Project No: USYD/AIN/12 Report No: USYD/AIN/AIA/B

ARBORICULTURAL IMPACT ASSESSMENT REPORT
TREE PROTECTION SPECIFICATION

Australian Institute of Nanoscience,
University of Sydney

Prepared for: University of Sydney

7th March 2012
Rev A

Author:

Anna Hopwood
Dip. Hort (Arboriculture)
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

Contents

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

1.0 INTRODUCTION

1.1 Background

1.1.1 This Arboricultural Impact Assessment Report and Tree Protection Specification was prepared for the University of Sydney in relation to the Stages 1 and 2 of the demolition works for the Australian Institute of Nanoscience at the University of Sydney (subject site).

1.1.2 This report is based on the supplied plans and a site meeting with Steven Botteril (Project Manager) of the University Sydney undertaken on the 29th November 2011 and a subsequent site meeting with Robert Ousey (Architect) of Architectus undertaken on the 5th February 2012.

1.1.3 TreeiQ previously prepared Preliminary Notes, dated 2nd December 2012 in relation to the protection of Trees 1 and 39. The TreeiQ Preliminary Notes should be read in conjunction with this Report.

1.1.4 In preparing this report the author is aware of and has taken into account the objectives of the City of Sydney's *Tree Preservation Order* and *Guidelines for Arborist Reports,* and the University of Sydney's *Tree Management Procedures*.

Refer to **Appendix 1:** Methodology

1.1.5 The following documentation/plans were viewed in the preparation of this report:

- AIN Building Outline & Tree Locations Plan (dwg no. SK-2078) – prepared by Architectus, dated 27.02.12
- Site Plan – Demolition (dwg no. ER-0004) – prepared by Architectus, not dated

Refer to **Appendix 3:** Supplied Plans

1.1.6 It is understood that the demolition works are to be undertaken in two stages (described as Stage 1 and Stage 2 within this report). Trees not covered by the provisions of Council's Tree Preservation Order (TPO) will be removed during the Stage 1 works. The remaining trees to be removed will be removed as part of the Stage 2 works, pending approval from Council. Refer to **Appendix 3:** Tree Demolition Plan.

1.1.7 The supplied plans outline that a building is to be constructed within the subject site however only the outline of the building has been provided at this time.

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 trees and their growing environment
- Review the supplied plans to determine the impact on the subject trees
- Where appropriate, recommend the use of sensitive construction methods to minimise the adverse impacts on the subject trees
- Prepare site specific tree protection measures for the subject trees to be retained

1.2.2 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 tree that was assessed and reflects the condition of the subject tree at the time of inspection.

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

2.0 RESULTS

2.1 The Site

2.1.1 For the purpose of this report, the subject site is the area bound by the Physics Building to the north, the Physics Annexure to the east, Wesley College to the west and the basketball court to the south.

2.1.2 The grassed area undulates throughout.

2.2 The Trees

2.2.1 Forty-two (42) trees have been surveyed as part of this assessment. In general the subject trees have been assessed as being of good health and structural condition. Full results of the tree assessment are shown in **Appendix 2**: Tree Assessment Schedule. Tree numbers correlate with the AIN Building Outline & Tree Locations Plan attached as **Appendix 3**.

3.0 ARBORICULTURAL IMPACT ASSESSMENT

3.1 Trees to be removed as part of the Stage 1 Demolition Works

3.1.1 Five (5) trees are to be removed as part of the Stage 1 Demolition Works; these are Trees 23, 24, 25, 27 and 35.

3.1.2 Trees 23, 24, 25 and 27 are not covered under the provisions of Council's Tree Preservation Order (TPO) due to their size.

3.1.3 Tree 35 is not covered under the provisions of Council's TPO as it is an *Exempt Species* when it is less that 10m in height.[1]

3.2 Trees to be removed as part of the Stage 2 Demolition Works

3.2.1 Thirty (30) trees are to be removed as part of the Stage 2 Demolition Works; of these:

- Fifteen (15) trees have been allocated a Retention Value of *Consider for Retention.* These are Trees 4, 5, 10-12, 21, 22, 26, 28, 31, 33, 34, 36, 41 and 42.
- Fifteen (15) trees have been allocated a Retention Value of *Consider for Removal.* These are Trees 3, 9, 13-20, 29, 30, 32, 37 and 38.

3.2.2 The trees listed above are covered under the provisions of Council's TPO and consent is required for their removal. These trees should be retained and protected through the Stage 1 Demolition Works until approval for their removal has been granted by Council.

3.2.3 To protect these trees through the Stage 1 Demolition Works, tree protection fencing should be established. Retaining walls adjacent to these trees should also remain in-situ. The location of the tree protection fencing and retaining walls to be retained is shown on the Tree Protection Plan attached as **Appendix 3**.

3.2.4 The existing building should demolished by pulling back into the existing building footprint to avoid damage to the trees. Machinery should not contact the trees' roots, trunk branches and crown**.**

[1] http://www.cityofsydney.nsw.gov.au/Council/documents/policies/StreetTreeManagement/StreetTreeManagementPolicy/TreePreservationOrder.pdf

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

3.3 Trees to be retained & protected

3.3.1 Seven (7) trees are to be retained and protected as part of the Stage 1 & 2 Demolition Works.

3.3.2 **Tree 1** has been identified as *Ficus microcarpa var. Hillii* (Hills Weeping Fig) and is located adjacent to the north-eastern corner of the Wesley College building. This tree has been assessed as being of good health and structural condition. Tree 1 has been determined to be of high Landscape Significance, with an estimated Useful Life Expectancy of 15-40 years and a Retention Value of *Priority for Retention.*

3.3.3 **Tree 2** has been identified as *Livistona australis* (Cabbage Tree Palm) and is located adjacent to the north-eastern corner of the Wesley College building. This tree has been assessed as being of good health and structural condition. Tree 2 has been determined to be of low Landscape Significance, with an estimated Useful Life Expectancy of 5-15 years and a Retention Value of *Consider for Removal.*

3.3.4 **Trees 6, 7, 8** have been identified as *Lophestemon confertus* (Brush Box) and are located adjacent to the existing tennis courts. These trees have been assessed as being of good health and structural condition. Trees 6, 7 and 8 have been determined to be of moderate Landscape Significance, with an estimated Useful Life Expectancy of 15-40 years and a Retention Value of *Priority for Retention.*

3.3.5 **Tree 39** has been identified as *Ficus macrophylla* (Moreton Bay Fig) and is located to the east of the Edward Ford building. This tree has been assessed as being of good health and structural condition. Tree 39 has been determined to be of high Landscape Significance, with an estimated Useful Life Expectancy of 15-40 years and a Retention Value of *Priority for Retention.*

3.3.6 **Tree 40** has been identified as *Jacaranda mimosifolia* (Jacaranda) and is located to the east of the Edward Ford building. This tree has been assessed as being of good health and structural condition. Tree 40 has been determined to be of high Landscape Significance, with an estimated Useful Life Expectancy of 15-40 years and a Retention Value of *Priority for Retention.*

3.3.7 To minimise impacts to Trees 1, 2, 6-8, 39 and 40, the following is recommended.

- The existing pavement and kerb adjacent to Trees 1 and 39 should be retained through Stages 1 & 2 of the Demolition Works.
- The tennis court and fence at the base of Trees 6-8 should be removed using tree sensitive demolition methods.
- The existing compost bins beneath Tree 39 should be removed by hand.
- The slab and footing from the brick shed at the base Tree 39 should remain in-situ.
- Where Tree 40 has enveloped the chain link fencing, steel is to be left in place and trimmed flush with the bark ensuring the bark is not damaged.
- The curved sandstone retaining wall at the base of Tree 40 should be retained. Columns and lintels may be removed using tree sensitive demolition methods.
- The existing building should demolished by pulling back into the existing building footprint to avoid damage to the trees. Machinery should not contact the trees roots, trunk branches and crown.

