TREE MANAGEMENT CONSULTING ARBORICULTURISTS

ARBORICULTURAL ASSESSMENT

An audit and health and condition assessment of existing site trees as a preliminary guide to site planning for development.

for

Royal Rehabilitation Centre Sydney
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RYDE NSW

SITE ADDRESS
PROPOSED CENTRAL PARKLAND AND WETLAND AREAS
ROYAL REHABILITATION CENTRE SYDNEY
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1 INTRODUCTION

1.1 This Arboricultural Assessment was commissioned by Mr. Mark Lewis, on behalf of the Royal Rehabilitation Centre Sydney.
The subject site is identified as the proposed Central Parkland and Wetland areas, within the grounds of the Royal Rehabilitation Centre Sydney, located in Ryde, New South Wales.

1.2 The purpose of this report is to provide information relating to the numbers and species of trees present on the subject site. The report is intended to assist in the planning and design of the proposed development of the subject site.

1.3 The report assesses the *health* and *condition* of the existing site trees, and provides guidelines for appropriate setbacks from trees, for structures and ground level changes.

1.4 This report also highlights those trees least suitable for retention due to declining health or condition.

1.5 Information contained in this Arboricultural Assessment covers only the trees that were examined and reflects the condition of the trees at the time of inspection.
Care has been taken to obtain all information from reliable sources.
All data has been verified as far as possible; however, I can neither guarantee nor be responsible for the accuracy of information provided by others.

1.6 This Arboricultural report is not intended as an assessment of any impacts on the trees by any proposed future development of the site.

1.7 This report is not intended to be a comprehensive *hazard* assessment, however the report may make recommendations, where appropriate, for further assessment or testing of trees where potential structural problems have been identified or where below ground investigation may be required.

2 METHODOLOGY

2.1 In preparation for this report, a ground level, limited *visual tree assessment* (Mattheck 1994) was undertaken by Urban Forestry Australia on 25th February and 3rd March, 2008.

2.2 Tree height and crown spread was estimated and expressed in meters. Trunk diameter was estimated at a point approximately at 1.4 metres above ground level. Dimensions are expressed in millimeters.

2.3 All assessed trees or tree groups were assigned a number and are identified on marked up copies of sheets 4, 5 and 10 of the site survey. These plans are called the Tree Location Plans, and are attached as Appendix C.

2.4 Field observations were written down for later entry into the Schedule of Assessed Trees. This schedule is attached as Appendix B.

2.5 Trees were accorded a 'Condition Rating' of between 0 – 5, with 0 representing a dead tree, and 5 representing a specimen with exceptional health and condition. Trees with a rating less than 3 (e.g. 0, 1 and 2) were generally treated as removable trees due to their declining health or condition, the presence of identifiable defects, or listed as exempt species under Ryde Council's Tree Preservation Order.

2.6 No *aerial inspections* or woody tissue testing were undertaken as part of this tree assessment. Information contained in this tree report covers only the trees that were examined and reflects the condition of those trees at the time of inspection.

2.7 Plans and documents referenced for the preparation of this report include:

- Relative Heights and Features Plan, Dwg. No. 32130 - 45, dated 19/02/08, prepared by Frank M Mason & Co., Pty Ltd.;
- Ryde City Council Tree Preservation Order 2006.

3 PRELIMINARY GUIDELINES FOR PLANNING AND DESIGN

3.1 Minimising Impacts on Trees to be Retained

3.1.1 Generally, potential impacts from site development can be summarised as follows;

- o Incursions (i.e. excavation or filling over existing ground, grading and removing of topsoils) into the root zones of trees resulting in loss of fine 'feeder' roots, or severing of structural woody roots.
- o Structural branch loss through close proximity of structures to trees.
- o Significant changes to surrounding soil levels which can affect soil hydrology and tree root health.

