Project No: GOSF/HOSP/15 Report No: GOSF/HOSP/AIA/C

ARBORICULTURAL IMPACT ASSESSMENT
TREE PROTECTION SPECIFICATION

Gosford Hospital
Health & Wellbeing Precinct Stage 1

Prepared for: AURORA PROJECTS

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Revision C

Author:

Anna Hopwood
Dip. Hort (Arboriculture)
Dip. Hort (Landscape Design)

Martin Peacock
BSc (hons.) Arboriculture (UK)
Higher National Dip. Arboriculture (UK)
National Dip. Hort (Arboriculture) (UK)
Dip. Hort (Landscape Design)

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

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f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
treeiQ.com.au

1.0 INTRODUCTION

1.1 Background

1.1.1 This Arboricultural Impact Assessment Report and Tree Protection Specification was prepared for Aurora Projects, on behalf of NSW Health Infrastructure, in relation to the proposed redevelopment of Gosford Hospital and Stage 1 of the Health and Wellbeing Precinct (HWP). The purpose of this report is to undertake a Visual Tree Assessment (VTA) of the subject trees, determine the impact of the proposed works on the subject trees, and provide tree protection measures for the subject trees to be retained.

1.1.2 In preparing this report the author is aware of and has taken into account the objectives of Gosford Council's *Development Control Plan (2013)*, *Australian Standard 4970-2009 Protection on Tree Development Sites* and *Australian Standard 4373-2007 Pruning of Amenity Trees.*

Refer to Methodology **(Appendix 1)**

1.1.3 The following documentation/plans were assessed in preparation of this report:

- Site Plan SSDA (Issue A) - Prepared by Fitzpatrick and Partners, dated 19.03.15
- Site Plan Existing (Issue A) - Prepared by Fitzpatrick and Partners, dated 19.03.15
- Site Plan Demolition (Issue A) - Prepared by Fitzpatrick and Partners, dated 19.03.15
- Survey SB01-SB10 – Prepared by Trehy Ingold Neate, dated 18.07.14

Refer to Plans **(Appendix 3)**

1.2 Aims

1.2.1 The aims of this report are to:

- Review Council's policies for applicable conditions regarding the preparation of Arboricultural Reports
- Conduct a visual assessment of the subject tree(s) and growing environment
- Review the supplied plan to determine the impact on the subject tree(s)
- Where appropriate, recommend the use of sensitive construction methods to minimise the adverse impacts on the subject tree(s)
- Where appropriate, prepare site specific tree protection measures for the subject tree(s) to be retained

1.2.2 There is no warranty or guarantee, expressed or implied that problems or deficiencies regarding the subject tree(s) or the subject site may not arise in the future. Information contained in this report covers only the subject tree(s) assessed and reflects the condition of the subject tree(s) at the time of inspection.

2.0 RESULTS

2.1 The Site

2.1.1 The site comprises of Gosford Hospital and grounds, plus a number of properties to the east of the Gosford Hospital main site on Holden Street and Showground Road. For the purpose of this report, the site has been divided into two separate areas:

- Area 1 – Gosford Hospital (main site)
- Area 2 – Holden Street/Showground Road properties (Health and Wellbeing Precinct Stage 1)

2.1.2 The topography of Area 1 is level to gently sloping with a generally southern aspect. Area 2 has a moderate slope with an easterly aspect.

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
treeiQ.com.au

2.2 The Trees

2.2.1 One hundred and fifty nine (159) trees (and groups of trees) were surveyed as part of this assessment. These trees consist of a mix of locally indigenous species, Australian native and exotic species. Full results of the tree assessment are shown in the Tree Assessment Schedule **(Appendix 2)**. Tree numbers correlate with the attached plans **(Appendix 3)**.

2.2.2 Trees 52, 81, 82, 83, 101, 102, 134, 135 and 159 are located outside the boundaries of the site within Council's road reserve on Showground Road. Tree 50 and Tree 128 (group of four trees) are located in the neighbouring properties adjacent to the Area 2 site. Trees outside of the subject site have not been assessed and have been allocated a Retention Value of *Priority for Retention*.

2.2.3 The VTA has identified a number of trees that have reduced health and/or structural defects which have reduced their ULE. In addition, there are numerous relatively small trees across the site which in the context of development are considered easily replaceable and have therefore been allocated a low Landscape Significance. Of the one hundred and fifty nine (159) trees (and groups of trees) assessed, seventy five (75) trees have been allocated a Retention Value of *Priority for Removal* or *Consider for Removal.*

2.2.4 Seven (7) trees were identified as being of particularly good examples of the species with long Useful Life Expectancies (15-40 years or 40+ years) and a high Landscape Significance. These trees have been allocated a Retention Value of *Priority for Retention* and are outlined in Table 1 below.

2.2.5 Table 1: Trees with a Retention Value of *Priority for Retention* (within the site boundaries)

Species	Tree Number
Araucaria cunninghamii (Hoop Pine)	78, 79 & 87
Corymbia maculata (Spotted Gum)	54 & 72
Eucalyptus pilularis (Blackbutt)	56
Glochidion ferdinandi (Cheese Tree)	155

2.2.6 Thirteen (13) of the trees are listed as exempt species within Appendix 1 of Section 6.6 of Council's Development Control Plan (2013)[1] and are outlined in Table 2 below.

2.2.7 Table 2: Exempt Species

Species	Tree Number
Cinnamomum camphora (Camphor Laurel)	8, 107, 122, 156 & 159
Citrus spp. (Citrus Tree)	109
Cupressus macrocarpa 'Brunnianan Aurea' (Golden Monterey Cypress)	153
Ligustrum ovalifolium (Narrow Leaf Privet)	106
Ligustrum lucidum (Broad Leaf Privet)	31
Robinia pseudoacacia (Robinia)	95
Schefflera actinophylla (Umbrella Tree)	110 &120
Syagrus romanzoffiana (Cocos Palm)	21

2.2.8 In addition to the above, Council's Development Control Plan (2013) also outlines that *trees within three (3) metres of an approved building (measured one (1) metre above ground level and between the face of the wall and the part of the trunk nearest the building), providing the tree species is not a threatened species or not listed on Council's Significant Tree Register or Heritage Item* are exempt from the Tree Management Controls.[2] Reference should be made to Council's Development Control Plan (2013) for further information on this exemption.

[1] Gosford Council (2013), *Development Control Plan*.
[2] Gosford Council (2013), *Development Control Plan*.

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
treeiQ.com.au

2.2.9 The species/trees listed in Table 3 are generally considered environmental weed species due to their propensity to self-seed. However, they are still covered by the Tree Management Controls within Council's Development Control Plan (2013).[3]

2.2.10 Table 3: Environmental Weed Species

Species	Tree Number
Acer negundo (Box Elder)	68
Cotoneaster spp. (Cotoneaster)	115

2.2.11 A search of the BioNet Atlas of NSW Wildlife Database was undertaken in December 2014. The species *Eucalyptus scoparia* - Wallangarra White Gum (Tree 77) and *Syzygium paniculatum* – Lillypilly (Tree 91) were identified at the subject site and are listed as an endangered species in NSW under the *NSW Threatened Species Conservation Act 1995*.[4] Based on the age, size and location of these trees, it is assumed that they are planted specimens and not components of an indigenous plant community. No other individual threatened tree species that were listed within this database for the area were identified during the current field investigations of the subject site. The ecological significance and habitat value of the subject trees has not been assessed and is beyond the scope of this report.

2.3 The Proposal

2.3.1 The supplied plans show the proposal includes:

- Demolition of a section of the existing main hospital building and existing hospital outbuildings within the proposed development footprint
- Demolition of all existing buildings and driveways and within the site to the east of Holden Street that are within the proposed development footprint
- Construction of a new addition to the main hospital complex
- Construction of a new carpark to the east of the main hospital complex
- Associated landscape works

3.0 ARBORICULTURAL IMPACT ASSESSMENT

3.1 Trees to be removed

3.1.1 Ninety nine (99) trees will need to be removed to accommodate the proposed development. These include ten (10) trees with a Retention Value of *Priority for Retention,* thirty nine (39) trees with a Retention Value of *Consider for Retention,* thirty nine (39) trees with a Retention Value of *Consider for Removal* and eleven (11) trees with a Retention Value of *Priority for Removal*.

3.1.2 Table 4: Trees to be removed

Priority for Retention	Consider for Retention	Consider for Removal	Priority for Removal
52, 54, 72, 78, 79, 101, 102, 134, 135 & 155	2, 3, 5, 6, 8, 63, 64, 65, 66, 68, 70, 71, 74, 75, 76, 77, 80, 84, 86, 88, 90, 103, 112, 117, 118, 125, 126, 127, 129, 130, 131, 132, 133, 136, 141, 148, 151 & 153	1, 4, 7, 9, 53, 58, 67, 69, 73, 85, 91, 92, 93, 94, 99, 100, 105, 108, 109, 110, 113, 114, 119, 120, 121, 124, 137, 138, 139, 140, 142, 144, 145, 146, 147, 149, 150, 157 & 158	104, 106, 107, 111, 115, 116, 122, 123, 152, 154 & 156

[3] Gosford Council (2013), *Development Control Plan*.
[4] NSW Environment & Heritage (2013), *Eucalyptus scoparia Endangered Species Listing* & *Syzygium paniculatum Endangered Species Listing*

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
treeiQ.com.au

3.2 Trees to be retained

3.2.1 Sixty (60) trees are to be retained as part of the proposed development. These include eight (8) trees with a Retention Value of *Priority for Retention,* twenty seven (27) trees with a Retention Value of *Consider for Retention,* twenty two (22) trees with a Retention Value of *Consider for Removal* and three (3) trees with a Retention Value of *Priority for Removal.*

3.2.2 Table 5: Trees to be retained

Priority for Retention	Consider for Retention	Consider for Removal	Priority for Removal
50, 56, 81, 82, 83, 87, 128 & 159	11, 13, 14, 15, 18, 19, 20, 22, 24, 25, 28, 30, 32, 33, 36, 37, 38, 39, 40, 42, 43, 51, 55, 57, 95, 96 & 98	10, 12, 16, 17, 23, 26, 27, 29, 34, 35, 44, 45, 46, 47, 48, 49, 59, 60, 61, 62, 89 & 97	21, 31 & 41

3.2.3 Of the trees listed in Table 5, Trees 55, 56, 57, 95, 96, 97, 98 and 128 are located in close proximity to the proposed areas of development works. Although no detailed plans have been provided, as per *Australian Standard 4970-2009 Protection of Trees,* the use of tree sensitive methods may be required where the works encroach into an area greater than 10% of the Tree Protection Zone (TPZ). Tree sensitive methods may include; tree sensitive demolition of existing structures, piered footings (located to avoid significant tree roots), above grade structures/pavements, cantilevered slabs and contiguous piling to eliminate over excavation. Additional assessment of the potential impacts of development on these trees will be required following the preparation of detailed construction plans.

3.2.4 The TPZ areas (either fencing or trunk/ground protection) should be established for all trees to be retained. TPZ fencing/ground protection should be set back from the trees in accordance with the radial TPZ distances (measured from the centre of the tree at ground level) detailed for each tree in the Tree Assessment Schedule **(Appendix 2)**. Trunk protection should be installed for the street trees to be retained. The existing pavement surface is considered sufficient to provide ground protection for the street trees.

3.3 Replacement Planting

3.3.1 To help offset the impact of the proposed tree removals, the landscape design should include the installation of extensive new tree plantings. These plantings include a variety of species and should be supplied in a range of pot sizes.

3.3.2 The new tree plantings should be supplied in accordance with *Australian Standard AS2303-2015 Tree Stock for Landscape Use.*

4.0 CONCLUSION

4.1 One hundred and fifty nine (159) trees (and groups of trees) were surveyed as part of this assessment. These trees consist of a mix of locally indigenous species, Australian native and exotic species.

4.2 The supplied plans show the proposed works include the demolition of a section of the existing main hospital building, existing hospital outbuildings and all of the buildings within Area 2, and construction of a new addition to the main hospital complex and carpark within Area 2.

4.3 Ninety nine (99) trees will need to be removed to accommodate the proposed development. These are Trees 1-9, 52-54, 58, 63-80, 84-86, 88, 90-94, 99-127 and 129-158.

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
treeiQ.com.au

4.4 Sixty (60) tree are to be retained as part of the proposed development. These are Trees 10-51, 55-57, 59-62, 81-83, 87, 89, 95-98, 128 and 159. Of these, Trees 55, 56, 57, 95, 96, 97, 98 and 128 are located in close proximity to the proposed areas of development works. The use of tree sensitive methods may be required where the works encroach into an area greater than 10% of the TPZ. Additional assessment of the potential impacts of development on these trees will be required following the preparation of detailed construction plans.

4.5 The TPZ areas (either fencing or trunk/ground protection) should be established for all trees to be retained. Trunk protection should be installed for the street trees to be retained. The existing pavement surface is considered sufficient to provide ground protection for the street trees. Refer to Tree Protection Specification **(Appendix 5)**.

4.6 To help offset the impact of the proposed tree removals, the landscape design should include the installation of extensive new tree plantings. The new tree plantings should be supplied in accordance with Australian Standard AS2303:2015 Tree stock for landscape use.

5.0 LIMITATIONS

5.1 Reference should be made to any relevant legislation including Tree Management Controls. All recommendations contained within this report are subject to approval from the relevant Consent Authority.

5.2 This report provides recommendations relating to tree management only. Advice should be sought from appropriately qualified consultants regarding design/construction issues.

5.3 A comprehensive hazard assessment and management plan for the trees is beyond the scope of this report.

5.4 There is no warranty or guarantee, expressed or implied that problems or deficiencies regarding the subject trees or the subject site may not arise in the future. Information contained in this report covers only the subject trees that were assessed and reflects the condition of the subject trees at the time of inspection.

5.5 Additional information regarding the methodology used in the preparation of this report is attached as Appendix 1.

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p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
treeiQ.com.au

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p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

7.0 APPENDICES

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

Appendix 1: Methodology

1.1 **Site Inspection**: This report was determined as a result of several comprehensive site inspections during September 2014 and January 2015. The comments and recommendations in this report are based on findings from this site inspection.

