

Arborist Report

Pre-Construction Assessment

Prepared For:

Baker Turner Inc.

Site Address:

2360 Bristol Cir,
Oakville, ON
L6H 6M5

Revised May 30th, 2023

Prepared by:

Pawan Paudyal
Consulting Arborist
Davey Resource Group
(289) 689-6050

pawan.paudyal@davey.com

And

Joseph Steinfeld

ISA Certified Arborist (OH-6403A)
ISA Tree Risk Assessment Qualified (TRAQ)
Phone: (647) 389-8160 || Email: Joseph.Steinfeld@Davey.com

©2023 Davey Resource Group. All rights reserved. This document must be used in conjunction with the tree inventory lists, and Tree Preservation Plans with arborist comments (these plans are to be printed on correct size to ensure scalability). This document must be used in whole and with all pages.

Contents

Summary.....3

Introduction.....4

Limitations of the Assignment4

Methods.....5

Observations.....5

Discussion.....6

Conclusion and Recommendations.....9

Appendix 1 – Tree Protection Action Key (TPAK)10

Appendix 2 – Tree Protection Plan (TPP) (Preview – to be printed to scale).....14

Appendix 3 – Tree Protection Fencing (TPF) Detail15

Appendix 4 – Tree Protection Zone (TPZ) Sign Detail.....16

Appendix 5 – References.....16

Appendix 6 – Glossary of Common Arboricultural Terms.....17

Appendix 7 – Arborist Qualifications.....20

Appendix 8 – Photographs.....21

Conditions of Assessment Agreement35

Summary

The following Arborist Report is with respect to the proposed construction of the warehouse building and entrance/driveway on the south side of exiting commercial property at 2360 Bristol Cir, Oakville. Trees on and near the subject property were inventoried and assessed for preservation, injury mitigation, or removal. Trees that are 10 cm in diameter or greater on private or neighboring properties, and City trees of any size, are regulated and require a permit to injure or remove.

66 trees were assessed on-site:

- Private trees: **49**
- Neighbor-owned trees: **3**
- Boundary: **1**
- Town-owned trees: **13**

13 trees (#6-11,28-30,48 and 53-55) are recommended to be fully protected. These trees are not expected to be injured so long as the Tree Protection Plans (TPP) are properly followed.

- Tree Protection Fencing (TPF) shall be installed around their Tree Protection Zones (TPZ), to protect their roots from soil compaction and damage during construction and movement of equipment or materials.

1 tree (#25) is expected to sustain minor root injury from construction of a new entrance and driveway to the site to serve the warehouse and loading area.

- We recommend excavation within the TPZ of trees #24 and 27 be done first in a low-impact manner (Hydro-Vac, Air Spade, or hand-digging) to expose roots for pruning and documentation by a certified arborist. Once roots are pruned, excavation may continue conventionally.
- Exposed root ends are recommended to be covered with native topsoil after completion of excavation work.

19 trees (#12-24,26-27and49-52) are recommended to be removed as all trees are within the proposed construction area for the new warehouse and driveway. All trees are >20 cm DBH, therefore a permit is required except trees #17,22 and 49.

33 Trees (#1-5,31-47 and 56-66) are recommended to be preserved without Tree Protection Fencing

- No TPZs are to be encroached by construction or material storage/transport at any time.

It is imperative for all crew contracted to perform this construction to thoroughly understand this report and the recommendations stated within.

Introduction

Davey Resource Group (DRG) was retained by the client, Baker Turner Inc. to develop an Arborist Report and Tree Protection Plan (TPP) for the construction of the warehouse building on the south side of the existing commercial property at 2360 Bristol Cir, Oakville.

An inventory and assessment of all trees greater than 10 cm within the property and up to 6 meters from construction as well as all trees on town-owned land were conducted. The Arborist was to document the current condition, size, and location of the trees as they relate to the proposed work. All trees within the scope of the survey were included in an inventory and assessed for protection or removal needs. Small shrubs were not surveyed for this report.

Recommendations for tree preservation or removal are to be provided.

This report must be accompanied by the following additional documents:

1. A full printing of the tree inventory was performed by Davey Resource Group (DRG), otherwise known as the Tree Protection Action Key (TPAK). (Appendix 1)
2. The construction maps with the Arborist Comments, otherwise known as the Tree Protection Plan (TPP). (Appendix 3)

Limitations of the Assignment

It must be understood that DRG is the assessor of the trees in relation to tree preservation practices. The construction supervisors should incorporate the information and recommendations provided within this report into their construction methodology to complete their project in a reasonable manner.

This Arborist Report was compiled from field data collected from the ground. A basic visual assessment of the tree was performed. No level of ISA Tree Risk Assessment was performed. The inspection of this site pertained strictly to trees with a Diameter at Breast Height (DBH) 6 cm or greater located on the property or within 6 m of the property boundary. The client should incorporate the information and recommendations provided in this report into their construction and installation procedures on an ongoing basis.

Methods

- Tools used to assess the trees included a metric DBH measuring tape, metric measuring tape, and a camera.
- All trees protected by Oakville's Private, and Town Tree Protection By-laws were included in the inventory.
- Trees were studied for their proximity to existing and planned structures to determine recommendations or precautions for trees requiring removal or injury.

