

Arborist Report

1000-1024 Dundas St. East
Mississauga, Ontario

June 1, 2022

Prepared for:

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CONTENTS

Executive Summary	1
Introduction	2
Site Observations.....	2
Results and Discussion	2
Conclusion.....	7
Appendix 1 – Tree Inventory	8
Appendix 2 – Tree Inventory Attributes	10
Appendix 3 – Selected Figures	11
Appendix 4 – Tree-related Plans	14
Appendix 5 – Tree Protection Specifications	16
Appendix 6 – Limitations of Assessment	22

NB: This Arborist Report has been prepared using the latest drawings and information provided by the client and/or agents and may be intended for inclusion in a site plan approval or similar planning submission. Any subsequent design or site plan changes affecting trees may require revisions to this report. New drawings and information should be provided to UFI prior to report submission to municipal planning authorities.

Links (URLs) provided to web-based resources are current to the date of the report.

EXECUTIVE SUMMARY

Urban Forest Innovations Inc. (UFI) has been retained by Ahmed Developments Inc. to prepare an arborist report for the proposed development application at 1000-1024 Dundas St. East in Mississauga, Ontario. The purpose of the arborist report is to document existing tree and site conditions, to evaluate anticipated impacts to site trees which may occur as a result of the proposed development, and to identify required and recommended tree protection measures and regulatory requirements associated with the proposed development.

In total, 48 trees are addressed in this report. Proposed tree removals and injuries requiring permit approval are summarized in Table 1, below. Based upon the results of the present assessment, it has been determined that 10 trees may be retained and 38 trees will require removal. The proposed works will require the implementation of specific tree protection measures to ensure effective tree retention, including tree protection fencing, root-sensitive excavation and root pruning, tree-sensitive asphalt demolition, and arborist site supervision.

Table 1: Summary of proposed tree actions at 1000-1024 Dundas St. E., Mississauga, ON.

Proposed Action	Municipal Trees	Subtotal	Private Regulated Trees	Subtotal	Total
Injure	-	0	#9, 10, 11, 12, 13	5	5
Remove (Development)	-	0	#2, 3, 4, 5, 6, 7, 8, 15, 16, 17, 81, 19, 20, 21, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 37, 38, 39, 40, 42, 43	32	32
Remove (Condition)	-	0	#35, 44	2	2

INTRODUCTION

Urban Forest Innovations Inc. has been requested by Ahmed Developments Inc. to prepare an arborist report for the proposed development at 1000-1024 Dundas St. East in Mississauga, Ontario. The proposed site works include the following activities:

- Demolition of the existing buildings and hardscapes.
- Construction of two mixed-use residential buildings with an underground parking lot.
- Installation of related amenities and landscaping.

This arborist report reviews the potential impacts of the proposed works upon 48 trees within or close to the limits of disturbance, and outlines required and recommended tree protection measures and regulatory requirements associated with the proposed development. General tree maintenance recommendations are also provided where appropriate. The report should be read in conjunction with all other servicing, grading and landscaping plans prepared for the project.

SITE OBSERVATIONS

Field observations were made on September 24, 2021, by Anna Mernieks, ISA Certified Arborist ON-2224A. There was no construction activity on the site at the time of the field observations. Trees within 6 metres of the potential limits of disturbance are included in the inventory. Trees were located using the latest site drawings and information provided by the client; trees for which no surveyed locations were provided were positioned approximately with the aid of field reference markers. Tree diameter was measured at 1.4 metres above grade (DBH) and trees were assessed for health, structural condition, and risk potential. Tree groups were identified where appropriate. All trees were assessed from the ground level. No trees were tagged as part of the inventory. A full explanation of tree assessment categories is included in Appendix 2 – Tree Inventory Attributes.

RESULTS AND DISCUSSION

This section of the report outlines the key issues related to the proposed works from an arboricultural and tree preservation perspective. Specific recommendations regarding tree protection are outlined. General recommendations are also provided in Appendix 5.

By-laws and Legislation

By-laws and legislation enacted by the City of Mississauga and/or the Province of Ontario regulate the injury or destruction of trees depending upon their location, size and other factors.

Private Tree Protection By-law

The City of Mississauga's Private Tree Protection By-law (0254-2012) regulates the injury and destruction of certain privately-owned trees. Pursuant to this by-law, removal or injury of more than 2 healthy trees with a diameter at breast height (DBH) of over 15 cm per calendar year requires a permit. Removal or injury of trees less than 15 cm in diameter, or removal or injury of one or two trees greater than 15 cm DBH per year does not require a permit.