3.1.2 Where tree retention is desired, the Tree Protection Area (TPA) of an individual tree is estimated as 10 times the stem diameter, or the outer extent of the *canopy dripline* (whichever is the greater).
An additional 1 - 2 metres is added to this setback to ensure construction scaffolding can be accommodated without excessive removal of foliage and branches from the tree.
Several trees have high crowns; therefore this additional setback may be reduced following further arboricultural assessment of impacts on individual trees near proposed development.
Without any specific root zone assessment the TPA is to be kept entirely free of any development works, e.g. changes to existing ground levels, use of machinery, stockpiling, etc.

3.1.3 To facilitate adequate protection of tree root zones and tree crowns, separate appraisal of each development area (proposed roads, lots and reserves) should be carried out.

3.1.4 If no root investigations are carried out, TPA setbacks must adhere to those identified for individual trees in Appendix C of this report.

3.1.5 Additional setbacks of 2m (to side of tree closest to structure under construction) must be provided to trees near future dwellings to allow for construction scaffolding to be erected without impacting on tree crowns.

3.1.6 Wherever possible all major utilities and services are to be located beneath internal roads and driveways to dwellings.

3.1.7 Future proposed dwellings and driveways must be reassessed by a competent arboriculturist prior to any finalising of design and/or construction.

3.1.8 Any proposed excavation within the specified TPA setbacks of trees must be subject to the outcome of root investigation and/or assessment by a competent arboriculturist. Any approved excavation must be carried out under the direct supervision of a suitably qualified and experienced arboriculturist

3.1.9 Container size of proposed plants within the root zones (as defined by minimum setbacks in Section 3.5) of trees to be retained should be determined prior to purchase of plants. This is to determine where and how large plants can be at the time of planting. Otherwise, any proposed landscaping within the specified TPA setbacks must consist of tube stock only. This is required to ensure that damage to the tree's roots is avoided. Mattocks and similar digging instruments must not be used within the minimum setbacks. Planting holes should be dug carefully by hand with a garden trowel, or similar small tool.

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APPENDIX A

TERMS AND DEFINITIONS

TERMS AND DEFINITIONS

The following relates to terms or abbreviations that have been used in this report and provides the reader with a detailed explanation of those terms.

Aerial inspection Where the subject tree is climbed by a professional tree worker or arborist specifically to inspect and assess the upper stem and crown of the tree for signs or symptoms of defects, disease, etc.

Age classes

- **I** *Immature* refers to a refers to a well-established but juvenile tree
- **SM** *Semi-mature* refers to a tree at growth stages between immaturity and full size
- **M** *Mature* refers to a full sized tree with some capacity for further growth
- **LM** *Late Mature* refers to a full sized tree with little capacity for growth that is not yet about to enter decline

Canopy dripline -an imaginary line drawn from the outer edge of the canopy vertically to the ground below.

Cluster describes a group of branches or stems arising from the same point on a larger branch or stem.

Co-dominant refers to stems or branches equal in size and relative importance.

Condition refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils) and the state of the scaffold (i.e. trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition.

Dead wood refers to any whole limb that no longer contains living tissues (e.g. live leaves and/or bark). Some dead wood is common in a number of tree species.

Defect Any structural weakness or deformity.

Diameter at Breast Height (DBH) refers to the tree trunk diameter at breast height (i.e.1.4 m above ground level)

Dieback Death of growth tips/shoots and partial limbs, generally from tip to base. Die back is often an indicator of stress and tree health

Epicormic Shoots which arise from adventitious or latent buds. These shoots often have a weak point of attachment. They are often a response to stress in the tree. Epicormic growth/shoots are generally a survival mechanism, often indicating the presence of a current, or past stress event such as fire, pruning, drought, etc.

Hazard refers to anything with the potential to harm health, life or property.

Health refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion, and the degree of dieback.

Inclusion - stem/bark, the pattern of development at branch or stem junctions where bark is turned inward rather than pushed out. This fault is located at the point where the stems/branches meet. This is normally a genetic fault and potentially a weak point of attachment as the bark obstructs healthy tissue from joining together to strengthen the joint.

