

# **Arborist Report**

Tree Preservation and Replanting Plan

## **Prepared For:**

Janet Rosenberg & Studio Inc. Contact person: Robert McIntosh

### Site Address:

1066 Dunbarton Rd, Pickering, ON L1V 1G8

October 11, 2022

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## Summary

The following Arborist Report is with respect to the proposed construction of a residence complex consisting of five 2-3 story townhouse and walkup apartment buildings as well as driveway and parking spaces for each the proposed buildings at 1066 Dunbarton Road in Pickering, ON. While on site we inventoried **50 trees** on or around the property:

- Private trees at 1066 Dunbarton Rd: 15;
- City owned trees: 4;
- Neighbor trees: **30**;
- Border tree: 1.

**12 trees** (#4; #21-24; #38-41; 47-50) are recommended **to be removed**. Trees were recommended to be removed if the planned construction would likely incur significant damage to the root system or crown branches of the tree, or if the trees were dead. **No tree removal permits are required** for removal of these trees, as these trees are located on the private property and trees on the subject property are not regulated by the City of Pickering Tree Protection By-law #6108/03.

**8 trees** (#1, #3, #15-17, #25-27) have proposed construction works within its TPZ and will likely **be injured** but is expected to survive.

- **Tree #1** is located in the private property and has asphalt hardscape removal works within its TPZ. We recommend the asphalt hardscape area within the TPZ to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion.
- **Tree #3** is located in the neighboring property and new house footprint encroaches the edge of its TPZ. We recommend low impact root-excavation (hand digging or air spading) under supervision of a Certified Arborist. Where necessary, root pruning is to be performed by a Certified Arborist at the limit of house footprint encroachment into TPZ. We also recommend asphalt hardscape area within the TPZ to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion.
- **Trees #15-17; #25-27** are located in the neighboring property and have asphalt hardscape removal works within their TPZ. We recommend the asphalt hardscape area within the TPZs to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion.
- For Trees #3, #15-17; #25-27 obtaining neighbor's written consent to injure tree is required. Permits to injure trees from the City of Pickering are not required.

**30 trees** (#2, #5-14, #18-20, #28-37, #40, #42-46) are recommended to be preserved. No digging or material storage is to take place within their Minimum Tree Protection Zones (MTPZs) and the trees should not be injured.

We recommend the client install Tree Protection Fencing (TPF) to protect **Trees #1-3**, **#5-9**, **#13**, **#18-20**, **#28-37**, **#40**, **42-46**.

Trees #10-12, #14 can be retained without the use of TPF.

The City of Pickering **Tree Protection By-law 6108/03 regulates** removal of trees in the specified **tree protection areas**, in an effort to protect and preserve the environment. The subject property 1066 Dunbarton Road and adjacent properties are not part of City's tree protection areas. The trees recommended for removal in this report are not regulated under the City of Pickering Tree Protection By-laws and do not



require permit. The City of Pickering is not expected to request to plant trees to compensate for planned tree removals. However, the client is planning to plant **40 replacement trees** to be planted on site after completion of the construction. Replacement tree species and planting locations are indicated in Replacement Tree Planting List (Appendix 1) and the Tree Protection and Replacement Plan (Appendix 2). Replacement trees are to be minimum 50mm caliper and should be planted no later than next Spring after completion of the project.

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



Davey Resource Group (DRG) was retained by Robert McIntosh of Janet Rosenberg & Studio Inc., to develop an Arborist Report and Tree Protection Plan (TPP) for the construction of a new residential complex within the property at 1066 Dunbarton Road in Pickering, ON. 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. To account for the spatial scope of work within the site, the location of the construction as well as all trees within 6 meters of it, including any neighboring lot areas within this scope were surveyed. All trees within the scope of the survey were included in an inventory and assessed for protection or removal needs.

Recommendations for tree preservation or removal are to be provided and follow The City of Pickering Tree Protection by-law (By-law **6108/03**).

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 2)

## 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. The property was not assessed for any arborist report prior to the assessment performed for this report. Conditions of the site are described as they were witnessed during the site assessment. Construction crews were not present during the assessment. Descriptions of the past and ongoing work are based on discussions with the client. No exploration of roots or digging into any grades was conducted during the assessment. Definitive assessment of any tree's root system would require an exploratory root excavation undertaken with an Air-Spade operated by a certified arborist.

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, and camera.
- Photographs included in this report are labeled copies of their originals and may have been cropped for formatting.
- All trees within 6 meters planned construction work were collected and assessed for this report.
- Trees were studied for their proximity to existing and planned structures to determine recommendations or precautions for trees requiring removal or injury.

