

# Tree Protection and Preservation Manual

March 2020



[fpdcc.com](http://fpdcc.com)

# TABLE OF CONTENTS

Introduction .....	1
Manual Organization.....	4
<b>SECTION I: Planning &amp; Design .....</b>	<b>6</b>
Introduction .....	7
Preliminary Planning.....	7
Pre-Design Meeting.....	7
Survey of Conditions .....	8
Tree Protection Plan .....	11
Tree and Plant Protection Zone .....	13
Mitigation Matrix .....	15
<b>SECTION II: Construction .....</b>	<b>16</b>
Introduction .....	17
Pre-Construction and Construction Procedures.....	19
Construction Details, Specifications and Requirements.....	21
Tree Care and Maintenance for Preserved Trees .....	28
Remedies.....	31
<b>SECTION III: Post-Construction .....</b>	<b>33</b>
Final Inspection Procedures.....	34
<b>Appendices</b>	
Appendix A: Additional Resources.....	37
Appendix B: Sample Tree Survey Chart .....	39
Appendix C: Tree Preservation Process Checklist.....	40
Appendix D: Quick Links .....	41
Appendix E: Planting Detail and Process.....	42



# Introduction

## About the Forest Preserve District of Cook County

The Forest Preserve District Cook County, Illinois (hereafter referred to as the “District” or “Forest Preserves”), is the largest forest preserve district in the United States. It was established in 1914 with a mission to “acquire, restore and manage lands for the purpose of protecting and preserving public open space with its natural wonders, significant prairies, forests, wetlands, rivers, streams, and other landscapes with all of its associated wildlife, in a natural state for the education, pleasure and recreation of the public now and in the future.”

Today, the District is nearly [70,000 acres](#) of oak woodlands, savannas, forests, tallgrass prairies, native wetlands, ponds and streams, spread across Cook County. It is a destination for millions of visitors each year who enjoy not only the natural environment, but also the educational and recreational opportunities it provides.



Since 2014, the District has been actively working on our [Next Century Conservation Plan](#) (NCCP) that directs our efforts to have active restoration on 30,000 acres. There are many aspects of the NCCP that guide our methods for land management, facilities, and volunteers.

## Trees and Forests of the Forest Preserve District of Cook County

Of the its nearly 70,000 acres, trees, forests and woody vegetation accounts for nearly 39,000 acres or 56% of the District’s landcover. The trees and forests of the District provide a respite from city life for visitors, along with important environmental, social and economic benefits to Cook County communities, including:

- Component of our [Sustainability and Climate Resiliency Plan](#)
- removing ozone from the air helping to reduce atmospheric warming and improving air quality and the public health effects of air pollution.

- storing carbon and reducing the amount returning to the atmosphere as a greenhouse gas.
- shading and cooling streets/buildings mitigating the urban heat island effect.
- intercepting and absorbing rainwater helping to reduce flooding and the amount entering community stormwater systems.
- improving water quality by filtering and removing pollutants.
- providing homes, food and shelter for wildlife.
- beautifying communities.
- increasing real estate values by 7-10%<sup>1</sup>.
- positively impacting the overall health of urban residents<sup>2</sup>.

## Impacts of Construction on Trees and Forests

The District works hard to protect and manage trees and forests by providing specifications in construction contracts and license agreements that require tree and shrub removal or impacts be minimized and compensated for according to the District's Tree Mitigation Plan. However, even with these standards and specifications in place, construction activities on District lands have not always adequately planned for the protection of trees and forests. This lack of planning has caused significant impacts to the District's forests and tree canopy, including:

- Physical damage to tree trunks, branches and roots caused by using equipment, storing construction materials or spilling chemicals (e.g. herbicides, equipment fluids) near trees.
- Compacting soil by driving, parking or storing equipment and materials in tree root zones. With the majority of a tree's root system in the top 18-inches of the soil, the compaction caused by these activities reduces soil pore space and decreases the ability of roots to access and take up oxygen, water and nutrients. This leads to poor tree growth, development and even death.
- Altering soil composition and hydrology through site grading. The removal of native soils around trees during construction reduces the soil's organic content and nutrient and water- holding capacity. This impacts the ability of tree roots to access water and nutrients. Grading can also change how much water a tree receives. Increasing

---

<sup>1</sup> Dwyer, J., McPherson, E.G., Schroeder, H.W., and Rowntree, R. (1992). Assessing the Benefits & Costs of the Urban Forest. 1992. *Journal of Arboriculture* 18(5), 1-12.

<sup>2</sup> Ulmer, J.A., K.L. Wolf, D.R. Backman, R.L. Tretheway, C.J. Blain, J.P.M. O'Neil-Dunne, L.D. Frank. (2016) Multiple health benefits of urban tree canopy: The mounting evidence for a green prescription. *Health and Place*, 42, 54-62.

or decreasing the amount of water reaching a tree's root system can cause significant health impacts and lead to death.

- Tree removals can change microclimates and alter the amount of sunlight or wind exposure around remaining trees.

This manual was developed to address these impacts, and protect and preserve the District's most valuable resources—its trees and forests—by improving protection and preservation methods and specifications. With these specifications in place, the District is helping to ensure that the important environmental, economic and social benefits its tree canopy provides today will continue to be provided to the Cook County region well into the future.

## **Tree Protection and Preservation Manual**

The specifications and standards outlined in this **Tree Preservation and Protection Manual** are based on industry standards and generally accepted best management practices. They apply to all construction and development projects that may impact the root zone of a tree, that occur on District lands, including, but not limited to, new construction, demolition, utility installation, special use activities, and Construction Permit Access applications.

The District reserves the right to modify or change standards outlined in this manual if different or more stringent legal or project requirements are needed based on emergencies, site conditions or project.

# Manual Organization

The manual is organized into three sections: **Planning & Design, Construction** and **Post-Construction**. Each section provides methods to choose and create specifications, standards, processes and guidelines to be followed during that phase. The manual contains links (blue underlined text) to relevant information within the document to assist with implementing the specifications and standards.

[Section I: Planning & Design:](#) Specifications, standards and processes to be followed during pre-planning, design and engineering. Information in this section includes, procedures and requirements for communication, pre-planning, design and engineering, and specifications and standards for tree surveys, tree and plant protection zones, and development of tree preservation and tree mitigation plans.

[Section II: Construction:](#) Processes, standards and specifications to be followed during the construction phase of the project. Information in this section includes, guidelines for pre-construction and progress meeting; monitoring standards; specifications for tree protection measures, root protection and the care and management of preserved trees; and contractual remedies for tree damage and removal.

[Section III: Post-Construction:](#) Specifications, standards and processes to be followed during the post-construction phase. Information in this section includes, guidelines for post-construction meetings, inspections, monitoring and post-construction enforcement.

[Appendices:](#) Additional resources, checklists, and quick links.

---

## *Goals of the Tree Preservation and Protection Manual*

---

- Support the District's mission to preserve, manage and protect natural resources.
- Maximize the environmental, social and economic benefits that the District's tree canopy provides to the Cook County region.
- Develop clear and concise guidance and specifications for tree protection and preservation to ensure trees and other sensitive ecosystems of the Forest Preserve District of Cook County are adequately protected during construction and recreational activities.
- Increase survivability of protected trees by providing protection and care standards and adhering to best management practices.
- Avoid damage to trees that are proposed to be preserved on site, including mechanical damage, grading and soil compaction.
- Improving coordination on construction projects and minimize conflicts between trees and new buildings, paths, driveways, roads or utilities.

*The tree protection and preservation specifications outlined in this manual align with the objectives and principles outlined in the District's Sustainability Doctrine, the District's Draft Mitigating Impacts on Nature policy and Chapter 2, 2-2-1, Protection of Native Landscape, of the Forest Preserve District of Cook County Code of Ordinances.*



# Section I: Planning & Design



# Introduction

The processes outlined in this section are provided to ensure that the preservation and protection of trees, forests and other sensitive ecosystems are adequately planned for during planning, design and engineering.

## Preliminary Planning

Communication is the key to ensuring trees are properly preserved and protected before, during and after a construction project. Providing opportunities for communication early and frequently throughout the planning, design and construction process can help avoid unnecessary tree damage or removal by identifying, investigating and addressing tree issues and conflicts promptly.