Kino is the brown or red gum-like resinous accretion stored in veins, pockets and cells of bark and wood, particularly of Eucalyptus and Angophora species.

Resistograph® testing A Resistograph® is a specialised machine that measures timber density by drilling a 3mm diameter probe through the wood, simultaneously plotting the results on a graph at full scale.

Visual Tree Assessment (VTA) a procedure of defect analysis developed by Mattheck and Breloer (1994), that uses the growth response and form of trees to detect defects.

APPENDIX B

SCHEDULE OF TREE INVENTORY

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Proposed Central Parkland and Wetland Area - Ryde Rehabilitation Centre Sydney – February, 2008.

Tree No.	Species and Common Name	Height (m)	Crown spread (m)	*DBH (mm)	Age	Health	Condition	Comments	*TPA (m)	Condition Rating
T1	*Eucalyptus microcorys* Tallowwood	5	6	120	I	Good	Good	No special problems visibly apparent at time of inspection.	**1.5**	**5**
T2	*Eucalyptus microcorys* Tallowwood	9	8	200	SM	Good	Good-Fair	Leaves insect damaged, stem twisted at base.	**3**	**4**
T3	Dead (Wattle)									**0**
T4	*Eucalyptus saligna* Sydney Blue Gum	12	7	180 / 240	I - SM	Good	Good	May be two trees sharing a root mass. Twiggy *deadwood* and broken smaller branches. Smaller of the two trees is in fair condition only, crown thinning.	**4.5**	**3**
T5	Dead (Wattle)									**0**
T6	Dead (Wattle)									**0**
T7	*Eucalyptus saligna* Sydney Blue Gum	12	10	300	SM	Good	Fair to Good	Obscured with grass and vine but possible stem *inclusion* at 3m above ground level. Lots of twiggy deadwood, thinning canopy.	**4.5**	**3**
T8	*Eucalyptus saligna* Sydney Blue Gum	12	12	250 / 330	SM	Good	Fair	Twiggy deadwood, insect damage to some leaves. *Co-dominant* stems @ base obscured with vine and long grass, possibly included.	**6.5**	**2**

Tree No.	Species and Common Name	Height (m)	Crown spread (m)	*DBH (mm)	Age	Health	Condition	Comments	*TPA (m)	Condition Rating
G9	*Eucalyptus saligna* x 3 Sydney Blue Gum Eucalyptus sp. x 1 *Casuarina glauca* Swamp She-oak	8	3 - 8	200 - 250	I - SM	Good	Fair to Good	Most specimens have co-dominant stems. Immature Eucalyptus sp. unable to be identified due to lack of identifying features at this stage.	**3 - 3.5**	**3 - 4**
G10	*Acacia parramattensis* x 6 Parramatta Green Wattle	3 – 7	4 – 7	80 – 220	I – SM	Fair to Good	Fair	Some dieback in at least 2 specimens. Normal small branch borer present.	**1 - 3**	**3**
T11	*Acacia ? filicifolia* Fern-leaf Wattle	7	14	Multi	SM	Good	Good-Fair	Twiggy deadwood, inclusions on upright stems/branch junctions. Borer evidence.	**8**	**3**
T12	*Eucalyptus robusta* Swamp Mahogany	3	6	120	I	Good	Good	Tree has developed lean to north/west.	**1.5**	**3**
T13	*Eucalyptus robusta* Swamp Mahogany	5	8	300 @ gl.	I	Good	Good-Fair	Twisted branches skimming ground. Stem wound from ground level to 0.5m above ground level.	**3.5**	**3**
T14	*Eucalyptus saligna* Sydney Blue Gum	9	10	205	I - SM	Good-Fair	Good-Fair	Maturing *epicormic* growth at base. Very low wide habit, immature epicormic growth along branches.	**4.5**	**3**
T15	Dead (wattle)									**0**
T16	*Acacia parramattensis* Parramatta Green Wattle	8.5	10	290	SM	Fair	Fair-Poor	Declining, borer damage noted. Death of various branches.	**2.5**	**1**

