Arboricultural Assessment Report

Prepared 30th April, 2009

Site Location

4-14 Merriwa & 3-11 McIntyre Street
Gordon NSW 2072

Client

Meriton Apartments Pty Limited

DISCLAIMER

The author and Tree & Landscape Consultants take no responsibility for actions taken and their consequences, contrary to those expert and professional instructions given as recommendations pertaining to safety by way of exercising our responsibility to our client and the public as our duty of care commitment, to mitigate or prevent hazards from arising, from a failure moment in full or part, from a structurally deficient or unsound tree or a tree likely to be rendered thus by its retention and subsequent modification/s to its growing environment either above or below ground contrary to our advice.

Peter Richards
Tree & Landscape Consultants

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SUMMARY

Following a visual ground assessment this report recommends the removal and replacement of the subject trees as they are not considered suitable for retention. The following observations were made and comments are provided:

- ***Tree 2*** *supports a cavity in the centre of a wound face created from a previous pruning cut and a leader to the south has fractured near to the union of the main trunk. Also to achieve the amended civil design, and associated levels changes to comply with council requirements the tree would be adversely impacted upon and would require removal to achieve this aspect of the development.*

- ***Tree 40*** *supports a large continuous cavity within an eastern leader and wood decay fruiting bodies of Phellinus robustus is present (see appendix C) .*

- ***Tree 49*** *supports a large basal cavity that has formed central to the eastern leaders with decay extending through to the root crown and up the leader to 3 x metres from ground. Wood decay fruiting body of Phellinus robustus is also present (see appendix C) .*

The trees are likely to fail in part in the short term and their retention poses an unnecessary risk to persons or property. It is considered appropriate tree management to remove the trees and replace them with alternate plantings as part of landscape works for the development. This course of action will remove the potential of injury occurring to persons or damage occurring to property and will provide for long term canopy trees for the immediate area.

TREE & LANDSCAPE CONSULTANTS

Site Analysis, Arboricultural Assessments

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30th April, 2010

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1. INTRODUCTION

This report has been prepared by Tree & Landscape Consultants for Meriton Apartments Pty Limited. The site was inspected by the author and the subject trees and their general growing environment evaluated on the 8th & 30th April 2010 in regards to concerns raised over the current health and condition of three trees.

This tree locations are indicated in Appendix D and this report details their current health & condition and determines from the assessment, recommendations for their retention or removal.

2.0 AIMS & OBJECTIVES

Aims

Provide as an outcome of the assessment, the following: a description of the trees, observations made, and make recommendations required for remedial or other works to the tree, if and where appropriate.

Determine from the assessment a description of the works or measures to ensure their long term retention, or the benefits of removal and replacement if appropriate for the medium to long term safety and amenity of the site.

Objectives

Assess the condition of the subject trees.

Provide recommendations for removal or management of the subject trees.

3. METHODOLOGY

3.1 The method of assessment of tree/s is applied from the ongoing knowledge and development of the author and considers but is not confined to:

- Tree health and subsequent stability, both long and short term
- Sustainable Retention Index Value (S.R.I.V.)© IACA 2009)
- Amenity values
- Significance

3.2 This assessment is undertaken using a standard tree assessment criteria for each tree based on the values above and is implemented as a result of at least one comprehensive and detailed site inspection.

3.3 In this report the dimensions of the tree recorded by the author for the trunk *diameter at breast height* (DBH) measurement is calculated at 1.4m above ground from the base of the tree. Where a tree is trunkless or branches at or near ground such as a mallee formed tree, an average diameter is determined by recording the radial extent of the stem mass at its narrowest and widest dimensions, adding the two dimensions together and dividing them by 2 to record an average.

3.4 Crown spreads are expressed as length by breadth measurements to accurately record their dimensions. Where appropriate, *crown spread orientation* is described along the length of the crown spread e.g. North/South, or as *radial* if the crown is distributed at an approximately even radius from the trunk e.g. 6x6m.

3.5 ***Pruning/Removal Guidelines***

- Any pruning recommended in this report is to be to the Australian Standard® AS4373 'Pruning of amenity trees', and conducted in accordance with the NSW Work Cover Authority Code of Practice for the Amenity Tree Industry, 1998

- All pruning or removal works are to be in accordance with the appropriate Tree Management Policy where applicable, or Tree Management Order (TMO), or Tree Preservation Order (TPO), or applicable consent conditions.