The tree protection phase begins by the project lead contacting the Department of Resource Management regarding all construction and development projects that may impact trees and their root zones that occur on District lands, including, but not limited to, new construction, demolition, utility installation, special use activities, and Construction Permit Access applications.

The Director of Resource Management and the Director of Planning and Development, or their designees, will determine which departments participate in the planning and design phase based on the size and scope of the project. ([Table 1](#)). The selected group of departments that participates in each project is referred to as the Development Review Team (DRT) throughout this document.

## Pre-Design Meeting

The project lead shall initiate a Pre-Design Planning meeting, on-site, if needed, with Resource Management and other departments that make up that project's Development Review Team. This meeting should occur prior to beginning project design and engineering for internal projects and after external projects go to the land use committee. The purpose of the meeting is to:

- To learn about the project, scope, location and timeline.
- Discuss trees that are candidates for preservation and how they, and their associated [tree and plant protection zones](#), can best be incorporated into the design.

- Determine which methods and what level of plans, drawing, and written specifications are required.

Following the Pre-Design Planning meeting, a [tree survey](#) would be conducted as directed by the DRT.

## Survey of Conditions

A survey of existing conditions shall be performed to obtain basic information needed to develop tree protection plans. The survey shall provide the following information which are directly related to tree preservation:

- 1. Existing Conditions.**
  - a. Proposed limits of soil disturbance.
  - b. Boundary and description of areas affected
  - c. Existing utilities
  - d. Dimensional layout of natural resources that includes nature preserves, water, soil, plants, and other natural features/resources that may be impacted
- 2. Demolition.** Identification of all trees and other areas to be removed or disturbed.
- 3. Grading and Soil Erosion Controls.** Grading and soil erosion controls with location of preserved trees and associated Protection Zones. Approved grading within a Protection Zone should follow the [grading specifications](#) outlined in this document.
- 4. Utilities.** Indicating location of proposed and sewer or access holes. Information on installation of proposed utilities (i.e. bored or trenched), location and depth of trench (if applicable), location of bore pits (if applicable).
- 5. Construction Logistics.** Location of construction entrance and exit routes, material and spoil storage areas, wash out areas, worker parking, equipment travel from staging/parking to work area, and other similar soil disturbing work.
- 6. All trees over 4" diameter** on the proposed project site and within 50 feet of the proposed centerline of disturbance and over 15" diameter from 50 feet to 100 feet are to be surveyed. The tree survey shall be completed by either a Certified Arborist as certified by the International Society of Arboriculture (ISA), licensed arborist in jurisdiction where project is located, current member of the American Society of Consulting Arborists (ASCA), registered Consulting Arborist as designated by ASCA or a District-approved professional. Surveys/inventories of other vegetation, including shrubs, grasses, forbs

and protected/important species, may be required. Inventory protocols and procedures for these surveys will be provided by the District. The following activities shall be completed in order to meet the tree survey requirement:

- a. Small, metal numbered tag affixed to tree trunk with an aluminum nail
- b. Species (common and botanical name)
- c. Size (diameter at 4.5' off the ground) and total height
- d. Condition (Good, Fair, Poor, Dead) see [Appendix B](#) for rating system and note presence of any defects, insects or diseases
- e. Identification of trees that are candidates for preservation. Include pictures of trees if needed.
- f. Identification of trees to be removed.

Department	Role	Planning & Construction Responsibilities	Level of Involvement and Recommended Involvement Phase
<b>Planning and Development</b>	Plan, design and implement capital improvement programs on District sites.	Project Lead responsible for planning, design and construction oversight. Ensures tree protection and preservation specifications are included in design and construction phases. Monitors project during and after construction for adherence to tree protection and preservation specifications.	<b>REQUIRED</b> Project Lead initiates process
<b>Resource Management</b>	Protect, restore and preserve the natural communities of the District.	Review plans for adherence to tree protection and preservation specifications. Monitors project before, during and after construction for adherence to tree protection and preservation specifications.	<b>REQUIRED</b> All Phases
<b>Law Enforcement</b>	Enforce and uphold all State, County and the District laws and ordinances.	Assist in code enforcement of tree protection and preservation specifications on construction project, both District-led and those of outside organizations.	<b>REQUIRED</b> Construction & Post-Construction
<b>Facilities and Fleet</b>	Provide routine maintenance, repairs and renovations of the District infrastructure.	Ensure Facilities and Fleet led projects include and adhere to tree protection and preservation specifications.	<b>RECOMMENDED</b> Participate in all phases or serve as Project Lead and initiate project
<b>Landscape Maintenance</b>	Assist in maintaining, repairing and cleaning recreational outdoor areas, facilities and structures of the District.	Ensure Landscape Maintenance department adheres to tree protection and preservation specifications when repairing and maintaining sites. Assist in monitoring events and construction projects for adherence to the tree preservation specifications.	<b>RECOMMENDED (based on project)</b> Planning & Pre-Construction
<b>Recreation, Volunteer Resources and Permits</b>	Supports the District's mission by providing access to special events, volunteer experiences and permitted recreational activities.	Ensure permitted activities and advise customers about adhering to tree protection and preservation specifications.	<b>AS NEEDED based on project</b>
<b>General Office</b>	Advances the District's mission through plans, policies, programs and activities.	Ensure planning and construction activities advance the District mission and sustainability vision	<b>AS NEEDED based on project</b>
<b>Legal</b>	Provide legal services and advice to the District.	Assist with enforcement of tree protection and preservation specifications.	<b>AS NEEDED based on project</b>

**Table 1:** The District Department Roles, Responsibilities and Level of Involvement in Planning and Construction Project



# Planning and Design: Details, Specifications and Requirements

## Purpose

Protection of trees is vital for continued benefits to the ecosystem, tree health, and safety of site users and the built environment. Trees, especially larger or older trees, are an irreplaceable resource in anyone's lifetime. For that reason, the FPCC requires a tree protection plan based on preset tree protection zones (TPZ) and best management practices to be a necessary aspect to construction activities. Tree protection zones are based on the protection of above and below ground parts of the tree and surrounding site to maintain the best possible tree health.

Avoiding any impact on trees is the best and most cost-effective option. Certain best practices require a cost or adjustment to construction activities, and damage or removal brings other much larger costs. While some values may seem excessive, they are based on a standardized evaluation methodology developed by the International Society of Arboriculture that the Forest Preserve has adapted to our site, codified, and in some cases has been using for several years. It is the Forest Preserve's primary goal to protect these irreplaceable resources that may be 100 or more years old and not to collect a fine for their destruction.

## Tree Protection Plan

Trees identified for protection shall have plans drafted by contractor or District staff. Detailed plans will be developed based on the tree protection and preservation information agreed upon by the DRT during the Pre-Design Planning meeting. Project size and complexity will determine the required time and scope of these steps. Plan drafts should be distributed to the Development Review Team for review.

**Step 1:** Individual departments/staff review draft plans.

**Step 2:** Meet with all plan reviewers together to discuss comments, concerns, and recommended plan changes.

**Step 3:** Repeat this process for subsequent drafts until a final plan created by contractor or the District is approved. Final plan will have specifications and drawings applicable to project as determined by DRT. Plans may be digital or paper in enough size and scale for review and use.

**Step 4:** Final tree protection plan is included in bid documents as a requirement of the project or used by District staff performing the work.

**Step 5:** If project approval is delayed for more than 2 years, additional assessments may be required to ensure site conditions are the same as detailed on the approved plans and tree survey.

This plan shall be incorporated into all design, preliminary, site, and construction plan documents and must always be available on the job site. The plan shall be referenced as a requirement in contract.

The plan shall be based on the specifications outlined within this manual and shall include, but is not limited to, the following elements:

1. Plan sheet that graphically shows the:
  - a) Location of all protected trees on the site with accurate location of [Protection Zones](#).
  - b) Location of trees removed with survey number shown.
  - c) Location of tree protection fencing and other tree protection measures.
  - d) [Tree Protection Fence details](#) and signage information.
  - e) Location and [protection measures required for reduced tree protection zones](#), if approved by the District.
2. Written description of [protection measures](#), including any required surface protection measures, trunk protection or other preservation methods required for the tree protection zone. Specifications and pertinent drawings are required part of a tree protection plan.
3. [Tree care and maintenance plan](#) with proposed activities to maintain or improve conditions before, during or after construction.

