NSW GOVERNMENT

Transport for NSW

St Peters Station Upgrade

Supporting Studies

Artist's impression of the proposed St Peters Station Upgrade, subject to change during detailed design.

March 2021

ALLIED TREE
CONSULTANCY
Level 5 and 8 Arboriculturist

Arboricultural Impact Assessment Report

For the site address
St Peters Station, St Peters, NSW

Prepared for
Transport for NSW
No. 7 Harvest Street
MACQUARIE PARK NSW

AUTHOR
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1.0 Introduction

1.1 *Allied Tree Consultancy* (ATC) has been commissioned by *RPS* on behalf of *Transport for NSW* (TfNSW) to prepare an Arboricultural Impact Assessment for the St Peters Station Upgrade. This proposal includes work related to upgrading the Station infrastructure to meet requirements of the Commonwealth *Disability Discrimination Act 1992*. This report includes twenty-three (23) trees located on and adjacent to the site and discusses the viability of these trees based on the proposed work.

1.2 This report will address for these trees, the:

- species' identification, location, dimensions, and condition;
- SULE (Safe Useful Life Expectancy) and STARS (Significance of a Tree Assessment Rating System) rating;
- discussion and impact of the proposed work on each tree;
- tree protection zones and protection specifications for trees recommended for retention.

2.0 Standards

2.1 ATC provides an ethical and unbiased approach to all assignments, possessing no association with private utility arboriculture or organisations that may reflect a conflict of interest.

2.2 This report must be made available to all contractors during the tendering process so that any cost associated with the required work for the protection of trees can be accommodated.

2.3 It is the responsibility of the project manager to provide the requirements outlined in this report relative to the Protection Zones, Measures (Section 7.0), and Specifications (Section 8.0) to all contractors associated with the project before the initiation of work.

2.4 All tree-related work outlined in this report is to be conducted in accordance with the:

- Australian Standard – AS4373; Pruning of Amenity Trees.
- Guide to Managing Risks of Tree Trimming and Removal Work[1].
- all tree work must be carried out at a tertiary level (minimum Certificate-level 3) qualified and experienced (minimum five years) arboriculturist.

[1] Safe Work Australia; July 2016; Guide to Managing Risks of Tree Trimming and Removal Work, Australia

- for any work in the vicinity of electrical lines, the arboriculturist must possess the ISSC26 endorsement (Interim guide for operating cranes and plant in proximity to overhead powerlines).

2.5 As a minimum requirement, all trees recommended for retention in this report must have removed all dead, diseased, and crossing limbs and branch stubs to be pruned to the branch collar. This work must comply with the local government tree policy (Inner West Council) and Section 2.4.

2.6 Any tree stock subject to conditions for work carried out in this report must be supplied by a registered Nursery that adheres to the AS 2303; 2015[2].

- All tree stock must be of at least 'Advanced' size (minimum 75 litre) unless otherwise requested.
- All tree stock requested must be planted with adequate protection. This may include tree guards (protect stem and crown) and if planted in a lawn area, a suitable barrier (planter ring) of an area, at least one square metre to prevent grass from growing within the area adjacent to the stem.

3.0 Disclosure Statement

Trees are living organisms and, for this reason, possess natural variability. This cannot be controlled. However, risks associated with trees can be managed. An arborist cannot guarantee that a tree will be safe under all circumstances, nor predict the time when a tree will fail. To live or work near a tree involves some degree of risk, and this evaluation does not preclude all the possibilities of failure.

4.0 Methodology

4.1 The following tree assessment was undertaken using criteria based on the guidelines laid down by the International Society of Arboriculture.

4.2 The format of the report is summarised below;

4.2.1 **Plan 1;** Tree Location Relative to Site: This is an unscaled plan reproduced from the Survey Plan, as referenced in Section 4.4.1, depicting the area of assessment.

4.2.2 **Table 1;** This table compiles the tree species, dimensions**,** brief assessment (history, structure, pest, disease, or any other variables subject to the tree), significance, allocation of the zones of

[2] Australian Standard; 2015, AS2303, Tree stock for landscape use, Australia

protection (i.e., Tree Protection Zone[3] ;TPZ and Structural Root Zone; SRZ) for each tree illustrated in Plan 1, Section 5.0. All measurements are in metres.

4.2.3 Discussion relating to the site assessment and proposed work regarding the trees.

4.2.4 Protection Specification; Section 8.0 details the requirements for that area designated as the Tree Protection Zone (TPZ), for those trees recommended for retention.

4.3 The opinions expressed in this report, and the material, upon which they are based, were obtained from the following process and data supplied:

4.3.1 Site assessment on the 29 October 2020 using the method of the Visual Tree Assessment[4]. This has included a Level 2 risk assessment, being a *Basic Assessment*[5]. The assessment has been conducted by Warwick Varley[6] on behalf of ATC. This meeting has included staff from *RPS* including a tour throughout the site for the intent of identifying areas and trees requested for inclusion, as well as a description of prospective work.

4.3.2 Trees included in this report are those that conform to the description of a prescribed tree by the local government policy.

4.3.3 All measurements, unless specified otherwise, are taken from the tree centre.

4.3.4 Raw data from the preliminary assessment, including the specimen's dimensions, were compiled by the use of a diameter tape, height clinometer, angle finder, compass, steel probes, Teflon hammer, binoculars, and recording instruments.

4.4 Documentation provided

The following documentation has been provided to ATC and utilised within the report.

[3] Australian Standard, 4970; 2009 – Protection of Trees on Development Sites, Australia
[4] Mattheck, C. Breloer, H.,1994, The Body Language of Trees – A handbook for failure analysis The Stationary Office, London
[5] Dunster J.A., 2013, Tree Risk Assessment Manual, International Society of Arboriculture, 2013, USA
[6] Consulting Arborist, Graduate Certificate and Diploma of Arboriculture (level 8 and 5)

4.4.1 Design and report

Drawn by *Design Inc. Sydney P/L*
Date: 11 December 2020
Reference: P20-069
Drawing No: 27 Sheets, Revision 3
Note 1: See Section 4.5.1

4.4.2 Landscape

Drawn by *Design Inc. Sydney P/L*
Date: 10 December 2020
Reference: P20-069
Drawing No: 5 Sheets, Revision 4
Note 2: See Section 4.5.2

4.4.3 Document

Review of Environmental Factors
Author: *Transport for NSW*
Date: March 2021
Reference: REF-6548524-

4.5 Limitations of the assessment/discussion process

4.5.1 Trees No. 19, 21, and 22 have been omitted from the plans provided, however, are required for inclusion because they conform to the definition of a prescribed tree within the local government tree policy. The tree location has been plotted onto the Plan 1 by *ATC.* The tree location was established by using survey points included in the plan. *ATC* is not a registered surveyor, and, however, the accuracy of the survey is attempted; the true position of the trees may marginally deviate. Any such deviation provides the potential for changing the actual impact (encroachment) provided to a tree.