Detailed information about the Private Tree Protection by-law can be found online at:

<http://www.mississauga.ca/portal/residents/parks-private-tree-protection>

Boundary Trees – Ontario Forestry Act, R.S.O. 1990

The Provincial *Forestry Act, R.S.O. 1990* states:

10. (2) Every tree whose trunk is growing on the boundary between adjoining lands is the common property of the owners of the adjoining lands. 1998, c. 18, Sched. I, s. 21.
- (3) Every person who injures or destroys a tree growing on the boundary between adjoining lands without the consent of the land owners is guilty of an offence under this Act. 1998, c. 18, Sched. I, s. 21.

21 inventoried trees (#3, 4, 5, 7, 8, 11, 12, 15, 16, 17, 25, 26, 31, 35, 36, 40, 41, 42, 43, 44, 46) appear to be growing on the boundary between the subject site and the adjacent properties.

Endangered, Rare or Protected Species – Endangered Species Act, 2007

The Provincial *Endangered Species Act, 2007* (ESA) provides for the conservation of endangered or threatened species in Ontario. The ESA identifies Species at Risk (SAR) based on the best available scientific information, protects SAR and their habitats, promotes the recovery of species that are at risk, and promotes stewardship activities to assist in the protection and recovery of SAR.

No endangered, rare or otherwise protected tree species were observed within the limits of proposed works.

Tree Removal

Tree removal will be necessary to facilitate the proposed works. Recommendations for tree removal are based upon consideration of the anticipated impacts upon trees due to implementation of the proposed works, the immediate and forecasted health and structural condition of the tree, and the ability of the tree to make continued contributions to the newly modified landscape.

Project Works

The proposed works will require the removal of 35 trees:

Table 2: Trees recommended for removal to permit site works at 1000-1024 Dundas St. E., Mississauga, ON.

Tree	Common Name	Scientific Name	Diameter (cm)	Location
1	Siberian Elm	<i>Ulmus pumila</i>	13	Subject Site
2	Siberian Elm	<i>Ulmus pumila</i>	37	Subject Site
3	Siberian Elm	<i>Ulmus pumila</i>	50	Boundary
4	Siberian Elm	<i>Ulmus pumila</i>	22	Boundary
5	Siberian Elm	<i>Ulmus pumila</i>	32	Boundary
6	Siberian Elm	<i>Ulmus pumila</i>	44	Subject Site
7	Siberian Elm	<i>Ulmus pumila</i>	23	Boundary
8	Siberian Elm	<i>Ulmus pumila</i>	29	Boundary
15	Siberian Elm	<i>Ulmus pumila</i>	43	Boundary
16	Manitoba Maple	<i>Acer negundo</i>	18	Boundary
17	Manitoba Maple	<i>Acer negundo</i>	40	Boundary
18	Siberian Elm	<i>Ulmus pumila</i>	33	Subject Site
19	Manitoba Maple	<i>Acer negundo</i>	32	Subject Site
20	Siberian Elm	<i>Ulmus pumila</i>	22	Subject Site
21	Siberian Elm	<i>Ulmus pumila</i>	24	Subject Site
22	Siberian Elm	<i>Ulmus pumila</i>	14	Subject Site
23	Siberian Elm	<i>Ulmus pumila</i>	22	Subject Site
25	Manitoba Maple	<i>Acer negundo</i>	15	Boundary
26	Manitoba Maple	<i>Acer negundo</i>	16	Boundary
27	Siberian Elm	<i>Ulmus pumila</i>	20	Subject Site
28	Siberian Elm	<i>Ulmus pumila</i>	16	Subject Site
29	Siberian Elm	<i>Ulmus pumila</i>	15	Subject Site
30	Siberian Elm	<i>Ulmus pumila</i>	19	Subject Site
31	Manitoba Maple	<i>Acer negundo</i>	25	Boundary
32	Siberian Elm	<i>Ulmus pumila</i>	48	Subject Site
33	Siberian Elm	<i>Ulmus pumila</i>	29	Subject Site
34	Manitoba Maple	<i>Acer negundo</i>	27	Subject Site
36	Manitoba Maple	<i>Acer negundo</i>	22	Boundary
37	Manitoba Maple	<i>Acer negundo</i>	24	Subject Site
38	Siberian Elm	<i>Ulmus pumila</i>	26	Subject Site
39	Siberian Elm	<i>Ulmus pumila</i>	31	Subject Site
40	Siberian Elm	<i>Ulmus pumila</i>	28	Boundary
41	Siberian Elm	<i>Ulmus pumila</i>	14	Boundary
42	Siberian Elm	<i>Ulmus pumila</i>	40	Boundary
43	Siberian Elm	<i>Ulmus pumila</i>	40	Boundary

