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|---|---|
| Client | Health Infrastructure c/o Capital Insight |
| Location | Westmead Millennium Research Institute & Research Hub. |
| Document Type | Arboriculture Assessment for Development Application |
| Date/Time | 16th August 2010 |

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| Client | Health Infrastructure c/o Capital Insight |
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| Document Type | Arboriculture Assessment for Development Application |
| Date/Time | 16th August 2010 |

## 1. Contents

# 2 Introduction

2.1 On the 14th August 2010 Mr Milne representing Capital Insight contacted The Ents Tree Consultancy in regards to obtaining a tree report for the trees located on the proposed Westmead Millennium Institute & Research Hub development site on the grounds of Westmead Hospital. The client stated that the trees on and one adjoining the site have been nominated to be inspected in relation to a part 3a. Consultation with the client about the number and position of trees to be inspected in relation to the works occurred prior to a survey being completed.

2.2 The site inspection of the nominated trees occurred on the 16th August 2010. The client's representative was present for the site inspection and issued a verbal brief providing background information in regards to the trees on site. The client's representative also issued a site plan showing the position of the trees on the site and another plan showing the extent of the works.

2.3 The purpose of this report is to assess the proposed works as well as the health and suitability of the trees nominated at the time of the inspection. Tree Protection Guidelines will be discussed for all trees nominated to be retained. The information in this report will be based on the information presented by the client at the time of the inspection as well as the site inspection. The Australian Standard AS4970 Protection of Trees on development sites will be used as a guide to managing the site.

2.4 To achieve the objectives of the report, the trees will be assessed noting the species, size, general condition with any defects discussed. The trees characteristics and eventual size will be taken into consideration as will the trees position in relation to structures and hard scapes. Recommendations will be outlined in section 5 of the report. A detailed list of the trees surveyed will be provided in Appendix 2 of the report and a numerical system will be used to identify them for this report and future reference on this job site. A site plan will show the trees and their allocated numbers in Appendix 4.

# 3 Methodology

3.1 The trees were assessed using the standard Visual Tree Assessment technique (VTA). The trees were assessed from the ground for the purpose of this report. VTA is an internationally recognised practice in the visual assessment of trees as formulated by Mattheck & Breloer (1994).

3.2 A Lufkin 6.5m diameter tape was used to obtain the Diameter at breast height (DBH) as recommended at 1.3 metres unless otherwise stated due to variations in the trees form.

3.3 The height of the trees was estimated and the spread of the trees canopy was paced out.

3.4 A Canon 350D Digital camera with a 20-40mm lens was used to take all photographs in this report. No image modification has been used in any of the images, although due to the wide angle lens some distortion of images may occur.

3.5 The SULE rating system has been used as a guide to assist in determining the Safe Useful Life Expectancy of the tree surveyed. Refer to Appendix 1.

# 4 Discussion

4.1 The trees nominated to be inspected are located on the proposed Westmead Millennium Institute & Research development site. The trees are significant in the immediate landscape and some are likely to be considered important in the local areas landscape in terms of amenity and function. The trees to the East form part of an avenue planting in the streetscape, whilst others form informal stands lining internal roads or are in garden areas.

4.2 The trees are located on an exposed site with some protection from surrounding structures and topography. The soil on site is a clay loam and it has been disturbed previously. All of the works proposed are limited to the within existing boundary of the site and it appears that there will be no impacts to trees in the surrounding areas or streetscapes.

4.3 Based on the information provided by the client, the site is to be redeveloped with the existing building to be demolished within the nominated construction area. A new building will be constructed the Eastern end of the site with a temporary car park constructed to the Western side of the site. The majority of the works have been planned with tree retention of the most significant trees in mind. There are many small, weedy or self sown trees planned to be removed but few significant specimens.

4.4 The majority of the trees that are worthy of retention are nominated to be retained. It is envisaged that all of the trees proposed to be retained can be kept in good condition for the duration of the works using the Australian Standard AS4970 2009 Protection of trees on development sites. Additional instructions will be discussed below as required.