3.3.8 Sections 1.10-1.15 of the Tree Protection Specification (Appendix 5) provide a detailed specification for undertaking these works.

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

3.4 Pruning

3.4.1 Pruning works are based on verbal descriptions of clearance requirements for the construction of the proposed building and associated works. Several additional branches have been identified by TreeiQ which should be removed regardless of future works.

3.4.2 Tree 1 - The following pruning works will provide 7m clearance, reduce terminal growth away from proposed building and will clear branches from the existing buildings.

3.4.3 Figure 1: Remove lowest 3rd order branch, 80mm diameter, SE-side at 3m above grade.

3.4.4 Figure 2: Remove x3 lowest 2nd order branches NE-side to provide clearance for road, 300mm maximum branch diameter.

3.4.5 Figure 3: Red line indicates approx location of new building.

3.4.6 Figure 4: Pruning to clear existing building to N-side of tree. Remove lowest 1st order branch (450mm diameter) W-side at 1.2m above grade to clear building (structure doesn't allow for reduction pruning).

3.4.7 Tree 2 - The following pruning works will provide additional clearance from the existing buildings.

3.4.8 Figure 7: Reduce structurally defective (1st order branch, 250mm diameter), N-side above footpath.

3.4.9 Figure 6: Remove 2nd order branch, 250mm diameter, E-side at 7m to clear building. Reduction of a number of smaller diameter branches may also be required.

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

3.4.10 Pruning works should be carried out by an experienced and qualified Arborist. The Arborist should hold a minimum qualification equivalent (using the Australian Qualifications Framework) of NSW TAFE Certificate Level 3 or above, in Arboriculture and a NSW TAFE Tree Surgery Certificate or its recognised equivalent. The Arborist should have a minimum of 3 years experience in practical Arboriculture including demonstrated experience in tree surgery.

3.4.11 All pruning work should be undertaken in accordance with *Australian Standard 4373: Pruning of Amenity Trees (2007)* and the *Workcover Code of Practice for the Amenity Tree Industry* (1998).

4.0 CONCLUSION

4.1 Forty-two (42) trees have been surveyed as part of this assessment. In general the subject trees have been assessed as being of good health and structural condition.

4.2 Five (5) trees are to be removed as part of the Stage 1 Demolition Works; these are Trees 23, 24, 25, 27 and 35. These trees are not covered under the provisions of Council's TPO.

4.3 Thirty (30) trees are to be removed as part of the Stage 2 Demolition Works; these are Trees 3-5, 9-22, 26, 28-34, 36-38, 41 and 42. These trees are covered under the provisions of Council's TPO and consent is required for their removal. These trees should be retained and protected through the Stage 1 Demolition Works until approval for their removal has been granted by Council.

4.4 Seven (7) trees are to be retained and protected as part of the Stage 1 & 2 Demolition Works; these are Trees 1, 2, 6-8, 39 and 40. These trees should be retained and protected through the entire development period.

4.5 The trees to be retained should be protected in accordance with the Tree Protection Speciation attached as Appendix 5.

4.6 Pruning works are also proposed and are based on verbal descriptions of clearance requirements for the construction of the proposed building and associated works. Several additional branches have been identified by TreeiQ which should be removed regardless of future works.

4.7 An assessment of the impact of the new building and the preparation of appropriate tree protection measures should be undertaken upon completion of the 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

NOTE 1: Reference should be made to any relevant legislation including Tree Preservation Orders.

NOTE 2: This report provides recommendations relating to tree management only. Advice should be sought from appropriately qualified consultants regarding design/construction issues.

NOTE 3: It should be acknowledged that a comprehensive hazard assessment and management plan for the trees is beyond the scope of this report.

AS 4970, 2009: Tree iQ- amended and reproduced under copyright Licence1110-c049

AS 437, 2007: Tree iQ- amended and reproduced under copyright Licence1110-c049

5.0 BIBLIOGRAPHY & REFERENCES

Barrell (1995), 'Pre-development Tree Assessments', in *Trees & Building Sites, Proceedings of an International Conference Held in the Interest of Developing a Scientific Basis for Managing Trees in Proximity to Buildings*, International Society of Arboriculture, Illinois, USA, pp. 132-142.

Harris, Clark & Matheny (1999), *Arboriculture: Integrated Management of Landscape Trees, Shrubs And Vines*, Prentice Hall, New Jersey.

Matheny & Clark (1994), *A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas*, International Society of Arboriculture, USA.

Mattheck & Breloer (1994), *The Body Language of Trees: A Handbook for Failure Analysis*, The Stationary Office, London.

Simon, Dormer &Hartshorne (1973), *Lowson's Botany*, Bell & Hyman, London.

Standards Australia (2003*), Composts, Soil Conditioners and Mulches AS-4454.*

Standards Australia (2009), *Protection of Trees on Development Sites AS-4970.*

Standards Australia (2007), *Pruning of Amenity Trees AS-4373.*

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

6.0 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 a comprehensive site inspection during March 2012. The comments and recommendations in this report are based on findings from this site inspection.

1.2 **Visual Tree Assessment (VTA)**: The subject tree was visually assessed from the ground using the standard VTA criteria and notes. The inspection was limited to a visual examination of the subject tree from ground level without dissection, probing or coring. No woody tissue testing was undertaken as part of this assessment. Trees outside the subject site were assessed from the property boundaries only.

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

1.4 **Tree Locations:** The location of the subject tree was determined from the supplied plans attached as Appendix 3. Trees Trees 8, 27, 29 and 38 were not shown on the supplied plans and 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 the Standard 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 the Standard 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 standard. 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 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 structure of the subject tree 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 in its growing conditions. This was calculated by estimating the expected lifespan of the species (in urban areas of Sydney), less the subject tree's estimated current age. The tree's ULE was modified where necessary to take in consideration the subject tree's health, structure and site suitability. The tree 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. Whilst these values are subjective, a rating of high, moderate, low or insignificant has been allocated to the tree. This provides a relative value of the tree's Landscape Significance which may aid in determining its Retention Value. If the tree can be categorized into more than one value, the higher value has been allocated.

