

Arboricultural Statement

Greenwich Hospital NSW

Client: Alex Lisney

Senior Project Manager

TSA Riley

Date: 14th August 2025

I refer to the subject tree, which I was requested by Alex Lisney, the Project Manager from TSA Riley, to provide comments and advice on design changes to tree 199.

Tree 199, an *Acer negundo* Box Elder Tree, is currently nominated for retention under the approved tree management plan. The modification proposes the removal of Tree 199 due to a conflict with a new retaining wall, which will result in a 50% encroachment as a consequence of cut-and-fill excavations for the foundations of the proposed retaining wall into the Nominal Root Zone of the tree.

The tree is 8 metres high and has an 8-metre canopy, a DBH of 150mm, a nominal root zone of 2 metres, a DBB of 180mm, and a SRZ of 1.8 Metres. These trees are considered a pest in some Local Government areas as they self-seed constantly and can infest a whole region, especially in native bushland.

The tree will have a restricted root zone on both the northern and southern sides of the tree.

When trees have restricted root systems in the built environment, they are susceptible to the impacts of human activities that can affect their health and reduce longevity. Reduced root systems from root loss or constriction can reduce stability and increase stress.

Tree root systems are generally shallow and widespread. Human activity around trees often impacts tree root systems, resulting in decreased tree health and reduced longevity compared to trees on natural sites. Construction and repair of infrastructure often sever tree roots. The presence of buildings and pavements can restrict root systems, with detrimental effects on both the tree and the structure, which is the issue with this tree and its deterioration.

Urban landscape design and maintenance can differ significantly from the natural environment to which the trees are adapted. The management challenge is to mitigate or minimize these impacts through proper management, including minimizing injury to existing roots, promoting root

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regrowth after severing occurs, and maximizing the quality and quantity of root space in the design. This has not happened during the development of these trees.

Tree stability depends heavily on both root system architecture and the anchorage of roots in the soil. Root/soil resistance gives rise to the characteristic mass of roots and soil seen on uprooted trees, known as the root plate. The anchorage strength of a tree root system has four components: 1) the mass of the roots and soil levered out of the ground, 2) the strength of the soil and depth of root penetration under the root plate, 3) the resistance to failure in tension of tree roots on the windward side as the upward movement of the root–soil plate causes roots to pull out of the soil with or without first breaking, and 4) the length of the lever arm (where the roots hinge) on the leeward side, which is affected by root diameter and resistance to bending of the tree roots (Coutts, 1983; Coutts 1986; Blackwell et al. 1990; Kodrik and Kodrik, 2002).

A change in one feature can affect several others. Thus, an increase in root plate diameter will increase the weight component, the length of lever arm between the trunk and the roots around the perimeter of the plate, and the area of root/soil contact under the plate. As each of these anchorage components increases, the greater the force needed to tip up the root plate. Uneven distribution (large sections without roots) reduces anchorage (Sundstrom & Keane, 1999).

Environmental factors influence root architecture and stability. If roots penetrate deeper, as can be the case in sandy soil, the taproot and deeper roots have a greater influence on overturning resistance compared to those in clayey soil (Fourcaud et al., 2008). Wind loading appears to result in increased growth of lateral roots at the expense of the tap root. The development of the lateral root system may therefore ensure better anchorage of young trees subjected to wind loading (Tamasi et al., 2005). However, this does not appear to have occurred on the southern side of the trees.

Root branching shortens the root plate lever arm, making tipping easier. The roots of nearly all trees in urban areas have been severed during transplanting, which creates branching at the cut end and smaller regenerated roots. This branching may shorten the root plate fulcrum on the leeward side and reduce the diameter of the roots at the perimeter of the root plate, potentially rendering urban trees less stable than their forest counterparts, which have less-branched, larger roots. The subject trees are very susceptible to failure from this.

Therefore, given the issues associated with a severely restricted root zone, it is recommended that the tree be removed and replaced with a 100-litre replacement tree elsewhere on the property as part of a revised landscape plan.