1.2 **Visual Tree Assessment (VTA)**: The subject tree(s) was visually assessed from the ground using the industry standard, VTA criteria and notes. The inspection was limited to a visual examination of the subject tree(s) from ground level only. No internal diagnostic testing was undertaken as part of this assessment. Trees outside the subject site have not been assessed.

1.3 **Tree Dimensions**: The dimensions of the subject tree(s) are approximate only.

1.4 **Tree Locations:** The location of the subject tree(s) was determined from the supplied plans attached as Appendix 3. A large number of trees were not shown on the supplied plans have been plotted in their approximate location only.

1.5 **Trees & Development**: Tree Protection Zones, Tree Protection Measures and Sensitive Construction Methods for the subject tree were based on methods outlined in *Australian Standard 4970-2009 Protection of Trees on Development Sites*.

The *Tree Protection Zone* (TPZ) is described in AS-4790 as 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 *Structural Root Zone* (SRZ) is described in AS-4790 as the area around the base of a tree required for the tree's stability in the ground. Severance of structural roots within the SRZ is not recommended as it may lead to the destabilisation and/or demise of the tree.

In some cases it may be possible to encroach into or make variations to the theoretical TPZ. A *Minor Encroachment* is less than 10% of the area of the TPZ and is outside the SRZ. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. A *Major Encroachment* is greater than 10% of the TPZ or inside the SRZ. In this situation the Project Arborist must demonstrate that the tree would remain viable. This may require root investigation by non-destructive methods or the use of sensitive construction methods.

1.6 **Tree Health**: The health of the subject tree(s) was determined by assessing:

I. Foliage size and colour
II. Pest and disease infestation
III. Extension growth
IV. Crown density
V. Deadwood size and volume
VI. Presence of epicormic growth

1.7 **Tree Structural Condition**: The structural condition of the subject tree(s) was assessed by:

I. Visible evidence of structural defects or instability
II. Evidence of previous pruning or physical damage

1.8 **Useful Life Expectancy (ULE)**: The ULE is an estimate of the longevity of the subject tree(s) in its growing environment. The ULE is modified where necessary to take in consideration tree(s) health, structural condition and site suitability. The tree(s) has been allocated one of the following ULE categories (Modified from Barrell, 2001):

I. 40 years +
II. 15-40 years
III. 5-15 years
IV. Less than 5 years

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
treeiQ.com.au

1.9 **Landscape Significance**: Landscape Significance was determined by assessing the combination of the cultural, environmental and aesthetic values of the subject tree(s). Whilst these values are subjective, a rating of very high, high, moderate, low or insignificant has been allocated to the tree(s). This provides a relative value of the tree's Landscape Significance which may aid in determining its Retention Value. If the tree(s) can be categorized into more than one value, the higher value has been allocated.

Landscape Significance	Description
Very High	The subject tree is listed as a Heritage Item under the *Local Environmental Plan* with a local or state level of significance.
	The subject tree is listed on Council's Significance Tree Register.
	The subject tree is a known remnant tree.
High	The subject tree creates a 'sense of place' or is considered 'landmark' tree.
	The subject tree is of local, cultural or historical importance or is widely known.
	The subject tree has been identified by a suitably qualified professional as a species scheduled as a Threatened or Vulnerable Species or forms part of an Endangered Ecological Community associated with the subject site, as defined under the provisions of the *Threatened Species Conservation Act* 1995 (NSW) or the *Environmental Protection and Biodiversity Conservation Act* 1999.
	The subject tree is known to provide habitat to a threatened species.
	The subject tree is an excellent representative of the species in terms of aesthetic value.
	The subject tree is of significant size, scale or makes a significant contribution to the canopy cover of the locality.
	The subject tree forms part of the curtilage of a heritage item with a known or documented association with that item.
Moderate	The subject tree makes a positive contribution to the visual character or amenity of the area.
	The subject tree provides a specific function such as screening or minimising the scale of a building.
	The subject tree has a known habitat value.
	The subject tree is a good representative of the species in terms of aesthetic value.
Low	The subject tree is an environmental pest species or is exempt under the provisions of the local Council's Tree Preservation Order.
	The subject tree makes little or no contribution to the amenity of the locality.
	The subject tree is a poor representative of the species in terms of aesthetic value.
Insignificant	The subject tree is declared a Noxious Weed under the Noxious Weeds Act

The above table has been modified from the Earthscape Criteria for Assessment of Landscape Significance

1.10 **Retention Value**: Retention Value was based on the subject tree's Useful Life Expectancy and Landscape Significance. The Retention Value was modified where necessary to take in consideration the subject tree's health, structural condition and site suitability. The subject tree(s) has been allocated one of the following Retention Values:

I. Priority for Retention
II. Consider for Retention
III. Consider for Removal
IV. Priority for Removal

<table>
<tr><th>ULE</th><th></th><th colspan="4">Landscape Significance</th></tr>
<tr><td></td><td>Very High</td><td>High</td><td>Moderate</td><td>Low</td><td>Insignificant</td></tr>
<tr><td>40 years +</td><td rowspan="3">Priority for Retention</td><td colspan="2">Priority for Retention</td><td rowspan="3">Consider for Removal</td><td rowspan="3">Priority for Removal</td></tr>
<tr><td>15-40 years</td><td>Priority for Retention</td><td>Consider for Retention</td></tr>
<tr><td>5-15 years</td><td colspan="2">Consider for Retention</td></tr>
<tr><td>Less than 5 years</td><td>Consider for Removal</td><td colspan="4">Priority for Removal</td></tr>
</table>

The above table has been modified from the Footprint Green Tree Significance and Retention Value Matrix.

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
treeiQ.com.au

Appendix 2: Tree Assessment Schedule

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	TPZ (m)	SRZ (m)	Implication
1	*Glochidion ferdinandi* (Cheese Tree)	200 250 150	5	3	Good	Fair	Co-dominant inclusion. Wound/s, early stages of decay. Partially suppressed. Pruned/lopped for line clearance.	15-40	Low	Consider for Removal	4.8	2.3	Remove.
2	*Glochidion ferdinandi* (Cheese Tree)	250	7	4	Good	Good	Pruned/lopped for line clearance.	15-40	Moderate	Consider for Retention	3	1.9	Remove.
3	*Glochidion ferdinandi* (Cheese Tree)	400	7	5	Good	Fair	Branch inclusion/s, major. Wound/s, early stages of decay. Pruned/lopped for line clearance.	15-40	Moderate	Consider for Retention	4.8	2.3	Remove.
4	*Ilex* spp	150 150 150	4	2	Good	Fair	Branch inclusion/s, minor. Pruned/lopped for line clearance.	15-40	Low	Consider for Removal	3	1.9	Remove.
5	*Glochidion ferdinandi* (Cheese Tree)	350 350 200	5	6	Good	Good	Phototropic lean, moderate.	15-40	Moderate	Consider for Retention	6	2.5	Remove.
6	*Glochidion ferdinandi* (Cheese Tree)	250 250 250	6	5	Good	Fair	Small (<25mm) diameter epicormic growth in low volumes. Pruned/lopped for line clearance.	15-40	Moderate	Consider for Retention	4.2	2.2	Remove.
7	*Hakea* spp.	300 250	4	2	Fair	Good	Small (<25mm) diameter deadwood in moderate volumes.	5-15	Low	Consider for Removal	4.8	2.3	Remove.
8	*Cinnamomum camphora* (Camphor Laurel)	1500	15	8	Fair	Fair	Small (<25mm) & medium (25-75mm) diameter deadwood in moderate volumes. Crown density 50-75%. Small (<25mm) diameter epicormic growth in moderate volumes. Wound/s, advanced stages of decay. Pruned/lopped for line clearance.	5-15	Moderate	Consider for Retention	15	4	Remove.

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	TPZ (m)	SRZ (m)	Implication
9	*Leptospermum petersonii* (Lemon Scented Tea Tree)	250 200	5	3	Good	Good	Small (<25mm) diameter deadwood in low volumes. Branch inclusion/s, minor.	5-15	Low	Consider for Removal	3.6	2	Remove.
10	*Callistemon viminalis* (Weeping Lillypilly)	350	5	3	Fair	Good	Crown density 25-50%. Branch inclusion/s, minor. Wound/s, advanced stages of decay.	5-15	Low	Consider for Removal	4.2	2.2	Retain. No works in TPZ.
11	*Glochidion ferdinandi* (Cheese Tree)	300	7	4	Good	Fair	Partially suppressed. Branch inclusion/s, major. Cluster wedge. Wound/s, early stages of decay.	5-15	Moderate	Consider for Retention	3.6	2	Retain. No works in TPZ.
12	*Callistemon viminalis* (Weeping Lillypilly)	150 av	4	2	Good	Good	Group of 7. Partially suppressed. Wound/s, early stages of decay.	5-15	Low	Consider for Removal	2	1.5	Retain. No works in TPZ.
13	*Eucalyptus capitellata* (Brown Stringybark)	600	18	7	Fair	Fair	Crown density 50-75%. Small (<25mm) & medium (25-75mm) diameter deadwood in moderate volumes. Wound/s, early stages of decay. Adaptive growth.	5-15	Moderate	Consider for Retention	7.2	2.7	Retain. No works in TPZ.
14	*Eucalyptus nicholii* (Narrow Leaf Peppermint)	400	17	3	Good	Good	Small (<25mm) diameter deadwood in low volumes. Previous branch failure/s. Wound/s, early stages of decay.	15-40	Moderate	Consider for Retention	4.8	2.3	Retain. No works in TPZ.
15	*Melaleuca styphelioides* (Prickly Tea Tree)	400	8	4	Good	Good	Damage to adjacent retaining wall. Restricted growing environment.	5-15	Moderate	Consider for Retention	4.8	2.3	Retain. No works in TPZ.
16	*Leptospermum petersonii* (Lemon Scented Tea Tree)	200	4	4	Fair	Good	Small (<25mm) diameter deadwood in moderate volumes. Phototropic lean, moderate.	5-15	Low	Consider for Removal	2.4	1.7	Retain. No works in TPZ.
17	*Glochidion ferdinandi* (Cheese Tree)	200	5	2	Good	Fair	Branch inclusion/s, minor. Wound/s, early stages of decay. Partially suppressed.	15-40	Low	Consider for Removal	2.4	1.7	Retain. No works in TPZ.
18	*Glochidion ferdinandi* (Cheese Tree)	300	12	3	Good	Good	Partially suppressed.	15-40	Moderate	Consider for Retention	3.6	2	Retain. No works in TPZ.

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	TPZ (m)	SRZ (m)	Implication
19	*Syncarpia glomulifera* (Turpentine)	200 200	10	4	Good	Fair	Co-dominant inclusion. Partially suppressed.	15-40	Moderate	Consider for Retention	2.4	1.7	Retain. No works in TPZ.
20	*Jacaranda mimosifolia* (Jacaranda)	250	9	5	Good	Fair	Phototropic lean, moderate. nab	15-40	Moderate	Consider for Retention	3	1.9	Retain. No works in TPZ.
21	*Syagrus romanzoffianum* (Cocos Palm)	300	9	0	Good	Good	No access to base.	<5	Low	Priority for Removal	3.6	2	Retain. No works in TPZ.
22	*Glochidion ferdinandi* (Cheese Tree)	450	7	5	Good	Good	Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	5.4	2.4	Retain. No works in TPZ.
23	*Lagerstroemia indica* (Crepe Myrtle)	200	5	2	Good	Fair	Lopped with resultant epicormic growth.	15-40	Low	Consider for Removal	2.4	1.7	Retain. No works in TPZ.
24	*Glochidion ferdinandi* (Cheese Tree)	500 at grade	7	5	Good	Fair	Branch inclusion/s, minor. Previous branch failure/s. Wound/s, early stages of decay.	15-40	Moderate	Consider for Retention	6	2.5	Retain. No works in TPZ.
25	*Lagerstroemia indica* (Crepe Myrtle)	250 250 250 250	7	5	Good	Fair	Wound/s, advanced stages of decay.	15-40	Moderate	Consider for Retention	4.8	2.3	Retain. No works in TPZ.
26	*Camellia japonica* (Camellia)	300 at grade	4	2	Good	Fair	Group of 2. Partially suppressed. Wound/s, early stages of decay.	15-40	Low	Consider for Removal	3.6	2	Retain. No works in TPZ.
27	*Lagerstroemia indica* (Crepe Myrtle)	300 at grade	9	6	Fair	Fair	Group of 2. Partially suppressed. Wound/s, early stages of decay.	5-15	Low	Consider for Removal	3.6	2	Retain. No works in TPZ.
28	*Ilex* spp	500 at grade	6	6	Good	Good	Wound/s, early stages of decay.	15-40	Moderate	Consider for Retention	6	2.5	Retain. No works in TPZ.
29	*Jacaranda mimosifolia* (Jacaranda)	300	14	3	Good	Fair	Partially suppressed. Large (>75mm) diameter deadwood in low volumes. Abrasion damage from adjacent tree.	5-15	Low	Consider for Removal	3.6	2	Retain. No works in TPZ.