## Tree and Plant Protection Zone

The Tree and Plant Protection Zone (Protection Zone or TPZ) is the undisturbed area around a tree or other preserved vegetation, where construction or construction-related activities are prohibited. Adjustments to the protection zone are determined by the DRT or as approved by Department of Resource Management.

The TPZ provides sufficient space to prevent, reduce or minimize impact to the above and below ground parts of a tree or changes to the site. Obvious damage to the trunk or canopy is visible while below ground damage to roots is worse over time as it is usually hidden and

roots provide necessary water, nutrients, and are the anchor that holds the tree upright. Large structural roots that commonly extend 2-4x the width of the tree canopy are the foundation that allows trees to grow for many years. Small roots under the canopy and extending beyond the structural roots gather vital water and nutrients. Root cutting or changes in soil chemistry can have severe impacts on tree health. Soil compaction from even foot traffic can impact roots ability to collect water and nutrients while vehicles or heavy equipment require remediation measures.

Prohibited activities include but are not limited to:

- Attaching signs to or wrapping materials around trees/plants unless otherwise permitted
- Digging
- Directing of stationary vehicle or equipment exhaust towards Protection Zone
- Dumping or spilling of any fuels, chemicals or other toxic or harmful substances
- Erection of sheds or structures
- Excavation or other digging unless otherwise indicated
- Foot traffic
- Grading
- Heat sources, flames, ignition sources and smoking within or directly impacting Protection Zone(s)
- Impoundment of water
- Parking vehicles or equipment
- Root cutting
- Soil compaction or disturbance
- Storage of construction materials, debris, excavated material, bathroom or washing facilities for any length of time
- Trenching

## Determining the Tree and Plant Protection Zone

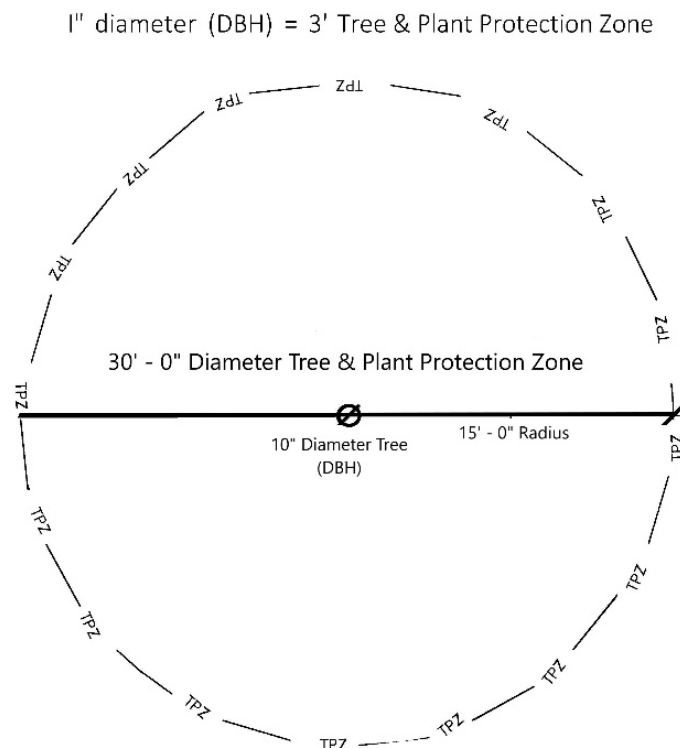
The diameter of the **Tree & Plant Protection Zone** is 3 feet for every 1-inch in diameter of the trunk (or diameter at 4.5 feet off the ground (DBH)).

The Protection Zone does not have to be circular in shape, but the TPZ edge should not be closer to the trunk than 1.5 feet for every 1-inch in diameter of trunk (DBH) on more than 2 sides. Changes to the shape and size of a Protection Zone must be approved by the District's Director of Resource Management, or designee.

The District's Director of Resource Management, or designee, retains discretion to extend or modify the Protection Zone at any time.

### Example:

10" diameter tree (DBH) x 3 feet = 30-foot diameter **OR** 15-foot radius from trunk.



**Figure 1:** Example Tree & Plant Protection Zone for a 10" DBH tree



# Mitigation Matrix

For projects with unavoidable tree loss, the [Forest Preserve District of Cook County Tree Mitigation Matrix](#), (most recent version) will be used to determine the loss to our ecosystem.

Trees to be removed will be surveyed, mapped, and assessed with all data collected being reported to the District using these approved methods.

A large, stylized number '2' in a light olive green color, positioned in the background of the slide. It has a thick, rounded stroke and a flat base.

# Section II: Construction

# Introduction

The specifications, standards and processes outlined in the Construction section are designed to assist in the implementation of the tree protection and mitigation plans that were developed during the [Planning and Design phase](#). This section includes the following:

## Pre-Construction and Construction Procedures

- **Pre-Construction Meeting:** outlines tree preservation and protection topics to include, but not limited to, in pre-construction meeting.
- **Progress meetings:** provides guidelines for establishing project progress meetings.
- **Monitoring:** provides guidelines for developing a program to monitor project site for adherence to the tree protection plan.

## Construction Details, Specifications and Requirements

- **Tree Protection Fencing:** provides requirements for installation of tree protection fencing.
- **Protection Measures and Grading Specifications for Reduced Tree and Plant Protection Zones:** provides specifications for surface protection, trunk protection and supplemental irrigation that may be required when working within an approved reduced tree and plant protection zone.
- **Protection of Roots:** outlines specifications for protecting roots during construction.
- **Site Restoration:** provides specifications for turf and site restoration.
- **Tree Care and Maintenance for Preserved Trees:** provides care and maintenance guidelines and specifications.
- **Tree and Stump Removal:** outlines specifications and standards for the removal of tree and stumps before construction.
- **Tree Planting:** provides specifications and guidelines for tree planting.

## Remedies

- **Unauthorized Tree Damage and Removal:** outlines consequences, including repairing damage, for the unauthorized removal or damage to preserved trees.
- **Penalties for Tree Damage and Removal:** outlines consequences and penalties for the unauthorized removal or damage of preserved trees.



# Pre-Construction and Construction Procedures

## Pre-Construction Meeting

Prior to beginning construction, a Pre-Construction Meeting shall be scheduled with the construction contractor, subcontractors, outside organizations (e.g. utility companies, municipalities, etc. if initiating project) and staff of the DRT. The Pre-Construction meeting must occur a minimum of 72 hours prior to work commencing but no more than 2 weeks prior. This meeting may be included as part of an overall District and contractor pre-construction meeting.

The meeting shall review the Tree Protection Plan, including, any required tree protection measures; describe remedies for damaging or failing to protect trees, and establish specific procedures for reporting unintentional or unauthorized tree damage on construction projects. Procedures should establish:

- Types of unauthorized tree damage.
- Person(s) to contact, including contact information, when tree damage is discovered.
- After-hour and alternate contacts, in case of emergency or when immediate action is required to remedy a dangerous situation.

## Progress Meetings

Progress meetings, as described in the contract, or agreed upon by contractor, the District project manager, and other pertinent District staff should be scheduled regularly throughout project. Identification and resolution of issues related to tree protection and preservation should be discussed during this meeting.

## Monitoring

The health and condition of preserved trees and their associated tree protection measures should be monitored frequently during construction. The approved Tree Protection Plan should be utilized during inspections and monitoring to ensure the plan is being implemented and followed during the construction phase.

Monitoring, as outlined in the project bid/contract, should occur throughout project and be performed by District staff as determined by the DRT and/or Director of Resource Management. Monitoring shall include but is not limited to the following phases:

- Demolition
- Grading
- Installation of utilities, including stormwater management system
- Building construction
- Walkway and path construction
- Road construction
- Excavation
- Trenching and boring
- Drainage system installation
- Landscaping

Inspection Reports and photos detailing information, including, changes to site conditions, encroachment into protection zones, missing or inadequate tree protection fencing/measures, unauthorized tree damage or removal, shall be prepared and submitted when found on-site or as directed by the Forest Preserve District of Cook County.