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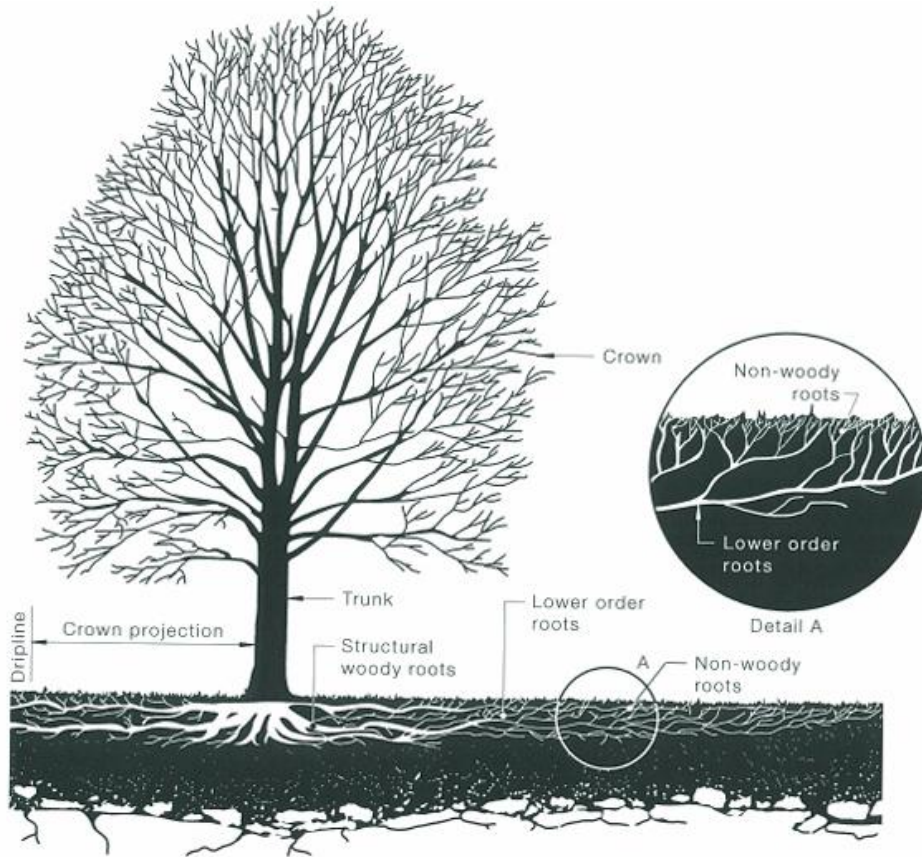


Tree 199

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MBury

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January 2006 Course Code RTF50203 International Society of Arboriculture Certified Arborist and Municipal
Arborist Licence Number AU-0345AM

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As can be seen, the tree will have a restricted root zone on both sides of the tree.



Brief Qualifications and Experience of Mark Bury

- 1. Qualifications:** Diploma of Horticulture/Arboriculture 2005, Advanced Certificate of Management 1995, Graduate Certificate in Parks Management UTS 2001. Advanced Certificate in Horticulture, TAFE 1986, Hadlington Certificate of Tree Care 1995, Licensed QTRA Practitioner since 2006. International Society of Arboriculture Tree Risk Assessment Qualification 2014,2018, 2023 licensed till 2029, International Society of Arboriculture Certified Arborist 2014,2018, 2021,2024 licensed till 2026, International Society of Arboriculture Certified Municipal Specialist 2015, 2018, 2021, and 2024 licensed till 2026. Currently studying the International Society of Arboriculture Board Master Arborist Course
- 2. Practical experience:** Twenty-Nine (29) years' experience as a consulting arborist, 20 years' experience in Local Government as a consulting arborist. A Founding member of the Institute of Australian Consulting Arborists (Resigned 2006) and the Local Government Tree Resources Group, of which I was secretary in 1995.
- 3. Continuing professional development:** Member of the International Society Of Arboriculture (AU0345A). Member of the Australian Institute of Horticulture (MXB0615), Attended courses by Jeremy Barrell and Claus Matteck. I attended the update of QTRA. certification in March 2015 and completed the course in Visual Tree Assessment in 2015, Moreover, a Visual Tree Assessment and an estimation of the probability of failure were conducted in 2015.
- 4. Relevant experience:** Twenty-Nine (29) Years of experience as a consulting arborist and twenty years' experience in tree management in local government. Twenty (20) years' experience in Local Government assessing development applications regarding tree management issues. (Councils: Warringah, North Sydney, Mosman, Manly, Ashfield, Pittwater, Marrickville, and Hornsby). With my qualifications and experience, I am an AQF 5. Furthermore, I have written and published books on Trees and Asset Management, Trees and Real Estate, Planning and Trees, and Inherent Failure Patterns of Trees in the Greater Sydney Area.