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	TPZ (m)	SRZ (m)	Implication
30	*Cupressus sempervirens* 'Stricta' (Italian Cypress)	300	8	2	Fair	Good	Medium (25-75mm) diameter deadwood in low volumes. Partially suppressed.	5-15	Moderate	Consider for Retention	3.6	2	Retain. No works in TPZ.
31	*Ligustrum lucidum* (Small Leaf Privet)	400	10	3	Good	Good	Noxious weed.	<5	Low	Priority for Removal	4.8	2.3	Retain. No works in TPZ.
32	*Liquidambar styraciflua* (Liquidambar)	800	14	6	Good	Good	Wound/s, early stages of decay. Girdled roots.	15-40	Moderate	Consider for Retention	9.6	3.1	Retain. No works in TPZ.
33	*Cupressus sempervirens* 'Stricta' (Italian Cypress)	300	11	2	Good	Good		15-40	Moderate	Consider for Retention	3.6	2	Retain. No works in TPZ.
34	*Lagerstroemia indica* (Crepe Myrtle)	200	7	4	Fair	Fair	Partially suppressed. Crown density 75-100%. Wound/s, advanced stages of decay.	5-15	Low	Consider for Removal	2.4	1.7	Retain. No works in TPZ.
35	*Lagerstroemia indica* (Crepe Myrtle)	600 at grade	7	4	Good	Fair	Coppice stool. Crown density 75-100%.	15-40	Low	Consider for Removal	7.2	2.7	Retain. No works in TPZ.
36	*Lagerstroemia indica* (Crepe Myrtle)	500 at grade	7	4	Good	Good	Wound/s, no visible signs of decay.	15-40	Moderate	Consider for Retention	6	2.5	Retain. No works in TPZ.
37	*Lagerstroemia indica* (Crepe Myrtle)	300	6	0	Good	Good	Partially suppressed. Wound/s, advanced stages of decay.	5-15	Moderate	Consider for Retention	3.6	2	Retain. No works in TPZ.
38	*Lagerstroemia indica* (Crepe Myrtle)	300	6	0	Good	Good	Partially suppressed. Wound/s, advanced stages of decay.	5-15	Moderate	Consider for Retention	3.6	2	Retain. No works in TPZ.
39	*Syncarpia glomulifera* (Turpentine)	650	14	5	Fair	Fair	Branch inclusion/s, major. Crown density 75-100%. Small (<25mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	7.8	2.8	Retain. No works in TPZ.
40	*Glochidion ferdinandi* (Cheese Tree)	250 250 250	8	4	Good	Fair	Branch inclusion/s, major.	15-40	Moderate	Consider for Retention	5.4	2.4	Retain. No works in TPZ.
41	*Lagerstroemia indica* (Crepe Myrtle)	600 at grade	6	4	Poor	Fair	Covered in wisteria.	<5	Low	Priority for Removal	7.2	2.7	Retain. No works in TPZ.

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	TPZ (m)	SRZ (m)	Implication
42	*Sapium sebiferum* (Chinese Tallow Tree)	450	8	4	Good	Good	Wound/s, early stages of decay.	15-40	Moderate	Consider for Retention	5.4	2.4	Retain. No works in TPZ.
43	*Callistemon viminalis* (Weeping Bottlebrush)	300, 250	8	5	Fair	Fair	Crown density 75-100%. Small (<25mm) diameter deadwood in moderate volumes. Co-dominant inclusion.	5-15	Moderate	Consider for Retention	4.8	2.5	Retain. No works in TPZ.
44	*Glochidion ferdinandi* (Cheese Tree)	100	5	2	Good	Good	Growing at base of wall.	5-15	Low	Consider for Removal	2	1.5	Retain. No works in TPZ.
45	*Michelia figo* (Port Wine Magnolia)	900 at grade	4	3	Good	Fair	Coppice stool.	5-15	Low	Consider for Removal	10.8	3.2	Retain. No works in TPZ.
46	*Lagerstroemia indica* (Crepe Myrtle)	550 at grade	5	3	Good	Fair	Lopped with resultant epicormic growth. Wound/s, advanced stages of decay.	5-15	Low	Consider for Removal	6.6	2.6	Retain. No works in TPZ.
47	*Callistemon viminalis* (Weeping Lillypilly)	250 av	7	3	Good	Good	Group of 6. Partially suppressed.	5-15	Low	Consider for Removal	3	1.9	Retain. No works in TPZ.
48	*Leptospermum petersonii* (Lemon Scented Tea Tree)	300 av	6	3	Good	Good	Group of 6. Partially suppressed. Small (<25mm) diameter deadwood in moderate volumes.	5-15	Low	Consider for Removal	3.6	2	Retain. No works in TPZ.
49	*Tristaniopsis laurina* (Water Gum)	250 max	4	2	Good	Good	Group of 4 street trees in nature strip. Wound/s, early stages of decay.	15-40	Low	Consider for Removal	3	1.9	Retain. No works in TPZ.
50	*Glochidion ferdinandi* (Cheese Tree)	400 at grade					Located in neighbouring property.			Priority for Retention	4.8	2.3	Retain. No works in TPZ.
51	*Jacaranda mimosifolia* (Jacaranda)	300	5	3	Good	Good	Wound/s, early stages of decay.	15-40	Moderate	Consider for Retention	3.6	2	Retain. No works in TPZ.
52	*Tristaniopsis laurina* (Water Gum)	200 max					Group of 5.			Priority for Retention	2.4	1.7	Remove.
53	*Acacia binervea* (Coast Myall)	75	4	2	Good	Good		15-40	Low	Consider for Removal	2	1.5	Remove.

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54	*Corymbia maculata* (Spotted Gum)	900	22	8	Good	Good	Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	40+	High	Priority for Retention	10.8	3.2	Remove.
55	*Melia azedarach* (White Cedar)	350	11	4	Fair	Good	Partially suppressed. Medium (25-75mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	4.2	2.2	Retain. Use tree sensitive construction methods.
56	*Eucalyptus pilularis* (Blackbutt)	900	24	10	Good	Good	Medium (25-75mm) diameter deadwood in low volumes. Roots and base of trunk lifting pavement.	15-40	High	Priority for Retention	10.8	3.2	Retain. Use tree sensitive construction methods.
57	*Syncarpia glomulifera* (Turpentine)	500 400	13	5	Good	Fair	Co-dominant inclusion. Partially suppressed.	15-40	Moderate	Consider for Retention	7.8	2.8	Retain. Use tree sensitive construction methods.
58	*Viburnum odorattissma* (Sweet Viburnum)	100	5	2	Good	Fair	Group of 5. Branch inclusion/s, minor.	15-40	Low	Consider for Removal	2	1.5	Remove.
59	*Banksia integrifolia* (Coastal Banksia)	100	5	2	Good	Good		15-40	Low	Consider for Removal	2	1.5	Retain. No works in TPZ.
60	*Grevillea* spp.	100	4	2	Good	Good		5-15	Low	Consider for Removal	2	1.5	Retain. No works in TPZ.
61	*Banksia integrifolia* (Coastal Banksia)	100	7	2	Good	Good		15-40	Low	Consider for Removal	2	1.5	Retain. No works in TPZ.
62	*Melaleuca* spp (Tea Tree)	150	4	2	Good	Fair	Group of 4. Branch inclusion/s, minor. Partially suppressed.	5-15	Low	Consider for Removal	2	1.5	Retain. No works in TPZ.
63	*Callistemon viminalis* (Weeping Lillypilly)	250	7	3	Good	Good	Group of 3. Small (<25mm) diameter deadwood in low volumes. Wound/s, no visible signs of decay. Partially suppressed.	5-15	Moderate	Consider for Retention	3	1.9	Remove.

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64	*Callistemon viminalis* (Weeping Lillypilly)	400	5	3	Good	Fair	Co-dominant inclusion. Crown density 75-100%.	5-15	Moderate	Consider for Retention	4.8	2.3	Remove.
65	*Glochidion ferdinandi* (Cheese Tree)	600	9	7	Good	Good	Wound/s, early stages of decay.	15-40	Moderate	Consider for Retention	7.2	2.7	Remove.
66	*Fraxinus* spp.	300	9	4	Good	Good	Small (<25mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	3.6	2	Remove.
67	*Fraxinus* spp.	100	4	2	Good	Good		40+	Low	Consider for Removal	2	1.5	Remove.
68	*Acer negundo* (Box Elder)	300	5	4	Good	Good	Wound/s, no visible signs of decay.	15-40	Moderate	Consider for Retention	3.6	2	Remove.
69	*Elaeocarpus reticulatus* (Blueberry Ash)	100	5	2	Good	Good		15-40	Low	Consider for Removal	2	1.5	Remove.
70	*Callistemon viminalis* (Weeping Lillypilly)	500	7	4	Fair	Fair	Crown density 50-75%. Branch inclusion/s, minor.	5-15	Moderate	Consider for Retention	6	2.5	Remove.
71	*Corymbia maculata* (Spotted Gum)	500	17	5	Good	Good	Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes. Crown density 75-100%. Partially suppressed.	15-40	Moderate	Consider for Retention	6	2.5	Remove.
72	*Corymbia maculata* (Spotted Gum)	800	19	8	Good	Good	Previous branch failure/s. Wound/s, early stages of decay.	15-40	High	Priority for Retention	9.6	3.1	Remove.
73	*Callistemon viminalis* (Weeping Lillypilly)	350	5	4	Good	Good	Crown density 75-100%. Partially suppressed.	5-15	Low	Consider for Removal	4.2	2.2	Remove.
74	*Acer japonicum* (Japanese Maple)	450 at grade	4	5	Good	Good	Branch inclusion/s, minor.	15-40	Moderate	Consider for Retention	5.4	2.4	Remove.
75	*Archontophoenix cunninghamiana* (Bangalow Palm)	200 200	9	2	Good	Good		15-40	Moderate	Consider for Retention	3.6	2	Remove.

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76	*Angophora costata* (Sydney Red Gum)	600 600	18	9	Fair	Good	Co-dominant inclusion. Crown density 50-75%. Medium (25-75mm) diameter deadwood in moderate volumes. Medium (25-75mm) epicormic growth in low volumes.	5-15	High	Consider for Retention	10.2	3.1	Remove.
77	*Eucalyptus scoparia* (Wallangarra White Gum)	250	6	4	Fair	Good	Crown density 50-75%.	5-15	Moderate	Consider for Retention	3	1.9	Remove.
78	*Araucaria cunninghamii* (Hoop Pine)	900	24	5	Good	Good	Partially suppressed.	40+	High	Priority for Retention	10.8	3.2	Remove.
79	*Araucaria cunninghamii* (Hoop Pine)	1000	24	5	Good	Good	Partially suppressed.	40+	High	Priority for Retention	12	3.4	Remove.
80	*Archontophoenix cunninghamiana* (Bangalow Palm)	250	10	2	Good	Good	Group of 4.	15-40	Moderate	Consider for Retention	3	1.9	Remove.
81	*Eucalyptus robusta* (Swamp Mahogany)	450								Priority for Retention	5.4	2.4	Retain. No works in TPZ.
82	*Eucalyptus robusta* (Swamp Mahogany)	600								Priority for Retention	7.2	2.7	Retain. No works in TPZ.
83	*Eucalyptus robusta* (Swamp Mahogany)	600								Priority for Retention	7.2	2.7	Retain. No works in TPZ.
84	*Araucaria cunninghamii* (Hoop Pine)	600	13	3	Good	Good	Root crown damaging kerb and water pipes at base.	15-40	Moderate	Consider for Retention	7.2	2.7	Remove.
85	*Callistemon viminalis* (Weeping Lillypilly)	400 at grade	7	3	Fair	Fair	Partially suppressed. Wound/s, early stages of decay. Branch inclusion/s, minor.	5-15	Low	Consider for Removal	4.8	2.3	Remove.
86	*Backhousia citriodora* (Lemon Scented Myrtle)	250	7	3	Good	Good	Partially suppressed. Growing through crown of Tree 85.	15-40	Moderate	Consider for Retention	3	1.9	Remove.
87	*Araucaria cunninghamii* (Hoop Pine)	800	22	6	Good	Good	Group of 8. Located outside of site. Partially suppressed.	40+	High	Priority for Retention	9.6	3.1	Retain. No works in TPZ.

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88	*Banksia integrifolia* (Coastal Banksia)	250	9	2	Good	Good	Group of 2.	15-40	Moderate	Consider for Retention	3	1.9	Remove.
89	*Loropetalum* spp. (Fringe Flower)	300 at grade	4	3	Good	Good	Group of 3.	5-15	Low	Consider for Removal	3.6	2	Retain. No works in TPZ.
90	*Callistemon viminalis* (Weeping Lillypilly)	300 at grade	6	4	Good	Good		15-40	Moderate	Consider for Retention	3.6	2	Remove.
91	*Syzygium paniculatum*(Lillypilly)	300	5	2	Good	Fair	Group of 3. Branch inclusion/s, minor. Partially suppressed.	40+	Low	Consider for Removal	3.6	2	Remove.
92	*Callistemon viminalis* (Weeping Lillypilly)	250	5	3	Good	Good	Partially suppressed.	5-15	Low	Consider for Removal	3	1.9	Remove.
93	*Acacia binervia* (Coast Myall)	200	5	3	Fair	Good	Crown density 50-75%. Wound/s, early stages of decay.	5-15	Low	Consider for Removal	2.4	1.7	Remove.
94	*Banksia integrifolia* (Coastal Banksia)	150	5	3	Good	Good		15-40	Low	Consider for Removal	2	1.5	Remove.
95	*Robinia pseudoacacia* 'Frisia' (Golden Robinia)	400	9	5	Good	Good	Wound/s, early stages of decay.	15-40	Moderate	Consider for Retention	4.8	2.3	Retain. Use tree sensitive construction methods.
96	*Eucalyptus saligna* (Sydney Blue Gum)	450	18	5	Good	Good	Crown density 75-100%.	15-40	Moderate	Consider for Retention	5.4	2.4	Retain. Use tree sensitive construction methods.
97	*Callistemon viminalis* (Weeping Lillypilly)	200	6	2	Good	Good	Partially suppressed.	15-40	Low	Consider for Removal	2.4	1.7	Retain. Use tree sensitive construction methods.
98	*Callistemon viminalis* (Weeping Lillypilly)	250	6	3	Good	Good		15-40	Moderate	Consider for Retention	3	1.9	Retain. Use tree sensitive construction methods.

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99	*Banksia integrifolia* (Coastal Banksia)	150	6	2	Good	Fair	Co-dominant inclusion.	15-40	Low	Consider for Removal	2	1.5	Remove.
100	*Ceratopetalum gummiferum* (NSW Christmas Bush)	100	5	2	Good	Good		5-15	Low	Consider for Removal	2	1.5	Remove.
101	*Glochidion ferdinandi* (Cheese Tree)	300 250								Priority for Retention	4.8	2.4	Remove.
102	*Glochidion ferdinandi* (Cheese Tree)	500 400								Priority for Retention	8	3	Remove.
103	*Eucalyptus botryoides* (Bangalay)	650	14	7	Good	Good	Small (<25mm) diameter deadwood in low volumes. Wound/s, early stages of decay. Medium (25-75mm) epicormic growth in low volumes. Climber in crown.	15-40	Moderate	Consider for Retention	7.8	2.8	Remove.
104	*Eucalyptus robusta* (Swamp Mahogany)	750	15	8	Fair	Fair	Crown density 50-75%. Small (<25mm) epicormic growth in low volumes. in high volumes. Small (<25mm), medium (25-75mm) & large (>75mm) diameter deadwood in moderate volumes. Dead first order stem with Phellinus bracket.	<5	Moderate	Priority for Removal	9	3.1	Remove.
105	*Camellia* spp. (Camellia)	150	4	2	Good	Good	Group of 3.	5-15	Low	Consider for Removal	2	1.5	Remove.
106	*Ligustrum sinense* (Small Leaf Privet)	350 at grade	3	0	Good	Fair		<5	Low	Priority for Removal	4.2	2.2	Remove.
107	*Cinnamomum camphora* (Camphor Laurel)	500 at grade	4	2	Good	Fair	Coppiced stool.	<5	Low	Priority for Removal	6	2.5	Remove.