**4.5 Trees to be Removed.**

4.5.1 Trees 2-13 are proposed to be removed as they are in the position of the proposed building. Trees 5- 8 are in poor condition and tree group 9, 12 and 13 are self sown. Trees 16 and 17 are also self sown trees that are proposed to be removed. Trees 19 – 24 are in the position of the new car park. Most of these trees are also self sown with the majority in poor condition.

**4.6 Trees to be Retained.**

4.6.1 All three trees nominated to be assessed are to be retained in good condition for the duration of the works using the Australian Standard AS4970 2009 Protection of trees on development sites as the basis for a tree management plan. The exception is that if the areas nominated to be fenced as a TPZ may need to be modified if pedestrian or vehicular access is required. Tree protection zones should be designed to allow for continued pedestrian access and uninterrupted traffic access. This will mean limiting the Tree Protection measures to trunk wraps or a modified fence that does not prevent access to land users in some situations.

4.6.2 Tree 1 is a semi mature tree nominated to be retained. There are no works within this tree's TPZ however due to its proximity to the access road it is anticipated that crown lifting may be required and some tree protection fencing. Trees 14 & 15 are both mature trees with average health and form. These trees will have no significant impacts to their structural root zones, however will have up to 10% of their biological root zone disturbed. Tree 14 will require minor crown pruning of secondary lateral branches to allow for the installation of the proposed building. The branches removed will account for less than 10% of the trees crown.

4.6.3 Tree 18 is a semi mature tree with average health and average form. No significant impacts are anticipated for this tree. Trees 25 to 34 are mature trees with average health and form. The trees will receive little or no disturbance to their root zones, due to their position at the Southern boundary away from all proposed works. It is envisaged that one Tree protection Zone could be established on the Western side of the Trees from the NE to the SW separating the works area for the trees.

4.6.4 Trees 35 to 44 will have little or no disturbance to their biological root zones occur, (less than 10%) and no disturbance to the trees structural root zone. This is due to their position away from the works. In some cases retaining wall and or physical barriers will separate these trees form the work zone. Tree 45 is close to the demolition zone and limited access to the trees TPZ will be permitted with no machinery access allowed with the trees SRZ.

4.6.5 Trees 46 to 48 are located in an area of proposed and existing traffic movement. No building works are planned to occur here and the areas use will remain largely unchanged. These trees will require tree protection fencing to ensure no damage to the trees vascular tissue occurs. All three trees nominated to be assessed are to be retained in good condition for the duration of the works using the Australian Standard AS4970 2009 Protection of trees on development sites as the basis for a tree management plan.

## 5 Recommendations

5.1 After reviewing the site plan and the information provided by the client's representative it is my recommendation the proposed plan for the Westmead Millennium Institute & Research Hub is allowed to proceed with the following actions carried out.

5.2 Trees 2-13, 16, 17 & trees 19 – 24 are removed. The majority of these trees are not significant and an effort should be made to incorporate new tree specimens in the new landscape management plan.

5.3 It is recommended that trees 1, 14, 15, 18 and trees 25 -28 are retained in good condition for the duration of the works using the Australian Standard AS4970 2009 Protection of trees on development sites. Some trees with road or pedestrian paths within their nominated tree protection area will require modified tree protection zone to allow for continued pedestrian access and continued vehicular movement. Pruning for crown clearance in required on trees 1 & 14. The pruning will be minimal and allows for 10% of the trees total crown to be removed.

5.3 Regular site inspections by a level 5 Arborist should be completed to ensure the appropriate tree protection measures and recognised horticultural practices are being utilised to keep these trees in good condition for the duration of the works.

*Note: All tree works are to be conducted by suitably qualified persons and should comply with the Australian standard for the pruning of Amenity trees AS4373.*

Please do not hesitate to call 0422 265 128 if you have any questions regarding the contents of this report.

Regards

Hayden Coulter
Diploma in Arboriculture
Advanced Certificate in Urban Horticulture

*The Ents Tree Consultancy. ABN: 95 598 933136* theents@bigpond.net.au


## Disclaimer

All trees have been assessed based on the information and facts of the site and as presented by the client or relevant parties at the time of inspection. No responsibility can be taken for incorrect or misleading information provided by the client or other parties.

The nominated tree/s are assessed for biological requirements and hazard potential with reasonable care. The trees are assessed from the ground and by visual means only unless otherwise stated. All tree protection and tree preservation measures are designed to minimise the damage to the tree/s or to reduce the hazard potential of the tree/s. Trees are inherently dangerous, therefore will always have a hazard potential.

