Arboricultural Impact Assessment

10 Missenden Rd, Camperdown

Prepared by Alex Austin
For
ISPT
August 2025 V006

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1 Summary

This Arboricultural Impact Assessment has been prepared by Alex Austin, an AQF level 8 Arborist, to accompany a Concept State Significant Development Application (SSDA) for a private hospital and associated ancillary uses located at 10 Missenden Road, Camperdown.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-79888213). This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 5 March 2025 as well as the City of Sydney Advice on SEARs dated 26th February 2025 which were issued for the SSDA (SSD-79888213).

An original ground based visual inspection was conducted on the 4th of November 2022 where all trees within and adjacent to the grounds of St Johns College were inspected by Alex Austin. A subset of 32 trees may be impacted by the concept proposal were reinspected on the 28th of April 2025. The 32 Trees subject to this report include;

- 14 Trees numbered 7, 9, 10, 11, 13, 15, 18, 24, 25, 28, 29, 31, 32 & 42 that hold High (A) Retention Value
- 13 Trees numbered 6, 8, 17, 19, 22, 23, 27, 33, 34, 41, 91, 92 & 93 that hold Medium (B) Retention Value
- Five (5) Trees numbered 12, 14, 16, 30 & 35 that hold Low (C) Retention Value

The concept proposal seeks consent for the entire development in concept form, including consent for a maximum building envelope, land uses, and overall gross floor area for the future private hospital proposal.

If the current proposed layout is to proceed, then 15 trees numbered 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 25, 27, 28, 29 & 30 are proposed for removal in order to facilitate the layout.

Four (4) trees including Two (2) mature Fig trees numbered 31, 32, and Two (2) mature Palm trees 33 & 34 are proposed to be transplanted as per the methods detailed in the Arborist Network Transplant Feasibility Study dated Jan 2023 in order to provide additional developable space.

13 trees numbered 6, 7, 8, 9, 22, 23, 24, 35, 41, 42, 91, 92 & 93 will be retained if the tree protection measures in the report are adhered to. No impact to the viability of these trees is anticipated if the protection measures are applied as per the guidance in this report.

To ensure the 13 trees nominated for retention remain viable during and post construction, mitigation measures including the engagement of a project arborist, tree protection fencing, tree protection signage, trunk protection, ground protection matts, temporary scaffold, the adoption of the tree protection measures using the details within the City of Sydney Street Tree Master Plan, Part D Technical Guidelines dated 2011 (Updated 2015), a restriction of activities within Tree Protection Zones (TPZ's) and compliance reporting, must be incorporated into the project.

A Tree Protection Plan has been prepared and can be located in the Appendix.

58 Trees are proposed for planting in the landscape master plan to replenish the lost canopy and soften the landscape impact of the proposal. The anticipated canopy cover at maturity is 25.7%

This document must be used in its entirety and further questions are to be directed to:

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3 Document Details

Version Number	Date	Description
001	05/06/2025	Draft awaiting Final landscape and Heritage report
002	18/06/2025	Draft following ISPT and Urbis Comments
003	19/06/2025	Final following ISPT and Urbis Comments
004	07/08/2025	Draft Following project updates
005	08/08/2025	Final
006	14/08/2025	Final with updated mapping

4 Background

This Arboricultural Impact Assessment has been prepared by Alex Austin, an AQF level 8 Arborist, to accompany a Concept State Significant Development Application (SSDA) for a private hospital and associated ancillary uses located at 10 Missenden Road, Camperdown.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 5 March 2025 as well as the City of Sydney Advice on SEARs dated 26th February 2025 which were issued for the SSDA (SSD-79888213).

An original ground based visual inspection was conducted on the 4th of November 2022 where all trees within and adjacent to the grounds of St Johns College were inspected by Alex Austin. A subset of 32 trees may be impacted by the concept proposal were reinspected on the 28th of April 2025.

This report has been collated and prepared in accordance with Australian Standard 4970:2025 Protection of trees on development sites. Complete tree data can found be in the table located in the Appendix.

Tree assessment and recommendations in this report are based on the condition of the trees at the time of inspection. As the trees continue to age and decline, further assessment, particularly from a hazard management perspective may be necessary. Site conditions and weather events may also change the condition of the trees from the time of inspection.

4.1 Reviewed Documents

The following documents were assessed as part of this report;

- Site Survey by Montheath and Powy PTY LTD, rev 2 dated 29/04/2015
- Conservation Management Plan v2.7 by Hector, Abrahams Architects dated –Jan 2020
- Transplant feasibility assessment by The Arborist Network dated 20th January 2023
- Heritage Impact Statement, by Urbis, Rev 1, dated 03/06/2025
- Preliminary Plans by architectus Rev S, dated 16/05/2025
- The tree strategy plan by architectus Rev A, dated 20/05/2025
- Preliminary Plans by architectus Rev T – TPZ Overlay, dated 16/05/2025
- The Secretary's Environmental Assessment Requirements (SEARs) dated 5 March 2025 and issued for the SSDA (SSD-79888213).
- Tree Encroachment Review completed by architectus dated 29/05/2025
- The City of Sydney Street Tree Master Plan, Part D Technical Guidelines dated 2011 (Updated 2015).
- Landscape Design Report by Aspect Studios dated 05/08/2025
- Reference Design Scheme Plans by architectus Rev DD, dated 31/07/2025

4.2 SEARs Requirements

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 5 March 2025 as well as the City of Sydney Advice on SEARs dated 26th February 2025 which were issued for the SSDA (SSD-79888213). Specifically, this report has been prepared to respond to the SEARs requirement issued below.

TABLE 1 SEARS REQUIREMENTS

Item	Description of Requirement	Section Reference
Planning Secretary's Environmental Assessment Requirements 8. Trees and Landscaping form	▪ Assess the number, location, condition and significance of trees to be removed and retained and note any existing canopy coverage to be retained on-site. ▪ Provide evidence that opportunities to retain significant trees have been explored and/or informs the plan.	Section 8, 9, 10 & 11 Appendix 15.4

Item	Description of Requirement	Section Reference
City of Sydney Advice on SEARs 3. Trees and Landscaping	Trees and Landscaping - Arboricultural Impact Assessment Report (AIA) The report shall include: ▪ Identification of the 21 trees located in the site and surrounding the immediate area. ▪ Visual Tree Assessment, Tree Protection Zone, Structural Root Zones and Retention Value for each tree.	Sections 8 & 9, Appendix 16.1 Section 8, Appendix 16.1 Section 11, Appendix 16.4

Item	Description of Requirement	Section Reference
	▪ An assessment and discussion of the likely impacts (above and below ground) the proposed development will have on the trees. ▪ Recommendations of any design modifications, construction techniques and/or other protection methods required to minimise adverse impacts on trees that should be retained during the demolition and construction works, and into the long term. ▪ Information on the Arborists involvement during the works. ▪ A Tree Protection Plan (drawing) showing the Tree Protection Zones and Structural Root Zones for trees being retained. ▪ A 'Pruning Specification Report' prepared by a qualified Arborist (minimum AQF Level 5),	Completed during design meetings. Section 12. Appendix 16.3 NA

5 Methodology

5.1 Aims and Objectives

- Determine the Retention Value and required area for each tree to be protected and remain viable during and post construction.
- Identify and reduce potential conflicts between subject trees and site development by providing accurate information on the area required for tree retention and methods/techniques suitable for tree protection during construction.
- Encroachments to the NRZs are to be minimized prior to construction.
- Works within the defined TPZ's shall utilize special measures to avoid or minimize adverse impacts on trees.
- To provide information on restricted activities within the area nominated for tree protection, as well as suitable construction methods to be adopted during construction.
- The trees to be retained are to be protected from all other demolition, excavation, and construction activities.

5.2 Tree Health and Condition

The inspection of the trees was made from the ground and involved inspection of the external features only. No invasive, diagnostic or laboratory testing was carried out.

Tree height and canopy spread were estimated and trunk diameter (DSH) and Diameter at Root Crown (DRC), have been measured with a diameter tape where applicable.

Data including species, age class, health, structure, landscape significance, defect and life expectancy were recorded. Tree species were identified using available seed and fruit during the site inspection.

All photographs were taken at the time of the site inspection by the inspecting arborist. Photographs have been altered for brightness and/or cropped only.

5.3 Notional Root Zone, Tree Protection Zone and Structural Root Zone

Calculating the **Notional Root Zone (NRZ).** The radius of the NRZ is calculated for each tree by multiplying its diameter at standard height (DSH) by 12.

Radius of the NRZ = DSH × 12; where

- DSH = trunk diameter measured at 1.4 m above ground
- The radius of the NRZ is measured from the centre of the stem.
- The NRZ for palms, cycads, tree ferns and the like, is not calculated but shall not be less than 2 m.
- Any NRZ radius shall not be less than 2 m nor greater than 15 m. Clause 3.3 of AS 4970:2025 details the methods to produce the TPZ based on the NRZ.

The NRZ is the starting point for determining the TPZ. The TPZ should be determined using the considerations and encroachments discussed in section 3.3.2 of AS 4970:2025.

The **Tree Protection Zone (TPZ)** is defined as the specified zone above and below ground and at given offsets from the trunk set aside to protect a tree's roots and crown where these might be damaged by development.

The **Structural Root Zone (SRZ)** is a notional area required for tree stability. A larger area is required to maintain a viable tree. The SRZ shall be calculated when major encroachment (greater than 20 %) into an NRZ is proposed. SRZ locations and dimensions may be included on arboriculture documentation.

Many factors affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). Natural or built structures, such as rocks and footings, can also influence the SRZ. An indicative SRZ radius can be determined from the trunk diameter measured immediately above the root buttress using the following formula.

SRZ radius = *(D × 50) 0.42 × 0.64*

Root investigation can provide more information on the extent of these roots.

5.4 NRZ Encroachments

5.4.1 Minor NRZ encroachment

The proposed encroachment is considered minor if it is less than or equal to 10 % of the area of the NRZ, has not had recent NRZ encroachments and is outside of the SRZ (see section3.4 of AS 4970:2025). Generally, it is unlikely that there will be a significant impact to tree health, longevity or structure. Tree protection should be implemented during site works. To avoid a net loss of soil area and volume, an area equivalent to the encroachment shall be incorporated into the TPZ, unless the project arborist otherwise demonstrates that the tree will remain viable.

5.4.2 Moderate NRZ encroachment

The proposed encroachment is considered moderate if it is greater than 10 % and less than or equal to 20 % of the area of the NRZ and is outside of the SRZ (see Clause 5.3 of AS 4970:2025). A project arborist shall be engaged to review the proposed impact and undertake any other necessary investigation to address the factors listed in Clause 3.3.2 of AS 4970:2025 to demonstrate how the tree will remain viable. This may be through the implementation of suitable design measures and construction controls to mitigate impacts during the development process.

To avoid a net loss of soil area and volume, an area equivalent to the encroachment shall be incorporated into the TPZ, unless the project arborist otherwise demonstrates that the tree will remain viable.

5.4.3 Major NRZ encroachment

The proposed encroachment is considered major if it is greater than 20 % of the area of the NRZ or inside the SRZ. The project arborist shall be engaged to explore alternative designs with the design team and/or demonstrate that the tree will remain viable. Relevant factors listed in Clause 3.3.2 of AS 4970: 2025 should also be considered.

For assessment of major encroachment a more detailed investigation is necessary. This can include research such as root investigation, soil analysis, historical records of the tree or site, relevant literature and examples of similar encroachments. To avoid a net loss of soil area and volume, an area equivalent to the encroachment shall be incorporated into the TPZ, unless the project arborist otherwise demonstrates that the tree will remain viable.

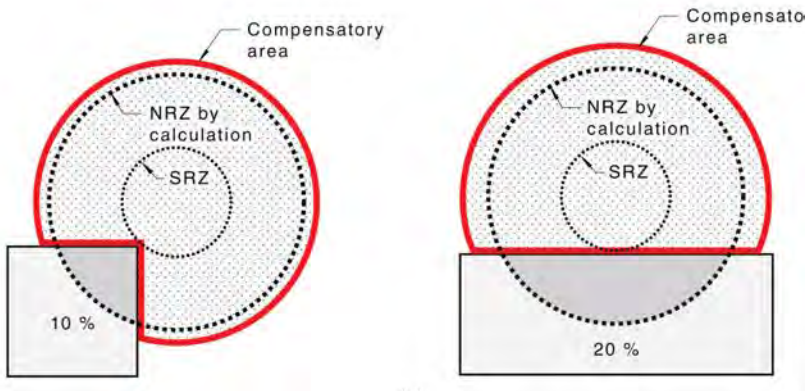


Figure 1: Example NRZ encroachments which are acceptable. (Source: AS 4970:2025)

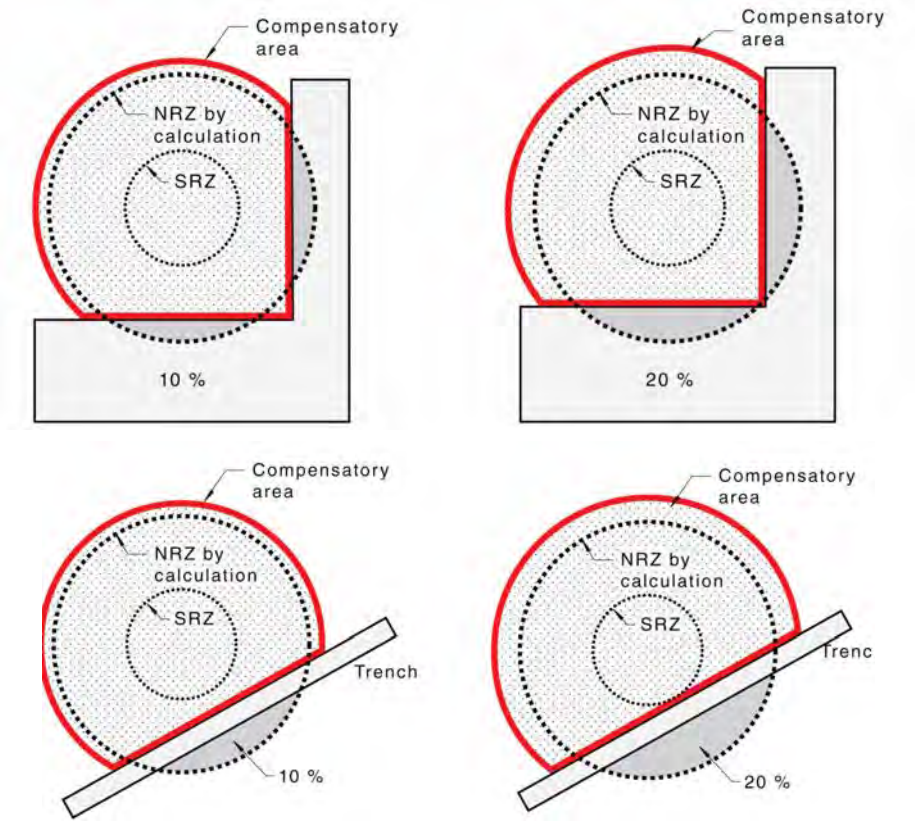


Figure 2: Example NRZ encroachments which are acceptable. (Source: AS 4970:2025)

5.5 Retention Value

The retention value method used is based on the IACA Significance of a Tree, Assessment Rating System (STARS) (IACA 2010)©. The retention value method used is a simplified rating system consisting of 4 categories as a summary of the survey's cascading process. The retention value considers the trees health and structure, age class, defects, life expectancy and significance in the landscape.

- Priority or Retention (High - A - Green) -These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 Protection of trees on development sites. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone. Considerable efforts should be made to retain these trees.
- Consider for Retention (Medium – B (Blue)These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted. Reasonable efforts should be made to retain these trees.
- Consider for Removal (Low- C –Grey) These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
- Priority for Removal (Remove – R- Red). -These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

6 Legislation.

6.1 Site Location

For abundant clarity, when referring to the site this is reference to the legal property allotment for 10 Missenden Road, Camperdown. Separately, when referring to the Concept Development Area this is reference to part of the allotment to which the concept proposal relates.

The proposed concept envelope is located at the southern part of the site, within an agreed Concept Development Area boundary, as outlined in blue in Figure 3 and Figure 4. The Concept Development Area comprises 7329 m2.

The site is located within the Camperdown Health, Education and Research Precinct (CHERP), which contains a mixture of healthcare services, medical research and education institutions. Surrounding land uses include the Royal Prince Alfred Hospital (RPAH), University of Sydney and ancillary student accommodation, and mixed-use buildings comprising commercial and residential activity.

6.2 Suburb Map

Figure 3: Map of Suburb showing site location (Source: Urbis Spatial 2025)

6.3 Aerial Image

Figure 4: Aerial image of the site showing boundaries. (Source: Urbis Spatial 2025)

6.4 Land Zoning

The site is zoned SP2 Infrastructure (Educational Establishment) under the Sydney Local Environmental Plan 2012 in the City of Sydney Local Government Area.

6.5 Biodiversity and Conservation SEPP

The subject trees are protected by the State Environmental Planning Policy (Biodiversity and Conservation SEPP) 2021. Trees proposed for removal or pruning, are covered by the SEPP unless they are considered an imminent danger to life and property (By a AQF Level 5 or above Arborist) and require a permit to be issued by Council.

6.6 State Environmental Planning Policy (Transport and Infrastructure) 2021

The subject site is covered by the State Environmental Planning Policy (Transport and Infrastructure) 2021. Trees proposed for removal or pruning, are covered by the SEPP unless they propose a risk to life and property (Assessed by a AQF Level 5 or above Arborist) and require a permit to be issued by Council.

6.7 Heritage Listings

St Johns College is identified under the Sydney Local Environmental Plan 2012 (SLEP 2012) as a local heritage item (no. 67). The Concept Development Area has been assessed as having medium to low archaeological significance, with a potential for Aboriginal archaeological materials to be present in the area. However, it is noted by the St Johns College Conservation Management Plan 2020 that based on the level of continued site disturbance, it is highly unlikely that any deposits or materials would be in situ or undisturbed. The Concept Development Area is also situated within the "University of Sydney" Heritage Conservation Area, which is listed under the SLEP 2012 (C5), and is within the curtilage of the State Heritage Register listing for the Sydney University campus (SHR #01974). Further, the Concept Development Area is located in proximity to the "Admission Block" and "Victoria & Albert Pavilions" of the RPAH to the south of the area, which are listed on the state heritage register (listing numbers 00830 and 00829, respectively).

