

Arborist Report

Tree Preservation Plan

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Site:
357, 365, and 375 Stegman's Mill Road
Kleinburg

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INTRODUCTION

It is imperative for all construction lead hands to thoroughly read and understand this report. Tree preservation specifications are mandatory to adhere to and penalties can be assigned as deemed appropriate by the City of Vaughan to the contractor for contravention of these specifications.

Popovich Associates (herein referred to as the client) proposes to construct a new subdivision on three properties located at Stegman's Mill Road (herein referred to as the subject property), in Vaughan, Ontario. The Arborist was to document the current condition of the trees that would be impacted by construction and prescribe recommendations for tree preservation. Trees were assessed for the overall health, size and potential impacts that would be caused by construction.

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 Preservation Plan (TPP). (Appendix 2)

In total there were 99 trees inventoried. 67 trees are privately owned by the client, 4 are shared, and 28 are ravine trees. 89 of the trees have a DBH of at least 20 cm and are therefore protected by the City of Vaughan's Tree Preservation By-Law (185-2007). A permit to injure or destroy 51 of the protected trees will be required as a result of the proposed construction.

Replacement trees will be required for any tree that is removed that is not dead or dying. The number of replacement trees will be determined by the Urban Design Manager. If the applicant does not wish to replant the trees on their property, a total of **\$550.00 for each tree** will be added to the permit cost in addition to a 15% administration fee. Replacement trees will then be planted by the City on City lands within the community.

It is recommended that Tree Preservation Fencing be installed to prevent injury to the ravine trees, as the construction plan requires staging and construction near the **Minimum Tree Protection Zone** (MTPZ). All trees with proposed construction near the MTPZ (a distance referenced from the most current Tree Preservation By-Laws of the City of Vaughan) must have hoarding installed to this distance (measured from the base of the tree) as detailed in the construction documents with Arborist comments.

ASSIGNMENT

Popovich Associates (herein referred to as the client) proposes to construct a new subdivision on three properties located on Stegman's Mill Road (herein referred to as the subject property), in Vaughan, Ontario. Davey Resource Group (DRG) was to conduct a tree inventory and prepare a Tree Preservation Plan. The arborist was to document the current condition of the trees that would be impacted by construction and prescribe recommendations for tree preservation. Trees were assessed for the overall health, size and potential impacts that would be caused by construction.

LIMITATIONS OF THE ASSIGNMENT

It must be understood that DRG is the assessor of the trees in regard to tree preservation practices as it relates to the most current tree protection by-laws. The client and 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.

The project scope and details for tree preservation were discussed. All proposed construction methods are limited to what was provided in the site plans and in discussions with the Project Leader. Estimates, measurements, and comments regarding tree preservation were based on the proposed construction plans.

OBSERVATIONS

- Information and data were collected on April 1st, 2015 by ISA Certified Arborists Dan Marina (ON-1947A), Kyle McLoughlin (ON-1734AM) and Stephanie Ulcar (ON-1873A).
- Pictures were taken from a single source on April 1st, 2015 by Stephanie Ulcar and remain unchanged. Pictures are available upon request.
- All trees were tagged. See Appendix 2 for details.
- *Juglans cinerea* (Butternut) was encountered on the Southeast corner along the property line in the ravine. See Appendix 2 for exact location. No other species at risk or endangered species were encountered.
- For further details and observations, refer to the TPAK and TPP in the supporting materials.

DISCUSSION

The following sections discuss specific areas regarding the preservation of trees during construction.

Tree preservation is a pro-active measure that starts at the planning stage. Understanding the importance of tree roots in overall tree health and survivability is of the highest importance in implementing effective tree preservation measures.

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 the majority 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 times 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. 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. 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). 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 with regard to the effects 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.**

1. Root Pruning within the **MTPZ** of any tree requires root exploration via Supersonic Air Tool or Daylighting Vehicle to first remove the soil and expose the roots. A Certified Arborist (CA) will be required onsite during the initial excavation to make appropriate recommendations to the contractor for suitable tree preservation as required. When trees are damaged or injured significantly, the CA must notify the project arborist immediately to report the circumstances. Generally:

- a. Roots fewer than 2 cm in diameter can be pruned using a sharpened tool such as hand pruners or a sharpened spade under the supervision of the Certified Arborist.
 - b. Roots 2 – 8 cm in diameter can be pruned by the Certified Arborist using a sharp tool, such as a handsaw, hand pruner or loppers and under the supervision of the Construction Inspector and/or the advisement of the Project Arborist.
 - c. All roots over 8 cm in diameter must be assessed by the Project Arborist prior to pruning unless the arborist on-site can confidently assess the effect of the removal of the root as not detrimental to the tree. This must be documented by the Certified Arborist and reported to the project arborist immediately.
2. Root Pruning within the **Critical Root Zone** and outside of the MTPZ, typically requires the use of a sharpened garden spade, cutting a line to a depth of about 30 cm **by the on-site Certified Arborist and the advisement of the project arborist if needed.** However, the same pruning protocol for the size of roots encountered (in the MTPZ) applies to the roots found within this area.

The trenches (when using SSAT) are typically backfilled with the same excavated soil or new topsoil or compost and hoarding should be installed along this trench to protect the remaining roots.

Tree Protection Zone (TPZ)

This is the area to be protected and is defined by the City of Vaughan's Tree Preservation Specifications and by the arborist and will change from tree to tree due to structural boundaries. Where some fill or excavate must be temporarily located near a TPZ, a plywood barrier must be used to ensure no material enters the TPZ. Rigid Hoarding is needed when construction machines are very close (within 1-2 m) of the trunk to prevent accidental bumps from machines. These seemingly harmless bumps stay with the tree forever and can cause significant chronic stress to the tree.

Diameter at Breast Height ¹ in centimeters	Minimum Protection Distances Required ² (Public and Private Trees)	Minimum Protection Distances Required Trees in Naturalized Areas
<10	1.2	The drip line ³ or 1.2 m
10-29	1.8	The drip line or 3.6 m
30-40 ⁴	2.4	The drip line or 4.8 m
41-50	3.0	The drip line or 6.0 m
51-60	3.6	The drip line or 7.2 m
61-70	4.2	The drip line or 8.4 m
71-80	4.8	The drip line or 9.6 m
81-90	5.4	The drip line or 10.6 m
91-100	6.0	The drip line or 12.0 m
>100	6 cm protection for each 1 cm diameter	12 cm protection for each 1 cm diameter or the drip line

The tree protection barriers shall be installed at the approved location and shall be maintained in its original location and condition until all construction activities within the site have ceased and all equipment is removed from the site. No equipment or material storage, flushing of fuel or washing of equipment is allowed within the TPZ. Any works within the TPZ shall be performed or supervised by a Certified Arborist.

Minimum Tree Protection Zone (MTPZ)

Work within the **MTPZ** of any tree would be considered serious root injury and would leave the tree with a high potential of structural failure or serious decline. Boxes surrounding existing trees on the TPP represent a 'best case scenario' for tree protection needs. The City of Vaughan will have final approval of tree protection requirements.

