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ACCREDITED MEMBER™

REPORT:

ARBORICULTURAL IMPACT ASSESSMENT

Transport Access Program
Waitara Station

Waitara Railway Station
Alexandria Parade
Waitara NSW

Prepared 25 March 2022 for Transport for NSW
Reference 24005
Revision.02

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SUMMARY and CONCLUSIONS

The Arboricultural Impact Assessment (AIA) Report (this report) has been commissioned by Transport for NSW to determine potential impacts to trees, as a result of the Waitara Station Upgrade (the Proposal). The Proposal forms part of the Transport Access Program, and includes the following key features:

- construction of a new pedestrian underpass at the northern end of the platform to provide a new accessible station entrance
- installation of two new lifts at the new northern station entrance including a lift from the commuter car park to the underpass and a lift from the underpass to the platform, including associated landings, canopies and support structures
- construction of new platform stairs and associated canopy to provide access from the new pedestrian underpass to the station platform
- construction of a new northern station entrance including a lift entrance and entrance stairs from the commuter car park off Waitara Avenue, and an eastern entrance from Alexandria Parade
- construction of an accessible pedestrian footpath on Alexandria Parade connecting to a new pedestrian crossing on Alexandria Parade
- provision of seating and wheelchair spaces at the two boarding assistance zones (BAZ) and installation of one canopy on the station platform
- modifications to the station building to provide additional Station Services Equipment (SSE)
- reconfiguration of the existing toilet facilities in the station building to provide a new family accessible toilet and new unisex ambulant toilet
- modifications to the commuter car park including relocation of the turning circle, relocation of two accessible parking spaces and provision of kiss and ride bays
- modifications to the parking on Alexandria Parade to provide a new station entrance including provision of two new accessible parking spaces adjacent to the new station entrance
- ancillary work including platform stabilisation and regrading, station power supply upgrade, protection and relocation of existing services and utilities, installation of new services and utilities, new or reinstatement of Tactile Ground Surface Indicators (tactiles) where required, handrails and fencing, new ticketing facilities including additional Opal card readers, improvement to station communication systems (including CCTV cameras) and wayfinding signage.

This report considers 13 trees (the trees), 12 located within the rail corridor on the embankment on the Alexandria Parade side of Waitara Station and separated from the street by car parking spaces, and one tree located within private property (No. 4 Romsey Street) which may be impacted by the proposed footpath works. A total of nine trees are proposed for removal and four would be retained. Of the trees to be removed the majority are weed species exempt from protection by the Hornsby Development Control Plan 2013. Most of the trees have previously been pruned, are of low stature and of minimal significance in the landscape and are likely to have a negligible impact on the local amenity if removed.

Statutory Considerations

Statutory consideration of potential impacts to trees considered in this report is provided in the Waitara Station Upgrade Review of Environmental Factors (REF).

Weeds

Trees 1, 6, 7, 9 and 13 (5 trees) are expected to be self-sown weeds species exempt from protection (Trees 1, 6 and 9 *Cinnamomum camphora* - Camphor Laurel, and Trees 7 and 13 *Ligustrum lucidum* - Broad-leaf Privet).

Tree Assessment

The trees assessed are numbered and their genus, species and common name included in Appendix A – Tree Assessment. Tree numbers are marked on Appendix B – Tree Location Plan.

Removal

Trees 4-12 (9 trees) are recommended to be removed as they are located within the building envelope of the rail corridor for the proposed works with a major encroachment into their Tree Protection Zones (TPZ) and Structural Root Zones (SRZ).

Retention

Trees 1-3 and 13 (4 trees) are to be retained and protected (Appendix A – Tree Assessment). Of these, Trees 1 and 13 are weed species. Trees 1-3 are located away from the proposed works and therefore unlikely to be impacted. Tree 13 is located within private property and should be able to be retained with the application of *tree sensitive* excavation and construction works supervised by the Project Arborist to ensure the protection of structural roots (roots >40 mm diameter).

No Encroachment

Trees 1-3 (3 trees) are not subject to encroachment.

Minor or No Encroachment

Trees 4 and 5 (2 trees) would be subject to a minor encroachment as per 'AS4970 (2009) Section 3, 3.3.2 *Minor Encroachment*' from proposed works within <10% of the radial area of the TPZ per (Appendix C- Tree Protection Plan). There is no encroachment into the SRZ of each retained tree.

Major Encroachment

Trees 6-13 (8 trees) would be subject to a major encroachment as per AS4970 (2009) Section 3, 3.3.3 Major Encroachment from the proposed works within >10% of the radial area of the TPZ. Trees 6 and 9 (*Cinnamomum camphora* - Camphor Laurel), and Trees 7 and 13 (*Ligustrum lucidum* - Broad-leaf Privet) are weed species, and exempt from protection by the Hornsby Development Control Plan 2013 (Appendix D - Hornsby DCP 2013, Part 1, General, Trees and Vegetation Preservation). For Tree 13, non-destructive root exportation works such as slit trenching can be applied to locate structural roots (roots >40 mm diameter) and results assessed by the Project Arborist. This would allow the Project Arborist to consider the findings and advise of any footpath design modification required, or remedial works to protect structural roots and retain the tree.

Tree Significance

Tree significance has been determined by using the Tree Significance - Assessment Criteria as outlined in the '*IACA Significance of a Tree, Assessment Rating System* (STARS)© (IACA, 2010) Appendix F'. The trees are rated, High, Medium or Low. The number of trees in each category is summarised in Table 1.0. The STARS significance rating of each individual tree is shown in Appendix A – Tree Assessment.

Table 1.0 Tree Significance – Summary of trees in different categories using the Significance of a Tree, Assessment Rating System (STARS)© (IACA, 2010).

Significance Scale	High	Medium	Low
Number of trees in each category	0	3	10

Tree Retention Value

Tree retention value has been determined by using the 'Retention Value – *Sustainable Retention Index Value* (SRIV)© (IACA, 2010), Appendix E'. The trees are rated, High, Medium, Low or Remove. The number of trees in each category is summarised in Table 2.0. The SRIV retention rating of each individual tree is shown in Appendix A – Tree Assessment.

Table 2.0 Retention Value - summary of trees in different categories using the SRIV© (IACA, 2010).

Retention Value	High Priority for Retention	Medium Consider for Retention	Low Consider for Removal	Remove Priority for Removal
Number of trees in each category	0	5	3	5

Tree Protection Setbacks

TPZ and SRZ setbacks are based on 'Australian Standard AS4970 2009 Protection of trees on development sites, Section 3'. The TPZ and SRZ of the selected trees are provided in Appendices G and H, respectively. Including excavation, the proposed works should be no closer than the dimensions stated above, save for 'AS4970(2009) Section. 3.3 Variations to the TPZ, 3.3.2 Minor Encroachment', ***"****If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ"* and Section 3.3.3 Major Encroachment *"If the proposed encroachment is greater than 10% of the area of the TPZ or inside the SRZ the project arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ."* The suitable trees requiring TPZ and SRZ protection setbacks are shown in Appendix C - Tree Protection Plan.

Replacement Tree Planting

Any vegetation including trees to be removed as part of the Proposal would be managed in accordance with Transport for NSW's Vegetation Management (Protection and Removal) Guideline (TfNSW, 2021) and Transport for NSW's *Vegetation Offset Guide* (TfNSW, 2019).

1.0 INTRODUCTION

Urban Tree Management © has prepared this report for AECOM on behalf of Transport for NSW. The land is located in the Hornsby Council LGA and the proposed work is subject to the environmental impact assessment and planning approval requirements of Division 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

Transport for NSW proposes to upgrade Waitara Station, located adjacent Alexandria Parade, Waitara. The proposed works include:

- construction of a new pedestrian underpass at the northern end of the platform to provide a new accessible station entrance
- installation of two new lifts at the new northern station entrance including a lift from the commuter car park to the underpass and a lift from the underpass to the platform, including associated landings, canopies and support structures
- construction of new platform stairs and associated canopy to provide access from the new pedestrian underpass to the station platform
- construction of a new northern station entrance including a lift entrance and entrance stairs from the commuter car park off Waitara Avenue, and an eastern entrance from Alexandria Parade
- construction of an accessible pedestrian footpath on Alexandria Parade connecting to a new pedestrian crossing on Alexandria Parade
- provision of seating and wheelchair spaces at the two boarding assistance zones (BAZ) and installation one canopy on the station platform
- modifications to the station building to provide additional Station Services Equipment (SSE)
- reconfiguration of the existing toilet facilities in the station building to provide a new family accessible toilet and new unisex ambulant toilet
- modifications to the commuter car park including relocation of the turning circle, relocation of two accessible parking spaces and provision of kiss and ride bays
- modifications to the parking on Alexandria Parade to provide a new station entrance including provision of two new accessible parking spaces adjacent to the new station entrance
- ancillary work including platform stabilisation and regrading, station power supply upgrade, protection and relocation of existing services and utilities, installation of new services and utilities, new or reinstatement of Tactile Ground Surface Indicators (tactiles) where required, handrails and fencing, new ticketing facilities including additional Opal card readers, improvement to station communication systems (including CCTV cameras) and wayfinding signage.

Urban Tree Management © attended Waitara Railway Station, Alexandria Parade, Waitara NSW (*the site*) on Wednesday 3 November 2021. The trees and their growing environment were examined and a Visual Tree Assessment (VTA) (Mattheck & Breloer, 1994) was conducted from the ground for the proposed works at the site (Appendix A – Tree Assessment).

A Tree Location Plan (Appendix B) and Tree Protection Plan (Appendix C) were prepared and are to be included into and used in conjunction with design drawings for the project. The Tree Protection Plan (Appendix C) will be provided to Transport for NSW separately as a dwg document.

Urban Tree Management © then prepared this Arboricultural Impact Assessment (AIA) Report in accordance with AS4970 (2009) Protection of trees on development sites. The objective of this report is to detail and comply with the tree protection requirements specified in AS4970 (2009) by preparing

- a Preliminary Tree Assessment ‘AS4970 Section 2.3.2’;

- a 'Preliminary Arboricultural Report 'AS4970. 2.3.3 (which may be combined),
- a Development Design and Review Report 'AS4970 Section. 2.3.4'.

Specifically the AIA report provides tree management and protection through all stages of development and:

- identifies the condition of the subject tree/s;
- determines the impact of development on the subject tree/s,
- provides recommendations for retention or removal of the subject tree/s,
- provides specifications for protection of tree/s to be retained,
- provides recommendations for replacement tree/s where appropriate.

The areas that may be impacted by the Proposal are indicated in Appendix B – Tree Location Plan. This report has relied upon the 'Waitara Station Schematic Plan - NSW Government, TfNSW, Waitara Station Upgrade', 19 January 2022.

2.0 METHODOLOGY

Note: Individual methodologies applied as applicable.

2.1 The method of assessment of tree/s applied is adapted from the principles of Visual Tree Assessment (VTA) (Mattheck & Breloer, 1994), undertaken from the ground, which considers and includes:

- tree health and subsequent stability, both long and short term;
- SRIV Version 4 (IACA, 2010) (Appendix E) © ,
- hazard potential to people and property,
- amenity values,
- habitat values,
- significance – Significance of a Tree, Assessment Rating System (STARS) (IACA, 2010) © (Appendix F).

