

JOURNAL OF ARBORICULTURE

May 1984
Vol. 10, No. 5

PARKWAY TREE AUGERING SPECIFICATIONS¹

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The history and the development of our tree augering specifications began in the fall of 1982, when several municipal foresters from North-eastern Illinois began to discuss a problem that was common to all of us; the construction in city parkways, around parkway trees, and the resulting damage.

Although construction in the parkways has been occurring for years, our interest in this area was intensified with the introduction of cable television to the Chicago area, and their proposal to install cables underground in the city parkways where we have trees growing. Also, as our communities continue to age, the utilities, most of which are buried underground, are slowly deteriorating or are inadequate to serve the community, warranting their replacement. Often, to speed replacement and cut costs, the utility installations are placed in the parkways, damaging the parkway trees.

In the Chicago area, most municipalities are serviced by the same utility companies. Therefore, our forestry organization in Northeast Illinois formed a committee for the purpose of establishing and using a standard specification for augering the root zone of parkway trees. The committee members were Paul Appelt, Downers Grove, IL; Sandy Forgacs, Mt. Prospect, IL; Brock LaMarca, Highland Park, IL; and myself, John Morell, Park Ridge, IL, chairman.

Our committee met on several occasions to discuss and work on this project. We learned that some of the municipalities do not have an ordinance regarding the augering of tree roots,

while others require that the root zone of parkway trees be augered. The most important fact that we discovered was that no two communities that had an ordinance pertaining to augering of tree roots had uniform requirements. In further research and discussions we learned that the utility companies in the Chicago area interpreted our requirements for tree root protection differently from what was written, and that one utility company had its own specification that it used for augering tree roots which was difficult to interpret. Remember that the interpretation and use of any ordinance of this type is generally accomplished by the supervisor working in the field, who is a layman in forestry.

To determine the various lengths of auger as they relate to the diameter of the trees, our committee measured several species of trees in the field, measuring not only the dbh of the tree trunk, but also the spread of the crown (distance from the face of the tree to the dripline) and calculated the average spread. We thus determined the various lengths of auger for each diameter class established by our tree augering specification.

After we had developed our augering specification, we noted a table for tunnelling or trenching near trees for the installation of utility lines in the text by R.W. Harris entitled *Arboriculture*.

Our rationale for developing a parkway tree augering specification was that every municipal forester, arborist, urban forester and horticulturist is concerned and has a responsibility for the maintenance and protection of all publicly owned trees that are located adjacent to public streets, sidewalks or rights-of-way, or in grass areas,

1. Presented at the annual conference of the International Society of Arboriculture in Indianapolis, Indiana in August 1983.

called parkways. The trenching operation when used in the root zone of a tree causes damage to that tree's root system. Trenching through the tree and root zone will cause one or more of the following to occur to the tree and remaining root system; slowing of the growth rate, die-back and decline of the tree's crown and/or root system, deadwood formation, wind throw, invasion of wood-decaying fungi and/or insects, or total tree mortality. Our maintenance and protection responsibilities include not only the portion of the tree above ground, but also the root system of the tree. The lack of an augering specification has resulted in varying interpretations for what is adequate for the protection of the tree's root system.

Our specification. The parkway tree root zone shall be protected by augering in the manner described in Table 1. The minimum depth of auger within the root zone shall be 24 inches below the soil surface. No trenching within the root zone of the tree, as described, shall be permitted (see Fig. 1).

Table 1. The distance for augering in each direction if the trench is located within this radius.

Tree diameter (dbh)	Auger distance from face of tree
0-2 inches	1 foot
3-4 inches	2 feet
5-9 inches	5 feet
10-14 inches	10 feet
15-19 inches	12 feet
over 19 inches	15 feet

A tree and/or its root system that is damaged during construction often doesn't immediately display any change in the crown. Therefore, most city engineering departments and utility companies have little or no concept of what happens when they trench and cut off the roots on one side of the tree. That makes it difficult for us as foresters to convince engineers, etc. that their trenching is the reason the trees died five or ten years after the construction project was completed. It's easy to see why the city engineering departments take this position. They don't see the trees die or weaken during trenching.