Landscape Significance	Description
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 forms part of the curtilage of a heritage item.
	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 is listed on Council's Significance Tree Register.
	The subject tree is scheduled as a Threatened Species or forms part of a Threatened Plant Community under the *Threatened Species Conservation Act* (1995).
	The subject tree is a remnant tree.
	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.
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

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, structure and site suitability. The subject tree 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

ULE	Landscape Significance			
	High	Moderate	Low	Insignificant
40 years +	Priority for Retention		Consider for Removal	Priority for Removal
15-40 years	Priority for Retention	Consider for Retention		
5-15 years	Consider for Retention			
Less than 5 years	Priority for Removal			

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.	Botanical Name	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Sign	Retention Value	TPZ (m)	Implication
1	*Ficus microcarpa* var. *Hillii* (Hills Weeping Fig)	n-s=1700 e-w=1500	18m	N 17 S 12 E 18 W12	Good	Good	5m clearance to lower branches. Crown density to 75 - 100%. First order branch inclusion (1000mm long) at 1m above grade. Minor inclusions in lower crown. Previously crown lifted on south-side of crown for building and road clearance. Pruning wound of up to 400mm diameter. Many larger wounds exhibiting early onset of decay at wound face. All wounds are developing woundwood at margins. Low volumes small diameter (<25mm) deadwood. Low volumes of small diameter (<25mm) epicormic growth present around pruning wound south-side. Ficus seedling growing from a pocket of accumulated debris between first order branches in lower crown. Surface structural roots present following top of low sand stone retaining wall, south-side, extending 7m from base of trunk. Exposed structural root mass northwest side adjacent to road, with extensive impact damage to bark. No decay observed at wound face. SRZ=4.1m.	15-40	High	Priority for Retention	15	Retain & protect.
2	*Livistona australis* (Cabbage Tree Palm)	300	15	2	Good	Fair	Partially suppressed. Wound/s, no visible signs of decay at base.	5-15	Low	Consider for Removal	3	Retain & protect.
3	*Celtis sinensis* (Chinese Hackberry	350	11	8	Good	Fair	Partially suppressed. Wound/s, early stages of decay at base.	5-15	Moderate	Consider for Removal	4.2	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
4	*Lophestemon confertus* (Brush Box)	550	10	5	Good	Fair	Small (<25mm) diameter deadwood in low volumes. Wound/s, no visible signs of decay on trunk.	15-40	Moderate	Consider for Retention	6.6	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
5	*Lophestemon confertus* (Brush Box)	300	12	5	Fair	Good	Wound/s, no visible signs of decay. Group of 8 trees.	15-40	Moderate	Consider for Retention	3.6	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
6	*Lophestemon confertus* (Brush Box)	250	12	5	Good	Good	Partially suppressed.	15-40	Moderate	Consider for Retention	3	Retain & protect.

Tree No.	Botanical Name	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Sign	Retention Value	TPZ (m)	Implication
7	*Lophestemon confertus* (Brush Box)	250	12	4	Good	Good		15-40	Moderate	Consider for Retention	3	Retain & protect.
8	*Lophestemon confertus* (Brush Box)	200 200 150	12	6	Good	Good	Partially suppressed.	15-40	Moderate	Consider for Retention	4	Retain & protect.
9	*Pittosporum undulatum* (Sweet Pittosporum)	200 100 200 150 100 150	7	4	Good	Good	Grade alteration, fill.	5-15	Low	Consider for Removal	6	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
10	*Melaleuca quinquenervia* (Broad Leaf Paperbark)	350	8	4	Good	Fair	Branch inclusion/s, major. Partially suppressed.	15-40	Moderate	Consider for Retention	4.2	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
11	*Melaleuca quinquenervia* (Broad Leaf Paperbark)	350	10	5	Good	Good	Partially suppressed.	15-40	Moderate	Consider for Retention	4.2	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
12	*Melaleuca quinquenervia* (Broad Leaf Paperbark)	300	9	5	Good	Good	Partially suppressed.	15-40	Moderate	Consider for Retention	3.6	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
13	*Melaleuca quinquenervia* (Broad Leaf Paperbark)	150	5	2	Poor	Good	Heavily suppressed.	<5	Low	Consider for Removal	2	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
14	*Melaleuca quinquenervia* (Broad Leaf Paperbark)	300	9	3	Fair	Good	Heavily suppressed.	<5	Low	Consider for Removal	3.6	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
15	*Melaleuca quinquenervia* (Broad Leaf Paperbark)	200	10	2	Fair	Good	Heavily suppressed.	<5	Low	Consider for Removal	2.4	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
16	*Callistemon viminalis* (Weeping Bottlebrush)	150 150 150	6	4	Fair	Good	Partially suppressed.	5-15	Low	Consider for Removal	3	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.

Tree No.	Botanical Name	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Sign	Retention Value	TPZ (m)	Implication
17	*Callistemon viminalis* (Weeping Bottlebrush)	100 100 100	6	2	Fair	Good	Heavily suppressed.	<5	Low	Consider for Removal	2.2	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
18	*Callistemon viminalis* (Weeping Bottlebrush)	100 100	5	2	Fair	Good	Heavily suppressed.	<5	Low	Consider for Removal	2	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
19	*Callistemon viminalis* (Weeping Bottlebrush)	100 100	6	3	Fair	Good	Heavily suppressed.	<5	Low	Consider for Removal	2	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
20	*Callistemon viminalis* (Weeping Bottlebrush)	75 75	5	2	Fair	Good	Partially suppressed.	<5	Low	Consider for Removal	2	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
21	*Lophestemon confertus* (Brush Box)	400 400 400 400	16	8	Good	Good	Branch inclusion/s, major.	15-40	High	Consider for Retention	9.6	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
22	*Lophestemon confertus* (Brush Box)	400 400 400 650	16	9	Good	Fair	Branch inclusion/s, major.	15-40	High	Consider for Retention	11.4	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
23	*Stenocarpus sinuatus* (Firewheel Tree)	75	4.5	1	Good	Good	Branch inclusion/s.	15-40	Low	Consider for Removal	2	To be removed as part of Stage 1 demolition works.
24	*Stenocarpus sinuatus* (Firewheel Tree)	<50	2	1	Good	Good		15-40	Low	Consider for Removal	2	To be removed as part of Stage 1 demolition works.
25	*Prunus persica* (Peach)	250	4.5	4	Fair	Fair	Fungal bracket/s on trunk.	<5	Low	Consider for Removal	2	To be removed as part of Stage 1 demolition works.
26	*Populus nigra* (Black Poplar)	550 500	17	10	Good	Good	Large (>75mm) diameter deadwood in low volumes.	5-15	High	Consider for Retention	9	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
27	*Viburnum tinus* (Laurustinus)		4				Shrub.					To be removed as part of Stage 1 demolition works.

