

Arboricultural Impact Assessment



Figure 1 Maroubra Switch yard

Site Address: Feeder 265 Replacement Matraville to Maroubra (M2M)

Client: Ausgrid

Date: May 2020

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1.0 Summary

Accurate Tree Assessment has been commissioned by Ausgrid (the client) to identify areas of encroachment into the Tree Protection Zone of trees located along the proposed route of the Feeder 265 Replacement Matraville to Maroubra Project. Fifty (50) trees and groups of trees have been identified as being subject to potential TPZ/SRZ encroachment from the proposed works.

Conclusions

Smaller trees are unlikely to be affected by the proposed works due to their setback from the excavation.

In most cases the location of the electrical services trench can be varied to allow the maximum setback from larger trees; it's important to note that the existing congestion of underground utilities in this area may reduce the proposed setback in some cases.

The implementation of specific protection measures detailed in section 7.0 and 7.1 of this report will assist in ensuring the viability of trees and gaining compliance with the provisions of AS4970-2009, *"Protection of Trees on Development Sites"*.

Recommendations

That prior to the commencement of any works:

- Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) of retained trees are clearly plotted on all plans and marked on-site,
- The trunks of retained trees are to be protected by observance of the respective setbacks which will be difficult to fence as they mainly occur over the roadway or pedestrian footpath. Ausgrid will be auditing the project to ensure compliance with NS174c- i.e. "Minimise activity (storage areas, stockpiles, vehicle parking, and access) within the TPZ".

That the location of the electrical services trench is varied giving due consideration and practicable set back from larger trees, consistent with the Tree Protection Zones (TPZ) detailed at section 5.0 of this report.

That all roots are to be retained within the SRZ of the subject trees.

That where there is no other option, and subject to inspection by an arborist, roots greater than 40 millimetres diameter may be severed between the SRZ and the TPZ where they conflict directly with the conduits using clean sharp hand-tools to minimise tearing.

That if required minor pruning is carried out in accordance with the Workcover Draft Code of Practice for Tree Works and Australian Standard AS4373-2007, "Pruning of Amenity Trees", and the Workcover Code of Practice for the Amenity Tree Industry, 1998.

2.0 Disclaimer

This report is to be read and considered in its entirety. The subject trees were inspected from the ground using Visual Tree Assessment methodology, no aerial investigations; underground or internal investigations were undertaken. It is the responsibility of the client to implement all recommendations contained in this report.

The assessment is made having regard for the prevailing site conditions; and does not account for the effects that extreme weather events may have on trees.

Information contained in this report reflects the condition of the trees at the time of the inspection. As trees are living organisms their condition will change over time, there is no guarantee that problems or deficiencies of the subject trees may not arise in the future. It must be accepted that living in close proximity to trees involves some level of risk.

No investigation into the presence on the site of threatened or endangered species of shrubs, groundcovers, grasses, herbs or orchids has been undertaken.

This report is for the use of the client and their contractors to assist in determining the tree protection measures to be undertaken in conjunction with the proposed development. Distribution to other parties is not permitted except with the express permission of the author, Ian Hills. No responsibility is taken by the author for unauthorised use of the information contained in this report.

3.0 Brief

Accurate Tree Assessment has been commissioned by Ausgrid (the client) to identify areas of encroachment into the Tree Protection Zone of trees located along the proposed route of the Feeder 265 Replacement Matraville to Maroubra Project. Fifty (50) trees and groups of trees have been identified as being subject to potential TPZ/SRZ encroachment from the proposed works.

In accordance with the client's specification this report will:

- Identify trees that may be affected by the proposed development
- Provide recommendations for the protection of retained trees based upon the level of encroachment that is expected in accordance with the provisions of AS4970-2009, 'Protection of Trees on Development Sites'

4.0 Method

A site inspection was carried out on 27 December 2019.

Calculation of tree protection zones was carried out in accordance with the Australian Standard AS4970-2009, "Protection of Trees on Development Sites", based on the trunk diameter (DBH) measured using a standard arboricultural diameter tape.

Trees subject to assessment have been marked on the aerial photomaps extracted from the .kmz file provided.

4.1. Documents

A .kmz file of the proposed route (Appendix 10.2) has been provided by Ausgrid and has been used as reference throughout the report.

