain Urban trees.



Modifiers: Bias Crown/Asymmetry (BC); Crown Shy (CS) (also referenced is the adjacent dominant tree canopy i.e. T4); Palm (P), Leaning (L); Basal Multi Trunked/stump sprout (BM); Emergent (E), 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, where D = stem diameter in metres):

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

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

(Following page)>

LEGEND

- + RL 101.45

Existing levels
- + RL 101.55

+ TOW 101.55

Proposed levels
- + TOW 101.55

+ TOW 101.55

Proposed Top Of Wall levels
- ---

Boundary
- ---

To be removed / demolished
- ---

Hydraulic lines - SW
- ---

Building under
- ---

Building
- ---

Building over
- ---

Retaining walls
- ---

Extent of REF

- Tree Protection Zone

Indicative crown spread

Existing tree

Structural Root Zone

Trunk diameter

Assessed tree within development footprint

High significance tree

Medium significance tree

Low significance tree (no hatch)

REVISION	DESCRIPTION	DRAWN	CHECK	DATE
K	SUBMITTED TO CLIENT FOR COMMENT - OPTION 8	AM	AS	22-02-24
L	SUBMITTED TO CLIENT FOR COMMENT - OPTION 8A	AM	AS	27-08-24
M	SUBMITTED TO CLIENT FOR COMMENT - OPTION 8A - IN PROGRESS	AM	AS	31-10-24
N	SUBMITTED TO CLIENT FOR COMMENT - OPTION 8A - CO-ORD	AM	AS	25-11-24