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108	*Lagerstroemia indica* (Crepe Myrtle)	750 av at grade	7	4	Good	Fair	Wound/s, early stages of decay. Small (<25mm) diameter deadwood in low volumes.	5-15	Low	Consider for Removal	8.4	3.1	Remove.
109	Citrus sp. (Citrus Tree)	150	3	2	Good	Fair	Wound/s, no visible signs of decay.	5-15	Low	Consider for Removal	2	1.5	Remove.
110	*Schefflera actinophylla* (Queensland Umbrella Tree)	450 at grade	5	2	Good	Fair	Branch inclusion/s, minor.	5-15	Low	Consider for Removal	5.4	2.4	Remove.
111	*Liquidamber styraciflua* (Liquidambar)	300 at grade	4	2	Good	Fair	Coppiced stool.	<5	Low	Priority for Removal	3.6	2	Remove.
112	*Jacaranda mimosifolia* (Jacaranda)	450 350 400 300	11	8	Good	Fair	Small (<25mm) epicormic growth in low volumes. Lopped first order branch. Wound/s, no visible signs of decay. Branch inclusion/s, minor.	15-40	Moderate	Consider for Retention	9	3	Remove.
113	*Glochidion ferdinandi* (Cheese Tree)	200	7	3	Poor	Good	Crown density 25-50%. Small (<25mm) diameter deadwood in moderate volumes.	5-15	Low	Consider for Removal	2.4	1.7	Remove.
114	*Glochidion ferdinandi* (Cheese Tree)	200	6	3	Good	Good	Partially suppressed. Branch inclusion/s, minor.	40+	Low	Consider for Removal	2.4	1.7	Remove.
115	*Cotoneaster* spp. (Cotoneaster)	900 at grade	5	4	Good	Fair		<5	Low	Priority for Removal	10.8	3.2	Remove.
116	*Camellia* spp. (Camellia)	100	2	1	Good	Good		5-15	Low	Priority for Removal	2	1.5	Remove.
117	*Magnolia grandiflora* (Bull Bay Magnolia)	400	7	4	Good	Good	Wound/s, advanced stages of decay.	15-40	Moderate	Consider for Retention	4.8	2.3	Remove.
118	*Cupressus* spp. (Cypress Pine)	300 300 200	7	4	Fair	Fair	Crown density 50-75%. Small (<25mm) diameter deadwood in moderate volumes. Co-dominant inclusion.	5-15	Moderate	Consider for Retention	5.7	2.6	Remove.

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119	*Plumeria acutifolia* (Frangipani)	250 250	3	4	Good	Good		15-40	Low	Consider for Removal	4.3	2.4	Remove.
120	*Schefflera actinophylla* (Queensland Umbrella Tree)	600 at grade	5	3	Fair	Fair	Wound/s, early stages of decay. Branch inclusion/s, minor.	5-15	Low	Consider for Removal	7.2	2.7	Remove.
121	*Pittosporum undulatum* (Native Daphne)	300	5	4	Good	Good		15-40	Low	Consider for Removal	3.6	2	Remove.
122	*Cinnamomum camphora* (Camphor Laurel)	150	6	2	Good	Fair	Group of 5. Appears to be self-seeded. Partially suppressed.	<5	Low	Priority for Removal	2	1.5	Remove.
123	*Melia azedarach* (White cedar)	150	5	4	Good	Fair	Partially suppressed. Lopped. Poor form.	<5	Low	Priority for Removal	2	1.5	Remove.
124	*Bauhinia variegata* (Orchid tree)	150	5	2	Fair	Good	Crown density 25-50%. Small (<25mm) diameter deadwood in moderate volumes.	5-15	Low	Consider for Removal	2	1.5	Remove.
125	*Brachychiton acerifolius* (Illawarra Flame tree)	400	10	3	Good	Good	Small (<25mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	4.8	2.3	Remove.
126	*Glochidion ferdinandi* (Cheese Tree)	550	8	5	Fair	Good	Crown density 75-100%. Wound/s, early stages of decay. Branch inclusion/s, minor.	15-40	Moderate	Consider for Retention	6.6	2.6	Remove.
127	*Glochidion ferdinandi* (Cheese Tree)	350	7	5	Good	Good	Partially suppressed.	15-40	Moderate	Consider for Retention	4.2	2.2	Remove.
128	*Melaleuca quinquenervia* (Broad Leaf Paperbark)	300					Group of 4. Located in neighbouring property.			Priority for Retention	3.6	2	Retain. Use tree sensitive construction methods.
129	*Glochidion ferdinandi* (Cheese Tree)	250 250	9	4	Good	Fair	Wound/s, advanced stages of decay. Pruned/lopped for line clearance.	5-15	Moderate	Consider for Retention	4.3	2.4	Remove.

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	TPZ (m)	SRZ (m)	Implication
130	*Glochidion ferdinandi* (Cheese Tree)	700	8	5	Good	Good	Crown density 75-100%. Small (<25mm) diameter deadwood in low volumes. Pruned/lopped for line clearance.	5-15	Moderate	Consider for Retention	8.4	3.1	Remove.
131	*Glochidion ferdinandi* (Cheese Tree)	300	6	3	Good	Fair	Wound/s, early stages of decay. Pruned/lopped for line clearance.	15-40	Moderate	Consider for Retention	3.6	2	Remove.
132	*Glochidion ferdinandi* (Cheese Tree)	300 300	6	3	Good	Fair	Co-dominant inclusion. Wound/s, early stages of decay. Medium (25-75mm) diameter deadwood in low volumes. Pruned/lopped for line clearance.	15-40	Moderate	Consider for Retention	5.2	2.4	Remove.
133	*Cupressocyparis leylandii 'Leighton Green'* (Leighton's Green)	450	7	3	Good	Good	Partially suppressed.	15-40	Moderate	Consider for Retention	5.4	2.4	Remove.
134	*Pinus* spp. (Pine Tree)	400								Priority for Retention	4.8	2.3	Remove.
135	*Prunus* spp. (Flowering Cherry)	400 at grade								Priority for Retention	4.8	2.3	Remove.
136	*Sapium sebiferum* (Chinese Tallow Tree)	400	8	3	Good	Fair	Lopped with resultant epicormic growth at 3m.	15-40	Moderate	Consider for Retention	4.8	2.3	Remove.
137	*Glochidion ferdinandi* (Cheese Tree)	150	4	2	Good	Good		40+	Low	Consider for Removal	2	1.5	Remove.
138	*Prunus* spp. (Flowering Cherry)	250 at grade	4	3	Good	Good		5-15	Low	Consider for Removal	3	2.2	Remove.
139	*Acmena smithii* 'Minor' (Lillypilly Small Growing Form)	150	4	2	Good	Fair	Lopped at 2m.	5-15	Low	Consider for Removal	2	1.5	Remove.

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	TPZ (m)	SRZ (m)	Implication
140	*Callistemon viminalis* (Weeping Bottlebrush)	400	8	6	Fair	Poor	Crown density 75-100%. Co-dominant inclusion. Wound/s, early stages of decay. Poor form.	5-15	Low	Consider for Removal	4.8	2.3	Remove.
141	*Glochidion ferdinandi* (Cheese Tree)	500	9	5	Fair	Fair	Crown density 50-75%. Wound/s, early stages of decay. Small (<25mm) diameter deadwood in moderate volumes. Previous branch failure/s.	5-15	Moderate	Consider for Retention	6	2.5	Remove.
142	*Lagerstroemia indica* (Crepe Myrtle)	250 50	6	4	Good	Good		15-40	Low	Consider for Removal	3	1.9	Remove.
143	*Cupressus sempervirens* 'Stricta' (Italian Cypress)	300	7	2	Fair	Good	Medium (25-75mm) diameter deadwood in low volumes. Crown density 50-75%. Branch inclusion/s, minor.	5-15	Moderate	Consider for Retention	3.6	2	Remove.
144	*Lagerstroemia indica* (Crepe Myrtle)	300	4	3	Good	Fair	Lopped with resultant epicormic growth. Wound/s, early stages of decay.	5-15	Low	Consider for Removal	3.6	2	Remove.
145	*Glochidion ferdinandi* (Cheese Tree)	150, 100, 100	6	2	Good	Fair	Group of 2. Partially suppressed. Co-dominant inclusion larger tree. Close to powerlines, future pruning may be required for clearance.	15-40	Low	Consider for Removal	2.5	2	Remove.
146	*Acmena smithii* 'Minor' (Small Growing Form Lillypilly)	150 at grade	4	2	Good	Fair	Co-dominant inclusion.	5-15	Low	Consider for Removal	2	1.5	Remove.
147	*Ulmus parvifolia* (Chinese Weeping Elm)	200	6	3	Good	Good		15-40	Low	Consider for Removal	2.4	1.7	Remove.
148	*Cupressus* spp. (Cypress Pine)	400 at grade max	8	3	Good	Fair	Group of 8 mixed Cypress species. Branch inclusion/s, major. Pruned/lopped for line clearance.	5-15	Moderate	Consider for Retention	4.8	2.3	Remove.

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	TPZ (m)	SRZ (m)	Implication
149	*Nerium oleander* (Oleander)	900 at grade	6	3	Good	Fair	Multi stemmed from base. Branch inclusion/s, minor.	5-15	Low	Consider for Removal	10.8	3.2	Remove.
150	*Glochidion ferdinandi* (Cheese Tree)	150, 150	8	3	Good	Fair	Group of 2. Partially suppressed. Co-dominant inclusion.	15-40	Low	Consider for Removal	2.6	2.2	Remove.
151	*Ceratopetalum gummiferum* (NSW Christmas Bush)	150	7	3	Good	Good		5-15	Moderate	Consider for Retention	2	1.5	Remove.
152	*Callistemon viminalis* (Weeping Bottlebrush)	300 200	6	6	Poor	Good	Crown density 0-25%. Small (<25mm) diameter deadwood in moderate volumes.	<5	Moderate	Priority for Removal	4.4	2.5	Remove.
153	*Cupressus macrocarpa* 'Brunnianan Aurea' (Golden Monterey Cypress)	900 at grade	10	3	Good	Fair	Exempt species. Branch inclusion/s, minor. Small (<25mm) diameter deadwood in moderate volumes. Cable occluded on trunk.	5-15	Moderate	Consider for Retention	10.8	3.2	Remove.
154	*Brachychiton acerifolius* (Illawarra Flame tree)	450	9	2	Fair	Poor	Heavily suppressed. Poor form. Wound/s, early stages of decay.	<5	Low	Priority for Removal	5.4	2.4	Remove.
155	*Glochidion ferdinandi* (Cheese Tree)	850	11	7	Good	Fair	Branch inclusion/s, minor. Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes. Rope occluded on first order branch.	15-40	High	Priority for Retention	10.2	3.3	Remove.
156	*Cinnamomum camphora* (Camphor Laurel)	550	7	4	Poor	Poor	Large (>75mm) diameter deadwood in high volumes.	<5	Low	Priority for Removal	6.6	2.6	Remove.
157	*Acmena smithii* 'Minor' (Small Growing Form Lillypilly)	200	7	2	Good	Fair	Group of 5. Branch inclusion/s, minor. Partially suppressed.	15-40	Low	Consider for Removal	2.4	1.7	Remove.
158	*Gordonia axillaris* (Fried Egg Plant)	300 at grade	6	2	Good	Good	Partially suppressed.	15-40	Low	Consider for Removal	3.6	2	Remove.
159	*Cinnamomum camphora* (Camphor Laurel)	350 x5 350 350								Priority for Retention	9	3	Retain. No works in TPZ.

Appendix 3: Plans

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

SHEET LAYOUT
SCALE 1:1000

CAUTION - SERVICES LOCATIONS

DIAL 1100 BEFORE YOU DIG

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MGA

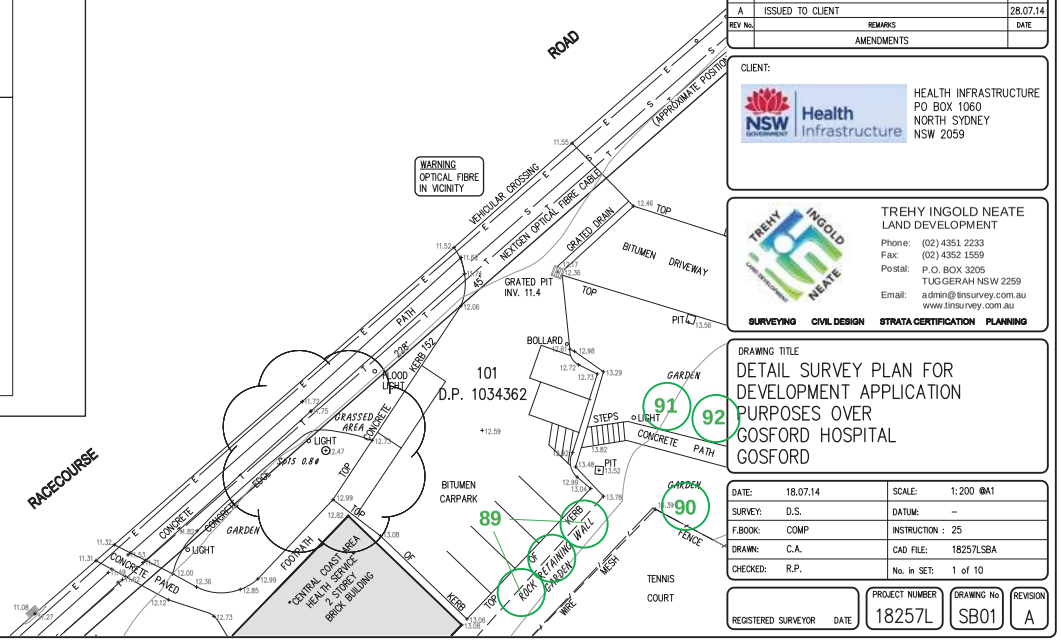
LEGEND

Sewermain	S
Sewer manhole	S
Watermain	W
Water hydrant	W
Water stop valve	W
Telstra line	T
Telstra Pit/Manhole	T
Gasmains	G
Electricity power pole	
Electricity overhead cables	E
Electricity underground cables	UE
Electric Light Pole	ELP
Bench mark	
Top of roof gutter	TG
Tree (Canopy spread, trunk diameter)	