- Tree maintenance work is specialised and in order to be undertaken safely and to ensure the works carried out are not detrimental to the survival of the tree or surrounding vegetation, all works should be undertaken by a qualified Arboriculturist with appropriate competencies recognised within the Australian Qualification Framework, with a minimum of 5 years of continual experience within the industry of operational amenity arboriculture, and covered by appropriate and current types of insurance to undertake such works.

- Any pruning near electricity wires should be undertaken in accordance with relative Electrical Safety Rules and be performed by persons individually authorised by Energy Australia

4. TREE ASSESSMENTS

Table 1

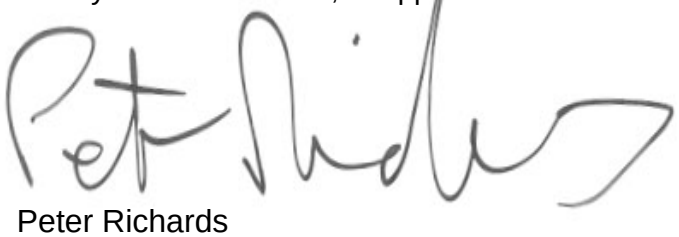
Tree No.	Genus & species Common Name	Age S-Sapling Y-Young M-Mature O-Overmature	Condition D-Dead P-Poor F-Fair G-Good	Pest & Diseases N=No or Y=Yes (If yes see comments)	Branch Bark Included N=No or Y=Yes (If yes see comments)	Canopy Orientation A-Asymmetrical Sy-Symmetrical N,S,E,W-Orientation	DBH (mm)	Height/Spread	Vigour L-Low G-Good A-Abnormal	Trunk Lean X-Straight or Slightly Leaning A-Acaulescent M-Moderate S-Severe C-Critical	SRIV Age,Vigour,Condition/ Index Rating (See Appendix A)
2	**Pistacia chinensis** *Chinese Pistachio*	M	P	N	N	Sy	400	14 4x4	G	X	MGVP6
Comments: Exotic tree of good vigour. Trunk extends to 1.9 metres from ground before dividing A cavity has formed in the centre of a wound face created from a pruning cut on the S/E aspect of the tree and the inward spread of decay is evident. Also a leader to the south has fractured near to the union of the main trunk which appears to be the result of conflict with passing traffic.											
40	**Eucalyptus saligna** *Sydney Blue Gum*	M	P	Y	N	Sy	500 Ave.	26 17x17	L	X	MLVP2
Comments: Indigenous evergreen tree of low vigour. Trunk extends to 2.4 metres from ground before dividing into multiple leaders. A large continuous cavity has formed on the eastern side of the eastern leader and extensive decay of heartwood is evident. Wood decay fruiting bodies of Phellinus robustus are present (see appendix C) . Other areas of wood decay and fruiting bodies are present within upper crown lower order branching (see appendix C).											
49	**Angophora floribunda** *Rough-barked Apple*	O	P	Y	Y	Sy	1700	22 10x10	G	X	OGVP4
Comments: Indigenous evergreen tree of good vigour. 3 x superior and 1 x inferior leader extends from ground. A large basal cavity has formed central to the eastern leaders. Wood decay extends through to the root crown and up the leader to 3 x metres from ground. Wood decay fruiting body of Phellinus robustus is present at the apex of the decayed area (see appendix C) .											

5. RECOMMENDATIONS

a. That the trees be removed and replaced with plantings following completion of construction works utilising the same species type.

b. That removal works be undertaken by a qualified Arboriculturist with appropriate competencies recognised within the Australian Qualification Framework, with a minimum of 5 years of continual experience within the industry of operational amenity arboriculture, and covered by appropriate and current types of insurance to undertake such works and in accordance with Work Cover NSW 2007, Code of Practice Tree Work.

c. That the replacement tree species to be planted, be advanced specimens with stems gradually tapering, with crowns symmetrical and roots established and proportional to the crown but not pot bound in at least a 25 litre volume bag, having been propagated to the standards of Specifying Trees a Guide to assessment of tree quality (2nd edition) by Ross Clark 2003, or approved similar.



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Appendix A
Matrix - Sustainable Retention Index Value (S.R.I.V.)©

Developed by IACA – Institute of Australian Consulting Arboriculturists www.iaca.org.au (2009)

To be used with the values defined in the Glossary.
An Index value as indicated where ten (10) is the highest value.