Condition

3 inventoried trees are recommended for removal for reasons unrelated to the proposed works:

- Tree #24, an 11 cm diameter Siberian elm (*Ulmus pumila*), located on the subject site, was assessed as standing dead at the time of field observations and should be removed prior to the commencement of site works.
- Tree #35, an 89 cm diameter Siberian elm (*Ulmus pumila*), located on the boundary between the subject site and an adjacent property, was assessed as having poor structure due to partial crown removal at the time of field observations and should be fully removed prior to the commencement of site works.
- Tree #44, a 73 cm diameter Manitoba maple (*Acer negundo*), located on the boundary between the subject site and an adjacent property, was assessed as having failed and being in poor condition at the time of field observations and should be removed prior to the commencement of site works. As the tree has failed and is in poor condition, permit exemption should be sought for its removal.

Tree Retention

All other trees addressed in this report are proposed for retention. This section outlines specific tree preservation and protection measures for retained trees. General tree protection recommendations and specifications are found in Appendix 5.

All trees to be retained within or adjacent to the limits of project works are designated for Preservation, Protection, or Injury.

Tree Preservation

No specific tree protection measures are recommended for 2 trees (#46, 48), which are in severe decline and do not warrant protection.

Tree Protection

Retained trees in proximity to the proposed works shall be protected by restricting access and land use within tree protection zones (TPZs), as through the installation of tree preservation fencing (or hoarding) that satisfies the minimum required distance (TPZ) for each tree, where possible. Minimum required TPZ distances are specified in Appendix 1, and recommended fencing configurations are illustrated in Appendix 4. Fencing is to be established in advance of all proposed works, including but not limited to material and equipment delivery, staging and storage, demolitions, excavation and grading work, and new construction activity.

Specifications for the establishment of protection fencing and signage are outlined further in Appendix 5 – Section 5.2.1.1.

Tree Injury

During the course of site works, retained trees may undergo injury, which is understood to be the encroachment of established Tree Protection Zones (TPZs), regardless of the extent of actual physical damage sustained by the retained tree.

In addition to tree protection fencing, trees designated for injury at 1000-1024 Dundas St. East require the implementation of the following supplemental tree protection measures:

- **Root-Sensitive Excavation and Root Pruning** – The Tree Protection Zones of 5 by-law regulated, inventoried trees (#9, 10, 11, 12, 13) will be impacted by excavation to enable the proposed works. All excavation within TPZs shall be accomplished by root-sensitive excavation utilizing hand-digging, hydrovac or pneumatic soil excavation (e.g., Airspade). Excavations must be supervised by a Certified Arborist, who must be enabled to stop works if, during the course of excavation, significant structural or transport roots (greater than approximately 25mm diameter) are encountered, in order to properly prune the roots. Specifications for root-sensitive excavation and root pruning are outlined in Appendix 5 – Sections 5.2.1.4 and 5.2.1.5.
- **Tree-Sensitive Demolition of Asphalt** – The Tree Protection Zones of 5 by-law regulated, inventoried trees (#9, 10, 11, 12, 13) will be impacted by the demolition of the existing parking lot. In order to minimize root zone disturbance, demolition should be undertaken in a tree-sensitive manner. Within the TPZs, the existing asphalt top-layer should be broken up and removed, as required, by hand or hand-operated machinery. The existing aggregate base and sub-base should not be disturbed nor removed. The demolition of the asphalt should be limited to the existing footprint of the driveway and no softscape should be excavated from the TPZs of these trees. As existing asphalt is removed, the extent and health of any exposed underlying significant roots should be evaluated by the consulting arborist, in order to properly prune the roots, if necessary, or assess the extent of potential injury.

Tree Risk and Required Tree Maintenance

At the time of inspection, there were no immediate risks posed by any trees within the project limits.

By-law and Permit Requirements

In total, 39 privately-owned trees equal to or greater than 15 cm DBH are proposed for removal and injury:

- Trees #2, 3, 4, 5, 6, 7, 8, 15, 16, 17, 18, 19, 20, 21, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, and 44 for removal.
- Trees #9, 10, 11, 12, and 13, for injury.

An *Application to Permit the Injury or Destruction of Trees on Private Property* and a *Tree Injury or Destruction Questionnaire and Declaration* may be required to enable the proposed removals and injuries.

