Arborist Report

Pre-Construction Assessment

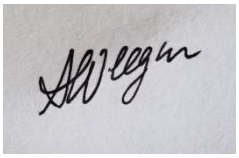
Prepared For:
Greenstation Landscaping

Site Address:
130 Southdale Road West
London, ON

June 29th, 2023

Prepared By:

Alex Weegen



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Contents

Summary

The following Arborist Report is with respect to the proposed construction at 130 Southdale Rd W, London, ON. This report serves to document the condition and provide recommendations to preserve trees within 6m of the proposed construction at the above address in advance of future construction work.

10 trees were assessed on site:

- Boundary trees: **0**
- Private trees: **10 (one of which straddles the property line with 126 Southdale Rd W)**
- City-owned trees**: 0**

7 trees can be fully protected during construction.

- We recommend installing Tree Protection Fencing (TPF) to protect their roots from soil compaction and damage during construction. TPF includes both vertical and horizontal hoarding and should be installed as indicated in the Tree Protection Plan (TPP).
- No digging or material storage is to take place within their Tree Protection Zones (TPZs) and the trees should not be injured.

2 trees will have construction within their TPZs and/or are expected to be injured.

- We recommend excavation by low-pressure Hydro-Vac (at 500psi) within the TPZ of these trees under supervision of a Certified Arborist as well as root pruning by a Certified Arborist prior to full depth excavation for the trench.

1 tree is located too close to the planned construction to preserve. This tree will require removal.

- We recommend a Certified Arborist be contracted to perform the tree removals.

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

This report is to accompany the Tree Protection Plan, which shall be printed to scale at 36x48" (Arch E).

Introduction

Davey Resource Group (DRG) was retained by the client, Greenstation Landscaping, to develop an Arborist Report and Tree Protection Plan (TPP) for the proposed construction at 130 Southdale Rd W, London, ON. The intent of this report is to provide the client with the documentation necessary for work to commence.

An inventory and assessment of all the trees within the scope of the assignment was conducted. The Arborist was to document the current condition, size, and location of the trees as they relate to the proposed work. In accordance with City of London requirements for Arborist Reports and Tree Protection Plans, the whole of the property as well as the closest 6 meters of the adjacent properties and the city rights-of-way were surveyed for this report. All trees over 5cm in diameter within the scope of the survey were included in an inventory. All trees within the scope of the survey were included in an inventory and assessed for protection or removal needs. Small trees and 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 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).

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

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 is based on the project scope and details for tree preservation as discussed. All proposed construction methods are limited to what was provided in the site plans. Estimates, measurements and comments regarding tree preservation were based on the proposed construction plans and field observations.

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. More data on risk may be obtained through a basic or advanced ISA Tree Risk Assessment.

Methods

- Tools used to assess the trees included a metric DBH measuring tape, metric measuring tape, range finder, hypsometer and camera.
- All trees over 5 cm DBH on Private, City and Boundary property, as well as within 6 meters of planned construction work were included in the inventory. Trees located over 6m of construction were not inventoried.
- Trees were studied for their proximity to existing and planned structures to determine recommendations or precautions for trees requiring removal or injury.
- Where there were multiple stems on a tree, the DBH for all trunk diameters at 1.4 m above the ground, sums of squares was utilized to provide a DBH for this report.

Observations

- The site was inspected on June 29th by Certified Arborist Alex Weegen.
- Weather condition was 21ºC and sunny with advisories against air quality due to pollution from wildfires.
- No evidence of construction was present, and work had not yet started.
- No material storage or soil compaction within Tree Protection Zones was observed.
- Survey stakes were found at the rear of the property; however, none were found on the street-side of the property.
- 10 trees were assessed for this report and labeled #1-10 in the Tree Protection Action Key and Tree Protection Plan included within Appendices 1 and 3.
    - 9 trees are located on neighbouring properties 126 Southdale Rd W and 166 Southdale Rd W; 1 tree straddles the property line between 130 Southdale Rd W and 126 Southdale Rd W.
- **6** trees were in good condition and **2** were in fair condition, **1** was in poor condition and **1** tree was found dead/dying onsite.
- All trees within 6m of proposed construction and related activity were inventoried and can be observed in the Tree Protection Action Key. Any trees outside of a 6m range of construction were not inventoried but were indicated in the Tree Protection Plan.
- 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.

Trees in London are protected by City by-law C.P.-1555-252 prohibiting the removal and injury of certain trees. Under the by-law, the removal or injury of any tree within a specified "Tree Protection Area" (TPA) is prohibited without a permit issued by the City of London. The TPA encompasses ravines, natural areas, and forest buffer zones within the Urban Growth Boundary of London. Additionally, the by-law protects "Distinctive Trees", defined as any tree of 50cm DBH or greater in any area of the City excluding the TPA. The City of London also protects trees existing within the any City owned right-of-way. Injury is defined as harming, damaging, or otherwise impairing the natural function of a tree, including the cutting of roots within a tree's "Critical Root Zone". The CRZ is the area of land within a radius of 10cm from the trunk of a tree for every 1cm of trunk diameter at 1.4m high.

The fees for tree injury or removal permits as of 2023 are $75 for any tree below 50cm within the TPA, and $100 for any Distinctive Tree, or any tree above 50cm within the TPA. Fees are waived for trees that are dead, dying, hazardous, or subject to court order.

As a condition of tree removal permit approval, the City may impose replacement tree planting requirements. If a property subject to a tree removal permit does not have reasonable space for accommodating tree planting, cash in lieu payments of $350 per replacement tree would be required to fund tree planting on streets and city properties.