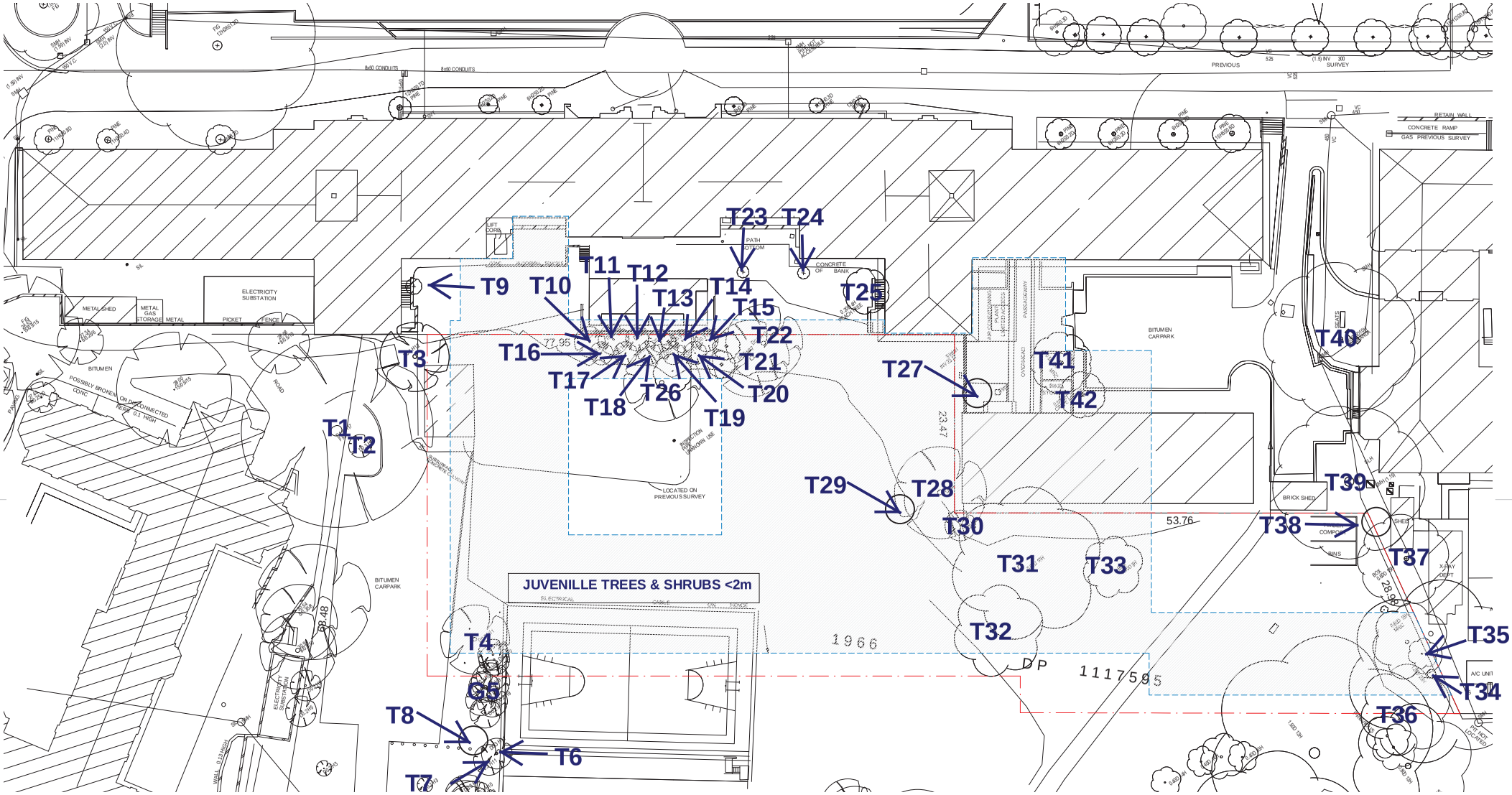
Tree No.	Botanical Name	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Sign	Retention Value	TPZ (m)	Implication
28	*Lophestemon confertus* (Brush Box)	350	10	4	Good	Good	Medium (25-75mm) deadwood in low volumes.	15-40	Moderate	Consider for Retention	4.2	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
29	*Livistona australis* (Cabbage Tree Palm)	300	16	2	Fair	Fair	Wound/s, early stages of decay on trunk.	5-15	Moderate	Consider for Removal	3	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
30	*Phoenix roebelenii* (Dwarf Date Palm)	200	7	2	Good	Fair	Wound/s, no visible signs of decay on trunk.	5-15	Low	Consider for Removal	3	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
31	*Lophestemon confertus* (Brush Box)	800	17	8	Good	Good	Branch inclusion/s, minor. Medium (25-75mm) deadwood. Small (<25mm) diameter deadwood in moderate volumes.	15-40	High	Consider for Retention	9.6	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
32	*Lophestemon confertus* (Brush Box)	450	10	6	Fair	Good	Small (<25mm) diameter deadwood. Medium (25-75mm) deadwood. Large (>75mm) diameter deadwood in high volumes. Wound/s, no visible signs of decay on trunk.	5-15	Moderate	Consider for Removal	5.4	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
33	*Lophestemon confertus* (Brush Box)	300	8	5	Good	Good		15-40	Moderate	Consider for Retention	3.6	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
34	*Populus nigra* (Black Poplar)	800	18	12	Good	Good	Large (>75mm) diameter deadwood in low volumes. Understorey of juvenile self-seeded Celtis beneath canopy.	5-15	High	Consider for Retention	9.6	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
35	*Celtis sinensis* (Chinese Hackberry	150	5	3	Poor	Fair	Heavily suppressed.	<5	Low	Priority for Removal	2	To be removed as part of Stage 1 demolition works.
36	*Celtis sinensis* (Chinese Hackberry	550	17	9	Good	Good	Partially suppressed.	15-40	Moderate	Consider for Retention	6.6	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
37	*Lophestemon confertus* (Brush Box)	750	14	6	Fair	No Value	Crown density 50-75%. Partially suppressed. No access to base.	5-15	Moderate	Consider for Removal	9	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
38	*Celtis sinensis* (Chinese Hackberry	300 150 150	10	7	Good	Good	Branch inclusion/s, minor. Heavily suppressed.	5-15	Low	Consider for Removal	4.4	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.

Tree No.	Botanical Name	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Sign	Retention Value	TPZ (m)	Implication
39	*Ficus macrophylla* (Moreton Bay Fig)	n-s=2200 e-w=1900	16	N 16, S 17, E 8, W11	Good	Good	Crown density to 75 - 100%. Extent of buttress roots: N/S 8m, E/W 9m. Previously crown lifted and reduced for building clearances. Large diameter (75mm+) pruning wound exhibiting early stages of decay at wound faces. Most wounds exhibiting woundwood production at margins. High volumes of small (<25mm) and medium (25-50mm) diameter epicormic growth in lower crown. SRZ=4.5.	15-40	High	Priority for Retention	15	Retain & protect.
40	*Jacaranda mimosifolia* (Jacaranda)	800	16	11	Good	Good	Medium (25-75mm) deadwood. Large (>75mm) diameter deadwood in low volumes.	15-40	High	Priority for Retention	9.6	Retain & protect.
41	*Magnolia* spp	700 at grade	8	5	Good	Good	Branch inclusion/s, minor.	15-40	Moderate	Consider for Retention	8.4	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.
42	*Lagerstoemia indica* (Crepe Myrtle)	600 at grade	10	7	Good	Good		15-40	Moderate	Consider for Retention	7.2	To be removed as part of Stage 2 demolition works. Consent required for removal by Council.