Trees fail in ways that are not predictable or fully understood. There is no guarantee expressed or implied that failure or deficiencies may not arise of the subject trees in the future. No responsibility is accepted for damage to property or injury/death caused by the nominated tree/s.

## Appendix 1
## S.U.L.E Categories (After Barrell) 1996 Updated 01/04/01.

1. **Long S.U.L.E-** the tree appeared retainable at the time of assessment for over 40 years with an acceptable degree of risk, assuming reasonable maintenance:
    - **a.** Structurally sound trees located in positions that can accommodate future growth.
    - **b.** Trees, which could be made suitable for long term retention by remedial care.
    - **c.** Trees of special significance which would warrant extraordinary efforts to secure their long term retention.

2. **Medium S.U.L.E-** the tree appeared to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk, assuming reasonable maintenance:
    - **a.** Trees, which may only live from 15-40 years.
    - **b.** Trees that may live for more than 40 years but may be removed for safety or nuisance reasons.
    - **c.** Trees which may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new plantings.
    - **d.** Trees which could be made suitable for retention in the medium term with remedial care.

3. **Short S.U.L.E-** trees that appeared to be retainable at the time of assessment for 5-15 years with an acceptable degree of risk, assuming reasonable maintenance:
    - **a.** Trees which may only live from 5 to 15 years.
    - **b.** Trees that may live for more than 15 years but may be removed for safety or nuisance reasons.
    - **c.** Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new plantings.
    - **d.** Trees which require substantial remediation and are only suitable for retention in the short term.

4. **Removal-** Tree which should be removed within the next 5 years.
    - **a.** Dead, dying suppressed or declining trees
    - **b.** Dangerous trees through instability or recent loss of adjacent trees.
    - **c.** Dangerous trees because of structural defects including cavities, decay included bark, wounds or poor form.
    - **d.** Damaged trees that are clearly not safe to retain.
    - **e.** Trees which may live for more than 5 years but would be removed to prevent interference with more suitable individuals or to provide space for new plantings.
    - **f.** Trees which are damaging or may cause damage to existing structures within the next 5 years.
    - **g.** Trees that will become dangerous after the removal of other trees for the reasons given in (A) to (F).
    - **h.** Trees in categories (A) to (G) that have a high wild life habitat value and with appropriate treatment could be retained subject to regular review.

5. **Small, young or regularly pruned-** Trees that can be reliably moved or replaced.
    - **a.** Small trees less than 5m in height.
    - **b.** Young trees less than 15 years old but over 5m in height.
    - **c.** Formal hedges and trees intended for regular pruning to artificially control growth.

## Appendix 2 Assessment of Trees

| Tree No | Species | Height (m) | Trunk Diameter (DBH*) | Canopy Spread (m) | Estimated Age Class | TPZ ** (M) | SULE *** | Observations and comments |
|---|---|---|---|---|---|---|---|---|
| 1 | *Platanus x hybrida* | 8 | .25 | 6 | Semi mature | 3m SRZ 1.85 | Long | This semi mature tree is located close to the foot path and driveway. The tree has average health and average form for the species. The tree has no significant wounds or defects evident. Possible crown lift required to the South of the tree for access. |
| 2 | *Jacaranda mimosaefolia* | 6 | .20 (multi) | 6 | Semi mature | 2.4 SRZ 1.7 | Medium | This semi mature tree is located close to the foot path and driveway. The tree has average health and below average form for the species. Proposed to be removed. |
| 3 | *Jacaranda mimosaefolia* | 7 | .42 | 7 | Semi mature | N/A | Medium | This semi mature tree is located close to the foot path. The tree has average health and below average form for the species. Proposed to be removed. |
| 3a | *Jacaranda mimosaefolia* | 7 | .31 | 5 | Semi mature | N/A | Medium | This semi mature tree is located close to the foot path. The tree has average health and below average form for the species. Proposed to be removed. |
| 4 | *Jacaranda mimosaefolia* | 8 | .42 | 7 | Semi mature | N/A | Medium | This semi mature tree is located close to the foot path. The tree has average health and below average form for the species. Proposed to be removed. |
| 5 | *Acacia decurrens* | 8 | .32 | 6 | Semi mature | N/A | Short | This mature tree is located close to the driveway. The tree has below average health and form for the species. The tree is proposed to be removed. |
| 6 | *Acacia decurrens* | 7 | .15 | 4 | Semi mature | N/A | Short | This mature tree is located close to the driveway. The tree has below average health and form for the species. The tree is proposed to be removed. |
| 7 | *Eucalyptus scoparia* | 9 | .49 | 6 | Mature | N/A | Medium | This mature tree is located close to the driveway. The tree has below average health and form for the species. The tree is proposed to be removed. |
| 8 | *Juniperus chinensis* | 11 | .37 | 4 | Semi mature | N/A | Medium | A mature tree with below average health, vigour and form. The tree has dieback throughout crown and is in position of building, proposed to be removed. |
| 9 | *Acacia decurrens* | 6 | .10 | 2 | Young | N/A | Medium | A group of semi mature trees with good health, vigour and form. Trees are self sown and are fast growing. These trees are located in the position of the proposed building. |
| 10 | *Grevillea robusta* | 8 | .29 | 5 | Semi mature | N/A | Medium | A self sown semi mature tree with average health, vigour and below average form. This tree is located in the position of the proposed building. |