6.7.1 Heritage Conservation Area

The site is located within the Sydney University Heritage Conservation Area provided for by the Sydney Local Environmental Plan 2012.

6.7.2 State Heritage Register

The grounds of University of Sydney, University Colleges and Victoria Park are listed on the State Heritage Register, listing number 01974. The State Heritage Register describes the importance of the grounds as follows;

"The grounds are important in providing an appropriate setting for the college buildings and they are one of the few remaining large undeveloped open spaces in the university. The Parramatta Road entry to the college is defined by two vehicular gates affixed to two sandstone pillars with carved St John's College Coat of Arms and decorative caps, flanked on either side by pedestrian iron gates and smaller sandstone piers. Phoenix palms originally lined the driveway but now only one survives".

6.7.3 Local Heritage Listing – Sydney University Grounds

The University of Sydney Site landscaping and grounds are listed as a local Heritage item (Listing # 172) under the Sydney Local Environmental Plan 2012.

6.7.4 Local Heritage Listing – St Johns College

St Johns College listed as a local Heritage item (Listing # 167) under the Sydney Local Environmental Plan 2012.

6.7.5 Register of Significant trees

Eight (8) trees onsite are listed on the Register of Significant Trees under the Sydney Local Environmental Plan 2012 for the Johns College group. Significant Trees listed on the Register include; Seven (7) Ficus macrophylla (Morten Bay Fig) and One (1*) Phoenix canariensis* (Canary Island Date Palm).

Analysis of the surveyed locations of these trees indicates that the Significant Tree Register has incorrectly allocated the tree ownership.

The Canary Island Date Palm (Tree 39) is the only tree within the listing that is located on St Johns College Land. The location of these Significant Trees in relation to the site boundaries can be observed on the Site Survey located in the Appendix.

Trees numbered 88 & 89 (Group of 5) Ficus macrophylla (Morten Bay Fig) are located on the Sydney University land on the northern side of the St Johns College Oval.

Tree number 57 Ficus macrophylla (Morten Bay Fig) is located on the neighbouring Santa Sophia College land and the northern section of the canopy overhangs a St Johns College garden bed.

One (1) *Phoenix canariensis* (Canary Island Date Palm) numbered Tree 39 is located on St John College Land.

Figure 5: The Significant Trees numbered 88 & 89 (Group of 5) *Ficus macrophylla* (Morten Bay Fig) are located on the Sydney University land on the northern side of the St Johns College Oval (Source: Austin 4th of November 2022).

Figures 6 & 7: The Significant Tree 57 *Ficus macrophylla* (Morten Bay Fig) is located neighbouring Santa Sophia College land and the northern section of the canopy overhangs a St Johns College garden bed(Left and Tree 39 *Phoenix canariensis* (Canary Island Date Palm) is located on St John College Land (Right)(Source: Austin 4th of November 2022).

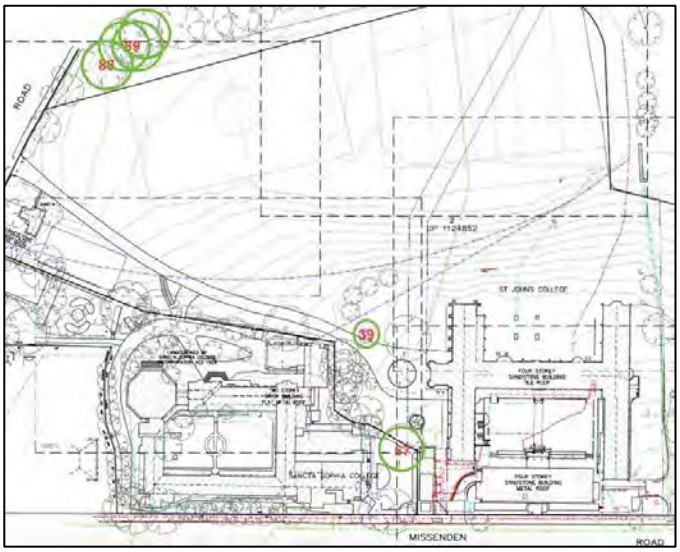


Figure 8: The Significant Trees numbered 57, 88 & 89 (Group of 5) all *Ficus macrophylla* (Morten Bay Figs) are located on neighbouring properties. Significant Tree 39 *Phoenix canariensis* (Canary Island Date Palm) is located on St John College Land (Source: Site Survey by Lockley Land Title Solutions dated 29/3/10).

6.7.6 Conservation Management Plan

A Conservation Management Plan (The CMP) identifies 15 trees as "substantial trees to be preserved" within and adjacent to the grounds of St Johns College. These "substantial trees to be preserved" have been assessed and reported on as Trees numbered 28, 29, 31, 32, 36, 37, 39, 40, 57(Neighbouring tree), 88 (Neighbouring tree) & 89 (Group of 5 Neighbouring tree).

Four (4) "substantial trees to be preserved" in the CMP are located within the development. These four (4) CMP significant trees include trees numbered Trees 28 & 29 *Lophostemon confertus* (Qld Box) and Trees numbered 32 & 33 *Ficus obliqua* (Small leafed Figs).

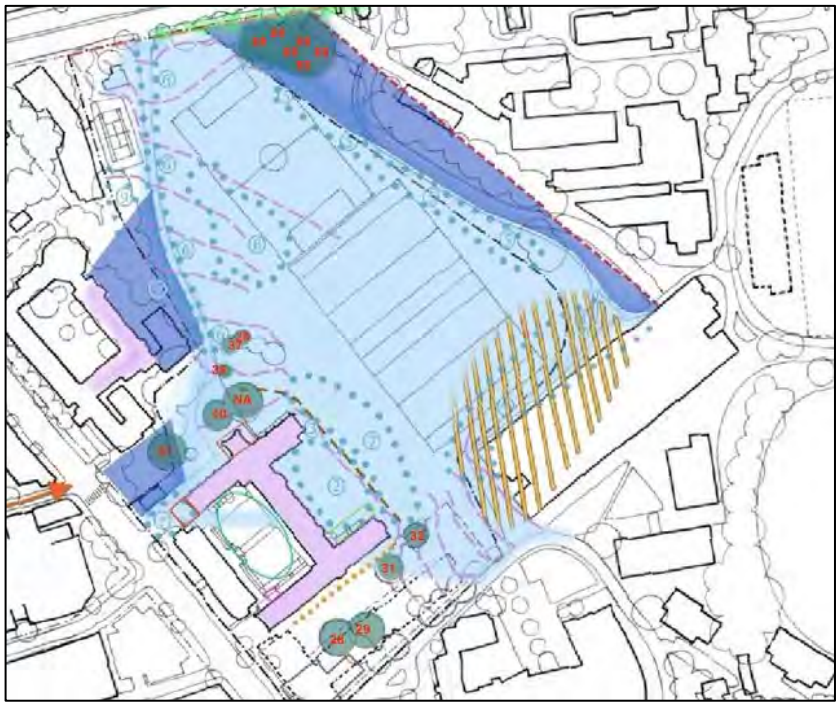


Figure 9: The location the 15 "substantial trees to be preserved" referred to in the CMP. (Source: Conservation Management Plan v2.7 by Hector, Abrahams Architects dated Jan 2020 modified by Austin).

7 Concept Development Area Site Conditions

The subject trees are located within and immediately adjacent to the St Johns College grounds within the wider University of Sydney Campus. The bulk of the development area is currently comprised of at-grade, outdoor carparking (public paid car park) with scattered tree plantings and a driveway/access point from Missenden Road. At the south-west corner, fronting Missenden Road, is a single-storey retail building, known as the Benning Building, which currently accommodates three retail tenancies, a post-office, a "7/11" convenience store and an office.

The Concept Development Area has a prevailing topography characterised by a moderate slope from Missenden Road to the east of the Concept Development Area located along John Hopkins Drive.


Figures 10 & 11: The typical appearance of the carpark. (Source: Austin 28th of April 2025)


Figures 12 & 13: Mature trees at the western boundary of the carpark (Left) and the carpark viewed from the Sydney University grounds at eh base of the Charles Perking building(Right) can be observed. (Source: Austin 28th of April 2025).


Figures 14 & 15: The John Hopkins Drive frontage (Left) and the and the Missenden Road Frontage (Right) can be observed. (Source: Austin 28th of April 2025)

8 Preliminary Tree Assessment

A Preliminary Tree Assessment of the whole site was conducted on the 4th of November 2022 where 90 trees were inspected by Alex Austin. The 98 trees are located within adjacent to the grounds of St Johns College within the wider University of Sydney Camperdown Campus. The 90 trees assessed in the wider site and curtilage include;

- 25 High (A) Retention Value Tree.
- 33 Medium (B) Retention Value Trees
- 24 Low (C)Retention Value Trees
- 8 (R) Remove Trees

8.1.1 Tree Ownership

18 Neighbours trees are located close to the boundary within the curtilage or may be impacted by site works and have been included in this report. The 18 Neighbouring trees included in this report include;

- Trees numbered 1- 6, are council owned trees located on the council verge on the Missenden Road frontage.
- Tree numbers 22, 23, 24, are on RPA Hospital Land.
- Tree number 57 is located Santa Sophia College
- Tree numbers 86, 87, 88, 89, 90, 91, 92 & 93 are Sydney University trees located on the northern side of the boundary.

The remaining 72 trees are located within St John's College land.

8.2 Aerial Image with Tree Locations

Figure 16: Aerial Image of the whole site showing tree locations. Includes group assessments. (Source: Arborsaw Tree Plotter 2025)

9 The Proposed Development Site

For abundant clarity, when referring to the site this is reference to the legal property allotment for 10 Missenden Road, Camperdown. Separately, when referring to the Concept Development Area this is reference to part of the allotment to which the concept proposal relates. The site is legally described as Lot 2 in DP 1124852

The Concept Development Area comprises 7,329m2. The bulk of the Concept Development Area is currently comprised of at-grade, outdoor carparking (public paid car park) with scattered tree plantings and a driveway/access point from Missenden Road. At the south-west corner, fronting Missenden Road, is a sing-storey retail building, known as the Benning Building, which current accommodates three retail tenancies, a post-office, a "7/11" convenience store and an office.

9.1 Concept Development Area Map

Figure 17: Aerial image of the site showing boundaries. (Source: Urbis Spatial 2025)

9.2 Concept Development Area Tree Map

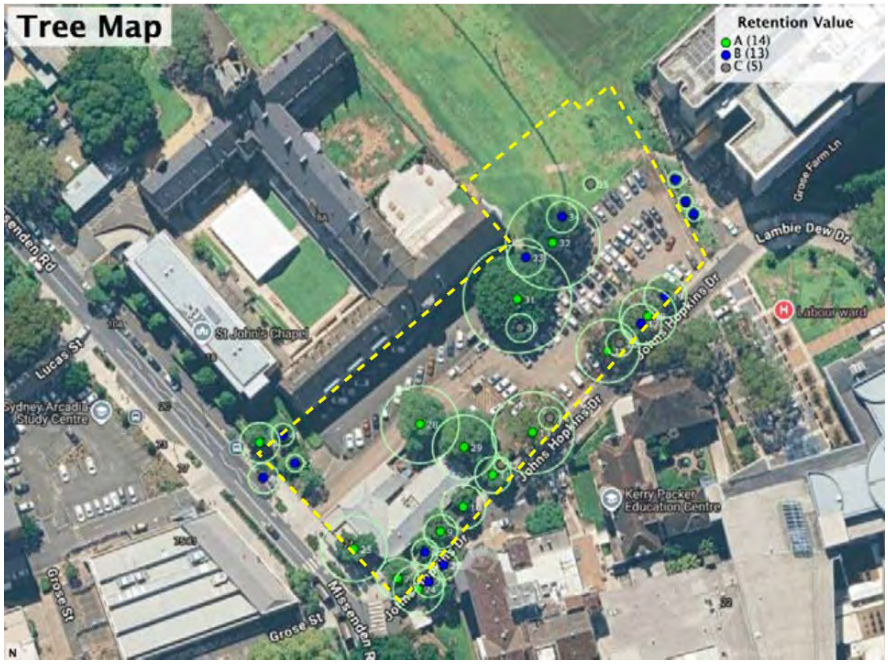


Figure 18: Indicates the tree number, position, retention value and TPZ size within and adjacent to the concept development area. Source: Tree Plotter 2025).

9.3 Trees within Concept Development Area

While data was collected for all trees on and adjacent to the whole site, a subset of 32 trees may be impacted by the proposed works. Trees potentially impacted by the development include;

The 32 Trees subject to this report include;

- 14 Trees numbered 7, 9, 10, 11, 13, 15, 18, 24, 25, 28, 29, 31, 32 & 42 that hold High (A) Retention Value
- 13 Trees numbered 6, 8, 17, 19, 22, 23, 27, 33, 34, 41, 91, 92 & 93 that hold Medium (B) Retention Value
- Five (5) Trees numbered 12, 14, 16, 30 & 35 that hold Low (C) Retention Value

23 Trees numbered 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 25, 27, 28, 29, 30, 31, 32, 33, 34, & 35 are located within the proposed Concept Development Area.

9.4 Trees Adjacent to Concept Development Area

Ten (10) trees numbered 6, 22, 23, 24, 35, 41, 42, 91, 92 & 93 are adjacent to the works area.

- Tree numbered 6 is a small council tree on Missenden Road.
- Three (3) Trees numbered 22, 23 & 24 are located on a neighbouring property on the eastern side of Charles Hopkins Drive and the canopies overhang the roadway.
- Three (3) Trees numbered 35, 41 & 42 are located on St Johns College land on the eastern end of the main buildings Missenden Road frontage.
- Three (3) Trees numbered 91, 92 & 93 are located on Syndey University land at the northern end of the development area.

9.5 14 High (A) Retention Value trees

14 Trees numbered 7, 9, 10, 11, 13, 15, 18, 24, 25, 28, 29, 31, 32 & 42 that hold High Retention Value were identified within the development area. Trees in this category have High landscape prominence, long life expectancies and considerable efforts should be made to incorporate these trees within the proposed development. Key examples include;

9.5.1 Tree 31 *Ficus obliqua* (Small leafed Fig)

Tree 31 *Ficus obliqua* (Small leafed Fig) is a large tree listed as a "substantial trees to be preserved "in the CMP. The tree has a 15m NRZ and a 4.2m SRZ.

Major observations which included; Co-dominant stems, Crossing/rubbing branches, Deadwood > 60mm, Exposed roots, Hanger(s), Mechanical damage to root(s), Poor pruning, Previous branch failure(s), Soil compaction, Unbalanced crown, Wound response growth.

Arborist notes included; Minor hanger, aerial roots.


Figures 19 & 20: Tree 31 can be observed in the landscape. (Source: Austin 28th of April 2025).

9.5.2 Trees 28 & 29 *Lophostemon confertus* (Qld Box)

Trees 28 & 29 *Lophostemon confertus* (Qld Box) are large site trees listed as "substantial trees to be preserved" in the CMP. The trees have High retention value and High landscape prominence. The trees are in good condition and have long life expectancies of 40+ years. The trees have large NRZ's. Considerable efforts should be made to incorporate these trees within the project.

Figures 21 & 22: Tree 28 (Left) and Tree 29 (Right) in the landscape (Source: Austin 28th of April 2025).

9.5.3 Tree 15 *Eucalyptus punctata* (Grey Gum)

Tree 15 *Eucalyptus punctata* (Grey Gum had major observations which included: Cavity, Crossing/rubbing branches, Previous branch failure(s), Trunk Wound(s), Wound response growth.

Arborist notes included; Bees nest at three (3) m height. Canopy skewed 12m over site. Remove rubbing branch.

Figure 23: Tree 15 can be observed in the landscape. (Source: Austin 28th of April 2025)

9.5.4 Trees 25 *Lophostemon confertus* (Qld Box)

Tree 25 *Lophostemon confertus* (Qld Box) is a large site tree adjacent to a site building. The tree has a High retention value and High landscape prominence. The tree is in good condition and has a long life expectancy of 40+ years. The tree has a large NRZ. The existing structure is built within the NRZ and SRZ. Demolition of the existing structure is likely to impact the viability of the subject tree due to stability loss. Considerable efforts should be made to incorporate this tree within the project


Figures 24 & 25: Tree 25 in the landscape. (Left) and Tree 25's growing location (Right). (Source: Austin 28th of April 2025).

9.6 13 Medium Retention Value trees

13 Trees numbered 6, 8, 17, 19, 20, 22, 23, 27, 33, 34, 41, 91, 92 & 93 assessed to hold Medium Retention Value status. Trees in this category generally posses fair or better health and structure and have life expectancies greater than 15 years. Reasonable attempts should be made to retain the trees through the project as they have the ability to be continuing components of the landscape. Examples include;

9.6.1 Tree 17 *Jacaranda mimosifolia* (Jacaranda)

Tree 17 *Jacaranda mimosifolia (*Jacaranda) is a medium sized tree. The tree has a Medium Retention Value retention value and moderate landscape prominance. The tree is in a suppressed condition and has a long life expectancy of 40+ years. Reasonable efforts should be made to incorporate this tree within the project.

Figure 26: Tree 17 can be observed in the landscape. (Source: Austin 28th of April 2025).

9.6.2 Trees 27 *Syzygium leuhmannii* (Lilly Pilly)

Tree 27 *Syzygium leuhmannii* (Lilly Pilly is a group of Four (4) small trees forming a hedge row on the Missendden Road frontage. The hedge is in good condition and have a small NRZ and a medium life expectancy.

Figures 27 & 28: The four (4) Trees forming tree 27 can be observed in the landscape. (Source: Austin 28th of April 2025).

9.7 Five (5) Low Retention Value trees

Five (5) Trees numbered 6, 12, 14, 30 & 35 form the Low Retention Value category. Trees in this category should not be considered a constraint on development as they have reduced health or condition, or have short life expectancies or have low landscape significance or are easily replaceable due to their small size.

Examples include;

Figures 29 & 30: Tree 14 *Corymbia maculata* (Spotted Gum) (Left) has multi stem form with included bark and weak unions, and Tree 30 *Syzygium leuhmannii* (Small leafed Lilly Pilly) (Right) has a suppressed form. (Source: Austin 28th of April 2025).