Appendix 3: Supplied 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



1 Building Outline + Survey

SCALE: 1 : 250 / 1:500 @ A3

issue	amendment	date

issue	amendment	date

LEGEND

- INDICATIVE AIN BUILDING OUTLINE
- SITE BOUNDARY

jestico + whiles
1 Cobourg Street
London
NW1 2HP
T (44) 207 380 0382
F (44) 870 622 0732
www.jesticowhiles.com

CH2MHILL.
Optima Building, Level 1 North
58 Robertson Street
Glasgow, United Kingdom G2 8DU
T (44) 141 204 2333
F (44) 141 204 2033
www.ch2mhill.com

architectus™
Sydney
Melbourne
Auckland
Brisbane
Shanghai
Architectus Sydney
Level 3 341 George Street
Sydney NSW 2000
T (61 2) 8252 8400
F (61 2) 8252 8600
sydney@architectus.com.au
ABN 11 098 4 89 448

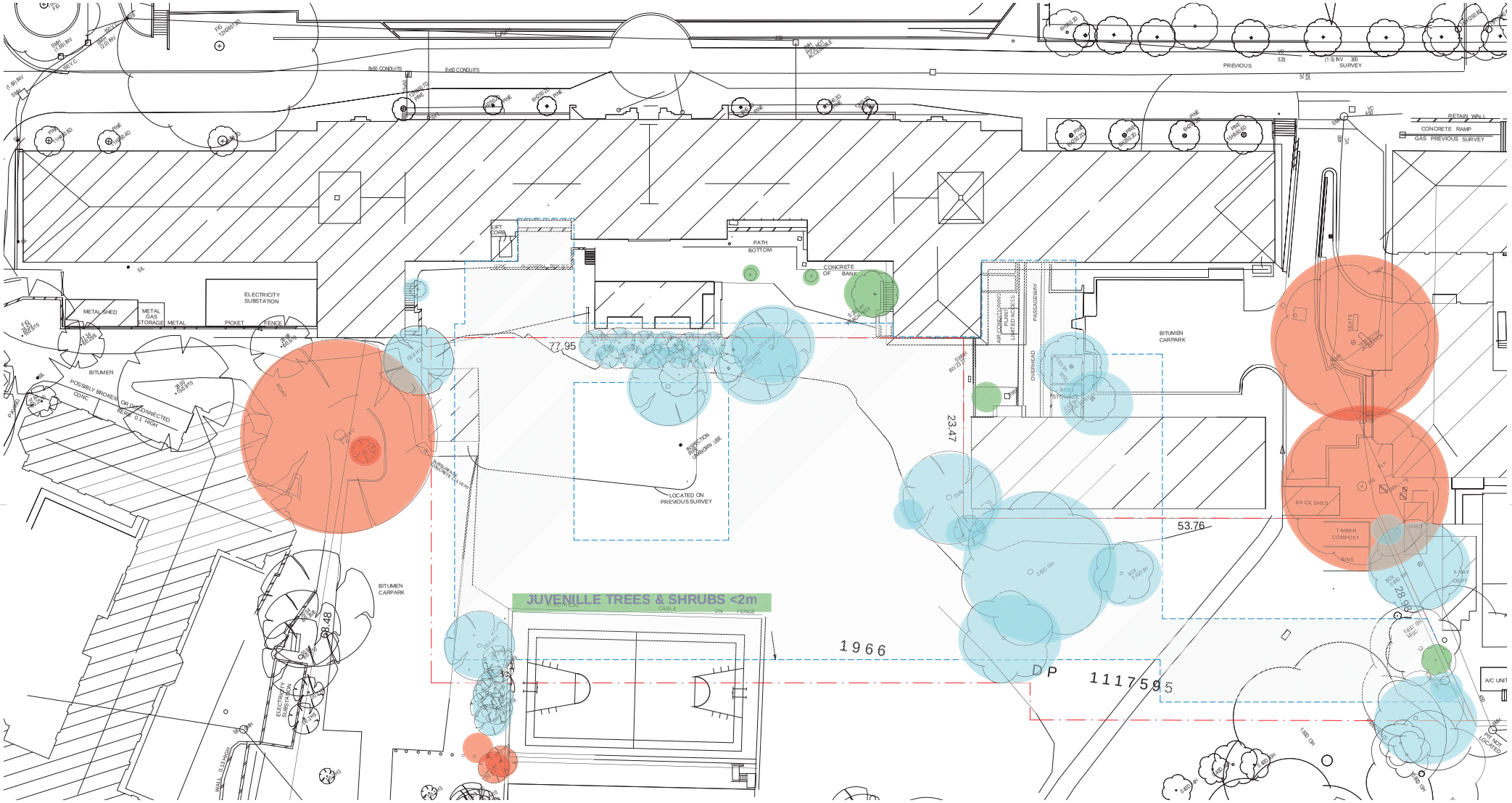
checked	Checker	scale	As indicated@A1
drawn	Author	project no	110010.00

project
Australian Institute of Nanoscience

drawing
AIN Building Outline + Tree Locations

drawing no. SK-2078 issue -

27/02/2012 12:52:50 PM



1 Building Outline + Survey

SCALE: 1 : 250 / 1:500 @ A3

tree to be removed as part of stage 1 demolition works

tree to be removed as part of stage 2 demolition works. consent required from council