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. Generally speaking, 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.

Hoarding

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 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.)

Hoarding locations should be field marked by the project arborist, and hoarding installation will be completed by the contractor. This hoarding must be anchored to the ground and must be installed to the lines defined by the City of Vaughan/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 in good condition the hoarding to prevent this from happening before and throughout the entire construction. **Urban forestry staff may have to assign penalties or fines, or civil action from the neighboring tree owners may occur if these preservation efforts are not adhered to.**

Tree Protection Signs

A sign should be displayed on the tree protection fencing as shown in Appendix 4. These signs could be made in bulk at a discounted rate and installed on the hoarding in various locations. Signage informs the public and reminds the contractors the significance of the TPZs and the efforts put forward by the client in tree preservation.

Permit Posting

If the permit to destroy/injure the trees is approved, it must be posted on the property during the time when the tree work is being conducted. It should be visible from the street edge.

Construction Access and Staging

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

Canopy Cover

At 375 and 365 Stegman's Mill Road, 100% of the canopy cover will be removed as a result of the proposed development. At 357 Stegman's Mill Road, which is the property directly adjacent to the ravine, 20% of the canopy is proposed for removal. The loss of overall canopy cover may be mitigated by replanting suitable tree species.

Replanting

All tree removals not for dead or dying trees will require replanting. The number of trees required for replanting is dependent upon the overall condition and size of the trees being removed, as well as the number of trees being removed. As a planting plan is not a component of this report, it is recommended that a planting plan be included in the landscape plan for this project. The setback area at the top of the ravine is a suitable location for reforestation and replanting of native tree species. See Appendix 6 for a list of appropriate tree species for natural areas. For the scope of this project 62 trees are recommended for removal, when we remove trees under 20cm DBH and dead or dying trees we have 51 bylaw protected trees that are recommended for removal that will require replacement. See below for appropriate replanting and replacement measures.

Within the scope of this project considering the updated site plans, the previous arborist report and the Urban Design Section Comments, a total of 116 trees need to be replaced on this property. The client has drafted a planting and landscaping plan that accounts for 113 of the above 116 required replacement trees. Due to the updated site plans and additional trees planned for replacement, a Cash in lieu fee of 1,500\$ is recommended to be paid to urban forestry to cover the additional charges for this project.

Butternut Health Assessment

Under the Endangered Species Act (2007), Ontario Regulation 242/08, a Butternut Health Assessment is required for any butternut tree within 25 m of construction. A Butternut Health Assessment is recommended. A certified Butternut Health Assessor must be obtained to perform a detailed inspection and complete a written report. The assessor's report must be submitted to the Ministry of Natural Resources and Forestry office 30 days prior to the proposed activity.

CONCLUSION

A total of 62 trees will require removal as a result of the proposed construction, 51 of these trees are protected and will require adequate compensation for their removal. Following the City of Vaughan's tree bylaws, we calculate that 116 trees will need to be planted or paid for in a cash in lieu manner for this property. The Client has drafted a planting plan to account for 113 new plantings in a landscaping plan, we additionally recommend that 1,500\$ be paid to urban forestry to cover the additional replacement trees. One tree will require injury due to construction of a new pathway. All ravine trees within the vicinity of the proposed construction are recommended to have Tree Preservation Fencing installed according to the specifications detailed in Appendix 3 and 4.

All trees with proposed construction within the Minimum Tree Protection Zone will have hoarding installed as per the by-law. They will be the least impacted from construction if the hoarding is completed prior to construction.

If preservation methods outlined in this report are adhered to, the remaining trees will incur minimal injuries. If the remaining trees have equally respected CRZs where machines are not used and foot traffic is kept to a minimum, even though there will not be any hoarding present, these trees' roots will incur no additional stress from the proposed construction.

If there is any need to remove the hoarding for any reason, approval from the City of Vaughan must be granted prior, otherwise there may be a risk of losing a security deposit placed by the contractor or may be subjected to remedial work or fines deemed appropriate by the City of Vaughan staff.

APPENDIX 1 – TREE PROTECTION ACTION KEY

Tree Map Number	Species	dbh (cm) @ 1.4 m	Tree Category	City of Vaughan Minimum	Health	Structure	Overall Condition	Construction entering TPZ	Construction Impact (None, Low, Medium, High)	Hoarding Required	Permit Required	Removal	Observations	Preservation Comments
701	spruce, Colorado	34	1-Private	2.4	Fair	Fair	Fair	Y	High	N	Y	Y	Cytospora canker	Removal due to construction of a new pathway
702	spruce, Colorado	28	1-Private	1.8	Fair	Fair	Fair	N	None	Y	N	N	T-bar at base	Rigid hoarding
703	spruce, Colorado	34	1-Private	2.4	Fair	Fair	Fair	N	None	Y	N	N	Interior deadwood in lower crown	Rigid hoarding
704	spruce, Colorado	27	1-Private	1.8	Poor	Poor	Poor	Y	High	N	Y	Y	Poor health and form	Removal due to construction of a new pathway
705	spruce, Colorado	24	1-Private	1.8	Poor	Poor	Poor	Y	High	N	Y	Y	Poor health and form, previously topped	Remove due to scope of work
706	spruce, Colorado	38	1-Private	2.4	Poor	Poor	Poor	Y	High	N	Y	Y	T-bar at base	Removal due to construction of a new pathway
707	mountain ash, European	19	1-Private	1.8	Poor	Poor	Poor	N	None	Y	N	N		Rigid hoarding
708	elm, Siberian	46	1-Private	3	Fair	Fair	Fair	N	None	Y	Y	N	Sapsucker damage	Rigid hoarding
709	elm, Siberian	123	1-Private	7.4	Fair	Fair	Fair	N	None	Y	Y	N	Co-dominant with included bark; one dead stem	Rigid hoarding
710	elm, Siberian	64	1-Private	4.2	Fair	Fair	Fair	N	None	Y	Y	N		Rigid hoarding
711	pine, Scotch	46	1-Private	3	Fair	Fair	Fair	Y	Medium	Y	Y	N	Declining	Rigid hoarding, injury due to construction of a new pathway
712	pine, Scotch	28	1-Private	1.8	Poor	Fair	Fair	N	None	Y	N	N	Declining; 30 % deadwood	Rigid hoarding
713	boxelder	61	1-Private	4.2	Fair	Fair	Fair	Y	High	N	Y	Y	Improperly pruned	Remove due to scope of work
714	elm, Siberian	75	6-Shared	4.8	Fair	Fair	Fair	Y	Medium	Y	N	Y	Limb failure, backs onto school	Remove due to scope of work
715	boxelder	120	1-Private	7.2	Poor	Poor	Poor	Y	High	N	Y	Y	Limb failure; approx. measurement; failed at base	Remove due to condition
716	elm, Siberian	98	1-Private	6	Poor	Poor	Poor	Y	High	N	Y	Y	Co-dominant with included bark	Remove due to scope of work
717	spruce, white	18	1-Private	1.8	Fair	Fair	Fair	Y	High	N	N	Y	Forest growth habit, declining	Remove due to scope of work
718	spruce, white	27	1-Private	1.8	Fair	Fair	Fair	Y	High	N	Y	Y	Forest growth habit	Remove due to scope of work
719	elm, Siberian	45	1-Private	3	Fair	Fair	Fair	Y	High	N	Y	Y	Forest growth	Remove due to scope of work