I have also been a high-level Asset Manager in Local Government for 10 years and have completed numerous courses in asset management and risk management, as well as developed Council Budgets in this area for over 15 years. I have also lectured at UTS on Asset Management. I have worked in the industry for 42 years and have carried out major Asset management inventories, including trees for large Local Government Areas, and developed financial and operations plans to manage assets. Furthermore, I have developed, written, and implemented asset tree master plans for Ashfield, Pittwater, Hornsby, and

Marrickville Councils.

International Society of Arboriculture Continuing Education Units Completed 2014, 2015, and 2016

Tree Risk-Strategies for Preserving Heritage Trees
Tree Risk-Mitigation and Reporting
Tree Risk-Structural Defects and Conditions
Tree Risk-Tree Load: Concept
Tree Risk—Loads and Growth Response
Tree Risk-Levels of Tree Risk Assessment
Tree Risk- Sap Rot
Tree Risk- Anchorage: Root Plate Resistance to Failure
Tree Risk- Indicators of Decay in Urban Trees
Tree Risk- Visual Inspection Before Dismantling
Urban Forestry-Wildfire and the Role of the Arborist
Urban Forestry-Managing Trees during Construction Part 1 and 2
Urban Forestry-Tree Risk Assessment: A Foundation
Urban Forestry-Tree Inventories Part 1 and Part 2
Trees & Their Environment- Fertilizing Trees & Shrubs Part 1 and Part 2
Urban Forestry-Root Management Challenges on Urban Sites
Urban Forestry-Challenges for the Built Environment
Urban Forestry - The Benefit of Trees
Urban Forestry- Root Planting Friendly Site Design
Urban Forestry- Root Management Challenges on Urban Sites
Urban Forestry- Tree Inventories Part 1
Urban Forestry- Tree Inventories Part 2
Urban Forestry- Tree Risk Assessment: A Foundation
Urban Forestry- Managing Trees during Construction Parts 1 and 2
Urban Forestry- Wildfire and the Role of the Arborist
Trees & Their Environment- Soil Properties: Part 1 and Part 2
Trees & Their Environment- Fertilizing Trees & Shrubs Part 1 and Part 2
Trees & Their Environment- Analyse Before You Fertilize
Trees & Their Environment- Back to Basics: Tree Fertilization
Trees & Their Environment- Slow or Controlled Release Fertilizers
Tree Maintenance- Trees & Lightning
Tree Maintenance- Cabling
Tree Maintenance- Pollarding: What Was Old Is New Again
Tree Maintenance- Why Utilities "V-Out" Trees
Tree Maintenance- Pruning Trees Part 1: Principles, Objectives & Pruning Types
Tree Maintenance- Pruning Trees Part 2: How, Where, and How Much
Plant Health Care- Plant Health Care
Plant Health Care- Maintaining Tree and Turf Associations
Plant Health Care- Preserving Trees during the Construction Process
Plant Health Care- Mulch
Plant Health Care- Preserving Trees During the Construction Process
Plant Health Care- Trees v Turf