Observations

- The site was inspected on April 17, 2023, by Arborist Pawan Paudyal at 11:00 a.m. local time.
- No evidence of construction was present, and work had not yet started on site.
- No material storage or soil compaction within Tree Protection Zones was observed.
- **66 trees** were assessed for this report and labeled **#1-66** in the Tree Protection Action Key (TPAK) and Tree Protection Plan (TPP) included within Appendices 1 and 3.
- The construction site access route is to be directly off the road on the southeast side of the property through the driveway. The staging area for equipment will be in the parking lots outside of the Tree Protection Zones.
- **Trees #1-11** are in front of the existing building's sidewalk within the town's property. These trees' overall condition is good except tree #2 is in fair condition. The proposed construction should not harm these trees. Trees (#6-11) are protected with TPF and hoarding.
- **Trees #12-21** are on the south side of the property away from the existing building. These trees' overall condition is good. Trees #12-16 are within the proposed warehouse construction area, and trees #17-21 are close to the existing driveway and entrance. Based on the footprint of the new building and reconfigured entrance, these trees are recommended for removal.
- **Trees #22-23** are on the south side of the existing property within the town right-of-way. These trees' overall condition is good. Trees #22 and 23 are within the proposed driveway construction area and recommended for removal.
- **Trees #24-30** are on the south side of corner of property. These trees' overall condition is good. Tree #24 and 27 TPZs encroach within the proposed construction zone for the driveway and will require root-safe excavation and pruning under arborist supervision. Tree Protection Fencing (TPF) shall be installed.
- **Trees #31-47** are in the rear areas of the property. These trees' overall condition is good. The proposed construction should not harm these trees. These trees are sufficiently far from construction such that TPF is not required.
- **Trees #48-50** are on the west side of the existing building of the city's property. These trees' overall condition is good. Tree #50 is within the proposed construction area and recommended for removal and Tree #49 TPZs encroach within the proposed construction zone and Tree Protection Fencing (TPF) should be installed to prevent injury.
- **Trees #51-65** are in front of the existing building on the property. These trees' overall condition is good. Tree #51 is within the proposed construction area and recommended for removal and the proposed construction should not harm these trees. Trees (#52-55) are protected with TPF and hoarding.
- **Tree# 66** is located on the side neighboring property. This tree's overall condition is good. The

proposed construction should not harm this tree.

For further details and observations, refer to the Tree Protection Action Key (Appendix 1).

Discussion

To preserve and protect trees, proper recommendations must be followed and abided by the client for the duration of the project.

Regulatory context

The Oakville Private Tree Protection By-law 2017-03 states that a permit is required to injure or remove any privately owned tree that measures 15 cm or more in diameter at breast height (DBH). Fees are exempt for trees that are dead, high risk, ash trees, or buckthorn trees.

The Oakville Town Tree Protection By-law 2009-025 states that a permit is required to injure or remove any Town tree.

Tree Protection Zone (TPZ)

Tree Protection Zone as defined by the Town of Oakville bylaw means a restricted area, enclosed by fencing, that is measured at diameter at breast height (DBH) 1.37m above grade. No construction activity or equipment is to be inside the TPZ at any time during the construction.

Minimum Tree Protection Zone (MTPZ)

Work within the MTPZ of any tree would be considered a serious root injury and would leave the tree with a high potential for structural failure or serious decline. Boxes surrounding existing trees on the TPP are based on the TPF setback distances provided by the Town of Oakville. These measurements have been recorded in the field and represent a ‘best case scenario’ for tree protection needs. The on-site project arborist will have final approval of tree protection requirements. The use of a supersonic air tool (SSAT) or daylighting may be required for trees with construction within the MTPZ while the construction project is underway to ensure these trees are reasonably preserved. Tree Preservation Specifications are there to protect trees while giving them their necessary information and actual footprints to ensure all work around trees can continue efficiently. Increasing TPZ distances should be done at the design stage. Field marking exact locations of new proposed structures and underground utilities by the planning personnel has been well proven to be the most effective way to ensure accurate distances from trees. It is better to add some fill than to excavate roots. Fill can be modified (such as using High-Performance Base(HPB)) to allow gas exchange and water permeability, while the tree adapts to the change slowly over time. Further discussions may be needed to ensure methods are useful, cost-effective, and will provide for the trees that are being protected.

Trunk Diameter (DBH)	<10cm	10-30cm	31-50cm	51-60cm	61-70cm	71-80cm	81-90cm	91-100+cm*
Minimum Protection Distance Required	1.8m	2.4m	3.0m	3.6m	4.2m	4.8m	5.4m	6.0m+*

*For trees over 100 cm. DBH, add 10 cm. to the TPZ for everyone centimeter of DBH.

Root Pruning Protocol

The roots provide nutrients and water to the leaves and branches while supporting the tree in windstorms and preventing failure. Trees are remarkable, in that the upper canopy can be completely green and full while most of the roots below have been removed; leaving the tree highly prone to failure and imminent death within a few years. Once a tree is injured, that injury is never “healed” but instead the tree allocates a great deal of energy to try and repair itself, often at the expense of its vitality and sometimes leading it into a mortality spiral that may not be noticed until years later.

Root pruning is a practice to minimize injuries to trees. Roots in comparison to upper canopy limbs store a great deal of energy and reserves for trees to survive and must be removed with the utmost care and consideration. Like pruning the upper canopy of the tree, roots are best removed (if needed) via target pruning practices and not by being torn off. Roots must be assessed by a qualified and experienced arborist and then pruned properly with a sharp tool.

Root pruning is not a common skill set and should be performed by a qualified arborist familiar with root excavation and root pruning. Tree’s roots are underground and are otherwise not detectable without physical exploration – i.e., using a Supersonic Air Tool (SSAT) such as an AirSpade® or Daylighting vehicle (Hydro-Vac with pressure not to exceed 500psi inside any TPZ). Root pruning trenches must be at least the depth of the deepest root (usually 30-60 cm) and about 15 cm wide. Roots are assessed by the arborist about the effect construction may have on the tree, and then either pruned with a sharp tool, possibly recommended for removal, or a design change may be needed on-site to accommodate. The use of a rotary saw is not acceptable to prune the roots of trees.

The Town of Oakville specifies the non-invasive methods of excavation including but not limited to air spade, hydro-vac, and hand digging to minimize the damage to the health and structure of the trees. Root pruning in open trench methods of construction is required under the direction of - and along with - written approval of an arborist. An arborist must be always present on-site when work is within the TPZ.