# Construction Details, Specifications and Requirements

All tree protection measures (including fencing and any alternative protection measures) shall be in place and inspected by the District's staff, or designee, before any tree removal, stump removal, clearing, grading, demolition or construction work begins. Tree protection measures shall remain in place for the duration of project and shall be the last item removed after construction and landscaping is completed.

The following notes must be included in the final copy of construction drawings and specifications:

- a) "Contractor is responsible for performance of and informing all staff and sub-contractors of tree protection requirements and penalties."
- b) "Tree protection fencing, and other tree protection measures must remain in use during construction."
- c) "All landscaping and mitigation activities within a Protection Zone must be done by hand to limit soil compaction. Mechanical equipment is prohibited within Protection Zone."
- d) "Additional soil is prohibited within Protection Zone, unless approved by the Forest Preserve District of Cook County."
- e) "Tree protection measures shall be in place and inspected by the Forest Preserve District of Cook County before any tree removal, stump removal, clearing, grading, demolition or construction work begins."
- f) "All trees that may be impacted by work to be protected unless otherwise approved for removal."
- g) "Contractor is responsible for compliance with the Tree Protection Plan, Mitigation Plan and standards outlined in the Tree Protection and Preservation Manual. Failure to comply with the standards, restrictions, conditions, and mitigation measures of the Tree Protection Plan, Mitigation Plans and Tree Protection and Preservation Manual may result in the issuance of a stop work order and may result in repair of damage and mitigation."

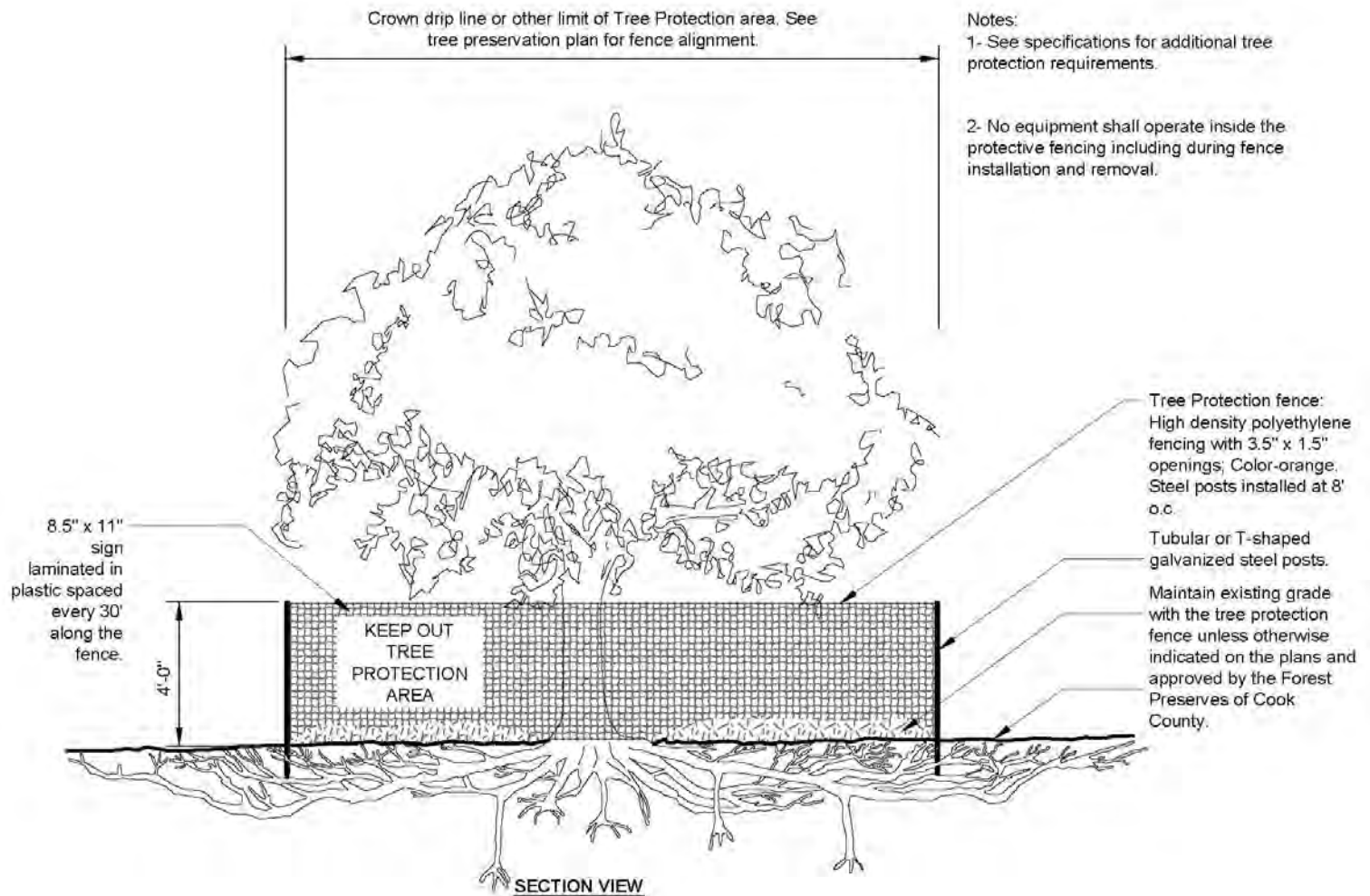
# Tree Protection Fencing

Protection Zone fencing shall be installed along edges of protection zones in a manner that will prevent people from easily entering protected areas except by designated entrance gates if installed. Examples provided (**Figures 2 and 3**).

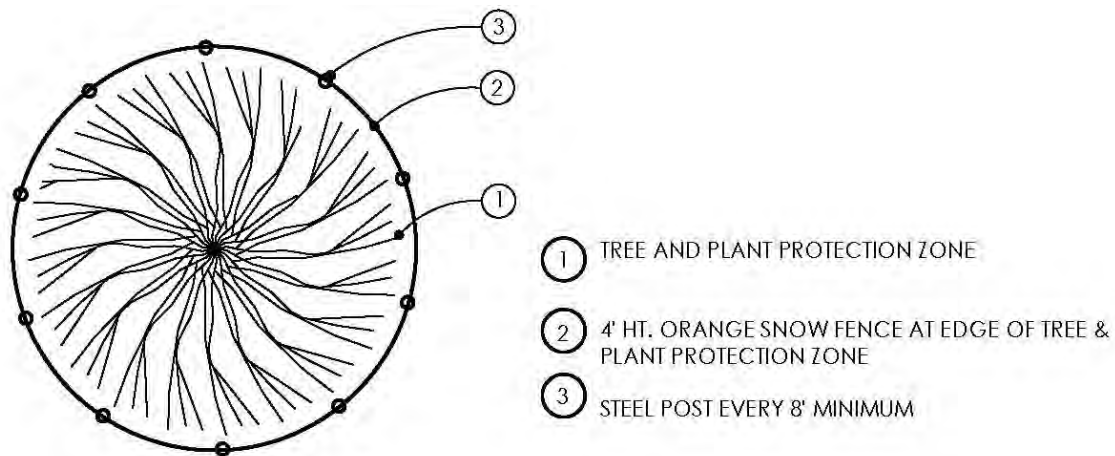
Fencing shall be fixed in position and meet the following requirements:

- **Plastic Fencing:** A minimum 4-feet high, plastic, heavy duty snow/warning barrier fencing constructed of high-density polyethylene with 3.5" maximum mesh size in high-visibility orange color, non-fading. Fence shall be attached to posts with a zip tie at the top and bottom and shall have a minimum of three ties for a 4-foot high fence or four ties for a 6-foot high fence.
- **Posts:** Tubular or T-shaped galvanized-steel posts not more than 8 feet apart, set or driven 2 feet deep into ground without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to the District.
- **Entrances:** Access entrances/gates that are clearly marked with signage and are different color than the tree protection fencing for visibility, shall be provided, if planned, to allow for maintenance activities within protection zones.
- **Signage:** Shall be posted every 30-feet, or centered if less than 50-feet, along the tree protection fence. For linear project (e.g. installation of trails) signs shall be placed every 50- feet, on both sides of the fence. The signs will be provided by the District unless otherwise agreed.