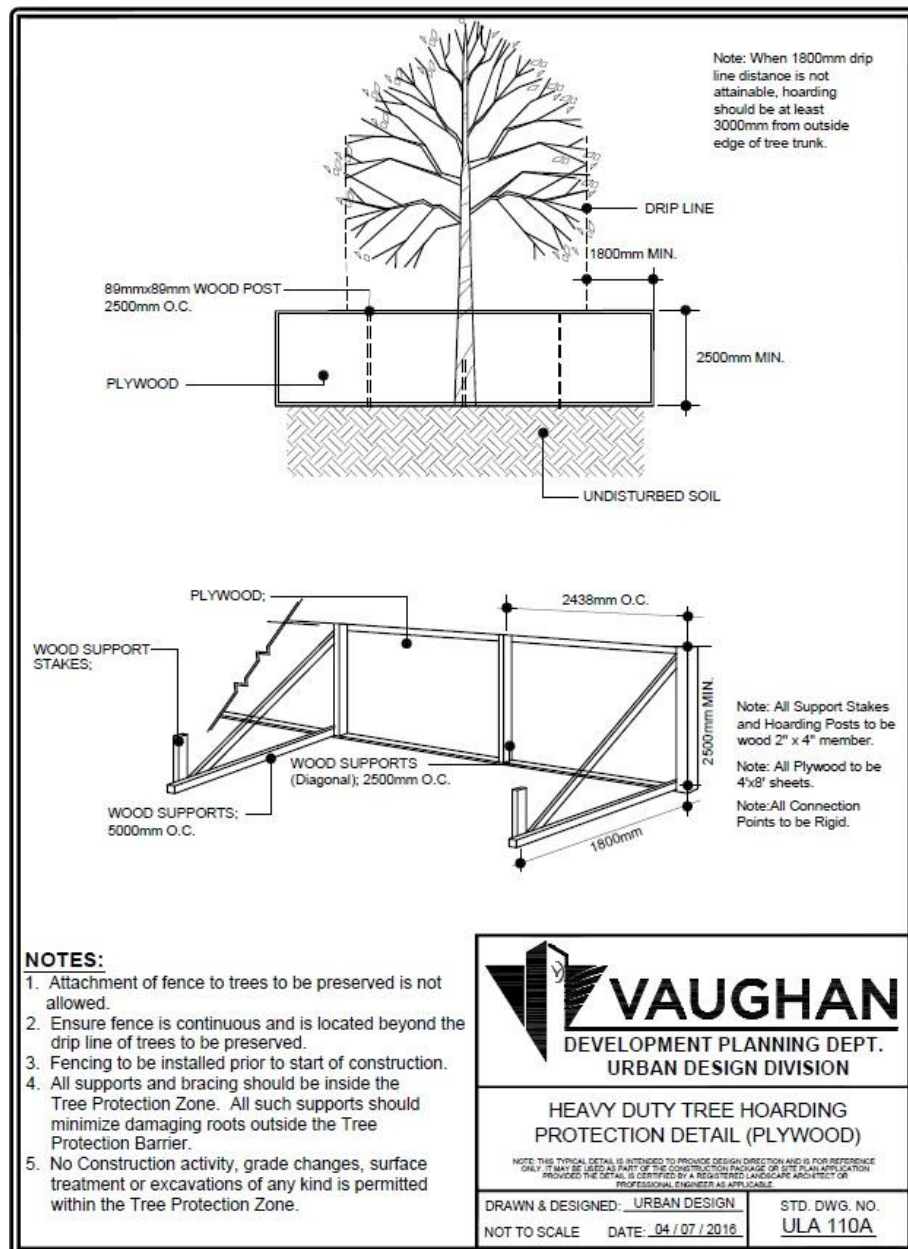
Tree Map Number	Species	dbh (cm) @ 1.4 m	Tree Category	City of Vaughan Minimum	Health	Structure	Overall Condition	Construction entering TPZ	Construction Impact (None, Low, Medium, High)	Hoarding Required	Permit Required	Removal	Observations	Preservation Comments
720	spruce, white	18	1-Private	1.8	Fair	Fair	Fair	Y	High	N	N	Y	Forest growth habit	Remove due to scope of work
721	elm, Siberian	54	1-Private	3.6	Fair	Fair	Fair	Y	High	N	Y	Y	Forest growth habit	Remove due to scope of work
722	spruce, white	26	1-Private	1.8	Fair	Fair	Fair	Y	High	N	Y	Y	10 % deadwood in lower crown	Remove due to scope of work
723	spruce, white	32	1-Private	2.4	Fair	Fair	Fair	Y	High	N	Y	Y	Chlorotic	Remove due to scope of work
724	spruce, white	42	1-Private	3	Fair	Fair	Fair	Y	High	N	Y	Y	Chlorotic	Remove due to scope of work
725	pine, eastern white	29	1-Private	1.8	Poor	Poor	Poor	Y	High	N	Y	Y	Dead	Remove due to scope of work
726	pine, Scotch	35	1-Private	2.4	Poor	Poor	Poor	Y	High	N	Y	Y	Dead	Remove due to scope of work
727	pine, Scotch	44	1-Private	3	Poor	Poor	Poor	Y	High	N	Y	Y	Dead	Remove due to scope of work
728	pine, Scotch	32	1-Private	2.4	Poor	Poor	Poor	Y	High	N	Y	Y	Dead	Remove due to scope of work
729	arborvitae, eastern	45	1-Private	3	Fair	Fair	Fair	Y	High	N	Y	Y	Broken branches	Remove due to scope of work
730	boxelder	45	4-Ravine	3	Fair	Fair	Fair	N	None	Y	N	N	Multi-stemmed	No impact
731	boxelder	32	4-Ravine	2.4	Fair	Fair	Fair	N	None	Y	N	N	Moderate lean West	No impact
732	boxelder	19	4-Ravine	1.8	Poor	Poor	Poor	N	None	Y	N	N	Broken branches in crown	No impact
733	maple, Norway	33	4-Ravine	2.4	Good	Good	Good	N	None	Y	N	N	Dead leader	No impact
734	boxelder	21	4-Ravine	1.8	Fair	Fair	Fair	N	None	Y	N	N	Moderate lean West	No impact
735	maple, Norway	28	4-Ravine	1.8	Good	Good	Good	N	None	Y	N	N		No impact
736	willow, spp.	52	4-Ravine	3.6	Fair	Poor	Fair	N	None	Y	N	N	Multi-stemmed; included bark at base	No impact
737	willow, spp.	72	4-Ravine	4.8	Poor	Poor	Poor	N	None	Y	N	N	Decay , large deadwood; declining	No impact
738	boxelder	42	4-Ravine	3	Poor	Poor	Poor	N	None	Y	N	N	Multi stemmed; decay; large deadwood	No impact
739	boxelder	45	4-Ravine	3	Poor	Poor	Poor	N	None	Y	N	N	Multi stemmed; decay; large deadwood; heavy lean;	No impact
740	boxelder	24	4-Ravine	1.8	Poor	Poor	Poor	N	None	Y	N	N	Heavy lean; multi stemmed	No impact