Tree Protection Hoarding (Appendix 4)

It is in the best interest of the client to take every precaution possible to minimize damage to trees where work is taking place, and to avoid any unnecessary injury to trees outside of work areas. To accomplish this, hoarding (Tree Protection Fencing (TPF)) is to be used on this construction site. The distance from trees that hoarding is installed is typically defined by a radial distance pursuant to the city regulations. In the City of London, this distance is to the dripline of the tree. However, it must be understood that sometimes this distance is not achievable due to hardscapes or other infrastructure being too close. In most situations, hoarding does not need to be installed beyond the closest extent of impermeable and/or paved surfaces. 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.)

On most landscapes within a private property, solid plywood hoarding best serves to protect tree trunks from inadvertent damage. However, along city streets and at driveway entrances, it is recommended that high-visibility snow fence be affixed to a wooden beam frame, which allows for proper tree protection while allowing vehicle and pedestrian traffic to maintain visibility through the tree protection zone.

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 in good condition the hoarding to prevent this from happening before and throughout the entire construction.

Root Pruning

Similar to pruning the upper canopy of the tree, roots are best removed (if needed) via target pruning practices and not by being torn off. Using mechanical tools or excavation equipment to remove or prune roots often leaves ragged edges, stripped bark, or splintered tissue. These surfaces are difficult for a tree to heal over and provide a high surface area for potential decay pathogens (bacteria, fungus, insects), to enter a tree. Minimizing the cross section of pruned roots allows for the most efficient recovery for the tree. Roots that are larger in diameter than 20% of its parent trunk's DBH are structurally integral to a tree and must be pruned with discretion. Root pruning is recommended to be carried out by a licensed professional, such as an ISA Certified Arborist.

Tree Protection Signage

It is recommended for the client to create Tree Protection Signs to affix to tree protection hoarding. A sign should be displayed on the tree protection fencing. These signs could be made in bulk at a discounted rate and installed on the hoarding in various locations. An example Tree Protection Zone sign is included within this report in Appendix 5. Signage informs the public and reminds the contractors 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 TPZs. At no time are materials, vehicles, traffic or debris to be stacked, staged, or piled inside the hoarding (Tree Protection Fencing).

Conclusion

To account for the proposed construction at 130 Southdale Rd W, London, ON, we assessed 10 trees for retention, protection, injury, or removal.

10 trees were assessed on site:

- Boundary trees: **0**
- Private trees: **10 (one of which straddles the property line with 126 Southdale Rd W)**
- City-owned trees**: 10**

7 trees can be fully protected during construction.

- We recommend installing Tree Protection Fencing (TPF) to protect their roots from soil compaction and damage during construction. TPF includes both vertical and horizontal hoarding and should be installed as indicated in the Tree Protection Plan (TPP).
- No digging or material storage is to take place within their Tree Protection Zones (TPZs) and the trees should not be injured.

2 trees will have construction within their TPZs and/or are expected to be injured.

- We recommend excavation by low-pressure Hydro-Vac (at 500psi) within the TPZ of these trees under supervision of a Certified Arborist as well as root pruning by a Certified Arborist prior to full depth excavation for the trench.

1 tree is located too close to the planned construction to preserve. This tree will require removal.

- We recommend a Certified Arborist be contracted to perform the tree removals.

Recommendations

In accordance with the numbering of trees in the inventory listed on the Tree Protection Action Key (TPAK, Appendix 1), we have provided the following recommendations.

- Trees to be fully protected are specified with "Protect" in the "Action" column in the TPAK
    - We recommend the client install and properly maintain Tree Protection Fencing (TPF) and horizontal hoarding (Appendix 3) following the Tree Protection Plan (Appendix 2) prior to and during construction work. We recommend all materials storage be kept outside of TPZs at all times during construction.
    - Tree Protection Signage provided should be affixed to all Tree Protection Fences.
    - Tree # 5 will require horizontal hoarding within the TPZ and tree #6 will require vertical hoarding.
- Trees likely to be injured are specified with "Injure" in the "Action" column in the TPAK.
    - We recommend excavation by low-pressure Hydro-Vac (500PSI) within the TPZs of trees to be injured under supervision of a Certified Arborist as well as root pruning by a Certified Arborist prior to full depth excavation.
    - Trees #3, 6, 8, & 9 will require low-pressure hydro-vac within the MTPZ (see TPAK and TPP, Appendices 1 & 3, respectively).
- Where the sidewalk is not present, construction vehicles must stay within a 4m range of the proposed watermain construction to avoid entering TPZ.
    - No equipment of any sort shall be stored within the TPZ of the protected trees except where hard surfaces are already present. This will be done to avoid compaction of the ground throughout the TPZ.
- 2 trees are required to be planted to replace tree #1, which is recommended for removal. Suggested planting locations have been indicated of the Tree Protection Plan (Appendix 3). Additionally, the City of London's approved species list and has been included in this report (Appendix 2).

Appendix 1 – Tree Protection Action Key (TPAK)

Tree Map Number	Species	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)	Notes and Recommendations
1	Maple, Silver	*Acer saccharinum*	54	Boundary	3.6	Good	Good	Good	16	9	80	25	Y	High	Remove	Y	Multi-stem. 4.2 m from sidewalk on property line. Tree recommended for removal, as over 30% of the roots and canopy will need to be removed for construction. Two replacement trees required.
2	Maple, Norway	*Acer platanoides*	40	Neighbour	2.4	Fair	Fair	Fair	14	8	80	45	N	None	Preserve	N	Tree located at 126 Southdale Rd W.
3	Maple, Norway	*Acer platanoides*	61	Neighbour	4.2	Poor	Fair	Poor	14	12	70	45	Y	Low	Injure	Y	Tree located at 126 Southdale Rd W, 3.8m from property line. Hydro-Vac excavation at low pressure (500 PSI) recommended along foundation over-dig (1.2m beyond building footprint). Roots require pruning by Certified Arborist.
4	Maple, Norway	*Acer platanoides*	50	Neighbour	DEAD	Dead	Dead	Dead	14	0	0	100	N	None	Preserve	N	Tree located at 126 Southdale Rd W, <1m from property line. Multi-stem.
5	Spruce, White	*Picea glauca*	28	Neighbour	1.8	Fair	Fair	Fair	14	6	90	14	N	None	Preserve	N	Tree located at 166 Southdale Rd W, 2.3m from property line. Horizontal hoarding comprised of double-layer 3/4" plywood above a bed of mulch.
6	Maple, Norway	*Acer platanoides*	55	Neighbour	3.6	Good	Good	Good	14	12	85	15	N	None	Preserve	N	Tree located at 166 Southdale Rd W, 3.6m from property line. Tree Protection Fencing at parking lot over-dig limit.
7	Maple, Norway	*Acer platanoides*	36	Neighbour	2.4	Good	Good	Good	14	5	90	10	N	None	Preserve	N	Tree located at 166 Southdale Rd W, 2.8m from property line.

