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Municipal Arboriculture: Does the Evidence Support the Claim?

Municipal Arboriculture: Does the Evidence Support the Claim?

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Municipal arborists deal with many challenges managing trees on municipal and private lands. Among the most contentious items are requests for tree removal, dealing with poor or improper pruning, debates about where new trees might be planted, and endless questions about the costs, affordability, and benefits of trees in urban areas.

The arguments presented need to be understood and validated before they can be accepted. This is done by reviewing the evidence, the assumptions underlying it, and the “facts” that supposedly result if the line of argument is believed. Often, the review will show flaws in the evidence, and the way it has been used to derive “facts.”

Evidence has several definitions, but in essence it is “proof supporting an argument, the available facts showing a proposition is true, or the information that supports a conclusion or opinion.”

Two fundamental principles always apply when collecting, analysing, presenting, or reviewing evidence:

Know what to look for.

Know what you are looking at.

When reviewing reports or conducting site visits, clearly understand the assignment and be sure you know what to look for. If it is a tree retention scheme, then where are the building footprints, the service corridors, access roads, and of course, the trees? Have the trees been correctly located on plans? Are the symbols to scale and do they accurately reflect reality? Have the tree and site conditions been correctly identified or are some factors deliberately overstated in order to satisfy client desires to have the trees removed? Errors at this stage can create opinions or conclusions that are not defensible.

In the reports or on site do you know what you are looking at? Do the development proposals reasonably reflect the extent of the actual or anticipated disturbance? Do the drawings show these properly? Have the arborist and design professionals (engineers, architects, landscape architects, planners) properly understood all of the implications? Again, errors at this stage can create false statements later on.

An obvious example is risk assessment. The person wanting a tree removed will claim unacceptable levels of risk or disturbance as justification, and submit a report claiming to prove it. The information presented may be valid, but how can you be sure? Ideally,

the report includes definitive statements about what was done, when, by whom, what they found, how they analysed it, and why they reached their conclusion. However, it is not unusual to find flawed reports, where the claims made are spurious, not clearly supported by credible evidence, or are simply wrong.

Reviewing risk assessment or other reports should start with a series of questions.

1. Is the arborist actually qualified for the assignment and is their credential current?

The Standard of Care in North America is the Tree Risk Assessment Qualification (TRAQ) promulgated by the International Society of Arboriculture (ISA) or similar tree risk assessment programmes promoted by federal or state government.

2. If the report deals with risk, what level of risk assessment did they undertake?

The Best Management Practices - Tree Risk Assessment, published by the ISA, establishes three levels. The level used should be specified.

3. When and how did they undertake the work?

What supporting materials were used? Site surveys, engineering plans? These should be referenced.

4. What did they actually see on site? Did they describe and illustrate it enough so that the reader can clearly see the issues described?

Copies of plans, photographs, and other graphics should be in the report so that the reader can clearly see and understand the issues described.

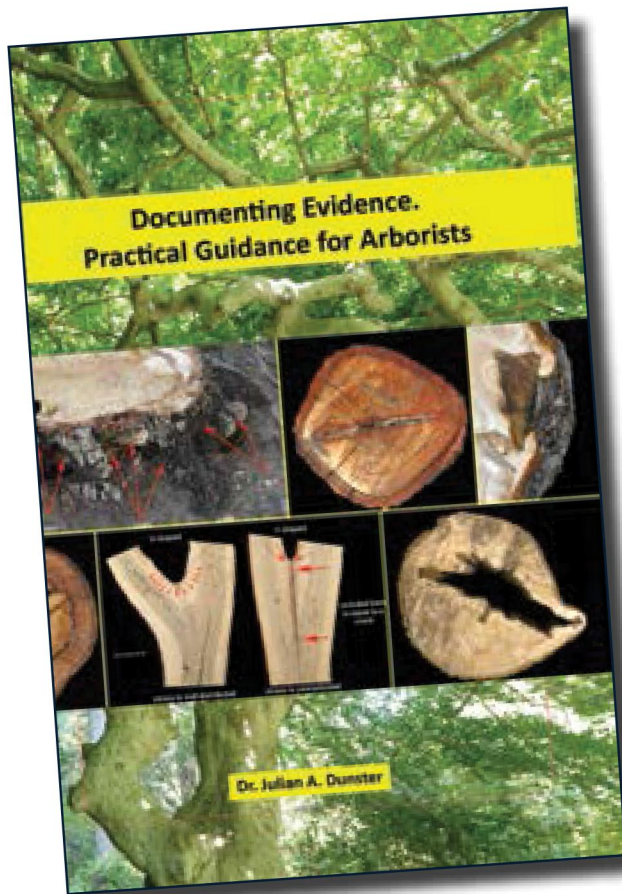
5. Is the analysis credible based on what is claimed to be on site?