Tree Map Number	Species	dbh (cm) @ 1.4 m	Tree Category	City of Vaughan Minimum	Health	Structure	Overall Condition	Construction entering TPZ	Construction Impact (None, Low, Medium, High)	Hoarding Required	Permit Required	Removal	Observations	Preservation Comments
741	boxelder	25	4-Ravine	1.8	Poor	Poor	Poor	N	None	Y	N	N	Heavy lean; multi stemmed; deadwood	No impact
742	apple, common	30	4-Ravine	2.4	Fair	Fair	Fair	N	None	Y	N	N		No impact
743	apple, common	35	4-Ravine	2.4	Fair	Fair	Fair	N	None	Y	N	N	Multi-stemmed	No impact
744	boxelder	22	4-Ravine	1.8	Fair	Fair	Poor	N	None	Y	N	N	Heavy lean; multi stemmed	No impact
745	boxelder	20	4-Ravine	1.8	Poor	Poor	Poor	N	None	Y	N	N	Heavy lean; multi stemmed	No impact
746	spruce, Norway	51	4-Ravine	3.6	Good	Good	Good	N	None	Y	N	N		No impact
747	pine, Scotch	21	4-Ravine	1.8	Poor	Poor	Poor	N	None	Y	N	N	Mortality spiral; low LCR	No impact
748	pine, Scotch	30	4-Ravine	2.4	Poor	Poor	Poor	N	None	Y	N	N	Fallen	No impact
749	spruce, white	19	4-Ravine	1.8	Fair	Fair	Fair	N	None	Y	N	N	Chlorosis	No impact
750	pine, Scotch	22	4-Ravine	1.8	Poor	Poor	Poor	N	None	Y	N	N	Dead	No impact
751	pine, Scotch	33	4-Ravine	2.4	Poor	Poor	Poor	N	None	Y	N	N	Dead	No impact
752	pine, Scotch	24	4-Ravine	1.8	Poor	Poor	Poor	N	None	Y	N	N	Low LCR	No impact
753	pine, Scotch	21	4-Ravine	1.8	Poor	Poor	Poor	N	None	Y	N	N	Dead	No impact
754	walnut, black	22	4-Ravine	1.8	Fair	Fair	Fair	N	None	Y	N	N		No impact
755	walnut, black	39	4-Ravine	2.4	Good	Good	Good	N	None	Y	N	N		No impact
756	butternut	20	4-Ravine	1.8	Poor	Poor	Poor	N	None	Y	N	N	Infected with canker death imminent	No impact; recommend butternut health assessment
757	butternut	49	4-Ravine	3	Fair	Poor	Poor	N	None	Y	N	N	Included bark; advanced decay and canker infection; death imminent	No impact; recommend butternut health assessment
758	walnut, black	56	4-Ravine	3.6	Good	Good	Good	N	None	Y	N	N	Deadwood in canopy	No impact
759	maple, silver	74	1-Private	4.8	Good	Good	Good	Y	High	N	Y	Y	Co-dominant growth habit with included bark	Remove due to scope of work
760	spruce, white	43	1-Private	3	Good	Good	Good	Y	High	N	Y	Y		Remove due to scope of work
761	spruce, white	52	1-Private	3.6	Good	Good	Good	Y	High	N	Y	Y		Remove due to scope of work

Tree Map Number	Species	dbh (cm) @ 1.4 m	Tree Category	City of Vaughan Minimum	Health	Structure	Overall Condition	Construction entering TPZ	Construction Impact (None, Low, Medium, High)	Hoarding Required	Permit Required	Removal	Observations	Preservation Comments
762	spruce, white	34	1-Private	2.4	Fair	Fair	Fair	Y	High	N	Y	Y	Thinning foliage	Remove due to scope of work
763	spruce, white	48	1-Private	3	Fair	Fair	Fair	Y	High	N	Y	Y	Thinning foliage	Remove due to scope of work
764	spruce, white	47	1-Private	3	Fair	Fair	Fair	Y	High	N	Y	Y	Thinning foliage	Remove due to scope of work
765	spruce, white	24	1-Private	1.8	Fair	Fair	Fair	Y	High	N	Y	Y	Thinning foliage	Remove due to scope of work
766	maple, silver	100	1-Private	6	Fair	Fair	Fair	Y	High	N	Y	Y	Moderate lean East; co-dominant leaders; deadwood	Remove due to scope of work
767	spruce, white	21	1-Private	1.8	Fair	Fair	Fair	Y	High	N	Y	Y	Suppressed growth	Remove due to scope of work
768	maple, silver	140	1-Private	8.4	Fair	Fair	Fair	Y	High	N	Y	Y	Co-dominant leaders; leaning west; included bark	Remove due to scope of work
769	arborvitae, eastern	36	1-Private	2.4	Good	Good	Good	Y	High	N	Y	Y	Chlorotic - early signs	Remove due to scope of work
770	maple, silver	74	1-Private	4.8	Fair	Fair	Good	Y	High	N	Y	Y	Limb failure	Remove due to scope of work
771	arborvitae, eastern	33	1-Private	2.4	Good	Good	Good	Y	High	N	Y	Y		Remove due to scope of work
772	pine, eastern white	30	1-Private	1.8	Fair	Fair	Fair	Y	High	N	Y	Y	Chlorotic; topped	Remove due to scope of work
773	spruce, white	18	1-Private	1.8	Good	Good	Good	Y	High	N	N	Y		Remove due to scope of work
774	oak, English	44	1-Private	3	Good	Good	Good	Y	High	N	Y	Y	Multi-stemmed	Remove due to scope of work
775	maple, Norway	53	1-Private	3.6	Good	Good	Good	Y	High	N	Y	Y		Remove due to scope of work
776	maple, sugar	40	1-Private	2.4	Good	Good	Good	Y	High	N	Y	Y		Remove due to scope of work
777	maple, sugar	60	1-Private	3.6	Fair	Poor	Fair	Y	High	N	Y	Y	Significant stem damage; canker, decay	Remove due to scope of work
778	spruce, white	44	1-Private	3	Fair	Fair	Fair	Y	High	N	Y	Y	Thinning foliage	Remove due to scope of work
779	apple, common	35	1-Private	2.4	Fair	Fair	Fair	Y	High	N	Y	Y		Remove due to scope of work
780	boxelder	41	6- Shared	3	Fair	Fair	Fair	Y	None	N	Y	Y		Remove due to scope of work
781	boxelder	30	6- Shared	2.4	Fair	Poor	Fair	Y	None	N	Y	Y		Remove due to scope of work
782	boxelder	62	6- Shared	4.2	Fair	Poor	Fair	Y	None	N	Y	Y	Included bark; co-dominant stems	Remove due to scope of work