Tree Map Number	Species	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)	Notes and Recommendations
8	Pine, Austrian	*Pinus nigra*	39	Neighbour	2.4	Good	Good	Good	14	6	85	15	Y	Medium	Injure	N	Tree located at 166 Southdale Rd W, 1.8m from property line. Hydro-Vac excavation at low pressure (500 PSI) required for asphalt installation. Roots require pruning by Certified Arborist.
9	Pine, Austrian	*Pinus nigra*	41	Neighbour	3.0	Good	Good	Good	14	6	90	15	Y	Medium	Injure	N	Tree located at 166 Southdale Rd W, 1.8m from property line. Hydro-Vac excavation at low pressure (500 PSI) required for asphalt installation. Roots require pruning by Certified Arborist.
10	Pine, Austrian	*Pinus nigra*	36	Neighbour	2.4	Good	Good	Good	14	4	5	20	N	None	Preserve	N	Tree located at 166 Southdale Rd W, 4m from property line.

Appendix 2 – City of London Species List

The following chart contains trees approved for replanting as well as a list of species that are not permitted for use.

APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Acer campestre** Hedge Maple	Non-Continental	Boulevard	Compact form/trunk suckers require extra maintenance.	Large	Rounded	7
Acer x freemanii Hybrid Soft Maple	Native to Ontario	Boulevard	Caution: Many cultivars of *Acer rubrum* and *A. saccharinum* exist under the name Freemanii, each with different characteristics	Large	Oval-Rounded	Autumn Fantasy, Indian Summer and Morgan all 1 Autumn Blaze 7
Acer ginnala** Amur Maple	Non-Continental	Boulevard	(by prior approval Only) Multi-stem Compact form/red & yellow face colour/lots of seeds/tends to sucker/specify single stem form	Small	Rounded	4
Acer nigrum Black Maple	Native to Ontario	Boulevard Park	Lots of seed for winter interest/rare/needs moist soil	Large	Oval	~7 (assumed to be same as sugar maple)
Acer pennsylvanicum Striped Maple	Native to Ontario	Boulevard Park	Specify single stem.	Medium	Rounded	6
Acer pseudoplatanus** Sycamore Maple	Non-Continental	Boulevard	Very pollution and salt tolerant Cankers cause high maintenance	Large	Oval-Rounded	8
Acer rubrum Red Maple ▪ 'October Glory' ▪ 'Red Sunset'	Native to Ontario	Boulevard Park	Green summer foliage & yellow to red fall colour tolerates wet soil	Large	Oval-Rounded	*1 *1
Acer saccharinum Silver Maple	Native to Ontario	Boulevard Park	Fast growing softwood maple; Maintenance issues as tree nears maturity due to weak wood.	Large	Oval-Rounded	Males: 9 Females: *1
Acer saccharum *Sugar Maple*	Native to Ontario	Boulevard Park	Upright form/fall colour varies/prefers good drainage/shallow roots/salt sensitive	Large	Oval-Rounded	7
Acer spicatum Mountain Maple	Native to Ontario	Boulevard Park	Specify single stem. Shade tolerant, seldom thriving in the open. Prefers cool shade. May spread by root shoots.	Small	Oval-rounded	Not available
Acer tataricum** Tatarian Maple	Non-Continental	Boulevard	Specify single stem. Good red & yellow fall	Medium	Rounded	5

APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Aesculus glabra Ohio Buckeye	Native to Ontario	Boulevard	Untested in London area and may suffer winter problems. Likes moist soil. *For use in limited circumstances*	Medium	Oval	7
Aesculus hippocastanum Horsechestnut ▪ 'Baumannii'	Non-Continental	Boulevard	Good spring flower with no fruit/limit use due to disease susceptibility	Large	Rounded	7
Amelanchier Arborea Downy Serviceberry	Native to Ontario	Boulevard Park	Showy flower & fruit/ tolerant of wet & dry soil	Medium	Rounded	Not available
Amelanchir canadensis Shadblow Serviceberry	Native to Ontario	Boulevard Park	Difficult to maintain single stem Four-season interest. Tolerates moist soil	Medium	Rounded	Not available
Amelanchier laevis Smooth Serviceberry	Native to Ontario	Boulevard Park	Multi-stem specimens by prior approval only	Small	Rounded	3
Asimina triloba Pawpaw	Native to Ontario	Park	Large fruit has food value to humans	Large	Rounded	
Betula alleghaniensis Yellow Birch	Native to Ontario	Parks	Interesting bark features and good fall colour	Large	Rounded-Spreading	7 (but only has a short blooming period)
Betula papyrifera White Birch	Native to Ontario	Parks	Interesting bark features and good fall colour	Large	Rounded-Oval	7
Carpinus betulus European Hornbeam 'Fastigiata'	Non-Continental	Boulevard	Difficult to transplant Keep away from road salt & spray	Medium	Pyramidal-Oval	8
Carpinus caroliniana Blue beech or Musclewood	Native to Ontario	Boulevard Parks	Difficult to transplant/keep away from road salt & spray/likes wet soil/thin bark and sculptured trunk	Medium	Rounded	8 (Rating for genus only)
Carya cordiformis Bitternut Hickory	Native to Ontario	Parks	Difficult to transplant due to large tap root, messy fruit	Large	Oval-Vase	8-10* (Rating for genus only)
Carya glabra Pignut Hickory	Native to Ontario	Parks	Difficult to transplant due to large tap root, messy fruit	Large	Oval-Vase	8-10*
Carya laciniosa Big Shellbark Hickory	Native to North America	Parks	Difficult to transplant due to large tap root, messy fruit	Large	Oval-Vase	8-10*
Carya ovata Shagbark Hickory	Native to Ontario	Parks	Difficult to transplant due to large tap root, messy fruit	Large	Oval-Vase	10

APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Celtis laevigata Sugarberry	Native to North America	Boulevard Park	Compact form/good in moist soils	Large	Vase	8
Celtis Occidentalis Common Hackberry	Native to Ontario	Boulevard Park	Requires pruning for general form. Very tolerant.	Large	Vase	8
Cercidiphyllum japonicum Katsura Tree	Non-Continental	Boulevard	Multi-stem by prior approval only. Difficult to transplant. Thin bark. Needs supplemental water.	Large	Rounded	Males: 8 Females: *1
Cercis canadensis Redbud	Native to Ontario	Boulevard Park	Seeds readily. Suitable for lawns but not formal boulevard due to low branching.	Medium	Vase-Rounded	5
Cladrastis kentukea (lutea) Yellowwood (Single Stem Only)	Native to North America	Boulevard	Few problems/use local seed sources or stock only/prune early	Large	Rounded	5
Cornus alternifolia Alternate-leaf Dogwood	Native to Ontario	Boulevard Park	Use local winter hardy material only Specify single stem	Medium	Rounded	5
Cornus florida Flowering dogwood	Native to Ontario	Park	Specify single stem only. Use local winter hardy material only/ good flower/ specify single stem Can be very sensitive. Prefers acid soil, Limited use only.	Small	Rounded	5
Cornus kousa Kousa dogwood	Non-Continental		Resistant to dogwood anthracnose; berries have human food value	Small	Vase	5
Corylus colurna Turkish Hazal	Non-Continental	Boulevard	Good form/ difficult to transplant/ winter interest/ needs supplemental water	Large	Pyramidal	8
Crataegus (varieties) Hawthorns	*(Dependent on species)*	Boulevard Park	Thornless & disease resistant varieties only. * For use in limited circumstances *Crataegus monogyna* is invasive*	Medium	Rounded	4
Fagus grandifolia American Beech	Native to Ontario	Boulevard Park		Large	Oval	7
Fagus sylvatica European Beech	Non-Continental	Park	Needs moist soil/different leaf colours with varieties/sensitive to activity within root zone/leaves persist through winter/thin bark	Large	Oval-Rounded	7
Fagus orientalis Oriental beech	Non-Continental	Park		Large	Oval-Rounded	7

APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Ginkgo biloba Maidenhair tree (Male cultivar only)	Non-Continental	Boulevard	Good yellow fall colour/thin bark/tolerant of city conditions & pollution/slow growing but very large at maturity/virtually pest and disease free	Large	Pyramidal Spreading	Males: 7 Females: *2
Gleditsia triacanthos* var. *inermis Thornless Honey Locust ▪ 'Shademaster' ▪ 'Skyline'	Native to North America	Boulevard	Provides a filtered shade/susceptible to defoliation by leafhopper/susceptible to canker and other pests and diseases	Large	Spreading	Males: 7 Females: *1 Bisexual: 4
Gymnocladus dioicus Kentucky Coffee tree	Native to Ontario	Park	Male variety only in boulevard **For limited circumstances*	Large	Oval	Males: *9 Females: *1
Halesia tetraptera Carolina Silverbell	Native to North America	Park	Low branched tree with broad, rounded crown/reserve for lawn areas	Medium	Large	3
Juglans nigra Black Walnut	Native to North America	Park	Messy fruit/needs large area ** For use in limited circumstances*	Large	Oval	8-*9
Koelreuteria paniculata Goldenrain tree	Non-Continental	Boulevard Park	Good yellow flower & fruit/susceptible to winter damage/weak	Medium	Rounded	4
***Laburnum* (varieties)** Golden chain tree	Non-Continental	Park	Poisonous pea-like seeds. yellow chain like flower/winter hardy local varieties only/borderline hardiness ** For use in limited circumstances*	Medium	Rounded	7
Liquidambar styraciflua Sweetgum	Native to Eastern Europe & North America	Boulevard Park	Borderline hardy – good for sheltered locations, lawn areas **For limited circumstances*	Large	Rounded	7
Liriodendron tulipifera Tulip tree	Native to Ontario	Boulevard Park	Good flowers and yellow fall colour/local sources/moist well drained soil/very large tree most appropriate for lawn areas/somewhat weak wooded	Large	Rounded	4
Maackia amurensis** Amur Maackia	Non-Continental	Boulevard	Small, round headed tree/slow growing/summer flowering/bronze coloured bark	Small	Rounded	3
Maclura pomifea Osage Orange	Native to Ontario	Park only	**For use in limited circumstances*	Large	Rounded	Males: *9 Females: *2

APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Magnolia acuminata Cucumber tree	Native to Ontario	Boulevard Park	Status: Endangered	Medium	Oval-Rounded	Deciduous:6 Evergreen: 5
***Malus* (most)** ** Flowering & Domestic Crab Apple:	*(Dependent on species)*	Boulevard	Maintenance problems/disease & insect problems/tolerates most soils Choose persistent fruit- holding, or poorly-fruiting types.	Small to Medium	Rounded-Spreading	4
Malus coronia Wild Crabapple	Native to Ontario	Park		Large	Rounded	4 (Genus only)
Nyssa sylvatica Black Gum	Native to Ontario	Park	Difficult to transplant due to tap root, interesting summer and fall foliage, not for heavily polluted areas	Medium	Rounded -Oval	Males: 9 Females: 1
Ostrya virginiana Hop Hornbeam or Ironwood	Native to Ontario	Boulevard Park	Mainly an understory species	Medium	Oval	7
Phellodendron amurense Amur corktree	Non-Continental	Boulevard	Good winter texture in bark/lots of black berries/use in protected areas	Medium	Spreading	Males: 8 Females: 1
Pinus strobus White Pine	Native to Ontario	Park Boulevard	Locate with care in boulevards, due to possible sight line and access issues when mature (bushy). Avoid *Ribes* (alternate host for white pine blister rust)	Large	Pyramidal	4
Platanus x acerifolia London Planetree	Hybrid of *Platanus occidentalis* (N. America) and *Platanus orientalis (Europe)*, so has no native range[11]	Boulevard	Frost cracks on trunk/attractive peeling bark/fruit can cause problems/very large at maturity – reserve for large lots and lawn areas	Large	Spreading	9
Platanus occidentalis *Sycamore*	Native to Ontario	Boulevard Park	Frost cracks on trunk/attractive peeling bark/fruit can cause problems/very large at maturity – reserve for large lots and lawn areas	Large	Spreading	9

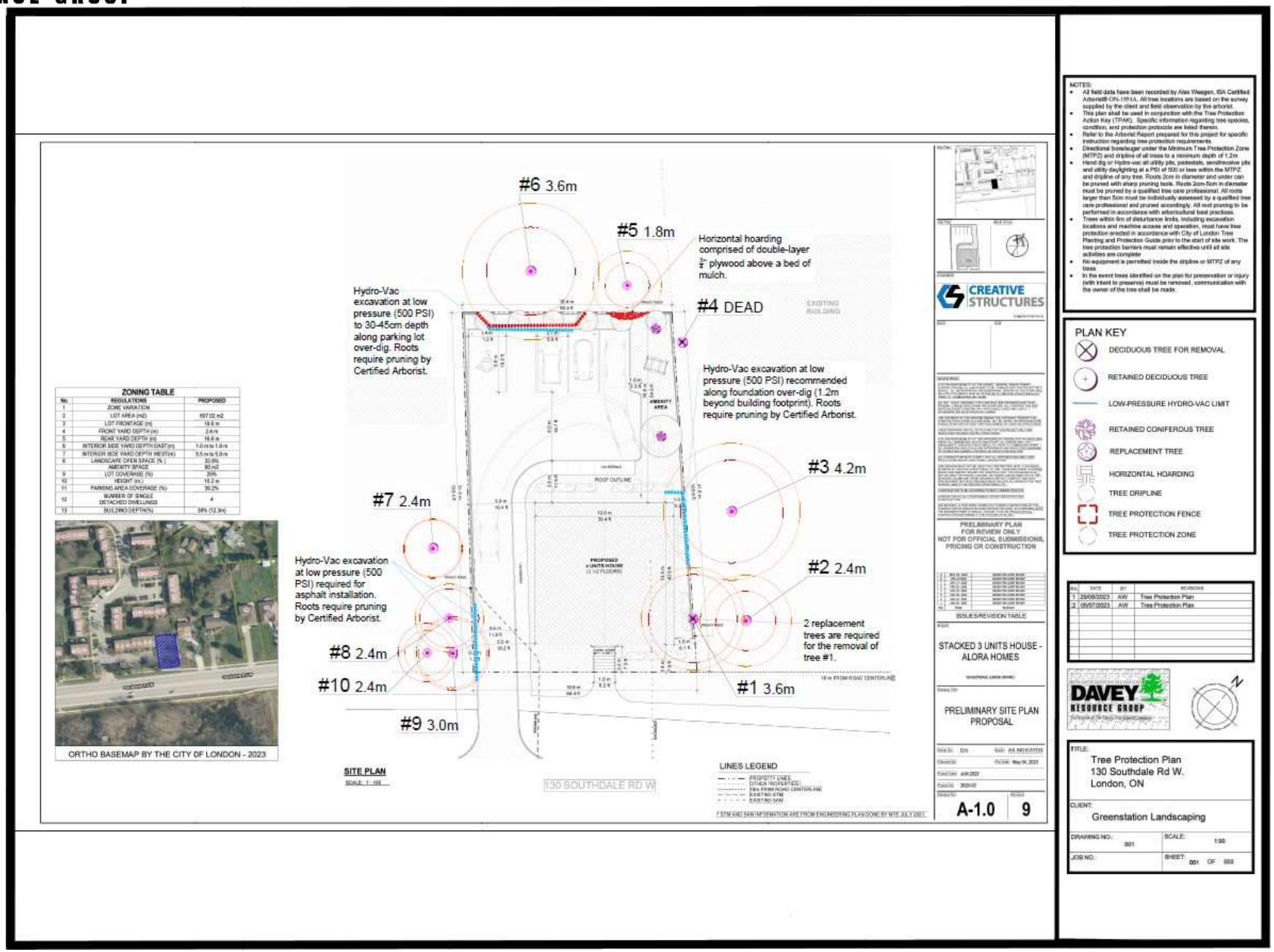
APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Populus ssp. Balsam Poplar, Eastern Cottonwood, Large-tooth Aspen, Trembling Aspen	Balsam Poplar, Eastern Cottonwood, Large-tooth Aspen: Native to Ontario Trembling Aspen: (TBD)	Park. Not permitted in Boulevard	Wood is light, soft and weak, breaks easily in storms, drops flowers, fruit, twigs and branches	Large	Pyramidal – Vase and Spreading	Males: 9 Females: 1
Populus ssp. Dwarf varieties.		Boulevard or Park	Limited numbers may be considered in Boulevards on a trial basis	Medium	Varies	
Prunus Americana American plum	Native to Ontario	Park	Somewhat thorny. Untested in boulevard.	Small	Rounded	2
Prunus nigra Canada plum	Native to Ontario	Park	Thorny. Untested in boulevard.	Medium	Rounded	3
Prunus pensylvanica Pin Cherry	Native to Ontario	Park	Excellent flowers with no fruit/single stem to be specified/weeping cankers * For use in limited circumstances	Small	Oval	5
Prunus serotina Black Cherry	Native to Ontario	Boulevard Park	Interesting bark, messy fruit; Better in lawns than in formal boulevard.	Large	Oval	5 (Genus only)
Prunus **(flowering varieties)** Small Cherry	*(Dependent on species; most popular flowering cherries are non-continental)*	Boulevard	Weeping cankers; prone to fungal infections *** For use in limited circumstances ***	Small	Vase	
Prunus virginiana Choke Cherry	Native to Ontario	Boulevard Park	green spring foliage & red in summer/bark tends to split	Small	Rounded	6
Ptelea trifoliata Hop-tree	Native to Ontario	Boulevard Park	Adaptable to wide range of growing conditions. Easily grown in average, dry to medium, well drained soils in part shade to full shade. Tolerates full sun. One of two native larval host plants for the rare Giant Swallowtail butterfly.	Medium	Rounded	Males: 7 Females: 1

APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Quercus alba White Oak	Native to Ontario	Boulevard Park	Needs moist soil/fruit maintenance/needs large space at maturity Monitoring use on a case by case basis due to Oak Wilt	Large	Rounded	8
Quercus bicolour Swamp White Oak	Native to Ontario	Boulevard Park	Grows in wetter conditions with acidic soils Monitoring use on a case by case basis due to Oak Wilt	Large	Rounded	8
Quercus ellipsoidalis Northern Pin Oak	Native to Ontario	Boulevard Park	Monitoring use on a case by case basis due to Oak Wilt			8
Quercus macrocarpa Bur Oak	Native to Ontario	Boulevard Park	Large size at maturity – reserve for large lots and lawn areas/fruit drop/difficult to transplant/requires good soils Monitoring use on a case by case basis due to Oak Wilt	Large	Rounded	8
Quercus muhlenbergii Chinquapin Oak	Native to Ontario	Boulevard Park	Attractive tree, especially in old age Monitoring use on a case by case basis due to Oak Wilt	Medium	Rounded	8
Quercus robur 'Fastigata' Fastigate English Oak	Non-Continental	Boulevard	Needs well drained soil/holds leaves through the winter/ difficult to transplant/very upright in form – reserve for sites with specific need for this form Monitoring use on a case by case basis due to Oak Wilt	Large	Columnar	8
Quercus robur English Oak	Non-Continental	Boulevard Park	Needs well drained soil/difficult to transplant/large size at maturity Monitoring use on a case by case basis due to Oak Wilt	Large	Rounded	8
Quercus rubra Red Oak	Native to Ontario	Boulevard Park	Needs sandy loam soil/difficult to transplant/more salt tolerant and faster growing than other oaks Monitoring use on a case by case basis due to Oak Wilt	Large	Rounded	8

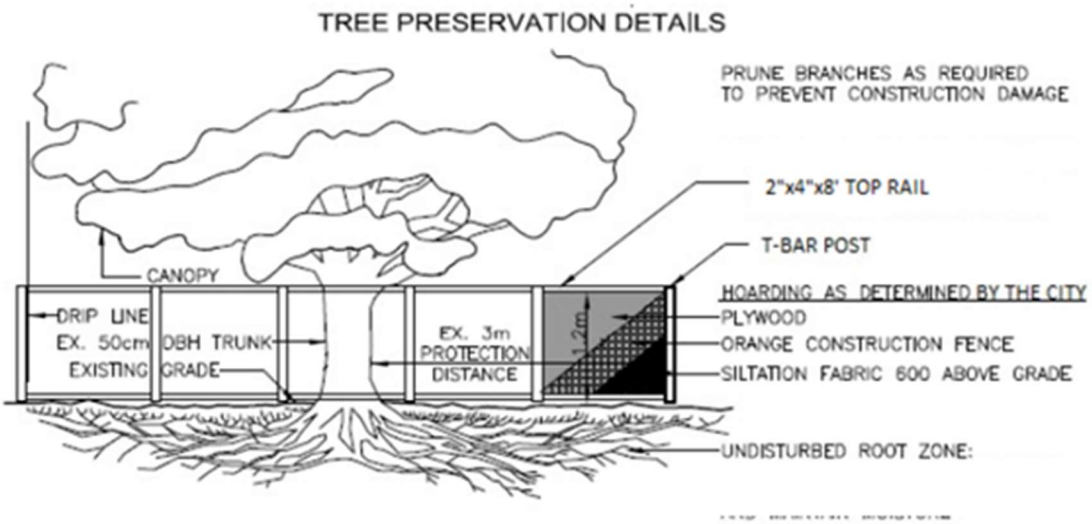
APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Quercus velutina Black Oak	Native to Ontario	Boulevard Park	Needs well drained soil/difficult to transplant/large size at maturity Monitoring use on a case by case basis due to Oak Wilt	Large	Rounded	8
Rhus ssp. Staghorn Sumac, Smooth Sumac	Native to	Boulevard Park	Spreads quick, freely suckers from roots creating wide spreading colonies. Tolerates dry sterile soils	Small	Rounded - Spreading	Males: 10 Females: 7
Sassafrass albidum Sassafrass	Native to Ontario	Boulevard Park	Prefers sandy soils			Males: 7 Females: 1
Sophora japonica Japanese Pagoda Tree	Non-Continental	Boulevard	Excellent white flower/green stem when young/limit use due to messy characteristics	Large	Spreading	5
Syringa reticulata Japanese Tree Lilac ▪ 'Ivory Silk'	Non-Continental	Boulevard	Good white summer flower/excellent small specimen. Prone to over-use	Small	Rounded	6
Tilia americana Basswood	Native to Ontario	Boulevard Park	Prefers deep moist fertile soil/will grow on drier heavier soil/needs large space	Large		7
Tilia cordata Littleleaf Linden ▪ 'Glenleven' ▪ 'Greenspire' ▪ 'Greenglobe'	Non-Continental	Boulevard	Aphid & borer problems; suckers from base; messy species	Medium	Pyramidal	7
Tilia x euchlora Crimean Linden	Non-Continental	Boulevard	Fruit messy/suckers from base ** For use in limited circumstances*	Medium	Rounded	7
Tilia tomentosa Silver Linden	Non-Continental	Boulevard	Heat and drought tolerant.	Medium	Pyramidal-Oval	7
Ulmus americana Elm ▪ 'Homestead' ▪ 'Pioneer' ▪ 'Sapporo Autumn Gold'	*Specific cultivars hybrydized for disease resistance*	Boulevard	Choose with care. Cultivars vary in resistance to Dutch elm disease and elm leaf beetle.	Large	Vase	8
Zelkova serrata Japanese Zelkova ▪ 'Green Vase' ▪ 'Village Green'	Non-Continental	Boulevard	Rapid growth/narrow branch angles promote fork split/frost susceptibility when young	Large	Vase	*10