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Plant Health Care- Resource Allocation Trade Off
Plant Health Care- Root System Care
Safe Working Practices –Innovations in Climbing Techniques and Equipment
Safe Working Practices- Basic Chain Saw Maintenance
Safe Working Practices- Felling Techniques
Safe Working Practices- Engineering Concepts for Arborists
Safe Working Practices- Tree Removals
Safe Working Practices- Chain Saw Cutting Techniques
Tree Science-Palms just not for the Tropics
Tree Science: Damage and Diagnosis Steps to Proper Diagnosis
Tree Science- Plant Traits that Resemble Abiotic Disorders
Tree Science- Adventitious Roots Occurrence and Management in Trees
Tree Science- Cool Trees Surviving Cold Temperatures
Tree Science- Identifying Wood Decay and Wood Decay Fungi in Urban Trees
Tree Science- How Pests Use Bark or Wood as Food
Tree Science- How trees get fat
Tree Science- Kissing under the Mistletoe
Biology-Tree Failure Risk Evaluations
Biology-Tree Growth Rings Formation and Form
Biology- Regulating Tree Growth Keeping the Green Side Up
Biology- How Wind Affects Trees
Biology- Allelopathy in Trees
Biology- Fantasy Facts and Fall Colour
Biology- Blowing in the Wind
Biology-Tree Physiology
Biology-Basic Woody Plant Biology
Diagnosis and Treatment- Plant Health Care and the Diagnostic Process
Diagnosis and Treatment- Want to be a Better Plant Diagnostician
Diagnosis and Treatment- Diagnosing Disease Problems on Trees
Diagnosis and Treatment- How Weather Influences Insect and Mite Populations
Diagnosis and Treatment- Understanding and Diagnosing Scale Insects
Diagnosis and Treatment- Surefire Rules of Diagnosis
Diagnosis and Treatment- Diagnosing Abiotic Disorders
Tree Selection and Planting- A plant by any Other Name
Tree Selection and Planting- Installation and Establishment of Trees and Shrubs
Tree Selection and Planting- Ten Keys to Plant and Site Selection
Tree Selection and Planting- Tree Transplanting
Tree Selection and Planting- Tree Transplanting and Establishment
Tree Selection and Planting- Post Planting Maintenance of Trees and Shrubs
Tree Selection and Planting- Tree Trunk Protection
Tree Selection and Planting- Siting, Selecting, and Planting Problems
Tree Selection and Planting- Girdling Root Formation in Landscape Trees
Tree Selection and Planting- Right Tree, Right Location
Tree Selection and Planting- Dendrology and Taxonomy
Tree and Development
The Landscape below Ground
General- Arborist Equipment Study Program

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International Society of Arboriculture
Continuing Education Units Completed 2017

Root Pruning Part 2
Palms: Woody Giants of the Monocots Part 2
Biology and Assessment of Callus and Woundwood
Managing Soils That Support Urban Trees Part 1
Palms: Woody Giants of the Monocots Part 1
Tree Injection Part 1
Plant Health Care and Diagnostics
Root Management: An Introduction
Bark Traits are Important to Tree Health and Survival.
The Cost of Not Maintaining the Urban Forest
Flood-Tolerant Trees in the Urban Sphere
Integrated Vegetation Management
Advanced Twig Anatomy
Tree Lightning Protection Systems Part 2
Tree Safety

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Continuing Education Units Completed 2018

Managing Soils That Support Urban Trees Part Two

Preserving Trees During Construction

Arborists and Wildlife Retaining Trees for Wildlife Habitat

Understanding Tree Responses to Abiotic and Biotic Stress Complexes

Storm Response Part 1: Types of Storms and Their Effects on Trees

Storm Response Part 2: Preparing for Safe and Effective Responses to Storms

Storm Response Part 3: Effective Response to Large and Small-Scale Storm Emergencies

Storm Response Part 4: Unique Aspects: Keeping Employees Safe, Talking to the Media, Saving Damaged Trees, Winding Down, and Lessons Learned

Tree Inventories

Understanding Tree Responses to Stress

Tree Lightning Protection Systems (Part One)

Root Management Challenges on Urban Sites: Achieving a Healthy Root Crown Balance

Root Management Challenges on Urban Sites: Human Intervention in Root Development

Tree Risk Assessment: Structural Defects and Conditions that Affect the Likelihood of Failure

Basic Tree Plumbing Translocation

Tree Injection (Part 2)

Advanced Twig Anatomy Starting Little to Get Big (Part 1)

Biology and Identification of Fungi

Urban Tree Inventory Data

Comparison of Tree Conditions

Roadside Soil Enhancement

Tree Species as Tools for Biodiversity and Phytoremediation

Homeowner Interactions with Residential Trees In Urban Areas

Does Modulus of Elasticity Vary

Long-Term Fluctuations in Water Status and Crown Die Back

Maximum Size Expectations in Designed Space

The Arboricultural and Economic Benefits of Formative Pruning

Protecting Your Assets

The Management of Tree Roots in Urban and Suburban Settings

The Costs of Not Maintaining and Maintaining the Urban Forest

Tree Performance during Early Years and Future Performance

Effects of Urbanisation on Tree Species Composition and Structure

Things Arborists Should Know about Soil Microbes

Wood Chips and Compost Improve Compacted Urban Soil

The Linear Index of Tree Appraisal Model

The Influence of Abiotic factors on street tree condition and mortality in a commercial retail Streetscape

Water Management Strategies in Dry Environments

Comparison of Shading Effectiveness, Vines, and Utility Arboriculture

Vegetation and Storm Water Run Off

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International Society of Arboriculture Continuing Education Units Completed 2021