10 Concept Proposal.

10.1 Proposed Layout

The Concept SSDA seeks development consent for a Concept Proposal for:

- Development of a private hospital, including the provision of ancillary health and research uses, ancillary retail and commercial office space and carparking;
- A building envelope comprising a stepped building form, with dual setbacks and cantilevered elements which responds to the surrounding heritage and context.
- A building envelope which includes:
  - Three (3) basement levels to a maximum depth of RL 13;
  - Five (5) storey terraced podium with a maximum height of RL 56.4;
  - A 10-storey tower, plus roof plant level, with a maximum height of RL 85.5;

The concept proposal *anticipates* the private hospital development will provide:

- Vehicular access from Missenden Road;
- 33,253m^2 gross floor area;
- A maximum of 264 basement car parking spaces and three (3) ground floor, hospital drop-off parking spaces;
- Associated tree removal and tree transplanting, site landscaping, public art and public domain upgrades within and adjacent to the site.
- Accommodation of approximately 90 ward beds, 26 ICU/CCU beds and 8 Theatre rooms. Additionally, spaces for ancillary uses, such as:
  - Radiology
  - Pathology
  - Clinical suites
  - Research / technology
  - Education
  - Retail food and beverage
  - Pharmacy

This Concept SSDA is being sought pursuant to Division 4.4 of the EP&A Act. No physical works are proposed as part of this Concept SSDA. The Concept SSDA seeks development consent for the proposed concept envelope and private hospital land use only, further detailed design in the submission of staged DAs will determine the exact use and operation of these spaces.

All physical works will be the subject of detailed proposals as part of a future required detailed DA. An indicative reference scheme has been prepared by Architectus which provides a proof of concept that the proposed built form outcome is able to sensitively respond and integrate within the existing heritage fabric of the surrounding sites while accommodating the intended land use operations.

The proposal will provide a private hospital that is co-located to the RPA and supports the broader Camperdown Health, Education and Research Precinct ecosystem by providing for contributory health and life science land uses.

Figure 31: The proposed upper ground floor plans. (Source: Plan of Upper Ground Floor from Preliminary Plans by architectus Rev DD, dated 31/07/2025)

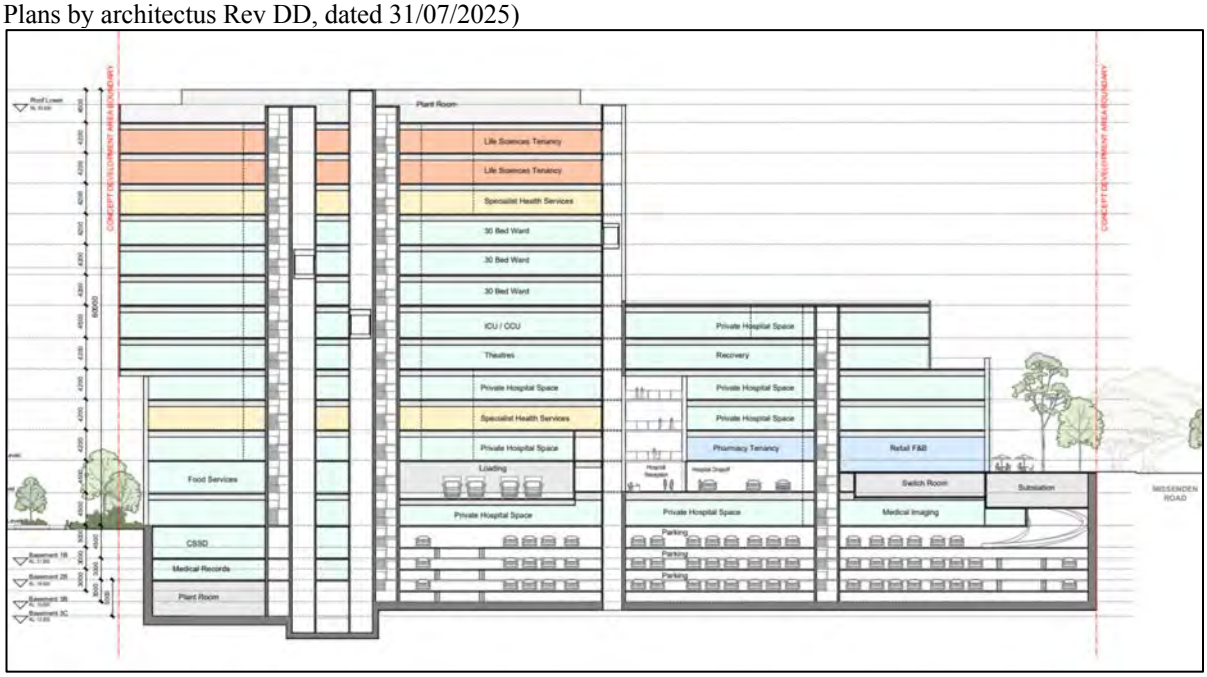


Figure 32: The proposed section plan. (Source: Section East /West Plan from Preliminary Plans by architectus Rev DD, dated 31/07/2025)

11 Impact from Concept Proposal

To enable the proposed concept proposal, 15 Trees are proposed for removal, Four (4) trees are proposed to be transplanted and 13 Trees are to be retained and protected.

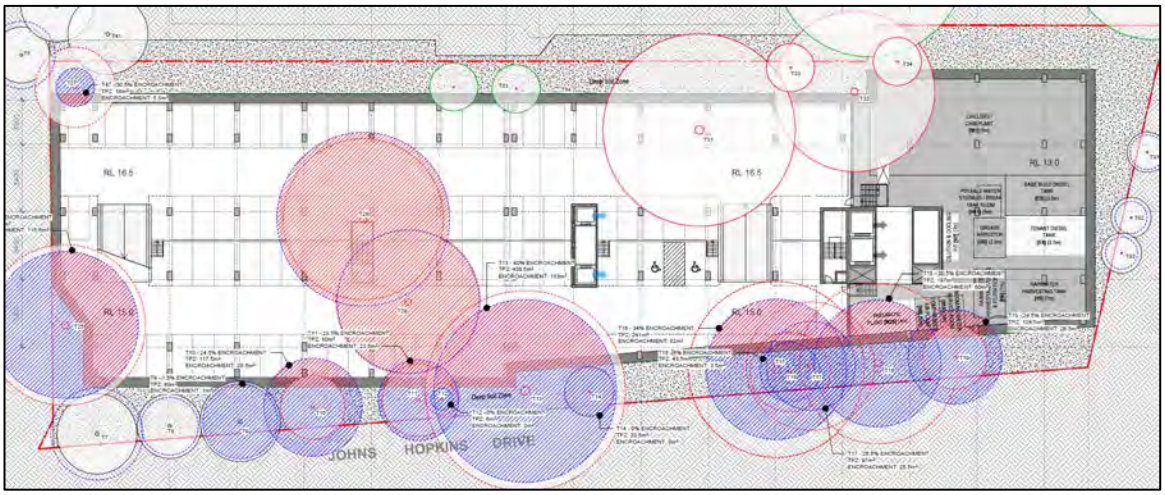


Figure 33: Basement 3 Plan showing tree impacts. (Source: Tree Impact Plans by architectus Rev U, dated 29/05/2025)

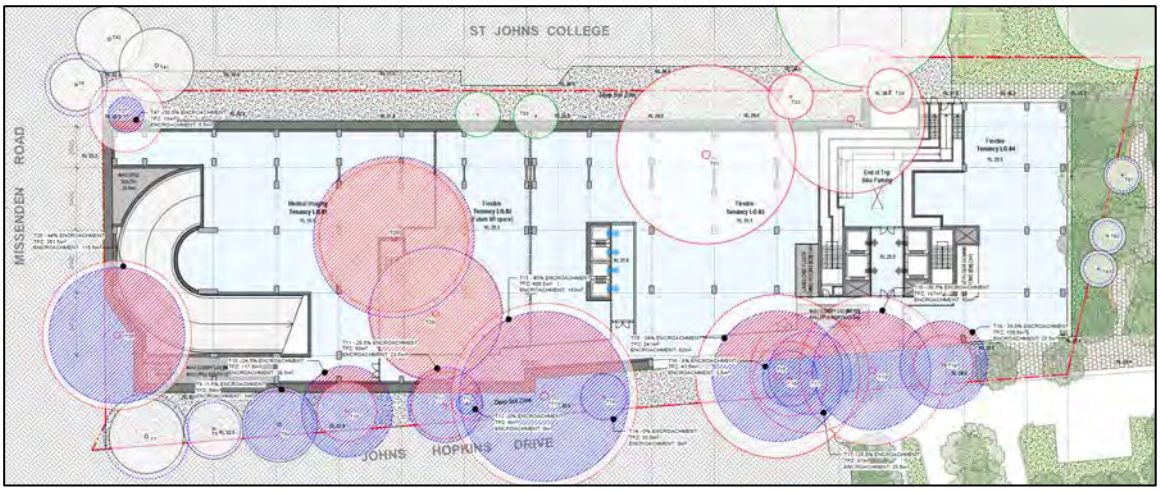


Figure 34: Lower Ground Plan showing tree impacts. (Source: Tree Impact Plans by architectus Rev U, dated 29/05/2025)

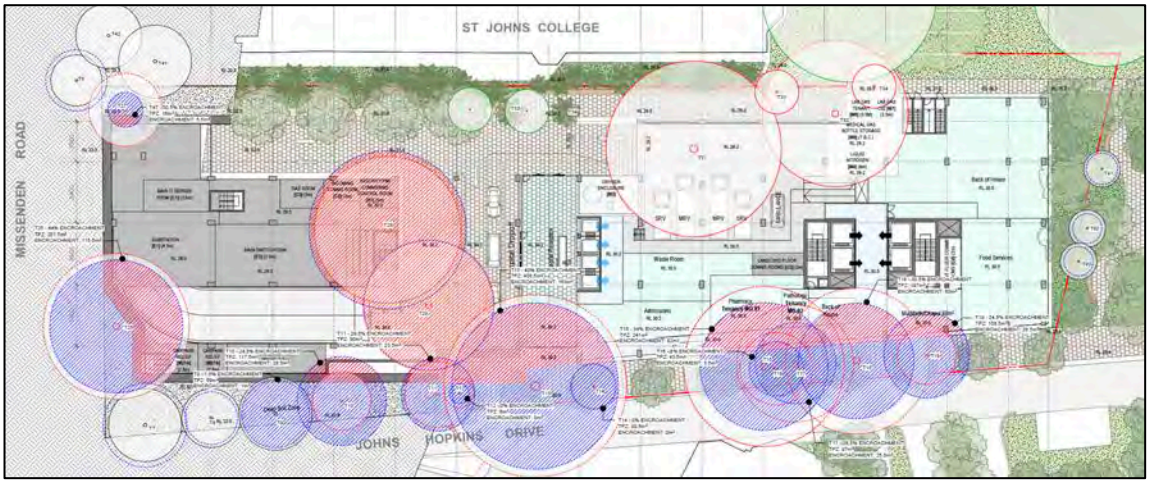


Figure 35: Mid Ground Plan showing tree impacts. (Source: Tree Impact Plans by architectus Rev U, dated 29/05/2025)

11.1 15 Tree Removals

The proposed development envelope allows for a symbiotic hospital building. It is important that all the levels make allowances for critical dimensions that enable this development to be a feasible and functional hospital. Consequently, tree removal and transplanting is proposed to create the space for the development.

If the current proposed construction layout is to proceed, then 15 trees numbered 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 25, 27, 28, 29 & 30 are proposed for removal in order to facilitate the layout.

Note - Two (2) mature Fig trees numbered 31, 32, and Two (2) mature Plan trees numbered 33 & 34 are proposed to be transplanted.

Detailed analysis of alternative layouts, the potential for retaining each tree and the impact to the project for trees proposed for removal is detail within the Tree Encroachment Review completed by architectus dated 29/05/2025 (Located in the Appendix).

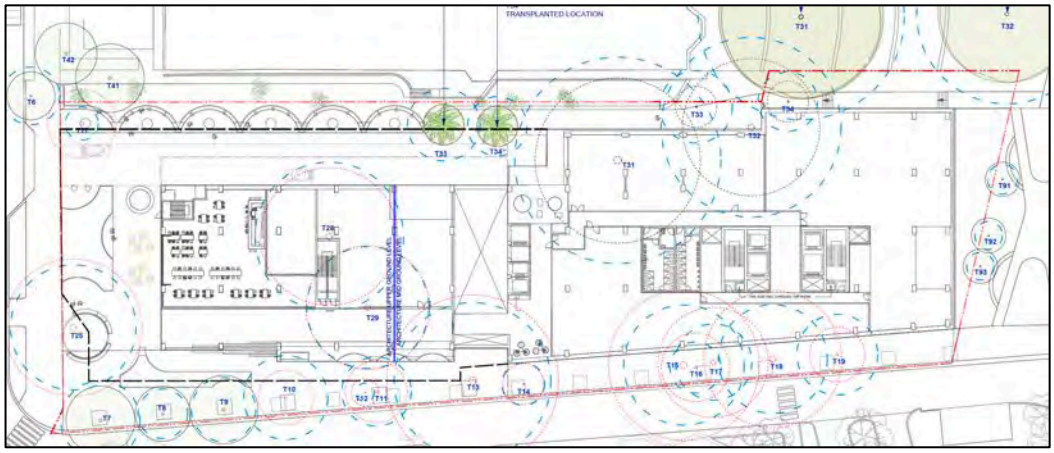


Figure 36:The tree strategy plan. (Source: The tree strategy plan by architectus Rev A, dated 20/05/2025)

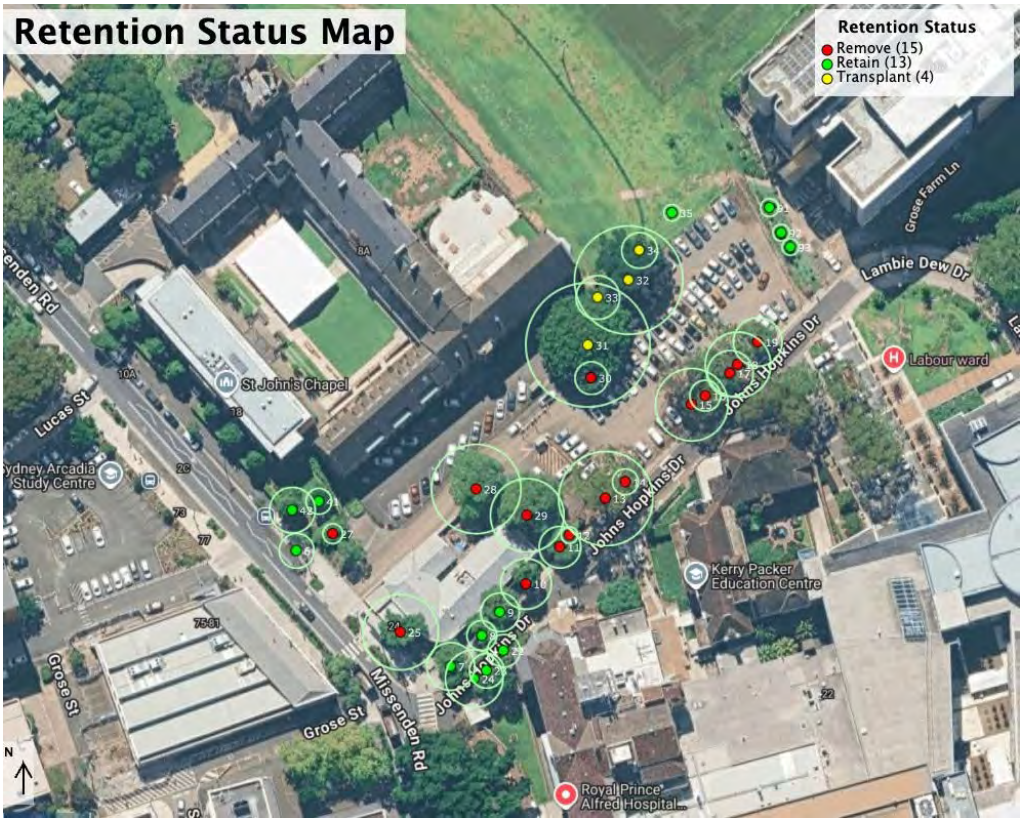


Figure 37: Indicates the tree retention status in the concept development area. (Source: Tree Plotter 2025).

11.1.1 Trees within the Site

Trees 28, 29, 31 & 32 are large trees with large NRZ area in the middle of the site. Tree 30 is a small tree within the NRZ of Tree 31. These trees are proposed for removal (Trees 28, 29 & 30) and Transplanting (Trees 31 & 32) to provide the space required for the development.

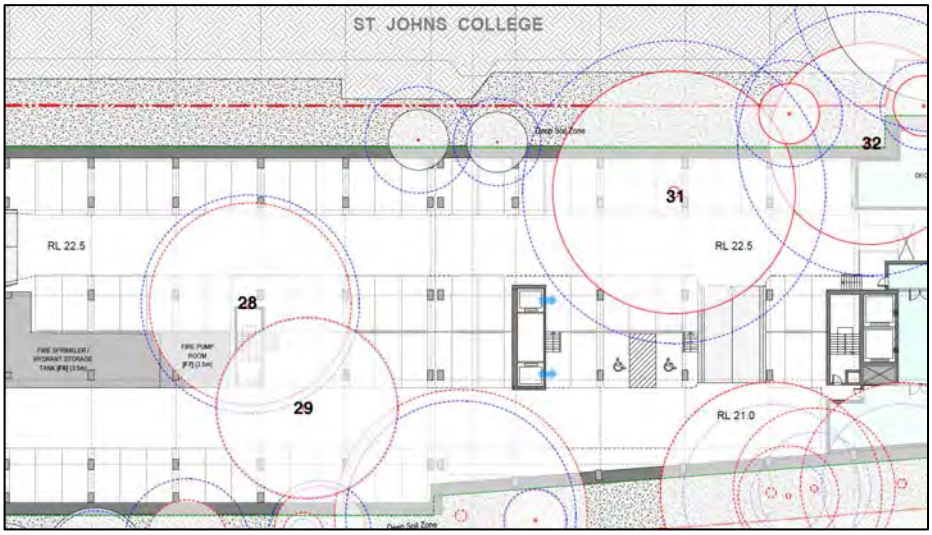


Figure 38:.The tree impact plan showing the NRZ conflict of trees 28, 29, 31 & 32. (Source: Lower Ground plan from Preliminary Plans by architectus Rev T – TPZ Overlay, dated 16/05/2025).