Tree Protection Hoarding (Appendix 3)

Hoarding (Tree Protection Fencing (TPF)) is used on construction sites to ensure that damage to the tree and its root zone is prevented. This distance is typically located by the MTPZ. However, it must be understood that sometimes this distance is not achievable due to the infrastructure being too close. It must be further understood the hoarding distance sometimes must accommodate a larger TPZ (than the typical MTPZ distance) due to a limited root growing area/volume (this area is typically defined by the project arborist.) This hoarding must be anchored to the ground and must be installed to the lines defined by the project arborist.

Problems will arise for tree preservation efforts when anyone removes the hoarding, even temporarily. It takes one instance of soil compaction from a heavy machine for roots to suffer from air and water deprivation and for the tree to become stressed. It is imperative to install and maintain good condition the hoarding to prevent this from happening before and throughout the entire construction.

Tree Protection Signage

The signs are provided and posted by the Town of Oakville Forestry Department once the hoarding set-up is approved. Signage informs the public and reminds the contractors of the significance of the TPZs and the efforts put forward by the client in tree preservation.

Staging Areas

All staging areas are understood to be outside the TPZ. At no time are materials, vehicles, traffic or debris to be stacked, staged, or piled inside the hoarding (Tree Protection Fencing).

Vertical Mulching

An aeration or fertilization technique. Drilling (auguring) vertical holes in the soil and filling them with materials (compost/ fertilizer) to improve aeration.

Permeable Surface Construction

When performing new hardscape construction in the root zone of a tree, it is imperative to pursue a minimum amount of disturbance to any open soil surface where such roots are or may be growing. The addition of an impermeable surface above existing tree roots serves to stress the roots in two ways. First, heavy material such as asphalt and cement serve to compact the soil, cutting off access to air pockets within the soil which serve as a medium for roots to perform their duties in fueling the tree's energy processes. Secondly, impermeable surfaces cut off access to water by redirecting groundwater and rainfall away from the soil beneath, chocking off a tree's water supply, which is a tree's most important below-ground resource. These stressors can be avoided by pursuing gravel surfaces, geotextile subsurface that distribute the load places upon the soil and tree root zone by the hard surfaces above.

Replacement Trees

As a condition of a tree permit, one tree must be planted for every 10 cm DBH of healthy tree removed. A \$300 security deposit is required for each tree to be planted. The security deposit will be refunded once a final inspection of the replacement plants is complete. Replacement trees must be planted on the same property as those removed. Where it is not possible to properly grow replacement trees on the site, the security deposit may be donated to the town to plant on nearby town property. The minimum tree replacement size is a 30-mm caliper (3 cm width) deciduous tree, or a 150-cm high coniferous tree in a five-gallon container, balled in burlap, or in a wire basket.

Conclusion and Recommendations

To account for the proposal for the construction of the warehouse building, driveway, and entranceway within the existing commercial property at 2360 Bristol Cir, Oakville. We assessed 66 trees for protection, injury, or removal.

- Trees to be fully protected are specified with “Preserve” in the “Action” column in the TPAK.
 - We recommend the client install and properly maintain Tree Protection Fencing (TPF) built to the Town of Oakville standards (Appendix 4,5) following the Tree Protection Plan (Appendix 3) prior to and during construction work.
 - We recommend the fencing be built of 1.2 meters (4 ft) high orange plastic web snow fencing on 2” x 4” frame. Where orange plastic web snow fencing creates a restriction to sightlines, page wire fencing with reflective tape can be used.
 - The tree Protection Signage (Appendix 5) provided should be affixed to all Tree Protection Fences.
 - **13 trees (#6-11,28-30,48 and 53-55) can be fully protected behind TPF.** These trees are not expected to be injured so long as the Tree Protection Plans (TPP) are properly followed.
- Trees expected to be injured are marked with “injury” in the “Action” column in the TPAK.
 - We expect that trees #24 and 27 will sustain a minor impact from work inside their TPZs. And all trees are above the by-law threshold of 20 cm, a TPZ Encroachment Permit will be required to be issued prior to the work.
 - We recommend excavation within the TPZ of tree #25 be done first in a low-impact manner (Hydro-Vac, Air Spade, or hand-digging) to expose roots for pruning and documentation by a certified arborist. Once roots are pruned, excavation may continue conventionally.
 - Exposed roots are to be covered with native topsoil after excavation.
 - It will be required to install vertical hoarding constructed of 3/4" plywood affixed to a 2*4 frame outside of new driveway areas.
- Trees expected to be removed are specified with “remove” in the “Action” column in the TPAK.
 - 19 trees (#12-24,26-27 and 49-52) are recommended to be removed and all trees are within the proposed construction area. All trees are >20 cm DBH, therefore a permit is required except trees #22 and 49. We recommend the client remove these trees prior to construction, after obtaining tree removal permits.
 - To account for the proposed removal of the 1 by-law regulated trees, the town may request up to 3 replacement trees be planted or that cash-in-lieu be paid if on-site planting cannot fulfill the replacement tree requirement. Recommended replacement planting locations are to be included in future landscaping plans.
- Trees (#1-5,31-47 and 56-66) are recommended to be preserved without Tree Protection Fencing.
- All material and equipment staging, and storage shall take place on the parking lots. No equipment of any sort shall be stored within the MTPZ of the protected trees except where hard surfaces are already present. This will be done to avoid compaction of the ground throughout the MTPZ.

For further details and observations, refer to the Tree Protection Action Key (Appendix 1).