The City's *Application to Permit the Injury or Destruction of Trees on Private Property* form can be found online at:

http://www7.mississauga.ca/documents/FormsOnline/Form_2205_Permitt_Destroy_Trees.pdf

The City of Mississauga's *Tree Injury or Destruction Questionnaire and Declaration* form can be found online at: <http://www7.mississauga.ca/Documents/FormsOnline/2206.pdf>

Boundary Trees – Ontario Forestry Act, R.S.O. 1990

21 inventoried trees (#3, 4, 5, 7, 8, 11, 12, 15-17, 25, 26, 31, 35, 36, 40, 41, 42, 43, 44, 46) appear to be growing on the boundary between the subject site and adjacent properties. Given the location of trees #3, 4, 5, 7, 8, 15, 16, 17, 25, 26, 31, 35, 36, 40, 41, 42, 43, and 44 on the boundary of the subject site, the property owner or their agent should receive confirmation of the adjacent property owners' consent to injure or remove these trees. This will likely ensure compliance with the provisions of the provincial *Forestry Act, 1990*, which regulates the injury and destruction of shared trees.

CONCLUSION

There are 48 trees associated with the proposed development at 1000-1024 Dundas St. East in Mississauga, Ontario. The proposed works will require the implementation of specific tree protection measures to ensure effective tree preservation. 32 by-law regulated trees will require removal and 5 by-law regulated trees will require injury to enable the proposed works. The removal of 2 by-law regulated trees is recommended due to poor condition. A 'Application to Permit the Injury or Destruction of Trees on Private Property' as well as a 'Tree Injury or Destruction Questionnaire and Declaration form' will likely be required to enable the proposed removals and injuries, although permit exemption should be sought for the removal of trees #35 and 44.

With the implementation of the recommendations provided in this report, no significant adverse effects are anticipated as a result of the proposed works upon the long-term health and condition of inventoried trees that have been designated for retention. It is important that good arboricultural practices be undertaken during the entire course of construction. No material storage or construction access shall take place within tree protection zones (TPZs); sensitive excavation and root pruning shall be undertaken, as required; and any necessary branch and/or root pruning shall be undertaken by an ISA Certified Arborist.

APPENDIX 1 – TREE INVENTORY

Table 3: Tree inventory, 1000-1024 Dundas St. E., Mississauga, Ontario. Tree assessments are based upon field observations undertaken on September 24, 2021, by Anna Mernieks, ISA Certified Arborist ON-2224A. Attribute definitions are provided in Appendix 2.

Tree	Common Name	Scientific Name	DBH	DBH_M	DBH_Calc	CW	TI	CS	CV	TPZ	Loc.	Rec.	Comments
1	Siberian Elm	<i>Ulmus pumila</i>	8	8, 6	13	4	G	F	G	1.5	S	R	
2	Siberian Elm	<i>Ulmus pumila</i>	28	24	37	6	F	F	G	2.4	S	R	
3	Siberian Elm	<i>Ulmus pumila</i>	50			6	F	F	G	3.0	B	R	
4	Siberian Elm	<i>Ulmus pumila</i>	22			5	G	F	G	1.8	B	R	
5	Siberian Elm	<i>Ulmus pumila</i>	27	18	32	4	F	F	G	2.4	B	R	
6	Siberian Elm	<i>Ulmus pumila</i>	44			4	G	F	G	3.0	S	R	
7	Siberian Elm	<i>Ulmus pumila</i>	23			4	G	F	G	1.8	B	R	
8	Siberian Elm	<i>Ulmus pumila</i>	21	20	29	4	G	F	G	1.8	B	R	
9	Siberian Elm	<i>Ulmus pumila</i>	18			4	G	G	G	1.5	N	I	
10	Siberian Elm	<i>Ulmus pumila</i>	25	22	33	4	G	F	G	2.4	N	I	
11	Siberian Elm	<i>Ulmus pumila</i>	33			4	G	F	G	2.4	B	I	
12	Manitoba Maple	<i>Acer negundo</i>	19	13, 13	26	8	G	F	G	1.8	B	I	
13	Siberian Elm	<i>Ulmus pumila</i>	42			6	G	F	G	3.0	N	I	DBH measured at 1.0 m.
14	Manitoba Maple	<i>Acer negundo</i>	12			3	G	F	G	1.5	N	P	
15	Siberian Elm	<i>Ulmus pumila</i>	43			8	G	F	G	3.0	B	R	
16	Manitoba Maple	<i>Acer negundo</i>	18			2	F	P	G	1.5	B	R	
17	Manitoba Maple	<i>Acer negundo</i>	40			6	G	F	F	2.4	B	R	DBH estimated
18	Siberian Elm	<i>Ulmus pumila</i>	33			3	G	F	G	2.4	S	R	
19	Manitoba Maple	<i>Acer negundo</i>	32			8	G	F	G	2.4	S	R	
20	Siberian Elm	<i>Ulmus pumila</i>	22			3	G	G	G	1.8	S	R	
21	Siberian Elm	<i>Ulmus pumila</i>	24			3	G	G	G	1.8	S	R	
22	Siberian Elm	<i>Ulmus pumila</i>	14			3	G	G	G	1.5	S	R	
23	Siberian Elm	<i>Ulmus pumila</i>	22			3	G	G	G	1.8	S	R	
24	Siberian Elm	<i>Ulmus pumila</i>	11			1	G	G	-	-	S	R (Cond.)	Dead
25	Manitoba Maple	<i>Acer negundo</i>	15			4	F	F	G	1.5	B	R	Growing in fence
26	Manitoba Maple	<i>Acer negundo</i>	12	10	16	6	F	F	G	1.5	B	R	Growing in fence
27	Siberian Elm	<i>Ulmus pumila</i>	20			4	G	G	F	1.5	S	R	
28	Siberian Elm	<i>Ulmus pumila</i>	16			4	G	F	G	1.5	S	R	
29	Siberian Elm	<i>Ulmus pumila</i>	15			4	G	F	G	1.5	S	R	
30	Siberian Elm	<i>Ulmus pumila</i>	19			4	G	F	G	1.5	S	R	
31	Manitoba Maple	<i>Acer negundo</i>	25			6	F	P	P	1.8	B	R	Sprawled over fence
32	Siberian Elm	<i>Ulmus pumila</i>	36	31	48	8	G	F	G	3.0	S	R	
33	Siberian Elm	<i>Ulmus pumila</i>	29			5	G	F	G	1.8	S	R	
34	Manitoba Maple	<i>Acer negundo</i>	27			5	F	F	G	1.8	S	R	
35	Siberian Elm	<i>Ulmus pumila</i>	89			12	F	P	G	5.4	B	R (Cond.)	
36	Manitoba Maple	<i>Acer negundo</i>	22			5	P	P	F	1.8	B	R	
37	Manitoba Maple	<i>Acer negundo</i>	24			5	G	F	G	1.8	S	R	
38	Siberian Elm	<i>Ulmus pumila</i>	26			5	G	F	G	1.8	S	R	