5.0 Tree Assessment

No	Common Name	Species	DBH (M)	TPZ (M)	SRZ (M)	HEIGHT (M)	SPREAD (M)	Age Class	SULE	Dist. to Kerb (M)	Height to first branch (M)	Location/ Comment
1	Honey Locust	<i>Gleditsia triacanthos</i>	0.4	4.8	2.37	8	6	M	1A	2.5	3.0	34 Robey St
2 a- e	Tuckeroo	<i>Cupaniopsis</i>	0.3	3.6	2.00	5	5	M	1A	1.5	2.0	16 Wise St
3	Tuckeroo	<i>Cupaniopsis</i>	0.34	4.08	2.25	5	5	M	1A	2.5	2.0	48 Robey St
4	Golden Locust	<i>Robinia pseudoacacia</i>	0.32	3.84	2.25	6	5	M	1A	2.2	3.5	80 Robey St
5	Weeping Bottlebrush	<i>Callistemon viminalis</i>	0.3	3.6	2.05	5	5	M	1A	2.0	2.0	88 Robey St
6	Native Hibiscus	<i>Hibiscus tileaceous</i>	0.28	3.36	2.00	5	5	M	1A	2.1	2.0	90 Robey St
7	Southern Mahogany	<i>Eucalyptus botryoidea</i>	0.6	7.2	2.85	14	12	M	1A	7.0	5.0	117 Fitzgerald St/private tree
8	Swamp Mahogany	<i>Eucalyptus robusta</i>	1.2	14.4	3.81	14	12	M	1A	1.5	7.0	opp 83 Robey
9	WA Willow Myrtle	<i>Agonis flexuosa</i>	0.6	7.2	2.67	4	5	M	2A	2.0	3.0	87 Robey St
10	WA Willow Myrtle	<i>Agonis flexuosa</i>	0.6	7.2	2.85	4	4	M	2A	1.5	4.0	91 Robey St
11	WA Willow Myrtle	<i>Agonis flexuosa</i>	1.5	18	3.92	4	7	M	1A	1.5	2.0	97 Robey St
12	Golden Wreath Wattle	<i>Acacia salignus</i>	0.4	4.8	2.47	4	4	M	1A	N/A, top of bank	4.0	109 Robey St
13	WA Willow Myrtle	<i>Agonis flexuosa</i>	0.5	6	2.57	4	3	M	1A	2.2	2.0	125 Robey St
14	Scribbly Gum	<i>Eucalyptus haemastoma</i>	0.5	6	2.67	8	7	M	1A	1.5	4.0	opp 135 Robey St
15	Scribbly Gum	<i>Eucalyptus haemastoma</i>	0.75	9	2.85	9	9	M	1A	1.5	3.5	opp 137 Robey St
16	Scribbly Gum	<i>Eucalyptus haemastoma</i>	0.35	4.2	2.25	6	4	M	3A	1.0	3.5	opp 149 Robey St/basal wound, deadwood
17	WA Willow Myrtle	<i>Agonis flexuosa</i>	0.7	8.4	2.93	7	7	M	1A	1.5	2.0	147 Robey St

No	Common Name	Species	DBH (M)	TPZ (M)	SRZ (M)	HEIGHT (M)	SPREAD (M)	Age Class	SULE	Dist. to Kerb (M)	Height to first branch (M)	Location/ Comment
18	Wallangarra White Gum	<i>Eucalyptus scoparia</i>	0.9	10.8	3.31	16	15	M	1A	1.2	4.0	148 Robey St
19	WA Willow Myrtle	<i>Agonis flexuosa</i>	0	4.56	2.47	4	3	M	2A	2.1	2.4	157 Robey St
20	Coast Banksia	<i>Banksia integrifolia</i>	0.5	6	2.67	7	5	M	1A	2.0	3.0	154 Robey St
21	Scribbly Gum	<i>Eucalyptus haemastoma</i>	0.27	3.24	2.00	4	5	M	2A	2.5	2.0	163 Robey St
22	Coast Banksia	<i>Banksia integrifolia</i>	0.34	4.08	2.25	5	5	M	1A	1.8	1.5	160 Robey St
23 a-e	Native Hibiscus	<i>Hibiscus tileaceous</i>	0.4	4.8	2.37	5	4	M	1A	1.8	N/A	354-356 Beauchamp Rd
24 a-b	Swamp Mahogany	<i>Eucalyptus robusta</i>	0.2	2.4	2.00	4	4	SM	1A	1.0	N/A	353-357 Beauchamp Rd
25	Broad-leaved Paperbark	<i>Melaleuca quinquenervia</i>	0.7	8.4	2.85	8	5	M	1A	N/A	N/A	park near bus-stop opp.intersection Ferguson St
26 a-j	Smmoth-barked Applegum	<i>Angophora costata</i>	0.35	4.2	2.37	8	5	M	1A	2.0	N/A	6-26 Menin Rd
27	Swamp Mahogany	<i>Eucalyptus robusta</i>	0.7	8.4	3.01	9	9	M	1A	2.5	4.0	11 Menin Rd
28	Spotted Gum	<i>Corymbia maculata</i>	0.6	7.2	2.85	12	9	M	1A	2.5	3.0	13 Menin Rd
29	Coast Banksia	<i>Banksia integrifolia</i>	0.4	4.8	2.47	5	6	M	1A	2.4	3.5	34 Menin Rd
30	WA Willow Myrtle	<i>Agonis flexuosa</i>	0.8	9.6	3.17	5	5	M	2A	2.0	3.0	47 Menin Rd
31 a-b	Native Hibiscus	<i>Hibiscus tileaceous</i>	0.35	4.2	2.47	5	5	M	1A	2.5	3.5	1 Wassell St
32	Tuckeroo	<i>Cupaniopsis</i>	0.4	4.8	2.37	5	6	M	1A	3.0	4.0	5 Wassell St
33 a-e	Coral Tree	<i>Erythrina X sykesii</i>	0.6	7.2	2.85	9	8	M	2A	5.5	N/A	opp intersection Caley St
34	Wallangarra White Gum	<i>Eucalyptus scoparia</i>	0.35	4.2	2.25	6	5	M	2A	2.5	N/A	2 Caley St
35 a-b	Native Hibiscus	<i>Hibiscus tileaceous</i>	0.3	3.6	2.25	5	6	M	1A	2.1	2.4	2 Caley St