Appendix 1 – Tree Protection Action Key (TPAK)

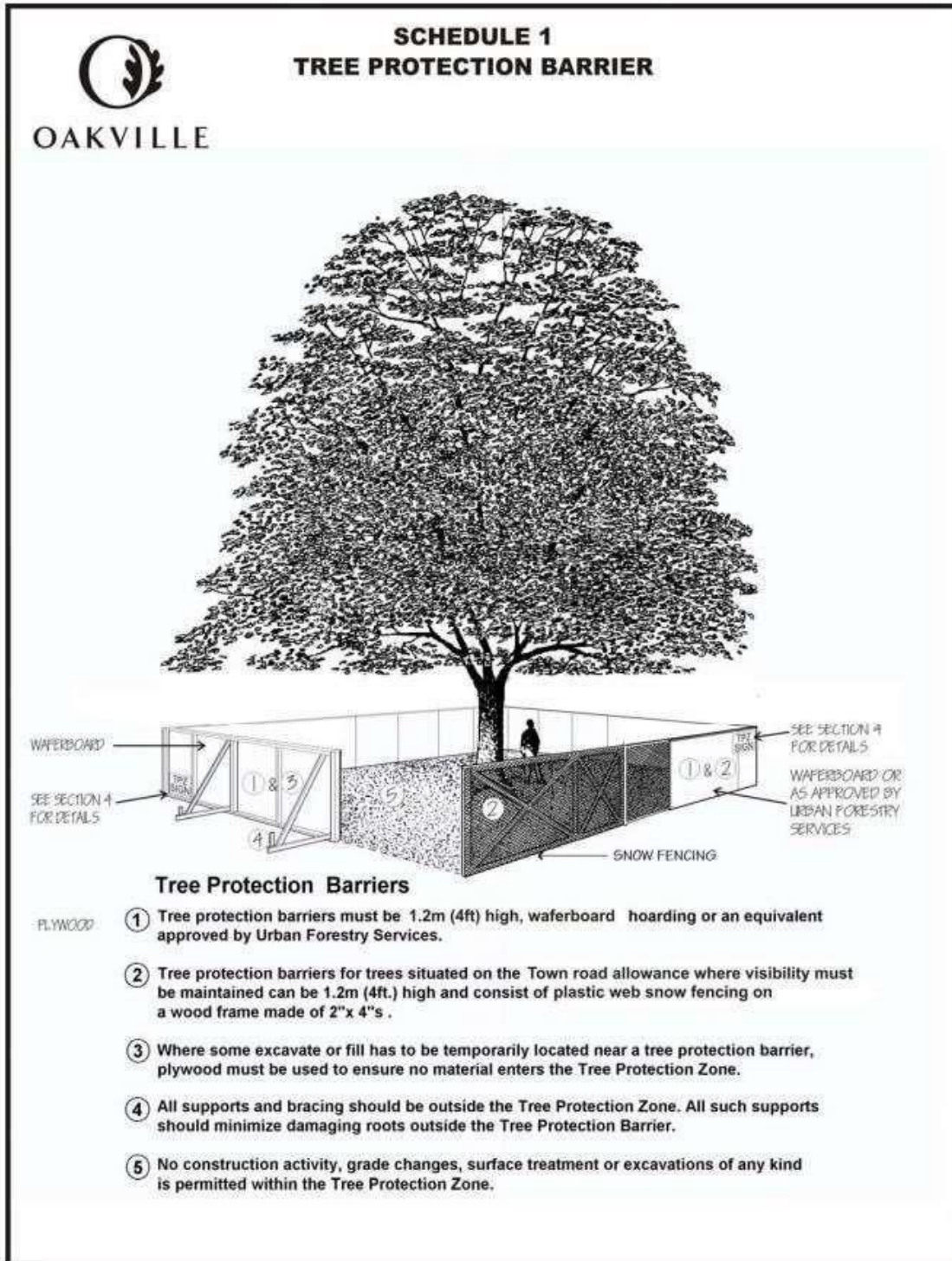
Tree Map Number	Inventory name	Botanical	DBH (cm) @ 1.4 m	Tree Ownership	Minimum Tree Protection Distance (m)	Health	Structure	Overall Condition	Tree Height (m)	Crown Width (m)	Live Crown Ratio (%)	Deadwood (%)	Construction inside Min TPZ? (Y/N)	Construction Impact (None, Low, Medium, High)	Action	Permit Required? (Y/N)	Recommendations and Observations
1	norway maple	<i>Acer platanoides</i>	17	City	2.4	Good	Good	Good	12	3	80	0	N	None	Preserve	N	
2	norway maple	<i>Acer platanoides</i>	9	City	1.8	Fair	Good	Fair	7	3	65	15	N	None	Preserve	N	Dead branches and root damage by mower
3	norway maple	<i>Acer platanoides</i>	17	City	2.4	Good	Good	Good	12	3	80	0	N	None	Preserve	N	Root damage by mower
4	american elm	<i>Ulmus americana</i>	21	City	2.4	Good	Good	Good	12	5	80	0	N	None	Preserve	N	
5	american elm	<i>Ulmus americana</i>	19	City	2.4	Good	Good	Good	12	5	80	0	N	None	Preserve	N	
6	american elm	<i>Ulmus americana</i>	17	City	2.4	Good	Good	Good	10	5	80	0	N	None	Preserve	N	
7	norway maple	<i>Acer platanoides</i>	19	City	2.4	Good	Good	Good	12	3	80	0	N	None	Preserve	N	Root damage by mower
8	coffee tree	<i>Gymnocladus dioicus</i>	5	City	1.8	Good	Good	Good	5	1	80	0	N	None	Preserve	N	
9	norway maple	<i>Acer platanoides</i>	15	City	2.4	Good	Good	Good	8	3	80	0	N	None	Preserve	N	Root damage by mower
10	norway maple	<i>Acer platanoides</i>	19	City	2.4	Good	Good	Good	12	3	80	0	N	None	Preserve	N	Root damage by mower
11	norway maple	<i>Acer platanoides</i>	17	City	2.4	Good	Good	Good	10	3	80	0	N	None	Preserve	N	
12	austrian pine	<i>Pinus nigra</i>	28	Private	2.4	Good	Good	Good	18	4	100	0	Y	High	Remove	Y	Remove for new warehouse
13	austrian pine	<i>Pinus nigra</i>	26	Private	2.4	Good	Good	Good	18	2	100	0	Y	High	Remove	Y	Remove for new warehouse
14	austrian pine	<i>Pinus nigra</i>	29	Private	2.4	Good	Good	Good	8	5	80	0	Y	High	Remove	Y	Remove for new warehouse
15	austrian pine	<i>Pinus nigra</i>	24	Private	2.4	Good	Good	Good	8	5	80	0	Y	High	Remove	Y	Small deadwood; Remove for new warehouse
16	austrian pine	<i>Pinus nigra</i>	44	Private	3.0	Good	Good	Good	8	5	80	0	Y	High	Remove	Y	Remove for new warehouse