Tree	Common Name	Scientific Name	DBH	DBH_M	DBH_Calc	CW	TI	CS	CV	TPZ	Loc.	Rec.	Comments
39	Siberian Elm	<i>Ulmus pumila</i>	31			5	G	F	G	2.4	S	R	
40	Siberian Elm	<i>Ulmus pumila</i>	20	19	28	6	G	F	G	1.8	B	R	
41	Siberian Elm	<i>Ulmus pumila</i>	12	8	14	5	F	F	G	1.5	B	R	Growing in fence
42	Siberian Elm	<i>Ulmus pumila</i>	32	24	40	7	G	F	G	2.4	B	R	
43	Siberian Elm	<i>Ulmus pumila</i>	30	21, 15	40	8	G	F	G	2.4	B	R	
44	Manitoba Maple	<i>Acer negundo</i>	73			10	P	P	P	4.8	B	R (Cond.)	Failed; tag present but grown over
45	Siberian Elm	<i>Ulmus pumila</i>	16	8	18	5	G	G	G	1.5	N	P	
46	Ginkgo	<i>Ginkgo biloba</i>	11			1	G	G	P	1.5	B	-	Severe decline
47	Black Locust	<i>Robinia pseudoacacia</i>	17			5	G	F	G	1.5	N	P	
48	Cherry Species	<i>Prunus sp.</i>	8			2	P	F	P	1.2	N	-	Severe decline

APPENDIX 2 – TREE INVENTORY ATTRIBUTES

Species	The common and scientific names are provided for each tree.
Diameter at Breast Height (DBH)	The diameter of each tree, in centimetres, at breast height (1.4 m above grade).
Diameter at Breast height, Multiple Stems (DBH_M)	The DBH of the second and third-largest stems of a multi-stemmed tree.
Calculated DBH (DBH_Calc)	DBH calculated for the purpose of determining the TPZ for multi-stemmed trees as per Mississauga Tree Preservation and Protection Standards, Revised 2019-07-15.
Canopy Width (CW)	An estimation of the average diameter of the tree canopy, in metres.
Trunk Integrity (TI)	An assessment of the tree's trunk for any externally-visible defects or weaknesses. It is rated on an ascending scale of Poor-Fair-Good.
Canopy Structure (CS)	An assessment of the tree's main scaffold branches and the canopy of the tree for defects or weaknesses visible from ground level. It is also rated on an ascending scale of Poor-Fair-Good.
Canopy Vitality (CV)	An assessment of the general health and vigour of the tree, derived partly through a comparison of deadwood and live growth relative to a 100% healthy tree. The size and colour of foliage are also considered in this category. During the leaf-off season, the number and distribution of buds is an important determinant of canopy vitality. This indicator is also rated on an ascending scale of Poor-Fair-Good.
Tree Protection Zone (TPZ)	The tree protection zone, in metres, as measured from the base of the subject tree's stem.
Location (Loc.)	The location of the tree relative to the subject site: on the subject site (S), on neighbouring property (N), on municipal property (M), or on a property boundary (B).
Recommendation (Rec.)	The recommendation for each tree: Protect (P), Injure (I), or Remove (R). Trees to be preserved with no active tree protection are denoted with a dash (-).
Comments	Comments pertaining to the tree provided as needed.