6. Is the final opinion believable? Does it seem reasonable in light of the evidence submitted, or is it simply written to support the answer that the client wanted, regardless of what was actually on site?

Of course a similar standard also needs to apply to reports and assessments conducted by staff within a municipal organisation. Leading by example is an important way to promote better standards.

When reviewing reports, it is not unusual to see bland or misleading statements. One recent example stands out. The writer claimed, “We conducted drill tests throughout the tree and all the results met accepted ISA standards.” At first glance the statement sounds

Dr. Dunster's new book, *Documenting Evidence: Practical Guidance for Arborists*, includes a comprehensive description of evidence and how to collect, analyse, and present it. Copies are available from the author at www.dunster.ca.



The book is complemented with a one-day course available by contacting Julian directly.

plausible. In fact, it is nonsense, and attempts to define a fact without any evidence to support it. The reader has no idea of the following aspects:

- ◆ What equipment was used to conduct the tests, was it used correctly, were the tests accurate?
- ◆ Where were the tests conducted on the tree? Why there and not elsewhere? Was the tester simply drilling for the sake of it, or did they have a well-thought-out reason for testing at any one point? If so, what was that reason?
- ◆ What did the results look like? Have they appended or included the data? Can the reader clearly see the issues described? Were the data properly analysed?
- ◆ What are "... accepted ISA standards"? In fact there are no accepted standards as described so the writ-

ter is either ignorant of what they should be doing, or they are deliberately misleading the reader by trying to sound knowledgeable when clearly, they are not.

These issues are typical of writers attempting to present an opinion that is clearly not supported by evidence.

Here are some suggested minimum criteria for reports. A credible report will include:

- ◆ A description of the assignment. The site address (it may include the legal description). The scope of work, and which tree(s) it applied to. The level of effort to be used, and what questions were to be answered in the report.
- ◆ Text and illustrations sufficient in extent so that the reader can clearly see and understand the present condition of the site and the tree(s), target issues, development plans and their implications for trees and targets, the extent of what was observed, and an explanation of limitations, such as what was not seen.
- ◆ Copies of development plans, such as survey plans of tree locations, and aerial photographs. If survey plans are used, make sure they have been plotted accurately, with tree trunks, crown spread, and critical root zone correctly portrayed. All such plans must include a North arrow and a scale bar (no exceptions).
- ◆ If detailed tests were conducted, describe the equipment used, the test locations, and the test data. What did these tests seek to prove, and what was the data analysis process used?
- ◆ The conclusion or opinion should be clearly stated and the evidence produced in the report must clearly support the conclusion or opinion.
- ◆ Recommended courses of action should be explained and justified.
- ◆ All applicable limitations should be noted.

These items apply in many other scenarios, so before the conclusion or opinion can be accepted, the reader should be asking:

- ◆ What type of evidence has been documented?
- ◆ Who collected it, when, where, and how?
- ◆ Are there data that were not collected? If so explain why (lack of time, money, accessibility to the site).
- ◆ How were the data analysed? Were there contrary explanations? If so, how did the writer select the preferred explanation? (This is a good place in the process to search for bias!)