Tree Map Number	Species	dbh (cm) @ 1.4 m	Tree Category	City of Vaughan Minimum	Health	Structure	Overall Condition	Construction entering TPZ	Construction Impact (None, Low, Medium, High)	Hoarding Required	Permit Required	Removal	Observations	Preservation Comments
783	willow, weeping	53	1-Private	3.6	Fair	Poor	Fair		High	N	N	Y		Remove due to scope of work
784	boxelder	70	1-Private	4.2	Poor	Poor	Poor	Y	High	N	Y	Y	Removed	Remove due to scope of work
785	walnut, black	18	1-Private	1.8	Good	Good	Good	Y	High	N	N	Y	Slight lean toward North	Remove due to scope of work
786	linden, little leaf	18	1-Private	1.8	Good	Good	Good	Y	High	N	N	Y	Slight lean toward North	Remove due to scope of work
787	spruce, Colorado	26	1-Private	1.8	Good	Good	Good	Y	High	N	Y	Y	Declining	Remove due to scope of work
788	boxelder	96	1-Private	6	Poor	Poor	Poor	Y	High	N	Y	Y	All major limbs fallen; advanced decay in mainstem; dead wood; polyporus squamosus	Remove due to scope of work
789	apple, common	38	1-Private	2.4	Fair	Poor	Poor	Y	High	N	Y	Y		Remove due to scope of work
790	arborvitae, eastern	36	1-Private	2.4	Fair	Fair	Fair	Y	High	N	Y	Y		Remove due to scope of work
791	apple, common	22	1-Private	1.8	Fair	Poor	Poor	Y	High	N	Y	Y	Poor vigor	Remove due to scope of work
792	arborvitae, eastern	35	1-Private	2.4	Fair	Poor	Poor	Y	High	N	Y	Y	Multi-stemmed	Remove due to scope of work
793	birch, paper	30	1-Private	1.8	Good	Good	Good	Y	High	N	Y	Y	Multi-stemmed	Remove due to scope of work
794	boxelder	38	1-Private	2.4	Fair	Fair	Fair	Y	High	N	Y	Y	Co-dominant leaders; topped in the past	Remove due to scope of work
795	boxelder	27	1-Private	1.8	Fair	Poor	Poor	Y	High	N	Y	Y	Lean	Remove due to scope of work
796	apple, common	29	1-Private	1.8	Good	Fair	Fair	Y	High	N	Y	Y	Suppressed growth; multi-stemmed	Remove due to scope of work
797	pine, eastern white	18	1-Private	1.8	Good	Good	Good	Y	High	N	N	Y	Quality specimen	Remove due to scope of work
798	pine, eastern white	19	1-Private	1.8	Good	Good	Good	Y	High	N	N	Y	Quality specimen	Remove due to scope of work
799	apple, common	20	1-Private	1.8	Fair	Poor	Poor	Y	High	N	Y	Y	Poor vigor, 20% deadwood	Remove due to scope of work

APPENDIX 3 – HOARDING (TPF) DETAIL



APPENDIX 4 – TREE PROTECTION SIGN

A sign that is similar to the illustration below is required to be mounted on all sides of a Tree Protection Fence for trees protected by the By-law.

The sign should be made of white gator board or equivalent material.

<u>TREE PROTECTION SIGN</u>			
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <div style="display: flex; justify-content: space-between; width: 100%;"> ← 60 cm → </div> <div style="border: 2px solid black; padding: 10px; margin: 0 auto; width: 80%;"> <div style="text-align: center; font-size: 1.5em; font-weight: bold; margin-bottom: 5px;">TREE PROTECTION</div> <div style="text-align: center; font-size: 2em; font-weight: bold; margin-bottom: 5px;">FENCE</div> <div style="text-align: center; font-size: 1.2em; font-weight: bold; margin-bottom: 5px;"> York Region </div> <div style="background-color: black; color: white; padding: 5px; text-align: center; font-weight: bold; margin-bottom: 5px;">DO NOT MOVE OR DAMAGE FENCE</div> <div style="background-color: black; color: white; padding: 5px; text-align: center; font-weight: bold;">NO ACTIVITES PERMITTED BEYOND FENCE</div> </div> <div style="display: flex; flex-direction: column; align-items: center; width: 10%;"> ↑ 50 cm ↓ </div> </div> </div>			
<u>TREE PROTECTION NOTES</u>			
FENCE MATERIAL: <ul style="list-style-type: none"> PLASTIC ORANGE FENCING (120 CM TALL) SHALL BE USED OR EQUIVELANT AS APPROVED BY YORK REGION AND INSTALLED WITH WIRE TIES ON METAL T-BAR POSTS (180 CM TALL) SPACED 250 CM APART FENCE MAY BE COMBINED WITH SILT FENCING 	FENCE MAINTENANCE: <ul style="list-style-type: none"> MAINTAIN FENCE IN WORKING CONDITION AT ALL TIMES DO NOT STORE MATERIALS OR EQUIPMENT IN THE PROTECTED AREA DO NOT MOVE FENCE WITHOUT PRIOR AUTHORIZATION FROM YORK REGION 	MONITORING: <ul style="list-style-type: none"> CONDUCT WEEKLY MONITORING OF FENCE AND TREE HEALTH THROUGHOUT THE DURATION OF THE CONSTRUCTION PROJECT OR ACCORDING TO A SCHEDULE NOTED IN AN APPROVED TREE PRESERVATION PLAN. 	
FENCE LOCATION: <ul style="list-style-type: none"> INSTALL FENCE AS PER NHFS-04 TREE PROTECTION DETAIL FOR INDIVIDUAL TREES, FENCE IS TO BE INSTALLED AT THE LIMITS OF CONSTRUCTION OR AT THE DRIPLINE OF THE TREE, WHICHEVER IS FURTHER FROM THE TREE. FENCE CAN BE LOCATED CLOSER TO THE TRUNK ONLY WITH AUTHORIZATION FROM YORK REGION FOR ROWS OF TREES, SUCH AS FOUND IN BOULEVARDS, A SINGLE LINEAR FENCE SHOULD BE INSTALLED WHICH FOLLOWS THE LIMITS OF THE CONSTRUCTION ZONE 	<div style="display: flex; align-items: center;"> <div> Transportation Services </div> </div>		
SIGNAGE: <ul style="list-style-type: none"> INSTALL TREE PROTECTION SIGN ON FENCE FACING CONSTRUCTION ZONE AT 100 METER INTERVALS AS PER NHFS-04 TREE PROTECTION DETAIL 	TREE PROTECTION NOTES AND SIGN DETAIL		
PRUNING: <ul style="list-style-type: none"> ALL ROOTS WHICH ARE EXPOSED THROUGH EXCAVATION ARE TO BE PRUNED BACK TO THE SOIL SURFACE BRANCHES DAMAGED OR INTERFERING WITH CONSTRUCTION ACTIVITIES ARE TO BE PRUNED BY AN INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA) CERTIFIED ARBORIST 	<div style="display: flex; justify-content: space-between;"> <div>DATE: MARCH 29, 2011</div> </div>		
<div style="display: flex; justify-content: space-between;"> <div>REV.</div> <div>SCALE N.T.S.</div> </div>		<div style="display: flex; justify-content: space-between;"> <div>REV.</div> <div>SCALE N.T.S.</div> </div>	
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APPENDIX 5 – NATIVE TREES FOR REPLANTING