ORIGIN OF LEVELS: SSM 119132
R.L. 28.036 AHD

SCALE 1 : 200

0 5 10 15 20 METRES



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A	ISSUED TO CLIENT	28.07.14
	AMENDMENTS	

CLIENT:

NSW Health Infrastructure

HEALTH INFRASTRUCTURE
PO BOX 1060
NORTH SYDNEY
NSW 2059

TREHY INGOLD NEATE
LAND DEVELOPMENT
Phone: (02) 4351 2233
Fax: (02) 4352 1559
Postal: P.O. BOX 3205
TUGGERAH NSW 2259
Email: admin@tinsurvey.com.au
www.tinsurvey.com.au
SURVEYING CIVIL DESIGN STRATA CERTIFICATION PLANNING

DRAWING TITLE
DETAIL SURVEY PLAN FOR DEVELOPMENT APPLICATION PURPOSES OVER GOSFORD HOSPITAL GOSFORD

DATE:	18.07.14	SCALE:	1:200 @A1
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F.BOOK:	COMP	INSTRUCTION :	25
DRAWN:	C.A.	CAD FILE:	18257LSBA
CHECKED:	R.P.	No. in SET:	1 of 10

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PROJECT NUMBER	DRAWING No	REVISION
18257L	SB01	A

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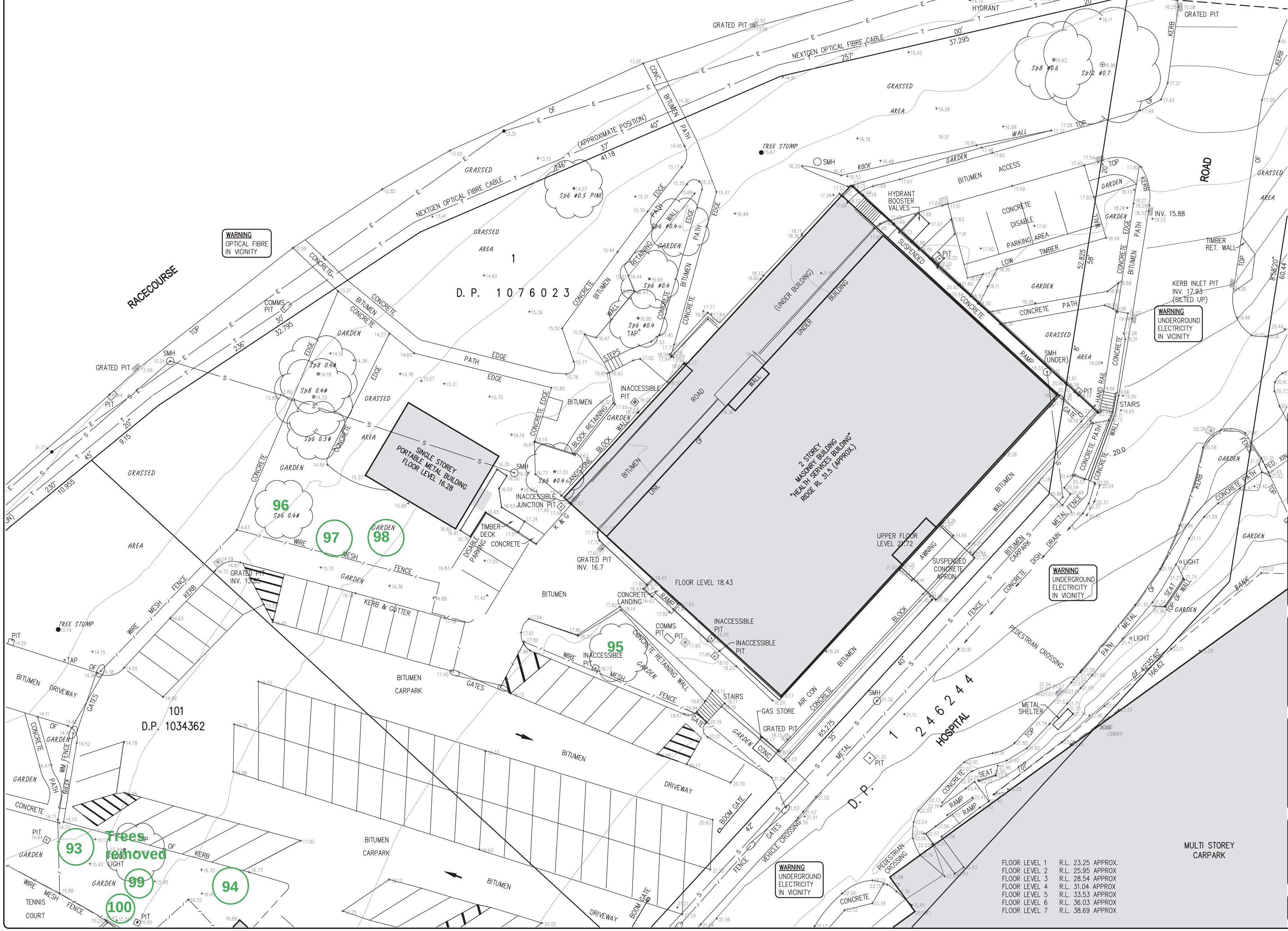

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LEGEND

Sewermain	S
Sewer manhole	S–O–S
Watermain	W
Water hydrant	W
Water stop valve	W
Telstra line	T
Telstra Pit/Manhole	T
Gasmains	G
Electricity power pole	•
Electricity overhead cables	E
Electricity underground cables	UE
Electric Light Pole	ELP
Bench mark	▲
Top of roof gutter	TG
Tree (Canopy spread, trunk diameter)	Sp8 ø0.4

ORIGIN OF LEVELS: SSM 119132 R.L. 28.036 AHD

SCALE 1 : 200

0 5 10 15 20 METRES

FLOOR LEVEL 1	R.L. 23.25 APPROX.
FLOOR LEVEL 2	R.L. 25.95 APPROX
FLOOR LEVEL 3	R.L. 28.54 APPROX
FLOOR LEVEL 4	R.L. 31.04 APPROX
FLOOR LEVEL 5	R.L. 33.53 APPROX
FLOOR LEVEL 6	R.L. 36.03 APPROX
FLOOR LEVEL 7	R.L. 38.69 APPROX

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NSW GOVERNMENT Health Infrastructure

HEALTH INFRASTRUCTURE
PO BOX 1060
NORTH SYDNEY
NSW 2059

TREHY INGOLD NEATE
LAND DEVELOPMENT
Phone: (02) 4351 2233
Fax: (02) 4352 1559
Postal: P.O. BOX 3205
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Email: admin@tinsurvey.com.au
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DRAWING TITLE

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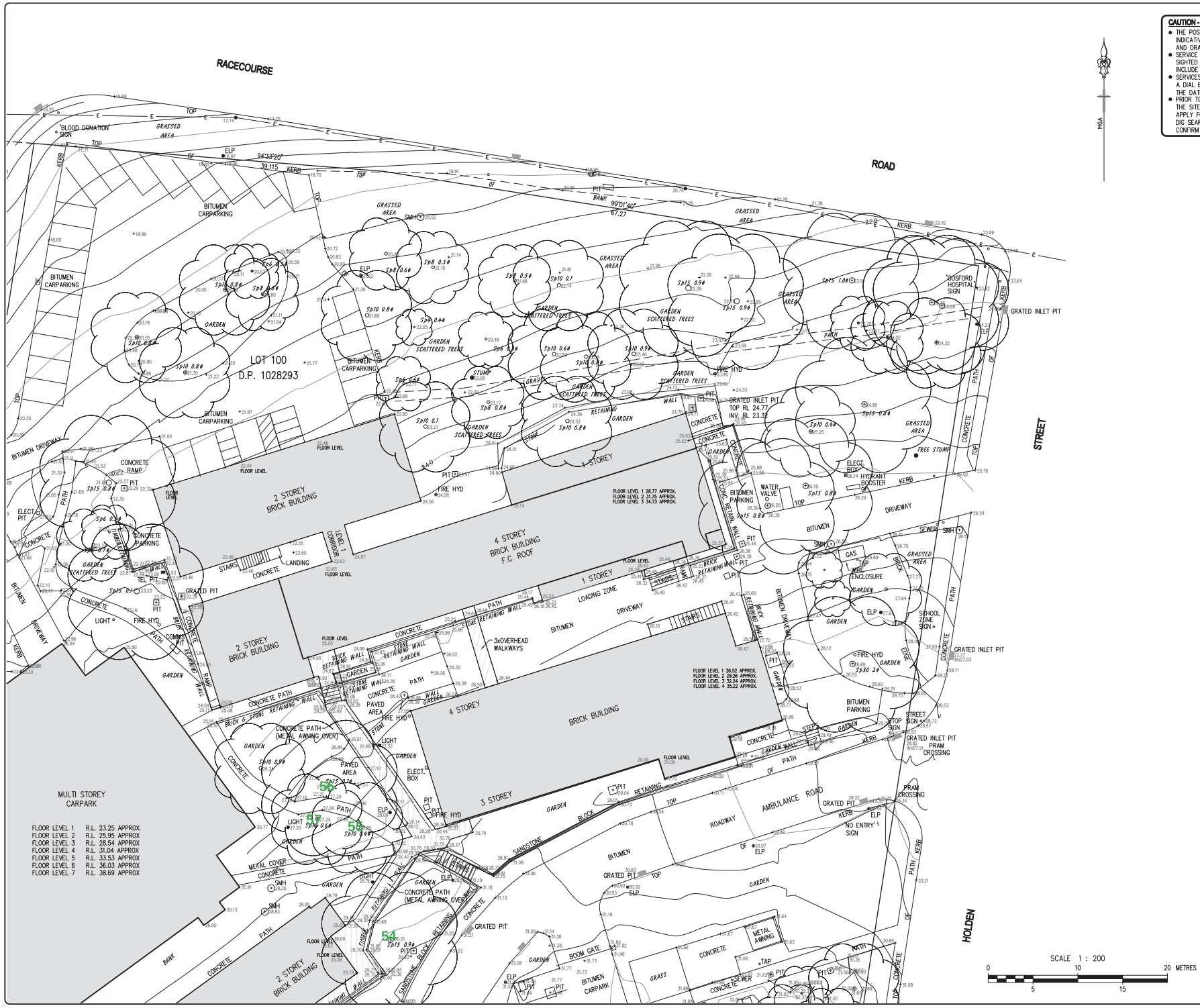
F.BOOK:	COMP	INSTRUCTION:	25
DRAWN:	C.A.	CAD FILE:	18257LSBA
CHECKED:	R.P.	No. in SET:	2 of 10

REGISTERED SURVEYOR DATE	PROJECT NUMBER	DRAWING No	REVISION
	18257L	SB02	A



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LEGEND

Sewermain	S
Sewer manhole	S
Watermain	W
Water hydrant	W
Water stop valve	W
Telstra line	T
Telstra Pit/Manhole	T
Gasmains	G
Electricity power pole	
Electricity overhead cables	E
Electricity underground cables	UE
Electric Light Pole	ELP
Bench mark	▲
Top of roof gutter	TG
Tree (Canopy spread, trunk diameter)	Sp# ⌀#

ORIGIN OF LEVELS: SSM 119132
R.L. 28.036 AHD

REV No.	REMARKS	DATE
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NSW Health Infrastructure
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PO BOX 1060
NORTH SYDNEY
NSW 2059

TREHY INGOLD NEATE
LAND DEVELOPMENT
Phone: (02) 4351 2233
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PROJECT NUMBER	DRAWING No	REVISION
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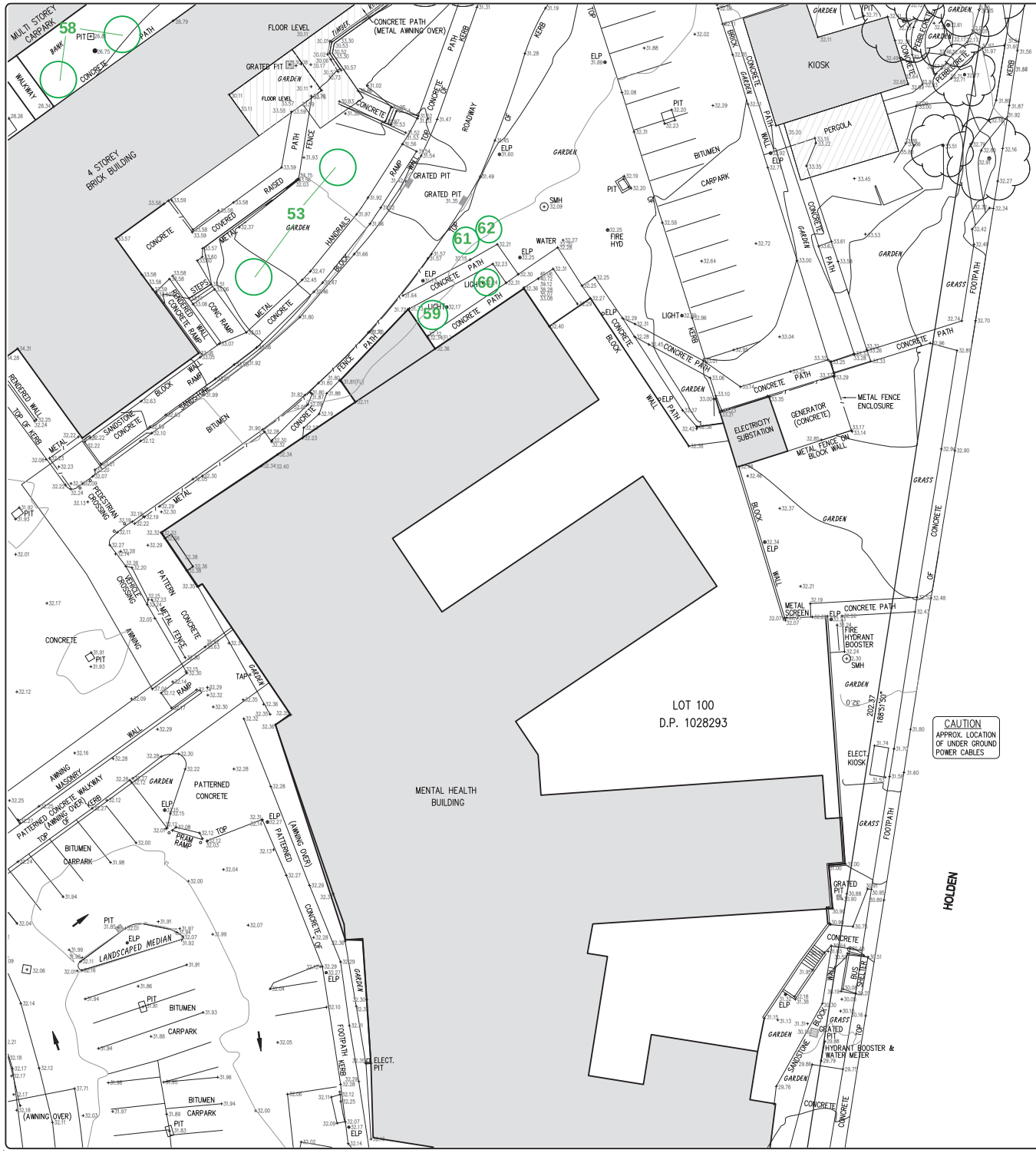