11.1.2 Trees along John Hopkins Drive

Trees 10 -19 along John Hopkins Drive are nominated for removal. The removal of these ten trees provides an additional combined 430sqm of developable space in the Concept Development Area. There will also be a canopy clash with the proposed use of the podium levels to facilitate a feasible and functioning hospital.

Figure 39: The tree impact plan showing the NRZ conflict of Trees 10-19 (Source: Lower Ground plan from Preliminary Plans by architectus Rev T – TPZ Overlay, dated 16/05/2025).

11.1.3 Missenden Road Frontage

Trees 25 (Brush Box) & 27 (A group of four Lilli pillies forming a hedge) along Missenden Road are nominated for removal. Tree 27 (Group) is located such that they will clash with access lane down the side of the development.

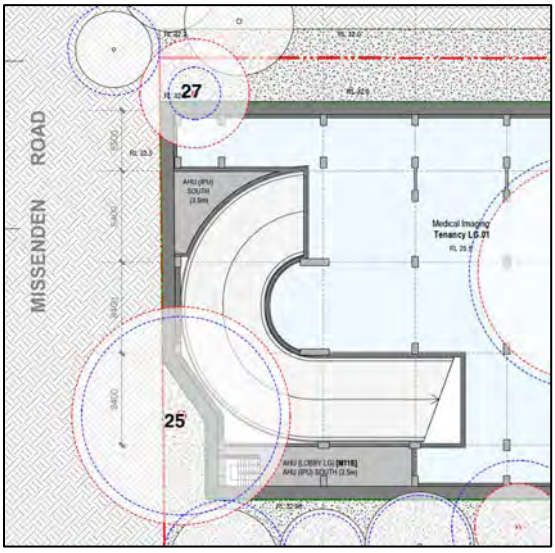


Figure 40: The tree impact plan showing the NRZ conflict of Trees 25 & 27 (Source: Basement 1 plan from Preliminary Plans by architectus Rev T – TPZ Overlay, dated 16/05/2025).

11.2 13 Trees to be Retained

13 trees numbered 6, 7, 8, 9, 22, 23, 24, 35, 41, 42, 91, 92 & 93 will be retained if the tree protection measures in the report are adhered to. No impact to the viability of these trees is anticipated if the protection measures are applied as per the guidance in this report.

11.2.1 Trees along John Hopkins Drive

Trees 7-9 along John Hopkins Drive are nominated for retention. These trees are located next to the existing building. The proposal development footprint has a reduced NRZ encroachment to that of the existing footprint.

The existing pavement must be left in situ to protect the soil until the landscape works.

Growing conditions for Trees 7 - 9 are expected to improve following the demolition of the existing structure and viability for the trees is not expected to be impacted.

Trees 7 & 8 have no NRZ encroachment Tree 9 has a minor NRZ encroachment of 1.5% of NRZ.

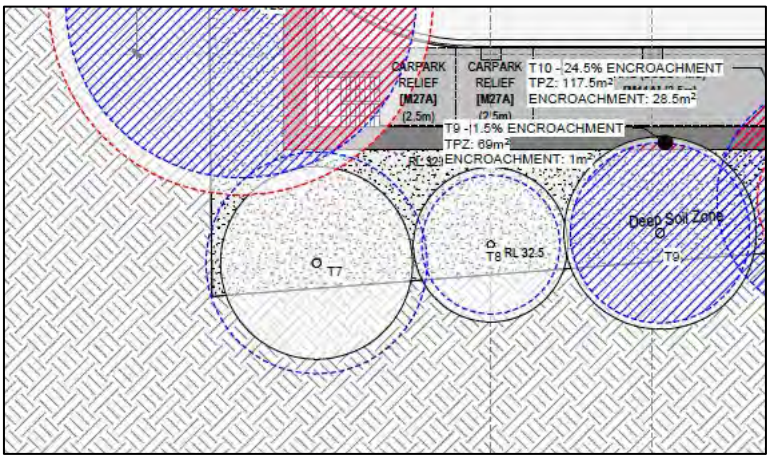


Figure 41: The tree impact plan showing the existing building TPZ conflict of Trees 7 -9 (Source: Lower Ground plan from Preliminary Plans by architectus Rev T – TPZ Overlay, dated 16/05/2025).

Figures 42 & 43: Trees 7 & 8 (Left) and Tree 9 (Right) can be observed next to the existing building. (Source: Austin 28th of April 2025).

11.3 Neighbouring Trees

11.3.1 Tree numbers 22, 23 & 24

Tree numbers 22, 23 & 24 are located on the opposite of John Hopkins drive and are not directly impacted by the works. At the time of inspection, these trees had construction activities occurring within their TPZ's including the storage of materials against the trunk of trees 23 & 24. These trees must be protected from the slinging of loads by future site cranes. The canopies must be placed on lift plans.

Figure 44: Indicates the Tree numbers 22, 23 & 24 opposite the development area. (Source: Tree Plotter 2025).

Figures 45 & 46: Neighbours tree 22 (Left) and Neighbours Trees 23 & 24 can be observed next to John Hopkins Drive (Right) (Source: Austin 28th of April 2025).

11.3.2 Trees 91,92 & 93

Tree numbers 91,92 & 93 are located on USYD land to the east of the site. Tree numbers 91,92 & 93 are not impacted by the works.

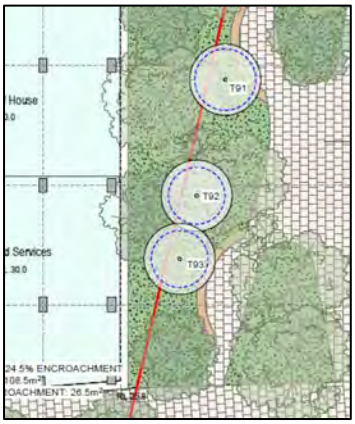


Figure 47: The proximity of neighbours trees 91 – 93 (Source: Lower Ground plan from Preliminary Plans by architectus Rev T – TPZ Overlay, dated 16/05/2025).

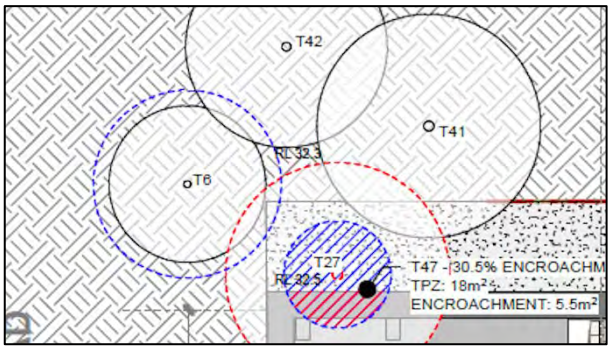
Figures 48 & 49: Neighbours tree 91(Left) and Neighbours Trees 92 & 93 can be observed next to the existing carpark (Right). (Source: Austin 28th of April 2025).

11.3.3 Trees 41 & 42

Tree numbers 41 & 42 are located on St Johns land to the north of the site. Tree numbers 41 & 42 are not impacted by the works.

11.3.4 Tree 6 – Small Council tree

Tree 6 is a small Council trees on the Missenden Road footpath is not impacted by the works.



Figures 50 & 51: The location of Council Tree 6 and neighbours trees 41 & 42 (Left) & The proximity of Council Tree 6 and Neighbours trees 41 & 42 to the works, (Source Left: Tree Plotter 2025) & (Source Right: Lower Ground plan from Preliminary Plans by architectus Rev T – TPZ Overlay, dated 16/05/2025).

11.3.5 Tree 35

Tree 35 is a small tree in the St johns Landscape area that is not impacted by the works.

Figures 52 & 53: Tree 35 in the landscape (Left) and the location of tree 35. (Right). (Source Left: Austin 28th of April 2025) & (Source Right: Tree Plotter 2025).

11.4 Four (4) Tree Transplants

Two (2) mature Fig trees numbered 31 & 32 as well as Two (2) mature Palm trees T33 & 34 are proposed to be transplanted as per the methods detailed in the Arborist Network Transplant Feasibility Study dated Jan 2023.These trees are proposed to be removed in order to provide developable space in the development area.

Palm trees 33 & 34 are proposed to be relocated into the new landscape between the proposed building and the St Johns College building.

The methods in the Transplant Feasibility Study must be applied as early as possible to ensure successful transplanting of the trees.

Two (2) mature Fig trees numbered 31 & 32 are proposed to be relocated to the lawn area between the St College building and the Charles Perkins Centre.

Figures 54 & 55: Tree 31 (Left) and Tree 32 (Right) are large site trees listed in the CMP as significant trees that are proposed to be transplanted into the St College grounds. (Source: Austin 28th of April 2025).

Figure 56: The lawn area in the St Johns College grounds where trees 31 & 32 are proposed to be relocated. . (Source: Austin 28th of April 2025).

11.5 Landscape Plan

58 trees are proposed to be planted as part of the landscape plan.

In addition, Two (2) Palms numbered 33 & 34 and Two (2) Figs numbered 31 & 32 are to be relocated into the landscape.

The proposed tree plantings include the following species;

- *Zelkova serrata 'Green Vase'*
- *Lophostemon confertus*
- *Elaeocarpus reticulatus*
- *Tristaniopsis laurina 'Lucious'*
- *Melaleuca quinquenervia Vase'*
- *Waterhousea floribunda*
- *Glochidion ferdinandi*
- *Livistona australis*

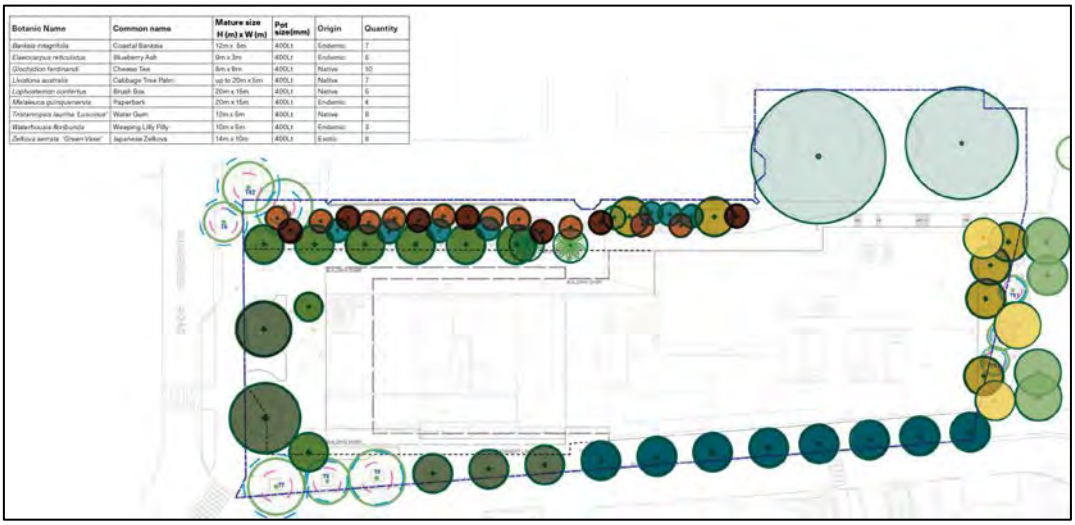


Figure 57: The proposed tree planting plan. (Source: Tree planting plan from Landscape Design Report by Aspect Studios dated 05/08/2025).

11.6 Canopy Cover

The proposed tree plantings anticipate a 25.7% canopy cover.

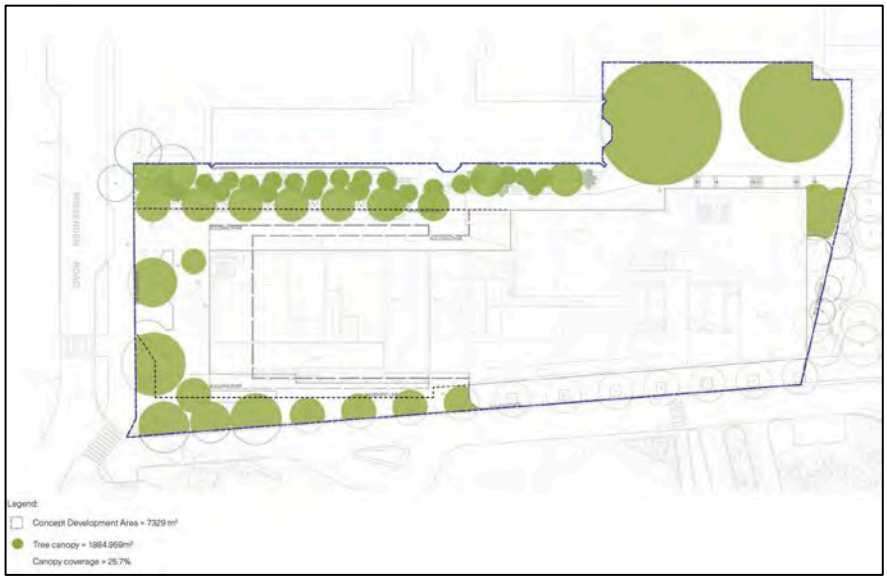


Figure 58: The anticipated canopy cover of 25.7% (Source: Tree canopy cover Landscape Design Report by Aspect Studios dated 05/08/2025).

12 Mitigation Measures

13 trees numbered 6, 7, 8, 9, 22, 23, 24, 35, 41, 42, 91, 92 & 93 will be retained if the tree protection measures in the report are adhered to. No impact to the viability of these trees is anticipated if the protection measures are applied as per the guidance in this report.

12.1 Summary Table for Mitigation Measures

Summary Table for Mitigation Measures			
Mitigation Number/ Name	**Mitigation Measure**	**Reason for Mitigation Measure**	**Timing**
TR1	**All trees shown on all plans and listed in the data sheet as being retained must be retained and protected.**	**To protect trees for retention from unnecessary damage.**	**Pre-Construction and Construction**
TR2	**Protect all trees for retention with Tree Protection fencing compliant with AS4970:2025**	**To protect trees for retention from unnecessary damage.**	**Pre-Construction**
TR3	**Protect all trees for retention with Tree Protection signage compliant with AS4970:2025**	**To protect trees for retention from unnecessary damage.**	**Pre-Construction**
TR4	**An official "Project Arborist" must be commissioned to oversee the tree protection, any activity within the TPZ's and complete compliance certification.**	**To protect trees for retention from unnecessary damage.**	**Construction**
TR5	**Project Arborist to supervise any earthwork or service installation the TPZ's of trees to be retained.**	**To protect trees for retention from unnecessary damage.**	**Construction**
TR7	**Construction Manager to ensure activities listed in Section 11.12 of the AIA do not occur in the TPZ of trees to be retained.**	**To protect trees for retention from unnecessary damage.**	**Construction**
TR8	**The Project Arborist is to complete monthly site visits and record photographic evidence to ensure compliance with mitigation measures**	**To protect trees for retention from unnecessary damage.**	**Construction**
TR9	**49 New trees to be planted in the site as per the Landscape Plans.**	**To reduce the impact of 15 removed trees and introduce a new tree population for the future.**	**Pre-occupation**
TR10	**Project Arborist to inspect and report on the condition of trees for retention and quality of tree new plantings.**	**To ensure trees for retention were protected and will remain viable post construction.**	**Within 12 months of commencement of operations**

12.2 Project Arborist

An official "Project Arborist" should be commissioned to oversee the tree protection, any works within the TPZ's and complete compliance certification. The Project Arborist should have minimum five (5) years industry experience in the field of arboriculture.

12.3 15 Tree Removals

If the current proposed construction layout is to proceed, then 15 trees numbered 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 25, 27, 28, 29 & 30 are proposed for removal in order to facilitate the layout.

These 15 trees proposed for removal should be removed at the beginning of the project (STCA). The trees nominated for retention must not be damaged during the tree removal works.

12.3.1 Standard of Works

To ensure a high standard of works is achieved, all proposed arboricultural works must be completed by a suitably qualified and experienced Arborist(s) of a minimum AQF Level 3 in accordance with the principles of the Australian Standard *4373-2007 Pruning of Amenity Trees.*

12.4 Tree Protection Fencing

The 13 trees nominated for retention must be fenced as per the fencing method described below and as shown in the attached Tree Protection Plan.

Protective fencing is to be installed as close as practicable from the trunk to the TPZ distances listed in the Tree Data table. Existing site features such as boundary fences will influence the extent of the TPZ fencing. The project arborist is to determine the suitability and extent of the tree protection fencing to be used.

Tree protection fencing must remain intact throughout all proposed construction works and must only be dismantled after the works are complete. The temporary dismantling of tree protection fencing must only be done with the authorisation of the project arborist and/or the responsible authority.

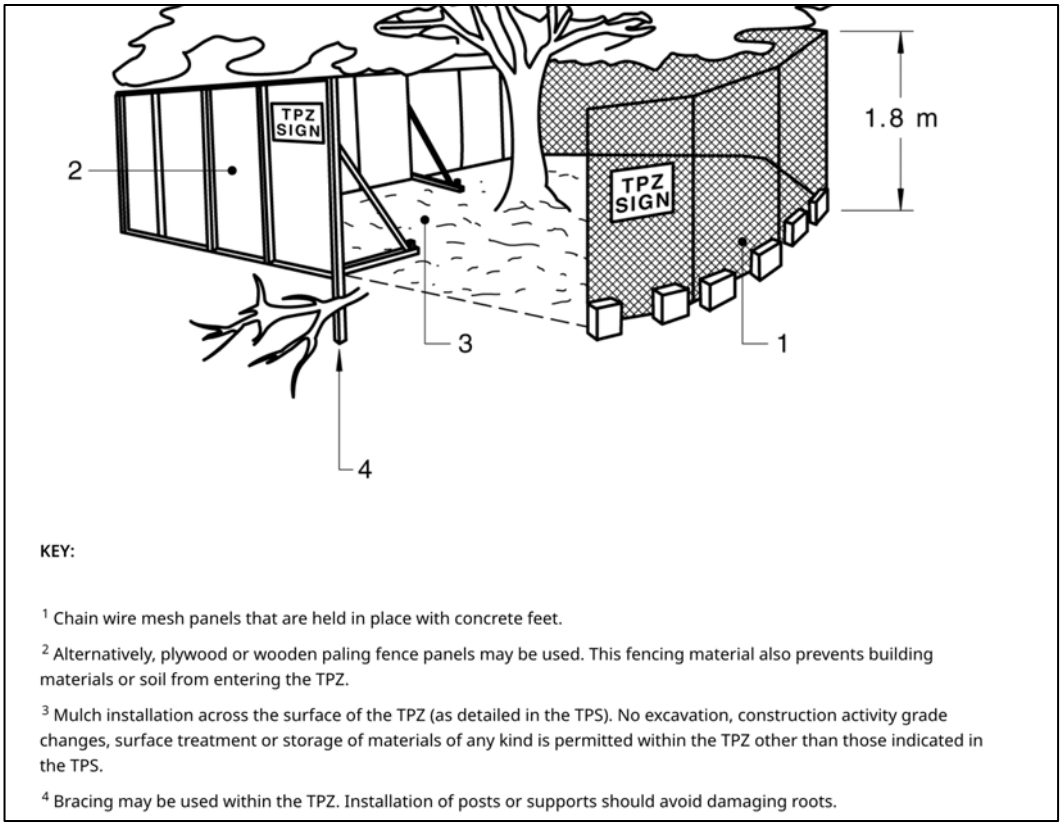


Figure 59: TPZ fencing specification. (Source: AS 4970:2025)

12.5 Tree Protection Signage

The tree protection signage below should be installed at 10m intervals along the Tree Protection Fences.