**Figure 2:** Tree Protection Fencing Detail (Source: Urban Tree Foundation – modified)



**Figure 3:** Tree Protection Fencing Detail – Plan View

# Protection Measures and Grading Specifications For Approved Changes in Protection Zones

In general, soil disturbance, grading and compaction is prohibited in Tree Protection Zones. However, for circumstances where encroachment and construction in the Tree Protection Zones is unavoidable, and a reduction in their shape and size has been approved by the District, the specifications outlined here shall be followed.

Tree protection measures shall remain in place for the duration of the project and shall be the last items removed after construction and landscaping is completed.

**Surface Protection Measures** should be designed for equipment type and frequency of use to disperse vehicle loads, reduce surface compaction and protect and minimize root damage. Surface protection measures may include, but are not limited to:

- Staking geotextile fabric (specified based on equipment frequency and weight use) tautly over area and applying 6-12 inches of coarse wood chip mulch to area.
- Placing 3/4-inch plywood on top of 4-inch x 4-inch wood beams over a 4-6-inch layer of coarse wood chip mulch and geotextile fabric
- Staking geotextile fabric tautly over area and adding 4-6 inches of gravel.
- Placing steel plates over a 4-6-inch layer of coarse wood chip mulch and geotextile fabric.
- Utilizing commercial or logging road mats on top of 4-6-inch layer of coarse wood chip mulch and geotextile fabric.

Site must be restored to pre-work conditions following construction, which includes the removal and proper off-site disposal of wood chips/mulch, geotextile fabric and any other surface protection measures used on site. Contractor will be responsible for correcting any ruts or soil/surface damage.

Any proposed Surface Protection measures must be included in [Tree Protection Plan](#) and approved by the Forest Preserve District of Cook County.

**NOTE:** Requests to the District for wood chips must be received a minimum of 14 days in advance of date needed. Wood chips may not always be available for a project and the District may deny or be unable to fulfill requests made with less than 14-day notice. If wood chips are available, it is the responsibility of the contractor to pick them up from nearest Resource Management locations and move them to the construction site with their own equipment.

**Trunk Protection Measures** should be in place when equipment operation is within 10 feet of a tree trunk or at the direction of the District to protect trees from damage caused by machinery or vehicles. Trunk Protection Measures shall be installed as follows:

- Install wood planks or other suitable lumber on top of foam sheeting with straps or wires. Straps and wires shall be placed every 2-feet of material height with a minimum of two attachments used. Do not drive fasteners, nails, or screws into the tree. Minimum height of the wood planks or lumber should be eight (8) feet or match the height of the vehicle/equipment with the tallest clearance, whichever is greater.
- If Trunk Protection Measures are to be installed for longer than 6 months, planks/lumber shall be adjusted every 3 months to allow for tree growth.

All Trunk Protection Measures must be included in [the Tree Protection Plan](#) and approved by the Director of Resource Management, or designee, of the Forest Preserve District of Cook County.

## **Supplemental Irrigation**

At the direction of the District, supplemental irrigation may be required in areas where tree and protection zones are impacted. Trees shall be irrigated to provide at least 1-inch of water per week, applied slowly over the root system to maximize infiltration or if rainfall does not meet this requirement. Trees should be monitored for signs of drought including:

- Leaf curling, rolling or wilting
- Leaf drop
- Early fall color
- Dieback of branches or leader

Signs of drought stress shall be reported immediately to the Resource Management department of Forest Preserve District of Cook County.

# Protection of Tree Roots

Roots absorb and transport water, nutrients and oxygen, store carbohydrate and serve as the tree's anchor and support system. They are typically within the top 18-inches of the soil and can grow 2-4 times the width of the tree canopy, making it easy for them to be damaged during construction. This damage can affect the tree's structural stability and its ability to absorb and transport water, nutrients and oxygen which can cause it to die.

The following specifications shall be followed to prevent tree root damage during construction and to help ensure the long-term survival of preserved trees on a site.

- Root pruning (see as described in the next section and approved by the District) may be necessary during a construction project, however, roots are not permitted to be ripped or torn during excavation, grading or any other construction related activities.
- Roots that are accidentally ripped, torn or damaged should be cut cleanly and perpendicular to root length (see Root Pruning).
- District staff shall be notified immediately of any protected trees or plants whose roots have been exposed or cut during construction to determine if the Contractor must perform any activities to repair or mitigate damage.
- The District reserves the right to evaluate the cutting of any roots greater than 2" in diameter prior to them being cut.
- At the direction of the District, relocation of lateral roots impacted by construction may be required. Root relocation involves the compressed air excavation of a lateral root to an extent that will allow the root to be bent without breaking and relocated outside the area of construction. Where root relocation is not practical, roots shall be cut approximately 3-inches back from new construction.
- Roots of preserved and protected trees and plants shall not be exposed during construction. Any exposed roots should be covered immediately with organic material, such as mulch, straw, burlap or soil, and irrigated and monitored until final grading has occurred.

## Root Pruning

Root pruning and cutting can have a significant impact on tree stability and health. It should be performed only when absolutely necessary and at the direction of the District utilizing a District-approved professional and adhering to the following specifications. The District may provide additional site-specific root pruning specifications.

- One-week prior to root pruning, all trees designated for root excavation or pruning may require watering. Trees shall be watered with 10 gallons of water per inch of tree diameter unless site conditions or rainfall meets this level.
- Root pruning using a mechanical root pruning saw shall be performed prior to digging, at locations noted on the approved plans or as directed by the District. Compressed air excavation consisting of hand and/or pneumatic excavation may be required if indicated on the approved plans or directed by the District or a Certified Arborist. Large trenching machines for root pruning are not permitted.
- Root Pruning at Edge of Protection Zone: Prune roots by cleanly cutting all roots perpendicular to the natural growth to the depth of the required excavation, some hand excavation may be necessary to make a proper root pruning cut.
- Root Pruning within Protection Zone: Clear and excavate by hand or with compressed air excavation to the depth of the required excavation to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots perpendicular to the natural growth, as close to excavation as possible.
- Backfill the areas where root pruning has occurred and water the area with 10 gallons of water per inch of tree diameter within one hour of cutting.

## **Installation of Silt Fence in Wooded Areas**

When installing silt fence in wooded areas, adjust layout to avoid structural roots. While the silt fence trench should be uniform in depth it does not need to be exact in direction or depth and can accommodate variations in depth to account for tree roots over 4' in diameter.

## **Boring/Trenching**

Boring is preferred over trenching (open cut) when installing utility lines (e.g. electric, water, sewer, etc.). Trenching activities can cut critical tree roots significantly impacting tree health and stability.

Utility lines should be bored at a depth that avoids serious damage or impacts to tree roots. The following standards shall be followed when boring:

- Trees less than 12" diameter (DBH) the minimum bore depth is 24-inches.

- Trees greater than 12” diameter (DBH) the minimum bore depth is 36-inches
- All bore pits shall be located outside the [Tree and Plant Protection Zones](#), unless a reduction in the Protection Zone has been approved by the District during the Planning and Pre-Construction phase.
- All construction equipment, materials and supplies related to boring operations must be placed outside the Tree and Plant Protection Zones.
- If boring cannot be used and trenching (open cut) is required, the following specifications must be met:
  - All trenching shall be located outside the Tree and Plant Protection Zone. If a reduction in Protection Zone has been approved by the District during the Planning and Construction phase, a minimum distance will be determined.
  - The District reserves the right to evaluate the cutting of any roots greater than 2” in diameter prior to them being cut.
  - Follow the specifications for root cutting/pruning detailed in this [section](#).

## Grade Changes

Changes to grades outside the protection zone can impact the flow of water in and around a tree’s root zone, leading to ponding or drought conditions. For circumstances where grade changes occur *outside* the Protection Zone, the following specifications shall be followed:

- **Lowering Grade:** Where new finished grade *outside* of Protection Zone is lower than existing grade, slope grade beyond Protection Zone and maintain existing grade within the Protection Zone.
- **Raising Grade:** Where new finished grade *outside* of Protection Zone is higher than existing grade, slope grade beyond the protection zone to avoid ponding of water inside the Protection Zone. Maintain existing grade within the Protection Zone.