2.2 Tree Assessment – This assessment is undertaken using standard tree assessment criteria for each tree based on the values outlined in Section 2.1 above, and is implemented as a result of at least one comprehensive and detailed site inspection to undertake a visual tree assessment of each individual tree, or stand of trees, or a representative population sample. See Appendix A – Tree Assessment.

2.3 Any dimensions recorded as averages, or by approximation are noted accordingly.

2.4 This report adopts Australian Standard AS4970 (2009) *Protection of trees on development sites* as a point of reference and guide to calculate minimum setbacks for the Tree Protection Zone (TPZ) (see Appendix G) and Structural Root Zone (SRZ) (see Appendix H) for each retained tree. The distances may be increased or decreased by the author in accordance with AS4970 as a result of other factors providing mitigating circumstances or constraints as indicated by, but not restricted to the following:

- condition of individual trees,
- tolerance of individual species to disturbance
- geology e.g. physical barriers in soil, rock floaters, bedrock to surface
- topography e.g. slope, drainage
- soil e.g. depth, drainage, fertility, structure
- microclimate e.g. due to landform, exposure to dominant wind
- engineering e.g. techniques to ameliorate impact on trees such as structural soil, gap graded fill, lateral boring

- construction e.g. techniques to ameliorate impact on trees such as pier and beam, bridge footings, suspended slabs
- root mapping
- physical limitations - existing modifications to the environment and any impact to tree/s by development, e.g. property boundaries, built structures, houses, swimming pools, road reserves, utility services easements, previous impact by excavation, or construction in other directions, soil level changes by cutting or filling, existing landscaping works within close proximity, modified drainage patterns
- extraneous factors e.g. potential future impacts from development on adjoining land when the tree is located on or near to a property boundary.

2.5 Stands of Trees - Trees in groups may be referred to as stands and a stand may exclusively contain specimens to be either retained or removed or a combination of both. A stand may be used to discuss all the trees on a given site to expedite their assessment, or refer to trees growing in proximity to one another or within a defined space. Stands may be comprised of mass boundary or screen plantings, to form a group of the same or a mixture of taxa. Each stand is considered as a single unit with each component tree assessed and expressed in tabular form, or indicated by a given percentage as a population sample of each stand. Where it is appropriate for a stand of trees to be retained in full or part, the location and setback of TPZ fences or works, are prescribed to provide for the preservation of the stand or selected component trees. The condition is to be that of the initial inspection, or if impacted by the development, mitigated through tree protection measures.

2.6 Tree Significance - The trees/s have been allocated a significance rating as determined by using the Tree Significance - Assessment Criteria of the IACA Significance of a Tree, Assessment Rating System (STARS)© (IACA, 2010), Appendix F.

2.7 The meanings for terminology used herein are taken from the IACA Dictionary for Managing Trees in Urban Environments (Draper and Richards, 2009).

3.0 PRUNING STANDARDS

3.1 Any pruning recommended in this report is to be to the Australian Standard® AS4373 *Pruning of amenity trees*, and conducted in accordance with the *Guide to Managing Risks of Tree Trimming and Removal Work*, July 2016, Safe Work Australia.

3.2 All pruning or removal works are to be in accordance with the appropriate Tree Management Policy where applicable, or Tree Management Order (TMO), or Tree Preservation Order (TPO).

3.3 Tree maintenance work is specialised, and in order to be undertaken safely to ensure the works carried out are not detrimental to the survival of a tree being retained and to assist in the safe removal of any tree, should be undertaken by a qualified Arboriculturist with appropriate competencies recognised within the Australian Qualification Framework. This includes having a minimum of five years of continual experience within the industry of operational amenity arboriculture, and covered by appropriate and current types of insurance to undertake such works.

4.0 DISCUSSION

This section addresses the relevant parts of the planning instruments for tree protection from the Hornsby Local Environmental Plan 2013 and The Hornsby Development Control Plan 2013, and other instruments and comments where appropriate.

Statutory consideration of potential impacts to trees considered in this report is provided in the Waitara Station Upgrade REF.

General

4.1 The excavation and construction works would require the removal of Trees 4-12.

4.2 Trees 1-3 are not expected to be adversely impacted by the proposed works with minimal encroachment into their radial SRZ and radial TPZ. The trees are located within the rail corridor and growing on the batter embankment for the railway station and the ideal radial TPZ and SRZ do not apply. Where roots located upslope and across slope within the batter are not disturbed within the prescribed TPZ and SRZ per (AS4970, 2009), these trees should be able to be retained to remain viable and stable despite the asymmetrical root crowns of Trees 2 and 3. This is due to the required continual pruning for clearance of aerial electrical cables located within the rail corridor parallel to its perimeter adjacent Alexandria Parade (see photographs in Appendix A – Tree Assessment).

4.3 Tree 13 is located within private property in a position close to the works boundary. To determine the viability of this tree to be retained it will require the application of *tree sensitive* non-destructive digging (NDD) root exploratory works by slit trenching with a water knife and vacuum truck to locate structural roots (roots >40 mm diameter) likely to be impacted within the works area. The NDD works will need to be supervised and results documented and assessed by the Project Arborist to recommend any remedial works necessary to ensure the protection of the tree subject to a major encroachment within their TPZ per AS4970 (2009) Section 3, 3.3.3.

4.4 Trees 1, 7, 9 and 13 are weed species of regional concern as determined by the Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022, under the Biosecurity Act 2015 (Appendix D), and wherever possible should be managed in accordance with its requirements.

5.0 RECOMMENDATIONS

5.1 Trees 1-3 and 13 (4 trees) are proposed to be retained and protected as part of the project the subject of this report as shown in Appendix B - Tree Location Plan and Appendix C – Tree Protection Plan.

5.2 Where TPZ works are to be modified this must be undertaken in consultation with the Project Arborist to ensure that tree protection is maintained.

5.3 Trees 4-12 (9 trees) are to be removed as detailed in Appendix C – Tree Protection Plan and undertaken in accordance with Section 3.0 Pruning Standards as outlined above.

5.4 Replacement planting would be undertaken in accordance with the Transport for NSW Vegetation Offset Guide (TfNSW 2019).

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DISCLAIMER

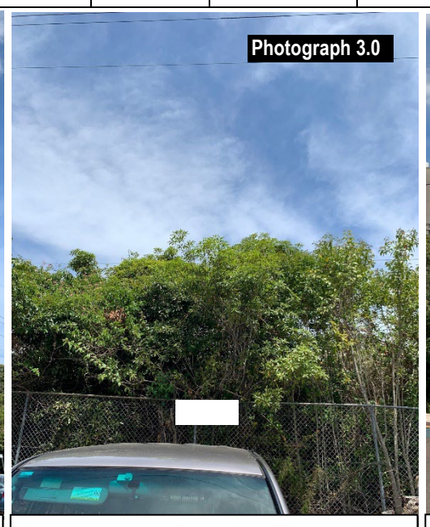
The author and Urban Tree Management take no responsibility for actions taken and their consequences, contrary to those expert and professional instructions given as recommendations pertaining to safety by way of exercising our responsibility to our client and the public as our duty of care commitment, to mitigate or prevent hazards from arising or risks from being eliminated or mitigated or managed to reduce harm or damage, from a failure moment in full or part, from a structurally deficient or unsound tree or a tree likely to be rendered thus by its retention and subsequent deterioration from modification/s to its growing environment either existing or proposed, either above or below ground, either existing or proposed, either above or below ground, contrary to our advice.

APPENDIX A – Tree Assessment

Tree ID number	**Botanical Name**	**Age** Y: Young M: Mature OM: Overmature (senescent)	**Height** (m)	**Spread** (m)	**DBH** (mm)	**DARB** (mm)	**TPZ** (m. rad) AS 4970 (2009)	**SRZ** (m. rad) AS 4970 (2009)	**SRIV** Age, Vigour, Condition / Index Rating (see Appendix E) www.iaca.org.au / Estimated Life Expectancy 1 = Long 2 = Medium 3 = Short	**STARS** Significance scale (see Appendix F) www.iaca.org.au 1 = High 2 = Medium 3 = Low / Retention Value 1 = High 2 = Medium 3 = Low 4 = Remove	**Geo-coordinates**	**Retain / Remove / Transplant** **pr = prune** **cr = crown** **rt = roots**	Comments and Recommendations
Tree ID number	**Botanical Name, common name**	**Age**	**Height**	**Spread**	**DBH**	**DARB**	**TPZ**	**SRZ**	**SRIV**	**STARS**	**Geo-coordinates**	**Action**	**Comments and Recommendations**
1	*Cinnamomum camphora* Camphor Laurel	Y	3.5	3	300	900	3.6	3.16613	YGVF - 8 / 3	3 / 4	-33.709734 Lat. 151.104343 Long.	**Retain**	Remaining first order structural branch (FOSB) of 5, others previously removed. This tree is to be protected by existing rail corridor perimeter fencing as it is located on an embankment with hardscape pavement in the existing car park restricting the development of root growth in this direction.
2	*Angophora costata* Smooth-barked Apple or Sydney Red Gum	M	12	14x9	700	750	8.4	2.93274	MGVP - 6 / 2	2 / 2	-33.709655 Lat. 151.104317 Long.	**Retain**	Crown asymmetrical bias to east over Alexandria Street. Tree repeatedly top lopped for clearance of aerial electricity cables on poles within the rail corridor. This tree is to be protected by existing rail corridor perimeter fencing as it is located on an embankment with hardscape pavement in the existing car park restricting the development of root growth in this direction.
3	*Angophora costata* Smooth-barked Apple or Sydney Red Gum	Y	5.0	3 x 2	120	140	2	1.5	YGVF - 8 / 3	3 / 2	-33.709643 Lat. 151.104194 Long.	**Retain**	Previously top lopped for clearance of aerial electricity cables on poles within the rail corridor parallel to the boundary fence. This tree is to be protected by existing rail corridor perimeter fencing as it is located on an embankment with hardscape pavement in the existing car park restricting the development of root growth in this direction.
4	*Pittosporum undulatum* Sweet Pittosporum	M	3.0	3	250	270	3	1.9095	MGVF - 9 / 2	3 / 3	-33.709566 Lat. 151.104140 Long.	**Remove**	*Lonicera japonica* - Honeysuckle, growing up through and over the crown.
5	*Pittosporum undulatum* Sweet Pittosporum	M	3.0	2.5	150	160	2	1.53277	MGVF - 9 / 3	3 / 2	-33.709566 Lat. 151.104140 Long.	**Remove**	*Lonicera japonica* - Honeysuckle, growing up through and over the crown.

Photograph 1.0 Taken 3/11/2021 by Danny Draper. View to west of Tree 1 *Cinnamomum camphora* – Camphor Laurel.

Photograph 2.0 Taken 3/11/2021 by Danny Draper. View to west of Trees 2 and 3, both *Angophora costata* – Smooth-barked Apple.

