

ATTACHMENT F

THE SUGAR FACTORY – PEER REVIEW

Review of the Report Prepared by
Tree Wise Men Australia Pty Ltd

Pertaining to the
“Review of Past and Future Management Options

“Central Avenue Hills Figs at

“Hyde Park North and South, Sydney”

This Review prepared for
The Council of the City of Sydney

By

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Attachment Letter of Instruction from City of Sydney

1 Introduction

This Peer Review was commissioned by Ms Mardi Flick, Senior Solicitor of the City of Sydney Council.

The brief was to “conduct a peer review in your area of expertise of the attached report by Tree Wise Men dated [23 April 2013] on the Hyde Park Central Avenue Hill’s Figs.”

The letter of instruction is included as Appendix A to this Review.

Documentation attached to the Tree Wise Men (TWM) report and included for review were:

- Brief (from City of Sydney) to Tree Wise Men dated 15 March 2013.
- Maps identifying relevant trees by number.
- “Arboricultural Hazard Assessment – Resistograph Testing *etc.*” Report prepared for City of Sydney by Urban Tree Management Australia Pty Ltd dated 24 October 2011.
- Tree assessment schedule 2012 (from Hyde Park Tree Management Plan).
- Heritage inventory report for Hyde Park (NSW Department of Environment & Heritage).
- Soil testing report dated 24 August 2012 prepared for City of Sydney by the Plant Disease Diagnostic Unit, Royal Botanic Gardens, Sydney.

The scope of works contained in the brief from City of Sydney to TWM required the following in the assessment of the Central Avenue Hill’s Figs:

“Based on relevant literature and your knowledge and observations from previous inspections, including the most recent aerial inspection undertaken in 2012 and additional documentation provided, you are asked to provide a comprehensive report detailing:

- a. A comprehensive review of currently documented defects, health or structural issues affecting each of the Hill’s Figs;*
- b. Any resulting impact / issues of risk to the public resulting from issues identified in (a) above;*
- c. Any likely impact on the longevity of the avenue from the issues identified in (a) and (b) above including an assessment of the likely lifespan of each tree; and*
- d. An assessment of all possible mitigation strategies that may help to alleviate the impacts of any defects and assist in the future management of the individual trees, and the Central Avenue trees as a whole, and an assessment of the benefits and risks arising in relation to each strategy.”*

This Peer Review examines the response by TWM to the requirements of their brief.

The brief for this Peer Review did not extend to a site inspection.

2 Summary of Findings

2.1 The TWM report

In respect of requirement (a) in the brief provided to TWM, I consider that the TWM report adequately reviews the currently documented defects, health, and structural issues affecting the Central Avenue Hill's Figs.

In respect of requirement (b), I consider that the TWM report appropriately addresses the resulting impact and issues of risk to the public arising from requirement (a).

In respect of requirement (c), I consider that the response by TWM appropriately considers the likely impact on the longevity/lifespan of the trees.

In respect of requirement (d), I consider that the assessment by TWM of the mitigation strategies and future management of the trees is comprehensive and satisfies requirement (d).

2.2 Minor Omissions in the TWM report

Citations and References.

There are several citations in the body of the TWM report which are not included in the list of References contained in Appendix D.

For example, page 13, paragraph 4.3.2, the citation ascribed to Mattheck (1999) is not referenced; page 18, paragraph 5.3.1, the citation to Hewett 2012 is not referenced, among others.

In a similar sense, Appendix D contains References which are not referred to in the body of the report.

The method of Visual Tree Assessment carried out has not been referenced.

Page 24, paragraph 7.2.4 contains the statement: "New trees have been recorded in 2012 due to improvements in the understanding of what constitutes a 'significant' inclusion in Hill's Figs". The statement should be supported by citation.

2.3 Reliance on Work by Others

Although I have concerns regarding the interpretation and presentation of data contained in the report by Urban Tree Management, I consider that TWM have made appropriate use of the information contained in that report in so far as it relates to the management of the subject trees.

3 TWM Review of Defects, Health, and Structural Issues

Requirement (a) of the brief to TWM was:

“A comprehensive review of currently documented defects, health or structural issues affecting each of the Hill’s Figs.”

The TWM report addresses these issues mainly under Sections 6 (Below Ground Defects) and 7 (Above Ground Defects), with results for individual trees summarised in Attachment B: Tree Schedules.

The methodology of assessment is given elsewhere in the TWM report as being Visual Tree Assessment (VTA). The methodology is not referenced but I presume it to be the methodology outlined by Mattheck & Breloer in *The Body Language of Trees – A Handbook for Failure Analysis*ⁱ.

