

CASE STUDY REPORT

When Tree Decay Isn't the Whole Story

*A Forensic Investigation into Construction-Related Tree Failure
Causation and Site Negligence.*

INCIDENT BACKGROUND

The Fatal Failure

A fatal tree failure occurred during an active transportation project. The incident resulted in the immediate death of a worker on site.

- ✓ Daytime operations under calm conditions.
- ✓ Construction equipment present (excavators/earth-movers).
- ✓ **Initial Narrative:** "Spontaneous failure due to internal decay."



THE "DECAY-ONLY" ARGUMENT



The Opposing Position

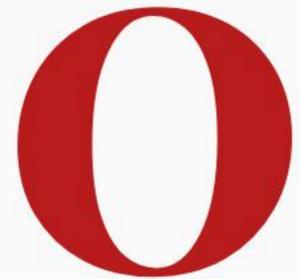
Defense experts claimed the tree was internally decayed and would have fallen eventually. Decay was visible in the trunk cross-section.



The Forensic Rebuttal

Trees with decay often stand for decades. Forensic science asks: Why did it fall at *this specific moment* when there was no wind?

| THE "SILENT DAY" ANALYSIS



WIND LOAD (MPH)

Weather Logs Verified

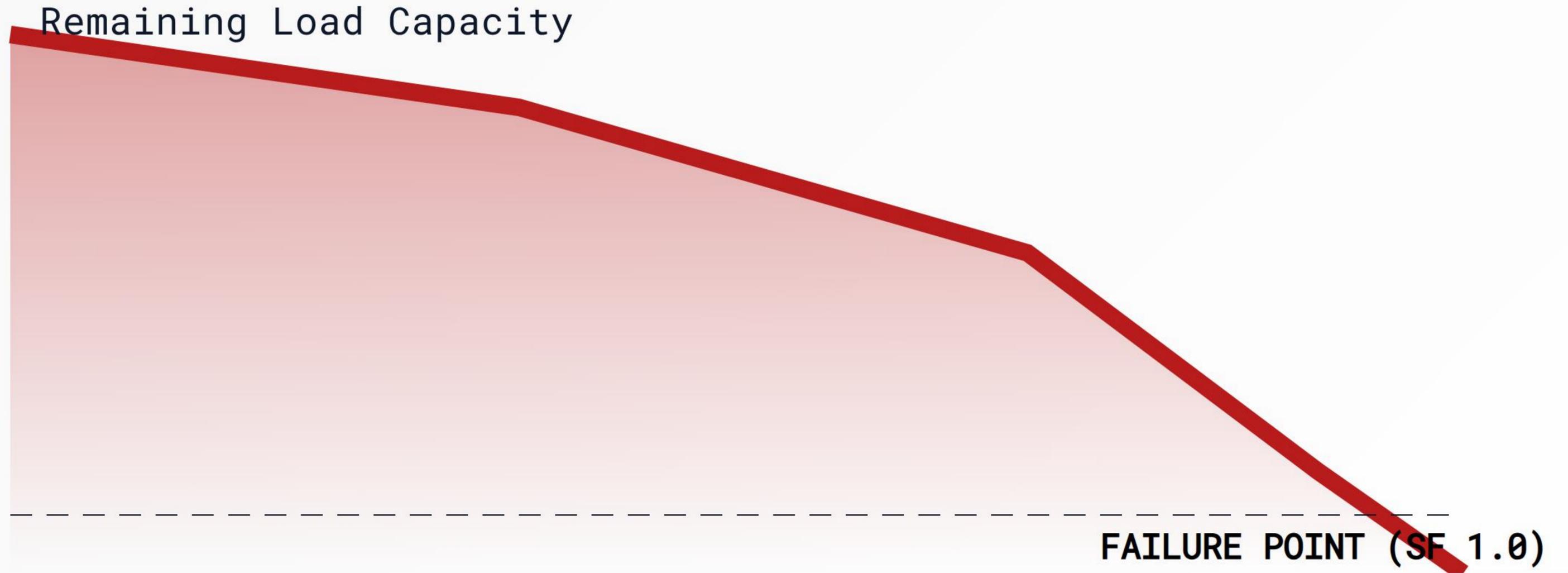
Atmospheric data confirmed static conditions at the time of collapse. No storm, gust, or precipitation occurred.