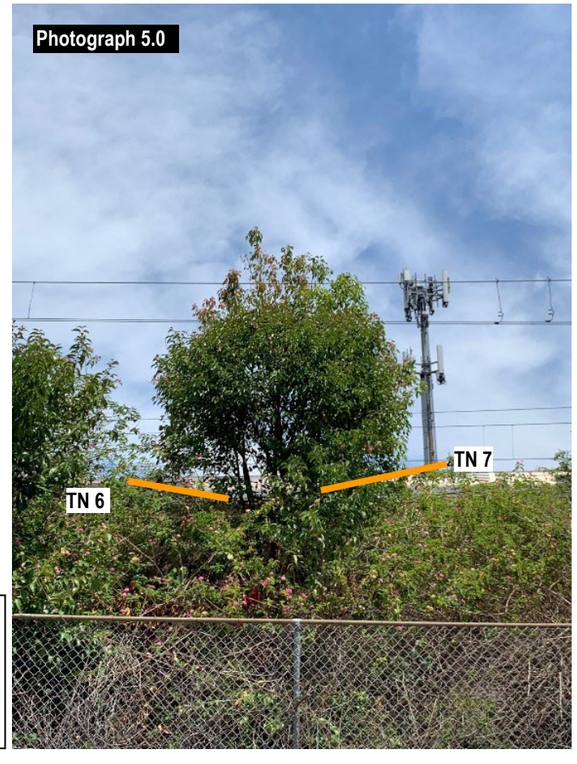


Photograph 3.0 Taken 3/11/2021 by Danny Draper. View to west of Trees 4 and 5 both *Pittosporum undulatum* – Sweet Pittosporum.

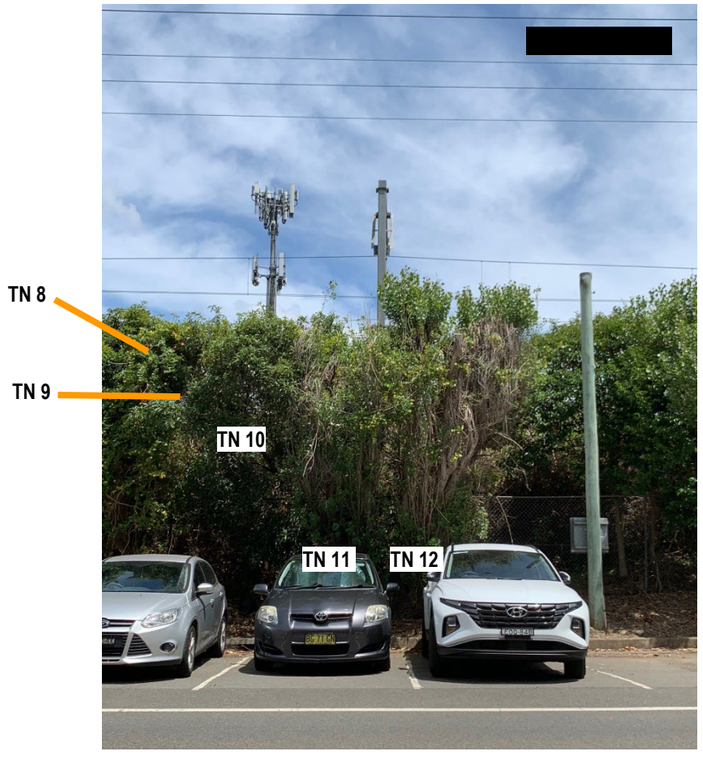
Photograph 4.0 Taken 3/11/2021 by Danny Draper. View to north to Alexandria Parade from Waitara Station of Trees 1-10.

APPENDIX A – Tree Assessment

Tree ID number	**Botanical Name**	**Age** Y: Young M: Mature OM: Overmature (senescent)	**Height** (m)	**Spread** (m)	**DBH** (mm)	**DARB** (mm)	**TPZ** (m. rad) AS 4970 (2009)	**SRZ** (m. rad) AS 4970 (2009)	**SRIV** Age, Vigour, Condition / Index Rating (see Appendix E) www.iaca.org.au / Estimated Life Expectancy 1 = Long 2 = Medium 3 = Short	**STARS** Significance scale (see Appendix F) www.iaca.org.au 1 = High 2 = Medium 3 = Low / Retention Value 1 = High 2 = Medium 3 = Low 4 = Remove	**Geo-coordinates**	**Retain / Remove / Transplant** **pr = prune** **cr = crown** **rt = roots**	Comments and Recommendations
Tree ID number	**Botanical Name, common name**	**Age**	**Height**	**Spread**	**DBH**	**DARB**	**TPZ**	**SRZ**	**SRIV**	**STARS**	**Geo-coordinates**	**Action**	**Comments and Recommendations**
6	*Cinnamomum camphora* Camphor Laurel	Y	2.0	2	300 approx.	300	3.6	1.9959	YGVP - 5 / 3	3 / 4	-33.709506 Lat. 151.104048 Long.	**Remove**	Previously cut down to a low stump and crown derived from basal epicormic shoots.
7	*Ligustrum lucidum* Broad-leaf Privet	M	2.0	1.5	200 approx.	200	2.4	1.68337	MGVP - 6 / 2	3 / 4	-33.709506 Lat. 151.104048 Long.	**Remove**	Previously cut down to a low stump and crown derived from basal epicormic shoots.
8	*Pittosporum undulatum* Sweet Pittosporum	M	4.0	6	200	200	2.4	1.68337	MGVF - 9 / 2	2 / 2	-33.709396 Lat. 151.104014 Long.	**Remove**	*Lonicera japonica* - Honeysuckle and *Lantana camara* - Lantana growing up through and over the crown.
9	*Cinnamomum camphora* Camphor Laurel	Y	3.5	3	300	900	3.6	3.16613	YGVF - 8 / 3	3 / 4	-33.709396 Lat. 151.104014 long.	**Remove**	Remaining FOSB of 5, others previously removed.
10	*Pittosporum undulatum* Sweet Pittosporum	M	3.5	4	200	220	2.4	1.75212	MGVF - 9 / 2	2 / 2	-33.709396 Lat. 151.104014 long.	**Remove**	Upper crown derived from epicormic shoots as a response to stimulus of top lopping for clearance of aerial electricity cables on poles within the rail corridor.



Photograph 5.0 Taken 3/11/2021 by Danny Draper. View to west of Tree 6 *Cinnamomum camphora* – Camphor Laurel and Tree 7 *Ligustrum lucidum* – Broad-lead Privet.



Photograph 6.0 Taken 3/11/2021 by Danny Draper. View to west of Tree 8 *Pittosporum undulatum* – Sweet Pittosporum, Tree 9 *Cinnamomum camphora* – Camphor Laurel and Tree 10 *Pittosporum undulatum* – Sweet Pittosporum.

APPENDIX A – Tree Assessment

Tree ID number	**Botanical Name**	**Age** Y: Young M: Mature OM: Overmature (senescent)	**Height** (m)	**Spread** (m)	**DBH** (mm)	**DARB** (mm)	**TPZ** (m. rad) AS 4970 (2009)	**SRZ** (m. rad) AS 4970 (2009)	**SRIV** Age, Vigour, Condition / Index Rating (see Appendix E) www.iaca.org.au / Estimated Life Expectancy 1 = Long 2 = Medium 3 = Short	**STARS** Significance scale (see Appendix F) www.iaca.org.au 1 = High 2 = Medium 3 = Low / Retention Value 1 = High 2 = Medium 3 = Low 4 = Remove	**Geo-coordinates**	**Retain / Remove / Transplant** **pr = prune** **cr = crown** **rt = roots**	Comments and Recommendations
Tree ID number	**Botanical Name, common name**	**Age**	**Height**	**Spread**	**DBH**	**DARB**	**TPZ**	**SRZ**	**SRIV**	**STARS**	**Geo-coordinates**	**Action**	**Comments and Recommendations**
11	*Populus nigra* var. *italica* Lombardy Poplar	M	3.5	2	600 approx.	650 approx.	3.6	2.6	MGVP - 6 / 2	3 / 3	-33.714877 Lat. 151.085058 Long.	**Remove**	Previously top lopped for clearance of aerial electricity cables on poles within the rail corridor. Located behind car park, near pole and drainage pit.
12	*Populus nigra* var. *italica* Lombardy Poplar	M			600	650	7.2	2.76166	MGVP - 6 / 2	3 / 3	-33.714877 Lat. 151.085058 Long.	**Remove**	Located behind car park, near pole and drainage pit.
13	*Ligustrum lucidum* Broad-leaf Privet	M	12.0	4.5	500 x 400 approx., 450 Av.	550	5.4	2.57454	MGVG - 10 / 2	3 / 4	-33.709902 Lat. 151.103745 Long.	**Retain**	Expected to be a self-sown specimen with an asymmetrical root plate due to its proximity to the footings of the adjacent building (<1 m). Roots to east appear to have been deflected by a low masonry wall or footpath (orientation N/S) with some fragments of the structure evident *in situ* (Photograph 8.0). As a consequence the structural roots evident and buttresses are concentrated on the north and south sides of the trunk parallel with the wall of the building and may not have developed extensively beneath the existing footpath in the street. Impact may be mitigated by the application of tree sensitive works by non-destructive slit trenching along the edge of the footpath within the road reserve to identify structural roots (roots >40 mm diameter) allowing the Project Arborist to consider the findings and advise of any footpath design modification required, or remedial works to protect structural roots and retain the tree.

Photograph 7.0 Taken 3/11/2021 by Danny Draper. View to west of Tree 13 *Ligustrum lucidum* – Broad-leaf Privet, located within 4 Romsey Street, Waitara. May be impacted by footpath reconstruction due to root disturbance.

Photograph 8.0 Taken 3/11/2021 by Danny Draper. View to west of Tree 13 *Ligustrum lucidum* – Broad-leaf Privet, showing buttress roots and possible restricted orientation North/South due to existing masonry from an old foot path and edge to east and building footings to west.

