



Parks Tree Preservation Protocols

Table of Contents

Contents

Introduction	2
How Construction Hurts Trees.....	2
Tree Protection in Design.....	2
Tree Removals.....	3
General Requirements for all Work	4
Construction within the Critical Root Zone of Any Tree	5
Additional Notes for DEP and Plumber Company Work around Trees	6
Site Restoration.....	6
Failure to Comply with Tree Protection Standards.....	7
Exceptions for Emergency Work.....	7

Introduction

Trees clean the air and water, reduce energy costs, increase property values and make streets and parks more beautiful. They are a vital component of PlaNYC, the Mayor's plan for growing and greening New York City. By shading hot surfaces, trees reduce the formation of ozone, which can trigger respiratory problems in children and the elderly. Trees also reduce storm water runoff. They are a vital part of the City's infrastructure, alongside traffic signs, fire hydrants, and bus shelters. The New York City Department of Parks & Recreation (Parks) has jurisdiction over all trees growing in the public right-of-way—including street and parkway trees—as well as those in parks, playgrounds and greenstreets. Parks' goal is to preserve and protect these valuable public assets.

This document sets forth to the best practices for protecting trees impacted by construction projects in the urban environment. Since large trees provide more than 65 times the benefits of small trees, the benefits achieved by preserving large trees far exceed the costs of the protection efforts. Tree protection begins with careful planning in the project design phase, and then relies on enforcement of these specifications and standards during construction. Attention to tree protection at all project stages will avoid often costly construction delays, fines and, in some instances, litigation. These best practices apply to all trees under the jurisdiction of Parks & Recreation that are impacted by any construction work. No work impacting a tree may proceed without the authorization of the Commissioner of Parks & Recreation.

How Construction Hurts Trees

Trees grow in a delicate balance with their environment and any changes to that balance must be minimized if the tree is to remain in a healthy state and fulfill its useful life potential. Tree decline and death on or adjacent to construction sites frequently occurs due to the vulnerability of the root system. Roots are cut or damaged when installing utilities, sewers, foundations, driveways, curbs, sidewalks, etc. Roots are also lost due to grading, soil pollution and soil compaction. Other more obvious damage to trees comes in the form of physical wounding to bark and branches from vehicles, cranes, scaffolding, and storage of materials. Construction damage may take several years to become apparent in the trees affected and often results in their slow decline and death long after the project has been completed. It should be noted that younger trees and certain species can be more tolerant to construction disturbance than older trees.

Tree Protection in Design

Tree protection begins in the planning and design stages of every project. From decisions made about utility placement and grading, to the location of curbs and equipment and work staging areas, the amount of damage that trees sustain throughout the construction process is often determined on paper long before construction begins. A critical element of tree protection is the protection of the soil and the root systems growing within that soil. Root systems often extend far beyond the dripline of the tree canopy. Disturbance of the root system can result in severe injury to the tree. Each project should have a Certified Arborist Report (CAR) detailing the following:

- a. A scaled plan of the area, including the existing and proposed locations of all building structures and utilities. Buildings should also include maximum vertical heights.
- b. The locations of all existing trees identified by common and/or botanical name, condition and diameter at breast height. Condition assessment should follow the method detailed in the International Society of Arboriculture's *Guide for Plant Appraisal* (Council of Tree &

- Landscape Appraisers, 9th edition, 2000, chapter 4.) The site plan should clearly identify which trees are to be retained, which are to be transplanted and which are to be removed.
- c. The location of perimeter and protective fencing around each tree or group of trees.
 - d. The locations of all Critical Root Zones (CRZs), defined as the area for each tree which contains the estimated minimal amount of both structural and feeder roots that must be protected to minimize tree damage and retain structural stability. The CRZ for each tree is calculated based on the Tree Species Tolerance to construction impacts and age class, as outlined in the International Society of Arboriculture's *Best Management Practices: Managing Trees During Construction* (K. Fite, T. Smiley, 2008). Although CRZs will differ by species and tree age, zones range from ½ foot per one inch DBH (diameter at breast height) to 1½ foot per one inch DBH. If the species tolerance is unknown, then the 1½ foot per one inch DBH standard is assumed. See detail No. 1.
 - e. The locations of all new plantings.
 - f. The location of storage areas and access routes within the site to be used during construction.
 - g. The location of any cranes, scaffolding, hoists and/or similar which would potentially interfere with tree canopies.
 - h. The location and design of any foundations adjacent to trees and also detailing any required overcuts.
 - i. Details of any grade changes.
 - j. Locations of utilities. All utility locations, depth, and size must be specified on plans. Utility installation and grading activities should avoid the fenced in areas; if working within the CRZ is absolutely necessary, however, then trenchless construction techniques must be specified to minimize root damage.
 - k. Locations of site activities. Construction site activities such as access routes, staging areas, materials and equipment stockpiling, truck or tool washing, etc. shall be located as to prevent disturbances to the CRZs.
 - l. Curb and pathway installation. Curb installation adjacent to existing trees should be avoided. Soft surfaces should be used for paths near trees. If curb replacement is necessary, consider using steel-facing without concrete curb adjacent to tree roots rather than excavating with machinery for mechanical forms.