| Tree No | *Species* | Height (m) | Trunk Diameter (DBH*) | Canopy Spread (m) | Estimated Age Class | TPZ ** (M) | SULE *** | Observations and comments |
|---|---|---|---|---|---|---|---|---|
| 11 | *Chaamocyparis lawsoniana* | 12 | .41 | 8 | Mature | N/A | Medium | A mature tree with average health, vigour and form. In position of building, proposed to be removed. |
| 12 | *Liquidambar styraciflua* | 7 | .10 | 4 | Semi mature | N/A | Medium | This group of 15 semi mature trees are located close to the existing building to be demolished. The trees have average health and below appear to have been self sown. Proposed to be removed. |
| 13 | *Cinnamomum camphora* | 5 | .09 | 2 | Young | N/A | Medium | A young tree with average health, vigour and form. In position of building, proposed to be removed. |
| 14 | *Corymbia citriodora* | 15 | .36 | 10 | Mature | 4.2 SRZ 2.15 | Medium | A mature tree with average health vigour and form. No significant defects evident. |
| 15 | *Corymbia citriodora* | 15 | .31 | 8 | Mature | 3.6 SRZ 2 | Medium | A mature tree with average health vigour and form. No significant defects evident. |
| 16 | *Jacaranda mimosaefolia* | 8 | .20 | 4 | Semi mature | N/A | Medium | This semi mature tree is located close to the existing building, self sown. In position of new building. Proposed to be removed. |
| 17 | *Jacaranda mimosaefolia* | 6 | .10 | 3 | Semi mature | N/A | Medium | This semi mature tree is located close to the existing building, self sown. In position of new building. Proposed to be removed. |
| 18 | *Jacaranda mimosaefolia* | 7 | .20 | 5 | Semi mature | N/A | Medium | This semi mature tree is located close to the existing building, self sown. In position of new building. Proposed to be removed. |
| 19 | *Grevillea robusta* | 6 | .10 | 2 | Semi mature | N/A | Medium | A self sown semi mature tree with average health, vigour and below average form. This tree is located in the position of the proposed car park. |
| 20 | *Grevillea robusta* | 16 | .55 | 9 | Mature | N/A | Medium | A self sown mature tree with average health, vigour and average form. This tree is located in the position of the proposed car park. |
| 21 | *Jacaranda mimosaefolia* | 7 | .10 | 3 | Semi mature | N/A | Medium | This semi mature tree is located close to the existing building, self sown. In position of new car park. Proposed to be removed. |
| 22 | *Grevillea robusta* | 11 | .17 | 4 | Semi mature | N/A | Medium | A self sown semi mature tree with average health, vigour and below average form. This tree is located in the position of the proposed car park. |