Tree Survey and Plan Specifications

Development plans often involve working around trees. In order to ensure accurate depiction of trees within plans the following specifications should be used. These will save time and money for all parties involved. These specifications should be used in all private and municipal surveys and all development plans.

For all Surveys and Development Plans

1 Check local bylaws and ensure that all bylaw sized trees are included in the survey.

2 Each bylaw sized tree needs to be identified by :

- trunk diameter size in centimetres measured at a set point above ground. This varies by locality and is defined in the local tree bylaw, typically 1.3 or 1.4 metres above ground.
- species (at a minimum differentiate conifers from deciduous trees)
- crown spread in metres measured as a radius from edge of canopy to trunk

The project arborist may add additional details such as present and predicted condition and health, risk, and required design issues.

- if trees are identified on site with numbered tags, place these systematically at the same point on each tree, such as 1 metre above ground on the North side.

- make sure the finished plans include the tag numbers correlated to a table of tree details.

3 All survey plans shall plot the trees accurately and to scale.

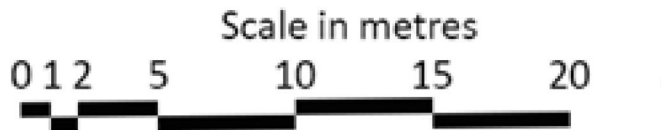
- trunk diameters and crown spread shall be proportionately scaled.
- tree locations shall be plotted using the centre of the tree trunk as the point location. Ground surveys should include an offset equal to the radius of the tree trunk to ensure accuracy. Trunk diameters are measured using a standard diameter tape that provides diameter as a direct reading.

NOTE The use of a single CAD icon that is not correctly scaled is not acceptable. These give no indication of relative tree size and mislead the reader about possible development effects close to the tree. Differentiate the symbols between conifers and deciduous trees.

4 All setback zones or Tree Protection Zones (TPZ) shall be accurately plotted to scale.

Many municipalities require fencing around trees, using the trunk diameter as the basis for size of TPZ. The TPZ must be correctly plotted based on an accurate depiction of the tree trunk (be centre of trunk) and trunk size (diameter). Often the TPZ will also be the required location of the tree protection fence.

5 All plans shall include a scale bar with scale shown in metres.



The use of a scale ratio alone is not sufficient as plans may be photocopied and distorted, or copied at sizes other than the originally intended scale, and not all users have access to architect's or engineer's scales.

The gradations should include at a minimum, divisions of 1 and 2 metres so that fine detail can easily be scaled right on the plans without needing to check for errors of distortion.

6 All plans shall include a North arrow, date, and source of the survey plan.

- any details extracted from the base plans shall provide the same details.

7 Provide a separate sheet for tree location and retention details.

Many development plans include multiple sheets of information. Providing a separate sheet for the tree data saves time and money as a reference point. Because project approval may take several years, it is often useful to be able to upgrade the one sheet alone - it may be required as a final condition of development permit approval. Updates required may include:

- either, check tree diameters are current and that fencing layout details match the new diameters or, provide a note on the plan that the fencing location is based in the tree diameters originally measured. That helps site inspectors determine if fencing is or is not correctly placed.
- check that all trees originally inventoried and depicted are still alive. Remove any dead trees from the base plans and ensure that all interested parties know why the tree symbols are now removed from updated plans.
- make sure the tree plan sheet is dated and any revisions are noted in a side panel. If necessary, cross reference the plan to additional reports provided by the project arborist.