## Site Restoration

All turf grass, plants, soils and landscaping disturbed, damaged or removed during construction activities shall be restored to the pre-construction condition, per plan or as directed by District staff. The District strives to protect all natural resources within its boundaries, and this document may be expanded or utilized in the future to include other natural resources.

# Tree Care & Maintenance for Preserved Trees

Preserved trees will require care and maintenance to ensure they remain healthy during and after construction. The following specifications shall be followed for tree care and maintenance activities that the District determines necessary or are part of an approved [Tree Protection Plan](#). ANSI Z133 Arboricultural Operations Standards (current edition) apply to all tree work including removals. Other maintenance methods may be used including but not limited to fertilization, watering, growth regulators, or soil amendments as approved in the plan.

## Pruning

- Tree pruning should be done to remove limbs that are hazardous or may be damaged during construction
- Pruning must be performed by a tree care company with an ISA Certified Arborist on staff, or equivalent professional approved by the District's Director of Resource Management, or designee, and in accordance with:
  - ANSI A300, Tree Care Operations Standards (current edition)
  - ANSI Z133 Arboricultural Operations Standards (current edition)
  - International Society of Arboriculture Tree Pruning Best Management Practices (current edition).
- Wound paint shall not be applied to any pruning cuts, unless directed by the District's Director of Resource Management or designee.
- Topping of trees for construction, utility, routine pruning practice, or sightline is strictly prohibited. Use of the District's mitigation matrix will be used to determine impact.
- Oak (*Quercus*) trees shall only be pruned from October 15 to March 30 to minimize the spread of Oak Wilt. Pruning of Oak trees is not permitted from April 1 – October 14, unless specifically instructed by the District's Director of Resource Management or designee.
  - Any damage or pruning of Oak trees from April 1 to October 14 may require oak wilt protection and preventative treatments be provided by the Contractor.



## Mulching

- If directed, apply 3-inches of shredded hardwood mulch within Protection Zone of preserved trees. Do not place mulch on or within 6 inches of trunk.
- All mulch must be applied by hand to limit soil compaction.
- **NOTE:** Requests to the District for wood chips must be received a minimum of 14 days in advance of date needed. Wood chips may not always be available for a project and the District may deny or be unable to fulfill requests made with less than 14-day notice. If wood chips are available, it is the responsibility of the contractor to pick them up from nearest Resource Management locations and move them to the construction site with their own equipment.
- The location of stockpiled mulch must be approved in advance by the District.
  - Any stockpiled mulch that is to be left more than 7 days will require protection to be installed around catch basins.
  - The length of time mulch will be permitted to be stockpiled must be approved by the District's Project Manager.
  - The site shall be restored to its previous condition within 3 days after all mulch has been removed, unless approved by the District's Project Manager. Mulch not used on project, must be properly disposed of off-site.

## Tree and Stump Removal

While the ultimate goal is to preserve and protect as many trees on site as possible, at times, there will be unavoidable impacts that will require tree removal. The following specifications shall be followed during tree and stump removal activities.

- All Tree protection measures (including fencing and alternative protection measures) shall be in place and inspected by District staff, or designee, before any tree/stump removal, clearing, grading, demolition or construction work begins.
- Prior to tree removal, all trees to be removed shall be marked by the Contractor and inspected and verified by District staff for compliance with approved plans.
- Tree removal activities should not damage or destroy preserved trees, vegetation or other sensitive areas on the District property.

- All debris from tree removal activities must be properly disposed of off-site, unless otherwise directed by the District.
- Tree removals must be performed by a tree care company with an ISA Certified Arborist on staff, and in accordance with:
  - ANSI A300, Tree Care Operations Standards (current edition)
  - ANSI Z133 Arboricultural Operations Standards (current edition)
  - International Society of Arboriculture Tree Pruning Best Management Practices (current edition).

## Tree Planting

Planting of trees and shrubs may be used as part of site repair at the District's discretion. Protection of trees is needed at all ages so proper planting on any project is vital. Tree selection process shall use ANSI Z60.1 (2014 or most recent edition) to develop specifications of desired trees, shrubs, and herbaceous plants. Further restrictions based on Resource Management input may cover species, provenance, and nursery chemical use restrictions. Tree planting shall be performed and specified according to ANSI A300 Part 6 standards, and the enclosed tree planting detail ([Appendix E](#)).

# Remedies

## Contractual Remedies

If a contractor is obligated by contract to follow a Tree Protection Plan and the Contractor violates such plan at any time during the term of such contract, then the contractor will be deemed in breach of contract and contractual remedies will apply. It is strongly advised that in the event that a contractor violates an applicable Tree Protection Plan, that a Stop Work Order be issued by the lead District Department for the project. The Stop Work Order will not be lifted until the protection measures are installed and all is to the satisfaction of the District.

## Code Remedies

In addition to contractual penalties, or if there is no applicable contract, fines may be assessed under the [Forest Preserve District Code of Ordinances](#).

## Tree Remediation

Under the applicable contract and/or through the administrative hearing process, the District may seek the following remediation actions:

- a. Contractor shall repair or replace damaged trees at the direction of the District's Resource Management department and under the guidance of a District-approved professional (e.g. ISA Certified Arborist, ISA Board Certified Master Arborist, Tree Risk Assessment Qualified (TRAQ) person), at no additional cost to the project.
- b. The method of repair shall be conducted in a manner approved by the District, and may include the following:
  - i. Root cutting/pruning, branch pruning, chemical treatments, or other methods to repair damage to trees and shrubs.
  - ii. Treatment of soil, damaged trunks, limbs, and roots according to written instructions of the District, their designee or as part of a District-approved plan.
  - iii. Completion of repairs/mitigation within 24 hours of damage.
  - iv. Replacement of vegetation that cannot be repaired and restored to full-growth status, as determined by the District.
- c. In the alternative the District may seek financial remedies as follows:

- i. For trees removed or completely destroyed, an amount shall be calculated in accordance with the [Tree Mitigation Plan of the Forest Preserve District of Cook County](#). Please note the Tree Mitigation Plan is subject to yearly increases. All destroyed trees shall remain the property of the District.
- ii. For partially damaged trees that do not need to be replaced, a proportional amount of the total tree value shall be paid to the District, for each tree damaged, based upon the amount of damage to the trunk and roots. District staff or qualified arborists will determine these values. Total trunk and root damage shall not exceed a factor of 1.0

**Tree Damage Penalty** = Total Tree Value x (Trunk Damage Factor+ Root Damage Factor)

Trunk Damage Factor =  
Maximum width of trunk damage (inches) divided by trunk circumference.

Root Damage Factor =  
Percentage of root damage based on size of root damaged.

Percentages will be added for multiple roots damaged within the root zone of one tree. The following table determines percentage of overall root damage based on size of root damaged.

Root Size (inches)	Equivalent Percent of Root Zone	Damage Factor
2 to 3	10	0.1
4 to 5	20	0.2
6 and larger	30	0.3

**Example:** 24-inch diameter Pine with 6-inch wide trunk damage and root damage of one 2-inch root and one 4-inch root.

**Formula Tree Damage Penalty** =  
Total Tree Value x (Trunk Damage Factor+ Root Damage Factor)

**Circumference:** 24-inch (DBH) x 3.14 (Pi) = 75.4 inches  
**Trunk damage factor:** 6 / 75.4 = 0.08 (6-inch trunk damage divided by circumference)  
**Root damage factor:** 0.1 + 0.2 = 0.3 (2" root damage factor + 4" root damage factor)  
**Total Tree Value:** \$2.16 X (75.4)<sup>2</sup> = \$12,280 (\$2.16 x (Trunk circumf. at DBH)<sup>2</sup>)

**TREE DAMAGE PENALTY:** \$12,280 x (0.08 + 0.3) = **\$4,666**

A large, light green, stylized number '3' is positioned in the background, centered vertically and horizontally. It has a thick, rounded stroke and serves as a decorative element for the slide.

# Section III: Post-Construction

# Post-Construction Procedures

The following steps shall be incorporated into the Post-Construction phase to ensure the long-term survival of any trees part of a project.