No	Common Name	Species	DBH (M)	TPZ (M)	SRZ (M)	HEIGHT (M)	SPREAD (M)	Age Class	SULE	Dist. to Kerb (M)	Height to first branch (M)	Location/ Comment
36	Wallangarra White Gum	<i>Eucalyptus scoparia</i>	0.3	3.6	2.25	5	5	M	2A	3.0	4.0	11 Wassell St
37	WA Willow Myrtle	<i>Agonis flexuosa</i>	0.7	8.4	3.01	5	6	M	1A	3.0	N/A	13 Wassell St
38	Narrow-leaved Ironbark	<i>Eucalyptus crebra</i>	0.32	3.84	2.15	10	5	SM	1A	2.8	4.0	33 Wassell St
39	Willow Bottlebrush	<i>Callistemon salignus</i>	0.6	7.2	2.67	8	6	M	1A	2.5	3.5	37 Wassell St
40	Brush Box	<i>Lophostemon confertus</i>	0.6	7.2	2.47	12	8	M	1A	4.5	4.0	37 Wassell St
41	Tallow-wood	<i>Eucalyptus microcorys</i>	0.6	7.2	2.85	14	10	M	1A	5.0	N/A	39 Wassell St
42 a-b	Weeping Bottlebrush	<i>Callistemon viminalis</i>	0.4	4.8	2.47	6	5	M	1A	4.0	2.0	45 Wassell St
43	Southern Mahogany	<i>Eucalyptus botryoides</i>	0.45	5.4	2.47	5	6	M	1A	3.2	4.5	55a Wassell St
44	Narrow-leaved Ironbark	<i>Eucalyptus crebra</i>	0.45	5.4	2.67	9	6	M	1A	3.2	4.0	57 Wassell St
45	Moreton Bay Fig	<i>Ficus macrophylla</i>	0.55	6.6	2.67	7	9	SM	1A	N/A	3.5	Entry to reserve end of Wassell St
46	Moreton Bay Fig	<i>Ficus macrophylla</i>	0.6	7.2	2.85	5	5	SM	1A	N/A	3.5	Entry to reserve end of Wassell St
47	Spotted Gum	<i>Corymbia maculata</i>	0.28	3.36	2.13	6	5	SM	1A	1.0	4.0	Intersection Bunnerong and Botany Rds
48	Spotted Gum	<i>Corymbia maculata</i>	0.3	3.6	2.25	10	5	M	1A	1.0	4.0	Intersection Bunnerong and Botany Rds
49	Swamp Mahogany	<i>Eucalyptus robusta</i>	0.6	7.2	2.85	9	6	M	1A	N/A	6.0	Entrance to easement
50	Swamp Mahogany	<i>Eucalyptus robusta</i>	0.6	7.2	2.85	11	6	M	1A	N/A	6.0	Entrance to easement

DBH – Trunk diameter at 1.4 metres

SRZ = Structural Root Zone (calculated in accordance with AS4970)

TPZ = Tree Protection Zone (calculated in accordance with AS4970)

SULE = Useful Life Expectancy (Barrel, J -1993-95) see appendix 12.1

6.0 Development impact

All parts of a tree may be damaged by construction activities, and the effects of damage are often cumulative meaning that seemingly minor damage to the tree can have adverse effects that may not become apparent until well after the project has been completed.

Crown damage often occurs when machinery impacts with branches of the tree resulting in a loss of foliage. As the foliage is where the tree produces the sugars required for healthy growth it therefore stands to reason that any loss of foliage will affect the trees ability to function normally.

In addition, when branches are torn or improperly pruned the trees ability to recover is affected and pathogens that cause wood decay or disease have an increased opportunity to penetrate the trees natural defenses.

Trunk damage is usually caused by mechanical impact, and again wounding predisposes the tree to infection by pathogens.

Root damage is the most common cause of damage to trees on development sites, and often has the most serious effects as it commonly goes un-noticed for some time. Damage can be caused by mechanical factors such as tearing during excavation, as well as factors such as chemical contamination, changes in hydrology and altering gaseous exchange rates by filling, and compaction during movement of equipment.

Australian Standard 4970, *Protection of Trees on Development Sites* was adopted in 2009 to provide Arborists and the construction industry with a guide to assist in the preservation of retained trees on all types of development sites.

To assist professionals working to protect trees the Standard proposes the following:

“Tree Protection Zone - A specified area above and below ground level at a given distance from the trunk set aside for the protection of a tree’s roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

Structural Root Zone – *The area around the base of a tree required for the tree’s stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres.*

This zone considers a tree’s structural stability only, not the root zone required for a tree’s vigour and long-term viability, which will usually be much larger.” (Ref. AS4970-2009)

Minor encroachment of the TPZ is sometimes unavoidable and at levels less than 10% of the total TPZ area can be tolerated if there is scope to increase the area of the TPZ contiguously about the unaffected perimeter. Where encroachment exceeds 10% further investigation will be required to determine the measures required to offset the incursion. Encroachment of the SRZ is not recommended as tree health and condition will almost certainly be adversely affected.

7.0 Discussion

Most trees on the route appear in generally good health and vigour with some deadwood and wounding noted, many of the trees exhibit asymmetrical form due to suppression by the larger trees and pruning for service line clearance. None of the trees were noted to contain hollows suitable for habitation by arboreal fauna.

The movement of machinery is to be carefully considered where hardstand is not present within the TPZ of retained trees; with under-boring techniques used to install services through the TPZ where necessary. Locations for the storage of spoil and materials are to be detailed in the CEMP provided by

Ausgrid's contractor and marked on all plans staff and restricted to areas that are already disturbed or away from trees and must not encroach the TPZ area of the subject trees (setbacks are to be marked on-site by an arborist).

Where excavation for the trench will cause an encroachment into the Tree Protection Zone (TPZ) of a retained tree exceeding 10% of the total TPZ area it is considered to be a major encroachment under the provisions of the Australian Standard AS4970-2009, Protection of Trees on Development Sites; and triggers the requirement for the implementation of measures to ensure that the tree will not be adversely affected by the works.