Tree No.	Species and Common Name	Height (m)	Crown spread (m)	*DBH (mm)	Age	Health	Condition	Comments	*TPA (m)	Condition Rating
T17	*Eucalyptus saligna* Sydney Blue Gum	11	12	335	SM	Good-Fair	Fair	Wounding to stem at base and at .5m above ground level. Borer activity present. Stem *cluster* at 3m above ground level, wounding present with *kino* production. Twiggy deadwood, insect damage to leaves. Crown thinning.	**5**	**2**
T18	*Acacia parramattensis* Parramatta Green Wattle	5	5	50 x 3	I	Good	Good	Possibly self seeded. Has had branches snapped off.	**1**	**3**
T19	*Acacia ? filicifolia* Fern-leaf Wattle	5	10	Multi	SM	Poor	Poor	Declining with only a couple of live branches.	**2**	**1**
T20	*Acacia parramattensis* Parramatta Green Wattle	4	5	2 x 80	I	Good	Good	No special problems visibly apparent at time of inspection.	**2**	**3**
T21	*Casuarina cunninghamiana* River She-oak	6	4.5	120	I	Good	Good	No special problems visibly apparent at time of inspection.	**1**	**4**
G22	*Corymbia citriodora* x 2 Lemon-scented Gum *Casuarina cunninghamiana* x 1 River She-oak	8 – 9	3 – 6	140 – 200	I – SM	Good	Fair to Good	Easternmost Gum has in inclusion at upper crown. Some borer damage noted. She-oak in good condition.		**3 - 4**
T23	*Corymbia citriodora* Lemon-scented Gum	12	8	420	SM	Good	Fair to Good	Possible branch inclusions in upper crown.	**4**	**3**

Tree No.	Species and Common Name	Height (m)	Crown spread (m)	*DBH (mm)	Age	Health	Condition	Comments	*TPA (m)	Condition Rating
T24	*Eucalyptus* sp. Ironbark	13	10	700	LS	Poor	Poor	Significant crown decline. Hazard tree.	**6**	**0**
G25	*Acacia? obtusifolia* x 5 *Acacia parramattensis* x 1 Parramatta Green Wattle	3 - 4	4 – 6	20 – 60	SM	Fair to Good	Fair	Green wattle declining. Other Wattles suckering.	**1**	**2**
G26	*Eucalyptus pilularis* x 2 Blackbutt *Lophostemon confertus* x 1 Brush Box	16	11	400 - 500	SM	Fair to Good	Fair to Good	Typical for species type. No special problems visibly apparent at time of inspection.	**7**	**4**
T27	*Eucalyptus saligna* Sydney Blue Gum	16	20	2 x 550	M	Good	Fair to Good	15% of crown epicormic. Co-dominant stems.	**11**	**3**
28	*Corymbia citriodora* Lemon-scented Gum	15	10	600	M	Good	Good	No special problems visibly apparent at time of inspection.	**7**	**4**
29	*Acacia decurrens* x 4 Black Wattle *Angophora costata* x 1 Smooth-barked Apple	3 - 8	2 – 8	50 – 250	I – OM	Poor to Good	Poor to Good	Wattles over mature and declining. *Angophora* is in good health. Several saplings of Lemon-scented Gums and Brush Box.	**5**	**2 - 3**
30	*Lophostemon confertus* x 5 Brush Box	6 – 8	3 – 4	180 Av	I	Fair	Fair to Good	No special problems visibly apparent at time of inspection.	**3**	**4**
G31	Eucalyptus microcorys x 6 Tallowwood *Eucalyptus saligna* x 1 Sydney Blue Gum	7 - 13	6 - 8	300 Av	SM	Fair to Good	Fair to Good	Most trees generally good. Typical branch inclusions noted. The Blue Gum is defective and needs to be further assessed if considered for retention.	**4**	**3**