#### **Observations**

- The site was inspected on September 9<sup>th</sup>, 2022 by ISA Certified Arborist Rashid Azimov at 9:00am. local time.
- Weather conditions were 23°C and sunny.
- 50 trees were located within the property and nearby areas of neighboring properties. These trees were assessed and numbered #1-50. in the inventory and Tree Protection Plan included within Appendices 1-2.
- 15 trees were located on this property, 30 trees were located on neighboring properties, 4 trees in city right of way and 1 tree was in borderline with neighbor properties.
- 42 trees were in good condition, 4 trees in fair, 3 trees in poor and 1 tree was in dead condition.
- Tree #1 is located in the private property. This tree has asphalt hardscape removal works within its TPZ and will likely be injured. We recommend the asphalt hardscape area within the TPZ to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion. No permit from the City of Pickering is required to injure this tree.
- Trees #15-17, #25-27 are recommended to be preserved. No digging or material storage is to take place within their Minimum Tree Protection Zones (MTPZs) and the trees should not be injured.
- Tree #3 is located in the neighboring property. It has new house footprint encroachment to the edge of its TPZ and will be injured. We recommend low impact root-excavation (hand digging or air spading) under supervision of a Certified Arborist. Where necessary, root pruning is to be performed by a Certified Arborist at the limit of house footprint encroachment into TPZ. We also recommend asphalt hardscape area within the TPZ to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion. No permit from the City of Pickering is required to injure this tree. However, **obtaining neighbor's permission to injure tree is required.**
- Trees #4, #21-24, #38-41, #47-50 are recommended to be removed. Trees were recommended to be removed if the planned construction would likely incur significant damage to the root system or crown branches of the tree, or if the trees were dead. No tree removal permits are required for removal of these trees, as these trees are located on the private property and trees on the subject property are not



regulated by the City of Pickering Tree Protection By-law #6108/03.

- Trees #15-17 and #25-27 are located in the neighboring properties. These trees have asphalt hardscape removal works within their TPZ and will likely be injured. We recommend the asphalt hardscape area within the TPZ to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion. No permit from the City of Pickering is required to injure this tree. **Obtaining written consent of the neighbor to injure these trees is required**.
- We recommend the Tree Protection Fencing (TPF) to be installed to protect Trees #1-3, #5-9, #13, #18-20, #28-37, #40, 42-46. TPF should be constructed of plastic orange snow fence attached on metal T-bar posts, 1.2 meters in height. No debris or materials to be stored in the TPZ.
- Trees #10-12, #14 may be retained without the use of TPF.
- The City of Pickering is not expected to request to plant replacement trees to compensate for planned tree removals and injures. However, the client is planning 40 replacement trees to be planted on site after completion of the construction. Replacement tree species and planting locations are indicated in Replacement Tree Planting List (Appendix 1) and the Tree Protection and Replacement Plan (Appendix 2). Replacement trees are to be minimum 50mm caliper and should be planted no later than next Spring after completion of the project.

#### Discussion

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

#### Regulatory context

The City of Pickering By-law 6108/03 protects trees within defined Tree Protection Areas. As none of the trees assessed in this report are located within the Tree Protection Area, they are not regulated by this by-law.

#### Tree Protection Zones

Tree Protection Zones surrounding each tree are defined by the drip line as per City of Pickering Tree Protection Notes. Tree Protection Zones and must be kept free of all construction activity above and below ground. If work is proposed within 6 meters of a tree but not within its TPZ, it is in the best interest of the client to protect it using a Tree Protection Fence built to city standards (depicted in Appendix 3). This serves to prevent any incidental contact or harm to a protected tree that would constitute a contravention of a by-law and may result in fines or a stop-work order.

#### Tree Protection Hoarding (Appendix 3)

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. On this construction site, hoarding (Tree Protection Fencing (TPF)) is recommended to protect all



trees from soil compaction and root cutting. The distance from trees that hoarding is installed is typically defined by the dripline pursuant to a city by-law. However, it must be understood that sometimes this distance is not achievable due to 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).

Vertical hoarding to be built of plastic orange snow fence on 2x4" wood frames or t-posts 1.22 meters high following City of Pickering specifications.

Hoarding locations will be indicated on the Tree Protection Plan (Appendix 2) which has been included in this report but will be printed to-scale for use on-site and in permit applications. Within the scope of this project, hoarding is recommended to be established around all trees at variable distances indicated on the tree protection plan. These distances may be achieved across softscapes and hardscapes surrounding all trees, protecting their Tree Protection Zones.