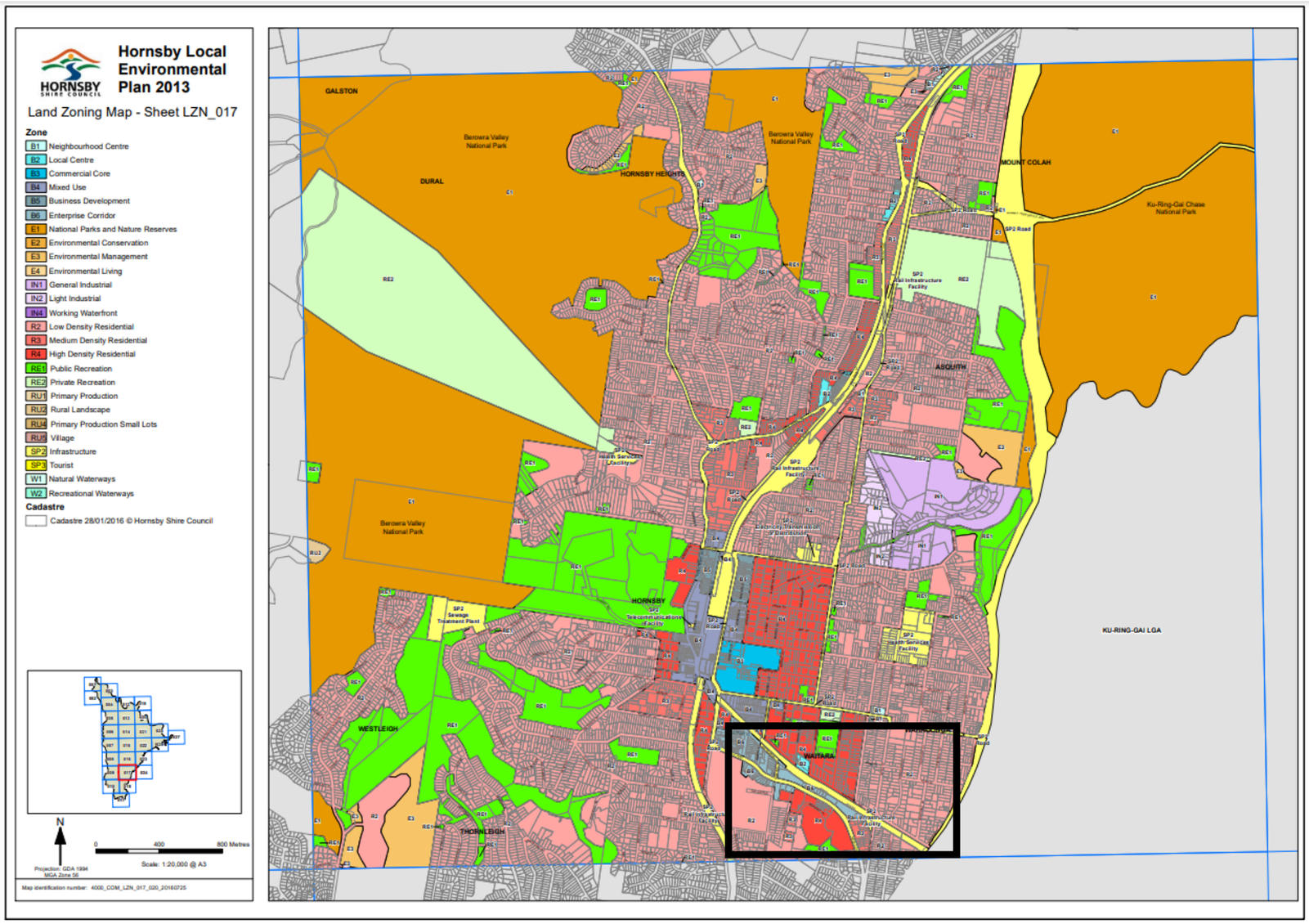
Appendix B – Tree Location Plan, Land Zoning Map, plan 1 of 3

Waitara Railway Station, Alexandria Parade, Waitara NSW, Ref: 24005, 22/10/2021.

Prepared by Urban Tree Management Australia P/L, 65 Excelsior Street, Merrylands NSW 2160, tel. 02 9760 1389.

From NSW Government, Hornsby Local Environmental Plan 2013, Land Zoning Map – Sheet LNZ_017.

URBAN TREE MANAGEMENT



Land Zoning Map – Highlighted black section showing location of subject trees (see Inset Plan)

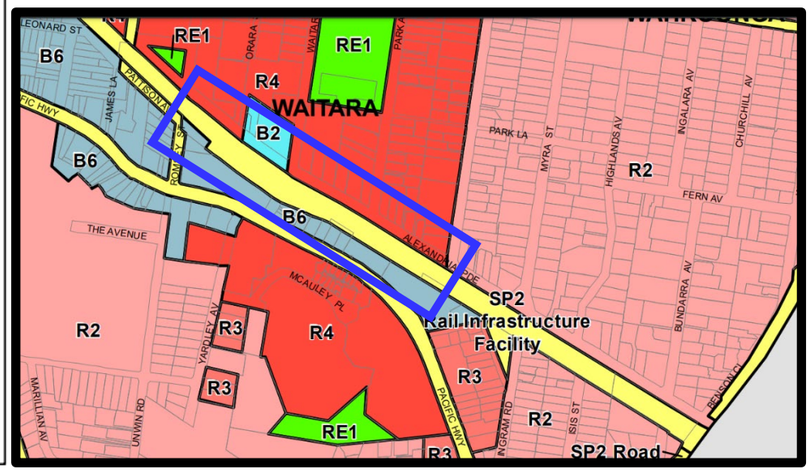
Legend

Zone

- B1 Neighbourhood Centre
- B2 Local Centre
- B3 Commercial Core
- B4 Mixed Use
- B5 Business Development
- B6 Enterprise Corridor
- E1 National Parks and Nature Reserves
- E2 Environmental Conservation
- E3 Environmental Management
- E4 Environmental Living
- IN1 General Industrial
- IN2 Light Industrial
- IN4 Working Waterfront
- R2 Low Density Residential
- R3 Medium Density Residential
- R4 High Density Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU2 Rural Landscape
- RU4 Primary Production Small Lots
- RU5 Village
- SP2 Infrastructure
- SP3 Tourist
- W1 Natural Waterways
- W2 Recreational Waterways

Cadastre

Cadastre 28/01/2016 © Hornsby Shire Council



Inset - Land Zoning Map – blue outlined area showing location of subject trees within and adjacent the rail corridor.

APPENDIX – **B**, Tree location Plan, Schematic Plan – Waitara Station Upgrade, plan 2 of 3

Waitara Railway Station, Alexandria Parade, Waitara NSW, Ref: 24005, 22/10/2021.

Prepared by Urban Tree Management Australia P/L, 65 Excelsior Street, Merrylands NSW 2160, tel. 02 9760 1389.

From NSW Government, TfNSW, Waitara Station Upgrade 19 January 2022 and provide by Aecom.

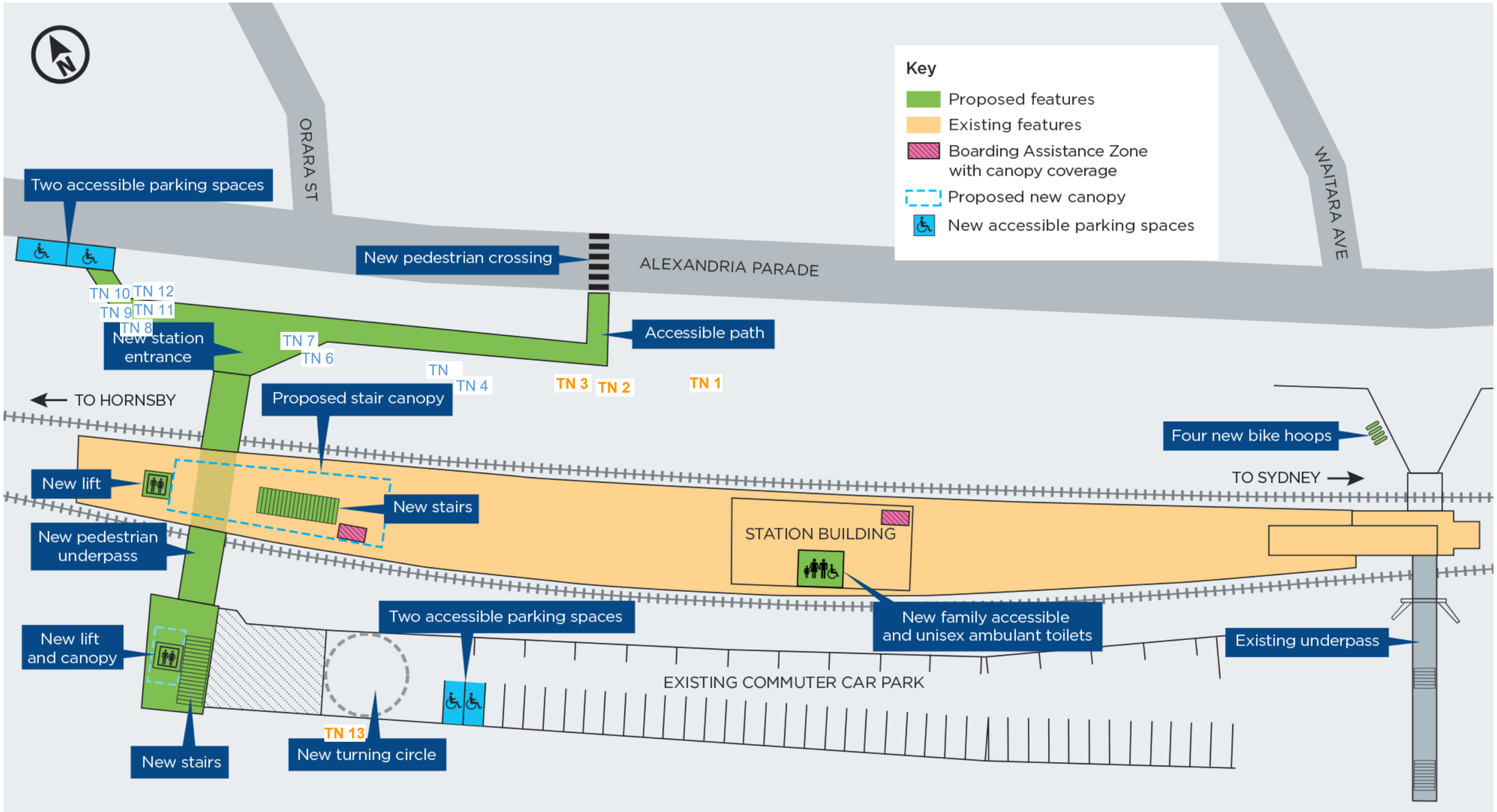
URBAN TREE MANAGEMENT

Legend

10. Tree/s or stands of trees numbered in orange and bold or surrounded by an unbroken line are recommended for retention.

11. Tree/s or stands of trees numbered in **blue and not bold** or surrounded by a broken line are recommended for **removal**.

Note: trees indicated, unnumbered are either shrubs, or trees of species, or dimensions, or condition class not protected by the Tree Preservation Order or trees not affected by the proposed works or were already removed.



Appendix B – Tree Location Plan, Aerial Photograph, plan 3 of 3 (trees numbered per Appendix A - Tree Assessment)

Waitara Railway Station, Alexandria Parade, Waitara NSW, Ref: 24005, 22/10/2021.

Prepared by Urban Tree Management Australia P/L, 65 Excelsior Street, Merrylands NSW 2160, tel. 02 9760 1389.