| Tree No | *Species* | Height (m) | Trunk Diameter (DBH*) | Canopy Spread (m) | Estimated Age Class | TPZ ** (M) | SULE *** | Observations and comments |
|---|---|---|---|---|---|---|---|---|
| 23 | *Grevillea robusta* | 9 | .11 | 3 | Semi mature | N/A | Medium | A self sown semi mature tree with average health, vigour and below average form. This tree is located in the position of the proposed car park. |
| 24 | *Ligustrum lucidum* | 5 | .10 | 4 | Semi mature | N/A | Medium | A self sown semi mature tree with average health, vigour and below average form. This tree is located in the position of the proposed car park |
| 25 | *Jacaranda mimosaefolia* | 12 | .42 | 9 | Mature | 4.6 SRZ 2.25m | Medium | This mature tree is located close to the footpath and forms part of an avenue. Tree to be retained no impacts are anticipated. |
| 26 | *Jacaranda mimosaefolia* | 11 | .27 | 7 | Mature | 3.6 SRZ 2m | Medium | This mature tree is located close to the footpath and forms part of an avenue. Tree to be retained no impacts are anticipated. |
| 27 | *Jacaranda mimosaefolia* | 11 | .35 | 7 | Mature | 4.2 SRZ 2.15 | Medium | This mature tree is located close to the footpath and forms part of an avenue. Tree to be retained no impacts are anticipated. |
| 28 | *Jacaranda mimosaefolia* | 11 | .31 | 8 | Mature | 3.6 SRZ 2m | Medium | This mature tree is located close to the footpath and forms part of an avenue. Tree to be retained no impacts are anticipated. |
| 29 | *Jacaranda mimosaefolia* | 11 | .39 | 9 | Mature | 4.6 SRZ 2.25m | Medium | This mature tree is located close to the footpath and forms part of an avenue. Tree to be retained no impacts are anticipated. |
| 30 | *Jacaranda mimosaefolia* | 11 | .31 | 7 | Mature | 3.6 SRZ 2m | Medium | This mature tree is located close to the footpath and forms part of an avenue. Tree to be retained no impacts are anticipated. |
| 31 | *Grevillea robusta* | 15 | .35 | 8 | Mature | 4.2 SRZ 2.15 | Medium | A self sown mature tree with average health, vigour and below average form. This tree has a wound on the E side at the base. |
| 32 | *Grevillea robusta* | 9 | .32 | 6 | Mature | 3.6 SRZ 2m | Medium | A self sown mature tree with average health, vigour and below average form. |
| 33 | *Grevillea robusta* | 15 | .35 | 8 | Mature | 3.6 SRZ 2m | Medium | A self sown mature tree with average health, vigour and below average form. |

| Tree No | *Species* | Height (m) | Trunk Diameter (DBH*) | Canopy Spread (m) | Estimated Age Class | TPZ ** (M) | SULE *** | Observations and comments |
|---|---|---|---|---|---|---|---|---|
| 34 | *Corymbia maculata* | 17 | .45 | 8 | Mature | 5.4 SRZ 2.37 | Medium | A mature tree with average health, vigour and form. No significant defects were observed at the time of the inspection. |
| 35 | *Corymbia citriodora* | 14 | .12 | 4 | Semi mature | 2 SRZ 1.5 | Medium | A mature tree with average health, vigour and form. No significant defects were observed at the time of the inspection. |
| 36 | *Syncarpia glomifera* | 13 | .19 | 5 | Semi mature | 2.4 SRZ 1.7m | Medium | This semi mature tree is located close to the footpath and forms part of an informal stand. Tree to be retained no impacts are anticipated. |
| 37 | *Eucalyptus scoparia* | 14 | .33 | 7 | Mature | 3.6 SRZ 2m | Medium | This mature tree is located close to the footpath and forms part of an avenue. The tree has winter bronzing. Tree to be retained no impacts are anticipated. |
| 38 | *Casuarina littoralis* | 9 | .21 | 6 | Mature | 2.4 SRZ 1.7m | Medium | This semi mature tree is located close to the footpath and forms part of an informal stand. Tree to be retained no impacts are anticipated. |
| 39 | *Eucalyptus scoparia* | 14 | .27 | 7 | Mature | 3.6 SRZ 2m | Medium | This mature tree is located close to the footpath and forms part of an avenue. The tree has winter bronzing. Tree to be retained no impacts are anticipated. |
| 40 | *Eucalyptus scoparia* | 14 | .33 | 7 | Mature | 3.6 SRZ 2m | Medium | This mature tree is located close to the footpath and forms part of an avenue. The tree has winter bronzing. Tree to be retained no impacts are anticipated. |
| 41 | *Eucalyptus scoparia* | 13 | .25 | 6 | Mature | 3.6 SRZ 2m | Medium | This mature tree is located close to the footpath and forms part of an avenue. The tree has winter bronzing. Tree to be retained no impacts are anticipated. |
| 42 | *Eucalyptus scoparia* | 12 | .21 | 5 | Mature | 3.6 SRZ 2m | Medium | This mature tree is located close to the footpath and forms part of an avenue. The tree has winter bronzing. Tree to be retained no impacts are anticipated. |
| 43 | *Corymbia maculata* | 18 | .43 | 8 | Mature | 5.4 SRZ 2.37 | Medium | A mature tree with average health, vigour and form. Tree has winter bronzing. No significant defects were observed at the time of the inspection. |
| 44 | *Corymbia maculata* | 17 | .42 | 8 | Mature | 5.4 SRZ 2.37 | Medium | A mature tree with average health, vigour and form. Tree has winter bronzing. No significant defects were observed at the time of the inspection. |