tree to be retained & protected

LEGEND

- INDICATIVE AIN BUILDING OUTLINE
- SITE BOUNDARY

TREE DEMOLITION PLAN
TO BE READ IN CONJUNCTION WITH ARBORICULTURAL REPORT

drawing: AIN Building Outline + Tree Locations

drawing no.: SK-2078

issue: -

27/02/2012 12:52:50 PM

issue	amendment	date

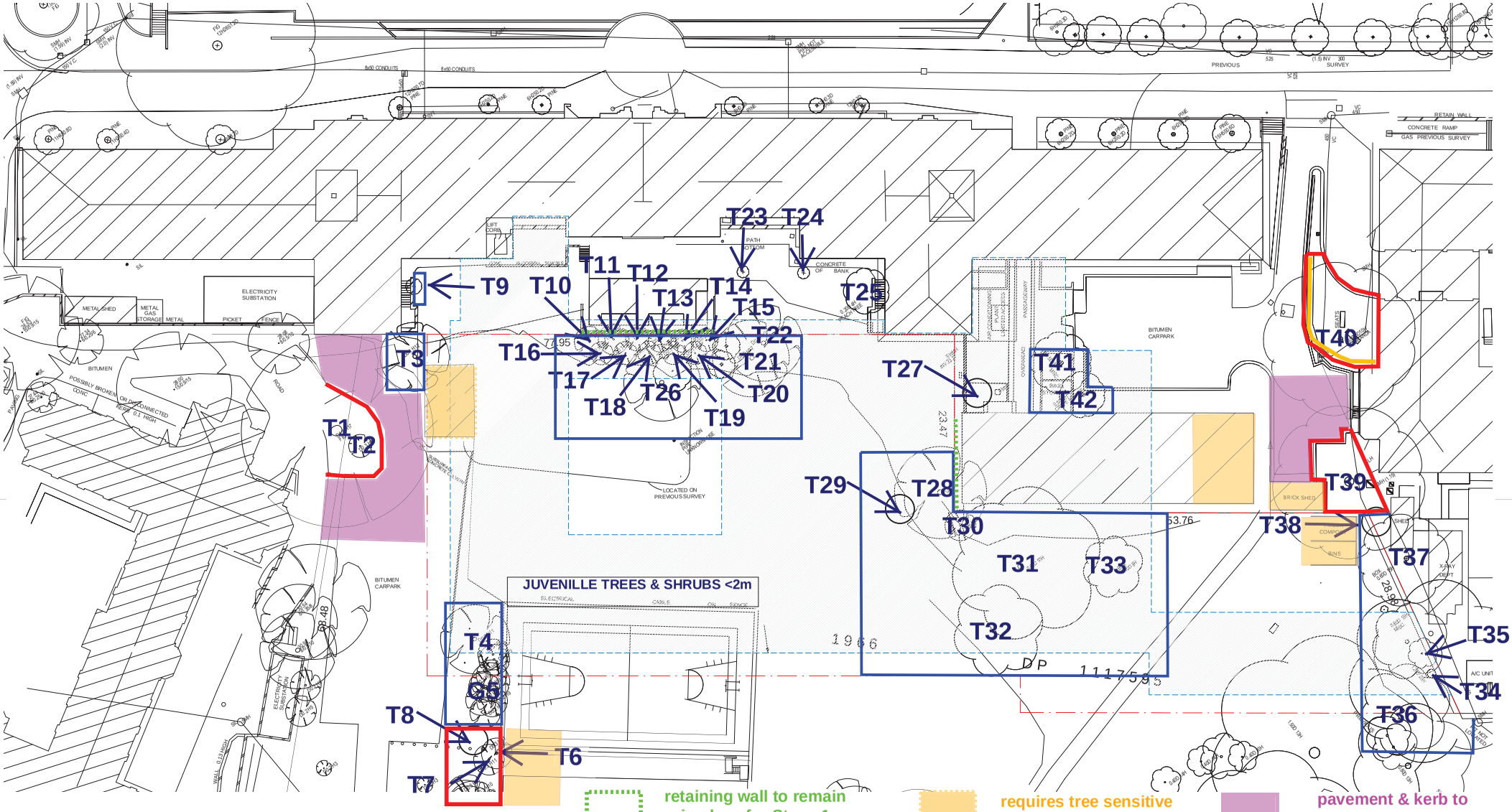
issue	amendment	date

jestico + whiles
1 Cobourg Street
London
NW1 2HP
T (44) 207 380 0382
F (44) 870 622 0732
www.jesticowhiles.com

CH2MHILL.
Optima Building, Level 1 North
58 Robertson Street
Glasgow, United Kingdom G2 8DU
T (44) 141 204 2333
F (44) 141 204 2033
www.ch2mhill.com

architectus™
Sydney
Melbourne
Auckland
Brisbane
Shanghai
Architectus Sydney
Level 3 341 George Street
Sydney NSW 2000
T (61 2) 8252 8400
F (61 2) 8252 8600
sydney@architectus.com.au
ABN 11 098 4 89 448

checked	Checker	scale	As indicated@A1
drawn	Author	project no	110010.00



tree protection fence to remain in place for entire development period

tree protection fence to remain in place for Stage 1 demolition works & until approval for tree removal has been granted by Council

retaining wall to remain in place for Stage 1 demolition works & until approval for tree removal has been granted by Council

requires tree sensitive demolition methods

pavement & kerb to remain in place through Stage 1 & 2 demolition works

issue	amendment	date

LEGEND

INDICATIVE AIN BUILDING OUTLINE

SITE BOUNDARY

jestico + whiles
1 Cobourg Street
London
NW1 2HP
T (44) 207 380 0382
F (44) 870 622 0732
www.jesticowhiles.com

CH2MHILL.
Optima Building, Level 1 North
58 Robertson Street
Glasgow, United Kingdom G2 8DU
T (44) 141 204 2333
F (44) 141 204 2033
www.ch2mhill.com

architectus™
Sydney
Melbourne
Auckland
Brisbane
Shanghai

Architectus Sydney
Level 3 341 George Street
Sydney NSW 2000
T (61 2) 8252 8400
F (61 2) 8252 8600
sydney@architectus.com.au

ABN 11 098 489 448

checked	Checker	scale	As indicated@A1
drawn	Author	project no	110010.00

TREE PROTECTION PLAN TO BE READ IN CONJUNCTION WITH ARBORICULTURAL REPORT

27/02/2012 12:52:50 PM

Appendix 4: Plates

Plates (left to right)
Plate 1: *Showing Trees 1 & 2*
Plate 2: *Showing Trees 4 and Group 5*
Plate 3: *Showing Trees 16-22*
Plate 4: *Showing Tree 9*
Plate 5: *Showing Trees 28-32*
Plate 6: *Showing Tree 39*
Plate 6: *Showing Tree 40*

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 Site Arborist

A Site Arborist shall be appointed prior the commencement of works on-site. The Site Arborist shall monitor the trees to be retained and supervise the tree protection measures. The Site 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 and irrigation, the location of tree protection fencing and other specific tree protection measures should be confirmed through consultation between the Head Contractor/Project Manager and the Site Arborist prior to the commencement of works.

1.1 Inspection Points

Give 5 working days notice to allow inspections to be undertaken at the following stages:-

Inspection Point	Inspection Personnel
Installation of Tree Protection Zone	Site Arborist
Modification of the Tree Protection Zone	Site Arborist
Works with the Tree Protection Zone	Site Arborist
Completion of the construction works	Site Supervisor Site Arborist

1.2 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.

1.3 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 structure. The area within the Tree Protection Zone (TPZ) shall exclude the following activities, unless otherwise stated:-

- Modification of existing soil levels
- Excavations and trenching
- Cultivation of the soil
- Mechanical removal of vegetation
- Soil disturbance
- Movement of natural rock
- Storage of materials, plant or equipment
- Erection of site sheds
- Affixing of signage or hoarding to the trees
- Preparation of building materials
- Disposal of waste materials and chemicals
- Lighting fires
- Refuelling
- 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 as shown on the Tree Protection Plan . As a minimum, the Tree Protection Fence shall consist of 1.8m high chain wire panels supported by concrete feet. They shall be fastened together and supported to prevent sideways movement. The fence must have a lockable opening for access. The tree's roots shall not be damaged during the installation of the Tree Protection Fencing. Refer to **Appendix 5**: Typical Tree Protection Details (3).

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

1.5 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 Mulching

Where deemed necessary by the Site Arborist the TPZ shall be mulched with Horticultural Grade Pine Bark as certified to *AS4454: Composts, Soil Conditioners and Mulches* (1997) and shall be maintained at a depth of 50-100mm for the duration of the project. The mulch shall be spread by hand to avoid soil disturbance and compaction within the root zone. The mulch shall be installed prior to the commencement of works on-site. Mulch shall not be stock piled within the TPZ.

1.7 Trunk & Branch Protection

Where deemed necessary by the Site 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 battons (75 x 50 x 200mm) 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 **Appendix 5**: Typical Tree Protection Details (4).

1.8 Site Management

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

1.9 Access

Wherever possible, pedestrian, vehicular and machinery movement within the TPZ shall be avoided. If required, specific access routes shall be determined through consultation between the Project Manager and Site Arborist prior to the commencement of works.

For pedestrian and compact/lightweight machinery, the ground surface within the TPZ shall be protected with a 100mm deep mulch cover overlaid with rumble boards. 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.

For heavy vehicles and machinery, the ground surface within the TPZ shall be protected laying a permeable geo-textile over a 100mm deep mulch (as specified above) cover. Road base shall be placed over the geo-textile material to a depth of 100mm. The geo-textile shall extend a minimum of 300mm beyond the edge of the mulch and road base.

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

1.11 Structure Demolition

Demolition of existing structures within the TPZ shall be supervised by the Site Arborist. Machinery is to be excluded from the TPZ unless operating from a temporary access way with ground protection (refer to Section 1.9) or from the existing slabs or pavements. The existing buildings shall demolished by pulling back into building footprint to avoid damage to adjacent trees to be retained. Machinery should not contact the trees' 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.

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

Where deemed necessary by the Site Arborist, the structures shall be shattered prior to removal with a hand-operated pneumatic/electric breaker.

Where the Site Arborist determines that the tree is using underground elements (i.e kerbing, footings, pipes, rocks etc.) for support, these elements shall be left in-situ.