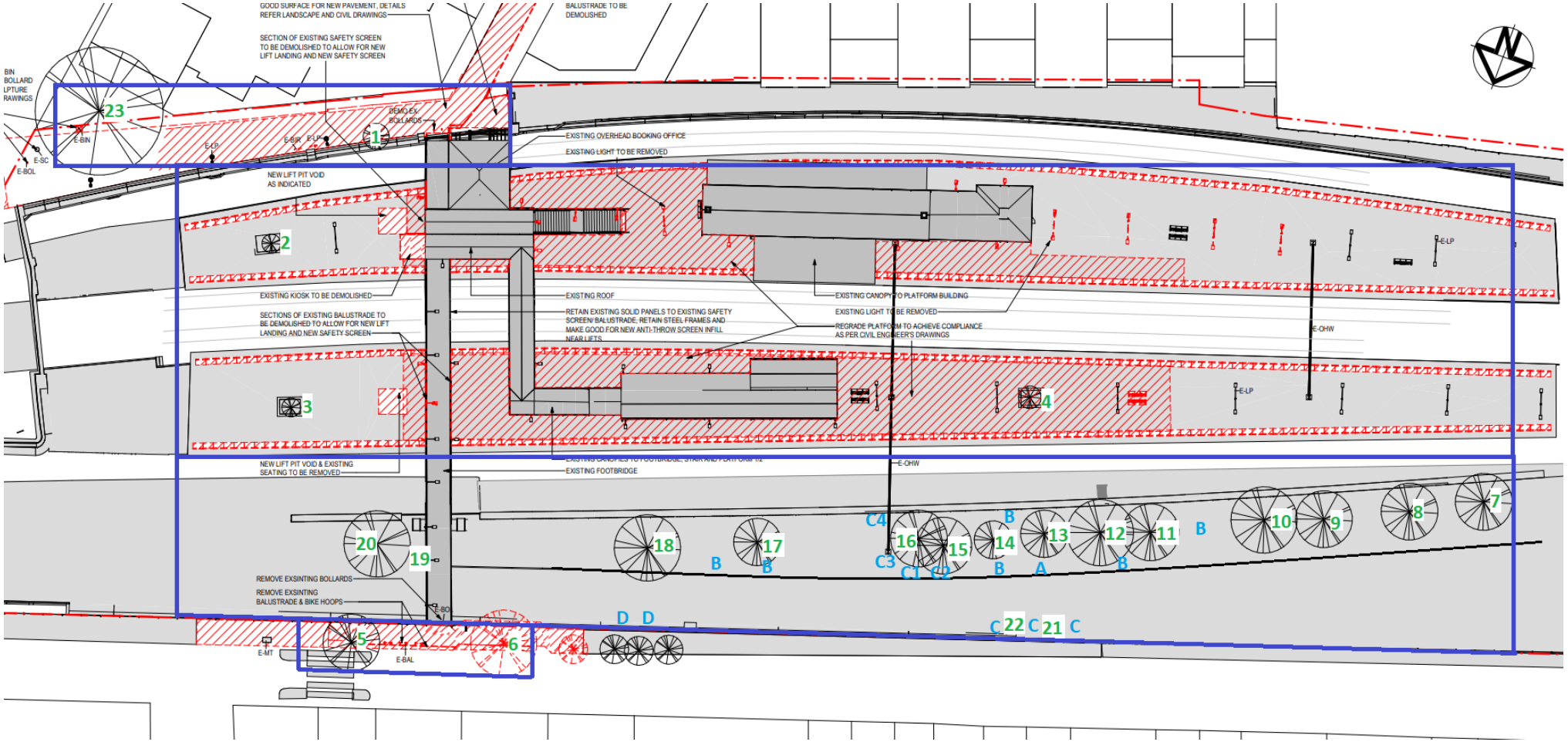
4.5.2 Based on the landscape drawings (Section 4.4.2), resurfacing of the footpath with brick paving has been nominated to extend around a street tree planting adjacent to tree No. 6. This tree is not nominated for removal and has not been included in this report because it did not form part of the nominated area of assessment.

4.5.3 The assessment has considered only those target zones that are apparent to the author and the visually apparent tree conditions during the time of assessment.

4.5.4 Any tree regardless of apparent defects, would fail if the forces applied to exceed the strength of the tree or its parts, for example, extreme storm conditions.

4.5.5 The assessment has been limited to that part of the tree, which is visible, existing from the ground level to the crown. Root decay can exist and, in some circumstances, provide no symptoms of the presence. This assessment responds to all the symptoms provided by a tree, however, cannot provide a conclusive recommendation regarding any tree that may have extensive root decay that leads to windthrow without the appropriate symptoms.

5.0 Plan 1; Area of assessment illustrating tree location



Not to scale
Areas labelled A, B, C and D, see Section 7.1.
Scope of work (Dark blue outline) See Section 4.5.2
Source: Adapted from *Design Inc. Sydney P/L,* Drawing 150338-STP-AR-DRG-110 (4), see Section 4.4.1

6.0 Table 1 – Tree Species Data

Terminology/references provided in Appendix A.

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
1	*Robinia pseudoacacia Frisis'* Golden Locust	10	0.47	5 x 11	O	C	N	A	**3D[E]**	**Medium**	**5.64**	**2.41**
Assessment This council-owned tree is located in a public thoroughfare servicing the southern side of the Station. A cavity exists in the root crown (size unknown), the opening is occluding. Two wounds occur in the crown structure from prior branch tear outs. The first at 4m above grade is occluding, the second extends into the crotch supporting the leaders and the integrity of this unknown. A collection of crossing branches and hangers occur on the eastern side of the crown mass. An aerial assessment, including internal diagnostic assessment of the bole is required to determine any related risk. The crown has a northern bias, likely a combination of pruning/past failure and the codominant class with the adjacent building, since removed.										**Development Impact** **See Section 7.1.3**	
2	*Plumeria acutifolia* Frangipani	3	0.19	4 x 4	M	D	Sym.	A	**1A**	**Medium**	**2.28**	**1.65**
Assessment Located on the eastern end of platform No. 3/4 this tree presents the habit typical for the species.											**Development Impact** **See Section 7.1.1**	
3	*Fraxinus griffithii* Evergreen Ash	2	0.16[B]	4 x 4	M	D	Sym.	B	**3A**	**Low**	**1.92**	**1.53**
Assessment Located on the eastern end of platform No. 1/2 this tree presents the habit typical for the species, although presents a declining vitality and stunted habit. Black sooty mould covers the entire crown mass.											**Development Impact** **See Section 7.1.1 and 7.1.2**	
4	*Fraxinus griffithii* Evergreen Ash	3	0.19[B]	5 x 5	M	D	Sym.	A	**2A**	**Medium**	**2.28**	**1.65**
Assessment Located on the western end of platform No. 1/2 this tree presents the habit typical for the species.											**Development Impact** **See Section 7.1.3**	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
5	*Melaleuca bracteata* Black Tea-tree	4	0.30 0.20 0.18	7 x 8	M	D	Sym.	A	**2D^{E}**	**Medium**	**4.84**	**2.26**
Assessment Street tree planting located adjacent to the northern Station entrance on Lord Street, displaying the habit typical for the species, and composed of three leaders from a 0.3m high stem. An old tear out wound extends into the primary (included) crotch and a transverse crack extends across the tension side of the wound face on the largest of the leaders. The crack is unknown whether it is superficial (i.e. limited to a growth ring) or forms a deeper crack, therefore impacting on the structural integrity.											**Development Impact** **See Section 7.1.3**	
6	*Melaleuca linariifolia* Narrow Leafed Paperbark	6	0.60	7 x 7	M	D	Sym.	B	**2A**	**Medium**	**7.20**	**2.67**
Assessment Street tree planting located adjacent to the northern Station entrance on Lord Street, displaying the habit typical for the species. Substantial twiggy dieback exists over the crown mass.											**Development Impact** **See Section 7.1.3**	
7	*Corymbia citriodora* Lemon Scented Gum	14	0.40	10 x 10	M	C	N	A	**1A**	**High**	**4.80**	**2.25**
Assessment This tree presents the habit typical for the species.											**Development Impact** **See Section 7.1.1**	
8	*Eucalyptus microcorys* Tallowwood	14	0.27 0.28 0.30	12 x 10	M	C	N	A	**2D**	**Medium**	**5.89**	**2.46**
Assessment This tree provides an atypical habit and is composed of three leaders that share a common root crown. This may be the result of coppiced regrowth. Some crossing branches occur and require remedial pruning.											**Development Impact** **See Section 7.1.1**	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
9	*Eucalyptus botryoides* Bangalay	10	0.46	8 x 10	M	I	Sym.	B	**2A/3A**	**Low**	**5.52**	**2.39**
Assessment Initially providing typical form, the leader has been removed, and a large wound (30% of the girth), likely from a lightning strike extends down the eastern side of the stem. The wound is occluding, and resonance soundings indicate the wound appears free from decay. Tagged by *Treeserve*, No. 120.											**Development Impact** **See Section 7.1.1**	
10	*Eucalyptus microcorys* Tallowwood	15	0.53	10 x 13	M	C	N	A	**1A**	**High**	**6.36**	**2.53**
Assessment This tree presents the habit typical for the species.											**Development Impact** **See Section 7.1.1**	
11	*Eucalyptus nicholii* Black Peppermint	12	0.44 0.45[C]	11 x 10	M	C	N	A	**2A**	**Medium**	**7.56**	**2.67**
Assessment This tree is composed of two leaders that share a common root crown. Limited assessment due to undergrowth.											**Development Impact** **See Section 7.1.1**	
12	*Eucalyptus nicholii* Black Peppermint	15	0.56 0.45	12 x 8	M	C	N	B	**4A**	**Low**	**8.62**	**2.88**
Assessment This tree is composed of two leaders that share a common root crown. Both leaders exhibit symptoms of decline (twiggy dieback and epicormic growth). The northern leader has a radial wound, and an active bracket (*Phellinus* sp.) exists on the wound. The decline is likely related to the pathogen. The target zone is likely the northern side of the tree, although an opportunity for the southern side where the rail corridor exists cannot be dismissed.											**Development Impact** **See Section 7.1.1 and 7.1.2**	
13	*Eucalyptus scoparia* Wallangarra White Gum	9	0.36 0.30	11 x 7	M	I	Sym.	A	**2A**	**Medium**	**5.62**	**2.41**