APPENDIX 3 – SELECTED FIGURES



Figure 1: Trees #1-4 are recommended for removal.



Figure 2: Trees #5-8 and 15-34 are recommended for removal, trees #9-13 are recommended for retention with injury, and tree #14 is recommended for protection.

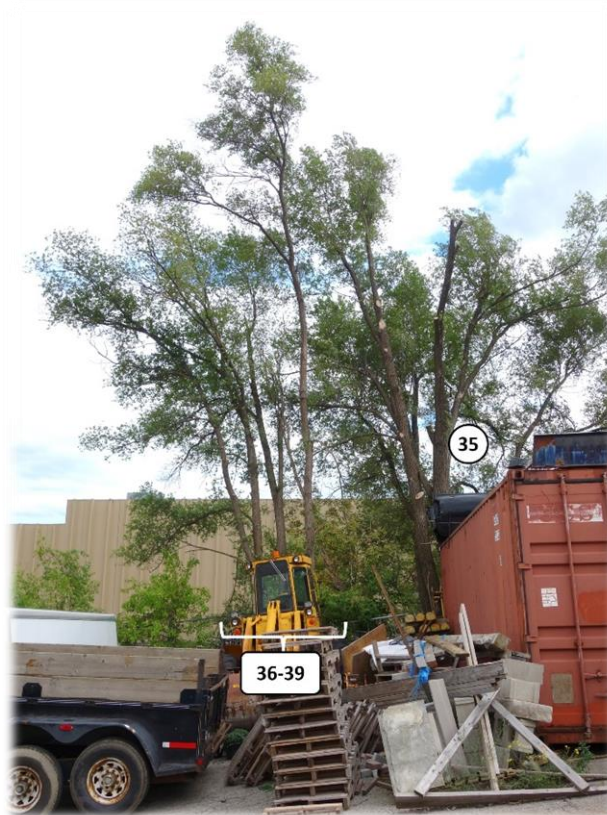


Figure 3: Trees #35-39 are recommended for removal.



Figure 4: Trees #40-44 are recommended for removal.



Figure 5: Trees #45 and 47 are recommended for protection; trees #46 and 48 are recommended for preservation.

APPENDIX 4 – TREE-RELATED PLANS

Inclusions:

1. Tree Protection Plan, dated May 27, 2022 (1 page)



LEGEND

TREE TO BE RETAINED

TREE TO BE REMOVED

TREE PROTECTION ZONE (TPZ)

TREE HOARDING/FENCING

No.	DATE	REVISIONS	BY:	CHKD.
1	27/05/2022	ISSUED FOR ARBORIST REPORT	SJ	--



URBAN FOREST INNOVATIONS INC.
1331 Northaven Drive
Mississauga, Ontario L5G 4E8
T: 905-274-1022
F: 905-274-2170

TREE PROTECTION PLAN

123 MAIN STREET, TORONTO, ONTARIO

SCALE
5.0m 2.5m 0m 5.0m

FIGURE

DATE
27/05/2022

TP-1

APPENDIX 5 – TREE PROTECTION SPECIFICATIONS

5.1 Scope and Purpose

This section outlines specifications for tree protection, and **not all recommendations may apply to the subject project**. Refer to the main body of the arborist report for tree-by-tree protection recommendations.

5.2 General Provisions

5.2.1 Tree Protection

Four important tree protection measures should be undertaken on the project site if trees are to be preserved in a manner which will maintain their health over the long term. These include:

1. Establishment of tree protection fencing and/or hoarding around adequately-sized Tree Protection Zones (TPZs) prior to the commencement of any construction activity;
2. Installation of root zone compaction protection where compaction may be caused by construction traffic or materials/equipment storage and staging;
3. Implementation of root-sensitive excavation wherever Tree Protection Zones (TPZs) or significant rooting areas may be encroached upon by excavation and/or grading, and;
4. Root pruning in advance of conventional excavation, on an as-needed basis.