- ✓ Eliminates "Act of God" defense.
- ✓ Points to external mechanical catalysts.
- ✓ Proves the tree did not fall under natural load.

Part II: Biomechanics

Analyzing wood fiber failure and structural loading factors.

REMAINING CAPACITY INTEGRITY



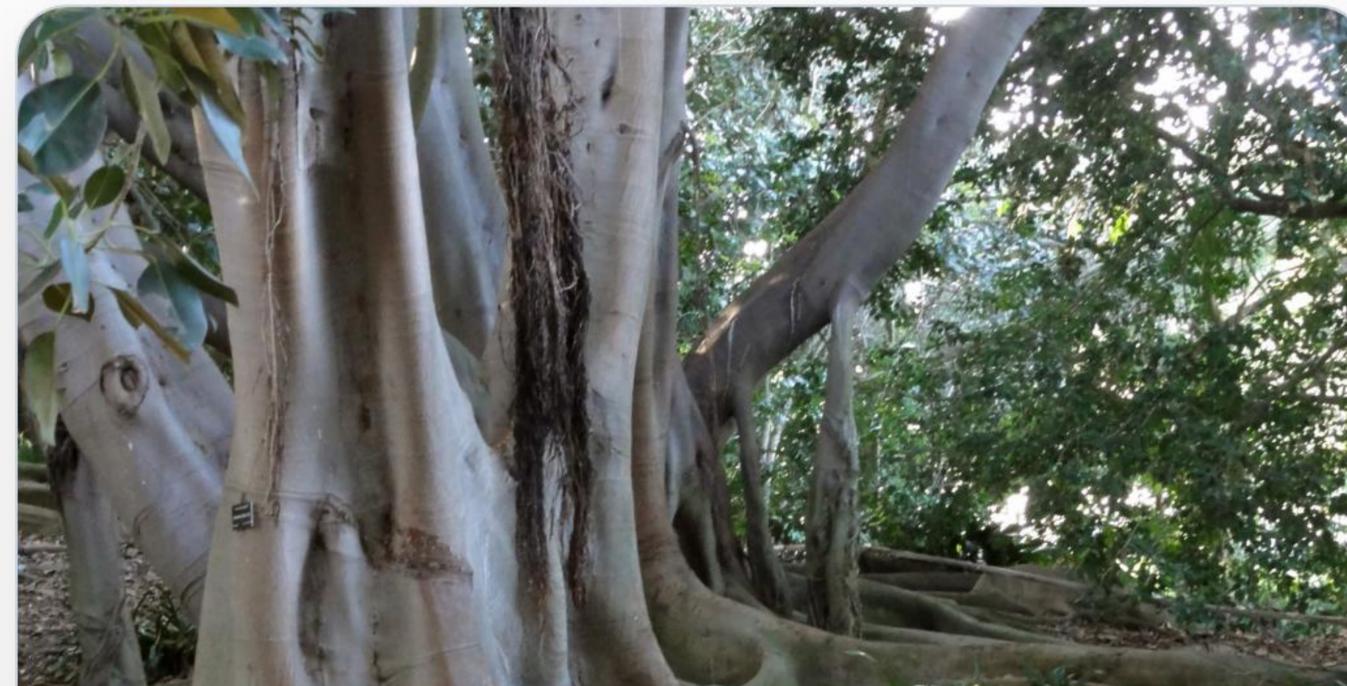
Construction activity dropped the safety margin until the tree could no longer support its own gravitational load.

THE STRUCTURAL ANCHOR

Importance of the Base

The basal region and buttress roots are the tree's anchorage system. Damage here is catastrophic for stability.

- ✓ Failure occurred exactly at the base.
- ✓ Basal failure modes point to site disturbance.
- ✓ Anchorage depends on tension and compression wood.



THE PHYSICS OF BASAL STRESS

Stress Calculation

Stability is governed by the wood's ability to resist the leverage (moment) of the canopy.

Severing roots or wounding the trunk reduces the Section Modulus (S), causing Bending Stress (σ) to spike.

$$\sigma = \frac{M}{S}$$

**Bending Stress (σ) =
Bending Moment (M) /
Section Modulus (S)**

PHYSICAL FORENSIC EVIDENCE



Mechanical Wounds Identified

Site photography revealed a conspicuous mechanical gash on the lower trunk—damage inconsistent with rot.