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
Assessment This tree is composed of two leaders that initiate from a 0.5m high stem.											**Development Impact** **See Section 7.1.1**	
14	*Eucalyptus leucoxylon* Yellow Gum	6	0.22	4 x 2	M	I	Sym.	B	**3A**	**Low**	**2.64**	**1.75**
Assessment The habit is scant, and the vitality poor. This tree provides poor form.											**Development Impact** **See Section 7.1.1 and 7.1.2**	
15	*Casuarina glauca* Swamp Sheoak	10	0.15	8 x 8	M	D	Sym.	A	**2A**	**Medium**	**1.80**	**1.49**
Assessment This tree appears to be the result of coppiced regrowth and has numerous smaller stems radiating from the same area. The dense suckers throughout this area limits the assessment.											**Development Impact** **See Section 7.1.1**	
16	*Eucalyptus nicholii* Black Peppermint	5	0.22 0.18	5 x 5	M	C	E	B	**3A**	**Low**	**3.41**	**1.95**
Assessment This tree is composed of two leaders that initiate from a common root crown. The western leader is dead, and the eastern leader a partial crown density. This tree is in decline and the symptoms are consistent with a pathogen infection.											**Development Impact** **See Section 7.1.1 and 7.1.2**	
17	*Eucalyptus sp.* Gum tree	14	0.15 average	6 x 6	M	D	Sym.	A	**4A**	**Low**	**1.80**	**1.49**
Assessment Composed of seven leaders that radiate from an area approximately 0.5m in diameter. This tree is coppiced regrowth and is likely to offer a risk for failure with further growth.											**Development Impact** **See Section 7.1.1 and 7.1.2**	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
18	*Eucalyptus nicholii* Black Peppermint	15	0.68	10 x 12	M	C	N	A	**2D**	**Medium**	**8.16**	**2.81**
Assessment This tree presents typical form. Some maturing epicormic growth extends from the pruning wounds towards the south. These will present a risk for failure with further maturity where the rail corridor is the target zone.											**Development Impact** **See Section 7.1.1**	
19	*Acacia spp.* Wattle	7	0.25	5 x 3	M	S	SW	A	**4A**	**Low**	**3.00**	**1.85**
Assessment Presents typical form, although has grown beneath the bridge where it is in contact. Prior branch failure exists. The habit presents poor form, and limited ability for maturing growth.											**Development Impact** **See Section 7.1.1 and 7.1.2**	
20	*Eucalyptus botryoides* Bangalay[A]	14	0.52	10 x 12	M	C	N	A	**1A**	**High**	**6.24**	**2.51**
Assessment This tree presents typical form.											**Development Impact** **See Section 7.1.1**	
21	*Casuarina glauca* Swamp Sheoak	8	0.26[B]	4 x 4	M	I	Sym.	A	**2A**	**Medium**	**3.12**	**1.88**
Assessment This tree presents typical form, and appear to mature suckering growth with a composite of smaller suckers surrounding.											**Development Impact** **See Section 7.1.1**	
22	*Casuarina glauca* Swamp Sheoak	10	0.27[B]	5 x 4	M	C	NE	A	**2A**	**Medium**	**3.24**	**1.91**
Assessment This tree presents typical form, and appear to mature suckering growth with a composite of smaller suckers surrounding.											**Development Impact** **See Section 7.1.1**	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
23	*Schinus molle* Peppercorn Tree	10	0.67 0.65	11 x 15	M	D	Sym.	A	**2A**	**High**	**11.20**	**3.22**
Assessment This council-owned tree, is located at the end of a public thoroughfare servicing the southern side of the Station and adjacent to the Princes Hwy. This tree presents the typical broad sprawling habit.											**Development Impact** **See Section 7.1.3**	

A. Incomplete identification of species due to insufficiently available plant material
B. Diameter taken below 1.4m due to low stem bifurcation
C. Estimate due to the overgrown area and/or limited access
D. Deciduous species, void of foliage at the time of assessment
E. Level 3 assessment required to determine the accurate rating

7.0 Site Assessment

The area of assessment comprises the northern (Lord Street) and southern sides (public thoroughfare) of St Peters Station. All trees included in this report are planted, and none are remnant. The tree species are a combination of exotic and native and provide common use within the landscape industry. A description for each of the areas containing these trees is discussed separately.

Station lot

The Station comprises five platforms, although only four are active. The island platforms (1/2 and 3/4) contain three plantings, being trees No. 2, 3, and 4. The active platforms are sealed in asphalt, and the trees are growing from planter squares, approximately 2000mm by 2000mm. All remaining trees, being No. 7-22 are located behind the inactive northern platform.

This area contains a unused platform (1000mm high and 5000mm wide), which has the concrete sides elevating the platform, although the top surface (where trees No. 7-20 reside) is natural ground. The platform is near void of structures other than billboards. Between this platform and the northern boundary is a disused area at the grade of the tracks, although void of any structures. This area is unmaintained lawn/weed stock, and the trees No. 21 and 22 occur on the batter extending up the northern boundary. These are self-sown and the result of root suckers. This area and the platform has numerous self-sown Acacias and groups of Casuarina. These have been included on Plan 1 because much of the root suckering regrowth forms stands of trees that conform to the definition of a tree, however inclusion within this report as individual trees is considered impractical, and the groups have been described below under the heading; Additional trees.