Tree Map Number	Inventory name	Botanical	DBH (cm) @ 1.4 m	Tree Ownership	Minimum Tree Protection Distance (m)	Health	Structure	Overall Condition	Tree Height (m)	Crown Width (m)	Live Crown Ratio (%)	Deadwood (%)	Construction inside Min TPZ? (Y/N)	Construction Impact (None, Low, Medium, High)	Action	Permit Required? (Y/N)	Recommendations and Observations
17	norway maple	<i>Acer platanoides</i>	19	Private	2.4	Good	Good	Good	12	4	80	0	Y	High	Remove	Y	Remove for new driveway/entrance
18	english oak	<i>Quercus robur</i>	25	Private	2.4	Fair	Good	Fair	15	3	70	15	Y	High	Remove	Y	Dead branches; Remove for new driveway/entrance
19	english oak	<i>Quercus robur</i>	25	Private	2.4	Fair	Good	Fair	12	3	70	15	Y	High	Remove	Y	Dead branches; Remove for new driveway/entrance
20	english oak	<i>Quercus robur</i>	25	Private	2.4	Good	Good	Good	18	3	80	0	Y	High	Remove	Y	Remove for new driveway/entrance
21	english oak	<i>Quercus robur</i>	25	Private	2.4	Fair	Good	Fair	10	3	70	15	Y	High	Remove	Y	Dead branches; Remove for new driveway/entrance
22	norway maple	<i>Acer platanoides</i>	18	City	2.4	Good	Good	Good	12	4	80	0	Y	High	Remove	Y	Remove for new driveway/entrance
23	norway maple	<i>Acer platanoides</i>	24	City	2.4	Good	Good	Good	12	4	80	0	Y	High	Remove	Y	Remove for new driveway/entrance
24	austrian pine	<i>Pinus nigra</i>	42	Private	3.0	Good	Good	Good	18	4	90	0	Y	High	Remove	Y	Remove for new driveway/entrance
25	austrian pine	<i>Pinus nigra</i>	34	Private	3.0	Good	Good	Good	18	4	90	0	Y	Low	Injure	Y	New driveway/entrance in TPZ; low-impact excavation (Hydro-Vac/Air-Spade/Hand-dig) with arborist supervision and root pruning
26	austrian pine	<i>Pinus nigra</i>	24	Private	2.4	Good	Good	Good	18	4	90	0	Y	High	Remove	Y	Remove for new driveway/entrance
27	austrian pine	<i>Pinus nigra</i>	22	Private	2.4	Good	Good	Good	18	4	90	0	Y	High	Remove	Y	Remove for new driveway/entrance
28	norway maple	<i>Acer platanoides</i>	27	Private	2.4	Good	Good	Good	12	5	80	0	N	None	Preserve	N	

Tree Map Number	Inventory name	Botanical	DBH (cm) @ 1.4 m	Tree Ownership	Minimum Tree Protection Distance (m)	Health	Structure	Overall Condition	Tree Height (m)	Crown Width (m)	Live Crown Ratio (%)	Deadwood (%)	Construction inside Min TPZ? (Y/N)	Construction Impact (None, Low, Medium, High)	Action	Permit Required? (Y/N)	Recommendations and Observations
29	norway maple	<i>Acer platanoides</i>	24	Private	2.4	Fair	Good	Fair	12	5	65	15	N	None	Preserve	N	Dead branches and root damage by mower
30	norway maple	<i>Acer platanoides</i>	21	Private	2.4	Fair	Good	Fair	10	5	65	15	N	None	Preserve	N	Dead branches and root damage by mower
31	norway maple	<i>Acer platanoides</i>	17	Private	2.4	Fair	Good	Fair	10	3	65	15	N	None	Preserve	N	Dead branches
32	norway maple	<i>Acer platanoides</i>	21	Private	2.4	Good	Good	Good	10	3	80	0	N	None	Preserve	N	
33	norway maple	<i>Acer platanoides</i>	23	Private	2.4	Good	Good	Good	10	4	75	5	N	None	Preserve	N	Dead Branches
34	norway maple	<i>Acer platanoides</i>	22	Private	2.4	Good	Good	Good	12	4	80	0	N	None	Preserve	N	
35	norway maple	<i>Acer platanoides</i>	22	Private	2.4	Good	Good	Good	12	4	80	0	N	None	Preserve	N	
36	blue spruce	<i>Picea pungens</i>	9	Private	1.8	Good	Good	Good	5	2	100	0	N	None	Preserve	N	
37	blue spruce	<i>Picea pungens</i>	9	Private	1.8	Good	Good	Good	5	2	100	0	N	None	Preserve	N	
38	blue spruce	<i>Picea pungens</i>	9	Private	1.8	Good	Good	Good	5	2	100	0	N	None	Preserve	N	
39	blue spruce	<i>Picea pungens</i>	9	Private	1.8	Good	Good	Good	5	2	100	0	N	None	Preserve	N	
40	blue spruce	<i>Picea pungens</i>	9	Private	1.8	Good	Good	Good	5	2	100	0	N	None	Preserve	N	
41	blue spruce	<i>Picea pungens</i>	9	Private	1.8	Poor	Good	Poor	5	2	40	50	N	None	Preserve	N	Dead crown
42	norway maple	<i>Acer platanoides</i>	25	Private	2.4	Good	Good	Good	12	5	80	0	N	None	Preserve	N	
43	Norway spruce	<i>Picea abies</i>	22	Private	2.4	Good	Good	Good	12	4	80	0	N	None	Preserve	N	
44	Norway spruce	<i>Picea abies</i>	36	Private	3.0	Good	Good	Good	12	4	80	0	N	None	Preserve	N	
45	Norway spruce	<i>Picea abies</i>	23	Boundary	2.4	Good	Good	Good	12	4	80	0	N	None	Preserve	N	
46	red oak	<i>Quercus rubra</i>	21	Neighbour	2.4	Good	Good	Good	15	4	80	0	N	None	Preserve	N	
47	norway spruce	<i>Picea abies</i>	24	Neighbour	2.4	Good	Good	Good	12	4	80	0	N	None	Preserve	N	
48	red oak	<i>Quercus rubra</i>	32	Private	3.0	Good	Good	Good	15	4	80	0	N	None	Preserve	N	
49	norway maple	<i>Acer platanoides</i>	17	Private	2.4	Good	Good	Good	12	4	80	0	Y	High	Remove	Y	Remove for new warehouse construction