City of Toronto
Urban Forestry

Native Trees for Naturalization

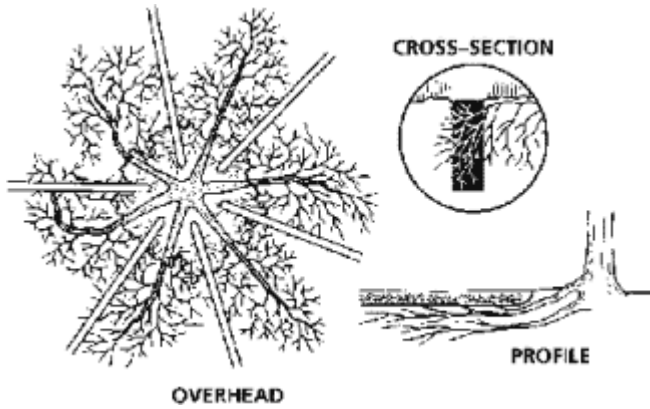
Common Name	Scientific Name	Favoured Moisture	Favoured Soil Type	Favoured Light Regime	Maximum Height	Species Attributes
Black Maple	<i>Acer nigrum</i>	Moist	loam, silt-loam	partial shade to full shade	35m	tolerant of urban conditions
Red Maple	<i>Acer rubrum</i>	Moist-Wet	sand, loam	full sun to partial shade	25m	orange to bright red fall colour
Silver Maple	<i>Acer sacharinum</i>	Moist-Wet	sand, loam, clay	full sun to partial shade	35m	fast growing and tolerant
Sugar Maple	<i>Acer sacharum</i>	Dry-Moist	loam, clay	partial shade to full shade	35m	yellow to orange-red fall colour
Speckled Alder *	<i>Alnus rugosa</i>	Moist-Wet	sand, loam, clay	full sun	8m	provides wildlife habitat
Yellow Birch	<i>Betula alleghaniensis</i>	Moist	loam, sandy-loam	full sun to partial shade	25m	attracts wildlife
White Birch *	<i>Betula papyrifera</i>	Dry-Moist-Wet	sand, loam, gravel-loam	full sun	25m	fast growing and attractive bark
Blue Beech	<i>Carpinus caroliniana</i>	Moist	loam, sandy-loam	full shade to partial sun	8m	interesting bark - looks like muscle
Bitternut Hickory	<i>Carya cordiformis</i>	Moist	sand, loam	full sun to partial shade	25m	fast growing
Shagbark Hickory (RT)	<i>Carya ovata</i>	Dry-Moist	loam, clay	full sun to partial shade	25m	interesting bark, attracts squirrels
Hackberry (RT)	<i>Celtis occidentalis</i>	Dry-Wet	loam, clay	full sun to partial shade	15m	fast growing, tolerant
Hawthorn	<i>Crataegus spp.</i>	Moist	loam, clay	full sun to partial shade	12m	provides wildlife habitat
American Beech	<i>Fagus grandifolia</i>	Moist	loam	partial shade to full shade	25m	flowers eaten by birds
Butternut	<i>Juglans cinerea</i>	Moist	loams	full sun	25m	seeds provide food for wildlife
Black Walnut	<i>Juglans nigra</i>	Moist	loam, clay	full sun	30m	seeds provide food for wildlife
Red Cedar	<i>Juniperus virginiana</i>	Dry-Moist	sand, loam	full sun	4m	provides food & shelter for wildlife
Tamarack*	<i>Larix laricina</i>	Moist	peat, wet sandy-loam	full sun	25m	interesting shape
Tulip Tree (RT)	<i>Liriodendron tulipifera</i>	Moist	sand, loam	full sun to partial shade	35m	pyramidal shape, interesting leaves
Ironwood	<i>Ostrya virginiana</i>	Dry-Moist	loam, clay	full sun to full shade	12m	interesting bark
White Spruce	<i>Picea glauca</i>	Moist	sand, loam, clay	full sun partial shade	25m	provides wildlife habitat
Red Pine (RT)	<i>Pinus resinosa</i>	Dry-Moist	sand, sandy-loam	full sun	25m	stabilizes soil
White Pine	<i>Pinus strobus</i>	Dry-Moist	sand, loam	full sun to partial shade	30m	provides wildlife habitat
Sycamore (RT)	<i>Platanoides occidentalis</i>	Moist-Wet	sand, loam, clay	full sun to partial shade	30 m	interesting, peeling bark
Eastern Cottonwood*	<i>Populus deltoides</i>	Moist-Wet	sand, loam, clay	full sun to partial shade	30m	fast growing
Large-tooth Aspen	<i>Populus grandidentata</i>	Dry-Moist	sand, loam	full sun	20m	fast growing
Trembling Aspen	<i>Populus tremuloides</i>	Moist	sand, loam, clay	full sun	25m	fast growing, tolerant
Pin Cherry	<i>Prunus pensylvanica</i>	Dry	sand, loam	full sun	12m	seeds provide food for wildlife
Black Cherry	<i>Prunus serotina</i>	Dry-Moist	sand, loam	full sun to partial shade	22m	interesting bark, provides habitat
White Oak	<i>Quercus alba</i>	Dry-Moist	sand, sandy-loam	full sun to partial shade	35m	provides food & shelter for wildlife
Bur Oak	<i>Quercus macrocarpa</i>	Dry-Wet	loam, clay	full sun to partial shade	15m	provides food & shelter for wildlife
Red Oak	<i>Quercus rubra</i>	Dry-Moist	sand to loamy-clay	full sun to partial shade	25m	fast growing, wildlife value
Black Oak	<i>Quercus velutina</i>	Dry-Moist	sand	full sun to partial shade	20m	seeds provide food for wildlife
White Cedar	<i>Thuja occidentalis</i>	Dry-Wet	sand, loam, clay	full sun to partial shade	15m	provides wildlife habitat
Basswood	<i>Tilia americana</i>	Dry-Wet	sand, loam, clay	full sun to partial shade	35m	tall stately tree
Hemlock	<i>Tsuga canadensis</i>	Moist-Wet	sand, loam	full shade	30m	provides food & shelter for wildlife

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	<p>An Arboricultural consultant is one of the following:</p> <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 1.37m 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 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 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	<p>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.</p> 
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 by 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">• 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 7 – ARBORIST QUALIFICATIONS

Updated Arborist Report Author

Christopher Preece is a consulting R.P.F. and Arborist with Davey Resources Group. His formal education includes a Bachelor of Environmental Management at York University with a certificate in sustainable energy as well as a Masters of forest Conservation from the University of Toronto, with a focus in long term forest productivity. Mr. Preece has a varied work experience in forestry, field research and arboriculture fields. Mr. Preece has worked with well-known forest researchers around the world and has spent the last three years working in private forestry and Urban forestry in Southern Ontario.