Southern side of assessment

The entrance to the Station is serviced by a public thoroughfare that exits to the Princess Hwy and Goodsell Street. Trees No. 1 and 23 occur in this area. The area surrounding tree No. 1 is entirely paved up to 200mm with the root flare. The paving is uneven and partially a result of root uplift. A brick retaining wall extends up to 2m above grade and is near flush with the northern side of the tree. This wall forms a 10m high retaining wall on the southern boundary of the Station. Recent excavation on the southern side of the tree (3000mm from the tree) for a development (No. 645 Princes Hwy) has exceeded the depth of the root zone (1000mm) and may have removed this portion of the root system that the calculated TPZ indicates has extended into. Pending the prior structure in this area, the root system may or may not have extended into this area. Tree No. 23 is located in an elevated garden bed (approximately 400mm high), from where the paving continues around the tree.

Northern side of assessment

Lord Street extends the length of the northern Station boundary from where entrance stairs service the Station. An inconsistent avenue planting exists of predominately native species, for which trees No. 5 and 6 form part of. The verge is entirely sealed with concrete, from where the trees are growing flush with the kerb and within planter squares approximately 1300mm by 1000mm.

Additional trees

The trees labeled as A, B, C, and D, that have been included on the drawing set (Plan 1) however excluded from this report because of the failure to conform to the description of a prescribed tree based on the definition of a tree to be greater than 3m in height.

Tree A: Dead trees

Tree B: Trees (*Acacia* sp.) below 3m in height or less than 100mm in diameter

Tree C: Stands of *Casuarina* suckers

- C1: approximately 25 stems, 2-5m high, 20-100mm in diameter
- C2: 3 stems, <6m high, <100mm in diameter
- C3: 2 stems, <6m high, <100mm in diameter
- C4: 2 stems, <6m high, <100mm in diameter

Tree D: Trees (*Celtis* sp.) < 5m in height

7.1 Proposed development

The proposed development consists of the upgrading of the Station infrastructure to meet requirements of the *Disability Discrimination Act 1992*. A list of the scope follows.

- two new lifts, lift landings and lift canopies at the Sydney (eastern) end of Platforms 1/2 and 3/4, connecting to the existing eastern footbridge
- closure and removal of the concourse retail kiosk for the installation of a new lift servicing Platform 1/2
- new canopies and anti-throw screens to stairs on Platform 3/4
- new canopies along Platform 3/4 for weather protection
- a standalone canopy at the western end of Platform 1 for weather protection at the boarding assistance zone (BAZ)
- modifications to the existing footbridge safety screens at new lift interface locations
- reconfiguration of the existing concourse building to accommodate a new family accessible toilet, new installation main switch board (IMSB) and existing station systems. A new switchboard would supply the required power to the lifts (and other station systems) from a pad mount transformer
- provision of one kiss and ride area on Goodsell Street and two on Lord Street

- regrading of the footpaths and landscaping work at the station entrances from Lord Street, King Street and Goodsell Street
- provision of up to six additional bike hoops at Railway Lane and Lord Street
- improvements to customer information and communications systems including wayfinding modifications, public address (PA) system modifications and new hearing induction loops as required
- platform regrading and the installation of new Tactile Ground Surface Indicators (TGSI) along the platforms
- improvements to station lighting and CCTV to improve safety and security
- electrical upgrades and service relocations and/or adjustments to accommodate the new infrastructure, including replacement of an existing transformer.

Public trees

Trees No. 1, 5, 6 and 23 are located in the adjacent areas outside of the Station lot, therefore constitute ownership by a second party, being the Inner West Council. Any proposed work within the zones of protection for these trees must not adversely impact these zones, and the trees shall be retained and protected from any site work unless permission for removal is granted by the Inner West Council.

The calculations included in the following discussion have not considered;

- subsurface utilities that have not been included in the design,
- Work methods related to subsurface utilities, for example, concrete encasing or replacement of existing lines, or
- work methods related to construction (stockpiling, site sheds, scaffolding) unless otherwise specified.

These may also increase the encroachment and tree impact and, therefore, the opportunity for tree retention.

Assumption 1: Zones of protection (TPZ, SRZ)

The calculations of the zones of protection (TPZ, SRZ) contained in Table 1 are based on the arbitrary formulae provided in the AS 4970, **Protection of Trees On Development Sites** and this document provides scope for modifying this zone, however, with supporting evidence.

Regarding tree No. 1

The brick retaining wall that separates the rail corridor from the public thoroughfare is of sufficient height to contain all root system from this tree to the area of the public thoroughfare, irrespective of the extension past these walls described by the calculated zones of protection (i.e. SRZ/TPZ). Therefore, any work that encroach up to the base of these walls are not considered to pose an adverse impact on these trees. Although any works within the area of the

thoroughfare will need to display additional caution regarding the disturbance of roots.

Regarding trees No. 5 and 6

The kerb/road provides an area that does not commonly support strong root growth and can act as a barrier or partial barrier. This would act as a barrier and reduce root extension into the area where the TPZ/SRZ appears to extend into. Therefore suggesting an asymmetrical root zone can exist, which to compensate, would result in increased root extension and biomass within the verge (footpath). Therefore, any work that encroach on the area of the TPZ that exists within the verge would likely have more impact than the calculated radius of the zones of protection.

Regarding trees No. 7-20

The elevated brick retaining walls that form the disused platform are of sufficient height coupled with the assumed depth of the footing to contain all root system from these trees, irrespective of the extension past these walls described by the calculated zones of protection (i.e. SRZ/TPZ). The height of these walls to limit root extension is based on the natural depth where roots will proliferate and will limit root extension outside of this contained area. Therefore, any work that encroaches up to the base of these walls is not considered to pose an adverse impact on these trees.

This report discusses the impact of the proposed design on the trees. Twenty-three (23) trees have been listed within this report based upon the vicinity of the proposed work. This has included trees where any part of the zones of protection; Tree Protection Zone (TPZ), and Structural Root Zone (SRZ) to encroach into the area proposed for work and areas nominated for inclusion. Recommendations based on the tree significance and condition, together with the impact on these trees, regarding the development, follow.

7.1.1 Trees and zones of protection (TPZ/SRZ) outside of the proposed design

Trees No. 2, 3, and 7-22.

Based on the drawing set, none of the proposed work conflict with the location of these trees or respective zones of protection. These trees can be retained without impact by the proposed design.

However, not included in the drawing set is the requirement for the construction storage and compound. This has been nominated to be located in the area adjacent to the northern boundary of the Station, where the predominant trees are located, being No. 7-22. The size or constraints for this are unknown, and therefore the following list provides the trees that should be retained and protected based on the significance

assigned as opposed to those that could be removed for a work compound.

- Trees that should be retained;
  Trees No. 7, 8, 9, 10, 11, 13, 15, 18, 20, 21 and 22
- Trees that can be removed;
  Trees No. 12, 14, 16, 17 and 19

7.1.2 Trees providing a limited useful life expectancy

Trees No. 3, 12, 14, 16, 17 and 19

These trees provide poor form and do not provide sufficient significance to retain and design around. These trees could be removed irrespective of work. Although tree No. 12, 16, 17, and 19 pose a potential risk for failure based on the existing structure and/or active decay pathogen, and will be required to be removed in the short term based on the use of the surrounding areas for construction works.