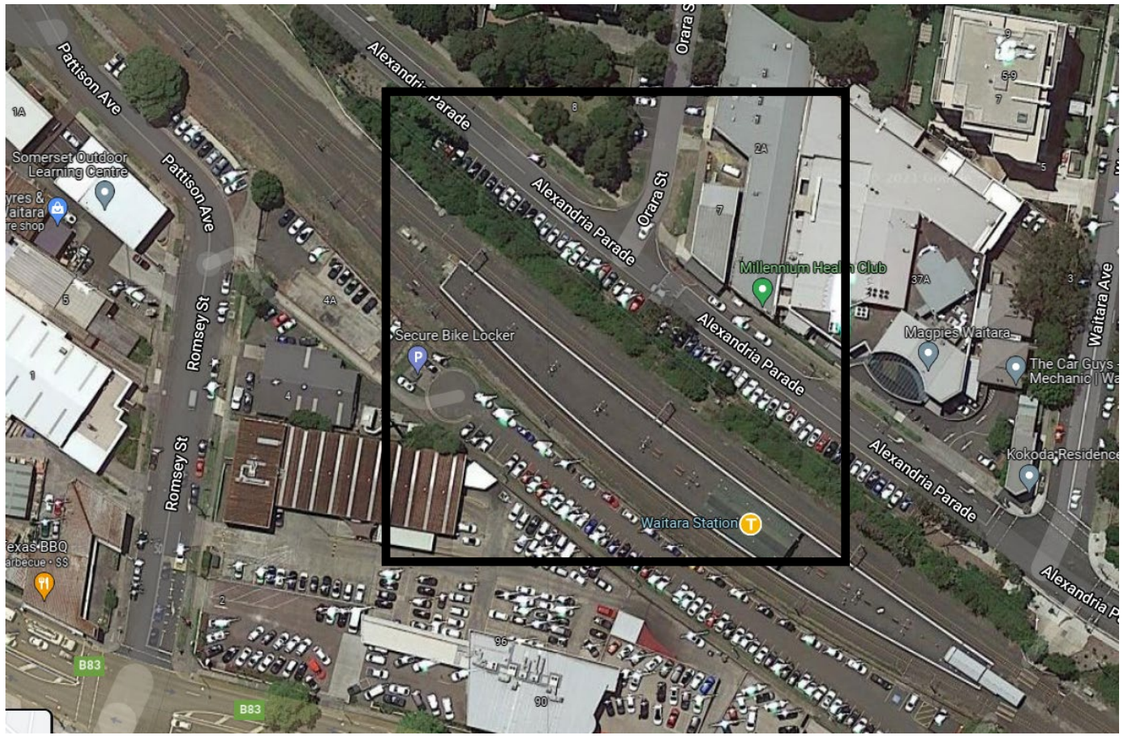
From Google Maps, 2021, Waitara Station, viewed 25/11/2021.

URBAN TREE MANAGEMENT

Legend

TN 10 Tree/s or stands of trees numbered.

Note: trees indicated, unnumbered are either shrubs, or trees of species, or dimensions, or condition class not protected by the Tree Preservation Order or trees not affected by the proposed works or were already removed.



Aerial Photograph – Highlighted black section showing location of subject trees (see Inset Plan)

Inset – Aerial Photograph – Showing the subject trees within and adjacent the rail corridor numbered per Appendix A – Tree Assessment.

APPENDIX C – TREE PROTECTION PLAN 1 of 3 - Tree Protection Zones - Standard Procedure

The Protective fencing where required may delineate the ***TPZ*** and should be located as determined by the project arborist in accordance with AS4970 *Protection of trees on development sites*, Section 4, 4.3. *"Fencing should be erected before any machinery or materials are brought onto the site and before the commencement of works including demolition. Once erected, protective fencing must not be removed or altered without approval by the project arborist. The TPZ must be secured to restrict access. AS4687 Temporary fencing and hoardings specifies applicable fencing requirements. Shade cloth or similar should be attached to reduce the transport of dust, other particulate matter and liquids into the protected area. Fence posts and supports should have a diameter greater than 20 mm and be located clear of roots. Existing perimeter fencing and other structures may be suitable as part of the protective fencing."*

AS4970 Section 4, Tree protection measures, Figure 3 Protective fencing shows examples of such fencing.

"Legend:
1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2 Alternative plywood or wooden paling fence panels. The fencing material also prevents building materials or soil entering the TPZ.
3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots. "

AS4970 Section 4, Tree protection measures, 4.2 Activities restricted within the TPZ
"Activities generally excluded from the TPZ included but are not limited to-
(a) Machine excavation including trenching;
(b) Excavation for silt fencing;
(c) cultivation;
(d) storage;
(e) preparation of chemicals, including preparation of cement products;
(f) parking of vehicles and plant;
(g) refuelling;
(h) dumping of waste;
(i) wash down and cleaning of equipment;
(j) placement of fill;
(k) lighting of fires;
(l) soil level changes;
(m) temporary or permanent installation of utilities and signs, and
(n) physical damage to the tree."

Tree Protection signage is to be attached to each ***Tree Protection Zone*** and displayed from within the development site in accordance with AS4970 2009 *Protection of trees on development sites*, Section 4.4 and example Figure C1 (as shown) and lettering to comply with AS1319.

Where a tree is to be retained and a ***Tree Protection Zone*** cannot be adequately established due to restricted access e.g. tree located along side an access way, the trunk and branches in the lower crown will be protected by wrapping 2 layers of hessian or carpet underfelt around the trunk and branches for a minimum of 2 m or as lower branches permit, then wire or rope secures 75x50x2000 mm hardwood battens together around the trunk (do not nail or screw to the trunk or branches). The number of battens to be used is as required to encircle the trunk and the battens are to extend to the base of the tree (AS4970 2009 *Protection of trees on development sites*, Figure 4 Examples of Trunk, Branch and ground protection).

Trunk/Branch and root protection If a tree is growing down slope from an excavation, a silt fence located along the contours of the site in the area immediately above the ***Tree Protection Zone*** fencing may need to be installed and regularly maintained to prevent burial and asphyxiation of the roots of the tree. To allow for the maintenance of both fences, the silt fence must be constructed separately to the tree protection fence and the 2 fences must be constructed independently of each other and standalone. To reduce competition with the tree the area within the ***Tree Protection Zone*** is to be kept free of weeds. These are best removed by the application of foliar herbicide with Glyphosate as the active constituent. This is the preferred method rather than removal by cultivation of the soil within the dripline, to minimise root disturbance to the tree. The removal of woody weeds such as Privet should use the cut and paint method of herbicide application. Weeds to be controlled within the ***Tree Protection Zone***, for the duration of the project.

The area of the Tree Protection Zone to be mulched to a depth of 100 mm with organic material being 75% leaf litter and 25% wood, and this being composted material preferably from the same genus and species of tree as that to where the mulch is to be applied, i.e. species specific mulch. The depth of mulch and type as indicated, to be maintained for the duration of the project. Where deep excavation will expose the soil profile to drying out the root plate is to be protected by pegging jute matting across the ground surface 2 m back from the edge of the profile and 2 m down the face of the profile and is to be in one continuous sheet or layers up to 5 mm thick and overlapped 300 mm and pegged. Pegs are to be a minimum length of 200 mm and spaced at 500 mm increments in a grid pattern. Once installed mulch is to be placed on top of the jute matting previously described.

No services either temporary or permanent are to be located within the ***Tree Protection Zone***. If services are to be located within the ***Tree Protection Zone***, special details will need to be provided by the Project Arborist for the protection of the tree regarding the location of the service/s.

A tree will not be fertilised during its protection within the ***Tree Protection Zone***, as this may hasten its decline if it were to decline. If a tree is to be fertilised this should be in consultation with the Project Arborist as per AS4970 (2009).

In the event of prolonged dry periods, or where a tree has been transplanted, or where excavation nearby, especially up slope, leads to drying out of a soil profile, or modification to ground water flow, or flows across an existing ground surface to the tree and its growing environment; deep root watering thoroughly at least twice a week is to be undertaken to irrigate the tree. The need for such watering is determined readily by observing the dryness of the soil surface within the dripline of the tree by scraping back some mulch. Mulch is to be reinstated afterwards. In the event of disrupted ground or surface water flows to the tree due to excavation, filling or construction, a reticulated irrigation system may be required to be installed within the ***Tree Protection Zone***. If an irrigation system is to be installed, consideration must be given to volume, frequency, and drainage of water delivered, and this should be in consultation with the Project Arborist as per AS4970 (2009).

Scaffolding *"Where scaffolding is required it should be erected outside the TPZ. Where it is essential for scaffolding to be erected within the TPZ, branch removal should be minimized. This can be achieved by designing scaffolding to avoid branches or tying back branches. Where pruning is unavoidable it must be specified by the project arborist in accordance with AS4373. Ground below the scaffolding should be protected by boarding (e.g. scaffolding board or plywood sheeting) as shown in Figure 5. Where access is required, a board walk or other surface material should be installed to minimise soil compaction. Boarding should be placed over a layer of mulch and impervious sheeting to prevent soil contamination. The boarding should be left in place until the scaffolding is removed."* (Standards Australia 2009, p. 18).

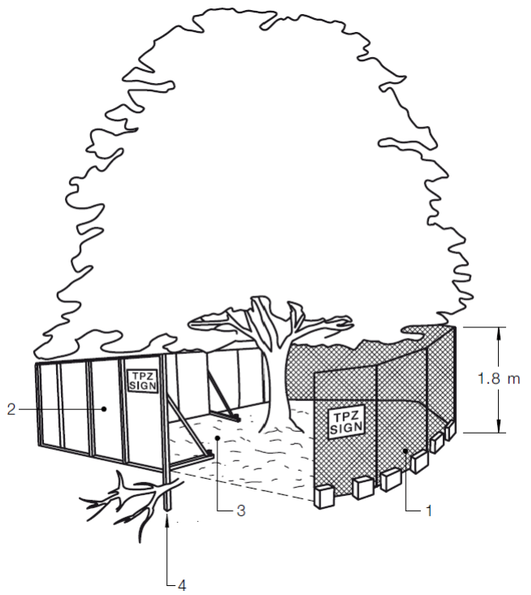


FIGURE 3 PROTECTIVE FENCING

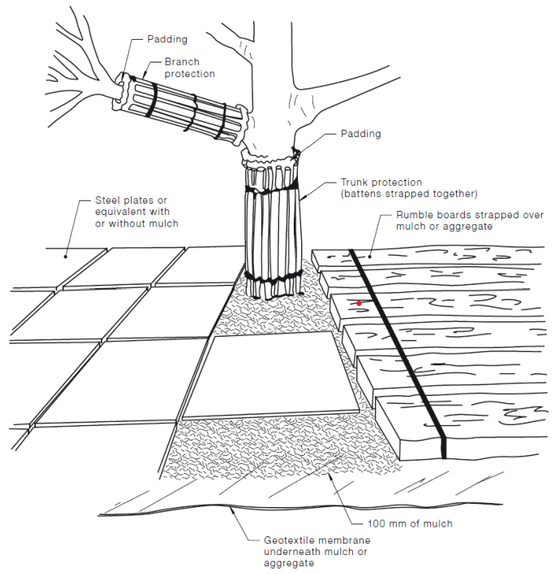
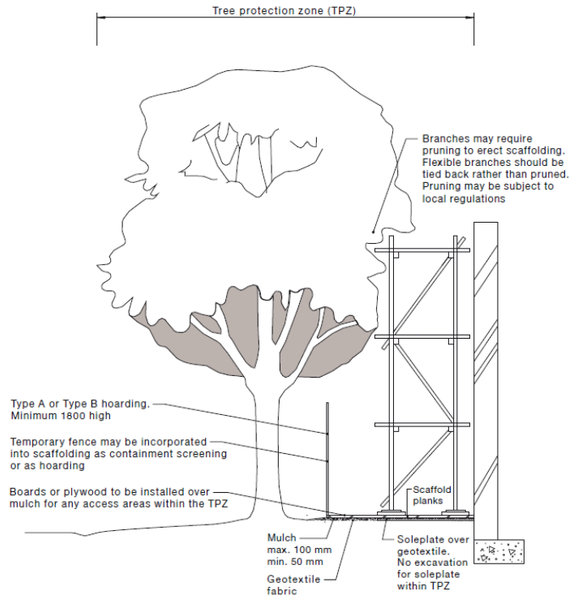


FIGURE 4 EXAMPLES OF TRUNK, BRANCH AND GROUND PROTECTION



NOTE: Excavation required for the insertion of support posts for tree protection fencing should not involve the severance of any roots greater than 20 mm in diameter, without the prior approval of the project arborist.