Tree Removals

No City trees shall be removed without the written permission of the Agency. Trees are considered for removal if they are (1) dead, (2) irreversibly diseased, (3), hazardous, and/or (4) in *unavoidable* conflict with a construction project. If seeking permission for the removal of a City tree, the following steps shall be taken:

- a. All tree removal requests must be made **in writing** and must include (1) an explanation as to why the tree needs to be removed, and (2) supporting documentation, such as construction drawings, site logistics, Department of Buildings approved / registered plans, Street Tree Checklist (Form ST-1), and utility plans that show the impact of construction on the tree(s). Documentation is important because any entity must always prove to the satisfaction of a Borough Forestry Manager that the project cannot move forward with the tree in its current location.
- b. In reviewing the application, DPR will first look for a solution to save the tree, by assessing whether the project design can be altered to avoid a conflict with the tree.

- c. If there is an unavoidable conflict with a tree, DPR determines if the tree is a suitable candidate for **transplant**. "Suitable" means that the tree has a very good chance for successful transplant and normal development. If the tree can be moved, DOT must hire a contractor to move the tree in the appropriate time of year (late fall/early spring). A general guide for establishing root ball size is one foot of root ball diameter for each inch diameter of the stem of the tree. DPR must first approve the proposed contractor and find a suitable location for the transplant. DPR will obtain a performance bond for the value of the tree (as per (d) below) from the landscape contractor as security in case the tree does not survive transplant.
- d. If the tree cannot be transplanted, DPR will assess the value of the tree based on the NYC Tree Valuation Protocol. DPR will deduct the appropriate condition percentage, location percentage and species percentage from the basal area to determine the replacement value of the tree and the number of required replacement trees.
- e. A tree removal permit must be issued to a qualified and insured tree contractor and it will detail the conditions for restitution. Restitution can be paid by check or through planting (through an approved contractor according to DPR standards) of the required number of replacement trees at locations approved by the Borough Senior Planting Forester. DPR will obtain a performance bond for the replacement value of the tree from the retained landscape contractor as security until the trees are planted and the guarantee period expires.

General Requirements for all Work

The protection measures must be in place prior to the start of work, including demolition. The following requirements must be adhered to during construction:

- a. **Treatment of tree roots.** No roots over one (1) inch diameter should be shaved or cut without the written permission of Parks. If small roots must be cut this should be done with a sharp implement to leave a clean finish. Use of heavy equipment such as a backhoe to cut roots is prohibited.
- b. **Pruning.** All contact between equipment and overhead tree limbs should be avoided. Bending or breakage of limbs is prohibited. If clearance pruning is proposed, it shall not take place without the written permission of the Agency, and shall only be performed with professional equipment as per the Agency's standards and specifications for such work. No trees shall be pruned or removed without the written permission of the Agency. Tree work is to be performed by an arborist holding certification from the International Society of Arboriculture (ISA). The Agency is to receive notification 48 hours before any tree work is to begin.
- c. **Fencing.** Fencing will be specified by the Borough Forestry Director. The minimum fencing material for low impact sites is four (4) feet orange plastic on flanged posts. Please see detail No. 2. For larger impact projects, five (5) foot chain-link on posts sunk into the ground with props may be more appropriate. Please see detail No. 3. Tree protection fences cannot be moved at any time without the written permission of the Borough Forestry Director. The fences must be maintained on a regular basis and repaired and/or re-staked as needed. Tree protection zone signs should be attached to these fences as shown in detail No. 4.
- d. **Tree guards.** All trees within the construction area (outside of the protective fencing) shall be encircled with wooden tree guards built to Parks' specifications. Please see detail No. 5.
- e. **Tree trunk protection.** In addition to the tree guards, each tree must be wrapped with an appropriate protective material (as approved by the Borough Forester's representative) as