7.1.3 Trees subject to encroachment by design

The following trees have proposed work that extend into the zones of protection (i.e. TPZ/SRZ). These are discussed relative to the tree significance and potential impact imposed by the design work.

Trees No. 1 and 23

These trees are not directly located in the footprint of the proposed design, however subject to a potential major encroachment. Based on the landscape drawing[7] this consists of the removal of the existing paved surfaces around these trees and replacement with new paving. The grades have not been nominated and assumed to be retained, and the paver dimensions[8] provide similar thickness as the existing although are not porous.

Tree No. 1, has a concrete edging proposed to extend around the tree. This offers a larger area than the existing. The concrete will require a footing, and this has the potential to compromise roots, and based on the root system assumed to radiate from this tree (see Assumption 1, Section 7.1), has the potential to compromise significant supporting roots. Either an alternative design is required to avoid the potential impact, or root mapping proceed to confirm the viability.

The existing garden bed surrounding tree No. 23 is to be retained, therefore protecting the SRZ, although the TPZ is likely spread throughout

[7] See Drawing No. 150338-STP-LA-DRG- 101 (3)
[8] Described in Drawing No. 150338-STP-LA-DRG- 103 (3)

the existing surrounding paved areas; therefore, conditions for the work methods employed are required.

The encroachment extends over the larger proportion of each root zone (TPZ), therefore comprises a major encroachment; although the works are removing and replacing an existing surface, therefore can constitute minimal disturbance. Based on the removal and replacement of this surface, an opportunity exists to use a surface that is more amicable to tree growth. That is a porous type surface can be employed, which can offer improved growing conditions for the trees and including the proposed new plantings. For this reason, the area constituting the proposed Brick mix Type 2, should consider the use of a porous flexible type surface.

The potential for damage to the root systems for these trees exists; therefore the work methodology outlined in Section 7.3.1 shall be included for the work in this area around and between trees No. 1 and 23.

Tree No. 4

This tree is not directly located in the footprint of the proposed design, however subject to a potential major encroachment. Based on the drawing[9] the works around this tree will be pending 'slip resistance testing' to determine any modification to the surface. Based on the removal and replacement of this surface, the grades should be retained. The potential for damage to the root system exists, therefore the work methodology outlined in Section 7.3.1 would be require.

Trees No. 5 and 6

These trees are not directly located in the footprint of the proposed design, however subject to a potential major encroachment. Based on the landscape drawing[10] this consists of the removal of the existing surfaces around these trees and replacement with concrete paving and a brick header course. The grades have not been nominated and assumed to be retained, and the surface[11] is described in a manner that this is poured exposed aggregate concrete.

The proposed works around each tree is similar to that which is existing, therefore assuming grades are retained, no additional impact should occur to these trees, although an opportunity exists to improve these growing conditions and would require the use of an alternative surface that offers

[9] See Drawing No. 150338-STP-AR-DRG- 201 (1)
[10] See Drawing No. 150338-STP-LA-DRG- 102 (3)
[11] Described in Drawing No. 150338-STP-LA-DRG- 103 (3)

flexibility to remove potential trip hazards forming and a porous surface amicable to tree growth. In addition, conditions for the work methods employed are required.

The potential for damage to the root systems for these trees exists; therefore, the work methodology outlined in Section 7.3.1 shall be included for the work in this area around and between trees No. 5 and 6.

7.2 Sub-surface utilities

No drawings have been provided for the proposed route of sub-surface utilities. Any trenching other than what has been allowed for shall be avoided within the area of the TPZ. Any proposed route shall be re-routed outside of the TPZ. Under boring may be required if a limitation for the route of a service is restricted to an area that falls within the TPZ. Any excavation in the area of a TPZ must be authorised and conditioned by the project arborist.

7.3 Protection measures

Tree protection measures will be required during the demolition and construction stage. However, the design of these will be pending the work methodology and final design. The project arborist shall be contracted after the completion/confirmation of design work for the instruction of the protection measures implementation that is the Arboricultural Method Statement. Examples of the protection measures are contained in Appendix B.

7.3.1 Work methodology

The following conditions are required during the demolition stages in the zones of protection.

1. Machinery must not be used in the areas of the TPZ for any tree at any time unless approved by the project arborist. The removal of the existing surfaces must be by hand based tools.
2. No pruning can occur for any related works.
3. After removal of the pavers, a soil conditioner is required to be applied immediately over the TPZ previously covered by the slab.
   Soil Conditioner: A non-synthetic type is recommended, such as ‘Seasol,’ ‘Tri-Kelp’ and applied as a diluted root drench via a hose applicator, appropriate to the manufacturer's recommendations. In addition to the soil drench, a surfactant (wetting agent) and carbohydrate treatment will aid with the wetting and movement of water in the ground. The carbohydrate treatment includes the addition of 25-50 gms of caster sugar per litre of water. These three ingredients can be combined and applied via a single application.
4. The existing (natural) grade must be retained so that any surface is located on this grade. That is, the existing sand/aggregate bed that the

existing pavers are laid onto must be retained and utilised for the new pavers. Filling of the existing grade is permitted and shall be no greater depth than 100mm. The fill material shall provide a texture that is majority river sand.

5. Any exposed woody roots greater than 30mm in diameter shall have foam (closed cell) pad of at least 10mm thickness placed over the root surface and the final surfaces laid over the foam.
6. No root pruning is permitted without an assessment and consent from the project arborist or council tree officer.
7. All root pruning requires the following procedures
   - **7a**. the cut provides the smallest surface area available; that is right angles to the side of the root.
   - **7b**. the cut face has a fungicide (e.g.,. sulphur) applied to the wound face immediately.
   - **7c**. the cutting equipment is sterilised between cuts, use of a solution of 70% methylated spirits and 30% water, in a spray bottle.

7.3.2 Conditions for compliance

The following conditions are required before any work proceed on site.

Site induction; All workers related to the construction process and before entering the site must be briefed about the requirements/conditions outlined in this report relative to the zone of protection, measures, and specifications before the initiation of work. This is required as part of the site induction process.

Project Arborist; A project arborist who conforms to the requirements of the AS 4970 is required to be nominated immediately after a *Notice of Determination* is issued, and they are to be provided with all related site documents.

7.4 Compliance Documentation

The following stages would require assessment and documentation (report, letter, certification) by the project arborist or person responsible for the specific work type, and the related documentation is to be issued to the principal certifying agent.

7.4.1 Table 2; Assessment/Certification hold points

Hold points	Work type	Document required
Pre-demolition	Installation of the protection measures, Section 7.3	Certificate
During demolition	Project arborist on-site during removal of surfaces around trees No. 1, 5, 6 and 23	Certificate

Excavation within TPZ's	Project arborist on-site during excavation	Certificate
During construction	Any <u>further work</u> required within the area of the TPZ or decline related to the trees that have not been covered by this report.	Report Brief
During construction	Any crown modification, including pruning or root disturbance.	Report Brief

Construction refers to the time between the initiation of demolition and until an occupation certificate is issued.

Project Arborist person nominated as responsible for the provision of the tree assessment, arborist report, consultation with stakeholders, and certification for the development project. This person will be adequately experienced and qualified with a minimum of a level 5 (AQF); Diploma in Horticulture (Arboriculture)[12].

8.0 Protection Specification

The retention and protection of these trees requires the remaining Tree Protection Zone (TPZ) not subject to encroachment to conform to the conditions outlined below. These conditions provide the limitations of work permitted within the area of the Tree Protection Zone (TPZ) and must be adhered to unless otherwise stated.