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

#### 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. For the scope of this project, no root pruning is recommended.

#### 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. The standard sign format is displayed in Appendix 4 within this report. 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 TPZ. At no time are materials, vehicles, traffic, or debris to be stacked, staged, or piled inside the hoarding (Tree Protection Fencing). We recommend that staging be done in the existing driveway.



#### Conclusion

To account for the proposed construction of a new residential complex within the property at 1066 Dunbarton Rd in Pickering, 50 trees were assessed for removal, injury, or preservation needs.

Twelve (12) trees are recommended to be removed. Eight (8) trees have proposed construction works within its TPZ and will likely be injured but is expected to survive. Thirty (30) trees are recommended to be preserved.

As the subject property 1066 Dunbarton Rd and neighboring properties are not part of the City of Pickering Tree Protection Areas, trees on these properties are exempt from permit requirements. The City is not expected to request to plant trees to compensate for planned tree removals. However, the client is planning to plant **40 replacement trees** to be planted on site. Replacement tree species and planting location are indicated in Replacement Tree Planting List (Appendix 1) and the Tree Protection and Replacement Plan (Appendix 2).

## Recommendations

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

- We recommend the client install and properly maintain tree protection fencing (Appendix 3) prior to and during construction work.
  - For Tree Protection Fencing, we recommend the vertical hoarding to be built of plastic orange snow fence on 2x4" wood frames or t-posts 1.22 meters high following City of Pickering specifications. Tree Protection Barrier specifications provided in Appendix 3.
  - We recommend the client install Tree Protection Fencing (TPF) to protect **Trees #1-3**, **#5-9**, **#13**, **#18-20**, **#28-37**, **#40**, **42-46**.
  - Tree Protection Signage similar to the example in Appendix 4 is recommended to be affixed to all Tree Protection Fences.
- For trees **#10-12**, **#14**, we recommend retaining without TPF.
- We recommend the client **to remove trees** #4; #21-24; #38-41; #47-50.
- For tree #3, we recommend low impact root-excavation (hand digging or air spading) under supervision of a Certified Arborist. Where necessary, root pruning is to be performed by a Certified Arborist at the limit of house footprint encroachment into TPZ.
- For Trees #1, #3, ##15-17 and #25-27, we recommend removing asphalt hardscape area within the TPZ using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion.
- The client is required to obtain written consent from the neighbors to injure trees #3, #15-17 and #25-27.
- We recommend 40 replacement trees to be planted on site to compensate for the proposed tree removals and injures. Replacement trees are to be minimum 50mm caliper and should be planted no later than next spring after project completion.



## **Appendix 1 – Tree Protection Action Key (TPAK)**

Tree Map Number	Species	Botanical	DBH (cm) @ 1.4 m	Tree Category	Minimum Protection Distance (m)	Health	Structure	Overall Condition	Live Crown Ratio (%)	Deadwood (%)	Crown Width (m)	Tree Height (m)	Construction inside TPZ	Construction Impact (None, Low, Medium, High)	Action	Permit Required	Recommendations and observations
1	Pine, Austrian	Pinus nigra	47	Private	6.0	Good	Good	Good	80	1	10	11	Ν	Low	Injure	N	Part of asphalt hardscape area within the TPZ to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion; Protect with Tree Protection Fencing; small deadwood
2	Cedar, eastern white (hedgerow)	Thuja occidentalis	9	Neighbor's	2.0	Good	Good	Good	100	0	2	4	Ν	None	Preserve	N	Protect with TPF; hedgerow, m-stem:9-5 cm
3	Walnut, black	Juglans nigra	38	Neighbor's	9.0	Good	Good	Good	80	0	16	17	Y	Medium	Injure	N	Obtaining neighbor's written consent to injure tree is required; Recommended low impact (air spading or hand digging) root excavation under supervision of a Certified Arborist. Root pruning to be performed by a Certified Arborist at the limit of house footprint) encroachment into TPZ. The asphalt hardscape within the TPZ to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion
4	Honeylocust	Gleditsia triacanthos	35	Private	7.0	Good	Good	Good	80	2	12	10	Y	High	Remove	N	
5	Spruce, blue	Picea pungens	8	Neighbor's	2.5	Good	Good	Good	100	1	3	4	Ν	None	Preserve	N	Protect with TPF
6	Cedar, Eastern white emerald	Thuja occidentalis 'SMARAGD'	7	Neighbor's	2.0	Good	Good	Good	100	0	2	4	Ν	None	Preserve	N	Protect with TPF; m-stem
7	Cedar, Eastern white emerald	Thuja occidentalis 'SMARAGD'	7	Neighbor's	1.5	Good	Good	Good	100	0	1	2.5	Ν	None	Preserve	N	Protect with TPF

