Objectives

The Niagara Parks Commission (NPC) is dedicated to the preservation of its urban forest and the individual trees making up that forest. When construction work is required around or adjacent to trees, steps must be taken to preserve and protect these trees from damage both above ground and below. This is accomplished through protection zones outlined with barrier fencing, ground matting over sensitive areas and proper arboricultural practices where required. The information below outlines these methods and what is required to meet the NPC standards.

Overview

1. Construction activities near trees may result in injury to the trunk, limbs or roots of trees causing damage or death of the tree. In order to prevent such damage:
    a. Trees within or adjacent to a construction area must be protected during construction by means of a fence barrier surrounding the drip line as outlined in the “Barrier Fence” section below
    b. Activities which are likely to injure or destroy the tree are not permitted within the Drip Line. Equipment or vehicles shall not be operated, parked, repaired or refueled within the drip line of trees or the Critical Root Zone (CRZ) which is the area outside of the Drip Line containing many of the trees feeder root system.
    c. Tree pruning or root cutting of NPC owned trees is to be done in accordance with this document or consultation with the NPC.
2. NPC will require a $10,000 security deposit to offset any damage or loss of trees and to ensure all aspects of the tree protection plan are adhered to during the period of construction. Should tree damage occur, it will be evaluated based on cost to repair Will be utilized to determine the value drawn from the security.
3. No objects may be attached by nails, screws or other fastening methods to trees owned by the NPC without written authorization by the NPC.
4. No NPC tree may be removed without the written permission of the NPC.

Critical Root Zone (CRZ)

A tree’s Critical Root Zone (CRZ), sometimes also called the Root Protection Zone (RPZ) and is defined as a circle on the ground corresponding to the drip line of the tree. Unfortunately, the “drip line” of a tree can be irregular and hard to define. An

alternative method of determining this dimension is to measure the diameter of the tree trunk in inches at breast height (DBH), multiplied by 12, as so:

Trunk diameter in cm at 1.4m (inches at 4 1/2') above grade (DBH) x 12 = radius in cm of the CRZ (essentially, roughly 1.2m of CRZ per 10cm of DBH (1' of CRZ radius per 1" DBH).

Bear in mind that root systems vary by depth and spread based on tree species, age, soil type, etc. The root systems of some oaks, for example, can extend well beyond the canopy drip line. This full root zone
may extend 2 to 3 times beyond the CRZ and the NPC reserves the right to require larger protection zones for any tree it sees fit

The Minimum Tree Protection Zone (MTPZ)

The following is a chart showing minimum required distances where feasible for determining a **Minimum Tree Protection Zone**. Some trees and some site conditions may require a larger Minimum Tree Protection Zone at the discretion of the NPC. If lay out of the proposed work area does not allow for the MTPZ according to the chart below than the NPC must be contacted and Written approval granted to reduce the below areas.

When viewing the Minimum Tree Protection Zone, use whichever is greater, the Drip Line of the tree or the radius measurement.

Table 1 – Minimum Tree Protection Zones Trunk Diameter (DBH) 2	Minimum Tree Protection Zone (MTPZ) Distances Required 3	Critical Root Zone (CRZ) Distances Required past MTPZ
< 10 cm	1.8 m or drip line	1.8 m
11 - 40 cm	2.4 m or drip line	4.0 m
41 - 50 cm	3.0 m or drip line	5.0 m
51 - 60 cm	3.6 m or drip line	6.0 m
61 - 70 cm	4.2 m or drip line	7.0 m
71 - 80 cm	4.8 m or drip line	8.0 m
81 - 90 cm	5.4 m or drip line	9.0 m
91 - 100+ cm	6.0 m or drip line	10.0 m

Barrier Fencing and Ground Protection

1. Overall fence design must form a complete circle around an individual tree or

a group of trees and must be one of 2 styles:
    a. Four-foot, free standing metal “hoarding fence” which must be pinned or weighted to the ground to ensure it will not topple.
    b. Four-foot plastic “snow fence” supported with metal “T” bars driven into the ground on eight foot centers and a wooden 2x4 top rail attached to the “T” bars which the fence is then attached.
2. Fencing is to be placed at the MTPZ of each tree or group of trees, or drip line, whichever is larger.
3. Locates must be obtained prior to piercing of any ground for the installation of stakes and/or “T” Bars and are the responsibility of the contractor as per the NPC policy **MPM 10-04**.
4. Please see Appendix for further details on NPC’s expectations on tree protection and repair from damage.
5. Construction material, supplies, or equipment and earth shall not be stockpiled within the drip line of any tree or the CRZ without written approval of the NPC.
6. If work requires equipment to be placed with in the CRZ, ground protection in the form of ¾” plywood or synthetic alternatives must be placed on the ground to reduce ground compaction and must be of a short duration of time only. The NPC must be notified of what is being placed there, how long it will remain and what protection is placed under the material.
7. The use of grass areas as “lay down” areas or storage areas for equipment must be approved by the NPC to ensure they will not impact adjacent trees.

<u>Excavation around trees</u>

Any time excavation around trees within the NPC lands take place the NPC must be consulted prior to commencement of work to determine how the work will impact the trees and whether the trees require greater protection then outlined in this document. Examples of this may be heritage trees, trees of merit or species at risk (SAR). Alternative excavation methods may be required when working inside CRZ such as hydro-water excavation or air spade excavation. The NPC reserves the right to request these alternatives if they determine necessary.

1. Large roots (15cm or above) exposed from excavation outside the drip line or MTPZ but within the CRZ or must be cleanly cut and where possible covered with soil, mulch or burlap to prevent drying out.
2. Any roots exposed within the CRZ or drip line must be cleanly cut, covered with soil and wet burlap and watered within 24 hours of exposure to prevent

drying out. The burlap must be kept wet at all times until the root zone is once more restored with topsoil.

3. Any branches which require pruning must be pruned by a qualified Arborist or other tree professional as approved by the NPC.
4. All pruning of tree roots and branches must be in accordance with good arboricultural standards.
5. Roots that have been exposed by digging must be pruned as per above standards within 24 hours. The Arborist/tree professional retained to carry out crown or root pruning must contact the NPC prior to conducting work so that the damage to the root system can be evaluated.

Tree Repair

Trees damaged by construction operations shall be repaired as per ISA standards by a certified ISA arborist as follows, within five days of the damage.

The NPC holds the right to perform the repair work and charge time and material back to the contractor. The NPC will further determine if the damage inflicted will affect the tree long term and if so, what cost will be levied against the contractor's deposit. If the damage is great enough that the tree needs to be removed the NPC holds the right to recoup the full landscape value of the tree from the contractor.

1. Branches 25 mm or greater in diameter that are broken shall be cut back cleanly on the tree side of the break or to within 10 mm of their base, if a substantial portion of the branch is damaged.
2. Bark that is damaged shall be neatly trimmed back to the uninjured bark without causing further injury to the tree.
3. Roots under 2 cm in diameter can be pruned using a sharpened tool such as hand pruners or a sharpened spade under the supervision of the Construction Inspector.
4. Roots between 2 and 8 cm in diameter can be pruned by the arborist using a sharp tool, such as a handsaw, hand pruner or loppers.
5. All roots over 8 cm in diameter must be assessed by the NPC prior to pruning unless the arborist on-site can confidently assess the effect of the removal of the root as not detrimental to the tree, in this case a photo record of both the damage and repair must be forwarded to the NPC
6. The cuts are typically backfilled with the same excavated soil or new topsoil or compost and hoarding should be installed along this trench to project the remaining roots.