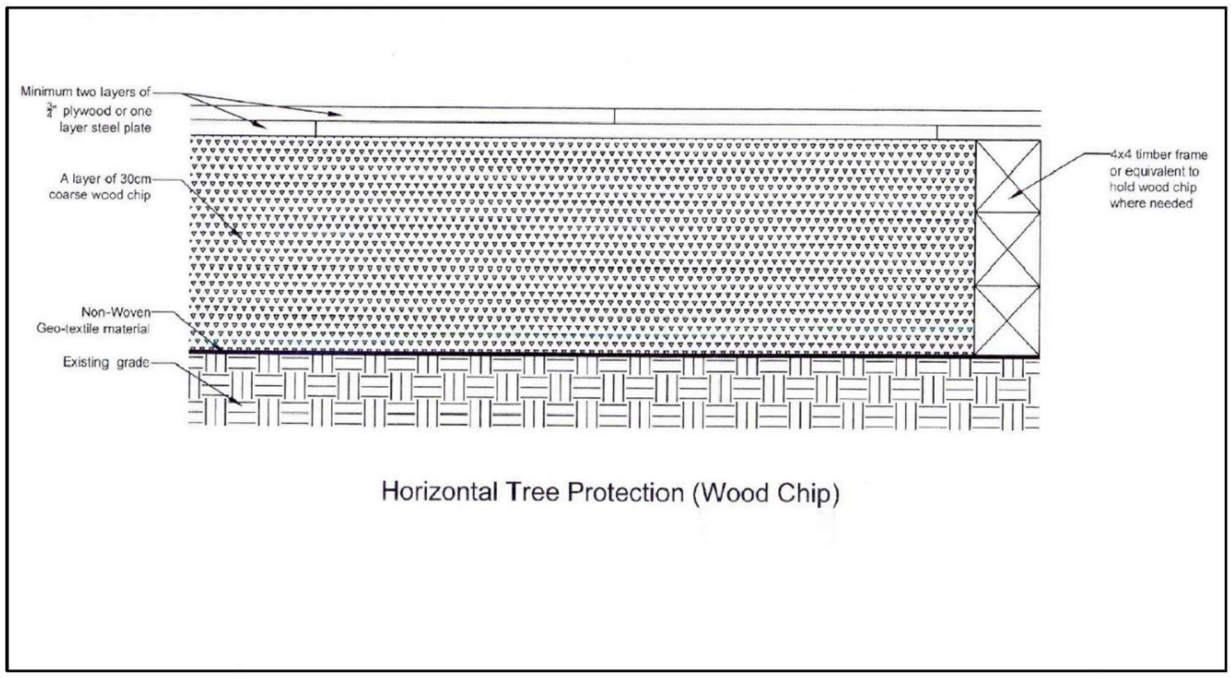
SPECIES NOT PERMITTED FOR USE					
Tree Species	**Native Range**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Acer platanoides *Norway Maple (many cultivars)*	*Non-Continental*	*Surface roots conflict with and turf/girdling roots/aphid and wilt problems.*	*Medium*	*Various Forms*	*8*
Ailanthus altissima *Tree of Heaven*	*Non-Continental*				
Alnus glutinosa *European Alder (Single Stem Only)*	*Non-Continental*	*Tolerant of wet & dry soil. Invasive tendencies checked by dry sites.*	*Medium*	*Pyramidal*	*9*
Caragana arborescens	*Non-Continental*	*Toxic*	*Small*	*Varies*	
Carpinus betulus *European Hornbeam 'Fastigiata'*	*Non-Continental*	*Difficult to transplant* *Keep away from road salt & spray*	*Medium*	*Pyramidal-Oval*	*8*
Eleagnus angustifolia *Russian Olive*	*Non-Continental*				
Maackia amurensis *Amur Maackia*	*Non-Continental*	*Small, round headed tree/slow growing/summer flowering/bronze coloured bark*	*Small*	*Rounded*	*3*
Paulownia spp.	*Non- Continental*				
Pyrus calleryana *Callery Pear* *'Chanticleer* *'Bradford'*	*Non-Continental*	*Fireblight problems* *Graft incompatibility problems with some rootstocks. Poor branch attachments and form.* *Objectionable smell.*	*Small*	*Pyramidal*	*Ornamentals:4* *Fruiting: 3*
Sorbus aria *Whitebeam Mountain Ash*	*Non- Continental*		*Medium*	*Pyramidal-Oval*	*4*
Sorbus aucuparia *European Mountain Ash*	*Non-Continental*	*Scab disease & insect problems; Limit use due to fruit and other problems.*	*Medium*	*Oval*	*4*
Sorbus x thuringiaca *Oakleaf Mountain Ash*	*Non- Continental*		*Small*	*Rounded*	*4*