| Tree No | *Species* | Height (m) | Trunk Diameter (DBH*) | Canopy Spread (m) | Estimated Age Class | TPZ ** (M) | SULE *** | Observations and comments |
|---|---|---|---|---|---|---|---|---|
| 45 | *Eucalyptus scoparia* | 17 | .72 | 8 | Mature | 8.4 SRZ 2.85 | Short | This mature tree is located close to the existing building, the tree has been lopped and has decay. The tree has winter bronzing. Tree to be retained no impacts are anticipated. If retained further investigation of decay required. |
| 46 | *Grevillea robusta* | 9 | .21 | 4 | Semi mature | 2.4 SRZ 1.7m | Medium | A self sown mature tree with average health, vigour and below average form. |
| 47 | *Eucalyptus moluccana* | 17 | .57 | 9 | Mature | 7.2 SRZ 2.7 | Medium | This mature tree is located close to the existing driveway and road. Tree to be retained no impacts are anticipated. |
| 48 | *Eucalyptus moluccana* | 9 | .30 | 5 | Mature | 3.6 SRZ 2m | Medium | This mature tree is located close to the existing driveway and road. Tree to be retained no impacts are anticipated. |

**Explanatory Notes for Table**

- *Dbh = Diameter of trunk at breast height.
- **TPZ refers to the Tree Protection Zones as recommended by The Ents Tree Consultancy and are to be used in conjunction with the Tree Protection Guidelines in Appendices 3. TPZ based on 10x the trees Dbh for retention of biological function, 5x Dbh for critical root zone and tree stability.
- ***SULE Explanation can be found in Appendix 2.

## Appendix 3 Tree Images




Picture above left shows tree 1. Picture above centre left shows trees 2- 4. Above centre right shows tree 7. Above right shows tree 11. Below left shows tree s 10, 11 & 8. Below right shows tree12 & 13