1. Crown pruning can be accommodated, however, must conform to the AS 4373; *Pruning of Amenity Trees*, and not misshape the crown nor remove in excess of 10-15 per cent of the existing crown, pending on the species, and vitality. The opportunity for, type and proportion of pruning will be required to be nominated by the project arborist.

2. <u>Soil levels within the TPZ must remain the same</u>. Any excavation within the TPZ must have been previously specified and allowed for by the project arborist:

   a) So it does not alter the drainage to the tree.

   b) Under specified circumstances,

   - Added fill soil does not exceed 100 millimetres in depth over the natural grade. Construction methodologies exist that can allow grade increases in excess of 100 millimetres, via the use of an impervious cover, an approved permeable material or permanent aeration system or other approved methods.

[12] Based upon the definition of a 'consulting arborist' from the AS 4970; Protection of trees on development sites; 2009, Section 1.4.4, p 6.

- Excavation cannot exceed a depth of more than 50 millimetres within the area of the TPZ, not including the SRZ. The grade within the SRZ cannot be reduced without the consent from a project arborist.

3. No form of material or structure, solid or liquid, is to be stored or disposed of within the TPZ.

4. No lighting of fires is permitted within the TPZ.

5. All drainage runoff, sediment, concrete, mortar slurry, paints, washings, toilet effluent, petroleum products, and any other toxic wastes must be prevented from entering the TPZ.

6. No activity that can cause excessive soil compaction is permitted within the TPZ. That is, machinery, excavators, etc. must refrain from entering the area of the TPZ unless measures have been taken, in consultation with the project arborist.

7. No site sheds, amenities or similar site structures are permitted to be located or extend into the area of the TPZ unless the project arborist provides prior consent.

8. No form of construction work or related activity such as the mixing of concrete, cutting, grinding, generator storage or cleaning of tools is permitted within the TPZ.

9. No part of any tree may be used as an anchorage point, nor should any noticeboard, telephone cable, rope, guy, framework, etc. be attached to any part of a tree.

10. (a) All excavation work within the TPZ will utilise methods to preserve root systems intact and undamaged. Examples of methods permitted are by hand tools, hydraulic, or pneumatic air excavation technology.

(b) Any root unearthed which is less than 50 millimetres in diameter must be cleanly cut and dusted with a fungicide, and not allowed to dry out, with minimum exposure to the air as possible.

(c) Any root unearthed which is greater than 50 millimetres in diameter must be located regarding their directional spread and potential impact. A project arborist will be required to assess the situation and determine future action regarding retaining the tree in a healthy state.

9.0 Summary of tree impact

Based on the design supplied, the following summary provides the impacts imposed on the trees included in this report.

9.1 Trees and zones of protection (TPZ/SRZ) estimated to be outside of the proposed design

Trees No. 2, 3, and 7-22.

These trees are not adversely impacted by the design; that is, they conform to a minor encroachment or less and the nominated zones of protection (TPZ, SRZ) based on the requirements of the Protection Specification, Section 8.0. The proposed design does not adversely affect these trees, although this has not included work methodology, including the material storage and work compound. For this reason, the following list provides the trees that should be retained and protected based on the significance assigned as opposed to those that could be removed for a work compound.

- Trees that should be retained;
  Trees No. 7, 8, 9, 10, 11, 13, 15, 18, 20, 21 and 22
- Trees that can be removed;
  Trees No. 12, 14, 16, 17 and 19

9.2 Trees that have the potential to be impacted by the design

Trees No. 1, 4, 5, 6 and 23

These trees could be impacted by the proposed works, the following conditions are nominated for specific trees.

Tree No. 1: this tree shall be subject to a level 3 assessment (aerial and internal diagnostic assessment) to determine respective risk, mitigation, and viability for retention and design mitigation. Based on tree retention, the proposed concrete edge around this tree will either require an alternative design to avoid the potential impact or root mapping shall be undertaken to confirm the design viability.

Tree No. 1, 4, 5, 6, and 23: The surfaces proposed to extend around the TPZ's for these trees should be replaced with surfaces that are flexible and porous.

Tree No. 1, 4, 5, 6, and 23: The work methodology outlined in Section 7.3.1 will require to be included for areas of the TPZ's for each tree.

9.3 Trees providing a limited useful life expectancy

Trees No. 3, 12, 14, 16, 17 and 19

These trees provide poor form and do not provide sufficient significance to retain and design around. These trees could be removed irrespective of work. Trees No. 12, 16, 17, and 19 provide a potential risk for failure based on the existing structure and/or active decay pathogen, and will be

required to be removed in the short term based on the use of the surrounding areas for construction works.

9.4 Sub-surface utilities

No drawings have been provided for the proposed route of sub-surface utilities. Any trenching, other than what has been allowed for, should be avoided within the area of the TPZ's for any tree nominated for retention. Any proposed route shall be re-routed outside of the TPZ. Under boring may be required if a limitation for the route of service is restricted to an area that falls within the TPZ from any tree. Any excavation in the area of a TPZ must be authorised and conditioned by the project arborist.

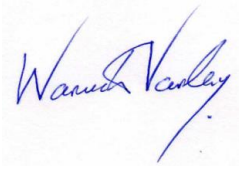
9.5 Protection measures

Protection measures (outlined in Section 7.3 and 7.4) are required to be implemented for the trees nominated for retention (referenced in Section 9.1) and installed before initiation of site work (including demolition/excavation) and retained until the landscaping work are required unless otherwise specified.

All workers related to the construction process and before entering the site must be briefed about the requirements/conditions outlined in this report relative to the zone of protection, measures, and specifications before the initiation of work.

A project arborist is required to be nominated, and the stages and related certification or similar documentation is to be issued to the principal certifying agent.

The opinions expressed in this report by the author have been provided within the capacity of a Consulting Arborist. Any further explanation or details can be provided by contacting the author.



Warwick Varley
Consulting Arborist
Level 5 and 8; Arboriculture
MIACA; Reg. #18
MISA
MIAH; Reg. # 32

10.0 Appendix A- Terminology Defined

Height
Is a measure of the vertical distance from the average ground level around the root crown to the top surface of the crown, and on palms - to the apical growth point.

DBH
Diameter at Breast Height – being the stem diameter in meters, measured at 1.4m from ground level, including the thickness of the bark.; Mult. refers to multiple stems, that is in excess of 4 stems.

Crown Spread
A two-dimension linear measurement (in metres) of the crown plan. The first figure is the north-south span, the second being the east-west measurement.

Age
Is the estimate of the specimen's age based upon the expected lifespan of the species. This is divided into three stages.

Young (Y)	Trees less than 20% of life expectancy.
Mature (M)	Trees aged between 20% to 80% life expectancy.
Over-mature (O)	Trees aged over 80% of life expectancy with probable symptoms of senescence.

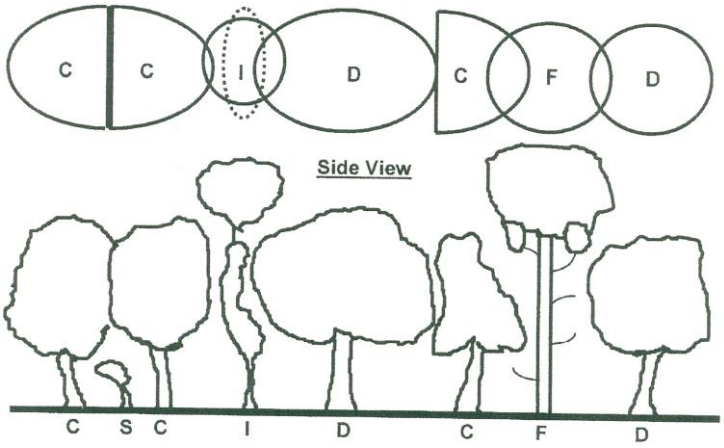
Crown Aspect
In relation to the root crown, this refers to the aspect the majority of the crown resides in. This will be either termed Symmetrical (Sym.) where the centre of the crown resides over the root crown or the cardinal direction the centre of the crown is biased towards, being either North (N), South (S), East (E) or West (W).