O	SUBMITTED TO CLIENT FOR COMMENT - OPTION 8A - REF	AM	AS	21-12-24
P	SUBMITTED TO CLIENT - OPTION 8A - REF - COMMENT	AM	AS	24-03-25
Q	SUBMITTED TO CLIENT - OPTION 8A - REF	AM	AS	01-04-25
R	SUBMITTED TO CLIENT - OPTION 8A - REVISED REF	AM	AS	20-11-25
S	SUBMITTED CLIENT - OPTION 8A - REVISED REF - REVISED LAYOUT	AM	AS	20-01-26

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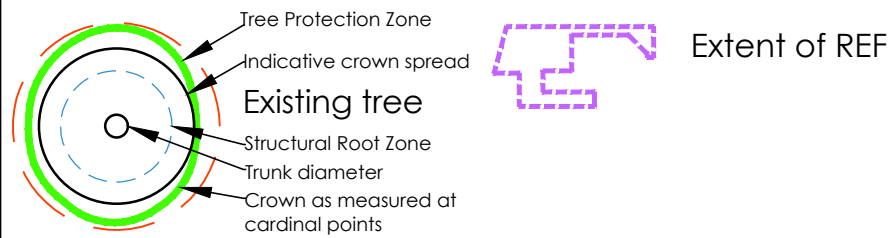
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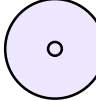
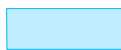
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PROJECT			
SCHOOL UPGRADE OPTION 8A REF ONLY			
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KEY PLAN + TREE SIGNIFICANCE			
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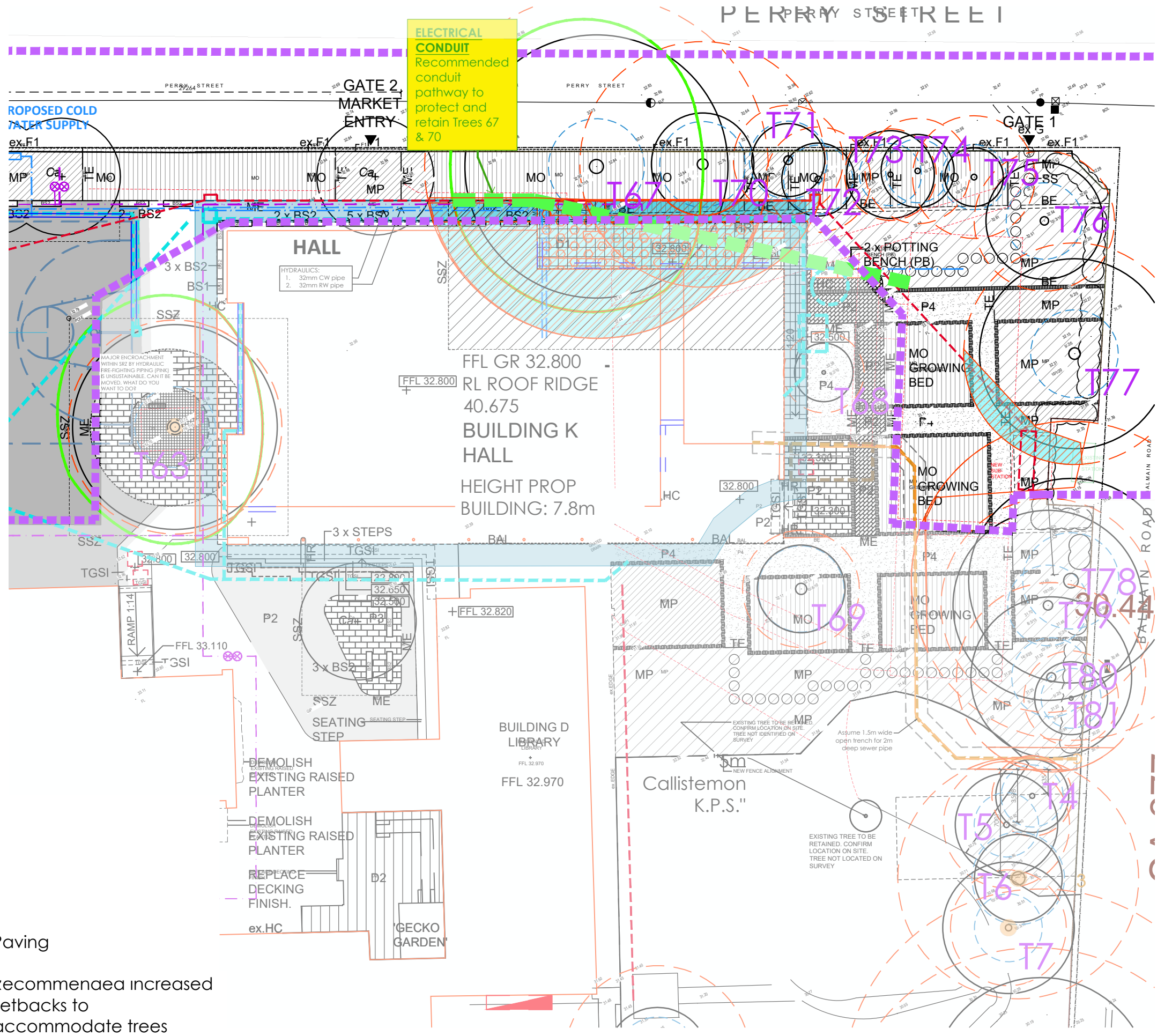
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| + RL 101.45 | Existing levels |
| + RL 101.55 | Proposed levels |
| + TOW 101.55 | Proposed Top Of Wall levels |
| — · — · — | Boundary |
| - - - - - | To be removed / demolished |
| - - - - - | Hydraulic lines - SW |
| - - - - - | Building under |
| ————— | Building |
| - - - - - | Building over |
| ————— | Retaining walls |