Tree Map Number	Inventory name	Botanical	DBH (cm) @ 1.4 m	Tree Ownership	Minimum Tree Protection Distance (m)	Health	Structure	Overall Condition	Tree Height (m)	Crown Width (m)	Live Crown Ratio (%)	Deadwood (%)	Construction inside Min TPZ? (Y/N)	Construction Impact (None, Low, Medium, High)	Action	Permit Required? (Y/N)	Recommendations and Observations
50	norway maple	<i>Acer platanoides</i>	21	Private	2.4	Good	Good	Good	12	4	80	0	Y	High	Remove	Y	Remove for new warehouse construction
51	blue spruce	<i>Picea pungens</i>	42	Private	3.0	Good	Good	Good	15	4	80	0	Y	High	Remove	Y	Remove for new warehouse construction
52	english oak	<i>Quercus robur</i>	48	Private	3.0	Good	Good	Good	15	3	80	0	Y	High	Remove	Y	Remove for new warehouse construction
53	english oak	<i>Quercus robur</i>	48	Private	3.0	Good	Good	Good	15	3	80	0	N	None	Preserve	N	Estimate DBH
54	english oak	<i>Quercus robur</i>	45	Private	3.0	Good	Good	Good	15	3	80	0	N	None	Preserve	N	Estimate DBH
55	english oak	<i>Quercus robur</i>	49	Private	3.0	Fair	Good	Fair	15	3	70	10	N	None	Preserve	N	Estimate DBH. Dead Branches
56	english oak	<i>Quercus robur</i>	35	Private	3.0	Fair	Good	Fair	15	3	70	10	N	None	Preserve	N	Estimate DBH. Dead Branches
57	english oak	<i>Quercus robur</i>	35	Private	3.0	Fair	Good	Fair	15	3	70	10	N	None	Preserve	N	Estimate DBH. Dead Branches
58	english oak	<i>Quercus robur</i>	39	Private	3.0	Fair	Good	Fair	15	3	70	10	N	None	Preserve	N	Estimate DBH. Dead Branches
59	english oak	<i>Quercus robur</i>	39	Private	3.0	Fair	Good	Fair	15	3	70	10	N	None	Preserve	N	Estimate DBH. Dead Branches
60	english oak	<i>Quercus robur</i>	39	Private	3.0	Good	Good	Good	15	3	80	0	N	None	Preserve	N	Estimate DBH
61	english oak	<i>Quercus robur</i>	49	Private	3.0	Good	Good	Good	15	3	80	0	N	None	Preserve	N	Estimate DBH
62	english oak	<i>Quercus robur</i>	45	Private	3.0	Good	Good	Good	15	3	80	0	N	None	Preserve	N	Estimate DBH
63	english oak	<i>Quercus robur</i>	35	Private	3.0	Good	Good	Good	15	3	80	0	N	None	Preserve	N	Estimate DBH
64	english oak	<i>Quercus robur</i>	49	Private	3.0	Good	Good	Good	15	3	80	0	N	None	Preserve	N	Estimate DBH
65	english oak	<i>Quercus robur</i>	40	Private	3.0	Good	Good	Good	15	3	80	0	N	None	Preserve	N	Estimate DBH
66	red maple	<i>Acer rubrum</i>	19	Neighbour	2.4	Good	Good	Good	10	3	80	0	N	None	Preserve	N	

Appendix 3 – Tree Protection Fencing (TPF) Detail



Appendix 4 – Tree Protection Zone (TPZ) Sign Detail

Tree Protection Zone

No grade change, storage of materials or equipment is permitted within this area.
This tree protection barrier must not be removed without the written authorization of the Town
of Oakville.

Report any contraventions to

Contact Name _____ Tel No. _____

Unauthorized removal of the tree protection barrier or other contraventions may result in
prosecution.