Appendix 3 – Tree Protection Plan (Preview only-to be printed to scale)



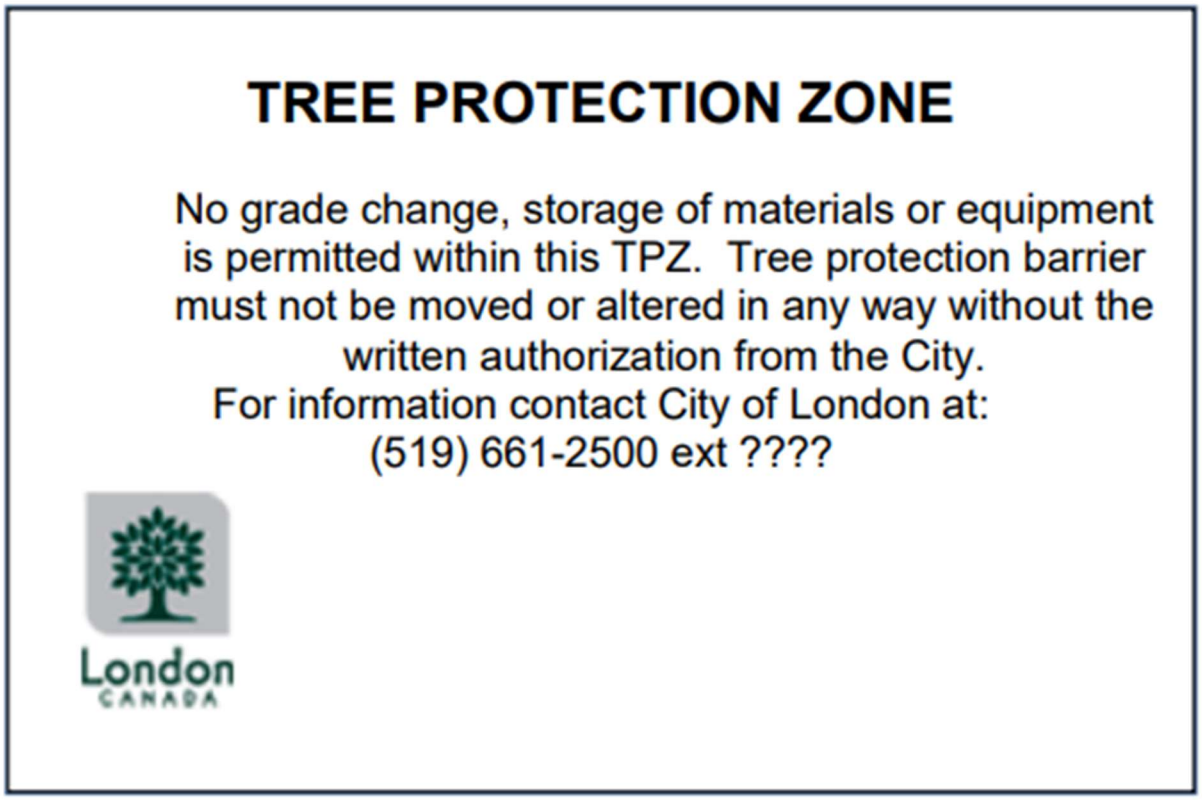
Appendix 4 – Hoarding (TPF) Detail





Horizontal Tree Protection (Wood Chip)

Appendix 5 – Tree Protection Zone Sign Detail



Appendix 6 – Photos

Photo 1. Trees 1 to 3 (right to left)

Photo 2. Trees 4 to 6 (right to left)

Photo 3. Trees 7 to 10 (right to left)

Appendix 7 – References

1. ISA, 2001-2011. Best Management Practices, Books 1-9, Companion publications to ANSI A300 Standards for Tree Care
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3. Sinclair and Lyon, 2005. Diseases of Trees and Shrubs, Second Edition
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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 8 – 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: • 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 siteconditions, 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 affectthe integrity of utility facilities or other structures, and leaving in placebranches 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 direct 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 that the moment is being calculated about.
Mortality Spiral	A sequence of stressful events or conditions causing the decline and eventual death of a tree.
Mulch	Material that is spread of 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 for 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. • Wall 1 prevents decay moving up and down in a tree • Wall 2 prevents decay moving inward in a tree • Wall 3 prevents decay moving laterally in a tree • Wall 4 is the new growth formed on the outside of the tree, callus growth.
Woundwood	Lignified, differentiated tissues produced on woody plants as a response to wounding.

Appendix 9 – Arborist Qualifications

Alex Weegen is a Consulting Arborist with Davey Resource Group. They have obtained a Bachelor of Science in Ecology focusing on resource conservation from the University of Guelph, and later completed a Master of Forest Conservation at University of Toronto. They have over 9 years of varied work experience in forestry, arboriculture, tree inventory and tree risk assessment.

Certifications

- International Society of Arboriculture Certified Arborist® (ON-1951A)
- International Society of Arboriculture Tree Risk Assessment Qualification (TRAQ)
- Registered Professional Forester in training
- Certified Ontario Tree Marker

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: _____