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Tree Map Number	Species	Botanical	DBH (cm) @ 1.4 m	Tree Category	Minimum Protection Distance (m)	Health	Structure	Overall Condition	Live Crown Ratio (%)	Deadwood (%)	Crown Width (m)	Tree Height (m)	Construction inside TPZ	Construction Impact (None, Low, Medium, High)	Action	Permit Required	Recommendations and observations
8	Cedar, Eastern white emerald	Thuja occidentalis 'SMARAGD'	4	Neighbor's	1.5	Good	Good	Good	100	0	1	2	N	None	Preserve	N	Protect with TPF
9	Cedar, Eastern white emerald	Thuja occidentalis 'SMARAGD'	3	Neighbor's	1.5	Good	Good	Good	100	0	1	1.5	N	None	Preserve	N	Protect with TPF
10	Cedar, Eastern white emerald	Thuja occidentalis 'SMARAGD'	3	Neighbor's	1.5	Good	Good	Good	100	0	1	1.5	Ν	None	Preserve	N	Retain without TPF
11	Cedar, Eastern white emerald	Thuja occidentalis 'SMARAGD'	2	Neighbor's	1.5	Good	Good	Good	100	0	1	1.5	Ν	None	Preserve	N	Retain without TPF
12	Cedar, Eastern white (hedgerow)	Thuja occidentalis	15	Border	3.0	Good	Good	Good	100	0	4	5	N	None	Preserve	N	Retain without TPF; m-stem: 15.13.10.9.6.6.6.5.
13	Walnut, black	Juglans nigra	82	Neighbor's	8.0	Good	Good	Good	90	2	14	20	N	None	Preserve	N	Protect with TPF; deadwood; estimated DBH
14	Maple, Manitoba	Acer negundo	9	Neighbor's	2.0	Good	Fair	Fair	90	5	2	5	N	None	Preserve	N	Retain without TPF; lean, sprouts, deadwood
15	Walnut, black	Juglans nigra	35	Neighbor's	8.0	Good	Good	Good	75	0	14	20	Y	Low	Injure	N	Obtaining neighbor's written consent to injure tree is required; The asphalt hardcape within the TPZ to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion; Protect with TPF;
16	Maple, Manitoba	Acer negundo	8	Neighbor's	2.5	Good	Good	Good	70	0	3	3	Y	Low	Injure	N	Obtaining neighbor's written consent to injure tree is required; The asphalt hardcape within the TPZ to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion; Protect with TPF;



Tree Map Number	Species	Botanical	DBH (cm) @ 1.4 m	Tree Category	Minimum Protection Distance (m)	Health	Structure	Overall Condition	Live Crown Ratio (%)	Deadwood (%)	Crown Width (m)	Tree Height (m)	Construction inside TPZ	Construction Impact (None, Low, Medium, High)	Action	Permit Required	Recommendations and observations
17	Walnut, black	Juglans nigra	85	Neighbor's	9.5	Good	Good	Good	75	0	17	20	Y	Low	Injure	N	Obtaining neighbor's written consent to injure tree is required; The asphalt hardcape within the TPZ to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion; Protect with TPF;
18	Buckthorn, common	Rhamnus cathartica	7	Neighbor's	2.0	Good	Good	Good	100	0	2	3.5	Ν	None	Preserve	N	Protect with TPF
19	Horsechestnut	Aesculus hippocastanum	12	Neighbor's	2.0	Good	Fair	Good	80	1	2	4	Ν	None	Preserve	N	Protect with TPF
20	Horsechestnut	Aesculus hippocastanum	15	Neighbor's	2.5	Good	Good	Good	80	0	3	6	Ν	None	Preserve	Ν	Protect with TPF
21	Yew spp.	Taxus spp.	4	Private	2.0	Fair	Good	Good	100	2	2	2.5	Y	High	Remove	Ν	m-stem: 4.2.2.2.2.2.2.; brown leaves
22	Honeylocust	Gleditsia triacanthos	25	Private	4.0	Poor	Poor	Poor	55	30	6	6	Y	High	Remove	Ν	deadwood
23	Elm spp.	Ulmus spp.	19	Private	4.0	Fair	Fair	Fair	75	8	6	8	Y	High	Remove	N	deadwood; included bark; codominant stems: 19.14
24	Cedar, Eastern white emerald	Thuja occidentalis 'SMARAGD'	6	Private	1.5	Good	Good	Good	100	0	1	4	Y	High	Remove	Ν	m-stem:6.4.
25	Spruce, Norway	Picea abies	50	Neighbor's	7.0	Good	Good	Good	80	0	12	27	Y	Low	Injure	N	Obtaining neighbor's written consent to injure tree is required; Part of asphalt hardcape area within the TPZ to be removed using hand tools (jackhammer and wheelbarrow)with topsoil and sod placed after completion; Protect with TPF; Estimated DBH;