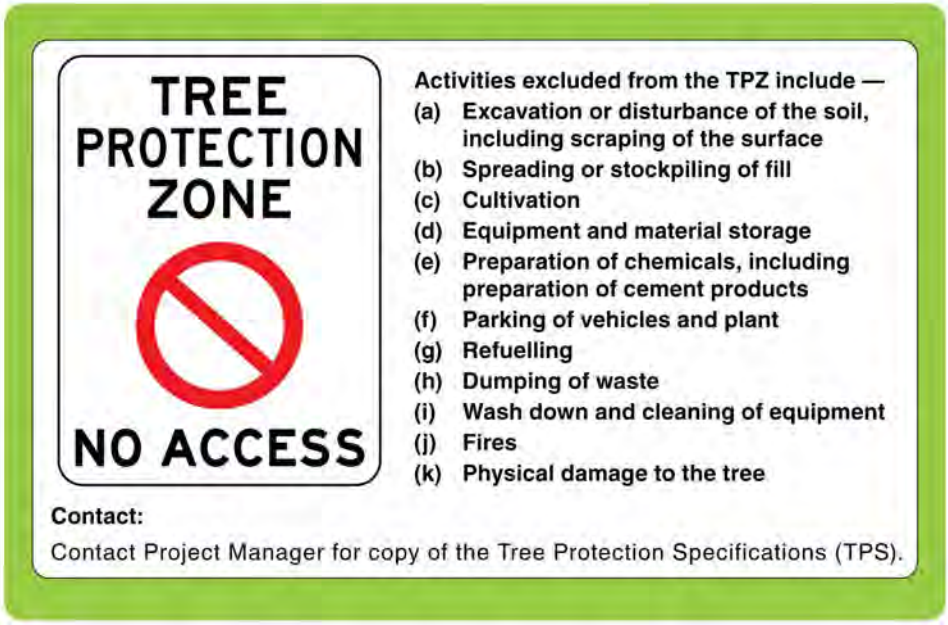


Figure 60: TPZ signage specification. (Source: AS 4970:2025).

12.6 Trunk and Branch Protection

Trunk and Branch Protection requires the wrapping of trunks and branches with padding then at the addition of boards to be strapped (Not Nailed) to the tree using galvanised strapping tape.

12.7 Ground Protection

Rumble boards are to be installed within TPZ's on the ground wherever access to the site is planned outside existing driveways. Rumble boards must be installed on aggregate or mulch above a geotextile base. The rumble boards must be of suitable thickness to prevent compaction to the ground.

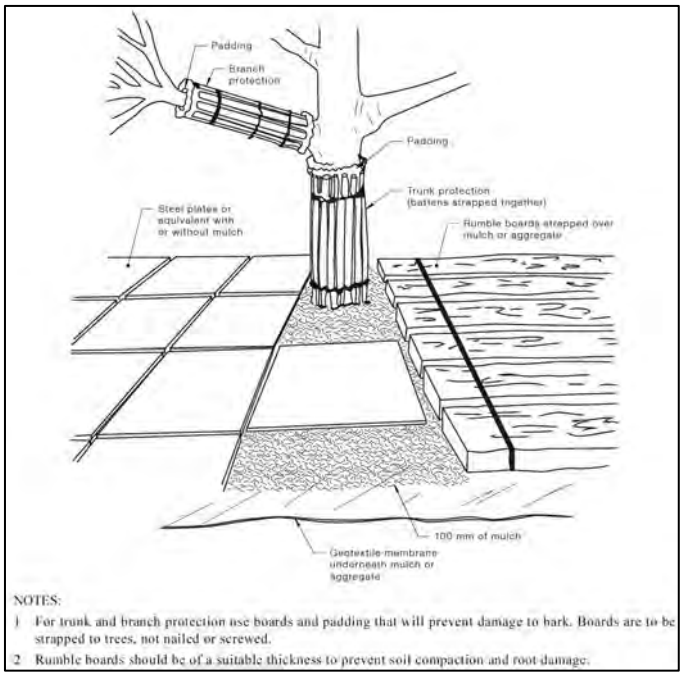


Figure 61: Trunk and branch wrapping as well as rumble board specifications. (Source: AS 4970:2025).

12.8 Existing Driveways

The existing driveways are suitable to use as access for demolition and site works. The existing driveways must be left in situ until the new driveways are ready to be poured.

12.9 Temporary Scaffold.

Temporary scaffold 1m wide may be required to facilitate the building works. The scaffold must be placed on ground protection matts as to not damage roots or compact the ground.

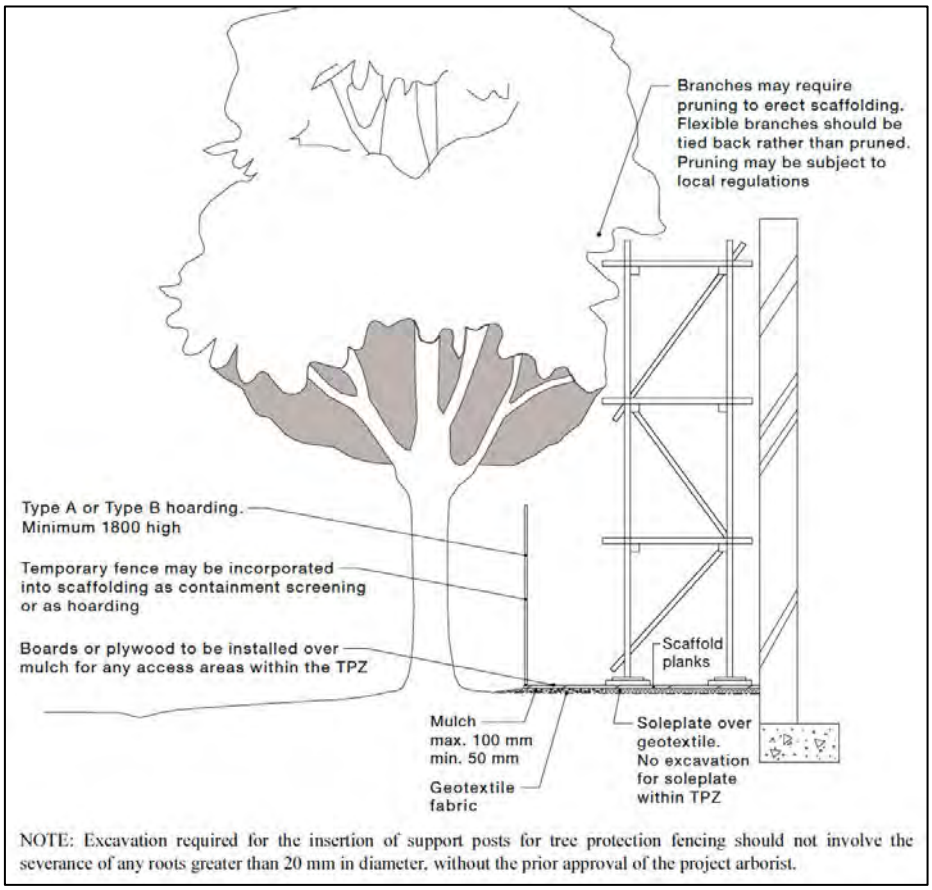


Figure 62: Scaffold within the TPZ specification. (Source: AS 4970:2025)

12.10 Four (4) Tree Transplants

Two (2) mature Fig trees numbered 31, 32, and Two (2) mature Plan trees numbered 33 & 34 are proposed to be transplanted as per the methods detailed in the Arborist Network Transplant Feasibility Study dated Jan 2023. A mature tree transplant specialist must be utilised and help responsible for the maintenance of these Four (4) trees during and post construction. The methods in the Transplant Feasibility Study must be applied as early as possible to ensure successful transplanting of the trees.

12.11 Works within TPZ's

All works within the TPZs must be completed by techniques that do not damage tree roots. Excavation works should be undertaken using techniques that are sensitive to tree roots to avoid unnecessary damage. Such techniques include:

- Excavation/demolition by hand
- Excavation/demolition by machine with Arborist supervision
- Excavation using a high-pressure water jet and vacuum truck
- Excavation using an air spade with vacuum truck

Machine excavation is prohibited within the remaining TPZ areas of retained trees unless undertaken at the direct consent from the project arborist and/or the responsible authority.

12.12 Activities Prohibited within the TPZ

Other than the approved works, the following activities are prohibited in the TPZ's of trees to be retained;

- Machine excavation without Arborist supervision
- Demolition by machine without Arborist supervision
- Excavation for silt fencing
- Storage
- Preparation of chemicals, including preparation of cement products
- Dumping of waste
- Wash down and cleaning of equipment
- Placement of fill
- Soil level changes
- Temporary or permanent installation of services, utilities, or signs
- Physical damage to the tree
- Parking or driving of vehicles/machinery.

12.13 Compliance Inspections & Reports

Inspections should be conducted by the Project Arborist at key points during the construction to ensure that protection measures are being adhered to during construction stages and any decline in tree health or additional remediation measures can be identified.

Tree inspections and compliance reporting by the project arborist is required:

1. Following the tree removal works and the installation of the tree protection including, tree protection fencing and trunk protection
2. During any demolition or excavation or demolition within TPZ's of the Trees to be retained.
3. Following the installation of the ground protection and scaffold in the TPZ's
4. During any other works within TPZ's of trees to be retained unless specific methodologies are developed and approved by the project arborist.
5. Every month during the works to ensure compliance

Following each inspection, the project arborist shall prepare a brief compliance report detailing the condition of the trees. These reports should contain photographic evidence where required to demonstrate that the protection measures are in place as specified.

Any Non-Compliance Statements shall be submitted to the Project Manager (as well as the clients' nominated representative) if tree protection conditions have been breached. Reports should contain clear remedial action specifications to minimise any adverse impact on any subject tree.

13 Conclusion

This Arboricultural Impact Assessment has provided a detailed analysis of the trees that could be affected by development on the subject site. The requirements for Tree Preservation Zones are in line with AS 4970:2025 *Protection of tree on development sites.* The viability of the trees nominated for retention is not anticipated to be impacted if the protection measures are applied as per the guidance in this report.

14 References

Australian Standard 4970: 2025 *Protection of trees on development sites.*

British Standard 5837:2012 *Trees in relation to design, demolition and construction – Recommendations.*

15 Industry Qualifications and Memberships

- AQF Level 5 Consulting Arborist – Ryde Tafe
- AQF Level 8 Consulting Arborist – Melbourne University
- ISA Certified Arborist # AU-0348A
- ISA Professional Member # CSID: 223350
- Tree Risk Assessment Qualification (TRAQ) (Exp Oct 2028)
- Advanced Quantified Tree Risk Assessment Registered User # 3692
- VALID Tree Risk Benefit Management & Assessment Registered User (Exp March 2030)
- Masters of Environmental Law – Sydney University 2018.

16 Appendices

16.1 Tree Data

16.2 Tree Retention Status Map

16.3 Tree Protection Plan

16.4 Tree Encroachment Review

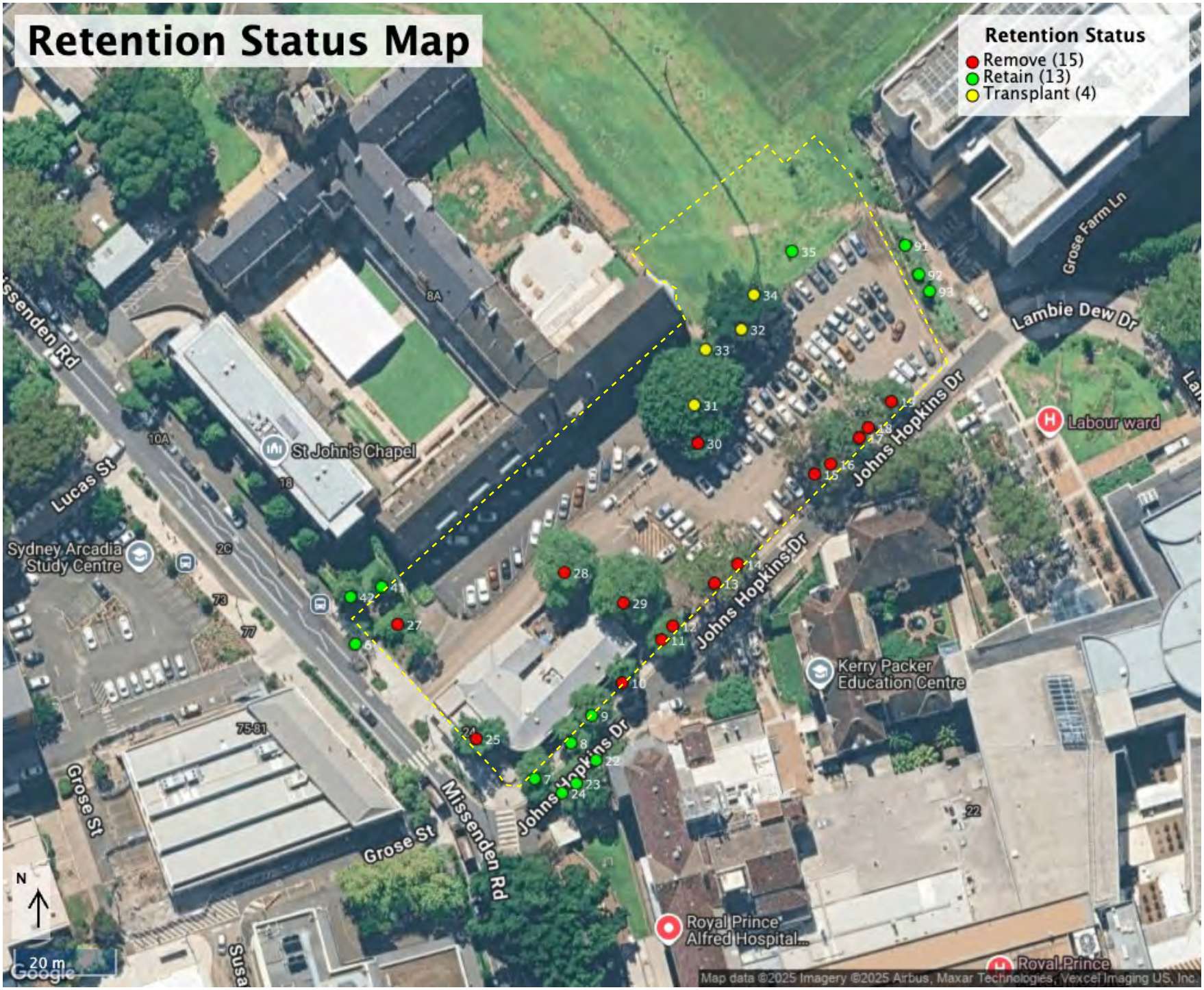
16.5 The City of Sydney Street Tree Master Plan, Part D Technical Guidelines dated 2011 (Updated 2015).