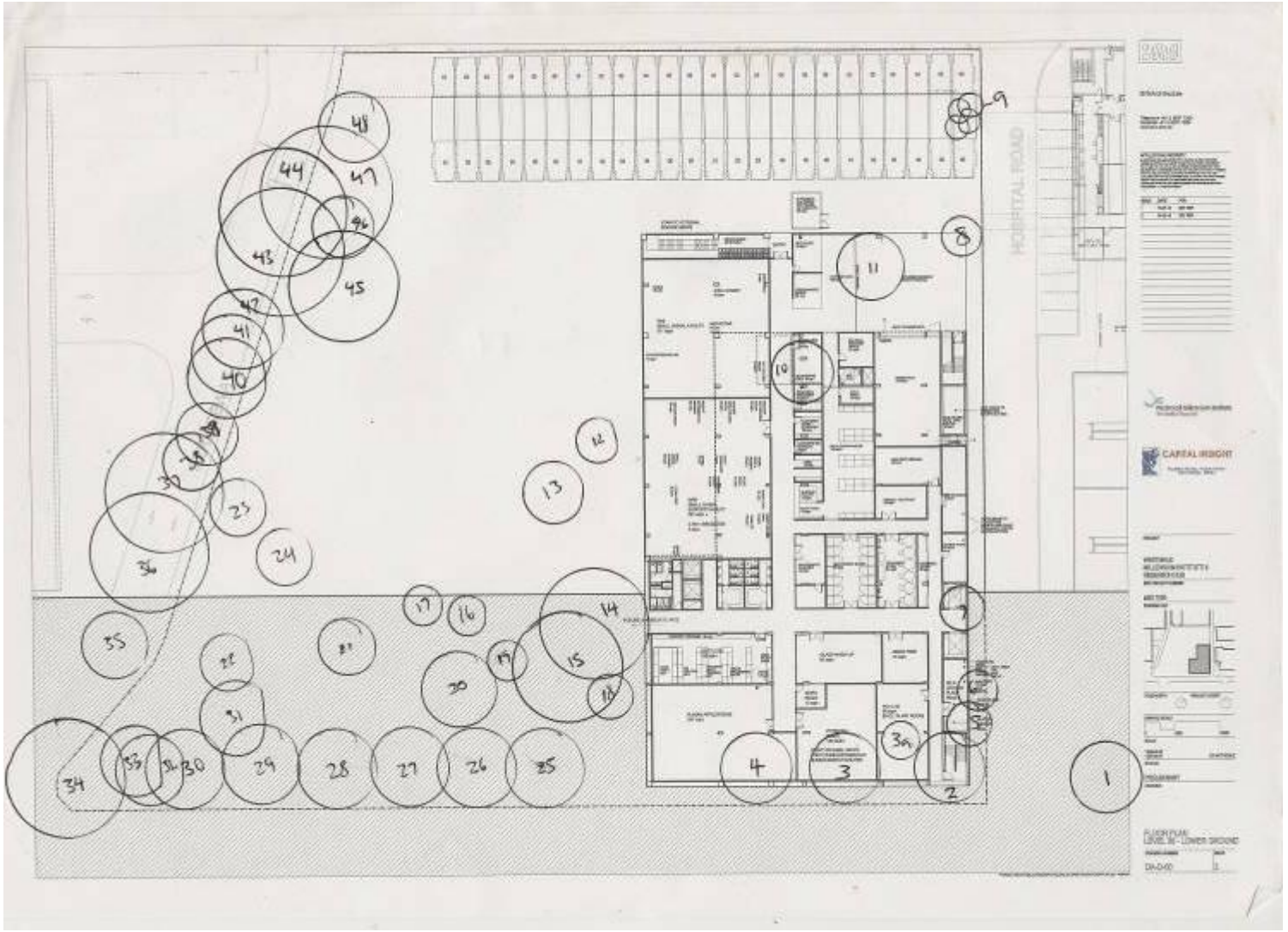


Picture above left shows trees 14, 15 & 18. Picture above right shows trees 19 – 27.
Picture below left 21 – 37. Pictured above right are trees 34 – 25



Pictured above left are trees 36-42. Pictured above right are trees 43 & 44.
Pictured below are trees 47 & 48.

Appendix 4 Site Plan (for Identifying Trees only)



Appendix 5
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## Appendix 6
## Glossary Of Terms