Where excavation is proposed within the TPZ of the subject trees it is to be carried out under close supervision; where roots are encountered that conflict with the location of conduits a consulting arborist is to assess the roots, making recommendations for their ongoing management. Wherever possible roots greater than 40 millimetres diameter are to be retained and protected, this may include excavating by hand around roots and passing the conduits beneath them. Wrapping roots in geo-textile fabric; utilising sandy material around retained roots when backfilling is recommended to protect retained roots from sharp edged filling materials.

Where no other option is available some roots greater than 40 millimetres diameter that conflict with the position of the electrical conduits may be severed within an established TPZ under advice from the consulting arborist using clean sharp hand-tools to minimise tearing, and therefore reducing the risk of incursion by harmful pathogens.

Prior to the commencement and for the duration of the works, the trunks of the subject trees are to be protected from unintended impacts by the observance of the respective TPZ setbacks which will be monitored in accordance with Ausgrid standard NS174c. Where required the trunks and/or branches of the retained trees will be protected by armouring as detailed in Section 4 of AS4970 (Appendix 12.4)

Several over-hanging branches are noted along the route which may be impacted by over-height machinery, branch and bark tearing is to be avoided. Where necessary branches are to be pruned by a suitably qualified contracting arborist in accordance with the Australian Standard AS4373-2007," *Pruning of Amenity Trees*", and the Workcover Code of Practice for the Amenity Tree Industry, 1998.

7.1 Tree Protection

The following general measures are to be adopted as applicable to the site:

Site establishment

- significant trees are marked on plans
- staff are to be made aware of tree protection measures during induction to the site

During construction

- no storage of equipment or materials is permitted within the TPZ, no cement wasting or other pollutants must be allowed to enter the TPZ
- a temporary barrier is to be installed at the SRZ perimeter for the duration of works in the vicinity of individual trees to prevent mechanical damage to the trunk/branches
- excavation is to be carried out by hand within 200 millimetres of roots greater than 40 mm diameter
- if required minor pruning of branches can be undertaken to avoid mechanical impacts that are likely to result in branch or bark tearing
- no roots are to be severed within an established SRZ.
- where roots greater than 40mm diameter are to be severed between the SRZ and TPZ an arborist is to be on-site to supervise the works

Post construction

- protective fencing is to be removed from site
- general maintenance pruning can be undertaken (in accordance with AS4373-2007) to remove deadwood or other defective branches up to 10% of the total canopy area of retained trees if required

8.0 Conclusions

Smaller trees are unlikely to be affected by the proposed works due to their setback from the excavation.

In most cases the location of the electrical services trench can be varied to allow the maximum setback from larger trees; it's important to note that the existing congestion of underground utilities in this area may reduce the proposed setback in some cases.

The implementation of specific protection measures detailed in section 7.0 and 7.1 of this report will assist in ensuring the viability of trees and gaining compliance with the provisions of AS4970-2009, *"Protection of Trees on Development Sites"*.

9.0 Recommendations

That prior to the commencement of any works:

- Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) of retained trees are clearly plotted on all plans and marked on-site,
- The trunks of retained trees are to be protected by observance of the respective setbacks which will be difficult to fence as they mainly occur over the roadway or pedestrian footpath. Ausgrid will be auditing the project to ensure compliance with NS174c- i.e. "Minimise activity (storage areas, stockpiles, vehicle parking, and access) within the TPZ".

That the location of the electrical services trench is varied giving due consideration and practicable set back from larger trees, consistent with the Tree Protection Zones (TPZ) detailed at section 5.0 of this report.

That all roots are to be retained within the SRZ of the subject trees.

That where there is no other option, and subject to inspection by an arborist, roots greater than 40 millimetres diameter may be severed between the SRZ and the TPZ where they conflict directly with the conduits using clean sharp hand-tools to minimise tearing.

That if required minor pruning is carried out in accordance with the Workcover Draft Code of Practice for Tree Works and Australian Standard AS4373-2007, "Pruning of Amenity Trees", and the Workcover Code of Practice for the Amenity Tree Industry, 1998.



Ian Hills - Principal Arborist
Accurate Tree Assessment



10.0 Appendices

10.1. Safe Useful Life Expectancy Categories

1: Long SULE: Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.

- (a) Structurally sound trees located in positions that can accommodate future growth.
- (b) Trees that could be made suitable for retention in the long term by remedial tree care.
- (c) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.

2: Medium SULE: Trees that appeared to be retainable at the time of assessment for 15–40 years with an acceptable level of risk.

- (a) Trees that may only live between 15 and 40 more years.
- (b) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.
- (c) Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (d) Trees that could be made suitable for retention in the medium term by remedial tree care.

3: Short SULE: Trees that appeared to be retainable at the time of assessment for 5–15 years with an acceptable level of risk.

- (a) Trees that may only live between 5 and 15 more years.
- (b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
- (c) Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (d) Trees that require substantial remedial tree care and are only suitable for retention in the short term.

4: Remove: Trees that should be removed within the next 5 years.

- (a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
- (b) Dangerous trees because of instability or recent loss of adjacent trees.
- (c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
- (d) Damaged trees that are clearly not safe to retain.
- (e) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (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 the reasons given in (a) to (f).
- (h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.

5: Small, young or regularly pruned: Trees that can be reliably moved or replaced.

- (a) Small trees less than 5m in height.
- (b) Young trees less than 15 years old but over 5m in height.
- (c) Formal hedges and trees intended for regular pruning to artificially control growth.