16.6 Tree Transplant Feasibility Study

Tree Id	Tree Ownership	Common Name	Botanical Name	Trees In Group	Tree Age	DBH [cm]	Root Crown Diameter [cm]	NRZ Radius [m]	NRZ Area [m2]	SRZ Radius [m]	Height [m]	Canopy [m]	Health	Structure	Significance	ULE [Yrs.]	Observations	Recommendations	Arborist Notes	Landscape Prominence	Retention Value	xc x	TPZ Encroachment Type	Tree Protection Considerations	Retention Status
6	Council land	Queensland Box	*Lophostemon confertus*	1	Mature	35	40	4.2	55.39	2.25	7	7	Average	Average	Amenity value	Medium (15-40 years)	Deadwood > 30mm, Epicormic growth - Shoots, Powerline clearance pruning, Uncharacteristic form, Wound(s) - trunk			Medium	B		NA	Trunk Protection,	Retain
7	Client site	Queensland Box	*Lophostemon confertus*	1	Mature	48	56	5.76	104.18	2.59	12	10	Good	Good	Amenity value	Long (>40 years)	Wound(s) - trunk, Wound response growth - Good			High	A	0%	NA	Trunk Protection,	Retain
8	Client site	Queensland Box	*Lophostemon confertus*	1	Mature	30	40	3.6	40.69	2.25	10	8	Average	Average	Amenity value	Medium (15-40 years)	Canopy Dieback, Suppressed, Wound(s) - trunk, Wound response growth - Good			Medium	B	0%	NA	Trunk Protection,	Retain
9	Client site	Queensland Box	*Lophostemon confertus*	1	Mature	39	54	4.68	68.77	2.55	12	10	Good	Good	Amenity value	Long (>40 years)				High	A	1.50%	Building footprint, basement & ground	Trunk Protection,	Retain
10	Client site	Queensland Box	*Lophostemon confertus*	1	Mature	51	61	6.12	117.61	2.69	15	8	Good	Average	Amenity value	Long (>40 years)	Epicormic growth - Shoots, Lifting Pavement, Wound response growth - Good, Wound(s) - trunk		Basal wound with moderate response growth	High	A	24.50%	Building footprint, basement, ground and upper levels		Remove
11	Client site	Queensland Box	*Lophostemon confertus*	1	Mature	42	56	5.04	79.76	2.59	11	9	Good	Good	Amenity value	Long (>40 years)	Deadwood Minor			High	A	29.5	Building footprint, basement, ground and upper levels		Remove
12	Client site	Spotted Gum	*Corymbia maculata*	1	Juvenile	8	12	2	12.56	1.36	5	2	Poor	Poor	Amenity value	Limited (<5 years)	Canopy thinning, Deadwood > 30mm, Canopy Dieback, Suppressed		Health in decline	Low	C		Building footprint upper levels. Not suitable for retention under building eve.		Remove
13	Client site	Spotted Gum	*Corymbia maculata*	1	Mature	95.01	102	11.4	408.07	3.34	26	25	Good	Good	Amenity value	Long (>40 years)	Co-dominant stems, Deadwood Minor, Previous branch failure(s), Wound response growth - Good, Wound(s) - trunk			High	A	40%	Building footprint upper levels		Remove
14	Client site	Spotted Gum	*Corymbia maculata*	1	Juvenile	26.02	35	3.12	30.57	2.13	10	6	Good	Poor	Amenity value	Short (5-15 years)	Co-dominant stems, Included bark, Uncharacteristic form, Weak attachments		Multi stem	Medium	C		Building footprint upper levels. Not suitable for retention under building eve.		Remove
15	Client site	Grey Gum	*Eucalyptus punctata*	1	Mature	73	80	8.76	240.96	3.01	16	22	Good	Average	Active nesting by fauna, Amenity value	Medium (15-40 years)	Cavity - trunk, Crossing/rubbing branches, Previous branch failure(s), Wound(s) - trunk, Wound response growth - Good	Prune - Remove selective branches	Canopy skewed 12m over site. Remove rubbing branch.	High	A	34%	Building footprint, basement, ground and upper levels		Remove
16	Client site	Spotted Gum	*Corymbia maculata*	1	Semi-Mature	31	35	3.72	43.45	2.13	18	10	Good	Average	Amenity value	Short (5-15 years)	Crossing/rubbing branches, Wound response growth - Good, Wound(s) - trunk, Wounds - Branches		Significant Rubbing wound with good response growth at 6m.	Medium	C	8%	Building footprint upper levels. Not suitable for retention under building eve.		Remove
17	Client site	Jacaranda	*Jacaranda mimosifolia*	1	Semi-Mature	46.32	49	5.56	97.07	2.45	10	16	Good	Good	Amenity value	Long (>40 years)	Suppressed			Medium	B	26.50%	Building footprint, basement, ground and upper levels		Remove
18	Client site	Lemon-scented Gum	*Corymbia citriodora*	1	Mature	66	74	7.92	196.96	2.92	18	20	Good	Good	Age/size, Amenity value	Long (>40 years)	Wound response growth - Good, Wound(s) - trunk, Wounds - Branches			High	A	30.50%	Building footprint, basement, ground and upper levels		Remove
19	Client site	Queensland Box	*Lophostemon confertus*	1	Mature	49	59	5.88	108.56	2.65	10	8	Good	Average	Amenity value	Medium (15-40 years)	Poor pruning, Wound response growth - Good, Wound(s) - trunk, Wounds - Basal			Medium	B	24.5	Building footprint, basement, ground and upper levels		Remove

Tree Id	Tree Ownership	Common Name	Botanical Name	Trees In Group	Tree Age	DBH [cm]	Root Crown Diameter [cm]	NRZ Radius [m]	NRZ Area [m2]	SRZ Radius [m]	Height [m]	Canopy [m]	Health	Structure	Significance	ULE [Yrs.]	Observations	Recommendations	Arborist Notes	Landscape Prominence	Retention Value	xc x	TPZ Encroachment Type	Tree Protection Considerations	Retention Status
22	Neighbouring property	Illawarra Flame Tree	*Brachychiton acerifolius*	1	Mature	33	38	3.96	49.24	2.2	9	4	Average	Good	Amenity value	Medium (15-40 years)			Not tagged	Medium	B	0%		Not required	Retain
23	Neighbouring property	Bull Bay	*Magnolia grandiflora*	1	Mature	35	40	4.2	55.39	2.25	8	12	Average	Average	Amenity value	Medium (15-40 years)	Deadwood > 100mm, Site work(s) in TPZ, Wound(s) - trunk		Not tagged	Medium	B	0%		Not required	Retain
24	Neighbouring property	Queensland Box	*Lophostemon confertus*	1	Mature	58	65	6.96	152.11	2.76	8	12	Average	Good	Amenity value	Medium (15-40 years)	Canopy Dieback, Deadwood > 30mm, Epicormic growth - Shoots, Site work(s) in TPZ, Wound response growth - Good, Wound(s) - trunk		Not tagged	High	A	0%		Not required	Retain
25	Client site	Queensland Box	*Lophostemon confertus*	1	Mature	76	86	9.12	261.17	3.11	11	10	Good	Good	Amenity value	Long (>40 years)	Epicormic growth - Shoots, Powerline clearance pruning, Wound response growth - Good, Wound(s) - trunk		Existing Building edge 1.7m west and 2.9m north. Existing building has air vents below slab suggesting soil beneath is likely to be available for root growth.	High	A	44%	Building footprint, basement, ground and upper levels		Remove
27	Client site	Small-leaved Lilly Pilly	*Syzygium leuhmannii*	1	Semi-Mature	20	20	2.4	18.09	1.68	3	8	Good	Good	Hedge tree	Medium (15-40 years)	Co-dominant stems, Wound(s) - trunk		Hedge of 4 trees	Medium	B	30.50%	Building footprint, basement, ground and upper levels		Remove
28	Client site	Queensland Box	*Lophostemon confertus*	1	Mature	90	105	10.8	366.25	3.38	20	20	Good	Good	Age/size, Amenity value CMP "substantial trees to be preserved"	Long (>40 years)				High	A	100%	Building footprint, basement, ground and upper levels		Remove
29	Client site	Queensland Box	*Lophostemon confertus*	1	Mature	74	81	8.88	247.6	3.03	18	18	Average	Good	Age/size, Amenity value "substantial trees to be preserved"	Long (>40 years)	Canopy thinning			High	A	100%	Building footprint, basement, ground and upper levels		Remove
30	Client site	Small-leaved Lilly Pilly	*Syzygium leuhmannii*	1	Semi-Mature	33	33	3.96	49.24	2.08	7	4	Average	Average	Amenity value	Short (5-15 years)	Co-dominant stems, Crossing/rubbing branches, Suppressed			Low	C	100%	Building footprint, basement, ground and upper levels		Remove
31	Client site	Small-leaved Fig	*Ficus obliqua*	1	Mature	166.54	185	15	706.5	4.29	16	24	Excellent	Good	Age/size, Amenity value CMP "substantial trees to be preserved"	Long (>40 years)	Co-dominant stems, Crossing/rubbing branches, Deadwood > 60mm, Exposed roots, Hanger(s), Mechanical damage to root(s), Poor pruning, Previous branch failure(s), Soil compaction, Unbalanced crown, Wound response growth - Good	Prune - Remove deadwood > 60mm, Prune - Remove hanging limb(s), Prune - Uplift tree crown height for medium sized vehicle access	Minor hanger, retain aerial roots. Tidy previous pruning cuts. Lift canopy to 4m height. 50mm cuts max.	High	A	100%	Building footprint, basement, ground and upper levels		Transplant
32	Client site	Small-leaved Fig	*Ficus obliqua*	1	Mature	109.09	122	13.09	538.03	3.6	15	20	Good	Good	Age/size, Amenity value CMP "substantial trees to be preserved"	Long (>40 years)	Co-dominant stems, Crossing/rubbing branches, Exposed roots, Soil compaction			High	A	100%	Building footprint, basement, ground and upper levels		Transplant
33	Client site	Washington Palm	*Washingtonia robusta*	1	Mature	44	44	5.28	87.54	2.34	18	4	Good	Good	Amenity value	Long (>40 years)	Deadwood > 60mm			Medium	B		Ground Level Plans		Transplant
34	Client site	Washington Palm	*Washingtonia robusta*	1	Mature	36	36	4.32	58.6	2.15	12	4	Good	Good	Amenity value	Long (>40 years)	Deadwood > 60mm			Medium	B		Ground Level Plans		Transplant
35	Client site	Smooth-barked Apple Myrtle	*Angophora costata*	1	Juvenile	8	10	2	12.56	1.26	4	1	Good	Good		Long (>40 years)		Health - Mulching	Not tagged	Low	C	0%		Not required	Retain
41	Client site	Irish Strawberry Tree	*Arbutus unedo*	1	Semi-Mature	26	26	3.12	30.57	1.88	7	6	Good	Average	Amenity value	Long (>40 years)	Co-dominant stems, Included bark			Medium	B	0%		Not required	Retain
42	Client site	Fire Wheel Tree	*Stenocarpus sinuatus*	1	Mature	46	49	5.52	95.68	2.45	12	8	Good	Good	Commemorative planting	Long (>40 years)				High	A	0%		Not required	Retain

Tree Id	Tree Ownership	Common Name	Botanical Name	Trees In Group	Tree Age	DBH [cm]	Root Crown Diameter [cm]	NRZ Radius [m]	NRZ Area [m2]	SRZ Radius [m]	Height [m]	Canopy [m]	Health	Structure	Significance	ULE [Yrs.]	Observations	Recommendations	Arborist Notes	Landscape Prominence	Retention Value	xc x	TPZ Encroachment Type	Tree Protection Considerations	Retention Status
91	Neighbouring property	Coast Banksia	*Banksia integrifolia*	1	Semi-Mature	18	20	2.16	14.65	1.68	5	5	Good	Good	Amenity value	Medium (15-40 years)				Medium	B	0%		Tree Protection Fencing	Retain
92	Neighbouring property	Weeping Lilly Pilly	*Waterhousea floribunda*	1	Semi-Mature	12.81	15	2	12.56	1.49	6	4	Good	Good	Amenity value	Medium (15-40 years)	Co-dominant stems			Medium	B	0%		Tree Protection Fencing	Retain
93	Neighbouring property	Weeping Lilly Pilly	*Waterhousea floribunda*	1	Semi-Mature	16.12	20	2	12.56	1.68	8	5	Good	Good	Amenity value	Medium (15-40 years)	Co-dominant stems			Medium	B	0%		Tree Protection Fencing	Retain


Retention Status Map
Retention Status
Remove (15)
Retain (13)
Transplant (4)
Grose Farm Ln
Lambie Dew Dr
Johns Hopkins Dr
Labour ward
St John's Chapel
Lucas St
Sydney Arcadia Study Centre
Kerry Packer Education Centre
Grose St
Missenden Rd
Royal Prince Alfred Hospital...
Royal Prince
N
20 m
Google
Map data ©2025 Imagery ©2025 Airbus, Maxar Technologies, Vexcel Imaging US, Inc.

Existing Tree Schedule

(All data has been taken from Arborsaw April 2025 report. Trees not relevant to the site works have been excluded from this schedule)

Tree No.	Botanic Name	Common Name	TPZ Radius (m)	Height (m)	Spread (m)	Retain, Remove, Transplant
5	*Lophostemon confertus*	Brushbox	2	5	2	Retain
6	*Lophostemon confertus*	Brushbox	4.2	7	7	Retain
7	*Lophostemon confertus*	Brushbox	5.76	12	10	Retain
8	*Lophostemon confertus*	Brushbox	3.6	10	8	Retain
9	*Lophostemon confertus*	Brushbox	4.68	12	10	Retain
10	*Lophostemon confertus*	Brushbox	6.12	15	8	Remove
11	*Lophostemon confertus*	Brushbox	5.04	11	9	Remove
12	*Corymbia intermedia*	Spotted Gum	2	5	2	Remove
13	*Corymbia maculata*	Spotted Gum	11.4	26	25	Remove
14	*Corymbia maculata*	Spotted Gum	3.12	10	6	Remove
15	*Eucalyptus punctata*	Grey Gum	8.76	16	22	Remove
16	*Corymbia maculata*	Spotted Gum	3.72	18	10	Remove
17	*Jacaranda mimosifolia*	Jacaranda	5.56	10	16	Remove
18	*Corymbia citriodora*	Lemon-scented Gum	7.92	18	20	Remove
19	*Lophostemon confertus*	Brushbox	5.88	10	8	Remove
25	*Lophostemon confertus*	Brushbox	9.12	11	10	Remove
27	*Syzygium leuhmannii*	Small-leaved Lilly Pilly	2.4	3	8	Remove
28	*Lophostemon confertus*	Brushbox	10.8	20	20	Remove
29	*Lophostemon confertus*	Brushbox	8.88	18	18	Remove
30	*Syzygium leuhmannii*	Small-leaved Lilly Pilly	3.96	7	4	Remove
31	*Ficus obliqua*	Small-leaved Fig	15	16	24	Transplant
32	*Ficus obliqua*	Small-leaved Fig	13.09	15	20	Transplant
33	*Washingtonia robusta*	Washington Palm	5.28	15	4	Transplant
34	*Washingtonia robusta*	Washington Palm	4.32	12	4	Transplant
35	*Angophora costata*	Sydney Red Gum	2	4	1	Remove
41	*Arbutus unedo*	Irish Strawberry Tree	3.12	7	6	Remove
42	*Stenocarpus sinuatus*	Firewheel Tree	5.52	12	8	Remove
91	*Waterhousia floribunda*	Weeping Lilly Pilly	5	5	5	Retain
92	*Waterhousia floribunda*	Weeping Lilly Pilly	6	8	4	Retain
93	*Waterhousia floribunda*	Weeping Lilly Pilly	8	5	5	Retain

TREE STRATEGY LEGEND

EXISTING TREE TO BE REMOVED; TPZ SHOWN AS BLUE DASHED LINE

EXISTING TREE TO BE RETAINED; TPZ SHOWN AS BLUE DASHED LINE

EXISTING TREE TO BE TRANSPLANTED FROM EXISTING LOCATION; TPZ SHOWN AS BLUE DASHED LINE

EXISTING TREE SHOWN IN FINAL TRANSPLANTED LOCATION; TPZ SHOWN AS BLUE DASHED LINE

Tree Protection Fence and Signage

Trunk Protection

T31 TRANSPLANTED LOCATION

T32 TRANSPLANTED LOCATION

T33 TRANSPLANTED LOCATION

T34 TRANSPLANTED LOCATION

MISSENDEN ROAD

ROYAL PRINCE ALFRED HOSPITAL

ARCHITECTURE UPPER GROUND LEVEL

ARCHITECTURE MID GROUND LEVEL

Arborsaw Tree Protection Plan August V1

SCALE AT A1 SCALE AT A3

4 6 M

Do not scale - use dimensions & callouts on drawings & schedules

Refer discrepancies to Lanecove Architects for clarification

29 May 2025

ISPT
Level 5, 24 York Street
Sydney, NSW 2000

To: Lachlan Adams
Project Director

Tree Encroachment Review

Dear Lachlan,

We have undertaken a review of existing trees impacted by the proposed works, including further investigation into the removal of partially encroached trees.

The project has sought to ensure that there is a continuous deep soil zone located around the envelope to allow for future large tree planting and continuous tree canopies around the development – which in turn will benefit the local environmental and pedestrian comfort benefits.

However, the impact to this has to be balanced against the reduced development envelope and carparking spaces that make a project like this viable. As such, to retain all of the trees on site, as well as deliver a deep soil zone will prove unviable – and we believe there will be good opportunity from the deep soil zones throughout to provide future tree planting in order to offset these existing tree losses. Therefore we have provided an assessment of the impact of retaining each of the existing trees in relation to the total NLA, carspaces and floor plate functionality.