Wood Decay Fungi Identification and Management
Nursery Production Systems
Core Concepts of Plant Appraisal
Plant Appraisal Data Collection (Part One)
Plant Appraisal Data Collection (Part Two)
The Cost Approach: Methods, Techniques, and Depreciation
Pruning Systems: Best Management Practices
Pruning Cuts: Best Management Practices—Tree Pruning, 3rd Edition
Applications of Biochar for Arboriculture
Arboricultural Operation Safety Standards: A Global Perspective, Part 2
Reducing the Tension Between Promoting Tree Diversity Versus Planting Natives
The Surprising Benefits of Biodiversity
Tree Defect Identification
The Case of the Lamentable
Reports: The Write Way
The Case of the Ailing Avenues
The Case of the Plane Plan
The Case of the Eloquent Elephant
The Case of the Redwood Roots
The Case of the Defiant Ficus
New Zealand Tree Project
The Case of the Movie Star Trees
The Case of the Mysterious Sugar Maple
Understanding Fall Protection
What Does Science Say About Pruning Mature Trees
The Case of the Beach House Beech
The Case of the Perished Pine
Tree-Size Variables for Appraisal Methods
Insect Vectors and Their Role in Disease Transmission Part II
The Case of the Curious Conifer
The Case of the Confounding Clues
The Case of the Frizzled Fronds
The Case of the Lonely Lashing Leader
The Case of the Lamentable Maples
The Reforestation of Chihuahua, Mexico
The Case of Justine's Junipers
Wildlife Retention
The Case of the Quercus Calamity
The Case of the Rooftop Restaurant
The Case of the Avocado Aficionado
The Case of the Midsummer Misery
The Case of the Baffling Butternut
The Case of the Beach House Beech
The Case of the Terrifying Twister
The Case of the Perished Pine

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International Society of Arboriculture Continuing Education Units Completed 2024

The Plant Appraisal Process

Identifying and Managing Cankers on Landscape Trees

Managing Dormant Buds as Arboricultural Assets: Lignotubers

Climb Smarter: Five Tips to Extend Your Career

Underperforming Soil Assessments

Understanding Native Wood-Borers

Boldly Planting for The Next Generation

Integrated Vegetation Management Control Methods

Sonic Tomography for Tree Risk Assessment

How to Assess Soil

The Big Five and Urban Decay Ecology

Beneficial Insects in the Urban Landscape

Administering Tree Injections

They Are There in Green and White: Variegated Trees Have Their Place

Trees and Construction—The Design Phase

Best Practices for Root Pruning

Tree Roots: A Closer Look at Roots with Secondary Thickening

Assessing Targets, Sites, and Trees for Utility Tree Risk Assessment

Selection, Timing, and Application of Tree and Shrub Fertilization

Utility Tree Risk Categorization

Biomechanics

Water Strategy & Collective Action

Tree Planting Configuration Influences Shade

An Analysis of the Field Precision of the CTLA Trunk Formula Method

A New Approach to Quantify Growth Response

Early Vegetation Responses to Eight Right-of-Way Integrated Vegetation Management Techniques in Northern Canada

A Social-Ecological Analysis of Urban Tree Vulnerability for Publicly Owned Trees in a Residential Neighbourhood

Frequency and Severity of Tree and Other Fixed Object Crashes in Florida

Comparison of Tree Responses to Different Soil Treatments Under Concrete Pavement

A Review of United States Arboricultural Operation Fatal and Nonfatal Incidents (2001–2017)

Load-Bearing of Bark-Included Junctions in the Presence and Absence of Natural Braces

Strain Patterns Across the Root-Stem Transition Zone in Urban Trees

Tracking Changes to Urban Trees over 100 Years in Ithaca, NY, USA

Structural Pruning in Callery Pear Does Not Change Union Strength in Seventh-Year Load Test

Stem Radius Fluctuations in Urban Trees

Plant and Wood Area Index of Solitary Trees for Urban Contexts in Nordic Cities

Replacing Trees Removed Under a Private Tree Regulation

Modern Urban Forestry for Modern Cities

Likelihood of Failure of Trees Along Electrical Utility Rights-of-Ways

Species Diversity and Urban Forest Resilience in the Milwaukee Metropolitan Area

Achieving the Urban Tree Trifecta

Modelling Four Neighbourhood-Scale Urban Forest Scenarios for 2050

Optimizing Reduction Pruning of Trees Under Electrical Lines

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