5.2.1.1 Tree Protection Zones (TPZs)

The purpose of a Tree Protection Zone (TPZ) is to prevent root damage, soil compaction and soil contamination, and workers and machinery must not encroach upon Tree Protection Zones in any way.

To prevent access and ensure that the TPZ is effective, the following steps shall be implemented in the establishment of TPZ fencing and/or hoarding.

1. The locations of TPZs should be clearly identified on the project Site Plan and associated tree-related plans. Typically, TPZs are to be shown as circles around tree location points, and drawn to scale in accordance with the minimum required TPZ radius, as specified in Appendix 1.
2. No groundbreaking activities or demolition should occur until all tree protection requirements have been met and the consulting arborist has confirmed the establishment of Tree Protection Zone fencing and/or hoarding.
3. Hoarding shall consist of 4' x 8' sheets of plywood laid lengthwise and supported using "L" shaped supports to prevent root damage. Hoarding shall be affixed to the frame in such a manner as to prevent removal of individual sections or movement of the entire hoarding structure. Construction fencing can be used where pedestrian or motorist sightlines may be obscured by solid hoarding. Framed construction fencing can also be used to frame large Tree Protection Zones or tree groups, with expressed prior approval of the municipal arborist or their designate. Framed

fencing must be supported by a solid 2' × 4' frame. Fencing and/or hoarding shall be maintained intact throughout the duration of the construction project, unless otherwise specified.

4. Upon installation, all tree protection fencing and/or hoarding must be approved by the municipal arborist or their designate.
5. All fencing and/or hoarding is to remain in place in good condition throughout the entire duration of the project. No fencing and/or hoarding is to be removed, relocated or otherwise altered without the written permission of the municipal arborist or their designate.
6. No grade change, excavation, or storage of fill, equipment or supplies is permitted within the TPZ at any time. Any encroachment of the TPZ shall not be undertaken without expressed written permission of the municipal arborist or their designate. TPZ encroachment may constitute Tree Injury as defined by various municipal tree protection policies and by-laws, and may subject the responsible parties to prescribed penalties.
7. All contractors and supervisors should be informed of the tree protection requirements, including potential penalties, at a pre-construction meeting.
8. Trees and TPZs should be regularly monitored by a consulting arborist throughout the duration of the project.
9. If TPZ encroachment should occur at any time during construction, the consulting arborist should evaluate the trees immediately so that appropriate treatment can be performed in a in a timely manner.
10. Signage similar to the figure shown below should be mounted on each side of TPZ fencing and/or hoarding immediately upon establishment and should be maintained for the duration of the project. Every sign should have minimum dimensions of 40 cm × 60 cm.

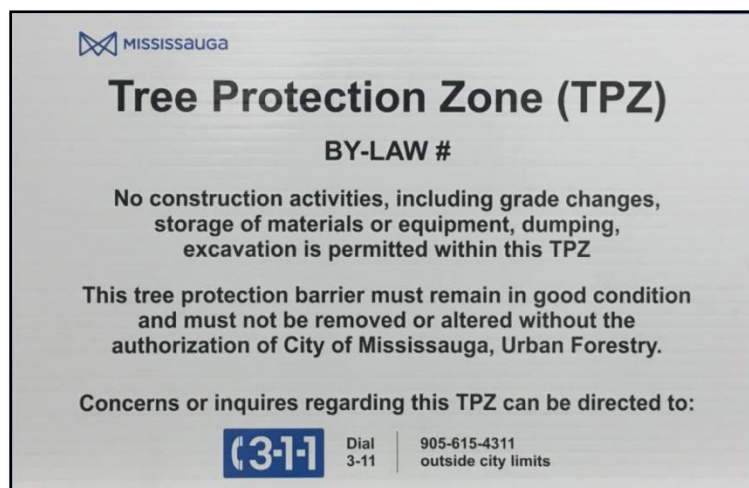


Figure 6: Sample TPZ information sign.

5.2.1.2 Root Zone Compaction Protection

Where traffic or access through the root zone is anticipated, a Root Zone Compaction Protection treatment should be installed.

Where limited non-vehicular access across the root zone is anticipated (e.g., occasional foot traffic, wheelbarrow), a Light Root Zone Compaction Protection specification should be implemented:

- Installation of medium-weight non-woven geotextile fabric or landscape cloth over affected area;
- Installation of 150 mm of wood chips over the fabric area;
- Installation of ½" plywood over wood chip mulch, and;
- Installation of appropriate covering material, if desired.

Where moderate non-vehicular access across the root zone is anticipated (e.g., materials staging) a Moderate Root Zone Compaction Protection specification should be implemented:

- Installation of medium-weight non-woven geotextile fabric or landscape cloth over affected area;
- 100 mm of granular clear stone laid over fabric area;
- Installation of medium-weight non-woven geotextile fabric or landscape cloth over the stone;
- Installation of 150 mm of wood chips over fabric area, and;
- Installation of ½" plywood over wood chip mulch.