Certifications

International Society of Arboriculture Certified Arborist (ON-2547A)
Forestry Grade Exterminator License # 32964
Registered Professional Forester R.P.F. #2613

APPENDIX 8 – REFERENCES

ISA, 2001-2011. Best Management Practices, Books 1-9, Companion publications to ANSI A300 Standards for Tree Care

1. 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
2. Sinclair and Lyon, 2005. Diseases of Trees and Shrubs, Second Edition
3. ISA, 2010. Glossary of Arboricultural Terms
4. Neely and Watson, ISA, 1994 and 1998. The Landscape Below Ground 1 and 2
5. Matheny and Clark, ISA, 1994. A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas, 2nd Edition
6. Matheny and Clark, ISA 1998. Trees and Development, A Technical Guide to Preservation of Tree During Land Development
7. PNW-ISA, 2011. Tree Risk Assessment in Rural Areas and Urban/Rural Interface, Version 1-
5

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: _____



Popovich Associates
1 Robert Speck Parkway, Suite 100
Mississauga, ON
L4Z 3M3

Arborist Report Addendum

357, 365, 375 Stegman's Mill Road, Kleinburg, ON

30 September 2020, revised 3 November 2020

Introduction

Amy Choi Consulting was retained by Popovich Associates to complete an Arborist Report addendum to a previously completed Tree Protection Plan by Davey Resource Group (14 November 2019) for a property located at 357, 365 and 375 Stegman's Mill Road in Kleinburg, Ontario. The subject property is located northeast of Major Mackenzie Drive West and Islington Avenue. The City of Vaughan's 'Private Property Tree Protection By-law no. 052-2018' is applicable to the subject property and neighbouring properties.

The purpose of this report is to:

- Re-assess trees located near the southern property limit and on the adjacent property to the south for size, health, condition, and ownership;
- Evaluate potential impacts to these trees based on the current proposed site plan; and
- Determine the number of replacement trees required to compensate for any proposed tree removals.

Existing Conditions and Proposed Works

The subject property consists of three naturalizing residential lots with scattered landscape trees and natural regeneration. A natural area exists towards the east of the subject property. The residential dwellings have been demolished and removed.

The proposed development includes 13 residential lots with dwellings with associated access road. Refer to the Tree Preservation Plan (Figure 1) for the existing conditions and the proposed site plan.

Methodology

Field assessments to collect tree inventory data were conducted on 24 September 2020. Trees greater than 10cm diameter at breast height (DBH) crossing the property line or on adjacent property were assessed. Existing tree tag numbers were used, where applicable. Newly inventoried trees were numbered 1 to 6. Groups of trees (tree polygons) that could not be individually located were identified with a prefix 'P'. Trees were located using the topographic survey provided or using aerial photo interpretation and approximations in the field. Survey stakes in the field were utilized to aid in ownership determination. All assessments were limited to ground survey. Trees located wholly on the subject

property were not included in this assessment. Trees located within the 'Open Space' area of the site plan, away from the proposed development, were not included in this assessment.

Species, diameter at breast height (DBH), health, condition, approximate dripline and relevant comments were recorded for each inventoried tree. Approximate surveyed driplines were also added to the topographic survey on 3 September 2020. The topographic survey was updated in October 2020 to include locations of Trees 4a, b, c, and d. Refer to Table 1 for the detailed tree inventory and the Tree Preservation Plan (Figure 1) for the location of the trees.

Results

Tree Inventory

A total of 12 trees and two tree polygons were inventoried on neighbouring property or crossing the property line (shared trees). The majority of the trees are of an undesirable species, and several of the trees are in poor, declining, and/or hazardous condition. Common Buckthorn (*Rhamnus cathartica*) and Common Lilac (*Syringa vulgaris*) are present in the area.

Tree species found include Manitoba Maple (*Acer negundo*), Green Ash (*Fraxinus pennsylvanica*), Siberian Elm (*Ulmus pumila*), Eastern White Cedar (*Thuja occidentalis*), and Norway Maple (*Acer platanoides*). Refer to Table 1 for the detailed tree inventory and Appendix A for photos of the trees.

Analysis and Discussion

Tree Preservation

The preservation of tree polygons P5 and P6 will be possible with the use of appropriate tree preservation measures, as described below. The trees in these polygons are located away from the proposed development and will be protected using tree protection hoarding at the greater of their minimum Tree Protection distances or their driplines. The tree protection hoarding for these trees should consist of a wood frame with plywood panels, to be installed according to the detail shown on the Tree Preservation Plan (Figure 1).

The tree protection barriers should be installed prior to construction and remain in place throughout the construction process, as specified in the Tree Preservation Plan (Figure 1). No grade changes, storage of materials or equipment is permitted within the tree protection zone (TPZ). Tree protection hoarding and tree protection notes, are shown on the Tree Preservation Plan (Figure 1).

Tree Removals

The removal of Trees 1, 2, 3, 4c, 714, 781, 782, and 784, are recommended due to their species, poor and declining condition and/or hazard potential, regardless of the proposed development. The removal of Trees 4a, 4b, and 4d will be required to accommodate the proposed development.

Trees greater than 20cm DBH and are protected by the Private Tree Protection By-law and will require a permit prior to their removal. A permit will be required for the removal of Trees 1, 4c, 4d,, 714, and 780 to 784. Based on the City of Vaughan's replacement tree requirements, a total of 6 replacement trees will

be required to compensate for the tree removals. Dead, hazardous and Ash trees are exempt from replacement tree requirements. The cost related to tree compensation for trees to be removed is \$3,300 (6 trees x \$550 each). Permission from the neighbouring property owner will be required prior to the removal of shared or neighbouring trees of any size.

Conclusion and Recommendations

The majority of the shared and neighbouring trees assessed near the south property line of 356, 365, 375 Stegman's Mill Road in Kleinburg, Ontario consist of undesirable species. Several of these trees are in poor, declining, and/or hazardous condition. The removal of the majority of the trees is recommended due to their species, health, and/or condition, regardless of the proposed development. As per the City of Vaughan's replacement tree requirements, a total of 6 trees are recommended to be planted to compensate for the proposed tree removals. Permission from the neighbouring property owner will be required prior to the removal of any shared or neighbouring trees, on any size.

The remaining trees can be protected, as discussed in this report, and should not be impacted by the proposed development. Additional analysis may be required once grading and servicing plans become available. Tree protection measures should be installed prior to any construction work, as discussed in this report. Tree protection fencing should be implemented at distances noted in Table 1 and shown in the Tree Preservation Plan (Figure 1) and maintained throughout the construction process. Refer to the Tree Preservation Plan (Figure 1) for further information regarding tree protection.