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Tree Map Number	Species	Botanical	DBH (cm) @ 1.4 m	Tree Category	Minimum Protection Distance (m)	Health	Structure	Overall Condition	Live Crown Ratio (%)	Deadwood (%)	Crown Width (m)	Tree Height (m)	Construction inside TPZ	Construction Impact (None, Low, Medium, High)	Action	Permit Required	Recommendations and observations
26	Spruce, Norway	Picea abies	45	Neighbor's	6.0	Good	Good	Good	75	0	10	21	Y	Low	Injure	Ν	Obtaining neighbor's written consent to injure tree is required; Part of asphalt hardcape area within the TPZ to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion; Protect with TPF; included bark, codominant leaders
27	Mulberry, white	Morus alba	25	Neighbor's	4.5	Good	Good	Good	100	0	7	13	Y	Low	Injure	N	Obtaining neighbor's written consent to injure tree is required; Part of asphalt hardcape area within the TPZ to be removed using hand tools (jackhammer and wheelbarrow) with topsoil and sod placed after completion; Protect with TPF; estimated DBH, sprouts
28	Buckthorn, common	Rhamnus cathartica	8	Neighbor's	2.5	Good	Good	Good	100	0	3	4	Ν	None	Preserve	N	Protect with TPF; multistem
29	Buckthorn, common	Rhamnus cathartica	12	Neighbor's	3.5	Good	Good	Good	100	0	5	6	N	None	Preserve	N	Protect with TPF; included bark, m-stems:12.10.8.4.
30	Maple, Norway	Acer platanoides	26	Neighbor's	6.0	Good	Good	Good	85	0	10	14	N	None	Preserve	N	Protect with TPF; Existing asphalt hardscape within TPZ serves as root protection
31	Elm, American	Ulmus americana	47	Neighbor's	8.5	Fair	Poor	Poor	80	0	15	14	Ν	None	Preserve	Ν	Protect with TPF; Existing asphalt hardscape within TPZ serves as root protection; m- stem:47.35.33; included bark, crack split



Tree Map Number	Species	Botanical	DBH (cm) @ 1.4 m	Tree Category	Minimum Protection Distance (m)	Health	Structure	Overall Condition	Live Crown Ratio (%)	Deadwood (%)	Crown Width (m)	Tree Height (m)	Construction inside TPZ	Construction Impact (None, Low, Medium, High)	Action	Permit Required	Recommendations and observations
32	Buckthorn, common	Rhamnus cathartica	8	Neighbor's	3.0	Good	Good	Good	100	0	4	5	N	None	Preserve	N	Protect with TPF; Existing asphalt hardscape within TPZ serves as root protection
33	Maple, Norway	Acer platanoides	15	Private	3.5	Good	Good	Good	70	0	5	10	N	None	Preserve	N	Protect with TPF; Existing asphalt hardscape within TPZ serves as root protection; m-stem: 15.12. included bark
34	Cedar, eastern white	Thuja occidentalis	12	Neighbor's	4.0	Good	Good	Good	100	0	6	7	N	None	Preserve	N	Protect with TPF; Existing asphalt hardscape within TPZ serves as root protection; m- stem:12.10.10.
35	Cedar, eastern white	Thuja occidentalis	10	Neighbor's	2.0	Poor	Poor	Poor	100	50	2	з	N	None	Preserve	N	Protect with TPF; lean; m- stem:10.8.
36	Cedar, eastern white	Thuja occidentalis	12	Neighbor's	2.0	Good	Good	Good	100	0	2	9	N	None	Preserve	N	Protect with TPF; m-st:12.8.
37	Cedar, eastern white	Thuja occidentalis	14	Neighbor's	2.5	Good	Good	Good	100	0	3	9	N	None	Preserve	N	Protect with TPF; Existing asphalt hardscape within TPZ serves as root protection; m-st:14.10.
38	Elm spp.	Ulmus spp.	15	Private	2.5	Dead	High Risk	Dead	n/a	100	3	9	N	None	Remove	N	Recommended for removal due to condition; m- stems:15.11.11.
39	Mulberry, white	Morus alba	14	Private	3.0	Good	Good	Good	75	0	4	8	N	None	Remove	N	Poor location
40	Cedar, eastern white (hedgerow)	Thuja occidentalis	15	Neighbor's	2.0	Good	Good	Good	100	0	2	9	N	None	Preserve	N	Protect with TPF; Existing asphalt hardscape within TPZ serves as root protection; m-stem: 15.12.12.8.3.
41	Cherry/plum, spp.	Prunus spp.	5	Private	2.0	Good	Good	Good	90	0	2	5	N	None	Remove	N	Poor location