Age Class	Vigour Class and Condition Class					
	Good Vigour & Good Condition (GVG)	Good Vigour & Fair Condition (GVF)	Good Vigour & Poor Condition (GVP)	Low Vigour & Good Condition (LVG)	Low Vigour & Fair Condition (LVF)	Low Vigour & Poor Condition (LVP)
	Able to be retained if sufficient space available above and below ground for future growth. No remedial work or improvement to growing environment required. May be subject to high vigour. Retention potential - Medium – Long Term.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work may be required or improvement to growing environment may assist. Retention potential - Medium Term. Potential for longer with remediation or favourable environmental conditions.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work unlikely to assist condition, improvement to growing environment may assist. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. No remedial work required, but improvement to growing environment may assist vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment may assist condition and vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	Unlikely to be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment unlikely to assist condition or vigour. Retention potential - Likely to be removed immediately or retained for Short Term. Potential for longer with remediation or favourable environmental conditions.
Young (Y)	Index Value 9 Retention potential - Long Term. Likely to provide minimal contribution to local amenity if height <5m. High potential for future growth and adaptability. Retain, move or replace.	Index Value 8 Retention potential - Short – Medium Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Medium-high potential for future growth and adaptability. Retain, move or replace.	Index Value 5 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Low-medium potential for future growth and adaptability. Retain, move or replace.	Index Value 4 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Medium potential for future growth and adaptability. Retain, move or replace.	Index Value 3 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Low-medium potential for future growth and adaptability. Retain, move or replace.	Index Value 1 Retention potential - Likely to be removed immediately or retained for Short Term. Likely to provide minimal contribution to local amenity if height <5m. Low potential for future growth and adaptability.
Mature (M)	Index Value 10 Retention potential - Medium - Long Term.	Index Value 9 Retention potential - Medium Term. Potential for longer with improved growing conditions.	Index Value 6 Retention potential - Short Term. Potential for longer with improved growing conditions.	Index Value 5 Retention potential - Short Term. Potential for longer with improved growing conditions.	Index Value 4 Retention potential - Short Term. Potential for longer with improved growing conditions.	Index Value 2 Retention potential - Likely to be removed immediately or retained for Short Term.
Over-mature (O)	Index Value 6 Retention potential - Medium - Long Term.	Index Value 5 Retention potential - Medium Term.	Index Value 4 Retention potential - Short Term.	Index Value 3 Retention potential - Short Term. Potential for longer with improved growing conditions.	Index Value 2 Retention potential - Short Term.	Index Value 0 Retention potential - Likely to be removed immediately or retained for Short Term.

Appendix B

Definitions & Terminology

From

Dictionary for Managing Trees in Urban Environments

Institute of Australian Consulting Arboriculturists (IACA) 2009.

Condition of trees

Condition A tree's *crown form* and growth habit, as modified by its *environment* (aspect, suppression by other trees, soils), the *stability* and *viability* of the *root plate*, trunk and structural branches (first (1^{st}) and possibly second (2^{nd}) order branches), including structural defects such as wounds, cavities or hollows, *crooked* trunk or weak trunk/branch junctions and the effects of predation by pests and diseases. These may not be directly connected with *vigour* and it is possible for a tree to be of *normal vigour* but in *poor condition*. Condition can be categorized as *Good Condition*, *Fair Condition*, *Poor Condition* and *Dead*.

Good Condition Tree is of good habit, with *crown form* not severely restricted for space and light, physically free from the adverse effects of *predation* by pests and diseases, obvious instability or structural weaknesses, fungal, bacterial or insect infestation and is expected to continue to live in much the same condition as at the time of inspection provided conditions around it for its basic survival do not alter greatly. This may be independent from, or contributed to by vigour.

Fair Condition Tree is of good habit or *misshapen*, a form not severely restricted for space and light, has some physical indication of *decline* due to the early effects of *predation* by pests and diseases, fungal, bacterial, or insect infestation, or has suffered physical injury to itself that may be contributing to instability or structural weaknesses, or is faltering due to the modification of the *environment* essential for its basic survival. Such a tree may recover with remedial works where appropriate, or without intervention may stabilise or improve over time, or in response to the implementation of beneficial changes to its local environment. This may be independent from, or contributed to by vigour.