Vitality Rating
Is a rating of the health of the tree, irrespective and independent of the structural integrity, and defined by the 'ability for a tree to sustain its life processes' ((Draper, Richards, 2009). This is divided between three variables, and based on the assessment of symptoms including, but not limited to; leaf size, colour, crown density, woundwood development, adaptive growth formation, and epicormic growth.
A: Normal vitality, typical for the species
B: Below average vitality, possibly temporary loss of health, partial symptoms.
C: Poor vitality; obvious decline, potentially irreversible

Crown Class
Is the differing crown habits as influenced by the external variables within the surrounding environment. They are:

D	– *Dominant*	Crown is receiving uninterrupted light from above and sides, also known as emergent.
C	– *Codominant*	Crown is receiving light from above and one side of the crown.
I	– *Intermediate*	Crown is receiving light from above but not the sides of the crown.
S	– *Suppressed*	Crown has been shadowed by the surrounding elements and receives no light from above or sides.
F	– *Forest*	Characterised by an erect, straight stem (usually excurrent) with little stem taper and virtually no branching over the majority of the stem except for the top of the tree which has a small concentrated branch structure making up the crown.

Top View



D C, I & S, and side view, after (Matheny, N. & Clark, J. R. 1998, Trees Development, Published by International Society of Arboriculture, P.O. Box 3129, Champaign IL 61826-3129 USA, p.20, adapted from the Hazard Tree Assessment Program, Recreation and Park Department, City of San Francisco, California).

Levels of assessment

Level 1: Limited visual: a visual tree assessment to manage large populations of trees within a limited period and in order to identify obvious faults which would be considered imminent.

Level 2: Basic assessment: a standard performed assessment providing for a detailed visual assessment including all parts of the tree and surrounding environment and via the use of simple tools.

Level 3: Advanced assessment: specific type assessments conducted by either arborist who specialise with specific areas of assessment or via the use of specialised equipment. For example, aerial assessment by use of an EWP or rope/harness, or decay detection equipment.

TPZ; Tree Protection Zone

Is an area of protection required for maintaining the trees vitality and long-term viability. Measured in meters as a radius from the trees centre. The requirements of this zone are outlined within the Protection Specification, Section 8.0, and are to be adhered to unless otherwise stated.

The size of the Tree Protection Zone (TPZ) has been calculated from the *Australian Standard, 4970; 2009* – Protection of Trees on Development Sites

The TPZ does not provide the limit of root extension, however, offers an area of the root zone that requires predominate protection from development work. The allocated TPZ can be modified by some circumstances; however will require compensation equivalent to the area loss, elsewhere and adjacent to the TPZ.

SRZ; Structural Root Zone

Is the area around the tree containing the woody roots necessary for stability. Measured in meters as a radius from the trees centre. The requirements of this zone are outlined within the Protection Specification, Section 8.0, and are to be adhered to unless otherwise stated.

Protection Measures

These are required for the protection of trees during demolition/construction activities.
Protective barriers are required to be installed before the initiation of demolition and/or construction and are to be maintained up to the time of landscaping. Samples of the recommended protection measures are illustrated in Appendix B.

All other definitions are referenced from;

Draper D.B., Richards P.A., 2009, Dictionary for Managing Trees in Urban Environments
CSIRO Pub., Australia

Internal Diagnostic Testing

Cavities and loss of supporting wood by decay can compromise the stability of a tree, and the risk for failure will be based on the extent of the wood loss. This often cannot be assessed without specialty equipment for diagnosing the internal structure of a tree. Methodologies exist for determining the extent of wood loss (be it from decay or termites), and based on industry standards, the risk of failure can be determined. This methodology is a specialised area of arboriculture and limited to consulting arborists who are equipped with the technology (internal diagnostic devices) to assess this area. The two most common forms of internal diagnostic testing consist of the 'Resistograph,' and 'Sonic Tomography.' This technology is not recommended for all trees; however, only those trees that are considered to present significant specimens. This is based on the size, species, amenity value, and use by native wildlife. Within most situations, the cost of tree removal far outweighs the cost related to the specialty assessment.

Aerial assessment

An aerial assessment consists of an arborist branching the tree, to assess an anomaly with the branch structure that is not able to be assessed confidently from the ground. The climbing technique must not use climbing spikes. The arborist must contain a minimum qualification of a level 5 in arboriculture, and a risk assessment qualification (e.g., QTRA, TRAQ) and not be involved with any school utility work.

Significance Rating, Significance of a Tree Assessment Rating System (S.T.A.R.S), IACA, 2010[13]

Tree Significance – Assessment Criteria

1. High Significance in landscape

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

2. Medium Significance in landscape

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

3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vitality;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences,

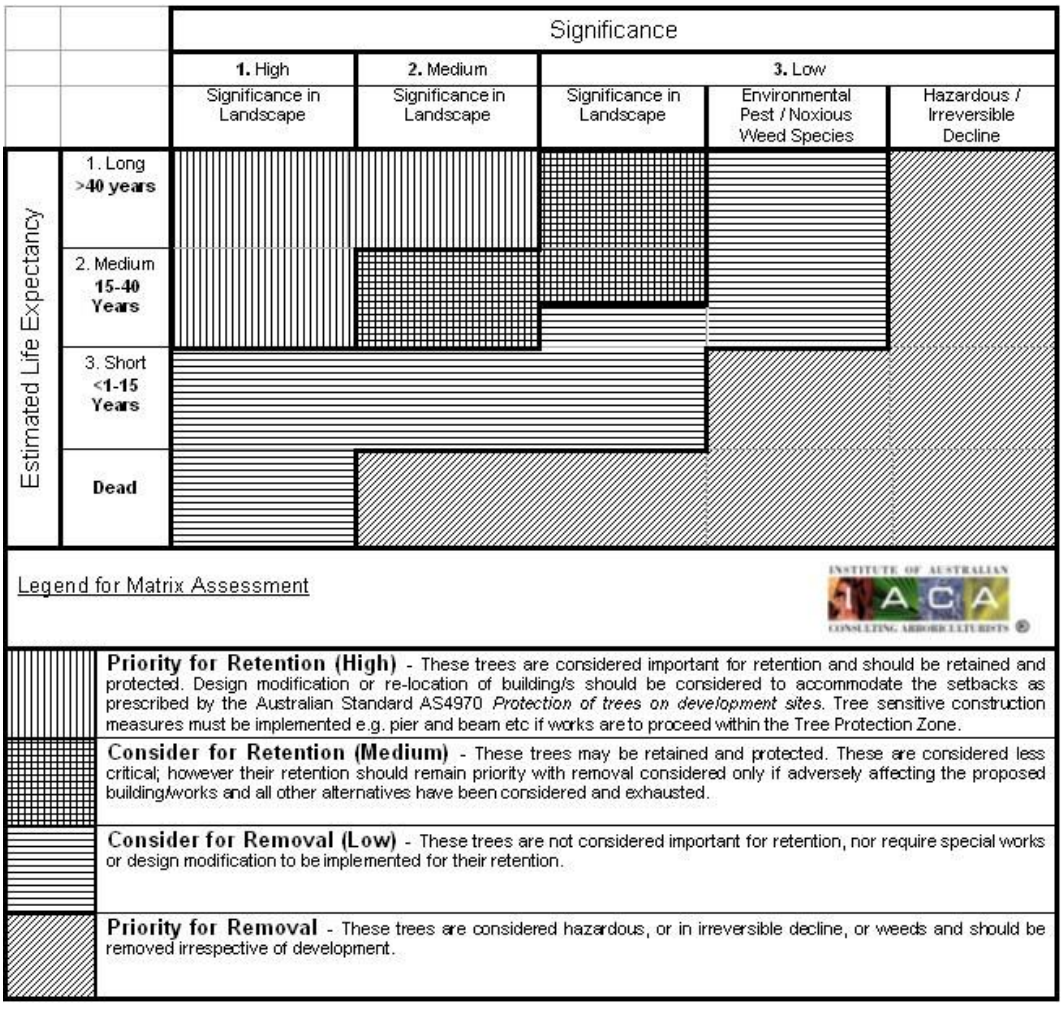
[13] IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