- ✓ Strike patterns matched machinery on-site.
- ✓ Wound was located at the point of failure.
- ✓ Fresh sapwood confirmed damage was very recent.

Part III: Site Impacts

Analyzing mechanical severance and root zone compromise.

SEVERING STRUCTURAL ANCHORAGE

Trenching & Excavation

Excavation was documented within the Critical Root Zone (CRZ). Structural anchor roots were ripped, not pruned.

- ✓ Removal of roots on the "tension" side.
- ✓ Loss of anchorage resulted in immediate instability.
- ✓ Mechanical tearing evident on major root leads.



THE INVISIBLE FAILURE: COMPACTION



Pore Space Asphyxiation

Repeated equipment traffic crushed soil pores, killing stabilizing feeder roots instantly and making wood brittle.



Hydrological Shock

Compacted soil prevented water absorption, causing internal fiber pressure to drop and initiating fracture.

THE LATENCY OF COLLAPSE

Structural Memory Failure

A tree doesn't always fall the moment it is struck. Damage is cumulative. Wood fibers fracture incrementally over hours or days until the final snap.

"The memory of the wood records every strike until the final load exceeds the remaining capacity."

Part IV: Standards of Care

Industry standards (ANSI A300) and site management negligence.

ANSI A300 AUDIT FINDINGS

Standard Protocol	Compliance Status
Tree Protection Zones (TPZ)	ABSENT
Pruning Structural Roots	RIPIPED/TORN
Daily Hazard Monitoring	NOT PERFORMED

FORESEEABLE NEGLIGENCE

Known Risks

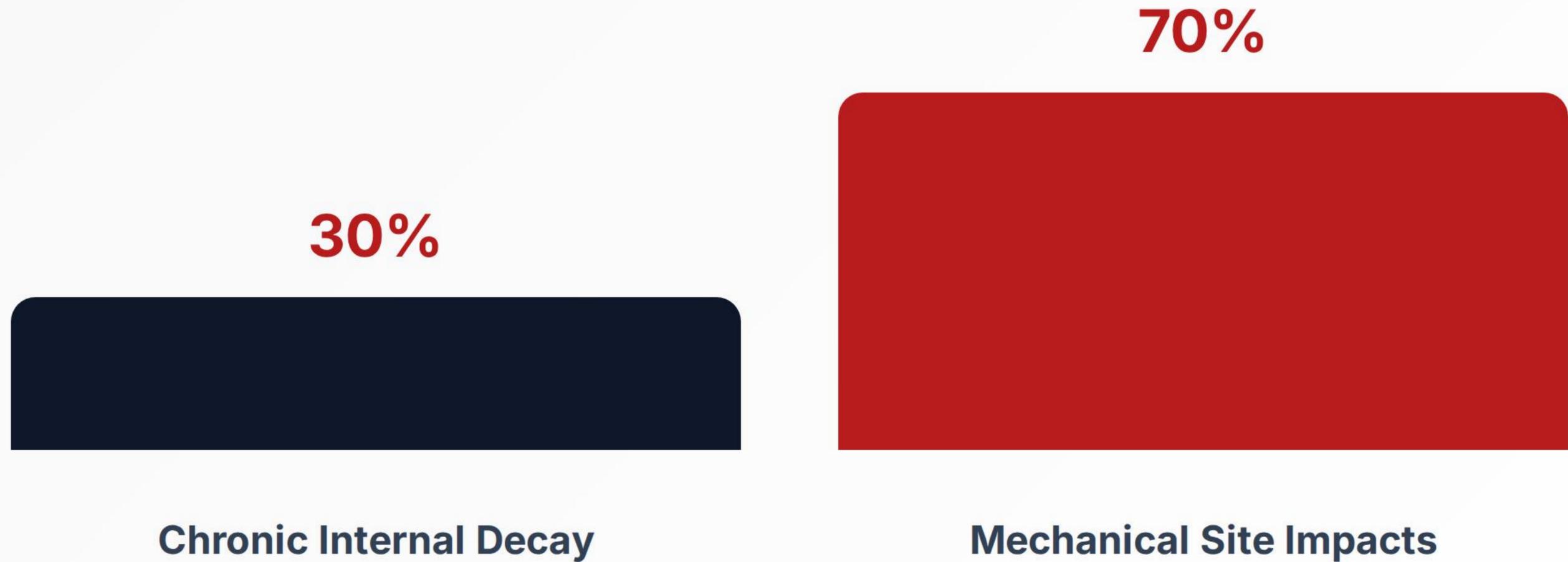
The danger was 100% observable. By ignoring safety zones, the contractor converted a manageable risk into a lethal hazard.