| | |
|---|---|
| Abiotic | Nonliving |
| Anthracnose | a fungal disease causing dead areas on the leaves, buds, stems. |
| Arboriculture | The science and art of caring for trees, shrubs and other woody plants in landscape settings. |
| Barrier Zone | Protective boundary formed in new wood in response to wounding or other injury. |
| Biotic | Alive, pertaining to living organisms. |
| Branch attachment | The structural union of a lateral branch. |
| Callus | Undifferentiated tissue produced in response to wounding. |
| Canker | A dead spot or necrotic lesion that is caused by a bark inhabiting organism/pathogen. |
| Cavity | an open wound characterized by the presence of decay resulting in a hollow. |
| Collar | the ring of tissue that surrounds the lateral branch at its point of attachment. |
| Compartmentalization | A physiological process that creates the chemical and physical boundaries that act to limit the spread of disease and decay organisms. |
| Compression wood | A type of reaction wood that forms on the underside of branches which tends to maintain a branch angle of growth. |
| Crown | The above ground parts of the tree, including the trunk. |
| DBH | The diameter of a trees trunk measured at 1.4m. |
| Decay | Process of degradation of woody tissues by fungi and bacteria through the decomposition of cellulose and lignin. |
| Decline | Progressive decrease in health of organs or the entire plant usually caused by a series of interacting factors. |
| Drip line | The width of the crown, as measured by the lateral extent of the foliage. |
| Epicormic shoot | a shoot that arises from latent or adventitious buds that occur on stems, branches or the bases of trees. |
| Included bark | Pattern of development at branch junctions where bark is turned inward, rather than pushed out; contrast with the branch nark ridge. |
| Mortality Spiral | The sequence of events describing a change in the trees health from vigorous to declining to death. |
| Photosynthesis | The transformation in the presence of chlorophyll and light, of carbon dioxide from (the air) and water (primarily from soil) into a simple carbohydrate and oxygen. |
| Pruning | systematic removal of branches of a plant usually a woody perennial. |
| Reaction wood | Specialized secondary xylem that develops in response to a lean or similar mechanical stress to restore the stem to vertical. |
| Taper | The change in diameter over the length of trunks and branches. Important to mechanical support. |
| Tension wood | A type of reaction wood that trees form on the upper side of branches and stems and roots. |
| VTA | Visual Tree Assessment is a method of evaluating structural defects and stability in trees. |
| Wound | Any injury that induces a compartmentalization response. |

## Appendix 7 Curriculum Vitae

**Education and Qualifications**

- 2005 Diploma of Arboriculture (AQF Cert 5), Ryde TAFE. Distinction.
- 2000 Tree Climbing Course (AQF Cert 2), Ryde TAFE.
- 1999 Advanced Certificate in Urban Horticulture, (AQF Cert 4), Ryde TAFE. Distinction.
- 1995 Greenkeepers Trade Certificate (AQF 3) Ryde TAFE. Credit.
- 1991 Higher School Certificate.
-

**Conference Attendance/presentation of Scientific Papers**

- **Barrell Tree Care Workshop- Trees on Construction Sites (Brisbane 2005)**
- **Tree Logic seminar- Urban Tree Risk Management (Sydney 2005)**
- **Tree Pathology and Wood Decay Seminar Sydney (2004)**
- **Excelsior Training Claus Mattheck (Sydney 2001)**
- **Managing Mature Trees NAAA(Sydney 2000), Presented a Paper "Habitat Value of Mature Trees"**

**Industry Experience**

- **2004 to Date, Sole Trader The Ents Tree Consultancy.** Writing of tree reports for development applications, master plans, hazard evaluations, tree management plans and expert witness reports. Hazard assessments, tree surveys and consultations.
- **2003 to 2008, Arborist University of New South Wales**. Survey all trees on site, developed a Tree Management Database. Minimise hazard potential of all trees on site through evaluation and works. Generate and prioritise works and tree assessment based areas usage, tree conditions and staff required. Development of UNSW Tree Protection Guidelines for master planning works. Acting Supervisor December 2006 to May 2007.
- **2003 Tree management Officer Randwick Council**. Liaise with public to explain and enforce the councils Tree Preservation order. Management of internal staff and contractors. Project management and co ordination of street tree planting and maintenance.
- **1999 to 2003 Animal Food Production Manager and Arborist.** Management of Koala food Plantation, Management of animal food supply registry for herbivores/omnivores. Coordination of staff contractors and volunteers. Maintain and manage tree management database, complete tree works within zoo grounds and at zoo owned plantations. Acting supervisor 6 month period 2002 for grounds dept and asset management trade team.
- **1998 to 1999 Sole Trader Techniques Lawn & Garden Consultancy.** Lawn, garden and Tree care. Garden design and maintenance. Tree works and tree removal. Installation of irrigation equipment.
- **1997 to 1998 Greenkeeper / Horticulturist Muirfield Golf Course.** General grounds duties, machinery maintenance, horticultural works, tree works
- **1992 to 1997 Greenkeeper / Horticulturist Ashlar Golf Course.** General grounds duties, machinery maintenance, horticultural works, tree works