- | | |
|---|--|
|  | Assessed tree within development footprint |
|  | Tree recommended for removal in AIA report |
|  | Cut - encroachment into Tree Protection Zone |
|  | Cover - encroachment into Tree Protection Zone |
|  | Encroachment from spot points - raised decking (discontinuous) |
|  | Encroachment within crown |
|  | Encroachment from anticipated scaffold |
| | Encroachment from cut - trenching |
|  | Encroachment from P4 permeable paving |

Extent of REF



REVISION	DESCRIPTION	DRAWN	CHECK	DATE
K	SUBMITTED TO CLIENT FOR COMMENT - OPTION 8	AM	AS	22-02-24
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O	SUBMITTED TO CLIENT FOR COMMENT - OPTION 8A - REF	AM	AS	21-12-24
P	SUBMITTED TO CLIENT - OPTION 8A - REF - COMMENT	AM	AS	24-03-25
Q	SUBMITTED TO CLIENT - OPTION 8A - REF	AM	AS	01-04-25
R	SUBMITTED TO CLIENT - OPTION 8A - REVISED REF	AM	AS	20-11-25
S	SUBMITTED CLIENT - OPTION 8A - REVISED REF - REVISED LAYOUT	AM	AS	20-01-26



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UPGRADES TO ORANGE GROVE PUBLIC SCHOOL PERRY STREET, LILYFIELD

CLIENT

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PROJECT

SCHOOL UPGRADE OPTION 8A REF ONLY

DRAWING

TREE LOCATION PLAN - WEST - COMMENTS

SCALE
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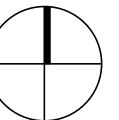
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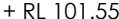
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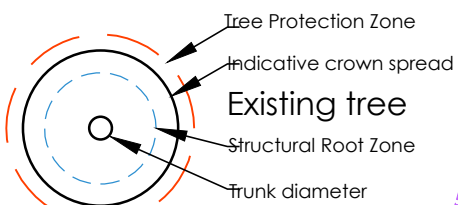
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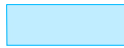
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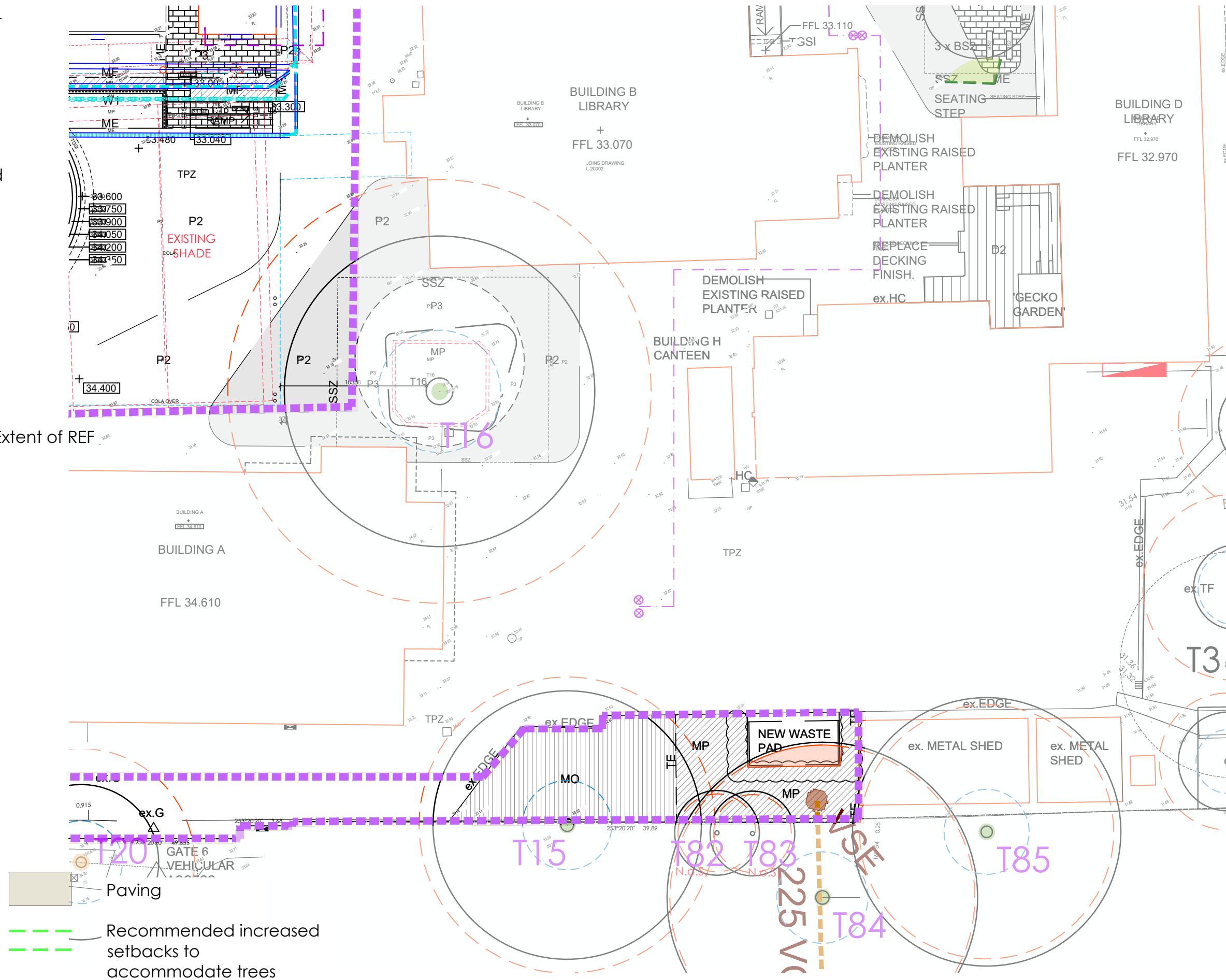
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|  | Proposed Top Of Wall levels |
|  | Boundary |
|  | To be removed / demolished |
|  | Hydraulic lines - SW |
|  | Building under |
|  | Building |
|  | Building over |
|  | Retaining walls |



- Assessed tree within development footprint
- Tree recommended for removal in AIA report



- | | |
|--|--|
|  | Encroachment from spot points - raised decking (discontinuous) |
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CLIENT _____

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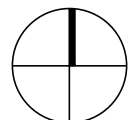
TREE LOCATION PLAN - WEST - COMMENTS

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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, where D is the stem Diameter in metres:

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

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 9680 7713"**.

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. Committee EV-018 (2009) **AS 4970 - 2009 Protection of Trees on Development Sites**; Standards Australia.
2. Committee EV-018 (2007) **AS 4373 - 2007 Pruning of Amenity Trees**; Standards Australia.
3. Chapman, G.A, Murphy, C.L.; **Soil Landscapes of the Sydney 1:100 000 Sheet**; Soil Conservation Service of NSW, Sydney; 2004.
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