Briefly, the VTA procedure is to examine the biological and mechanical characteristics of the tree, first visually, and then if a cause for concern is noted the inspection becomes more detailed. The detailed inspection may include coring or drilling, excavation, pathology testing, mapping of decayed areas, aerial inspection, *etc.*

Mattheck & Breloer’s method of VTA is contained in related arboricultural texts by Lonsdaleⁱⁱ, and Harris *et al*ⁱⁱⁱ, and is the method of tree assessment taught in the Diploma of Horticulture (Arboriculture) course at NSIT Ryde. The method is locally and internationally widely used in arboriculture, and is an accepted methodology of tree assessment.

Below Ground Defects are given by TWM as various fungi, namely *Phellinus ssp*, *Armillaria luteobubalina*, and *Phytophthora cinnamomi*. Where possible the defects were quantified by micro-drilling to map and evaluate the decayed area, which is consistent with the methodology of VTA. The TWM report considers the ability of the trees to react to decay, which is in keeping with the principals outlined by Lonsdale (1999). Other impacts of below-ground problems are canvassed in Section 5, which sets out the history of tree failures or removals.

The TWM report relies work carried out by relevant experts on the identification of diseases and an evaluation of soil conditions, which is appropriate.

The TWM report canvasses the results of diagnostic testing for extent of decay carried out in 2005 with the results from 2011, and uses this in forming a prognosis. This approach is supported by Weber & Mattheck^{iv}.

ⁱ Mattheck, C, and Breloer, H (1994) *The Body Language of Trees - A Handbook for Failure Analysis.* HMSO, London.

ⁱⁱ Lonsdale, D (1999) *Principles of Tree Hazard Assessment and Management.* HMSO, London.

ⁱⁱⁱ Harris, RW, Clark, JR, and Matheny, NP (2004, 4th ed.) *Arboriculture: Integrated Management of Landscape Trees, Shrubs and Vines.* Prentice Hall, New Jersey.

^{iv} Weber, K. and Mattheck, C (2003) *Manual of Wood Decays in Trees* The Arboricultural Association, Ampfield House, Ampfield.

The Above Ground Defects are given in Section 7 of the TWM report as comprising significant (bark) inclusions, deadwood, branch failures, branch/trunk defects, and sunscald. The TWM inspection of defects included aerial assessments of tree crowns by EWP (Elevating Work Platform or cherry-picker). These are characteristics that can be assessed visually.

The report canvasses the history or incidence of occurrence of the various defects by comparing current results to the results of earlier inspections, which is appropriate in considering individual trees and the trees as a group and thereby identifying failure profiles specific to the species.

Matheny and Clark attach great weight to species' failure profiles, as differing species can vary widely in their failure patterns. They state that knowledge of the type of failure and associated defects is invaluable in making hazard evaluations. By observing typical failure patterns, it can be recognised that species have general themes in defects and failure^v.

The TWM report asserts at paragraphs 3.3.1 and 3.3.2 that, given TWM's involvement with the subject trees over a period of around one decade, TWM are in a unique position to comment on the hazard potential and future management of the Central Avenue planting, and I concur.

The TWM report states at paragraph 7.2.4:

"... New trees have been recorded in 2012 due to improvements in the understanding of what constitutes a 'significant' inclusion in Hill's Figs..."

A statement of this importance should, in my view, be supported by citation or, failing that, a description should be provided as to what constitutes a 'significant' inclusion.

In any event, I consider it appropriate to study the circumstances and configurations attending the failure of included unions in order to gain an understanding of when the common characteristic of included bark on Hill's Figs can become identifiable as a defect that gives rise to a risk of failure. This includes consulting with or drawing upon the works of others who study the species.

^v Matheny, N. P and Clark, J. R (1994, 2nd ed.) *'A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas'* International Society of Arboriculture, Champaign, Illinois.

4 The TWM Examination of the Issues of Risk, Impact on Longevity, and Mitigation Strategies *etc*

The remaining requirements of the brief to TWM were an assessment of:

- b. *Any resulting impact / issues of risk to the public resulting from issues identified in (a) above;*
- c. *Any likely impact on the longevity of the avenue from the issues identified in (a) and (b) above including an assessment of the likely lifespan of each tree; and*
- d. *An assessment of all possible mitigation strategies that may help to alleviate the impacts of any defects and assist in the future management of the individual trees, and the Central Avenue trees as a whole, and an assessment of the benefits and risks arising in relation to each strategy.”*

Section 8 of the TWM report describes the risks, as does parts of Sections 5 and 9, with the higher risks identified as tree failure due to decay and dead or live limb drop. The stated risks are of necessity statements of the obvious flowing from the identification of those parts found to be at risk of failure, as described in the discussion of above ground and below ground defects. In short, the TWM report addresses the risks to the public.

The lifespan of the trees is expressed in the Tree Schedules (Attachment B to the TWM report) as a SULE, modified for the subject trees. The SULE or Safe Useful Life Expectancy^{vi} method of rating was first published some 20 years ago and is widely used in the arboriculture industry. It provides for a hierarchical ranking of individual trees by longevity taking into account the current age of the tree and expected remaining life span, site conditions, significance, the need for replanting, and issues such as health and structure.