- ✓ Tree should have been removed or fenced.
- ✓ Site supervisors ignored machine-to-tree impacts.
- ✓ **Fact:** Failure was entirely preventable.

Professional Breach

Failure to implement ANSI A300 protocols constitutes a direct breach of the duty to maintain a safe environment for site workers.

ATtribution OF PROXIMATE CAUSE



Weight of scientific evidence attributing failure to construction triggers.

| THE "BUT-FOR" TEST



"But for the mechanical severance of structural anchorage and the repetitive trunk impacts, the tree would have remained standing indefinitely."

LEAD FORENSIC EXPERT

Matt Latham

BCMA, RCA

Board Certified Master Arborist and Registered Consulting Arborist specializing in biomechanical failure forensics and litigation causation.

- ✓ Advanced Biomechanical Diagnostic Expert.
- ✓ Site Safety & Duty of Care Compliance Auditor.

- ✓ Expert Witness for Wrongful Death



SCIENCE WINS CASES

Tree law requires more than "educated guesses." We replace assumptions with Daubert-standard scientific methodology.

- ✓ Replace "it looked rotten" with Resistograph data.
- ✓ Replace "it just fell" with Vector Load Analysis.
- ✓ Clear, undeniable causal links for the jury.

LITIGATION SERVICE PORTFOLIO

Deposition Support

Providing data-backed rebuttals to opposing expert narratives.

Exhibit Creation

3D failure simulations and biomechanical diagrams for court.

Discovery Audit

Finding hidden mechanical triggers in machinery logs and site photos.

REBUTTING THE "ACT OF GOD"

Defense Strategy

"Rot is natural. Trees with rot fall. Therefore, this was a tragic but unavoidable natural event."

The Rebuttal

"Rot is chronic. The tree stood for years with rot. It fell today because the excavator strike at 9:00 AM broke the final fibers."

BEYOND FATALITIES: PROPERTY LOSS

Forensic arboriculture is essential for high-value timber trespass and real estate damage valuation.

- ✓ Replacement cost methodologies.
- ✓ Loss of ecosystem benefit calculation.
- ✓ Depreciation of land value analysis.



INTEGRITY OF EVIDENCE

Chain of Custody Protocols

Our firm ensures all physical and digital evidence meets strict admissibility standards for legal discovery.

- ✓ Digital time-stamped and GPS-verified site photography.
- ✓ Evidence storage for biological wood samples.
- ✓ Strict handling of machinery logs and site sensors.

BENEFITS OF EARLY DISCOVERY

Immediate Assessment

Engaging an expert within 48 hours is critical before site clean-up crews destroy root plate evidence.

Discovery Counsel

We assist in drafting technical interrogatories for equipment maintenance and site vibrations.

| MEDIATION OUTCOME

Following the submission of forensic findings, the case moved from a total denial of liability to a successful multi-million dollar settlement.

When causation matters, science makes the difference.

PREVENTABILITY CHECKLIST

- ✓ Establish TPZs BEFORE heavy equipment mobilization.
- ✓ Train operators on basal and root zone sensitivity.
- ✓ Monitor trees daily for fresh mechanical wounding.
- ✓ Implement hand-pruning of structural roots.

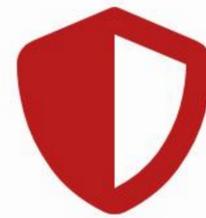
| PROFESSIONAL CREDENTIALS



ISA BCMA



ASCA RCA



TRAQ Qualified

FINAL FORENSIC SUMMARY

- ✓ Environmental conditions were calm (Zero Load).
- ✓ Internal decay was static and did not initiate failure.
- ✓ Direct mechanical disturbance was the acute trigger.
- ✓ Failure occurred at the point of site impact.
- ✓ **Final Conclusion:** Negligence was the proximate cause.

Forensic Support Nationwide

Ensuring your litigation is grounded in scientific and biomechanical certainty.

Arborist On Demand

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NATIONWIDE EXPERT WITNESS SUPPORT