Respectfully Submitted,



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ISA Tree Risk Assessment Qualified

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Table 1. Detailed Tree Inventory

Location: 357, 365, 375 Stegman's Mill Road, Kleinburg

Date: 24 September 2020 Surveyors: AC

Tree #	Common Name	Scientific Name	Diameter at Breast Height (DBH) ²	Trunk Integrity	Crown Structure	Crown Vigour	Crown Dieback	Approx. Dripline	minimum Tree Protection Distance ¹	Comments	Action	Ownership	Required Compensation
			(cm)	Good (G), Fair (F), Poor (P)			%	(m)	(m)				
784	Manitoba Maple	<i>Acer negundo</i>	85	P	P	FP		5	10.8	Hazardous, major cavity in stem, co-dominant at 2m with crack and 1 stem dead, moderate epicormic branching, 1 stem previously failed, moderate lean towards the school	Remove - condition	Shared	0
1	Manitoba Maple	<i>Acer negundo</i>	22	FP	F	F		4	3.6	Stem wound at base with decay, moderate lean towards the southeast, conflict with chain link fence, stem wounds with decay, moderate epicormic branching	Remove - condition	Neighbouring	1
782	Manitoba Maple	<i>Acer negundo</i>	45,40 [60.2]	FP	F	F		4	7.2	Small root flare, reverse stem taper, co-dominant at 0.25m with very heavily included bark, moderate epicormic branching, moderate bow towards the school	Remove - condition	Neighbouring	4
2	Green Ash	<i>Fraxinus pennsylvanica</i>	10	F	F	F		2	1.2	Minor bow, emerald ash borer infestation	Remove - species	Neighbouring	0
781	Manitoba Maple	<i>Acer negundo</i>	41,34 [53.3]	P	FP	FP		10	7.2	Hazardous, history of failure, 1 scaffold branch failed resulting in major stem wound with decay, moderate epicormic branching, 1 stem dead, conflict with chain link fence, smaller stem removed with decay, co-dominant at base with heavily included bark	Remove - condition	Neighbouring	0

780	Manitoba Maple	<i>Acer negundo</i>	30,23 [37.8]	P	FP	FP		4	4.8	Hazardous, stem wound at base with decay, co-dominant at 1.2m with minor included bark, small stem dead and removed, conflict with chain link fence, bowed, moderate epicormic branching, small root flare, reverse stem taper, fruiting bodies	Remove - condition	Neighbouring	0
3	Manitoba Maple	<i>Acer negundo</i>	15.5	FP	FP	F		3	1.2	Topped at 3m with decay, moderate lean towards the southeast, moderate epicormic branching, moderate asymmetrical crown, conflict with fence	Remove - condition	Neighbouring	0
4a	Manitoba Maple	<i>Acer negundo</i>	17	F	F	F		3	1.2	Moderate bow towards the east, moderate epicormic branching	Remove - development	Neighbouring	0
4b	Manitoba Maple	<i>Acer negundo</i>	14	F	F	F		3	1.2	Moderate bow towards the east, moderate epicormic branching, moderate asymmetrical crown	Remove - development	Shared	0
4c	Manitoba Maple	<i>Acer negundo</i>	19,13 [23]	FP	FP	FP		3	3.6	Hazardous, co-dominant at base with moderate included bark, moderate lean towards the southeast, smaller stem dead with decay, topped at chain link fence, previous branch failure	Remove - condition	Neighbouring	0
4d	Manitoba Maple	<i>Acer negundo</i>	27	F	F	F		4	3.6	Moderate coppice growth at base, moderate lean towards the east, minor epicormic branching	Remove - development	Neighbouring	1
714	Siberian Elm	<i>Ulmus pumila</i>	90	FP	FP	F		7	10.8	Hazardous, unions near base, 1m and 2m with moderate included bark and wetwood, previous branch failures, moderate epicormic branching	Remove - condition	Neighbouring	0
P5	Eastern White Cedar	<i>Thuja occidentalis</i>	~5-10cm	F	F	F		1	1.2	Hedgerow, moderate asymmetrical crown due to competition, 3 to 6m in height, 100-200 stems	Preserve	Neighbouring	0
P6	Norway Maple	<i>Acer platanoides</i>	11	FG	F	F		3	1.2	Moderate tar spot, moderate exposed roots	Preserve	Private	0
	Manitoba Maple	<i>Acer negundo</i>	8,6 [10]	F	F	F		3	1.2	Union at base with moderate included bark, spiral fused stems, moderate epicormic branching	Preserve	Shared	0

Appendix A. Photos of Trees



Photo 1 Tree 784



Photo 2 Tree 1

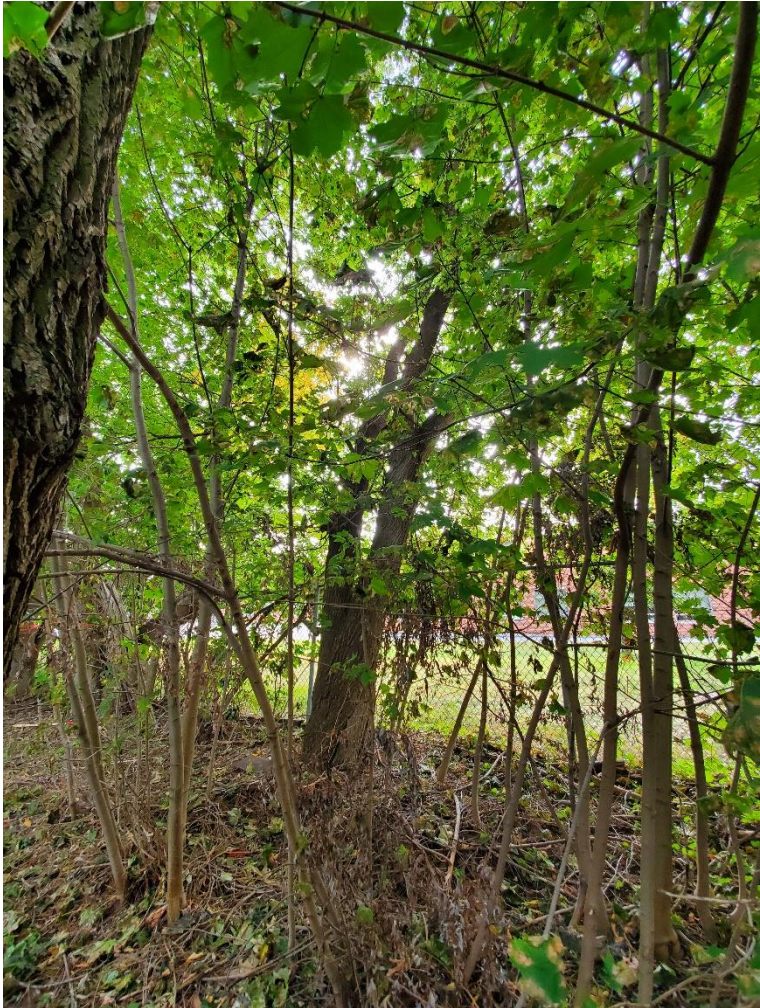


Photo 3 Tree 782



Photo 4 Trees 2, 781, 780 and 3 (right to left)



Photo 5 Tree 4a, 4b, 4c, 4d (right to left)



Photo 6 Tree 714



Photo 7 Tree polygon P5



Photo 8 Tree polygon P6 (centre, foreground)