unlikely to reach dimensions typical for the taxa in situ – tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.
Environmental Pest / Noxious Weed Species
- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.
Hazardous/Irreversible Decline
- The tree is structurally unsound and/or unstable and is considered potentially dangerous, - The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short-term.

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

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

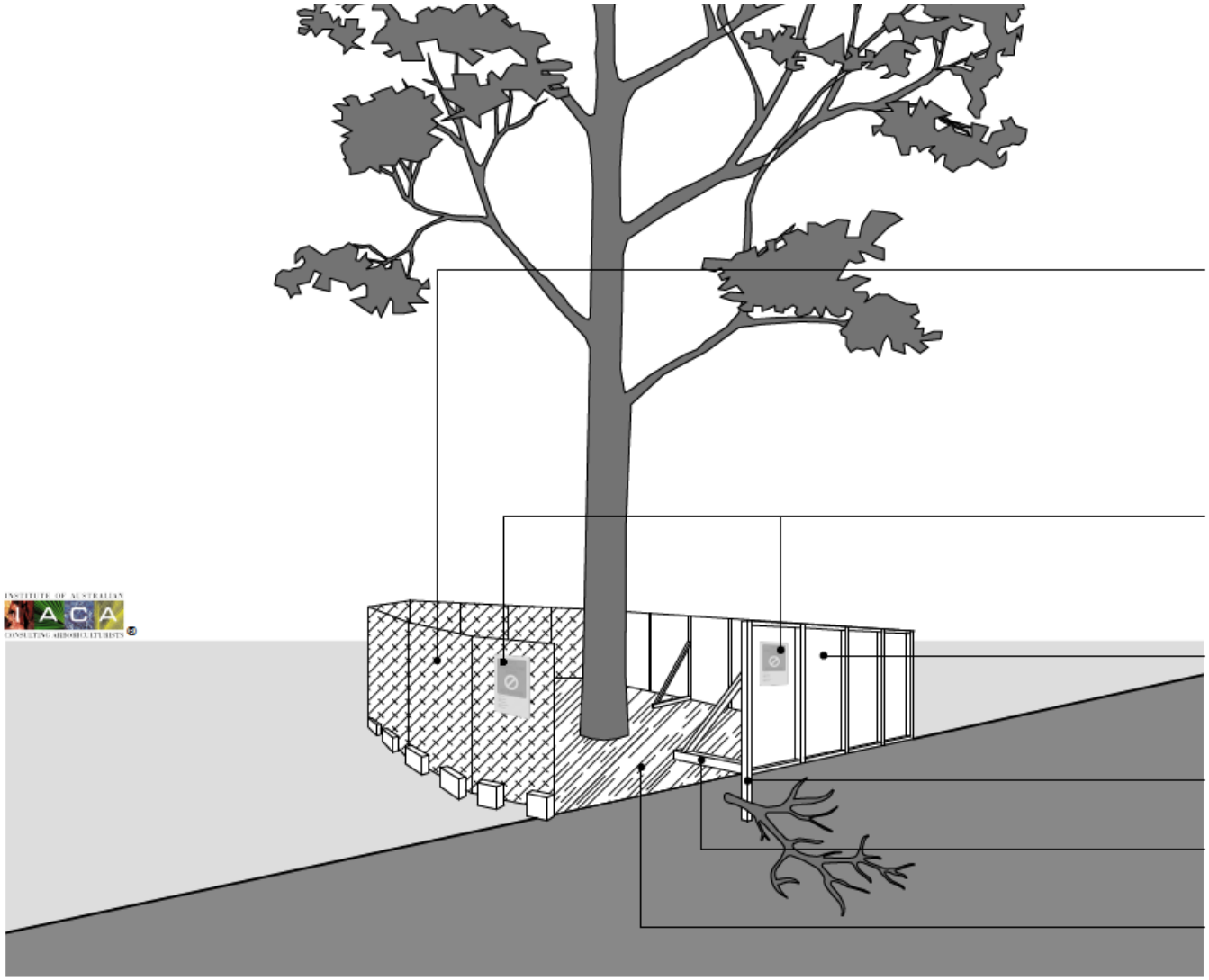
Table 3; Tree Retention Value – Priority Matrix.



Safe Useful Life Expectancy – S.U.L.E (Barell 1995)

	1. Long	2. Medium	3. Short	4. Removal	5. Moved or Replaced
	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 15 – 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 5 – 15 years with an acceptable level of risk.	Trees that should be removed within the next 5 years.	Trees which can be reliably moved or replaced.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees that may only live between 15 and 40 years.	Trees that may only live between 5 and 15 more years.	Dead, dying, suppressed or declining trees through disease or inhospitable conditions.	Small trees less than 5m in height.
B	Trees that could be made suitable for retention in the long term by remedial tree care.	Trees that may live for more than 40 years but would be removed for safety or nuisance reasons.	Trees that may live for more than 15 years but would be removed for safety or nuisance reasons.	Dangerous trees through instability on recent loss of adjacent trees.	Young trees less than 15 years old but over 5m in heights
C	Trees of special significance for historical, commorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.	Trees that may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees that may live for more than 15 years but should be removed to prevent interference with more suitable individuals or to provide space for new planting.	Damaged trees through structural defects including cavities, decay, included bark, wounds or poor form.	Trees that have been pruned to artificially control growth.
D		Trees that could be made suitable for retention in the medium term by remedial tree care.	Trees that require substantial remedial tree care and are only suitable for retention in the short term.	Damaged trees that are clearly not safe to retain.	
E				Trees that may live for more than 5 years but should be removed to prevent interference with more suitable individuals or to provide space for new plantings.	
F				Trees that are damaging or may cause damage to existing structures within 5 years.	
G				Trees that will become dangerous after removal of other trees for reasons given in (A) to (F).	

Appendix B- Protection measures;
Protective fence



Note:
No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.

Option 1 - Fencing
1.8m high chain wire mesh panels with shade cloth attached (if required), held in place with concrete feet.

Tree Protection Zone (TPZ) sign

Option 2 - Fencing
Plywood or wooden panel paling fence. This type of fencing material also prevents building materials or soil entering the TPZ.

Installation of supports should avoid damaging roots.

Bracing is permissible within the TPZ.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer installed across surface of TPZ.

Stem and Ground protection