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December 6, 2001

The Regional Municipality of Halton
1151 Bronte Road
Oakville, Ontario L6M 3L1

Attention: Edward Soldo, P. Eng.

RE: PRELIMINARY ASSESSMENT OF WHITE OAK FUTURE REGION OF HALTON OPERATIONS CENTRE BRONTE ROAD (FORMER HWY 25), TOWN OF OAKVILLE

Dear Sir,

This letter report is summary of the meeting on November 30, 2001 (Region of Halton, Marshall Macklin Monoghan, National Shade, and Aboud & Associates), and requests for additional information concerning the Region's white oak tree. The following discussion and attached documents reflect my assessment.

1. Comparison of Tree Preservation Approaches

The monitoring of the white oak tree by Aboud & Associates (May to November 2001) has determined that its health is moderate to high with minor (5-10%) crown dieback, and moderate to high structural condition with moderate decay of a main surface root. In other words, using a rating system of poor, fair, good and excellent, the tree is in good overall condition. Based on the future upgrade of Bronte Road in 2004 and the requirement to preserve (save) the white oak tree, there are two options for the tree's continued survival: road modifications and transplanting.

A. Road Modifications (tree remains where it is)

This option requires the construction of two new lanes (northbound) on the east side of the tree. The two existing lanes on the west side of the tree would remain in their present location and carry traffic southbound only. The tree would be contained within the center median of the new divided roadway.

Impact to Tree: The impacts to the tree during construction would be minimal providing that no excavation, digging, filling, storage of equipment/supplies, or any disturbance occurs within the tree protection zone (TPZ). The tree protection zone is the area defined as a minimum as one (1) metre outside of the dripline of the tree. Impacts to the tree following construction are:

i. Additional salt spray is expected from the two additional lanes, increased traffic volume and possibly increased traffic speed (resulting in more extensive drifting of salt spray). Typical symptoms are leaf buds on the terminal part of branches are slow to open or do not open (dead); new growth arises from the basal sections of twigs (results in a "broom" appearance). NOTE: None of these symptoms were recorded from my observations of the tree from May to November 2001.

Impacts from salt spray damage can be minimized by:

a. Washing down the tree with thorough, fresh water dousing of the entire crown during mild weather periods in the winter and early spring. One suggestion is for the fire department to perform this operation (Cost est. - $700 - $1,000/visit).
b. Use alternative (non-sodium) road de-icing salts such as calcium chloride or calcium magnesium acetate. To reduce the costs of using these more expensive alternatives, their application can be limited to sections of the road 150 metres north and south of the tree.

ii. Increased levels of sodium from additional road surfaces may accumulate within the soil of the TPZ from road runoff. Additional sodium in the soil from pavement runoff may cause increased soil density, and reduce soil permeability, moisture retention, and fertility, which affect plant growth. NOTE: Given that the texture of the soil is sand to sandy loam, accumulation of sodium in the soil is not expected. However, should methods to ensure soil sodium levels do not impact the tree, soil testing is recommended.

iii. The increased area of pavement and its close proximity to the tree will contribute additional heat loading to the above ground parts of the tree. This may cause minor stress to the tree during hot periods. However, given that the area is relatively open, allowing for air movement, and that two lanes of pavement have been present on the west side of the tree for several decades with no observed symptom of stress, impacts from heat loading to the tree are expected to be minor and intermittent.

Further considerations: A natural ground cover (e.g., sedges, *Carex* spp.) of typical white oak woodlands, and an application of leaf compost and wood chips is recommended over the entire area within the TPZ. This treatment can be done before, during or after construction. However mulch should be applied prior to construction.

Monitoring: It is recommended that monitoring of the tree continue intensely (bi-monthly, April to November) during road work operations and for five years following construction, and infrequently (semi-annually) for the remainder of the tree's life.

Survival Potential: Based on the above discussion, including the recommendations to mitigate impacts from road construction and expansion, the tree is expected to have a 90% chance of surviving indefinitely.

B. Transplanting

The second option to preserve the tree is to transplant it from its current location to other ones nearby (within 500 metres) where it would not be affected by any new road construction and operations (including, road salts, heat loading, etc.) as discussed above (see Road Modifications). Two recipient sites were identified in front of the Region's Administration Centre, and other potential nearby sites on private property were assessed with at least one being suitable from a transplanting point of view.

Survival Potential: The exercise of transplanting mature trees and the rates of success were explained by David Cox (National Shade) at the November 30th meeting. Literature prepared by National Shade provided information about the process of moving mature trees, including timing, root pruning operations, pre and post transplanting tasks, and monitoring. According to Mr. Cox, since 1993 National Shade has moved over forty trees of similar size and lost one. Based on these numbers, the transplanting success rates are very high. Mr. Cox stated that given the proper pre- and post transplanting treatments, the survival of the white oak tree from transplanting is approximately 90%.

NOTE: Monitoring before, during and after transplanting is strongly recommended to identify changes to the condition of the tree and to provide appropriate action, as required.

The survival potential of the white oak tree between road modifications and transplanting is approximately the same: that is 90% or very good. Other factors such as specific site preparation requirements, road design preferences and costs, and transplanting costs are not discussed here and will play a major role in selecting the preferred option to preserve the tree.

2. Morphology of Tree Roots

Most (>95%) tree root systems including those of large mature trees occur within 100cm (39 inches) of the soil surface, and most of the smaller feeder roots occur within 30cm (one foot) of the soil surface. To help understand the form and growth pattern of tree roots, attached please find a copy of a journal article entitled "Tree Roots: Facts and Fallacies" by T. O. Perry. The article provides an overview of root morphology and function, and I have highlighted areas that may be of particular interest with respect to the white oak tree.

For you information included is a prospectus of Aboud & Associates Inc. and my curriculum vitae. If you require additional assistance or more clarifications about the information included herein, please do not hesitate to contact me.

Yours truly,

Steven Aboud, B. Sc,
Senior Ecologist & Certified Arborist
Aboud & Associates Inc.