If structural roots (>25mmø) are encountered during the demolition and construction works, these roots must be retained in an undamaged condition. Exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with mulch.

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

COMPOST BINS: The existing compost bins beneath Tree 39 shall be removed by hand. The footing shall be shattered prior to removal with a hand-operated pneumatic/electric breaker.

BRICK SHED: The slab and footing from the brick shed at the base Tree 39 shall remain in-situ.

CHAINLINK FENCE: Where Tree 40 has enveloped the chain link fencing, steel shall be left in place and trimmed flush with the bark ensuring the bark is not damaged.

SANDSTONE WALL: The curved sandstone retaining wall at the base of Tree 40 shall be retained. Columns and lintels may be removed by hand. The structures shall be shattered prior to removal with a hand-operated pneumatic/electric breaker.

The existing pavements shall be left in-situ and be used as root and soil protection until the new pavement works are due to commence.

1.12 Tennis Court Demolition

Demolition of the existing tennis court pavement within the TPZ of trees to be retained shall be supervised by the Site 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.

Where the existing sub-base has become degraded and requires refurbishment, it shall be carefully removed by hand to prevent damage to tree roots.

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

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

1.13 Excavations & Root Pruning

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

Excavations within the TPZ shall be undertaken by hand trenching/hydro vacuum excavation methods shall be used to minimise damage to tree roots Pruned roots 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 Site Arborist.**

The exposed roots and excavation face shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute mat. The mat shall be kept in a damp condition at all times until the new surface is installed.

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

1.14 Stormwater Lines & Underground Services

Wherever possible, underground services shall not be located within the TPZ.

Installation of underground services within the TPZ shall be supervised by the Site Arborist. Where underground services run through the TPZ of trees to be retained, hand trenching/hydro vacuum excavation methods shall be used to minimise damage to tree roots. When undertaking hydro-vacuum excavation, the tip of the high pressure lance shall 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.

If structural roots (>25mmø) are encountered during the excavation works, these roots should be retained in an undamaged condition and advice sought from the Site Arborist. Adjustment of final levels and location of pipe work should remain flexible to enable the retention of structural roots (>25mmø) where deemed necessary by the Site Arborist.

Root pruning and excavations shall be undertaken as outlined within Section 1.13.

In sections of trench where structural roots (>25mmø) are present and are to be retained, the services shall be either be re-routed or where falls permit, feed below these 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 mat. The mat shall be kept in a damp condition at all times.

Excavations required for underground services within the Structural Root Zone shall undertaken by sub-surface boring. The top of pipes shall be installed at a minimum depth of 600mm below existing grade. The excavations for starting and receiving pits for thrust boring equipment shall be located outside the TPZ. Techniques involving external lubrication of the boring head with materials other than water (e.g. oil, bentonite, etc.) shall not be used.

1.15 Monitoring

The Site Arborist shall monitor the site fortnightly throughout the development period to ensure these specifications are maintained. A site log shall record the details of the site inspections for review by the Principal Certifying Authority prior to the release of the Compliance Certificate. Any changes to the design will require additional arboricultural assessment. Upon the completion of construction works, a final assessment of the tree/s shall be undertaken by the Site Arborist.

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)

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

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.

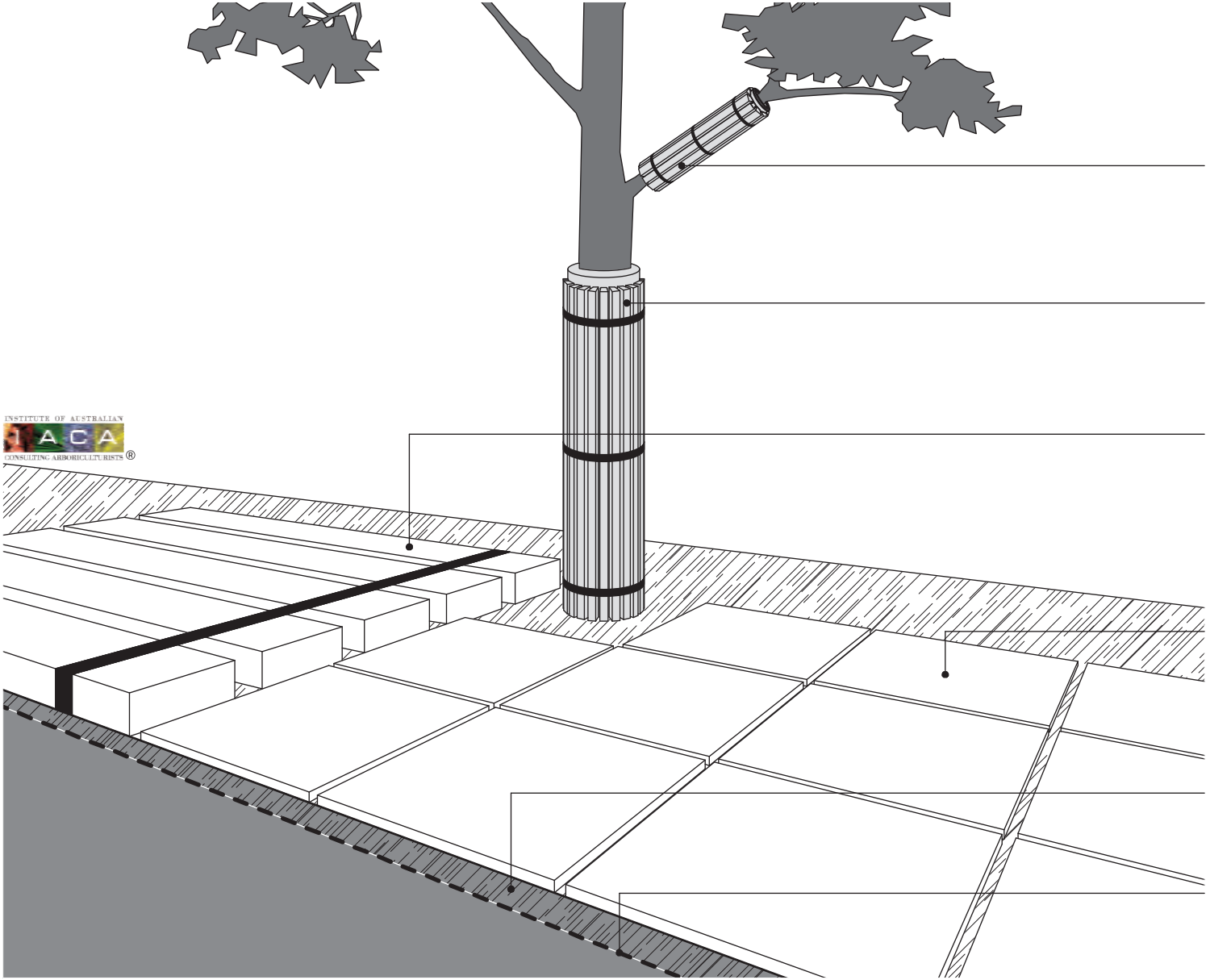
Bracing is permissible within the TPZ.

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

12th September 2012

ADDENDUM
University of Sydney – Australian Institute of Nanoscience

1.0 Introduction

1.1 This document is an Addendum to the Arboricultural Impact Assessment and Tree Protection Specification (USYD/AIN/AIA/B, dated 07.03.12, prepared by TreeiQ) for Stages 1 & 2 of the demolition works for the Institute of Nanoscience at the University of Sydney. The March 2012 TreeiQ Report should be read in conjunction with this Addendum.