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LEGEND

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Sewer manhole	S
Watermain	W
Water hydrant	W
Water stop valve	W
Telstra line	T
Telstra Pit/Manhole	T
Gasmains	G
Electricity power pole	
Electricity overhead cables	E
Electricity underground cables	UE
Electric Light Pole	ELP
Bench mark	▲
Top of roof gutter	TG
Tree (Canopy spread, trunk diameter)	Spd Ø.Ø

ORIGIN OF LEVELS: SSM 119132
R.L. 28.036 AHD

REV No.	REMARKS	DATE
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F.BOOK:	COMP	INSTRUCTION :	25
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CHECKED:	R.P.	No. In SET:	4 of 10

SCALE 1 : 200
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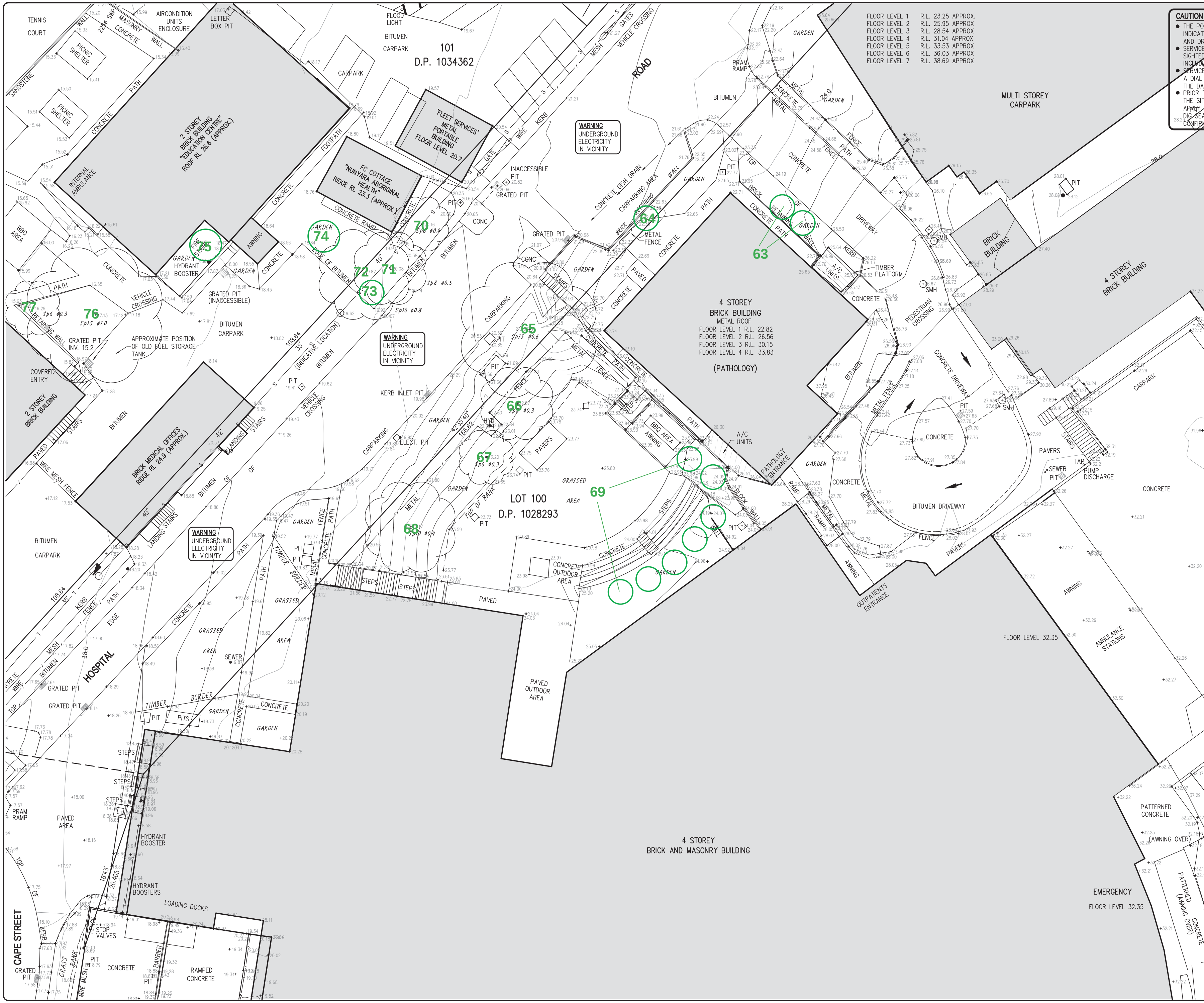
5 15

REGISTERED SURVEYOR DATE	PROJECT NUMBER	DRAWING No	REVISION
	18257L	SB04	A



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Sewer manhole
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Water hydrant
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Gasmains
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Electricity overhead cables
Electricity underground cables
Electric Light Pole — ELP
Bench mark
Top of roof gutter — TG
Tree (Canopy spread, trunk diameter) — Sp8 ø0.4

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R.L. 28.036 AHD

SCALE 1 : 200
0 5 10 15 20 METRES

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LAND DEVELOPMENT
Phone: (02) 4351 2233
Fax: (02) 4352 1559
Postal: P.O. BOX 3205
TUGGERAH NSW 2259
Email: admin@tinsurvey.com.au
www.tinsurvey.com.au
SURVEYING CIVIL DESIGN STRATA CERTIFICATION PLANNING

DRAWING TITLE
DETAIL SURVEY PLAN FOR DEVELOPMENT APPLICATION PURPOSES OVER GOSFORD HOSPITAL GOSFORD

DATE:	18.07.14	SCALE:	1:200 @A1
SURVEY:	D.S.	DATUM:	–
F.BOOK:	COMP	INSTRUCTION :	25
DRAWN:	C.A.	CAD FILE:	18257LSBA
CHECKED:	R.P.	No. in SET:	5 of 10

REGISTERED SURVEYOR	DATE	PROJECT NUMBER	DRAWING No	REVISION
		18257L	SB05	A

CAUTION - SERVICES LOCATIONS

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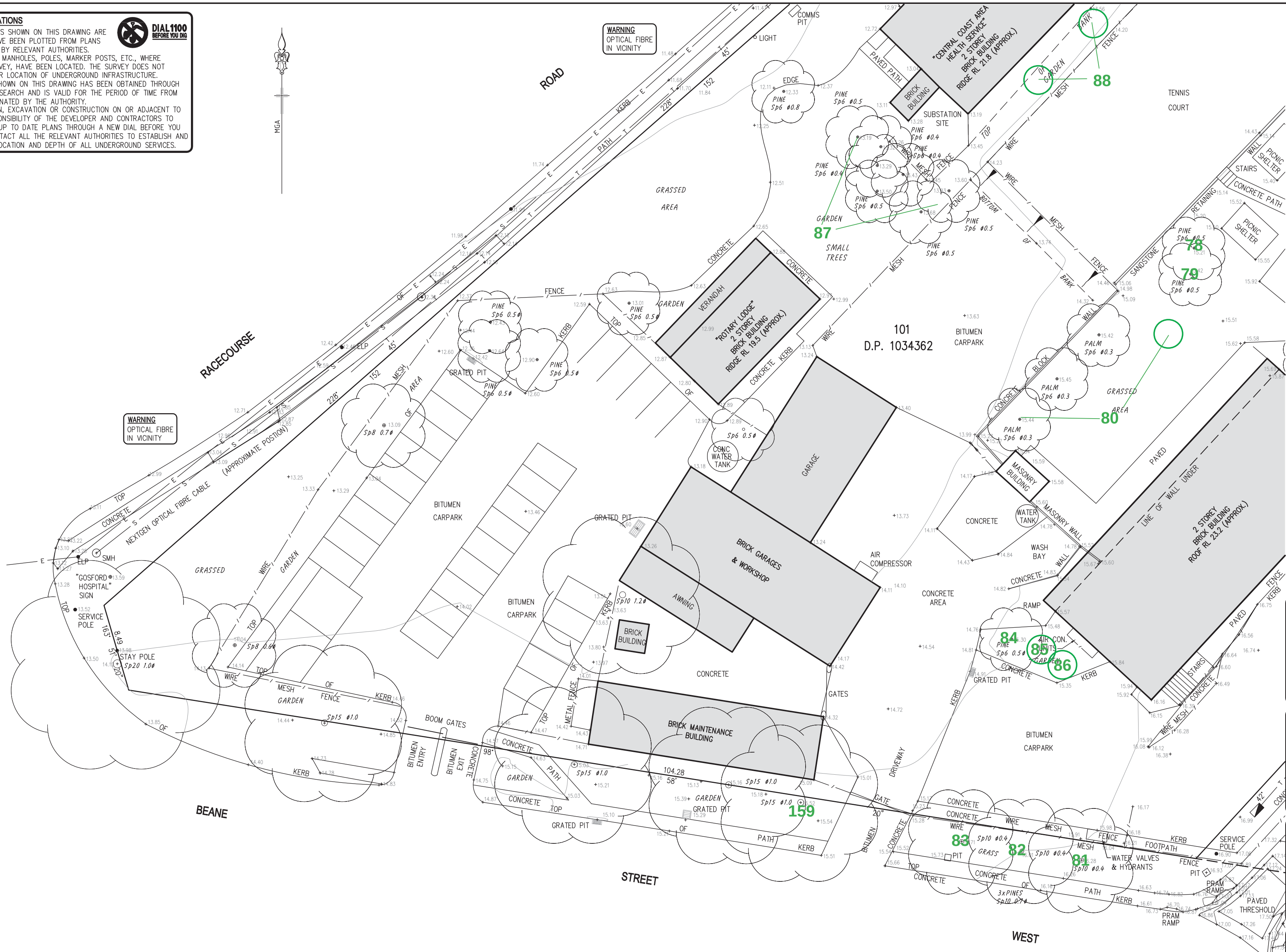
DIAL 1100 BEFORE YOU DIG



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LEGEND

Item	Symbol
Sewermain	S
Sewer manhole	S
Watermain	W
Water hydrant	W
Water stop valve	W
Telstra line	T
Telstra Pit/Manhole	T
Gasmains	G
Electricity power pole	•
Electricity overhead cables	E
Electricity underground cables	UE
Electric Light Pole	ELP
Bench mark	▲
Top of roof gutter	TG
Tree (Canopy spread, trunk diameter)	Sp8 ø0.4

ORIGIN OF LEVELS: SSM 119132
R.L. 28.036 AHD

SCALE 1 : 200
0 5 10 15 20 METRES

REV No.	REMARKS	DATE
A	ISSUED TO CLIENT	28.07.14

AMENDMENTS

CLIENT:
NSW GOVERNMENT Health Infrastructure
HEALTH INFRASTRUCTURE
PO BOX 1060
NORTH SYDNEY
NSW 2059

TREHY INGOLD NEATE
LAND DEVELOPMENT
Phone: (02) 4351 2233
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LEGEND

Sewermain	S
Sewer manhole	S
Watermain	W
Water hydrant	W
Water stop valve	W
Telstra line	T
Telstra Pit/Manhole	T
Gasmains	G
Electricity power pole	
Electricity overhead cables	E
Electricity underground cables	UE
Electric Light Pole	ELP
Bench mark	▲
Top of roof gutter	TG
Tree (Canopy spread, trunk diameter)	SPR ⌀0.4

ORIGIN OF LEVELS: SSM 119132
R.L. 28.036 AHD

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NSW Health Infrastructure

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NORTH SYDNEY
NSW 2059

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Phone: (02) 4351 2233
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LEGEND

Sewermain	S
Sewer manhole	S
Watermain	W
Water hydrant	W
Water stop valve	W
Telstra line	T
Telstra Pit/Manhole	T
Gasmains	G
Electricity power pole	
Electricity overhead cables	E
Electricity underground cables	UE
Electric Light Pole	ELP
Bench mark	▲
Top of roof gutter	TG
Tree (Canopy spread, trunk diameter)	SPR Ø0.4

ORIGIN OF LEVELS: SSM 119132
R.L. 28.036 AHD

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REGISTERED SURVEYOR DATE | PROJECT NUMBER 18257L | DRAWING No SB08 | REVISION A

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LEGEND

Sewermain	S
Sewer manhole	S
Watermain	W
Water hydrant	W
Water stop valve	W
Telstra line	T
Telstra Pit/Manhole	T
Gasmains	G
Electricity power pole	●
Electricity overhead cables	E
Electricity underground cables	UE
Electric Light Pole	ELP
Bench mark	▲
Top of roof gutter	TG
Tree (Canopy spread, trunk diameter)	SPR Ø0.4