FIGURE 5 INDICATIVE SCAFFOLDING WITHIN A TPZ

APPENDIX C – Tree Protection Plan, 2 of 3

Waitara Railway Station, Alexandria Parade, Waitara NSW, Ref: 24005, 22/10/2021.

Prepared by Urban Tree Management Australia P/L,
65 Excelsior Street, Merrylands NSW 2160, tel. 02 9760 1389.

URBAN TREE MANAGEMENT

Tree Protection Works - General

All retained tree/s Existing levels are to be preserved and no excavation except by hand to protect structural roots is to be undertaken within the Tree Protection Zones. No cutting or filling is to be undertaken within any TPZ unless specified by the Project Arborist.

Induction for Tree Protection All workers entering the site involved in construction must be advised of the tree protection measures and specifications outlined within this report during the site induction. This is to be verbally acknowledged and signed off before commencement of work.

Tree Protection Works - Specific

Prior to Demolition

TPZ Fencing or works Trees 1, 2 and 3 These trees are to be protected by existing rail corridor perimeter fencing as they are located on an embankment with hardscape pavement in the existing car park restricting the development of root growth in this direction. Where additional fencing may be required this is to be installed as shown in Appendix C– Tree Protection Plan - Tree Protection Zone - Standard Procedure, Plan 1. Tree Protection zone signage is to be applied to the fence per Appendix C - Plan 1 of 3 Figure C1.

Trunk and Branch protection and pruning Trees 1, 2 and 3 Not required these trees are at a sufficient distance not to be adversely impacted. However the crown of Tree 2 protrudes over the car park and will need to be protected from the movement of plant equipment and trucks.

TPZ Fencing or works Tree 13 This tree is separated from *the site* by an existing property boundary fence adjacent the road reserve and by a footpath in the street parallel to the boundary fence and therefore an additional TPZ fence is not required.

Scaffolding within the Tree Protection Zone or any protected Trees 1, 2, 3 and 13 Not required.

Mulching Trees 1, 2, 3 and 13 Not required.
Any plant equipment is to work from outside of the TPZ reaching into the TPZ to minimise damage to overhanging branches and to protect roots.

Root Protection – Trees 1, 2, 3 and 13 No work is to be undertaken within the TPZ. Where access is required within the TPZ, roots are to be protected from soil compaction by the application of ground protection as per AS4970 (2009) section 4, 4.5.3 Ground Protection, where a permeable membrane such as geotextile fabric is to be located at existing ground level beneath a layer of mulch or crushed rock with no fines 100 mm deep and covered with rumble boards or steel plates as per AS4970 (2009) Figure 4, (see Appendix C, Plan 1). Plant equipment is to work from outside of the TPZ reaching into the TPZ to minimise soil disturbance and compaction, this to include driveways garage floor slabs and pavement.

During Demolition

Tree Removal – Trees 4-12 These trees are to be removed and the stumps ground to 300 mm or approved similar. Adjacent retained trees are to be protected during tree removals.

Crown Protection - all retained trees Plant equipment is to be kept away from the crown of each of these trees and work is to be conducted from outside of the TPZ reaching into the TPZ to minimise soil disturbance and compaction and branch and trunk damage.

Root Protection – all retained trees No work is to be undertaken within the TPZ. Where access is required within the TPZ, roots are to be protected from soil compaction by the application of ground protection as per AS4970 (2009) section 4, 4.5.3 Ground Protection, where a permeable membrane such as geotextile fabric is to be located at existing ground level beneath a layer of mulch or crushed rock with no fines 100 mm deep and covered with rumble boards or steel plates as per AS4970 (2009) Figure 4, (see Appendix C, Plan 1). Plant equipment is to work from outside of the TPZ reaching into the TPZ to minimise soil disturbance and compaction, this to include driveways garage floor slabs and pavement.

TPZ Fencing or works Trees 1, 2, 3 and 13 Tree Protection Zone fences and works are to remain in place during this part of the project.

During Excavation, Construction

TPZ Fencing or works Trees 1, 2 and 3 Tree Protection Zone fences and works are to remain in place during this part of the project.

TPZ works Tree 13 Non-destructive slit trenching, supervised and monitored by the Project Arborist is to be undertaken along the edge of the footpath within the road reserve to identify structural roots (roots >40 mm diameter) allowing the Project Arborist to consider the findings and advise of any footpath design modification required, or remedial works to protect structural roots and retain the tree.

Root Protection from Soil Profile Desiccation - utility trenches – all protected Trees Where an excavation profile is to be open for 1 day or more the exposed structural roots (roots >400 mm diameter) and those within the soil profile are to be protected drying out. The exposed structural roots are to be wrapped with a triple layer of hessian which is to be fastened to itself with hessian to prevent unraveling. The soil profile to 2 m deep (or to the base of the excavation if less than 2 m) is to be achieved by applying a double layer of hessian fabric to cover the exposed soil profile from grade within the Tree Protection Zone of these trees and fixed into place by metal pegs at the bottom, and the fabric is to overlap the ground at surface by 300 mm and be pegged into place with metal pegs. The soil profile protection is to remain in place and be maintained until backfilling is completed.

Root protection when excavating using water knife and vacuum truck Use water knife with a fan nozzle at low pressure to disrupt soil while simultaneously removing the dislodged soil with a vacuum truck. When structural roots are encountered, reduce the pressure of the water knife to protect bark or stop the water knife and excavate manually above and beside the root using brooms, spades, crow bars (used cautiously near roots) and hand trowels, brooms and brushes to expose the root and displace the soil. Using the water knife at low pressure wash the soil from the root and move to the side to excavate beneath. When passing the root above and below the water knife is to be reduced in pressure or turned to the off position (by releasing the trigger stopping flow) to protect the root from delamination and ringbarking.

Location of underground utilities within a Tree Protection Zone – All retained tree/s All underground utilities and stormwater are to be located on the east side of the site away from the trees to be protected on the adjoining property to west. Utility services should not be located within the Tree Protection Zone. Any utility services to be located underground within the TPZ are to be undertaken utilising excavation techniques that prevent or minimise damage to structural roots (roots greater than >40 mm diameter). Such works should be conducted with non-motorised hand tools of with an air knife or water knife and vacuum truck or with directional drilling with minimum depth to top of bore of 600 mm, to prevent soil compaction and root damage and works are to be monitored and certified by the Project Arborist.

Precautions in respect to temporary work – All retained tree/s If pedestrian or vehicular access is required within a Tree Protection Zone the roots of these trees are to be protected from soil compaction by the application of ground protection as per AS4970 (2009) Figure 4, (see Appendix C, Plan 1 of 3), where a permeable membrane such as geotextile fabric is to be located at existing ground level beneath a layer of mulch or crushed rock with no fines 100 mm deep and covered with rumble boards or steel plates. Such works are to be monitored and certified by the Project Arborist. Any plant equipment is to work from outside of the TPZ reaching into the TPZ to minimise soil disturbance and compaction. The ground protection works are to remain in place until building works are completed. Maintain tree protection, and waste material is to be kept clear of the trunk and branches.

Root Pruning Were required, root pruning is to be conducted in accordance with (AS4373, 2007, p. 18) sec. 9 *Root Pruning* after excavation with tree sensitive techniques, manually with non-motorised hand tools or with water knife and vacuum truck where each exploratory trench or pot hole is to be located within the Structural Root Zone (SRZ) per (AS4970, 2009) of any tree. All root pruning is to comply with AS4373 (2007) Pruning of amenity trees, Sec. 9 *Root Pruning* and is to be approved by the Project Arborist. Cuts are to be made with clean sharp tools with final cuts made to undamaged tissue. Final cuts should be made perpendicular to the length of the root with a final cut to undamaged tissue to remove injured or crushed tissues allowing the tree to develop strong internal boundaries and generate new roots (Shigo 1989, p. 199).

Backfilling within a Tree Protection Zone Not to be undertaken with in a Tree Protection Zone.

Landscaping

Excavation for tree plantings within the Tree Protection Zones This should be undertaken manually, to prevent damage to structural roots. Existing soil grades should be maintained with plant container size restricted to a maximum size of 5 litres. No more than 2 plants per square metre for 5 litre and 5 plants per square metre for 150 mm pot size. Maintain crown protection, and waste material is to be kept clear of the trunk and branches.

TPZ Fences and works Trees 1, 2 and 3 Temporary fences to be removed at practical completion of works.

APPENDIX C – Tree Protection Plan, 3 of 3

(trees numbered per Appendix A - Tree Assessment)
Waitara Railway Station, Alexandria Parade, Waitara NSW, Ref: 24005, 22/10/2021.

Prepared by Urban Tree Management Australia P/L,
65 Excelsior Street, Merrylands NSW 2160, tel. 02 9760 1389.

From NSW Government, TfNSW, Waitara Station Upgrade 19 January 2022 and provide by Aecom.