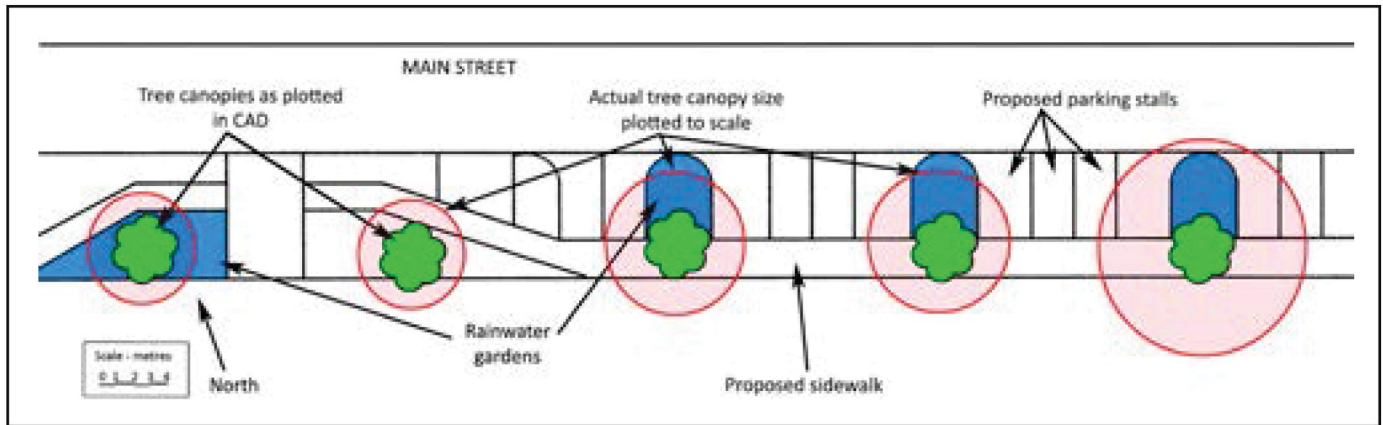
- ◆ Are the facts being presented supported by the available evidence?

There will be many situations where simple evidence will suffice to make a decision, so it is unwise to expect reams of detail in all cases. For example, tree height may be irrelevant in some applications, but vital in others. Trunk diameter is almost always a good criterion since most bylaws and ordinances have that as a threshold. But not all risk assessments require an advanced level of investigation, and not all aspects of every tree are always readily apparent, even if a lot of time and effort is expended.

Location on site is always important, so make sure the tree(s) are correctly mapped. That means making sure that all plans and CAD symbols are correctly portrayed. Trunk and crown spread symbols must be plotted proportional to their actual size, and not simply what the designer felt would look good! If you need evidence about the potential effect of disturbances within a critical root zone, and that is calculated based on trunk diameter, then be sure the diameter was correctly measured, is up-to-date, and CAD symbols are correctly scaled from that data.

Finally, when checking reports, be sure to check that the facts are supported by evidence. Evidence should not have been fabricated to support a foregone conclusion, and facts cannot be spontaneously generated without supporting evidence. Many aspects of arboriculture are subjective, but under no circumstances should the conclusion or opinion be arbitrary. It should always be clearly supported with well-presented evidence that is systematically laid out.

CAD Plan



The original plans have all of the trees plotted incorrectly (green). They are simply CAD symbols plotted without any sense of the actual trunk or canopy size. Subsequent design used the incorrect data to design a sidewalk, parking stalls, and rainwater garden areas. The field inspection reveals trees with much larger canopies (red circles), and by extension, much larger critical root zones. The implication is that the proposed design will almost certainly have a very undesirable impact on all of the trees.

In this case the baseline evidence is totally wrong. It misleads all other design work and, in the absence of verification, provides a plan that would fail to protect the trees. Note the inclusion of a North arrow and scale bar—both items should always be required in any plan submissions.

This photo (right) depicts one of the trees affected by the CAD plan (above). Will it be feasible to install a standard sidewalk between the existing fence and the tree trunk? Is the raingarden setback from the trunk large enough? Will the parking stalls adversely affect the tree roots? The original plans and tree symbols bear no relation to reality and provide false evidence about the site and design implications. 🌿