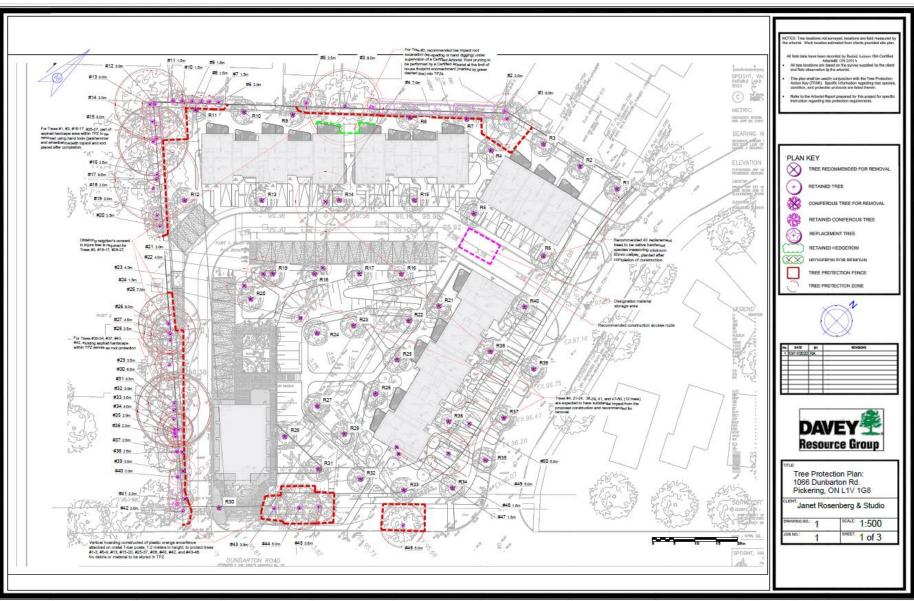
Tree Map Number	Species	Botanical	DBH (cm) @ 1.4 m	Tree Category	Minimum Protection Distance (m)	Health	Structure	Overall Condition	Live Crown Ratio (%)	Deadwood (%)	Crown Width (m)	Tree Height (m)	Construction inside TPZ	Construction Impact (None, Low, Medium, High)	Action	Permit Required	Recommendations and observations
42	Maple, Norway	Acer platanoides	8	Private	2.0	Good	Good	Good	90	0	2	8	N	None	Preserve	N	Protect with TPF; Existing asphalt hardscape within TPZ serves as root protection; m-stem:8.6.6.4.
43	Spruce, Norway	Picea abies	48	City owned	3.0	Good	Good	Good	85	0	4	20	Ν	None	Preserve	Ν	Protect with TPF;
44	Spruce, Norway	Picea abies	76	City owned	5.0	Good	Good	Good	75	1	8	21	N	None	Preserve	N	Protect with TPF; included bark, codominant stems
45	Horsechestnut	Aesculus hippocastanum	53	City owned	3.5	Good	Good	Good	70	0	5	12	Ν	None	Preserve	Ν	Protect with TPF;
46	Maple, Norway	Acer platanoides	38	City owned	5.0	Good	Good	Good	80	0	8	9	N	None	Preserve	Ν	Protect with TPF; girdling roots
47	Cedar, eastern white emerald	Thuja occidentalis	5	Private	1.5	Good	Good	Good	100	0	1	3	Y	High	Remove	Ν	m-stem:5.4.
48	Cedar, eastern white emerald	Thuja occidentalis	7	Private	1.8	Good	Good	Good	100	0	1.5	4	Y	High	Remove	Ν	m-stem:7.5.3.
49	Maple, Norway	Acer platanoides	37	Private	5.0	Fair	Fair	Fair	80	7	8	10	Y	High	Remove	Z	girdling roots
50	Maple, Norway	Acer platanoides	32	Private	5.0	Fair	Fair	Fair	80	0	8	10	Y	High	Remove	Ν	included bark, low vigour