## Final Inspection Meeting

A post-construction meeting with the contractor(s), the DRT, and other pertinent District staff should be scheduled immediately following completion of major construction and site restoration. The meeting should be held on-site to review the project, identify any final items that may need to be completed/repared, inspect the planting of trees and landscaping, and inspect preserved trees and protection zones.

- Inspect all preserved trees on site and tree protection zones, noting any tree damage or evidence of soil disturbance. Photographs of preserved trees should be taken at this time.
- Inspect soil for compaction or evidence of chemicals or other materials that may alter soil chemistry and biota.

The Protection Zone Fencing and other protection measures shall not be removed until work has been completed to the satisfaction of the Forest Preserve District of Cook County and they have authorized its removal. This includes any tags, or flagging used to identify individual trees.

During this meeting, trees may be identified as impacted by construction outside of planned or approved impacts. A monitoring, repair plan, or the mitigation matrix will be determined at this time. Refer to [Remedies](#) section.

## Monitoring Inspections and Work

A post-construction work and monitoring schedule should be developed for preserved trees with unapproved impacts by construction activities.

Damage repair mitigation methods will be performed by qualified arborists. Repair activities may include but are not limited to, fertilization, chemical injections, vertical mulching, soil fracturing, core aeration, radial trenching, irrigation and pruning.

Inspections shall be performed by qualified or approved staff of the contractor. Preserved trees should be monitored every 3 months during the first year after construction, and then every 6 months over agreed upon time frame. Photographs of preserved tree(s) should be taken during each site visit to document changes. Monitoring should include an inspection of tree health and condition, noting changes in leaf color, loss of leaves and presence of dead or dying limbs. An inspection report with pictures, shall be submitted to the District within 14 days of the monitoring inspection.



# Appendices

# Appendix A: Additional Resources

In the event of conflict between the specifications and processes provided in this Tree Protection and Preservation Manual (including Appendices) and a contract with a contractor, the contract shall govern.

**Definition of Words** encountered in arboricultural and forestry practices. All words are defined as listed in this link unless the District specifically defines otherwise.

- <https://www.isa-arbor.com/education/onlineresources/dictionary>

## Planting Requirements

All vegetation planted shall conform to below seed policy and approved reference material.

- Flora of the Chicago Region – Wilhelm and Rericha (2017)
- Forest Preserve District of Cook County Seed Source Policy and Guidelines - [Seed Source Policy](#)

## Additional Documents Governing Tree Policy on District Property

- [Tree Risk Management and Removal Policy](#)
- [Tree Mitigation Matrix](#)

## Forest Preserve District Master Plans

- [Next Century Conservation Plan](#) (2014)
- [Natural and Cultural Resources Master Plan](#) (2015)
- [Sustainability and Climate Resiliency Plan](#) (2018)

## Forest Preserve District Construction Access Permit Application

- <https://fpdcc.com/downloads/permits/land-use/FPCC-Construction-Access-Permit-Overview.pdf>

## International Society of Arboriculture

Additional information regarding nursery, planting, irrigation, and tree protection.

- <https://www.isa-arbor.com/education/onlineresources/cadplanningspecifications#TreeProtection>

## Illinois Urban Manual

- Tree Protection and Forest Ecosystem Preservation  
<https://illinoisurbanmanual.org/wp-content/uploads/2018/08/CODE-984-TREE-AND-FOREST-ECOSYSTEM-PRESERVATION-urbst984-8-30-17.pdf>

- **Tree Protection – Augering**  
<https://illinoisurbanmanual.org/wp-content/uploads/2018/08/TREE-PROTECTION-AUGERING-urbst991-8-30-17.pdf>
- **Tree Protection in Highly Urbanized Areas**  
[https://illinoisurbanmanual.org/wp-content/uploads/2018/08/CODE-990B-TREE-PROTECTION-in-HIGHLY-URBANIZED-AREAS-8-30-17\\_.pdf](https://illinoisurbanmanual.org/wp-content/uploads/2018/08/CODE-990B-TREE-PROTECTION-in-HIGHLY-URBANIZED-AREAS-8-30-17_.pdf)
- **Tree Protection in Moderately Urbanized and Open Space Areas**  
<https://illinoisurbanmanual.org/wp-content/uploads/2018/08/CODE-990ATREE-PROTECTION-in-Moderately-Urbanized-and-Open-Space-Areas-8-30-17.pdf>

# APPENDIX B: Sample Tree Survey Chart

Species (Botanical Name)	Size (Diameter at 4.5 feet from ground level in inches (DBH))	Condition*	Preserved? Yes Or No	Size of Tree & Plant Protection Zone (in feet) DBH x 1.5	Removed? Yes or No	Picture Provided  Yes or No
<i>Acer saccharum</i>	24"	Good	Yes	36'	No	Yes

\*Condition Rating: For preserved trees use the condition rating listed below. For trees to be removed use the mitigation matrix in the Forest Preserve District of Cook County [Tree Mitigation Plan](#) (as amended).

## CONDITION RATING – Preserved trees:

In general, the health and structure of each tree shall be assigned to one of the following condition categories based on visible root, trunk, scaffold branch, twig, and foliage conditions at the time of the inventory. This rating systems is adapted from an establish system of the International Society of Arboriculture.

1. Excellent. 100% condition rating.
2. Very Good. 90% condition rating.
3. Good. 80% condition rating.
4. Fair. 60% condition rating.
5. Poor. 40% condition rating.
6. Critical. 20% condition rating.
7. Dead. 0% condition rating.

# Appendix C: Tree Preservation Process Checklist

PLANNING AND DESIGN		Notes	DATE COMPLETED
Development Review Committee members identified			
Pre-Design Planning Meeting			
Plan Set completed with the following sheets:			
<i>Existing Conditions, including tree/vegetation survey</i>			
<i>Demolition</i>			
<i>Natural Features</i>			
<i>Grading and Soil Erosion Controls</i>			
<i>Utilities</i>			
<i>Construction Logistics</i>			
<i>Tree Protection</i>			
<i>Tree Mitigation</i>			
Plan Review and Approval			
<i>Individual department/staff review</i>			
<i>Joint meeting with all plan reviewers</i>			
CONSTRUCTION		Notes	DATE COMPLETED
Pre-Construction Meeting			
Progress Meetings (schedule determined at Pre-Construction)			
<i>Progress Meeting #1</i>			
<i>Progress Meeting #2</i>			
<i>Progress Meeting #3</i>			
Monitoring Inspections of preserved trees & protection measures during construction (# determined by the District)			
<i>Monitoring Inspection #1</i>			
<i>Monitoring Inspection #2</i>			
<i>Monitoring Inspection #3</i>			
POST-CONSTRUCTION PHASE		Notes	DATE COMPLETED
Post-Construction Meeting and Year 1 Inspection #1			
<i>Year 1 Inspection #2</i>			
<i>Year 1 Inspection #3</i>			
<i>Year 1 Inspection #4</i>			
<i>Year 2 Inspection #1</i>			
<i>Year 2 Inspection #2</i>			
	Checklist Completed By:		

# Appendix D: Quick Links

PLANNING AND DESIGN	
	<a href="#">Survey of Conditions</a>
	<a href="#">Tree Protection Plan</a>
	<a href="#">Tree and Plant Protection Zones</a>
	<a href="#">Tree Mitigation Matrix</a>
CONSTRUCTION	
	<a href="#">Tree Protection Fencing</a>
	<a href="#">Protection Measures for Approved Protection Zone Changes</a>
	<a href="#"><i>Surface Protection Measures</i></a>
	<a href="#"><i>Trunk Protection Measures</i></a>
	<a href="#"><i>Supplemental Irrigation</i></a>
	<a href="#">Protection of Tree Roots</a>
	<a href="#"><i>Root Pruning</i></a>
	<a href="#"><i>Installation of Silt Fence in Wooded Areas</i></a>
	<a href="#"><i>Boring/Trenching</i></a>
	<a href="#"><i>Grade Changes</i></a>
	<a href="#">Site Restoration</a>
	<a href="#">Tree Care and Maintenance of Preserved Trees</a>
	<a href="#"><i>Pruning</i></a>
	<a href="#"><i>Mulching</i></a>
	<a href="#">Tree and Stump Removal</a>
	<a href="#">Tree Planting</a>
	<a href="#">Remedies</a>
POST-CONSTRUCTION	
	<a href="#">Post-Construction Meeting</a>
	<a href="#">Post Construction Monitoring Inspections</a>

# APPENDIX E: Planting Detail and Process

## Planting Season

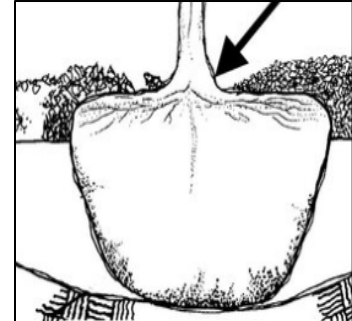
Planting should occur during the dormant season, in early spring or late fall before budbreak or after leaf drop. Planting outside the dormant season shall only be done with the approval of the District's Director of Resource Management, or their designee and should include additional watering and care to ensure survival.