To convince the Park Ridge City Engineering Department that trenching through the root

system of parkway trees was detrimental to a tree's health and survival, we revisited in January 1983 our 1971 and 1972 construction projects. The projects that we examined were watermain installations. The tree roots were not augered in these projects. In the 1971 project, a 10-inch diameter pipe was installed, and in the 1972 project 12-inch and 8-inch diameter pipes were installed at different locations.

The 1971 construction area contained 135 parkway trees. We recorded the presence or absence of trees, current tree condition (particularly noting top dieback), trunk damage and/or the presence of trunk cavities or decay. The survey revealed that 60 trees had been removed, a 44 percent loss, and 13 trees had significant dieback in their crowns. The 1972 project contained 127 parkway trees. Of these 32 trees no longer existed, a 25 percent loss, and 14 trees had crown dieback. These results confirmed what we already knew, that there was significant damage to the parkway trees as a result of trenching through the root zone during the installation of

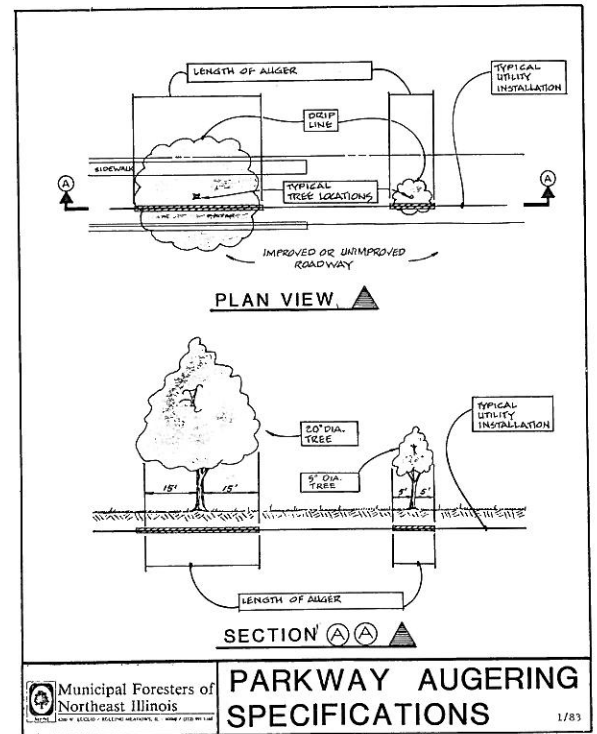


Fig. 1. Parkway augering specifications.



Fig. 2. Construction damage to the root system of a parkway tree during installation of a sewer.

these watermains. The losses ranged in some blocks from none to a high of 100 percent.

As a result of our survey, our engineering department acknowledged that trenching through the root zone of our parkway trees was causing damage. A major concern of theirs then was what would the increased cost be for following our augering specifications. This is a valid concern. We calculated the cost of augering an 8-inch diameter pipe to be \$45 per linear foot, a 10-inch diameter pipe to be \$55 per linear foot, and a 12-inch diameter pipe to be \$65 per linear foot. The 1971 construction project totalled approximately \$330,221. The cost to auger the parkway trees using our specifications would have been \$32,230, or about 10 percent of the total contract. The 1972 project cost approximately \$246,475, with the cost of augering the parkway



Fig. 3. Top dieback damage caused by trenching through the root system in 1972 to install a water main in the parkway.

trees approximately \$26,257 or 11 percent of the total contract.

Of equal concern to the forestry department is the cost to remove and replace parkway trees. Total removal and replacement costs for the 60 trees lost in the 1971 construction project was calculated at approximately \$29,580 which nearly equals the total cost of augering. The costs for the 1972 construction project removals and replacements was approximately \$14,350 or half of the projected augering costs.

The value of the trees removed as a result of the 1971 project was approximately \$137,883, and the value for the trees removed as a result of the 1972 project totalled approximately \$55,700. These costs were based on the \$11 per square inch of trunk cross section.

In conclusion, the results of our study and the



Fig. 4. Tree decline and top dieback resulting from trenching in the parkway in 1972.

minimal increase in costs required to auger under tree roots convinced our engineering department to accept the specifications that we developed. These specifications are now used in all City construction projects. Private utility companies working in Park Ridge, also must abide by these augering specifications when working on the City parkways.



Fig. 5. Trunk damage caused by careless construction workers while installing a water main in the parkway.

Literature Cited

Harris, Richard W. 1983. *Arboriculture*. Prentice-Hall, Inc. Table 7-1, p. 182.

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