Remedial Action Plan 3rd Line Berms

Introduction: Trees are one of the longest lived, best adapted forms of life on earth. They can be found in habitats as diverse as deserts, high alpine slopes and river deltas with recorded ages as high as 5,000 years. In their natural environment, only the most vigorous and healthy specimens will survive (live to reproduce). In most urban environments however, the life span of the average tree is 25 to 30 years as a result of stress imposed by adverse growing conditions, environmental impacts and the effects of man. One of the most important factors affecting tree growth is the soil in which it is planted. Compacted soil, nutrient deficiency, soil Ph, organic matter and soil texture all play an important part. As soil becomes more dense, movement of water and gases decreases, root growth is limited, organic matter decreases and clay content increases. Under natural forest conditions only the best adapted trees will grow on a given soil type. Transplanted trees on poor sites often result in poor growth, unattractive tree appearance or tree death.

Road side berms and greenbelts have typically been planted as a means of reducing noise levels, screening, wind breaks and improving aesthetic values. As a result of concerns from local residents directed to the Town of Oakville Forestry Dept. regarding the poor growth rate and/or deaths of trees planted on berms, Complete Tree Service was contracted to undertake a site assessment and make recommendations for remedial actions.

Location and Field Assessment: The areas assessed are located on berms on 3rd Line between Greenridge Circle south to 100m past Abbeywood Drive. Three plots approximately 75 feet long and 25 feet wide were assessed on each side of 3rd Line. Site visits to carry out soil sampling, compaction tests and soil pH were carried out October 4, 2005. In each plot five compaction readings were taken, one soil pH and one soil sample for texture.

Findings: A visual assessment of this site showed poor, stunted growth on many trees, small thin crowns and small leaf size. Annual growth on some trees was 1/4-1/3 of what it should be. Twig dieback and witch's broom appearance on terminal twigs was present on some trees and

early fall colouring was evident on many of the broad leaf trees. All of these are indications of tree stress due to soil compaction and poor site conditions. A comparison of trees on the berm and trees

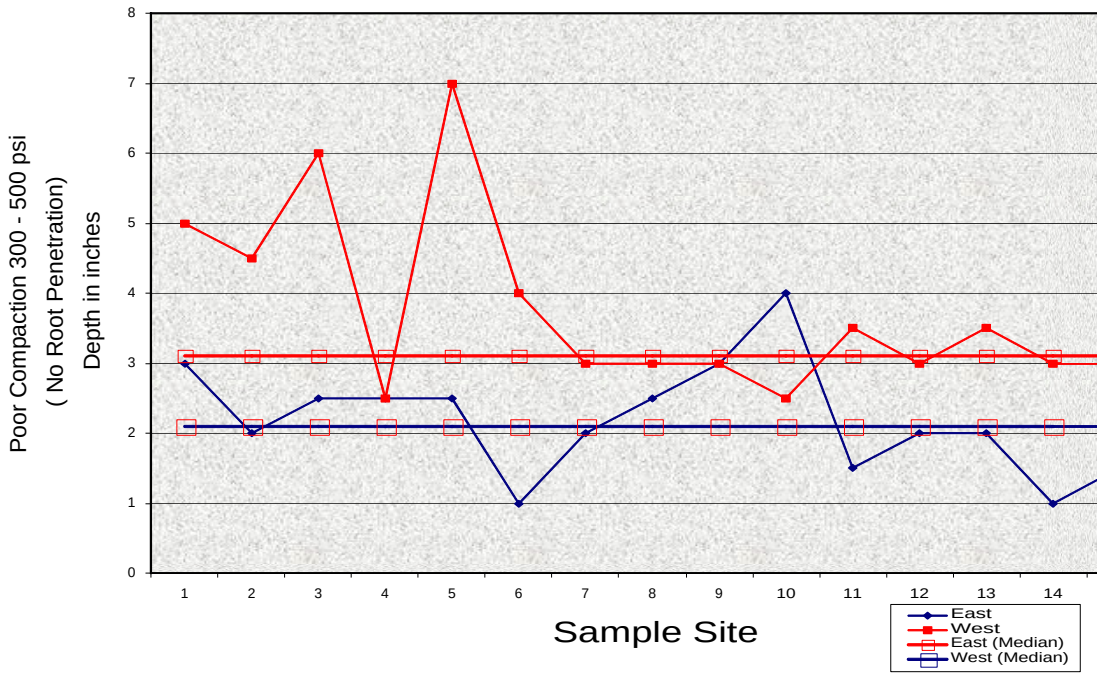

Figure 1: Soil compaction was measured in the following manner:

0-200lbs	good	
200-300lbs	fair	
300-500lbs	poor	(No root penetration)

planted at the edge of front lawns by Forestry Dept. at approximately the same time show a marked difference. Lawn edge trees are 3 times as large, with full crowns and good leaf size and colour and have a more regular annual growth increment. The reason for this, in part, would be due to a better quality and greater depth of soil medium plus the added care given to the home landscape by the homeowner i.e. regular watering and fertilizing.

Test readings of soil compaction on these plots ranged from poor (300-500lbs psi. or the level at which roots cannot penetrate) at 1 - 7 inches, with the median depth being 2.1 inches on the east side and 3.1 inches on the west side (Figure 1). Overall compaction on this site is severe. Physical analysis indicates parent material is classified as a silt loam, with 21% clay content,

54% silt content and just 25% sand content. By industry standards, a good growing medium should be a sandy loam where sand content is 50% or greater, with 70% preferred. A higher sand content provides better soil oxygen levels, improved drainage and reduced susceptibility to compaction. One to 11/2 inches of topsoil was present in each soil core with the remainder being classified as a silt loam. Soil pH is between 7.5 to 7.6; most trees grow best in slightly acidic soil with pH between 5.5 to 6.5 Soil chemistry also suggests that phosphorus values are poor and the soils are lacking available nitrogen. Salt levels on this site are within the acceptable range and road salt can not be blamed for poor health of these trees.

Recommendations: Side effects of poor soil and compaction are shallow rooting and poor anchoring trees that are susceptible to uprooting under snow loads or winds. Typically soils along road sides are of poor quality and condition, quite often being nutrient poor, heavily compacted and consisting of large amounts of construction debris. Remedial action in the form of soil aeration and soil amendments would have a significant impact on growing conditions of trees on this site.

1) Radial trenching is one means of improving soil compaction and quality. This involves digging trenches 4 to 18 inches wide and 10 to 24 inches deep, removing existing soil and back filling with good quality soil or amended soil. Soil amendments could include sand, peat moss, perlite, vermiculite, water retaining granules, compost, mulch, or any combination thereof. When carrying out radial trenching, it is important to start the trench 6 inches away from the trunk of the tree for every inch of tree diameter (ie: a 20 inch diameter tree trench should start 10 feet from trunk).
2) Use good quality soil or amended soil on the top 24 inches of a planting site. The accepted industry standard for a growing medium is a sandy loam where sand content is 50%.(70% preferred).
3) Mulch each tree to the drip line with a 3 to 4 inch layer of good quality mulch made up of 1 inch size chips mixed with composted leaf and yard waste. (Do not use bark chips).
4) Provide irrigation.
5) Ensure good drainage.
6) Provide an annual fertilizer treatment. For this site, add potassium in the sulphate form such

as 0-0-50 or 0-0-22, Sulpho-Mag.

Planting Specifications:

1. Dig planting hole 2 to 21/2 times as wide as the root ball and deep enough that the root collar is at ground level - relative to the surrounding ground.
   a. Do not use an auger for hole digging.
   b. Avoid glazing planting hole, especially when using a mechanical digger.
   c. Scarify planting hole (break up interior) to allow water percolation and root development.
2. If using wire baskets, remove the top 12 inches of basket after the tree has been placed in the planting hole in its final position. Balled and burlap trees should have the burlap and any strings untied from around the trunk and folded back into the planting hole at least half way down the planting ball.
3. All trunk guards and burlap stem protection used for transportation should be removed.
4. Stake trees with “T” bars when necessary. Remove all ‘T” bars and guy wires after 1 full year.
5. Mulch to the drip line with 3 to 4 inches of good quality mulch.