## Tree Stock

All plant material shall conform to most recent version of *American Standard for Nursery Stock Z60.1*. Plants shall be true to species and variety specified and nursery grown in accordance with good horticultural practices under climatic conditions similar to the site for at least 2 years. They shall be freshly dug during the most favorable harvest season.

## Planting Procedures

1. **Identify root flare and remove root problems.** The root flare is where the roots connect to the trunk at the base of the tree (Figure 5). If the flare is not visible, remove soil from the top of the root ball or planting container to find it. The tree must be planted so the tree's root flare is at grade. Container trees may have circling roots at main stem or container sides. Remove container and cut circling roots at stem or shave ½-1" off the sides. Removal of more than 20% height or 20% width is cause for tree rejection.
2. **Dig a shallow, broad planting hole.** A planting hole should only be as deep as necessary to ensure the tree's trunk flare is planted at grade. The hole should be wide, as much as two to three times the diameter of the root ball.
3. **Prepare tree for planting.** Any ties or flagging in the tree's canopy should be removed prior to planting. Remove any staking.
4. **Place tree in the hole.** Before placing the tree in the hole, check depth to ensure trunk flare will be at final grade. Place tree in hole and check depth of the hole and trunk flare by placing a shovel handle across the hole. If necessary, remove tree from the hole and



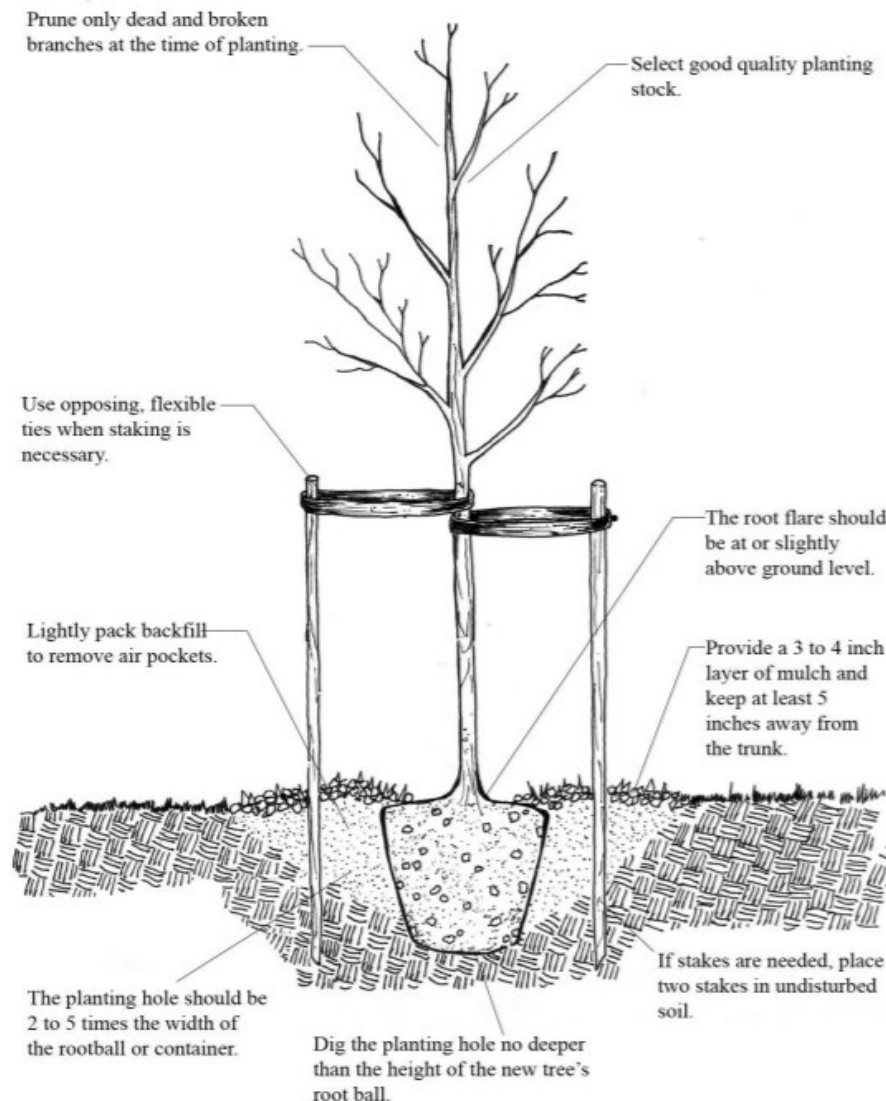
**Figure 5. Root Flare**

(Source: Tree Manual and Standards of Practice, Racine, WI)



add/remove soil to ensure the trunk flare is at the correct depth. Always lift the tree by the root ball and not the trunk to prevent damage.

5. **Straighten tree in the hole.** Check that the tree is straight and centered in the hole - looking at it from a variety of angles. Straighten tree by moving or tilting ball – do not pull on trunk.



**Figure 4** Tree Planting Detail

(Source: Pacific Northwest ISA. 2019. Planting – Prepare the Tree.  
<https://pnwisa.org/tree-care/adding-trees/planting/> Accessed April 19, 2019.)

6. **Fill hole.** If the tree is wrapped with burlap, plastic or wire, cut and remove as much of it as possible, remove from hole and dispose of properly. In no case will burlap, rope, or wire basket be allowed at soil surface. Place soil in hole and gently, but firmly tamp down the soil. Do not stomp or jump, but rather firmly walk or press on the soil. Continue

adding and tamping down the soil until the hole is filled to grade. Only soil should be placed in the planting hole. You should use water at this time to settle soil.

**Do not** fertilize at time of planting, it can damage and burn new tree roots. Broken or damaged branches may be pruned, but no other pruning is needed at time of planting.

7. **Mulch tree.** Place 2 - 4 inches of mulch in planting area, leaving a 1 to 3-inch mulch-free area around trunk (Figure 4).
8. **Water tree.** When the tree has been planted and mulched, water to moisten the entire planting area and tree root system. Water should be allowed to filter into the soil then add more water.
9. **Deer Protection.** To protect trunk from deer damage, wrap 4-6' tall green colored snow fence twice around the trunk loosely and zip tie in 3 places.
10. **Stake tree as necessary.** Trees establish quickly and develop stronger roots and trunks without stakes. If the site is windy, the tree is large (greater than 3-inch caliper) or vandalism is a concern, stake tree with two wooden stakes placed on opposite sides of the tree (Figure 4). Attach nylon strapping or fabric ties to the stake and around the tree. Stakes and straps should be removed after 1-year or one full growing season, whichever is longer. Damage caused by improper placement or use of stakes/straps may require replacement of the tree.

# Acknowledgements

## Prepared by:



Davey Resource Group, Inc.  
1500 N. Mantua Street  
Kent, Ohio 44240  
800-828-8312

## Funded by:

A grant administered through the Morton Arboretum supported in part by the Illinois Department of Natural Resources and the USDA Forest Service Urban and Community Forestry Program was used to develop this document.

## Developed by:

The Forest Preserve District of Cook County's Department of Resource Management, with support from the Department of Planning and Development who researched and developed the priorities, methods, and procedures. A consolidation of priorities from the Office of the General Superintendent; Facilities and Fleet; Landscape Maintenance; Permits, Rentals & Concessions; and Law Enforcement leadership helped us develop a working document.