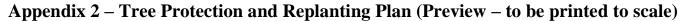


#### **Replacement Tree Planting List**

Replacement Tree Number	Species	Replacement Tree Number	Species
R1	Red Maple (Acer rubrum)	R21	Littleleaf Linden (Tilia cordata)
R2	Red Maple (Acer rubrum)	R22	Littleleaf Linden (Tilia cordata)
R3	Red Maple (Acer rubrum)	R24	Littleleaf Linden (Tilia cordata)
R4	Red Maple (Acer rubrum)	R26	Littleleaf Linden (Tilia cordata)
R5	Red Maple (Acer rubrum)	R23	Littleleaf Linden (Tilia cordata)
R6	Red Maple (Acer rubrum)	R25	Littleleaf Linden (Tilia cordata)
R7	Red Maple (Acer rubrum)	R27	Bur oak (Quercus macrocarpa)
R8	Red Maple (Acer rubrum)	R 28	Bur oak (Quercus macrocarpa)
R9	Red Maple (Acer rubrum)	R 29	Bur oak (Quercus macrocarpa)
R10	Red Maple (Acer rubrum)	R 30	Bur oak (Quercus macrocarpa)
R11	Sugar Maple (Acer saccharum)	R 31	Bur oak (Quercus macrocarpa)
R12	Sugar Maple (Acer saccharum)	R 32	Bur oak (Quercus macrocarpa)
R13	Sugar Maple (Acer saccharum)	R 33	Sugar Maple (Acer saccharum)
R14	Sugar Maple (Acer saccharum)	R 34	Sugar Maple (Acer saccharum)
R15	Sugar Maple (Acer saccharum)	R 35	Sugar Maple (Acer saccharum)
R16	Honeylocust (Gleditsia triacanthos)	R 36	Sugar Maple (Acer saccharum)
R17	Honeylocust (Gleditsia triacanthos)	R 37	Sugar Maple (Acer saccharum)
R18	Honeylocust (Gleditsia triacanthos)	R 38	Sugar Maple (Acer saccharum)
R19	Honeylocust (Gleditsia triacanthos)	R 39	Sugar Maple (Acer saccharum)
R20	Honeylocust (Gleditsia triacanthos)	R 40	Sugar Maple (Acer saccharum)

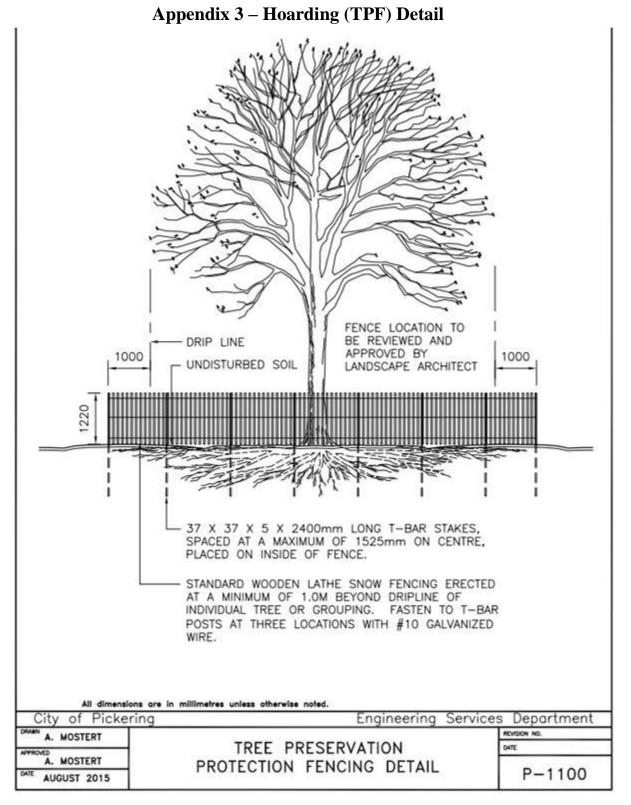






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## **Appendix 4 – Tree Protection Zone Sign Details**

## **Tree Protection Zone**

No grade change, storage of materials or equipment is permitted within this area.

Report any contraventions to

Contact Name \_\_\_\_\_ Tel No. \_\_\_\_\_ Unauthorized removal of the tree protection barrier or other contraventions may result in prosecution.