ORIGIN OF LEVELS: SSM 119132
R.L. 28.036 AHD

REV No.	REMARKS	DATE
	AMENDMENTS	
A	ISSUED TO CLIENT	28.07.14

CLIENT:

NSW GOVERNMENT Health Infrastructure

HEALTH INFRASTRUCTURE
PO BOX 1060
NORTH SYDNEY
NSW 2059

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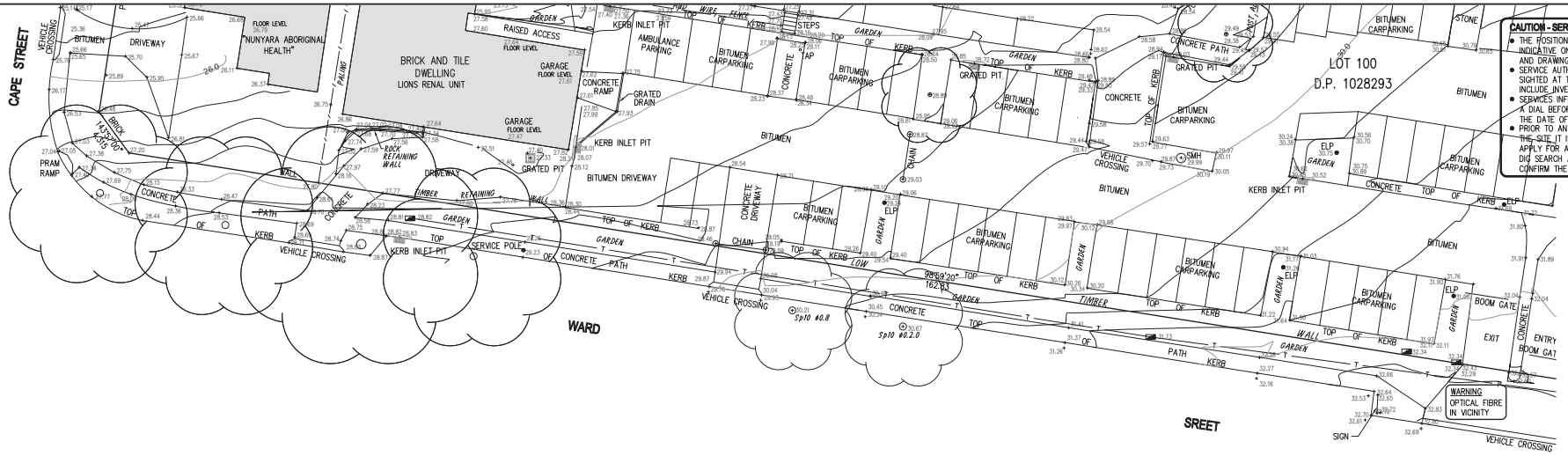
SCALE 1 : 200
0 10 20 METRES
5 15

REGISTERED SURVEYOR DATE	PROJECT NUMBER	DRAWING No	REVISION
	18257L	SB09	A



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Sewer manhole	S
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Water stop valve	W
Telstra line	T
Telstra Pit/Manhole	T
Gasmains	G
Electricity power pole	
Electricity overhead cables	E
Electricity underground cables	UE
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Tree (Canopy spread, trunk diameter)	SPR ⌀0.4

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LAND DEVELOPMENT
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0 10 20 METRES
5 15

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18257L	SB10	A

29/09/2014 6:43:17 PM

NB98078-ECA-DG-10001

SITE PLAN_EXISTING

Scale : 1 : 2000 Date : 17/09/2014 Rev :3

JACOBS

NSW GOVERNMENT Health Infrastructure

GOSFORD HOSPITAL

CONCEPT DESIGN

1 PHASING PLAN - PHASE 1
1 : 750

NOTES:

PHASE 1	
	ENABLING
D.1	DEMOLISH EDUCATION BUILDING
D.2	DEMOLISH HARRY MATTLOCKS BUILDING
D.3	DEMOLISH ICT BUILDING
D.4	DEMOLISH PATHOLOGY / AMBULATORY CARE BUILDING
D.5	REMOVE CABINS
D.6	DEMOLISH TENNIS COURT AND RETAINING WALL
1.3	EXISTING SERVICES IN ROAD MODIFIED TO SUIT NEW DEVELOPMENT. HATCHED PART OF HOSPITAL ROAD TO BE CLOSED OFF. REMAINING SECTIONS TO BECOME TWO WAY TRAFFIC.

LEGEND

- AMBULANCE ACCESS
- VEHICLE ACCESS
- DELIVERIES/ UTILITY ACCESS
- PEDESTRIAN ACCESS
- CONSTRUCTION OR REFURBISHMENT AREA
- BUILDING / FACILITY TO BE DEMOLISHED

PHASE 1 WORK

REV	DATE	DRAWN	REV'D	APP'D	AMENDMENT
3	19/12/2014				PRELIMINARY 100% SD ISSUE
2	03/12/2014				FOR INFORMATION
1	21/11/2014				70% SD ISSUE

KEY PLAN

PROJECT MANAGER
aurora

CLIENT
NSW GOVERNMENT Health Infrastructure

JACOBS

PROJECT
GOSFORD HOSPITAL

HOLDEN STREET
GOSFORD, NSW 2250

TITLE
ARCHITECTURE
PHASING PLAN - PHASE 1

DRAWING STATUS
PRELIMINARY ISSUE

DRAWN: Jacobs	DRAWING CHECK: CP
DESIGNED: Jacobs	DESIGN REVIEW: CY
REVIEWED: VL	DATE: 19/12/14
APPROVED: VL	DATE: 19/12/14
SCALE (A1): As indicated	
DRAWING No.: NB98078-NEWB-AR-DG-0009	REV: 3

28/01/2015 1:31:39 PM

Appendix 4: Plates

Plate 1: Showing Trees 1-4

Plate 2: Showing Tree 8

Plate 3: Showing Tree 54

Plate 4: Showing Trees 78 & 79

Plate 5: Showing Trees 81-83

Plate 6: Showing Tree 101

Plate 7: Showing Tree 134

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
treeiQ.com.au

Appendix 5: Tree Protection Specification

1.0 Appointment of Project Arborist

A Project Arborist shall be engaged prior the commencement of work on-site and monitor compliance with the protection measures. The Project Arborist shall inspect the tree protection measures and Compliance Certification shall be prepared by the Project Arborist for review by the Principal Certifying Authority prior to the release of the Compliance Certificate.

The Project Arborist shall have a minimum qualification equivalent (using the Australian Qualifications Framework) of NSW TAFE Certificate Level 5 or above in Arboriculture.

The site specific requirement for mulching, irrigation, the location of tree protection fencing and temporary access, and other specific tree protection measures shall be confirmed through consultation between the Head Contractor/Project Manager and the Project Arborist prior to the commencement of works.

1.1 Compliance

Contractors and site workers shall receive a copy of these specifications a minimum of 3 working days prior to commencing work on-site. Contractors and site workers undertaking works within the Tree Protection Zone shall sign the site log confirming they have read and understand these specifications, prior to undertaking works on-site.

1.2 Tree & Vegetation Removal

Trees approved for removal by the determining authority shall be removed prior to the establishment of the tree protection measures. Tree removal shall not damage the trees to be retained.

Tree removal works shall be undertaken in accordance with the *Workcover Code of Practice for the Amenity Tree Industry* (1998).

Trees to be removed that contain hollows shall be inspected by a Fauna Ecologist prior to the tree removal works commencing. In the event that wildlife is found, the Fauna Ecologist shall advise on tree dismantling requirements appropriate to the observed species.

1.3 Tree Protection Zone

The trees to be retained shall be protected prior and during construction from activities that may result in an adverse effect on their health or structural condition. The area within the Tree Protection Zone (TPZ) shall exclude the following activities, unless otherwise stated:-

- Modification of existing soil levels, excavations and trenching
- Mechanical removal of vegetation
- Movement of natural rock
- Storage of materials, plant or equipment or erection of site sheds
- Affixing of signage or hoarding to the trees
- Preparation of building materials, refueling or disposal of waste materials and chemicals
- Lighting fires
- Movement of pedestrian or vehicular traffic
- Temporary or permanent location of services, or the works required for their installation
- Any other activities that may cause damage to the tree

NOTE: If access, encroachment or incursion into the TPZ is deemed essential, prior authorisation is required by the Site Arborist.

1.4 Tree Protection Fencing

Tree Protection Fencing shall be installed at the perimeter of the TPZ (refer to Tree Assessment Schedule). Where trees are located in close proximity to one another TPZ areas may be combined. The minimum radial TPZ for each tree within the group shall be adhered to when setting out fencing.

Where works approved by the determining authority are required within the TPZ areas, fencing may be setback to provide temporary access, only where ground and trunk protection has been provided. Refer to Sections 1.5 & 1.8.

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
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As a minimum, the Tree Protection Fence shall consist of 1.8m high wire mesh panels supported by concrete feet. Panels shall be fastened together and supported to prevent sideways movement. The fence must have a lockable opening for access. The tree shall not be damaged during the installation of the Tree Protection Fencing. Refer to Typical Tree Protection Details (3) **(Appendix 6)**.

1.5 Signage

Signs identifying the TPZ should be placed around the edge of the TPZ and be visible from within the development site. The lettering on the sign should comply with *Australian Standard - 1319 (1994) Safety signs for the occupational environment*. The signage shall be installed prior to the commencement of works on-site and shall be maintained in good condition for the duration of the development period.

1.6 Trunk & Branch Protection

Where deemed necessary by the Project Arborist, trunk protection shall be installed by wrapping padding around the trunk to a minimum height of 2m or as the lower branches permit. 2m lengths of timber batons (75mm x 45mm) spaced at 100mm centres shall be strapped together and placed over the padding. Branch protection shall be installed to those branches 1m or closer to scaffolding. Branch protection shall be installed by wrapping padding around the branch. Refer to Typical Tree Protection Details (4) **(Appendix 6)**.

1.7 Site Management

Materials and waste storage, site sheds and temporary services shall not be located within the TPZ.

1.8 Ground Protection & Temporary Access

Where required, Ground Protection & Temporary Access within the TPZ shall be shall be confirmed through consultation between the Head Contractor/Project Manager and the Project Arborist.

Where light traffic access <3.5tons is required the ground surface shall be protected by a 100mm deep mulch cover overlaid with rumble boards/road plates. The mulch shall be Horticultural Grade Pine Bark as certified to *AS4454: Composts, Soil Conditioners and Mulches* (1997). The mulch shall be spread by hand to avoid soil disturbance and compaction.

Where heavy traffic access >3.5 tons is required the ground surface shall be protected by a layer of geo-textile fabric over which a 300mm layer of compacted road base is to be installed. The geo-textile shall extend a minimum of 300mm beyond the edge of the road base. When removing temporary access road the material shall be removed with care to prevent disturbance of natural ground levels below. Refer to Typical Tree Protection Details (4) **(Appendix 6)**.

1.9 Scaffolding

Where possible, scaffolding shall not be located within the TPZ. Scaffolding shall not be in contact with the tree. As necessary, this shall be achieved by erecting scaffolding around branches. Branches shall be tied back and protected as deemed necessary by the Project Arborist. Refer to Typical Tree Protection Details (5) **(Appendix 6)**.

1.10 Works within the Tree Protection Zones

In some cases works within the TPZ may be authorized by the determining authority. **These works shall be supervised by the Project Arborist**. When undertaking works within the TPZ, care should be taken to avoid damage to the tree's root system, trunks and lower branches.

If roots (>25mmø) are encountered during the demolition, excavation and construction works, these roots must be retained in an undamaged condition and advice sought from the Project Arborist. Adjustment of final levels and design shall remain flexible to enable the retention of roots (>25mmø) where deemed necessary by the Project Arborist.

1.11 Structure Demolition

Demolition of existing structures within the TPZ shall be supervised by the Project Arborist. Machinery is to be excluded from the TPZ unless operating from the existing slabs, pavements or areas of ground protection (refer to Section 1.8). Machinery should not contact the tree's roots, trunk, branches and crown.

When removing slab sections within TPZ, machinery shall work backwards out of the TPZ to ensure machinery remains on un-demolished sections of slab at all times. Wherever possible, footings or elements below grade shall be retained to minimise disturbance to the tree's roots.
Where deemed necessary by the Project Arborist, the structures shall be shattered prior to removal with a hand-operated pneumatic/electric breaker.

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
treeiQ.com.au

If roots (>25mmø) are encountered during the demolition works, these roots must be retained in an undamaged condition and advice sought from the Project Arborist. Exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute geotextile fabric. The geotextile fabric shall be kept in a damp condition at all times. Where the Project Arborist determines that the subject tree is using underground elements (i.e footings, pipes, rocks etc.) for support, these elements shall be left in-situ.

1.12 Pavement Demolition

Demolition of the existing pavements within the TPZ shall be supervised by the Project Arborist. The existing pavement shall be carefully lifted by hand to minimise damage to the existing sub-base and to prevent damage to tree roots. Wherever possible, the existing sub-base material shall remain in-situ.

The exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute geotextile fabric. The geotextile fabric shall be kept in a damp condition at all times.

If roots (>25mmø) are encountered during the demolition works, these roots must be retained in an undamaged condition and advice sought from the Project Arborist. Exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute geotextile fabric. The geotextile fabric shall be kept in a damp condition at all times. Where the Project Arborist determines that the subject tree is using underground elements (i.e footings, pipes, rocks etc.) for support, these elements shall be left in-situ.

1.13 Underground Services

Installation of underground services within the TPZ shall be supervised by the Project Arborist. Wherever possible, underground services shall not be located within the TPZ.

The location of stormwater pipes shall be excavated by hand/hydrovac to a depth of 600mm. When undertaking hydro-vacuum excavation, the tip of the high pressure lance is not to be pointed directly at roots at close range to avoid the removal or damage to bark. It is essential that the bark of roots remain intact.

Where roots (>25mmø) are present and are to be retained (as determined by the Project Arborist), the pipes shall be installed by either inserting pipes beneath roots or using thrust (trenchless) boring methods.

Excavations for starting and receiving pits for thrust boring equipment shall be located outside the TPZ wherever possible. The top of the pipe being installed must be installed at a minimum depth of 600mm below existing grade. Boring techniques involving external lubrication of the boring head with materials other than water (e.g. oil, bentonite, etc.) shall be avoided.