1.2 This Addendum has been prepared to address issues regarding the impact of the proposed stormwater pipe and retaining wall on Tree 1 (*Ficus microcarpa* var. Hilli) and Tree 4 and Group 5 (*Lophostemon confertus*).

2.0 Stormwater Pipe and Retaining Wall

2.1 Tree 1 has a Tree Protection Zone (TPZ) of 15m. The supplied plan shows a 900mm diameter stormwater pipe and retaining wall running tangentially through the eastern section of the TPZ of this tree. At the closest point the proposed retaining wall is located 12.0m from the centre of the tree with the stormwater pipe at 13.2m.

Refer to Appendix 1: Supplied Plan

2.2 The works are considered a *Minor Encroachment* as defined by *Australian Standard 4970-2009 Protection of Trees on Development Sites* (AS-4970) as the extent of TPZ encroachment represented by the stormwater pipe and retaining wall is less than ten percent of the total TPZ area.

2.3 A *Minor Encroachment* is considered acceptable by the AS-4970 when it is compensated for elsewhere and contiguous with the TPZ. The *Minor Encroachment* can be compensated for within the subject site by extending the area of the TPZ to the north, south and west.

2.4 Over excavation and temporary battering should be avoided within the TPZ to minimise the level of encroachment during the installation of the retaining wall. Contiguous piling should be used to construct the section of the retaining wall that extends through the TPZ of Tree 1. A hand dug trench should be excavated to a depth of 600mm along the line of the proposed retaining wall within the TPZ to prevent shattering of roots by piling equipment. All exposed roots should be cleanly severed with a pruning saw or secateurs prior to the commencement of piling installation.

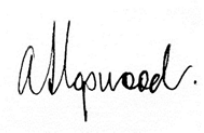
p. 0404 424 264
f. 02 9012 0924
1/9 venus st gladesville
info@treeiQ.com.au
abn 62 139 088 832
treeiQ.com.au

2.5 If there is any delay between root pruning works and piling installation, the exposed roots should be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute mat. The mat should be kept in a damp condition at all times.

2.6 Existing ground levels within the TPZ should be maintained. Re-grading of levels to the west of the retaining wall should not be permitted.

2.7 Modifications to the layout of TPZ fencing for Tree 1 will be required to provide access for the retaining wall and stormwater pipe installation. The TPZ fencing should be located immediately to the west of the retaining wall and installed in accordance with Appendix 5: Tree Protection Specification of the March 2012 TreeiQ Report.

2.8 The supplied plans show the stormwater pipe and retaining wall running through the TPZ of Tree 4 and Group 5, with re-grading works to the south and west. The proposed works either directly conflict with Tree 4 and Group 5 or represent *Major Encroachment* as defined by the AS-4970. The removal of these trees will be required as part of development works.



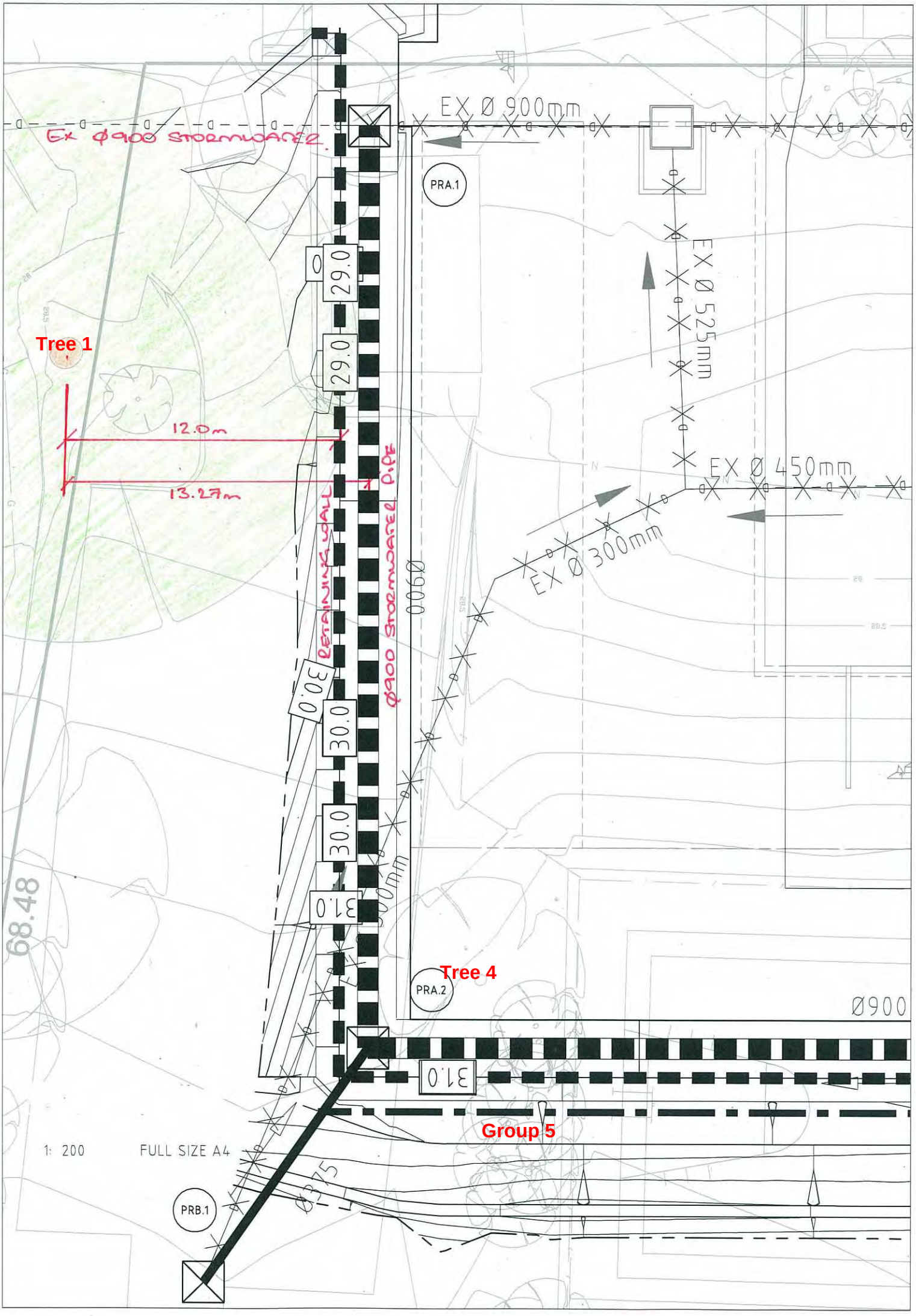
Anna Hopwood
Dip. Hort (Arboriculture)
Dip. Hort (Landscape Design)

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

Appendix 1: Supplied 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


EX Ø 900mm
Ex ϕ900 STORMWATER.
PRA.1
EX Ø 525mm
EX Ø 450mm
EX Ø 300mm
Tree 1
12.0m
13.27m
29.0
29.0
30.0
30.0
30.0
31.0
RETAINING WALL
Ø900 STORMWATER PIPE
Ø900
68.48
Tree 4
PRA.2
Ø900
31.0
Group 5
1: 200
FULL SIZE A4
PRB.1