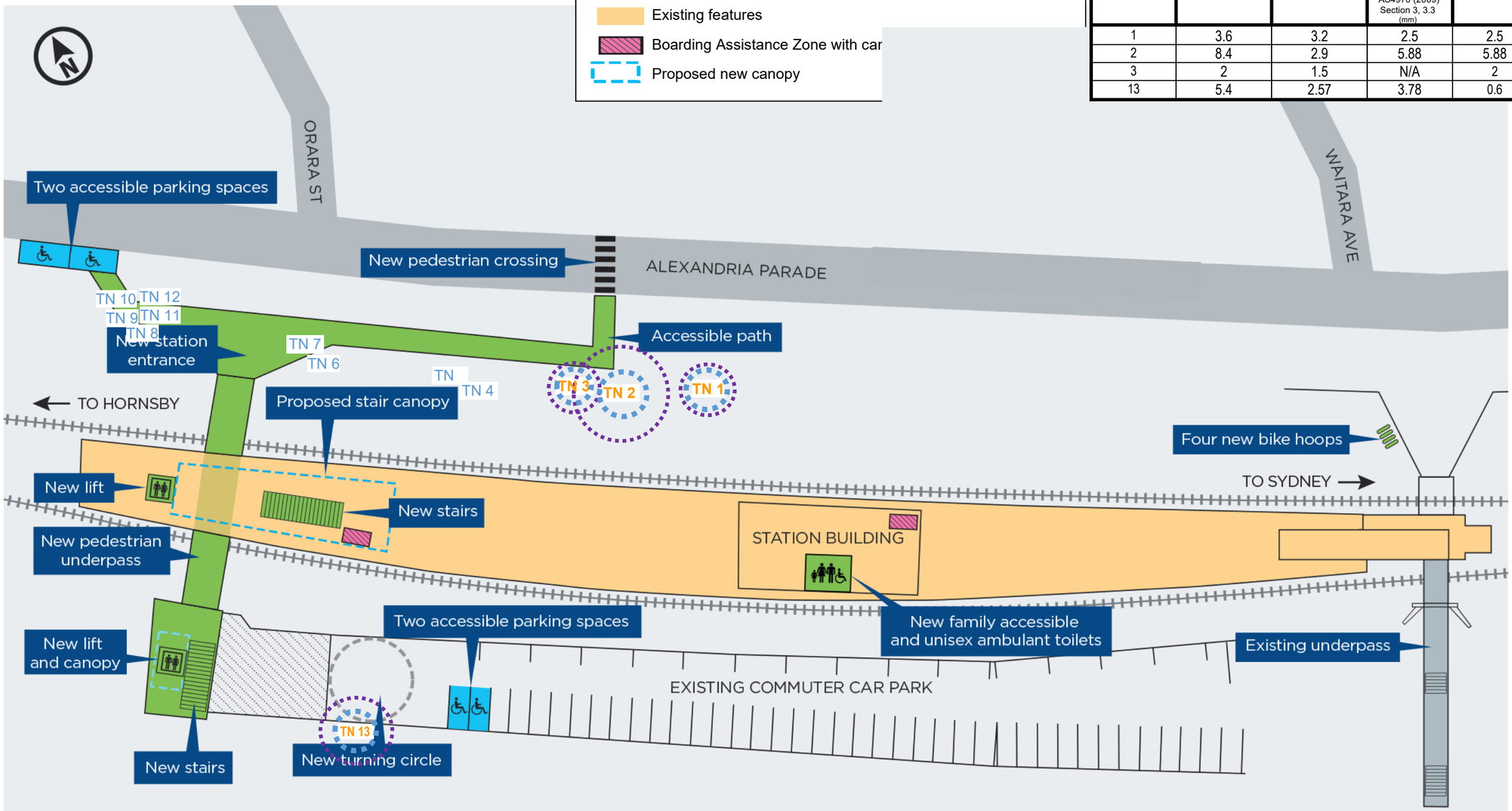
URBAN TREE MANAGEMENT

Legend

- TN 9 Trees numbered in blue and not bold are recommended for removal.
- **TN 10** Trees numbered in orange and bold are recommended for retention.
- Tree Protection Zone per AS4970(2009)
- Structural Root Zone per AS4970(2009)
- Proposed features
- Existing features
- Boarding Assistance Zone with car
- Proposed new canopy

Tree Protection Zone setbacks

1. UTM Tree No. / UTM Stand No.	2. Tree Protection Zone (TPZ) = **12 x DBH** (m) From center of trunk (COT) in metres AS4970 (2009) Section 3 (see Appendix G)	3. Structural Root Zone **SRZ** From center of trunk (COT), trunk diameter above root buttress (DARB) AS4970 (2009) Section 3, 3.3.5 (see Appendix H) where applicable (m)	4. Distance of fence with TPZ setback **reduced by 10%** of area on one side of tree only, in metres equating to approx. 0.3 radius as per AS4970 (2009) Section 3, 3.3 (mm)	5. Proposed distance of works on the side closest to excavation / building construction in metres From center of trunk (COT), (m)
1	3.6	3.2	2.5	2.5
2	8.4	2.9	5.88	5.88
3	2	1.5	N/A	2
13	5.4	2.57	3.78	0.6



APPENDIX D

Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022
(Reviewed September 2019) – extract containing tree weeds, and **Hornsby DCP 2013, Part 1, General,** Trees and Vegetation Preservation.

Source: NSW Government Department of local Land services (Greater Sydney), Greater Sydney Regional Strategic Weed Management Plan 2017 - 2022, viewed 6 July 2021, Greater-Sydney-Regional-Weed-Mgmt-Plan-FINAL-Sept-2019.pdf

Appendix 1: Priority weeds for the Greater Sydney Local Land Services region

This appendix covers State level determined priorities (A1.1) and regionally determined priorities (A1.2). The Biosecurity Act 2015 and regulations provide specific legal requirements for state level priority weeds (A1.1) and high risk activities. For each state level priority weed, the state objective and how this objective is achieved through specific requirements under the Biosecurity Act 2015 and regulations is covered. These specific regulatory requirements include Prohibited Matter, Biosecurity Zones, Mandatory Measures, Control Orders (see Table 2.1 and Section 4.2).

A1.2 in this appendix identifies regionally prioritised weeds and outcomes to demonstrate compliance with the General Biosecurity Duty. Recommended measures for these weeds are provided in the NSW DPI web and mobile based application WeedWise, as practical advice on achieving these outcomes.

Hierarchy of A1.1 and A1.2

To be considered a priority weed, the species must appear in either A1.1 or A1.2. Species are generally listed in a hierarchical order based on management objective, with Prevention the highest priority followed by Eradication, Containment and Asset Protection. Specific legal requirements apply to State determined priorities (A1.1), while Regional Priorities (A1.2) include "outcomes to demonstrate compliance with the General Biosecurity Duty" and "Strategic responses in the region" to achieve the relevant management objective (ie Prevention, Eradication, Containment or Asset Protection).

Generally a priority weed species will appear in either A1.1 or A1.2, however some species appear in both of these lists. This can be for a number of reasons including:

• For alligator weed and water hyacinth – that the Greater Sydney Region occurs within the core infestations of these weeds. In these cases, the regional management objectives, outcomes to demonstrate compliance with the GBD, and strategic response are given in A1.2.

• The legal requirements specified in A1.1 need to be supplemented by outcomes to demonstrate compliance with the GBD in A1.2 to achieve the desired management objectives in the Greater Sydney region, e.g., Cat's claw creeper, Serrated tussock, Salvinia and some Asparagus species.

A1.1 State level determined priority weeds

State Priority Weed Objective – ASSET PROTECTION (Whole of State):
These weeds are widely distributed in some areas of the State. As Weeds of National Significance, their

Species	Biosecurity Act requirements & Strategic Response in the region
†Willows - Salix spp.(excludes S.babylonica, S.x calodendron & S. x reichardtiji)	Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017): A person must not import into the State or sell. Regional Strategic Response: Identify priority assets for targeted management. # Refer Appendix 1.2 Prevention. † Refer Appendix 1.2 Eradication. †† Refer Appendix 1.2 Containment. ‡ Refer Appendix 1.2 Asset Protection

A1.2 Regional priority weeds

Regional Priority Weed Objective – ERADICATION:
The following weeds are present in limited distribution and abundance. Elimination of the biosecurity risk

Outcomes to demonstrate compliance with the GBD	Strategic response in the region
Species	
Black willow - *Salix nigra*	
The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017): A person must not move, import into the State or sell.	Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations.
Grey sallow – *Salix cinerea*	
The plant is eradicated from the land and the land is kept free of the plant. • Local Control Authority is notified if the plant is found on the land. • The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017): A person must not move, import into the State or sell.	• Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations.
Mysore thorn - *Caesalpinia decapetala*	
The plant is eradicated from the land and the land is kept free of the plant. • The plant or parts of the plant are not traded, carried, grown, or released into the environment.	• Destruction of all infestations where feasible. • Manage in accordance with New Weed Incursion Plan. • Detailed surveillance and mapping to locate all infestations. • Implement quarantine and/or hygiene protocols.

Regional Priority Weeds objective – CONTAINMENT:

These weeds are widely distributed in the region. While broad scale elimination is not practicable,

Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
African olive - *Olea europaea* subsp. *cuspidata*		
An exclusion zone is established for all lands in the Blue Mountains local government area and lands to the west of the Nepean River in the Penrith local government area. The remainder of the region is classified as the core infestation area.	Whole region: • The plant or parts of the plant are not traded, carried, grown, or released into the environment. Within Exclusion zone: • The plant is eradicated from the land and the land is kept free of the plant. Within Core infestation: • Land managers prevent spread from their land where feasible. • Land managers reduce the impact on priority assets.	Whole region: • Implement quarantine and/or hygiene protocols. • Surveillance and mapping to locate all infested properties and maintain currency of exclusion zone and objectives. • Monitor change in current distribution to ensure containment of spread. Within Exclusion zone: • Destruction of all infestations, aiming at local eradication where feasible Within Core infestation: • Identify priority assets for targeted management.

Appendix 2: Other weeds of regional concern

The following table recognises that whether a plant is a weed depends on the location, and that some plants grown as crops may function as weeds in other land uses. For example, kikuyu is a valuable pasture grass in grazing paddocks but is an invasive weed in the natural environment i.e., bushland and National parks. Agapanthus are very popular garden plants, often used as border plants or to hold low banks. However, agapanthus are also known to invade roadsides, bushland and waterways.

Weeds listed in Appendix 2 include species known to occur in the Greater Sydney region as well as species not currently known to occur but at risk of moving into the region in the future. They have been identified as a potential risk in some (not all) situations. Many of the species pose potential risks to biodiversity (i.e. the environment), for example if they were to spread to or be found in a National Park. Some of the species pose potential risks to agriculture and some of the weeds pose potential risks to human health. In most situations this is when ingested but can also include risks associated with asthma and other allergic reactions.

This plan recognises that many weeds are already so well established that they can only be managed and will never be eradicated from the region. The species included in Appendix 2 may warrant resources for control or management programs, or occur in neighbouring regions and are a priority to keep out of the region. Inclusion on the list may assist Local Control Authorities and/or land managers prioritise action in certain circumstances where it can be demonstrated the weed poses a threat to the environment, agriculture and/or the community/human health.

The Biosecurity Act 2015 provides powers to Local Control Authorities to take action in relation to these weeds in particular circumstances, for example where a weed threatens a high value asset and prevention, elimination or reduction of the risk is feasible and reasonable.