Given the current documented issues of health and structure, I concur with the SULE categories as assigned to the subject trees.

The mitigation strategies are canvassed in Section 9. I agree with the general statement by TWM that given the age of the trees, the planting environment, and the issues of tree health and risk, that there is in practicality no real scope to increase the life expectancy of the existing planting beyond that which has been anticipated under the SULE ratings.

In canvassing the future management of the Central Avenue trees as a group, the TWM report examines the proposed block removal and replacement contained in Council’s Plan of Management and Masterplan for Hyde Park, discusses the pros and cons of in-fill planting and mini-block removal, and recommends instead a three-stage block removal process as being the more practical option in minimising risk and damage to temporarily retained trees.

From an arboricultural perspective, I agree that removal of the trees in blocks will secure the best long-term result in re-establishing the ‘cathedral’ effect of the Central Avenue.

^{vi} Barrell, J (1993) ‘Pre-planning Tree Surveys: Safe Useful Life Expectancy (SULE) is the Natural Progression.’ *Arboricultural Journal* 17: pp 33-46, AB Academic Publishers, Great Britain.

5 Other Documentation

The other documents provided to me for review were:

1. Maps identifying relevant trees by number.
2. “Arboricultural Hazard Assessment – Resistograph Testing *etc.*” Report prepared for City of Sydney by Urban Tree Management Australia Pty Ltd dated 24 October 2011, and further testing detailed in report of same title dated May 2013.
3. Tree assessment schedule 2012 (from Hyde Park Tree Management Plan).
4. Heritage inventory report for Hyde Park (NSW Department of Environment & Heritage).
5. Soil testing report dated 24 August 2012 prepared for City of Sydney by the Plant Disease Diagnostic Unit, Royal Botanic Gardens, Sydney.

Documents 1, 3, 4, and 5 were informative only and not subjected to critique. An evaluation of Document 2 is however within my purview.

The report by Urban Tree Management (UTM) contains the results of diagnostic testing for extent of decay by use of a resistograph machine. Test results for individual trees are contained in Appendix A, and Appendix C contains the resistograph charts only for those trees “with a *t/R* ratio of 0.4 or with decay equal to or greater than 60%...” (page 5, para. 2).

The *t/R* ratio test is referenced to Mattheck & Breloer’s *The Body Language of Trees – A Handbook for Failure Analysis*.

Broadly speaking, I have concerns with the presentation of data in the UTM report and the tree ranking methodology, for example, the apparent categorisation of trees on the basis of a single *t/R* result, a point noted by TWM in their report at paragraph 6.2.1:

“Of these trees 1 only (T185N) had decay that failed Mattheck. [T]his tree was not removed as only one of the three drill readings marginally failed Mattheck.”

Overall my view of the UTM report is that it could be strengthened by including calculations for the percentages of hollowness for individual trees recommended for short term retention, and by relating the works as carried out to the procedures contained in Lonsdale’s *Principles of Tree Hazard Assessment and Management*^{vii}. In particular to Figure 5.2 ‘Strategy for detailed assessment of decay’ and associated commentary, section 5.3.1.1 ‘Criteria for allowable amounts of decay in stems’ and in Figure 5.5 ‘Criteria for strength assessment of hollow stems’.

Where the author of the UTM report has a preference for a particular interpretation of results or applicable parameters, then the reasons for the preference should be clearly stated and supported by appropriate citation.

^{vii} Lonsdale, D (1999) *Principles of Tree Hazard Assessment and Management*. Research for Amenity Trees No. 7, HMSO, London.

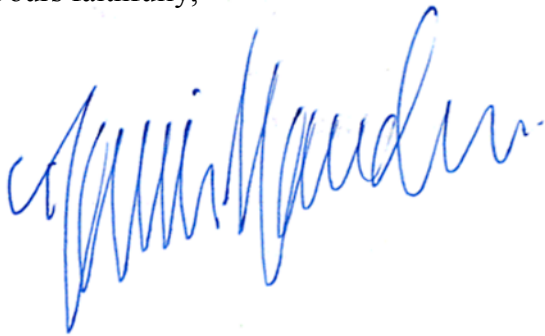
6 Conclusions

My general opinion is that the report of TWM presents a thorough review of the current defects, health and structural issues affecting the Hill's Figs and that the principals of visual tree assessment have been followed. The report provides a sound basis for the conclusions drawn and opinions offered by the author and applied in the tree management strategies.

The report contains minor omissions only in respect of citations and references. Ordinarily this would not be regarded as significant, however I am mindful that any errors, however tiny, can assume a disproportionate significance when exposed to the glare of public scrutiny.

In my view the report by Urban Tree Management contains aspects of data interpretation and presentation which could be revisited for the purpose of clarity.

Yours faithfully,



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