The exact location of stormwater pits and headwalls shall be flexible to enable the retention of roots (>25mmø). The approximate location of the pits/headwalls shall be excavated by hand/hydrovac to a depth of 600mm. Where roots (>25mmø) are present and are to be retained (as determined by the Project Arborist), the location of the pit/headwall should be adjusted.

Root pruning and excavations shall be undertaken as outlined within Section 1.14.

1.14 Excavations & Root Pruning

Excavations and root pruning within the TPZ shall be supervised by the Project Arborist. Excavations within the TPZ shall be avoided wherever possible.

Excavations within the TPZ shall be undertaken by hand or using hydro vacuum excavation methods (or similar approved device) to protect tree roots. If there is any delay between excavation works and backfilling, exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute geotextile fabric. The geotextile fabric shall be kept in a damp condition at all times.

Roots to be pruned shall be cleanly severed with sharp pruning implements to ensure a smooth wound face, free from tears. Severance of structural roots (>25mmø) within the Structural Root Zone is not recommended as it may lead to tree destabilisation. **All root pruning requires approval from the Project Arborist.**

Other than for approved works only, no over excavation, benching or battering should be permitted when excavating adjacent to or within TPZ areas.

p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
treeiQ.com.au

Appendix 6: Typical Tree Protection Details

Adapted from *AS 4970-2009 Protection of Trees on Development Sites*
(Source: Institute of Australian Consulting Arboriculturists)

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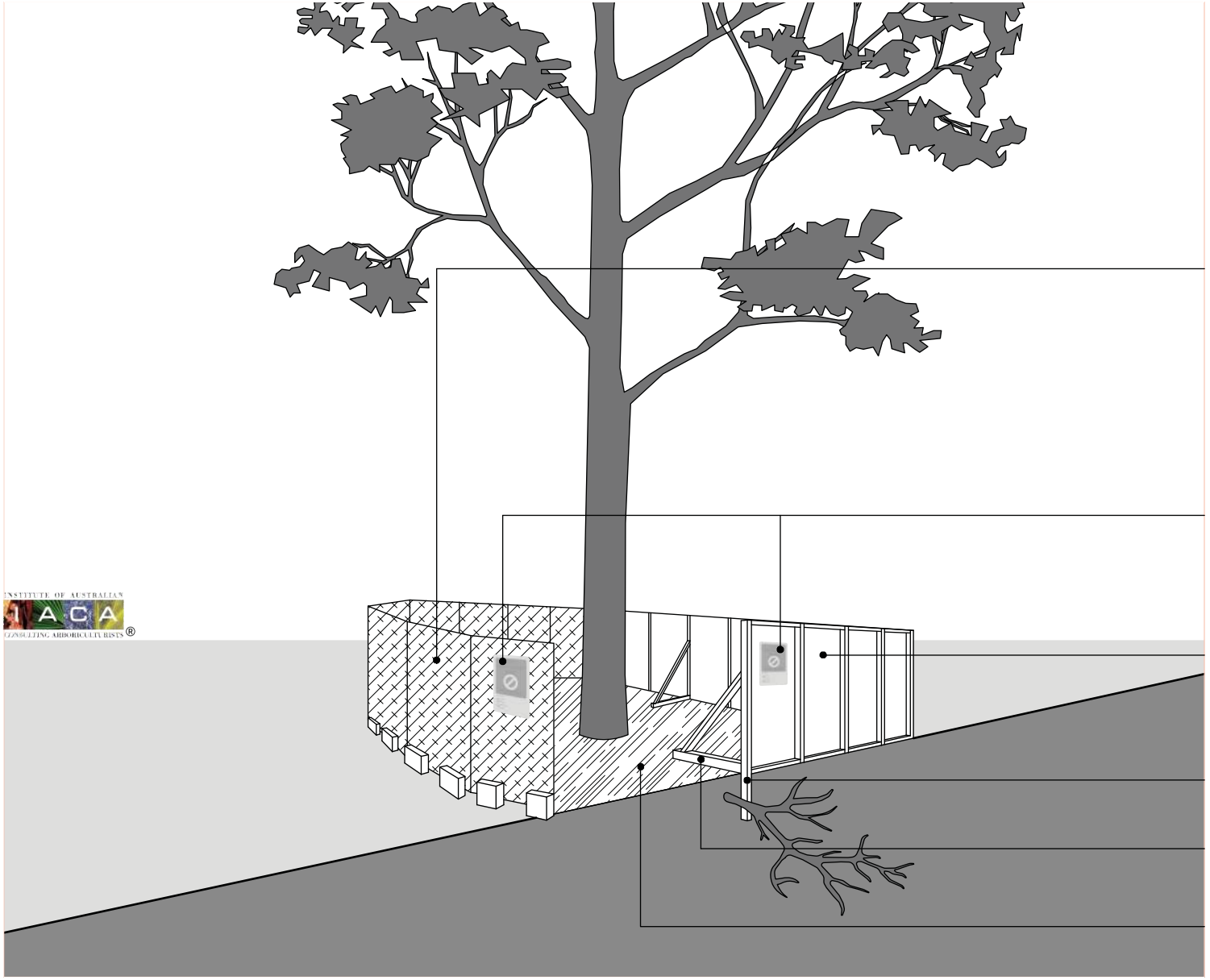
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au



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

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

Tree Protection Zone (TPZ) sign

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

Installation of supports should avoid damaging roots.

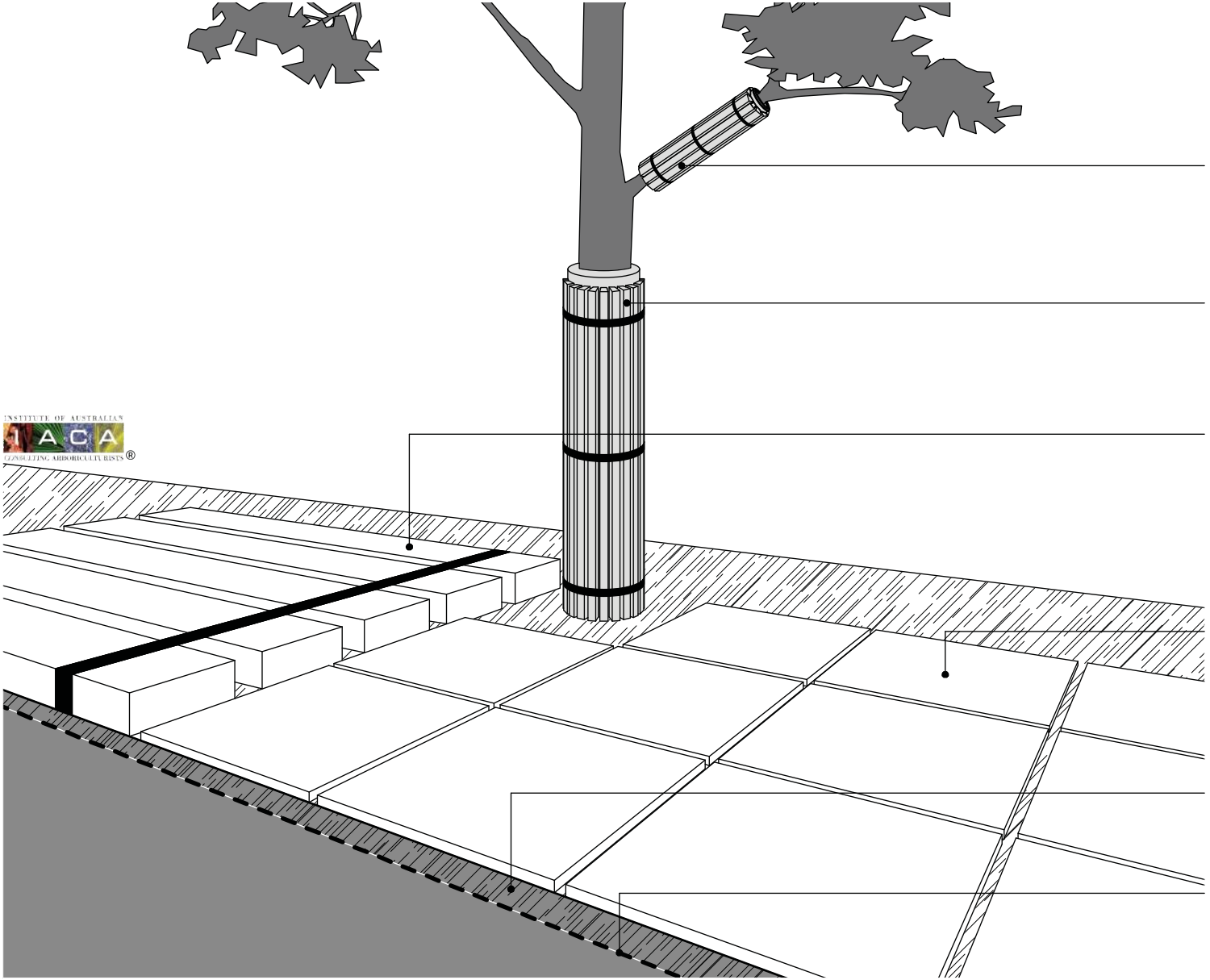
Bracing is permissible within the TPZ.

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

03

Tree Protection Fencing

Not to Scale



Branch Protection - use boards and padding to prevent damage to bark on branch. Boards are to be strapped, not screwed or nailed to the branch.

Trunk Protection - use boards and padding to prevent damage to bark (minimum 2m). Boards are to be strapped, not screwed or nailed to the trunk.

Ground Protection - use device strapped over mulch or aggregate layer. Ground protection device should be of a suitable thickness to prevent soil compaction and root damage.

Steel plates (or approved equivalent) with or without mulch or aggregate layer below.

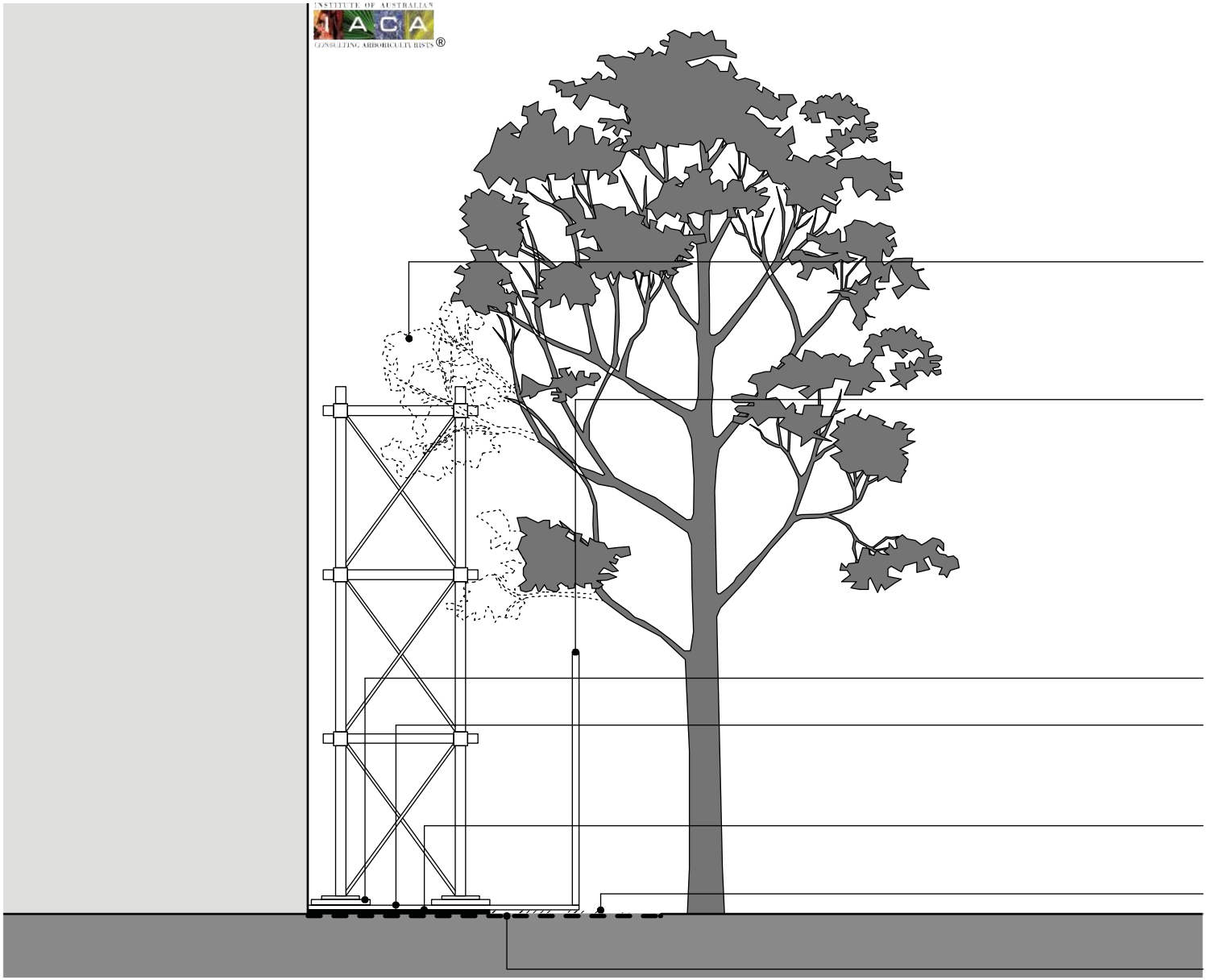
Maximum 100mm and minimum 50mm depth mulch or aggregate layer.

Geotextile fabric underneath mulch or aggregate layer.

04

Examples of Branch, Trunk and Ground Protection

Not to Scale



Branches may require pruning to erect scaffolding. Pruning may be subject to local regulations. Flexible branches should be tied back in preference to pruning.

Minimum 1.8m high hoarding. Temporary fencing may be incorporated into scaffolding as either containment screening or as hoarding.

Note:
If excavation is required for installation of support post for fencing, the Project Arborist should assess any pruning of roots greater than 20mm diameter.

Scaffold planks

Boards or plywood to be installed over mulch or aggregate layer for any areas requiring access within the TPZ.

Soleplate over geotextile. No excavation for soleplate within TPZ.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer within TPZ.

Geotextile fabric

05

Indicative Scaffolding within a Tree Protection Zone (TPZ)

Not to Scale