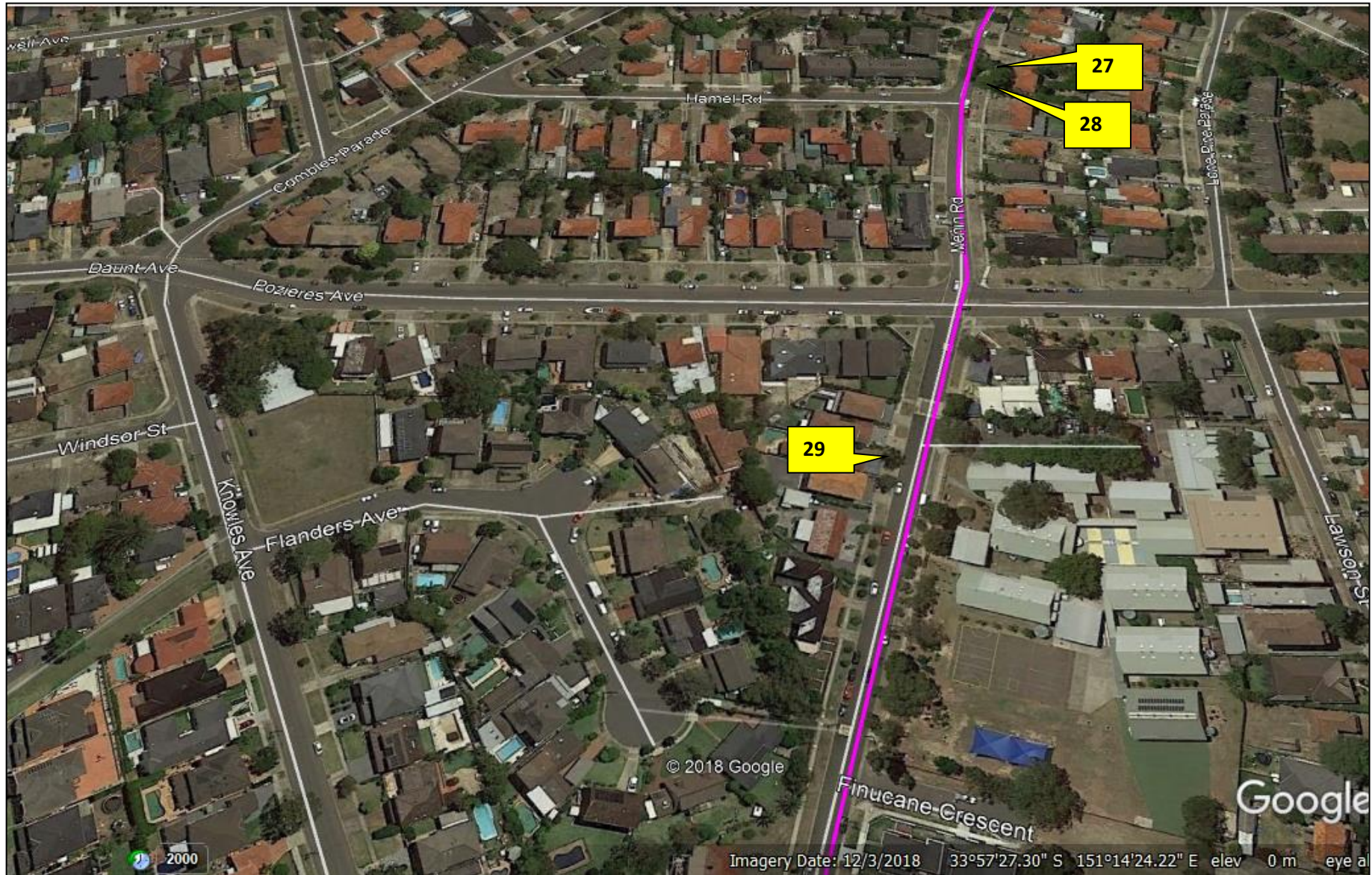
10.2 Tree Location Plans –Sheet 1

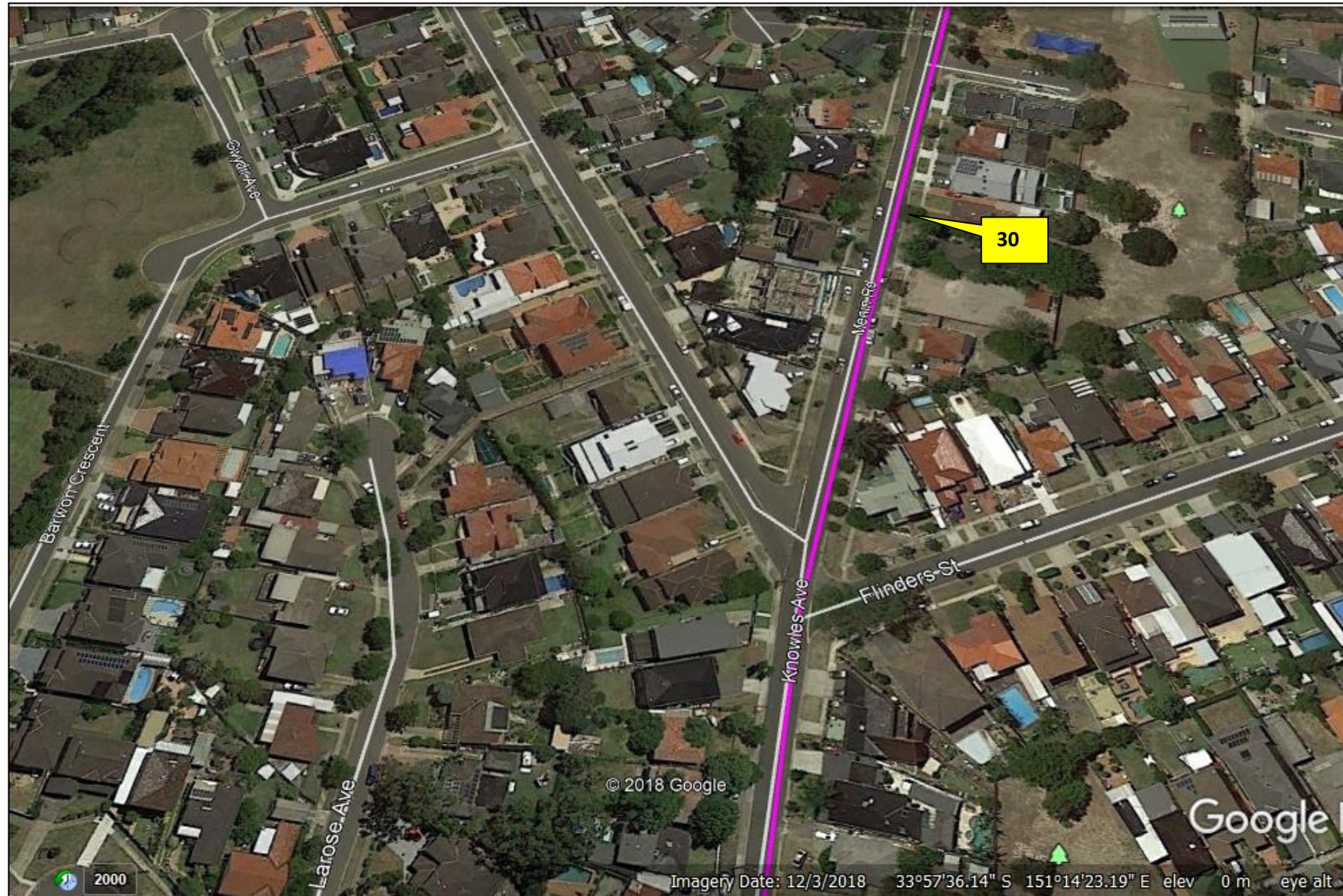












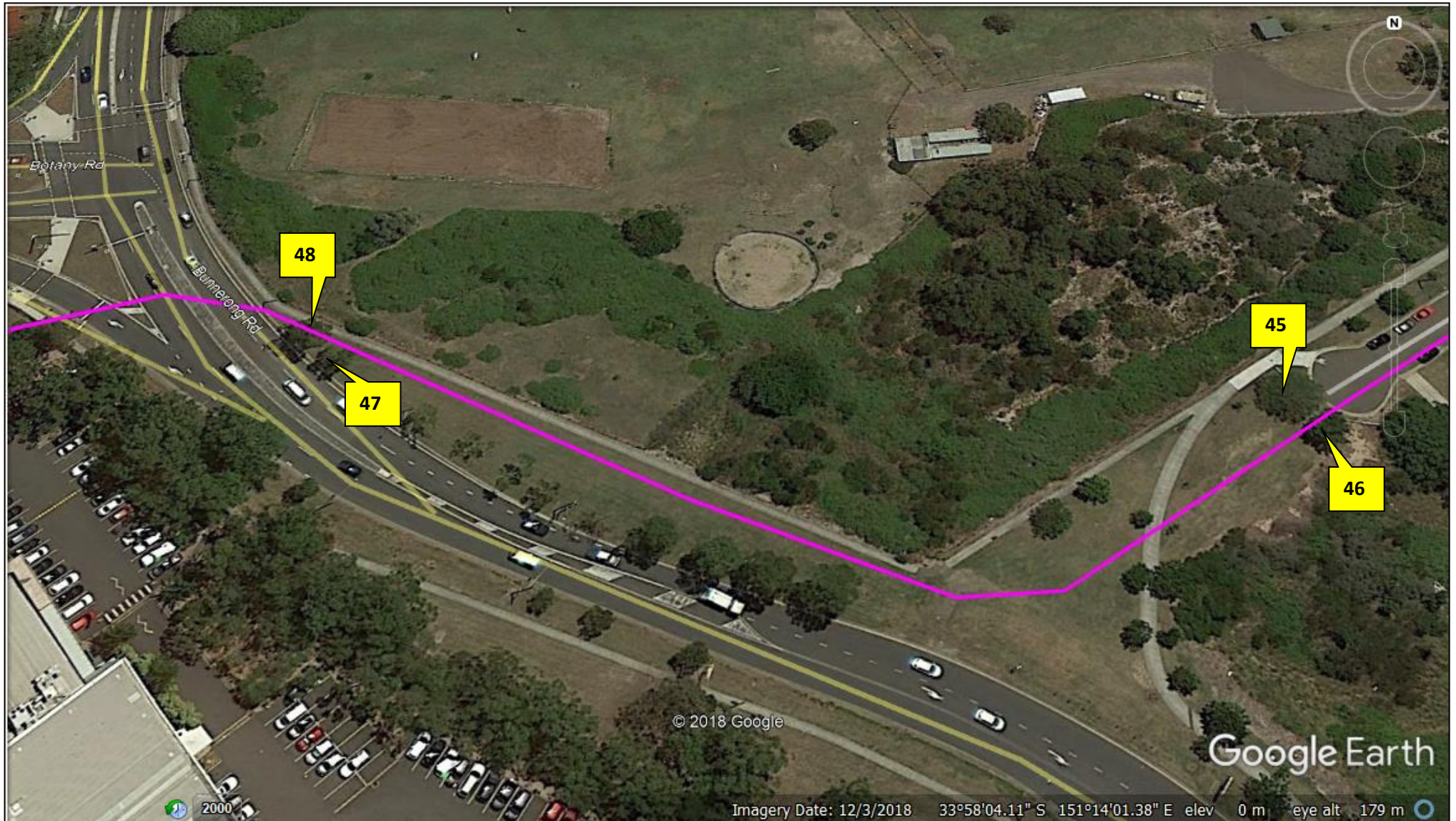


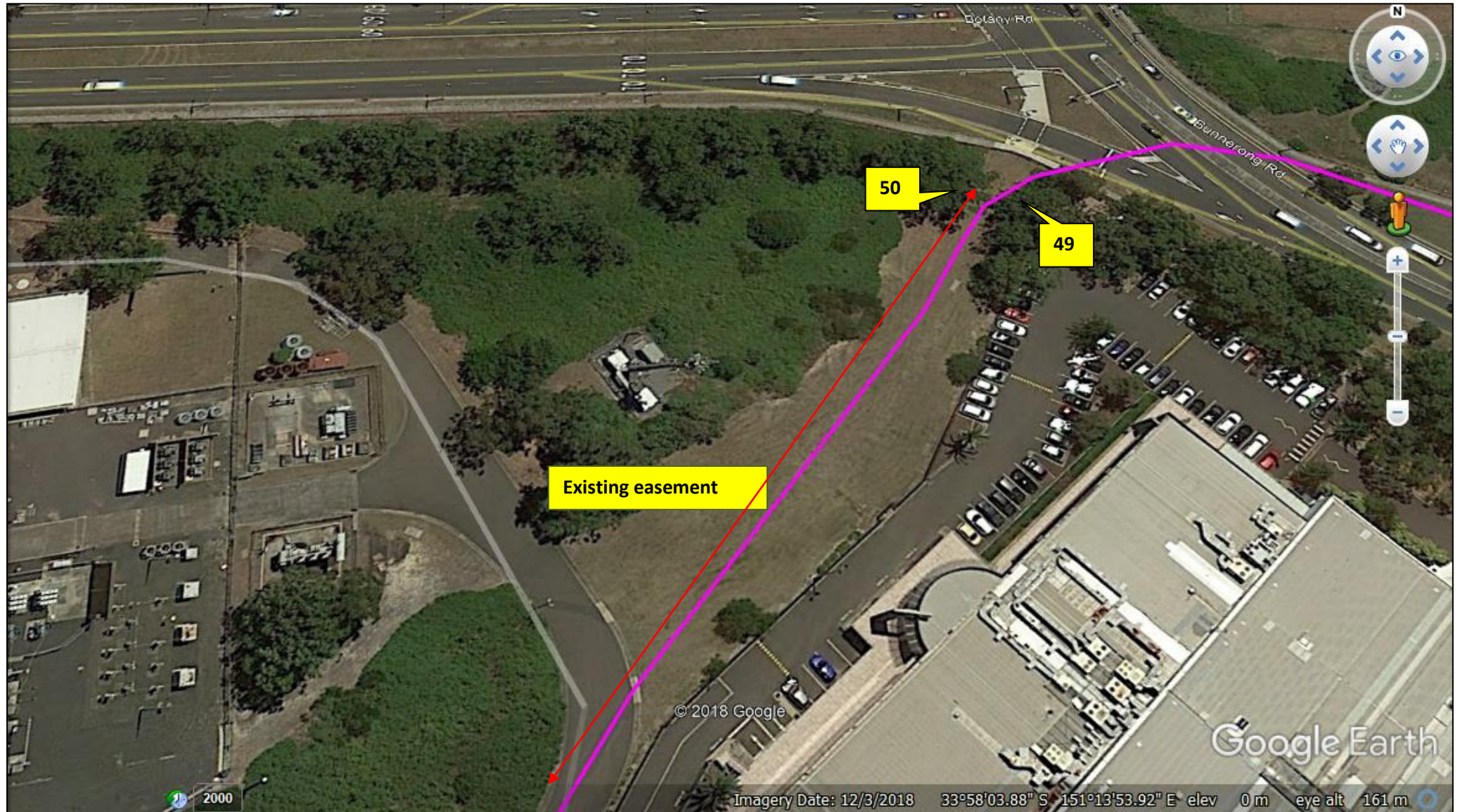




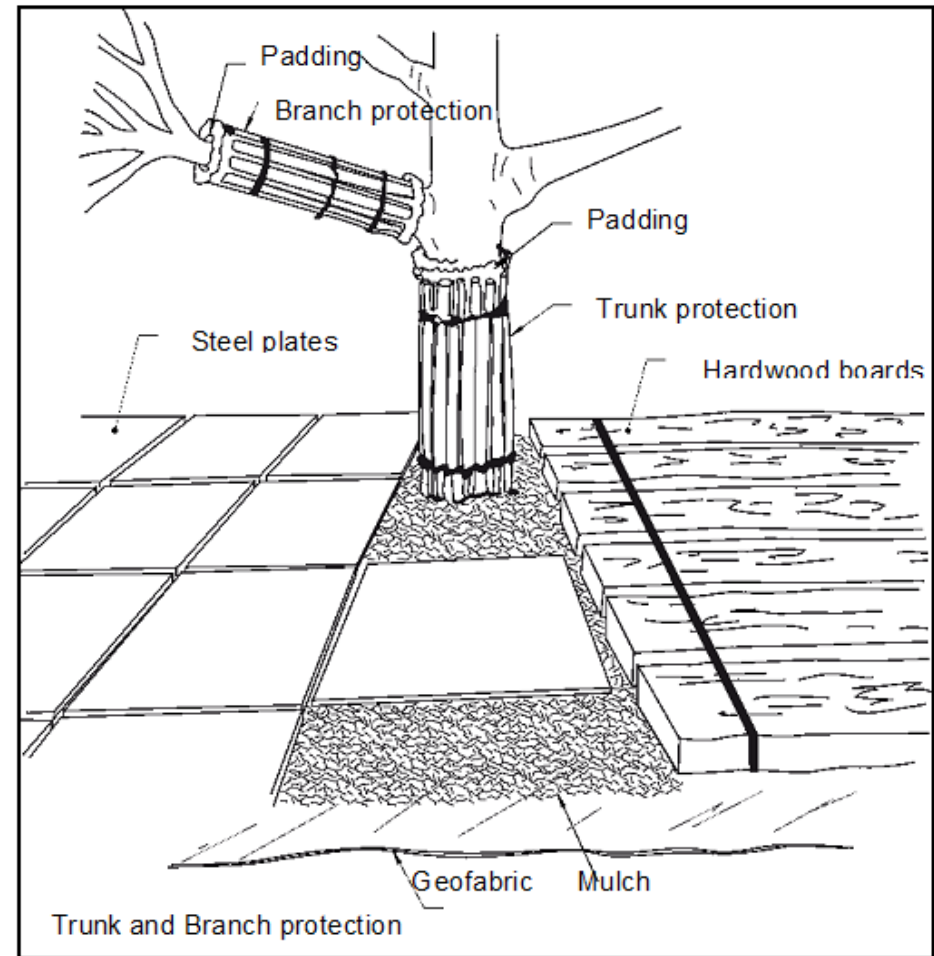
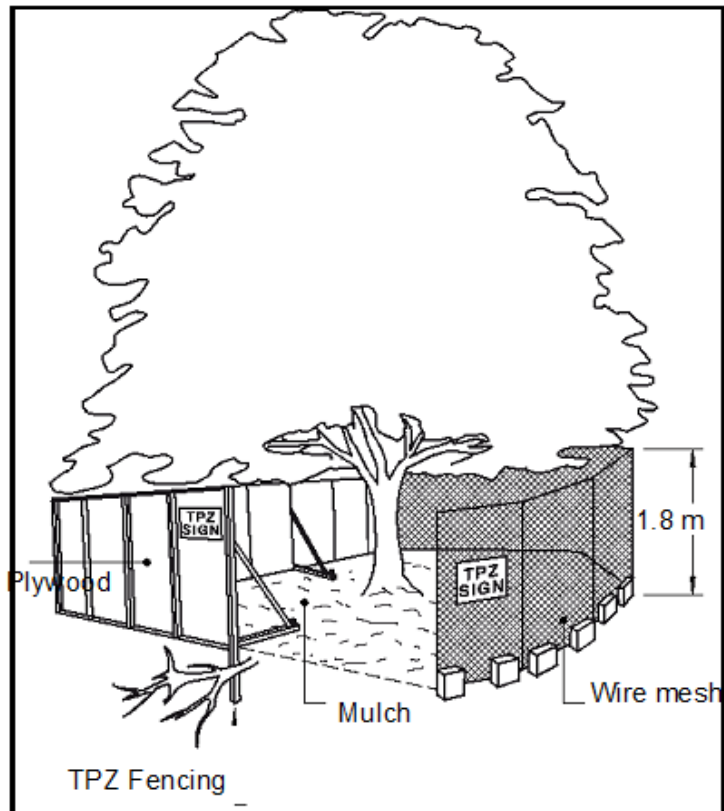








10.3 Tree, Trunk and Branch Protection Methods (Source AS4970-2009)



10.4. References