A sign that is similar to the illustration above may be required to be mounted on all sides of a tree protection barrier for trees protected by the bylaw. The sign should be a minimum of 40cm x 60cm and made of white gator board or equivalent material.



## **Appendix 5** – **References**

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



## **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.
	An Arboricultural consultant is one of the following:
	<ul> <li>American Society of Consulting Arborists, Registered Consulting Arborist (ASCA RCA#)</li> </ul>
Consulting Arborist	<ul> <li>International Society of Arboriculture, Board Certified Master Arborist (ISA BCMA #B)</li> </ul>
	• ISA Certified Arborist/Municipal Specialist in good standing for a minimum of 6 years with 6 years of proven experience in a management role related to arboriculture, and has attested and signed to a code of ethics related to arboriculture (ISA#)
Compartmentalization	Natural defense process in trees by which chemical and physical boundaries are created that act to limit the spread of disease and decay organisms
Critical Root Zone – (CRZ)	Area of soil around a tree where the minimum amounts of roots considered critical to the structural stability or health of the tree are located. CRZ determination is sometimes based on the drip line or a multiple of dbh (12:1, 12cm of ground distance from the trunk for every cm of dbh) but because root growth is often asymmetric due to site conditions, on-site investigation is preferred.
Daylighting	Also known as Hydro-vac, this is the process by which soil is vacuumed up. In the context of tree care this allows workers to access the soil below the roots without mortal damage to significant roots.
DBH	Acronym for tree diameter at breast height. Measured at 1.4m above ground.
Decurrent	Rounded or spreading growth habit of the tree crown.
Directional Pruning	Providing clearance by pruning branches that could significantly affect the integrity of utility facilities or other structures, and leaving in place branches that could have little or no effect.
Dripline	Imaginary line defined by the branch spread of a single parent or group of plants



r	
Excurrent	Tree growth habit characterized by a central leader and a pyramidal crown.
Included bark	Bark that becomes embedded in a crotch (union) between branch and trunk or between codominant stems. Causes a weak structure.
Lion's Tailing	Poor pruning practice in which an excessive number of branches are thinned from the inside and lower part of specific limbs or a tree crown, leaving mostly terminal foliage. Results in poor branch taper, poor wind load distribution, and higher risk of branch failure.
MTPZ	Acronym for Minimum Tree Protection Zone, also known as the Structural Root Zone (SRZ), which is the distance from the tree equal to 6 times the dbh, within which the likelihood of encountering roots that are structural supports for the tree.
Moment	Rotational force that is created by any line force on a body. The magnitude of a moment is defined as the product of the force magnitude and perpendicular distance from the line of action of the force to the axis of which the moment is being calculated.
Mortality Spiral	A sequence of stressful events or conditions causing the decline and eventual death of a tree.
Mulch	Material that is spread 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	<ul> <li>Trees have 4 walls in a process known as compartmentalization.</li> <li>Wall 1 prevents decay moving up and down in a tree</li> <li>Wall 2 prevents decay moving inward in a tree</li> <li>Wall 3 prevents decay moving laterally in a tree</li> <li>Wall 4 is the new growth formed on the outside of the tree, callus growth.</li> </ul>
Woundwood	Lignified, differentiated tissues produced on woody plants after wounding.







**Rashid Azimov** is a Consulting Arborist for the Davey Resource Group (DRG). His formal education includes a Master of Forest Conservation from the University of Toronto. Mr. Azimov has over eight years of varied work experience in the forest conservation research and arboriculture fields. Mr. Azimov has worked for the Davey Tree Expert Company of Canada for three years as a Plant Health Care Technician, Climber and Consulting Arborist.

#### **Designations and certificates**

Registered Professional Forester (R.P.F.) #2696

ISA Certified Arborist #ON-2591A

ISA Tree Risk Assessment Qualification (ISA TRAQ)



## **Appendix 8 – Photographs**



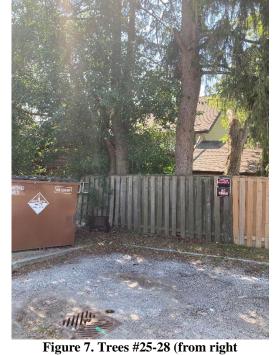




Figure 5. Tree ##12 (foreground), #13-20 (background from right to left)



Figure 6. Tree #21 (left), #22-23 (foreground) and Tree #24 (center, background)



igure 7. Trees #25-28 (from right to left, behind fence)



Figure 8. Trees #30-36 (from right to left)





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#### **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: \_\_\_\_\_