Poor Condition Tree is of good habit or *misshapen*, a form that may be severely restricted for space and light, exhibits symptoms of advanced and *irreversible decline* such as fungal, or bacterial infestation, major die-back in the branch and *foliage crown*, *structural deterioration* from insect damage e.g. termite infestation, or storm damage or lightning strike, ring barking from borer activity in the trunk, root damage or instability of the tree, or damage from physical wounding impacts or abrasion, or from altered local environmental conditions and has been unable to adapt to such changes and may decline further to death regardless of remedial works or other modifications to the local *environment* that would normally be sufficient to provide for its basic survival if in *good* to *fair* condition. Deterioration physically, often characterised by a gradual and continuous reduction in vigour but may be independent of a change in vigour, but characterised by a proportionate increase in susceptibility to, and *predation* by pests and diseases against which the tree cannot be sustained. Such conditions may also be evident in trees of advanced senescence due to normal phenological processes, without modifications to the growing environment or physical damage having been inflicted upon the tree. This may be independent from, or contributed to by vigour..

Dead Tree is no longer capable of performing any of the following processes or is exhibiting any of the following symptoms;

Processes

Photosynthesis via its foliage crown (as indicated by the presence of moist, green or other coloured leaves);

Osmosis (the ability of the root system to take up water);

Turgidity (the ability of the plant to sustain moisture pressure in its cells);

Epicormic shoots or *epicormic strands* in Eucalypts (the production of new shoots as a response to stress, generated from latent or adventitious buds or from a *lignotuber*);

Symptoms

Permanent leaf loss;

Permanent wilting (the loss of turgidity which is marked by desiccation of stems leaves and roots);

Abscission of the *epidermis* (bark desiccates and peels off to the beginning of the sapwood).

Removed No longer present, or tree not able to be located or having been cut down and retained on a site, or having been taken away from a site prior to site inspection.

Description of Tree Dimensions

Height The distance measured vertically between the horizontal plane at the lowest point at the base of a tree, which is immediately above ground, and the horizontal plane immediately above the uppermost point of a tree.

Spread The furthest expanse of the crown when measured horizontally from one side of the tree to the other, generally through the centre of the trunk. Where the crown is not circular a measurement should be an average of the narrowest and widest diameters and this is dependent upon crown form and to a lesser extent its symmetry.

Crown Cover Percent of the homogenous distribution of foliage across the entire crown based upon that expected for a specimen of that species in good condition and of normal vigour, depending on form in situ, e.g. this may be influenced by crown die-back, proximity to other trees or structures, moisture stress, or overshadowing.

Vigour

Vigour Ability of a tree to sustain its life processes. This is independent of the *condition* of a tree but may impact upon it. Vigour can appear to alter rapidly with change of seasons (seasonality) e.g. *dormant*, deciduous or semi-deciduous trees. Vigour can be categorized as *Normal Vigour, High Vigour*, *Low Vigour* and *Dormant Tree Vigour*.

Normal Vigour Ability of a tree to maintain and sustain its life processes. This may be evident by the typical growth of leaves, crown cover and crown density, branches, roots and trunk and resistance to predation. This is independent of the condition of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

High Vigour *Accelerated growth* of a tree due to incidental or deliberate artificial changes to its growing *environment* that are seemingly beneficial, but may result in *premature aging* or failure if the favourable conditions cease, or promote *prolonged senescence* if the favourable conditions remain, e.g. water from a leaking pipe; water and nutrients from a leaking or disrupted sewer pipe; nutrients from animal waste, a tree growing next to a chicken coop, or a stock feed lot, or a regularly used stockyard; a tree subject to a stringent watering and fertilising program; or some trees may achieve an extended lifespan from continuous *pollarding* practices over the life of the tree.

Low Vigour Reduced ability of a tree to sustain its life processes. This may be evident by the atypical growth of leaves, reduced crown cover and reduced crown density, branches, roots and trunk, and a deterioration of their functions with reduced resistance

to predation. This is independent of the condition of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

Dormant Tree Vigour Determined by existing turgidity in lowest order branches in the outer extremity of the crown, with good bud set and formation, and where the last extension growth is distinct from those most recently preceding it, evident by bud scale scars. Normal vigour during dormancy is achieved when such growth is evident on a majority of branches throughout the crown.
Poor Vigour See low vigour
Good Vigour See Normal Vigour

Age of Trees

Age of Trees Most trees have a stable biomass for the major proportion of their life. The estimation of the age of a tree is based on the knowledge of the expected lifespan of the taxa in situ divided into three distinct stages of measurable biomass, when the exact age of the tree from its date of cultivation or planting is unknown. These increments are Young, Mature and Overmature.
Young Tree aged less than 20% of life expectancy.
Mature Tree aged 20-80% of life expectancy.
Over-mature Tree aged greater than 80% of life expectancy tending to senescent with or without reduced vigour, and declining gradually or rapidly but irreversibly to death.
Sapling A young tree, early in its development with small dimensions.
Senescent Advanced old age, over-mature.