Clark R.J & Matheny N (1998) *Trees & Development – A technical guide to Preservation of trees during land development*: International Society of Arboriculture

Mattheck C., Breloer, (1999) *The Body Language of Trees – a handbook for failure analysis* 5th ed., London: The Stationery Office, U.K

Barrell, J. (1993-95) 'Pre-planning Tree Surveys Safe Useful Life Expectancy (SULE) is the Natural Progression' *Arboricultural Journal* Vol. 17, PP 33 - 46, Academic Publishers, Great Britain.

Shigo, A.L (1991) 'Modern Arboriculture- A Systems Approach to the Care of Trees and Their Associates'. Shigo and Trees, Associates 4 Denbow Road Durham NH 03824-3105, USA

Standards Australia. 2009 'Australian Standard 4970-2009 Protection of Trees on Development Sites' Standards Australia GPO Box 476 Sydney NSW 2001, Australia.

Standards Australia. 2007 'Australian Standard 4373-2007 *'Pruning of Amenity Trees'*', Standards Australia GPO Box 476 Sydney NSW 2001, Australia.

Workcover NSW, 1998. 'Amenity Tree Industry Code of Practice'. Workcover NSW 92-100 Donnison Street Gosford NSW 2250 Australia.

10.6 Qualifications – Ian Hills

Associate Diploma Horticulture
AQF3 Horticulture (Arboriculture)
AQF5 Diploma Horticulture (Arboriculture)
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