Sonic Tomography & Resistance Drilling

Sonic tomography and resistance drilling are great options when detailed information is needed about the internal structure of a tree trunk, branch, or root. While each technology works a little differently, they both result in information on the presence of a loss of internal structural integrity. Common reasons for a loss in structural integrity are compromised areas such as cracks, cavities, decay, or voids. It is common practice to use both technologies if the initial results show a high loss of structural integrity.

Typically, an arborist uses these specialized technologies as part of a Level 3 advanced assessment of tree risk. The arborist will combine their knowledge, experience, and other information with the sonic tomography and/or resistance drilling results to determine the likelihood of failure of the tree, trunk, branch(s), or root(s).

Sonic Tomography

Sonic tomography devices use soundwaves to estimate the presence of internal loss of structural integrity (Figure 1). Soundwaves move from sensor to sensor quicker through wood that is intact and not structurally compromised. Soundwaves will move around compromised areas causing additional time to reach the other sensors. The times for a soundwave to reach the other sensors are presented as a graphic image, called a tomogram.

Figure 1: When using sonic tomography, arborists tab sensors to send soundwaves through a tree.

Estimated structural integrity is represented by a color scale from areas with high structural integrity to areas of no structural integrity (Figure 2). The software can also “stack” individual tomograms to create a 3-D representation (Figure 3).

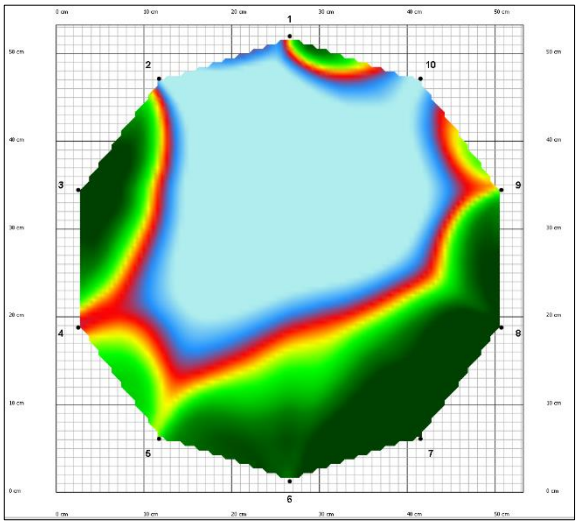

Figure 2: Example of a sonic tomography tomogram.

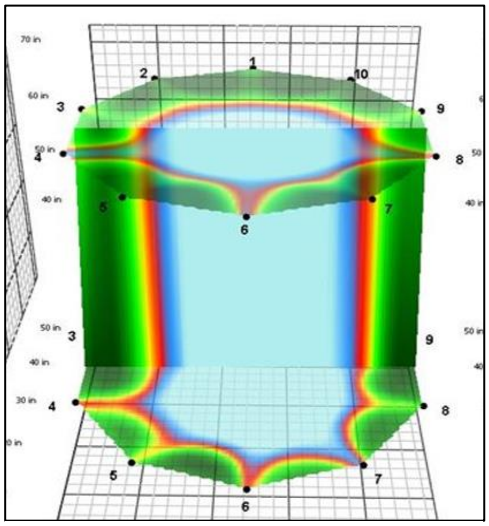

Figure 3: Example of a 3-D representation from sonic tomography.

Resistance Drilling

Resistance drilling devices use a small diameter drill bit to drill into the tree trunk, branch, or root, and measure the amount of resistance encountered (Figure 4). The drill bit will encounter more resistance in wood that is intact and less in those structurally compromised areas. The drill bit will move easily through compromised areas causing a drop in resistance.

Figure 4: Resistance drills use small drill bits to record resistance within a tree.

The amount of resistance measured is presented as a graphic image from areas with high structural integrity to areas with no structural integrity (Figure 5).

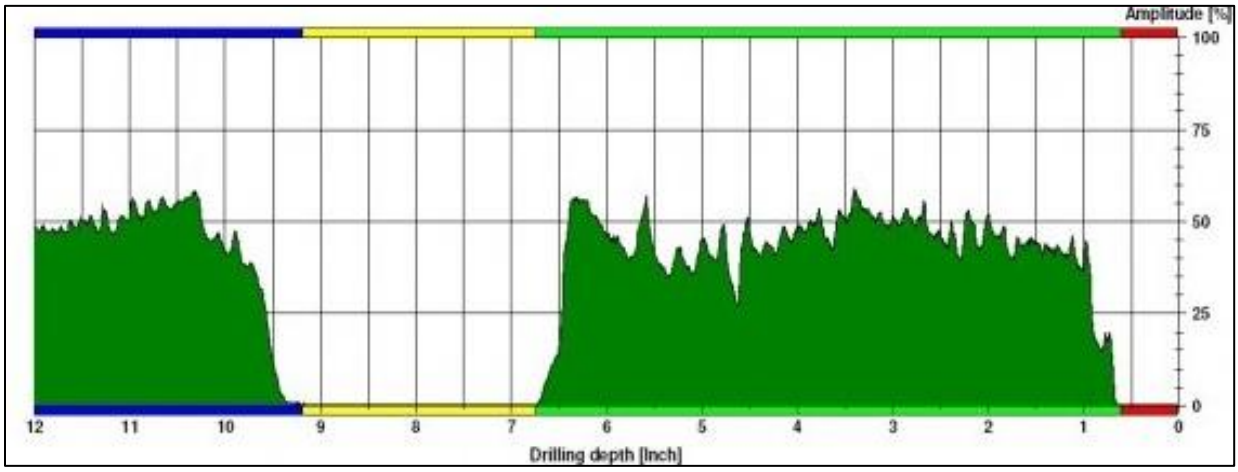

Figure 5: Example of resistance drilling results displaying areas of high structural integrity in green.

These specialized technologies can provide valuable information; however, each technology may have uncertainty, require qualified estimations, and exact measures may not be feasible. It is also important to understand that the amount of structural integrity loss shown can vary based on the version of the program software used. Therefore, these technologies can be limited and should not be used by the tree owner/manager as the sole decision-making criteria, but rather one of many factors used in the decision-making process.

Please contact the Consulting Advisor team at consulting@bartlett.com to find out more information or to schedule a conference call or webinar presentation. You can also visit www.bartlett.com/bartlett-consulting.cfm to learn more about the Bartlett Consulting team.

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