Tree No.	Species and Common Name	Height (m)	Crown spread (m)	*DBH (mm)	Age	Health	Condition	Comments	*TPA (m)	Condition Rating
T32	*Eucalyptus saligna* Sydney Blue Gum	10	8	260	SM	Fair	Fair to Poor	Wounds and *defects* requiring further investigation. Tree forming secondary crown. *Dieback* noted.	**5**	**2**
T33	*Robinia pseudoacacia* 'Frisia' Black Locust	8.5	10	280	SM	Good	Good-Fair	Fluted stem at base, stem wound at 1.6m above ground level. Typical suckering habit of species. Pruned for road/footpath clearance. Trimmer damage.	**2.5**	**3**
T34	*Robinia pseudoacacia* 'Frisia' Black Locust	5.5	8	170	I	Good	Fair	Stem cluster included at 1.5m above ground level. Pruned for road/footpath clearance. Trimmer damage. Typical suckering habit of species. Wound on stem at base on road side.	**1.5**	**3**
T35	*Eucalyptus saligna* Sydney Blue Gum	12	11	360	SM	Good-Fair	Fair	Pruned for road/footpath clearance. Trimmer damage. Extensive borer activity noted. Large wound on stem, road side, bark being pushed away and possible beginning of fungal body growth noted. Crown thinning, epicormic growths on stem, dead. Extensive borer activity noted.	**5.5**	**2**
T36	*Robinia pseudoacacia* 'Frisia' Black Locust	4	4	70	I	Good	Good-Fair	Pruned for road/footpath clearance. Trimmer damage. Typical suckering habit of species. Wound on north/western side of stem at base. Borers noted and wounds along branches.	**0.5**	**3**

Tree No.	Species and Common Name	Height (m)	Crown spread (m)	*DBH (mm)	Age	Health	Condition	Comments	*TPA (m)	Condition Rating
T37	*Robinia pseudoacacia* 'Frisia' Black Locust	7	5	125	I	Good	Good-Fair	Pruned for road/footpath clearance. Typical suckering habit of species. Basal wound to the east. Stems included at 2m above ground level. Trimmer damage.	**1**	**3**

LEGEND

TREES OR TREE GROUPS IDENTIFIED AS SIGNIFICANT

T#	These trees may have a low condition rating due to identifiable defects or other problems. However, due to their visual amenity and contribution to the landscape character of the site, these trees may warrant design changes to ensure their retention. Some further assessment may be required to determine their longevity and risk potential before critical design modifications or changes are made to any proposed development of the site.

TREES WHICH WOULD BE REMOVED DUE TO POOR CONDITION RATING

0	Trees that are dead, or near dead.	
1	Trees that are declining, or obviously hazardous	
2	Trees that are stressed or damaged, or have poor form or structure. Includes trees exempt from protection under the Tree Preservation Order. This rating incorporates trees that may require further investigation of suspected defects, particularly those trees identified as 'significant'.	Trees that require further investigation may be those with cavities or other symptoms of internal decay of an extent that cannot be quantified by external examination. Further inspection may be by way of aerial inspection, root crown investigation and/or Resistograph © testing.

TREES WHICH COULD BE RETAINED DUE TO GOOD CONDITION, SUBJECT TO REASONABLE MAINTENANCE

3	Trees that would benefit from Crown Maintenance pruning as defined in Australian Standard 4373-2007 Pruning of Amenity Trees.
4	Tree that require little or no maintenance at the time of inspection.
5	Trees of good form, structure and condition.

***DBH** Diameter at Breast Height **-** The diameter of the trunk estimated at approximately 1.4m above existing ground level.

***TPA** Tree Protection Area -This is the minimum radial offset in metres, measured from the center of the tree trunk. The RPA is estimated at 10 x the DBH, plus an extra 1 - 2m to accommodate construction scaffolding, and/or other potential incursions into or near the tree root or branches/canopy area. Under the advice of an arboriculturist the specified setback for a tree may be increased or reduced subject to the type and height of proposed structures in proximity to the tree.

APPENDIX C
TREE LOCATION PLANS