Appendix 5 – References

1. ISA, 2001-2011. Best Management Practices, Books 1-9, Companion publications to ANSI A300 Standards for Tree Care
2. Dujesiefken, Dr. Dirk, 2012. Director of the Institute for Tree Care in Germany, The CODIT Principle, research presented on cambial regrowth on trees after injury at the Annual ISA Conference in Kingston Ontario
3. Sinclair and Lyon, 2005. Diseases of Trees and Shrubs, Second Edition
4. ISA, 2010. Glossary of Arboricultural Terms
5. Neely and Watson, ISA, 1994 and 1998. The Landscape Below Ground 1 and 2
6. Matheny and Clark, ISA, 1994. A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas, 2nd Edition
7. Matheny and Clark, ISA 1998. Trees and Development, A Technical Guide to Preservation of Tree During Land Development
8. PNW-ISA, 2011. Tree Risk Assessment in Rural Areas and Urban/Rural Interface, Version 1-5
9. Todd Hurt & Bob Westerfield, 2005. Tree Protection During Construction and Landscaping Activities

Appendix 6 – Glossary of Common Arboricultural Terms

Arborist	A professional who possesses the technical competence gained through experience and related training to provide for or supervise the management of trees and other woody plants in residential, commercial, and public landscapes.
ANSI A300	Acronym for American National Standards Institute. In the United States, industry-developed, national consensus standards of practice for tree care.
Bark Tracing	Cutting away torn or injured bark to leave a smooth edge.
Branch Bark Ridge	Raised strip of bark at the top of a branch union, where the growth and expansion of the trunk or parent stem and adjoining branch push the bark into a ridge.
Callus wood	Undifferentiated tissue formed by the cambium, usually as the result of wounding.
Clinometer	A device used to calculate the height of trees.
Consulting Arborist	An Arboricultural consultant is one of the following: <ul style="list-style-type: none"> • American Society of Consulting Arborists, Registered Consulting Arborist (ASCA RCA# ___) • International Society of Arboriculture, Board Certified Master Arborist (ISA BCMA #____B) • ISA Certified Arborist/Municipal Specialist in good standing for a minimum of 6 years with 6 years of proven experience in a management role related to arboriculture, and has attested and signed to a code of ethics related to arboriculture (ISA#_____)
Compartmentalization	Natural defense process in trees by which chemical and physical boundaries are created that act to limit the spread of disease and decay organisms
Critical Root Zone – (CRZ)	Area of soil around a tree where the minimum amounts of roots considered critical to the structural stability or health of the tree are located. CRZ determination is sometimes based on the drip line or a multiple of dbh (12:1, 12cm of ground distance from the trunk for every cm of dbh) but because root growth is often asymmetric due to site conditions, on-site investigation is preferred.
Daylighting	Also known as Hydro-vac, this is the process by which soil is vacuumed up. In the context of tree care this allows workers to access the soil below the roots without mortal damage to significant roots.
DBH	Acronym for tree diameter at breast height. Measured at 1.4m above ground.
Decurrent	Rounded or spreading growth habit of the tree crown.
Directional Pruning	Providing clearance by pruning branches that could significantly affect the integrity of utility facilities or other structures and leaving in place branches that could have little or no effect.
Dripline	Imaginary line defined by the branch spread of a single parent or group of plants

Excurrent	Tree growth habit characterized by a central leader and a pyramidal crown.
Included bark	Bark that becomes embedded in a crotch (union) between branch and trunk or between codominant stems. Causes a weak structure.
Lion's Tailing	Poor pruning practice in which an excessive number of branches are thinned from the inside and lower part of specific limbs or a tree crown, leaving mostly terminal foliage. Results in poor branch taper, poor wind load distribution, and higher risk of branch failure.
MTPZ	Acronym for Minimum Tree Protection Zone, also known as the Structural Root Zone (SRZ), which is the distance from the tree equal to 6 times the dbh, within which the likelihood of encountering roots that are structural supports for the tree.
Moment	Rotational force that is created by any line force on a body. The magnitude of a moment is defined as the product of the force magnitude and perpendicular distance from the line of action of the force to the axis of which the moment is being calculated.
Mortality Spiral	A sequence of stressful events or conditions causing the decline and eventual death of a tree.
Mulch	Material that is spread or sometimes sprayed on the soil surface to reduce weed growth, to retain soil moisture and moderate temperature extremes, to reduce compaction from pedestrian traffic or to prevent damage from lawn-maintenance equipment, to reduce erosion or soil spattering onto adjacent surfaces, to improve soil quality through its eventual decomposition, and/or to improve aesthetic appearance of the landscape. Mulch can be composed of chipped, ground, or shredded organic material such as bark, wood, or recycled paper; unmodified organic material such as seed hulls; organic fiber blankets or mats; or inorganic material such as plastic sheeting.
Organic Matter	Material derived from the growth (and death) of living organisms. The organic components of the soil.
CRZ	Acronym for Critical Root Zone, also known as the Critical Root Zone (see definition above), within which there is a high likelihood of encountering roots that are necessary for the survival of the tree.
Project Arborist	The consulting arborist retained to provide all tree preservation recommendations to the project manager or contractors on a given construction project.
Qualified Arborist	An arborist who has documented related training (i.e. ISA, MTCU, or equivalent) and on-the-job experience (minimum of 5 years)
Radial trenching	Technique for aerating the soil or alleviating compaction around a tree by removing and replacing soil (which may be amended) in trenches (typically 300mm deep and 150mm wide) made in a spoke like pattern (radially from the trunk) in the root zone to improve conditions for root growth.
Reaction Wood	Wood formed in leaning or crooked stems or on lower or upper sides of branches as a