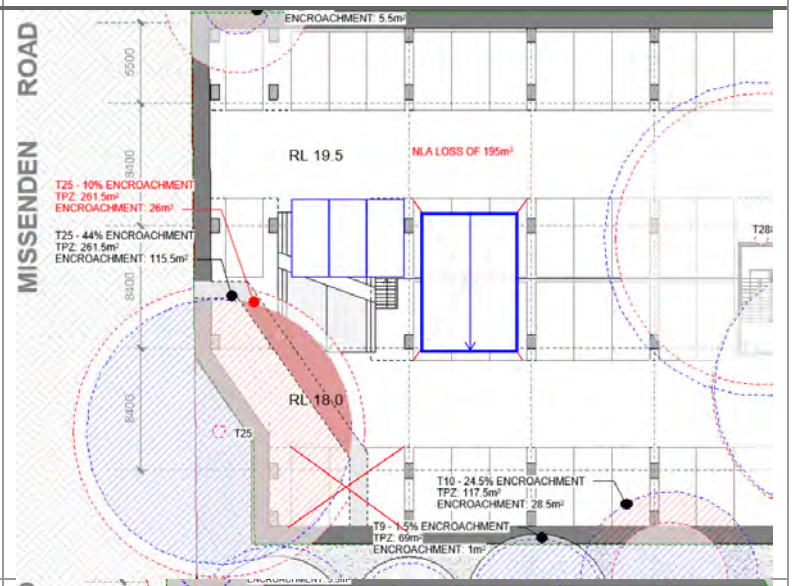
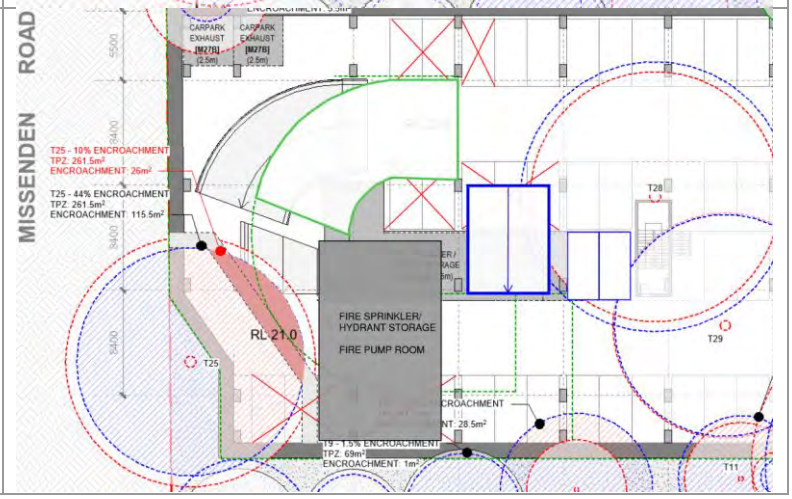
Architectus Australia Pty Ltd
ABN 90 131 245 684

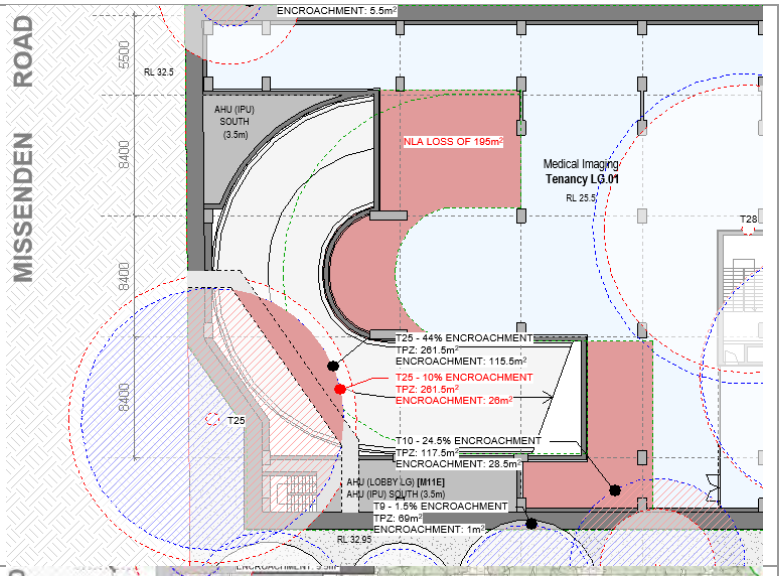
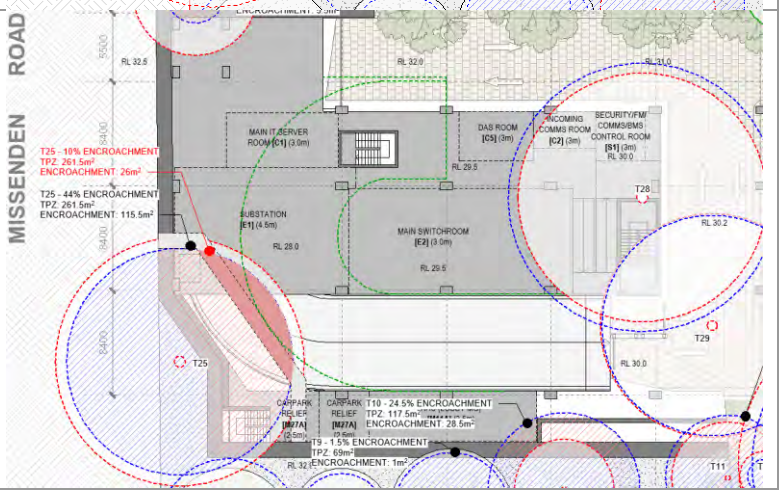
Registrations and
Nominated Architects
ACT: Ray Brown 2528
NSW: Ray Brown 6359,
Mark van den Enden 7593,
Robert Ousey 10214,
Lawrence Toaldo 10255
NT: Architectus Australia
Pty Ltd AR750
QLD: Lawrence Toaldo 3117
SA: Architectus Australia 3426
TAS: Architectus Australia F109
VIC: Architectus Australia 51176
WA: Architectus Australia 3209,
Ray Brown 2929

Tree 25

Tree 25 is heavily impacted by street access requirements of the substation and ramp entrance on Missenden Road, meaning that encroachment of over 10% into the TPZ would be unavoidable. Retaining tree 25 would;

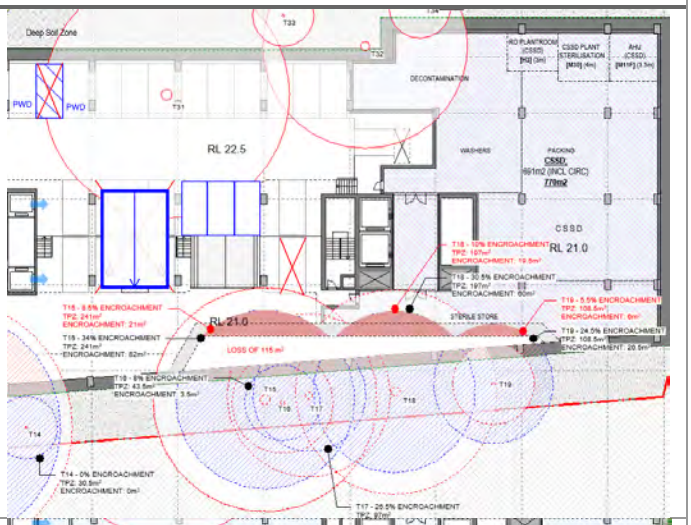
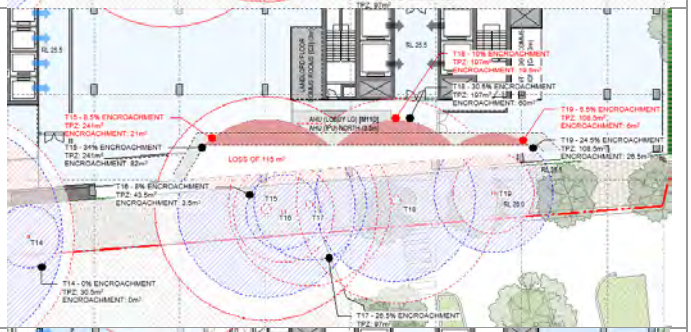
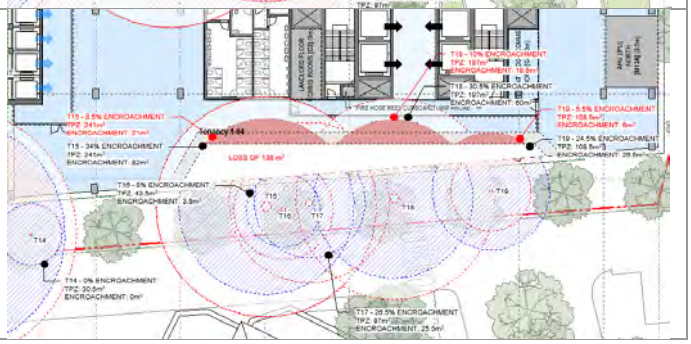
- Move into the lettable floor plates resulting in a loss of 190m2
- Impact the substation envelope given it has to be located on the edge of the site facing Missenden road and is surrounded by two carpark ramps
- Remove 24 carpark spaces from the development.

LEVEL	Design Impact	
B3 – B2	-Reconfiguration of carpark flow, loss of 6 car parks on each level, 12 in total	
B1	-Reconfiguration of carpark access ramp, requiring the loss of approximately 12 car parks -Relocation of fire sprinkler storage and pump room	

Lower Ground	-Reconfiguration of carpark access ramp, resulting in a loss of over 195m^2 NLA	
Mid Ground	-Impact to substation street access and connection	

Trees 15 – 19

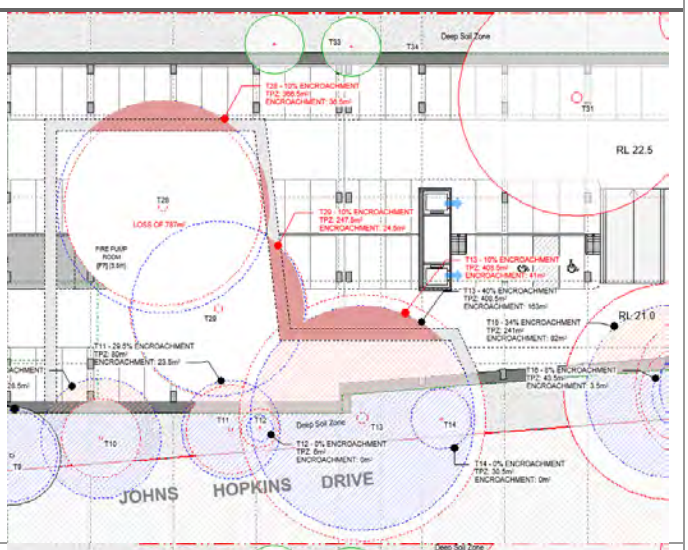
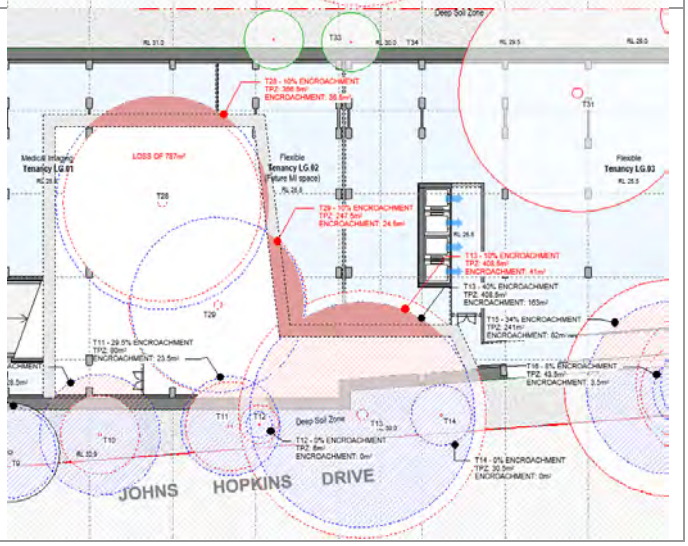
Because of their proximity to the building's core, their retention would have significant flow on effects. In the basement levels, there would be a loss of 12 car parks due to reconfiguring the carparking ramp. Due to a significant amount of program being located throughout the various levels in this area, there would also be a podium area loss of 989m^2.

LEVEL	Design Impact	
B3 – B1	-Reconfiguration of carpark access ramp, requiring the loss of approximately 12 car parks -Loss of 115m^2 per floor, 345m^2 in total	
Lower Ground to Mid Ground	-Loss of 115m^2 per floor, 230m^2 in total	
Upper Ground to Level 2	-Loss of 138m^2 per floor, 414m^2 in total	

Trees 13, 28, 29

Retaining trees 13, 28 and 29 would have significant impacts on the site's feasibility. The building form would have to completely split around the trees, resulting in the segregation of the site into two sides. In addition, the retention of the trees would;

- Result in a loss of over 787m2 per floor, 7870m2 in total from Basement 1 to Level 4
- Halve the number of possible carparks
- Compromise the entry of cars into the site
- Severely limit the clinical flow capabilities of podium floors.

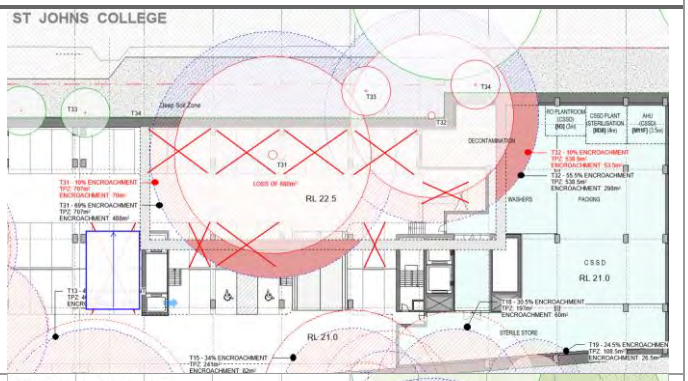
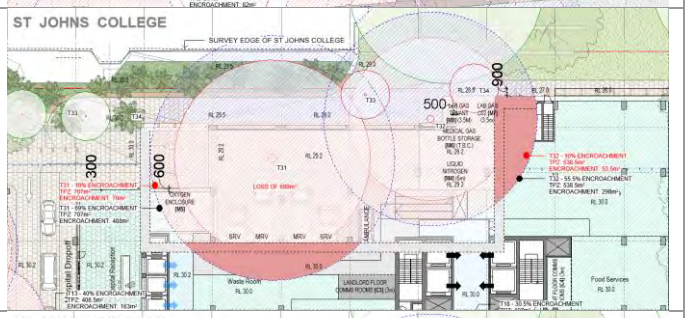
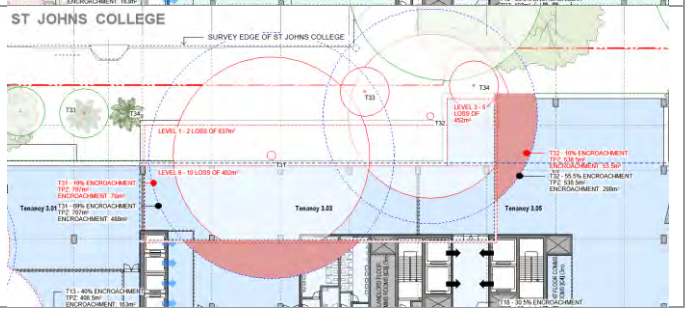
LEVEL	Design Impact	
B3 – B1	-Basement carparking unable to connect through -Retention of tree 13 alone would still prevent car circulation, as cars would be unable to navigate around core -Major loss to carparking spaces -Loss of 787m^2 per floor, 2361m^2 in total	
Lower Ground to 4	-Loss of 787m^2 NLA per floor, 5509m^2 NLA in total	

Trees 31 – 32

Trees 31 – 32 are to be relocated, as retaining them would affect the loading dock, access to goods lift, and location of the tower. These elements require reasonable adjacency to each other, while the tower location is also limited by site set backs. Moving any of these elements would likely result in inefficient floor plates and increased loading dock visibility from the street.

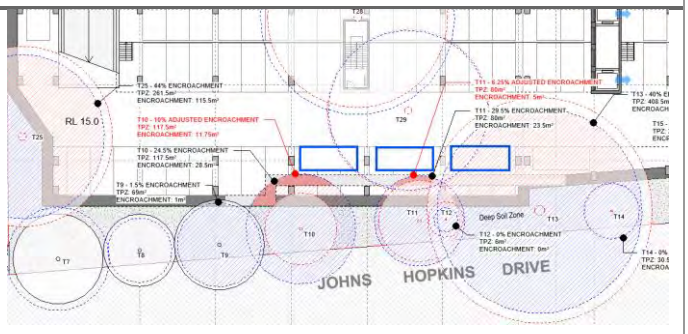
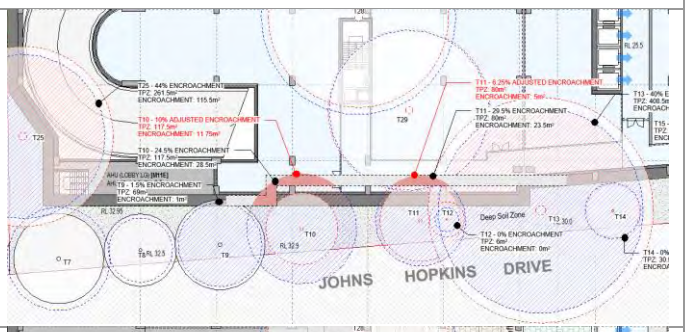
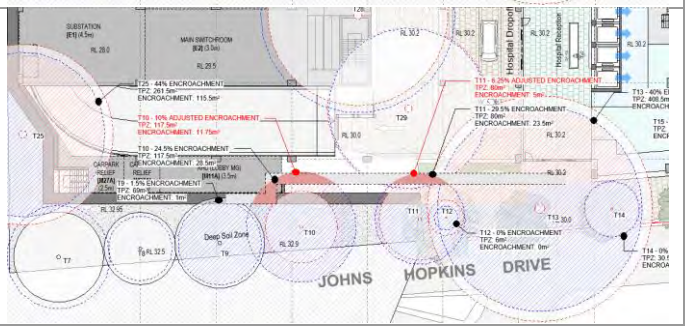
Retaining trees 31 and 32 in their current location would;

- Remove 62 car parks from the design
- Remove 7369m^2 overall from the basement, podium and tower levels
- Compromise loading dock and lift adjacency
- Severely limit the clinical flow capabilities of podium floors.

LEVEL	Design Impact	
B3 – Lower Ground	-B1 loss of 22 parking spaces -B2 loss of 19 parking spaces -B3 loss of 21 parking spaces -LG loss of 680m^2 NLA - 2720m^2 total area loss	
Mid Ground	-Complete obstruction of Loading Dock, requiring relocation into more undesirable location on site.	
Upper Ground – Level 10	-Significant NLA loss -Blocked entrance to lift lobbies -Lv 1-2 Loss of 637m^2 per floor, 1274m^2 total -Lv 3-5 Loss of 455m^2 per floor, 1365m^2 total -Lv 6-10 Loss of 402m2 per, 2010m^2 total	

Trees 10 - 12

Retaining trees 10 to 12 would require an adjustment to the basement retaining wall, resulting in a loss of 21 carparks. Impacts to ground floor levels would result in a loss of 53m2 of Net Lettable Area, as well as restricting the area available to plant and AHU. There would be no impact to podium or tower levels, as the current architectural form has a less than 10% encroachment into the TPZ.

LEVEL	Design Impact	
Basement 1 - 3	-Loss of 7 parks per floor, 21 carparks in total	
Lower Ground	-Loss of 53m^2 NLA	
Mid Ground	Loss of 7.5m^2 plant area	

If you have any further questions or would like to discuss this further please do not hesitate to contact me.

Yours sincerely,

Andrew Dowe
Senior Associate

8. Existing Street Tree Protection Measures During Construction

8.1 Staff Training and Induction

All staff working on the contract shall be adequately inducted to ensure they are aware of the following tree protection requirements.

8.2 Trunk Protection

Trunk and major limb protection shall be installed to any tree within 5 metres of the work site prior to any delivery of machinery or works commencing, and shall remain in place for the duration of the works. It shall consist of wrapping of each tree trunk and any major branches within the work area with hessian or similar material to limit damage, then space planks (50mm x 100mm or similar), at 100mm intervals, and fixed against the trunk with tie wire, or strapping. The trunk protection shall not be fixed to the tree in any instance, or in any fashion, e.g., no nails or screws are to be used.

8.3 Trenching and Excavation Near Trees

During any trenching or excavation works, the use of mechanical equipment must stop if tree roots greater than 50mm diameter are encountered. Approval must be sought from the Council Street Tree Coordinator (ph 9265 9333) to cut any root greater than 50mm diameter. Excavation shall be done by hand, or other approved non-destructive method, in any area known to, or suspected of having roots larger than 50mm diameter.