- extra protection from physical wounding. Appropriate materials may be, but are not limited to, roadway drainage geocomposite.
- f. **Stockpiling of materials.** Under no circumstances should equipment and materials be stockpiled within the fenced areas.
 - g. **Disposal of wastewater and other debris.** No contaminants or wastewater from construction activities should be disposed of within or around protected areas.
 - h. **Parking.** No vehicle shall be parked within or driven into the fenced areas.
 - i. **Grade changes.** All grade changes within the fenced areas should be avoided. If grade changes are called for within the CRZ, follow the specific requirements below.

Construction within the Critical Root Zone of Any Tree

In general, no encroachment of the CRZ shall occur without the written permission of the Agency, and without the on-site presence of the Agency's representative or an approved arborist. If encroachment is permitted, the following preventative measures shall be employed:

- a. **Soil protection.** To mitigate soil compaction the CRZ must first be mulched with a minimum eight (8) inch layer of mulch and/or plywood/plastic sheeting, as specified by the Agency. Please see detail No. 6. Mulch should be maintained during the course of construction and removed after the end of construction. Removal shall be by hand or as specified by the Agency.
- b. **Removal of existing infrastructure.** Extreme care must be exercised in removing concrete or asphalt within the CRZ, lifting rather than dragging paving pieces. Tools and equipment for this activity shall be approved by the Agency prior to the start of excavation.
- c. **Methods of excavation.** Any excavation for utility or infrastructure installation within a CRZ or elsewhere on the site as designated by the Agency shall be done by hand or pneumatic excavation, or micro tunneling. Trenching shall not occur within the CRZ unless absolutely necessary and without prior agreement of the Agency.
- d. **Treatment of exposed roots.** Where such excavation does occur for the removal of existing features or the installation of new work, the excavated area shall be backfilled immediately. Exposed roots shall be covered with burlap or other approved material, and kept constantly moist. Burlap shall be checked a minimum of two (2) times a day, once in the morning and once in the afternoon in order to maintain appropriate levels of moisture, until backfill is complete. If directed, soaker hoses shall be installed to facilitate properly moist conditions of excavated areas.
- e. **Grade reduction.** Many tree roots occur within the top six to eight inches of the soil. Soil removal can result in the loss of tree roots. Soil removal within the tree protection zone is prohibited without the written approval of the Agency. Soil removal methods are to be determined by the Agency. Any removal of soil within the CRZ shall be performed under the supervision of a Consulting Arborist or a Parks Borough Forestry representative.
- f. **Grade increase.** The addition of soil can smother tree roots, by reducing the amount of water and oxygen reaching the soil area where roots occur. Fill of up to three (3) inches additional depth *may* be permitted with the written approval of the Agency. Fill exceeding three inches shall not occur without the prior installation of an aeration system or other detail approved by the Agency, such as a tree well, retaining wall, terracing, or other such mechanism.
- g. **Planting.** Planting beds that are installed within tree protection zones can only be done with the written permission of the Agency and the presence of a CA. All excavation and plant installation is to be done by hand, with minimal soil disturbance. No roots over 1-inch in diameter shall be cut. Plants shall not be placed within three (3) feet of the tree trunk.

Additional Notes for DEP and Plumber Company Work around Trees

This permit applies to all digging activities conducted by DEP or by other entities acting of behalf of DEP addressing the repair of City-owned water or sewer mains. All requirements detailed above—as well as these additional rules—must be followed when activities occur in these locations.

1. **Sidewalk Excavation** (between the curb and the right-of-way):
 - a. In order to avoid excavation, trenching, or similar work within the CRZ, consider relining existing infrastructure, relocating new infrastructure, or tunneling underneath existing tree roots where tree root conflicts occur.
 - b. Excavation within the CRZ requires a DPR permit and must be done carefully by hand or by using pneumatic tools.
 - c. All contact between equipment and overhead tree limbs should be avoided. Bending or breakage of limbs is prohibited. If clearance pruning is necessary, no trees shall be pruned or removed without the written permission of the Parks as stated on the permit. Tree work is to be performed by an arborist holding certification from the International Society of Arboriculture (ISA). Parks is to receive notification 48 hours before any tree work is to begin.
 - d. Exhaust fumes and excessive heat should always be directed away from trees to prevent scorching.