General Terms

Significant Important, weighty or more than ordinary.
Significant Tree A tree considered important, weighty or more than ordinary. Example: due to prominence of location, or in situ, or contribution as a component of the overall landscape for *amenity* or aesthetic qualities, or *curtilage* to structures, or importance due to uniqueness of taxa for species, subspecies, variety, form, or as an historical or cultural planting, or for age, or substantial dimensions, or habit, or as remnant vegetation, or habitat potential, or a rare or threatened species, or uncommon in cultivation, or of aboriginal cultural importance, or is a commemorative planting.
Substantial A tree with large dimensions or proportions in relation to its place in the landscape.
Excurrent Tree where the crown is comprised of one (1) dominant first order structural branch which is usually an extension of the trunk, erect, straight and continuous, tapering gradually, with the main *axis* clear from base to apex, e.g. *Araucaria heterophylla* - Norfolk Island Pine. Note: some tree species of *typical* excurrent habit may be altered to deliquescent by physical damage of the *apical meristem*, or from top lopping, or from the propagation of inferior quality stock. However, *formative pruning* may be able to correct a *crown* to excurrent if undertaken when a tree is *young*.
Sustainable Retention Index Value (SRIV) A visual method of rating the viability of urban trees for development sites and management, based on general tree and landscape assessment criteria. SRIV© is for the professional manager of urban trees to consider the tree in situ with an assumed knowledge of the taxa and its growing environment and is based on the physical attributes of the tree and its response to its environment considering its age class, vigour class, condition class and its sustainable retention with regard to the safety of people or damage to property and the ability to retain the tree with remedial work or beneficial modifications to its growing environment or removal and replacement. (IACA 2005)
Crown Spread Orientation Direction of the *axis* of *crown spread* which can be categorized as *Orientation Radial* and *Orientation Non-radial*.
Diameter at Breast Height (DBH) Measurement of trunk width calculated at a given distance above ground from the base of the tree often measured at 1.4 m. The trunk of a tree is usually not a circle when viewed in cross section, due to the presence of *reaction wood* or *adaptive wood*, therefore an average diameter is determined with a *diameter tape* or by recording the trunk along its narrowest and widest axes, adding the two dimensions together and dividing them by 2 to record an average and allowing the orientation of the longest axis of the trunk to also be recorded. Where a tree is growing on a lean the distance along the top of the trunk is measured to 1.4m and the diameter then recorded from that point perpendicular to the edge of the trunk. Where a *leaning* trunk is *crooked* a vertical distance of 1.4m is measured from the ground. Where a tree branches from a trunk that is less than 1.4m above ground, the trunk diameter is recorded perpendicular to the length of the *trunk* from the point immediately below the base of the flange of the *branch collar* extending the furthest down the trunk, and the distance of this point above ground recorded as *trunk* length. Where a tree is located on sloping ground the DBH should be measured at half way along the side of the tree to average out the angle of slope. Where a tree is *acaulescent* or *trunkless* branching at or near ground an average diameter is determined by recording the radial extent of the trunk at or near ground and noting where the measurement was recorded e.g. at ground.
Remedial Pruning Pruning to repair previously poorly undertaken works or to assist in re-establishing the *crown form* and shape of a tree that has been damaged, or exhibits *dieback*. Pruning may require a *final cut* beyond the branch collar to stimulate epicormic shoots from which the new crown structure is developed by *reduction pruning* or *crown thinning* (Australian Standard 2007, pp. 14, 15).