Common name	Scientific name	Asset/value at risk
American Cotton Palm, Cotton Palm, California fan palm.	*Washingtonia filifera*	Environment
Black cherry, Wild black cherry	*Prunus serotina*	Environment
Box elder	*Acer negundo*	Environment
Broad leaf pepper	*Schinus terebinthifolius*	Environment
Buckthorn	*Rhamnus alaternus*	Environment
Camphor laurel	*Cinnamomum camphora*	Environment, Agriculture, Human health
Cherry guava	*Psidium cattleyanum*	Environment, Agriculture
Chinese celtis/ Chinese hackberry	*Celtis sinensis*	Environment, Agriculture
Chinese elm	*Ulmus parvifolia*	Environment
Chinese tallow	*Triadica sebifera*	Environment
Cockspur coral tree	*Erthrina crista-galli*	Environment
Cocos palm	*Syagrus romanzoffiana*	Environment
Coral tree, Common coral tree	*Erythrina x sykesii*	Environment
European olive	*Olea europaea* subsp. *europaea*	Environment
Golden rain tree	*Koelreuteria elegans*	Environment
Golden wreath wattle	*Acacia saligna*	Environment
Holly, English holly	*Ilex aquifolium*	Environment
Honey locust	*Gleditsia triacanthos*	Environment, Agriculture
Lote tree, Nettle tree, Mediterranean hackberry	*Celtis australis*	Environment
Orange jessamine, Murraya	*Murraya paniculata*	Environment
Osage orange	*Maclura pomifera*	Environment
Patula pine, Mexican weeping pine	*Pinus patula*	Environment
Phoenix palm, Canary Island date palm	*Phoenix canariensis*	Environment
Privet spp.	*Ligustrum sinense, Ligustrum lucidum, Ligustrum vulgare*	Environment, Human health
Radiata pine, Pine wildings	*Pinus radiata*	Environment
Rhus tree	*Toxicodendron succedaneum*	Human health
Tree of heaven	*Ailanthus altissima*	Environment, Human health
Umbrella tree	*Schefflera actinophylla*	Environment

Hornsby DCP 2013, Part 1, General,

Extract, 1B.6 Tree and Vegetation Preservation, 1B.6.1 Tree Preservation, 1B.6.2 Vegetation Preservation

1B.6 Tree and Vegetation Preservation This section is made in accordance with State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 (the Vegetation SEPP) and prescribes the trees and vegetation to which the Vegetation SEPP and/or Clause 5.10 of the HLEP applies and the applicable approval process. 1B.6.1 Tree Preservation Prescribed Trees

a. The prescribed trees that are protected by the Vegetation SEPP and/or Clause 5.10 of the HLEP and this Section of the DCP includes:

„ trees except exempt tree species in Hornsby Shire, as listed in Table 1B.6 (a) or subject to the Biodiversity Offset Scheme,

„ all trees on land within a heritage conservation area described within the HLEP, and

„ all trees on land comprising heritage items listed within the HLEP.

b. To damage or remove any tree protected under this DCP is prohibited without the written consent of Council, except in accordance with the exemptions prescribed in this part (under the heading 'Exempt Tree Work').

Table 1B.6(a) Exempt Tree Species in Hornsby Shire

Botanical name	Common Name
Acacia baileyana	Cootamundra Wattle
Acacia saligna	Golden Wreath Wattle
Acer negundo	Box Elder
Ailanthus altissima	Tree of Heaven
Alnus jorullensis	Evergreen Alder
Arecastrum romanzoffianum	Cocos Palm
Celtis sinensis	Hackberry
Cinnamomum camphora	Camphor Laurel
All edible fruit and nut trees except native species such as *Acmena spp* (Lilli Pilli), *Syzygium spp* (Lilli Pilli) *Elaeocarpus spp* (Blueberry Ash) or *Macadamia spp* (Macadamia Tree)	Fruit and Nut trees
Cotoneaster spp.	Cotoneaster
Eriobotrya japonica	Loquat
Erythrina spp	Coral tree
Ficus elastica	Rubber tree
Gleditisa triacanthos	Honey Locust
Lagunaria patersonii	Norfolk Island Hibiscus
Ligustrum spp	Privet
Populus spp	Poplar
Pyracantha augustifolia	Firethorn
Robinia pseudoscacia	Golden Robinia
Salix spp	Willow
Schefflera actinophylla	Umbrella Tree
Schinus spp	Peppercorn Tree
Toxicodendron spp	Rhus

Appendix E

Matrix - Sustainable Retention Index Value (SRIV) ©

Version 4, 2010
Developed by IACA – Institute of Australian Consulting Arboriculturists www.iaca.org.au

The matrix is to be used with the value classes defined in the Glossary for Age / Vigour / Condition.
An index value is given to each category where ten (10) is the highest value.

Age Class	Vigour Class and Condition Class					
	Good Vigour & Good Condition (GVG)	Good Vigour & Fair Condition (GVF)	Good Vigour & Poor Condition (GVP)	Low Vigour & Good Condition (LVG)	Low Vigour & Fair Condition (LVF)	Low Vigour & Poor Condition (LVP)
	Able to be retained if sufficient space available above and below ground for future growth. No remedial work or improvement to growing environment required. May be subject to high vigour. Retention potential - Medium – Long Term.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work may be required or improvement to growing environment may assist. Retention potential - Medium Term. Potential for longer with remediation or favourable environmental conditions.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work unlikely to assist condition, improvement to growing environment may assist. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. No remedial work required, but improvement to growing environment may assist vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment may assist condition and vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	Unlikely to be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment unlikely to assist condition or vigour. Retention potential - Likely to be removed immediately or retained for Short Term. Potential for longer with remediation or favourable environmental conditions.
(Y) Young	**YGVG - 9** **Index Value 9** Retention potential - Long Term. Likely to provide minimal contribution to local amenity if height <5 m. High potential for future growth and adaptability. Retain, move or replace.	**YGVF - 8** **Index Value 8** Retention potential - Short – Medium Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium-high potential for future growth and adaptability. Retain, move or replace.	**YGVP - 5** **Index Value 5** Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Low-medium potential for future growth and adaptability. Retain, move or replace.	**YLVG - 4** **Index Value 4** Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium potential for future growth and adaptability. Retain, move or replace.	**YLVF - 3** **Index Value 3** Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Low-medium potential for future growth and adaptability. Retain, move or replace.	**YLVP - 1** **Index Value 1** Retention potential - Likely to be removed immediately or retained for Short Term. Likely to provide minimal contribution to local amenity if height <5 m. Low potential for future growth and adaptability.
(M) Mature	**MGVG - 10** **Index Value 10** Retention potential - Medium - Long Term.	**MGVF - 9** **Index Value 9** Retention potential - Medium Term. Potential for longer with improved growing conditions.	**MGVP - 6** **Index Value 6** Retention potential - Short Term. Potential for longer with improved growing conditions.	**MLVG - 5** **Index Value 5** Retention potential - Short Term. Potential for longer with improved growing conditions.	**MLVF - 4** **Index Value 4** Retention potential - Short Term. Potential for longer with improved growing conditions.	**MLVP - 2** **Index Value 2** Retention potential - Likely to be removed immediately or retained for Short Term.
(O) Over-mature	**OGVG - 6** **Index Value 6** Retention potential - Medium - Long Term.	**OGVF - 5** **Index Value 5** Retention potential - Medium Term.	**OGVP - 4** **Index Value 4** Retention potential - Short Term.	**OLVG - 3** **Index Value 3** Retention potential - Short Term. Potential for longer with improved growing conditions.	**OLVF - 2** **Index Value 2** Retention potential - Short Term.	**OLVP - 0** **Index Value 0** Retention potential - Likely to be removed immediately or retained for Short Term.

Appendix F

IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010)©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined.

Tree Significance - Assessment Criteria

1. High Significance in landscape

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

2. Medium Significance in landscape

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

3. Low Significance in landscape

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

Environmental Pest / Noxious Weed Species

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

Hazardous/Irreversible Decline

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

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

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

Table 1.0 Tree Retention Value - Priority Matrix.

		Significance				
		1. High	**2.** Medium	**3.** Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long **>40 years**					
	2. Medium **15-40 Years**					
	3. Short **<1-15 Years**					
	Dead					

Legend for Matrix Assessment

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

REFERENCES

Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia

Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au

Appendix G

Extract from Australian Standard AS4970 2009 Protection of trees on development sites

Section 3, Determining the tree protection zones of the selected trees

3.1 Tree protection zone (TPZ)

"The tree protection zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.

The TPZ incorporates the structural root zone (SRZ) (refer to Clause 3.3.5)."

3.2 Determining the TPZ

The radius of the TPZ is calculated for each tree by multiplying its DBH x 12.

TPZ = DBH x 12

where

DBH = trunk diameter measured at 1.4 m above ground

Radius is measured from the centre of the stem at ground level.

Appendix H

Extract from Australian Standard AS4970 2009 Protection of trees on development sites

Section 3, Determining the protection zones of the selected trees

3.3.5 Structural root zone (SRZ)

"The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree. The SRZ only needs to be calculated when a major encroachment into a TPZ is proposed. Root investigation may provide more information on the extent of these roots."

Determining the SRZ

The radius of the TPZ is calculated for each tree by multiplying its DBH x 12.

SRZ radius expressed by the curve is calculated by the following formula,

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

where

D = trunk diameter, in metres measured immediately above the root buttress.

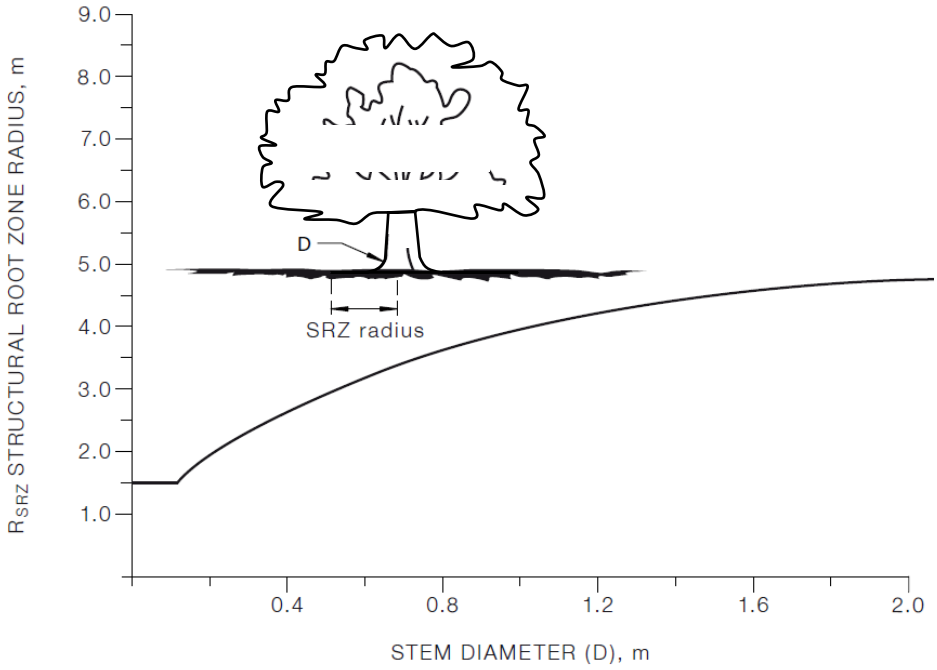

FIGURE 1 STRUCTURAL ROOT ZONE CALCULATION

(AS 4970 – 2009, Amendment No. 1 March 2010)

NOTES:

1 R_{SRZ} is the calculated structural root zone radius (SRZ radius).

2 D is the stem diameter measured immediately above root buttress.

3 The R_{SRZ} for trees less than 0.15 m diameter is 1.5 m.

4 The R_{SRZ} formula and graph do not apply to palms, other monocots, cycads and tree ferns.

5 This does not apply to trees with an asymmetrical root plate.