2. **Roadbed Excavation** (between the curbs). In addition to those requirements detailed above:
 - a. All contact between equipment and overhead tree limbs should be avoided. Bending or breakage of limbs is prohibited. If pruning is required, this shall be done under separate permit to the Agency's representative. Any company seeking to prune City trees must obtain a Tree Work Permit from the Borough Forestry Office and follow all standards and requirements contained within. Parks must receive notification from the permittee 48 hours before any tree work is to begin.
 - b. Standard wooden tree protection is required for all trees adjacent to the work area.

Site Restoration

At the completion of the construction project and in response to field conditions, any of the following site restoration/mitigation measures may be required by the Agency in addition to those specified in the CAR. These measures shall be assumed at the expense of the permittee, and shall not be done without the approval of the Agency:

- a. Soil analysis. Soil testing may be required to determine fertilization and soil amendment applications.
- b. Compensatory soil decompaction and enrichment (scarification, vertical mulching and/or fertilization, radial trenching, air tilling).
- c. Pruning of dead or diseased tree branches, and/or dead tree removal.
- d. Root collar excavation, to remove any soil that accumulated around the base of the tree during construction.
- e. Tree irrigation, for up to one year after the end of construction.
- f. Mature tree regeneration through the use of a tree growth regulator.
- g. Soil replacement in eroded areas.

Failure to Comply with Tree Protection Standards

As a result of the failure to comply with the required standards the Agency, during either planned or emergency work, may choose to take any or all of the following steps. This work must be completed as directed and at the expense of the entity not in compliance.

- a. **Tree/plant injury.** The entity shall complete any remedial work such as pruning, watering, fertilizing, or soil compaction mitigation required and/or necessary to prevent loss of plant material when trees and shrubs are injured by the entity and or a subcontractor, as determined by the Agency. This work shall be accomplished under the Agency's standards and specifications for such work.
- b. **Tree destruction.** Any trees destroyed during the course of construction shall be assessed according to the New York City Tree Valuation Protocol. Trees that are damaged but not destroyed shall also be assessed according to measures outlined in the Protocol. The removal of a tree without a permit is a criminal misdemeanor punishable by a fine not to exceed \$15,000 and/or imprisonment for up to one year, in addition to civil damages.
- c. **Tree removal.** Any tree destroyed during the course of construction shall be removed completely upon written permission of the Agency. The stump shall also be completely removed according to the direction of the Agency.
- d. **Tree replacement.** Restitution for any tree removals shall be made according to the Tree Valuation protocol.
- e. **Tree protection deficiencies.** In addition to the remedial actions described above, failure to follow these tree protection guidelines may result in work being stopped on site, DPR permits cancelled and summons issued. When a tree protection deficiency is identified, it must be remedied within 24 hours of notification by the Agency. No further DPR permits will be issued until all tree protection is restored to the Agency's satisfaction and any required restitution is paid in full.

Exceptions for Emergency Work

Parks' recognizes that under certain circumstances the preparation of a CAR prior to obtaining a permit is impractical. In emergency situations, utility work may need to be addressed immediately to safeguard people and property. However, City trees impacted by emergency work that are damaged cannot be left in an unsafe condition as a result of this. The following guidelines shall be used in the case of emergencies:

The Emergency response team shall assess if the work will likely damage a City tree. If so, Parks' and any retained Consulting Arborist (CA) must be made aware of the situation as soon as reasonably possible.

- a. If a CA is retained he/she must attempt to get to the site as soon as possible and advise the construction team on how to mitigate potential tree damage. The CA must also contact Parks' immediately by calling the Borough Forestry Manager if the situation occurs during normal working hours or by calling 311 if outside of these times. Photographs should be taken to document the damage.
- b. If the tree(s) are unstable then the CA should either arrange for the tree(s) to be made safe or the site should be secured until DPR can respond to the emergency.
- c. The CA or entity must endeavor at all times to record the tree damage and construction work in progress so DPR can fully understand and document the incident.

- d. If a CA is retained he/she should supply DPR with a full report including a tree survey listing all damage and their recommendations for any required remedial tree work.
- f. DPR will issue a permit to complete any necessary remedial work if required.
- g. Entities, including some City agencies and utility companies may receive a blanket permit for such work that would need to be renewed annually.