8.4 Pruning

The Contractor shall not undertake pruning of any branch of any street tree without permission. If pruning or small branches or limbs are required for machinery access, or any other reason, contact the Council's Street Tree Coordinator.

8.5 Kerb Removal Adjacent To Trees

Existing sections of kerbs adjacent to any street tree shall not be removed without approval from the Street Tree Coordinator. Removal of kerbs adjacent to mature trees can cause trees to become unstable and fail.

Figure 88- Proper tree protection is essential to avoid unnecessary damage to trees during construction activities (Photo: Arterra)

Figure 89- This illustrates the minimum trunk protection measures expected by the Council for street trees adjoining construction sites. (Photo: Arterra)

Figure 90- Where access is required through an identified tree protection zone the ground surface shall be protected through appropriate boarding and mulch or gravel placed above the existing ground surface to protect the roots and limit soil compaction. (Photo: Arterra)

8.6 Signs - Tree Protection

Temporary signs, or any other items, shall not be fixed or attached to any street tree.

8.7 Stockpiling and Storage of Materials

Fuel or any type of liquid waste shall not be stored or disposed of at the base of any street tree.

8.8 Damage to Trees to be Retained

Any damage sustained to any street trees is to be immediately reported to the Council's Street Tree Contract Coordinator, to determine the appropriate response for maintaining the health and structural integrity of the tree/s.

Should any damage occur to Council's trees and not be rectified by the Contractor to a satisfactory standard, as directed by Council's Street Tree Coordinator, Council will undertake the necessary works, which may include the full replacement of trees, and all associated costs will be recovered. Damage to street trees may also result in a prosecution being sought under Sections 626 and 629 of the Local Government Act for an offence where such damage occurred wilfully or negligently. Significant financial penalties can be imposed for such offences.

Figure 91- Groups of street trees within a grass strip may also require tree protection fencing installed to protect the trees and the ground surface around them. (Photo: Arterra)

Figure 92- Where ground is uneven or the site is subject to strong winds the fencing may be held securely by wiring to strategically placed star pickets driven into the ground. (Photo: Arterra)

Figure 93- Where tree trunks are low branching and difficult to protect with other methods, water filled barricades and fencing may also be applied . (Photo: Arterra)

Figure 94- Younger trees that are too small to apply trunk protection shall be fenced as above to protect the roots, foliage and trunk during construction periods. (Photo: Arterra)

Figure 95- Hand excavation or other non-destructive methods such as water jetting and vacuum extraction to excavate around tree roots. (Photo: Arterra)

Figure 96- Non-destructive excavation methods can allow services to be installed across verges without the need to sever important and structural tree roots. (Photo: Arterra)

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Transplant feasibility assessment

Site Address:	St Johns College 10 Missenden Road, Camperdown
Prepared For:	St Johns College C/O: Lena Louangkhoth
Prepared On:	20th January 2023
Report Number:	CD2452
Prepared By:	**Mark Hartley** Senior Consulting Arborist- AQF Level 8 Grad Cert Arboriculture (1st Class Honours) Dip Hort (Arboriculture) with Distinction Dip Arboriculture, Dip Horticulture LMAA; LMISA; LMIPS ISA Certified Arborist WC-0624 (since 1990) Registered Consulting Arborist™ #0005 ISA Tree Risk Assessment Qualified Registered QTRA user (No. 807) Member - Society of Risk Analysis Australia & New Zealand
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Table of Contents

Brief

The author has been asked to:

- visit the site,
- assess the suitability of the trees for transplanting,
- assess the site conditions that may impact on the transplanting of the trees,
- determine if transplanting the trees is feasible and if so,
- prepare a transplant method report for the moving the trees and
- provide prices for transplanting the trees.

Method and assumptions

A site inspection took place on the 17th of January 2023. The trees were assessed from the ground. No invasive or diagnostic testing was performed.

No plans have been provided or referenced in relation to the works.

No soil tests were performed. The soil texture is assumed based on the general soil profiles in the area.

No fixed locations were provided for the final location of the trees.

No search for underground services was performed.

The information in this document is not intended to be an Arboricultural Impact Assessment Report.

Observations

The Fig trees are healthy specimens that appear to be free of any major structural defect that would affect their ability to be successfully transplanted. All three species have high levels of active parenchyma and generally compartmentalise well. Tree 31 has numerous aerial roots and some of these are contributing to the above trunk diameter. The effective DBH is probably closer to 120 cm.

The two Cotton palms are healthy young specimens. They are growing within the outer edges of the canopy of Tree 32, and this may require some minor modifications of the canopy of this tree or of the transplant technique or route.

Trees 31 and 32 are relatively young trees. They are not present in the 1995 aerial image but may be present as young trees in the 1998 aerial image (https://tinyurl.com/yzzx673e). All four trees to the south of the site are clear in the 2002. It would appear these four trees are less than 30 to 35 years old.

Tree 57 was not present in the 1955 aerial image and was a small tree in the 1971 aerial image. This suggests that this tree was part of a 1960's planting. This means the tree is around 65 years old.

The planting site at the north of the oval is not at natural ground level. It is likely that fill has been used but this is unlikely to be a problem in this situation. It may mean that soil testing and the use of soil amendments will be required.

#	Genus / species	DBH (cm)	Height (m)	Spread (m)	Comments
31	*Ficus obliqua*	162	16	24	Fairly straight forward to transplant, preparation works will impact on the use of the adjacent car park activities.
32	*Ficus obliqua*	106	15	18	Fairly straight forward to transplant, preparation works will impact on the use of the adjacent car park activities.
33	*Washingtonia robusta*	44	18	4	Easily transplanted.
34	*Washingtonia robusta*	36	12	4	Easily transplanted.
57	*Ficus macrophylla*	180	20	25	On neighbouring property - access past the remaining trees, in particular the Cedar, may be problematic.

The above dimensions are from a Pre Development Tree Survey prepared by Alex Austin from Arborsaw in December 2022, and appeared to be in the right order of magnitude

Discussion

Transplanting the trees

Most palms are easy to move provided that some frond removal occurs to reduce transpiration and supplementary irrigation is provided while new roots develop. The Washingtonia palms are easy to move and are likely to recover well from the move. These two specimens could be readily removed with a tree spade or with more traditional methods.

The ideal system for moving evergreen trees is the Allanton method. This system involves moving an appropriate volume of soil and roots in what is often called a root ball (or a root plate when referring to larger diameter trees). While the first recorded use of this system was by the Egyptian pharaoh Hatshepsut before 1,400 BC, it was popularised by Sir Henry Steuart of Allanton in the early 1800s.

The advantage of the Allanton method is that it preserves a sufficient proportion of the absorbing roots within the root plate, where they are surrounded by humidity and moist soil. The retention and protection of the absorbing roots allows the tree to be moved with its branches and canopy intact. This results in the tree looking visually the same before and after the transplant. Typically, a root plate between 10 to 12 times the trunk diameter was used.

The following videos show the Allanton method using different techniques.

https://www.facebook.com/NSWGovernment/videos/540404396347062/
https://www.youtube.com/watch?v=uAP1tjQfNH0
https://www.youtube.com/watch?v=BFTj0hM3DHM

The fig trees are healthy specimens that appear to be free of any major structural defect that would affect their ability to be successfully transplanted. All three species have high levels of active parenchyma and generally compartmentalise well.

Extensive root damage is required as a part of transplanting a tree. That said, figs are relatively easy to transplant because of their high energy reserves and abundance of active parenchyma. Consequently, large figs are often moved with root plates as small as six to eight times their trunk diameter. Smaller root plates require more intensive preparation and aftercare to minimise the impact on the trees. To achieve the smaller sized root plates suggested in this report one year of preparation and five years of post-transplant monitoring should be considered to be the minimum requirement.

In response to root loss, figs can sometimes shed all their leaves. Six to twelve weeks after shedding, Figs will start to develop a whole new canopy.

The site soils are likely to be clay or clay loam, potentially with some urbic soils. Clay soils usually have high cohesive properties and are ideal for transplanting trees, as shown in the adjacent image.

Figure 1: A multi-stemmed Fig we transplanted with an 8 metre by 13-metre root plate.

Perhaps the biggest restraint to transplanting is the cost. Typically, transplants of this size take considerable engineering and design work, unique equipment, and specialist labour.

In addition, an allowance needs to be made for ongoing care and maintenance. Ideally, this will occur for several years after the move until the supervising arborist advises otherwise.

Transport route

The route required to move the trees to the perimeter of the oval is tolerable but will result in surface damage that will require repairing. There is, however, a significant obstacle blocking the route of Tree 57 and that is the Cedar tree to the east. This tree would need to be removed or transplanted to allow sufficient space for transporting the tree. In addition, the Phoenix palm restricts the shortest route to the proposed planting site, and it is likely that this will need to be relocated to move this tree.

Root systems

The critical issue when transplanting trees or undertaking any sort of excavation adjacent to large trees is the impact of that excavation on the root system. To understand this impact, it is important that we understand how the root system functions.

- All roots start as '**pioneer roots'**, pushing their way through the soil in order to take advantage of newly available soil moisture and solutes that are in the zone that they have entered (hence the term pioneer). This push by the roots is created by cell division at the tip of the root and cell elongation behind this tip. This '**zone of elongation**' is typically a few millimetres to less than 100 mm in length.

Cell elongation uses water, and the presence or readily available water, solutes (soluble nutrients), and soil temperature (generally around $16^{O}C$ for most temperate trees) stimulates root growth. Whilst cells absorb some water in the zone of elongation, at best they seldom meet their own needs.

- Once the roots have fully elongated single-celled hairs develop on the surface of the root and these roots with '**root hairs**' to form '**absorbing roots**.'

  The absorbing roots are responsible for the uptake of nearly all the water and the majority of solutes used by the tree. They are highly ephemeral, often lasting only a few weeks. However, in association with beneficial fungi, they can last a year or more.

  Where trees are already growing well, we can generally assume that soluble nutrients are present at satisfactory levels. Likewise, we can assume that the soil surface temperature often exceeds16 degrees Celsius most of the year and that at depth, the soil temperature does not vary significantly throughout the year. The biggest limiting factor, therefore, is normally the ready availability of water.

  A percentage of these pioneer/absorbing root structures survive the various environmental stresses and within a few weeks to a few months become woody.

- '**Woody roots**' are essentially underground branches. These roots can be a little under a millimetre in diameter and can grow to be hundreds of millimetres in diameter over time. Their thick bark prevents them from drying out, but as a result, they are not able to absorb water and nutrients from the soil to any great extent.

Whilst many young woody roots die because of disease, environmental damage or competition; they have the potential to be long-lived, sometimes lasting for hundreds of years. Woody roots act as the connection between the absorbing roots and the rest of the tree

- A small portion of the woody roots, closest to the stem, provide physical support for the tree. These '**structural roots'** grow directly from the trunk (first-order lateral roots) or are roots that branch close to the trunk. These roots provide support in compression and tension. They have a greater wood content and, as a result, tend to be much thicker to allow for strength, as well as transport.

In response to the forces of compression and/or tension, these structural roots develop an asymmetric shape rather than the normal circular shape. As the roots grow further from the trunk, they get rapidly thinner (zone of rapid taper) and more circular in shape.

In fast draining soils such as this, it is common to see an increased incidence of sinker roots. In addition, there can be distinct stratification and even dimorphic root plate development where distinct soil interfaces are present.

Damage to roots

Damage to larger roots inside the zone of rapid taper is extremely undesirable and, in most circumstances, should be avoided. These are woody roots, and therefore excavation is more significant in its impact than careful construction over the top of these roots.

Depending on the amount of root division, cutting a woody root with a diameter of 25mm could conceivably result in the death of many millions of root hairs. This loss of absorbing roots has a direct impact on a tree's ability to absorb water and solutes. In addition, it can impact hormone production, resulting in reduced growth above ground until the root/foliage ratio is restored to its ideal levels.

The loss of roots can result in wilting or thinning of the foliage, the loss of foliage and death of smaller branchlets and sometimes the death of specific larger branches. The ready availability of soil moisture is important in minimising this impact.

Not only do higher soil moisture levels reduce the energy expended to absorb water, but it also stimulates new root development. The faster that sufficient new roots are developed, the less the impact on normal function

Roots are often close to the surface; therefore, construction activity can indirectly impact on the health of roots through direct damage or soil compaction. Even regular pedestrian activity influences the roots close to the surface. In addition, altering levels by adding fill has the potential to alter the movement of water into the soil and, in some circumstances, can cause the soil to become anoxic, in turn causing the death of the roots and potentially the death of the tree.

AS4970 and the Structural Root Zone

Amongst other things, the Australian Standard AS4790-2009 *Protection of Trees on Development Sites* (the Standard) provides an algorithm to determine the SRZ. The SRZ algorithm is based on a data set of trees that failed and does not consider the trees that did not

fail. It does not consider the support of any remaining roots outside the SRZ. Likewise, it does not consider the impact of root morphology or the distribution of roots.

The function of the indicative SRZ provided in the Standard is to alert the assessor to the possibility that the works may be impacting on roots that provide structural support. It is important to note that the standard does not prohibit works occurring within the SRZ. In fact, 3.3.4 of the standard states "*If the proposed encroachment is… inside the SRZ … the project arborist must demonstrate that the tree(s) would remain viable*". The standard continues in 3.3.6 to state, "*There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture)*."

The particular algorithm provided in the Standard is based on an unpublished field study with an unknown method (Mattheck 1994, p 95 & 187)[1]. The data produced by the field study used to derive the algorithm involved trees that failed (Mattheck 1994, pp 83, 84), but we remain uninformed about the conditions under which failure occurred or what other factors may have contributed to the failures.

Numerous authors have suggested that cutting three times trunk diameter from the base of a tree will seldom have any long-term impact on a tree. In saying this, it is assumed that a modicum of aftercare will; be provided to assist the tree.

Smiley (2008[2], 2017[3]) and others have taken a more systematic approach which has involved progressively cutting root plates and looking for changes in the forces required to adjust the angle of the stem.

Interestingly, unlike Mattheck, Smiley found that trees with different root morphology were affected differently by the same extent of root cutting. Most importantly, Smiley (2017) demonstrated that cutting in a straight line three times the trunk diameter of a tree had little effect on tree stability regardless of root morphology. However, depending on the root morphology, cutting in a straight line as close as one times trunk diameter had little effect on trees with a more vertical root system

From an anatomical perspective, roots that constantly provide structural support for a tree must be located closest to the trunk. In order to provide support, these roots have a higher percentage of lignified tissue. At the same time, because they are closest to the trunk, they also have the highest volume of water-conducting cells (tracheids or vessels).

For structural roots to perform the above functions and for the support system to grow larger over time, they need to rapidly increase in taper as they get closer to the trunk. This gives rise to the term Zone of Rapid Taper (ZRT). Wilson (1964)[4] states that the ZRT is usually within a metre or two of the trunk of a large tree.

---

[1] **Mattheck, C. Breloer, H** 1994, *The body language of trees: a handbook for failure analysis*, Her Majesty Safety Office, London

[2] **Smiley ET**, 2008 *Root Pruning and Stability of Young Willow Oak* Arboriculture & Urban Forestry 2008. 34(2):123–128.

[3] **Smiley ET**, 2017 *Root and stem cutting and its impact on tree stability* Proceedings of Arboriculture Australia May 2017 Canberra

[4] **Wilson B**, 1964 *Structure and growth of woody roots of Acer rubrum L*. Harvard Forest Paper 11 Harvard University Petersham, MA

Horizontal roots can usually be cut up to the zone of rapid taper (Hamilton 1989)[5]. Hamilton advises that caution should be exercised when cutting large sinker roots close to the tree. However, based on Smiley (2017), excavation is not likely to cause a structural issue for most trees if it occurs as close as two to three times trunk diameter away from the tree, provided that the excavation is limited to one side only.

Hamilton summarises the situation as follows:

> *Severe root pruning of landscape trees does not adversely affect the value of the tree to the general public. Growth reduction and unacceptable appearance from root severance can be of a relatively short duration if the tree has strong vigour and vitality. Trees re-establish their root-shoot balance by enhancing root generation at the expense of shoot growth. With the development of new roots, water imbalances in the tree improve and photosynthesis and shoot growth rates increase.*

Conclusion

There is nothing that would prevent any of the trees from being transplanted. The Allanton method should be used for moving the Fig trees, with pruning kept to a minimum. All the dead fronds and between 40% and 60% of the live fronds should be removed from the palms

If a decision was made to move the trees, a more detailed Transplant Method Report would be required.

Recommendations

Table 1: Summary of details for palm transplant

#	Tree	Critical details	Other details	Budget
33	*Washingtonia robusta*	• Root plate of not less than 2 cubic metres	• A system that does not require bracing should be used. • Depending on access, it can be moved with a tree spade. • Canopy pruning is required. • No preparation is required.	$5,000
34	*Washingtonia robusta*	• Root plate of not less than 2 cubic metres		$5,000

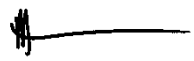
[5] **Hamilton WD,** 1989 Significance of Root Severance on Performance of Established Trees, Arboricultural Journal, 13:3, 249-257

Table 2: Minimum details for fig tree transplants

#	Tree	Critical details	Other details	Budget
31	*Ficus obliqua*	• Root plate of not less than 60 cubic metres	• 12 months preparation time required. • May be a benefit to encouraging contact of aerial roots and the ground. • Root plate will need to be isolated from the car park at least 12 months before the move.	$240,000
32	*Ficus obliqua*	• Root plate of not less than 45 cubic metres	• 12 months preparation time required. • Root plate will need to be isolated from the car park at least 12 months before the move.	$160,000
57	*Ficus macrophylla*	• Root plate of not less than 75 cubic metres	• 12 months preparation time required. • Consent from neighbour required. • Removal or transplanting of adjacent Cedar and possibly a Phoenix palm is required. • Root plate will need to be isolated from the car park at least 12 months before the move	$320,000

The budget provided is for the preparation and moving of the trees. It does not include transport or disposal of soil, site restoration, and landscaping works. The budget given has taken into consideration the current economic conditions and is appropriately conservative.

Regardless of the shape or dimensions of the root plate used, it should have the same root volume as those specified in the above table.



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