	means of counteracting the effects of gravity.
Removal Cut	A cut that removes a branch at its point of origin. Collar cut.
Reduction Cut	A pruning cut that reduces the length of a branch or stem back to a lateral branch large enough to assume apical dominance.
Resistograph®	A brand name of a device consisting of a specialized micro-drill bit that drills into trees and graphs density differences that are used to detect decay.
Soft-Scaped	Landscaping practices that do not involved solid or deeply dug foundations. Patios consisting of slab rocks laid on-top of the soil with minimal excavation and base (less than 10cm) and causing minimal damage to existing tree roots.
Static Support System	Cabling system that utilizes rigid materials such as rods and steel cables to limit movement and provide constant support of limbs.
Structural cells	Modular system consisting of units of soil and integrated support structures that serve both as a foundation for paved surfaces and a hospitable environment for tree root growth,
Structural pruning	Pruning to establish a strong arrangement or system of scaffold branches.
Structural Soil™	Pavement substrate that can be compacted to meet engineering specifications yet remains penetrable be tree roots in the urban environment. Composed of angular crushed stone, clay loam, and hydrogel mixed in a weight ratio of 100:20:0.03. Developed at the Urban Horticulture Institute, Cornell University, Ithaca, NY.
Supersonic Air Excavation Techniques (SSAT)	A methodology using a device that directs a jet of highly compressed air to excavate soil. Used within the root zone of trees to avoid or minimizing damage to the roots, or near underground structures such as pipes and wires to avoid or minimize damage to them.
Tree Protection Zone (TPZ)	Defined area within which certain activities are prohibited or restricted to prevent or minimize potential injury to designated trees, especially during construction. TPZ is sometimes based on a minimum multiple of dbh (e.g. 6:1, 6cm of ground distance from the trunk for 1cm of dbh)
Walls	Trees have 4 walls in a process known as compartmentalization. <ul style="list-style-type: none"> o Wall 1 prevents decay moving up and down in a tree o Wall 2 prevents decay moving inward in a tree o Wall 3 prevents decay moving laterally in a tree o Wall 4 is the new growth formed on the outside of the tree, callus growth.
Woundwood	Lignified, differentiated tissues produced on woody plants after wounding.

Appendix 7 – Arborist Qualifications



Joseph Steinfeld is a Consulting Arborist with Davey Resource Group. His formal education includes a Bachelor of Science in Ecology, Evolution, and Natural Resources with a focus in Forest and Landscape Ecology from Rutgers, the State University of New Jersey. Mr Steinfeld has ten years of varied work experience in the forestry, arboriculture, and ecological assessment fields. Mr. Steinfeld has worked with DRG for over four years as an Inventory Arborist, Asian Longhorned Beetle Damage Surveyor, Urban Forester, Site Manager, and Consulting Arborist.



Pawan Paudyal is a Consulting Arborist with Davey Resource Group. His formal education includes a Bachelor of Science in forestry from Hemwati Nandan Bahuguna Garhwal University, India and a Master in forest Ecology and Management from Helsinki University. Mr. Paudyal has 10 years of varied work experience in forestry, climate change and environment assessment fields. Mr. Paudyal has worked with DRG as Consulting Arborist.

Appendix 8 – Photographs



Figure 1 Tree #1-3



Figure 2 Trees #4-5



Figure 3 – Tree#6



Figure 4 Tree# 7



Figure 5 tree# 8-11



Figure 6 Trees#12-16



Figure 7 Tree#17



Figure 8 Trees#18-21



Figure 9 Trees 22-23



Figure 10 Trees#24-27



Figure 11 Trees# 28-30



Figure 12 Trees 29-34



Figure 13 Tree#35



Figure 13 Trees#36-38



Figure 14 Trees#39-41



Figure 15 Trees#42



Figure 16 Trees# 43-45



Figure 17 Trees# 46-47



Figure 18 Tree#48



Figure 19 Trees49-50



Figure 20 Tress



Figure 21 Trees#52-54



Figure 22 Tress 555-56



Figure 23 Trees 57-60



Figure 24 Trees# 61-63



Figure 25 Trees#64-65



Figure 26 Trees#66

Conditions of Assessment Agreement

This Conditions of Assessment Agreement is made pursuant to and as a provision of Davey Resource Group, a division of The Davey Tree Expert Co. of Canada, Limited (“Davey”), providing tree assessment services as agreed to between the parties, the terms and substance of which are incorporated in and made a part of this Agreement (collectively the “Services”).

Trees are living organisms that are subject to stress and conditions and which inherently impose some degree or level of risk. Unless a tree is removed, the risk cannot be eliminated entirely. Tree conditions may also change over time even if there is no external evidence or manifestation. In that Davey provides the Services at a point in time utilizing applicable standard industry practices, any conclusions and recommendations provided are relevant only to the facts and conditions at the time the Services are performed. Given that Davey cannot predict or otherwise determine subsequent developments, Davey will not be liable for any such developments, acts, or conditions that occur including, but not limited to, decay, deterioration, or damage from any cause, insect infestation, acts of god or nature or otherwise.

Unless otherwise stated in writing, assessments are performed visually from the ground on the above-ground portions of the tree(s). However, the outward appearance of trees may conceal defects. **Therefore, to the extent permitted by law, Davey does not make and expressly disclaims any warranties or representations of any kind, express or implied, with respect to completeness or accuracy of the information contained in the reports or findings resulting from the Services beyond that expressly contracted for by Davey in writing, including, but not limited to, performing diagnosis or identifying hazards or conditions not within the scope of the Services or not readily discoverable using the methods applied pursuant to applicable standard industry practices.** Further, Davey’s liability for any claim, damage or loss caused by or related to the Services shall be limited to the work expressly contracted for.

In performing the Services, Davey may have reviewed publicly available or other third- party records or conducted interviews and has assumed the genuineness of such documents and statements. Davey disclaims any liability for errors, omissions, or inaccuracies resulting from or contained in any information obtained from any third- party or publicly available source.

Except as agreed to between the parties prior to the Services being performed, the reports and recommendations resulting from the Services may not be used by any other party or for any other purpose. The undersigned also agrees, to the extent permitted by law, to protect, indemnify, defend and hold Davey harmless from and against any and all claims, demands, actions, rights and causes of action of every kind and nature, including actions for contribution or indemnity, that may hereafter at any time be asserted against Davey or another party, including, but not limited to, bodily injury or death or property damage arising in any manner from or in any way related to any disclaimers or limitations in this Agreement.

By accepting or using the Services, the customer will be deemed to have agreed to the terms of this Agreement, even if it is not signed.

Acknowledged by:

Name of Customer: _____

Authorized Signature: _____

Date: _____