Appendix C

Tree Photos

Tree 40- Above images show cavity on southern aspect of southern leader extending to approximately 14 metres from ground

Tree 40 - Above images show wood decay of upper crown branches and multiple fruiting bodies of Phellinus robustus

T49- Large cavity base of eastern superior leader

T49 -Decay extends through to root crown

T49- Decay extends up the leader to three metres from ground to root crown. Fruiting body of Phellinus robustus at apex of decayed wood

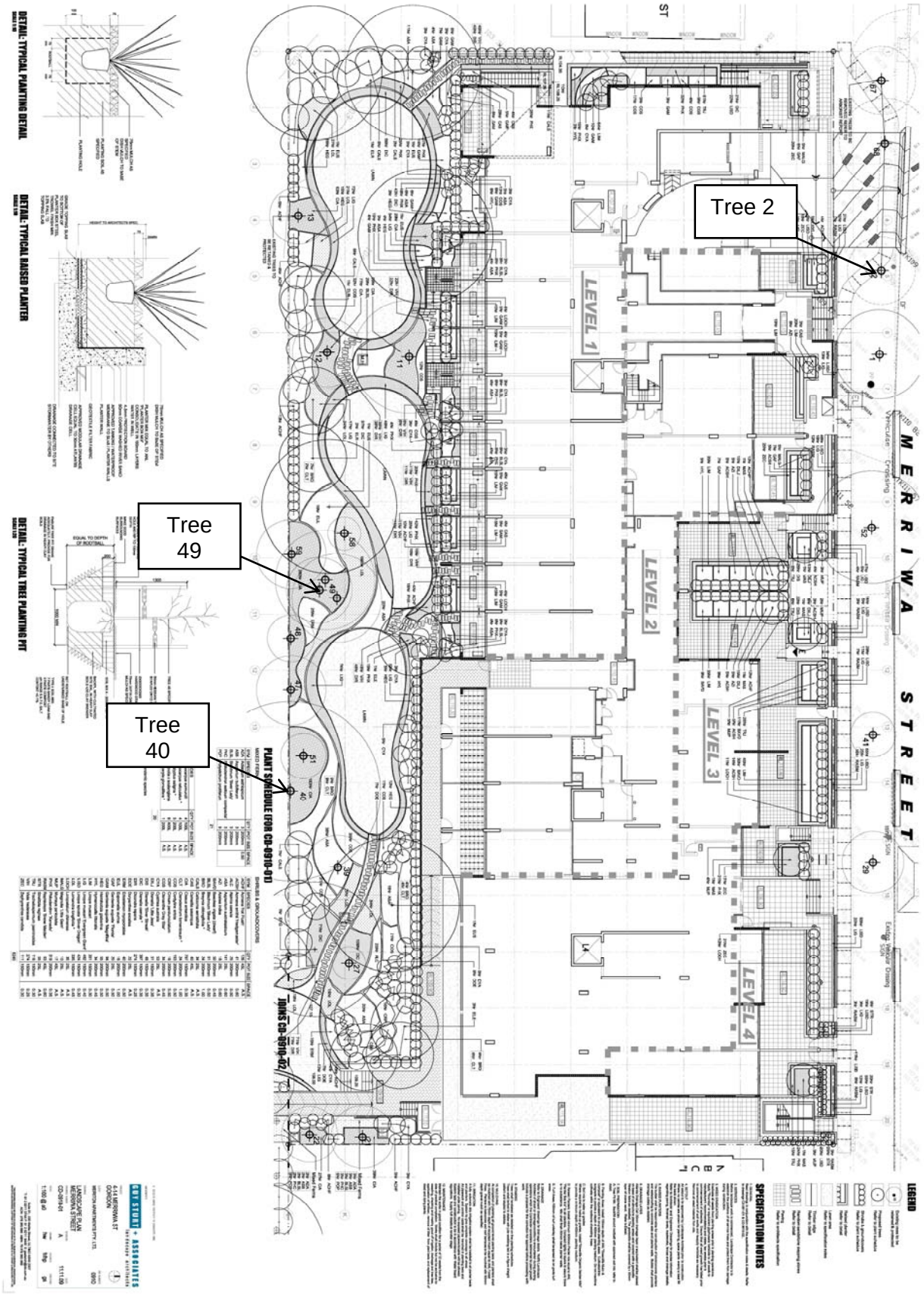
T49- Separation of leader viewed from western aspect.

T2- Cracked and split leader.

T2- Cracked and split leader - Cavity in pruning wound face.

Appendix D

Tree Locations



Appendix E
References

REFERENCES

1. IACA (2009), Sustainable Retention Index Value, Institute of Australian Consulting Arboriculturists, www.iaca.org.au .

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4. Work Cover NSW 2007, *Code of Practice Tree Work*, New South Wales Government, Australia.