In areas where frequent non-vehicular access or longer-term materials storage in the root zone is anticipated, or in areas where additional measures must be implemented to ensure complete exclusion of excavation activity, a Horizontal Hoarding/Excavation Exclusion specification should be implemented:

- Installation of medium-weight non-woven geotextile fabric or landscape cloth over affected area;
- Installation of 3 stacked and joined courses of 4" x 4" timbers around the area to be protected (including cross-members or joists, as required to maintain structural integrity);
- Installation of wood chip mulch in entire protected area, and;
- Installation of 2 layers of ¾" plywood or 1 steel plate over the protected area.

In areas where vehicular access or severe potential root zone compaction are anticipated, such as site access roads, temporary parking areas or heavy machine staging areas, a more robust Heavy Root Zone Compaction Protection specification should be developed and implemented on a site-specific basis. Key elements of such a specification may include multiple steel plates over load-dissipating materials, or modular geocellular systems such as Permavoid ArborRaft.

5.2.1.3 Tree-sensitive Demolition

Trees are often damaged by demolition activities undertaken during the clearing stage of the development process. For trees to be adequately protected during site demolitions, root-sensitive demolition protections must be implemented within Tree Protection Zones, as described below:

1. Prior to the commencement of site demolition, tree protection fencing must be established for retained trees.
2. Hardscape materials shall be broken up by hand or hand-operated machinery only (e.g., a hand-operated jackhammer to break up pavement, building foundations, etc.).
3. Machinery should be operated at shallow angles and broken-up materials should be removed by pulling away radially from the protected tree bases, or parallel to the direction of anticipated or observed root growth.
4. Upon removal of demolished materials, uncovered vertical soil profiles must be maintained in good structural integrity and prevented from disintegration (i.e. crumbling, erosion, fragmentation, etc.). Between the time of demolitions and new construction, exposed vertical soils may require shoring reinforcement, including a layer of burlap between shoring and exposed soil.
5. Following demolitions, affected TPZ areas should be reinstated with a high quality soil, such as triple mix soil, to provide a favourable growing medium for the development of new roots of the injured trees. Soil amendments, such as biochar, may also be considered for backfills inclusion. Soil depth should be sufficient to match existing surrounding soil grades.
6. Any roots exposed by demolition should be inspected and, where necessary, pruned by the supervising Certified Arborist in order to minimize permanent root damage.

5.2.1.4 Root-sensitive Excavation

Efforts should be made to exclude excavation or grade changes, including cutting or filling, from all TPZs. Where this is not possible, and unless otherwise specified, excavation shall utilize a root-sensitive methodology such as hand-digging, hydrovac or pneumatic (e.g., AirSpade) soil excavation, as specified in the arborist report.

Root-sensitive excavation must be conducted in advance of excavation using conventional excavation machinery. The objective of root-sensitive excavation is twofold: 1) to determine whether roots will be present beneath areas to be excavated and therefore determine the likely extent of damage to trees to be retained, and 2) to enable proper root pruning, as described below.

Root-sensitive excavation typically entails the creation of a trench approximately 200-300 mm wide between the subject tree (e.g., outside the established tree protection fencing) and the area to be excavated, without damaging existing significant roots. Unless otherwise specified, root-sensitive excavation should be undertaken to a minimum depth of 800 mm, unless excavation is proposed to a

shallower final depth. If excavation is for exploratory reasons and root pruning is not anticipated, equipment utilized during root-sensitive excavation should be operated at reduced pressures to prevent damage to root bark.

No excavation, whether undertaken by conventional or root-sensitive means shall take place within established tree protection zones without expressed written permission of the municipal arborist or their designate.

5.2.1.5 Root Pruning

Root pruning can help reduce the stresses experienced by a tree with root damage, encourage the growth of new fine and feeder roots, and prevent the spread of decay. Root pruning should be undertaken in conjunction with root-sensitive excavation in advance of conventional excavation, or immediately afterwards if unexpected roots are encountered. Root pruning should only be undertaken by an ISA Certified Arborist, and in the manner outlined below:

1. Roots that are severed, exposed, or diseased and are greater than 2.0 cm in diameter should be properly pruned. All roots must be pruned with clean and sharp hand tools only. Shovels, picks or other construction tools shall not be used to prune roots. Wound dressings or pruning paint must not be used to cover the ends of any cut.
2. Roots should be pruned in a similar fashion as branches, taking care to maintain the integrity of the root bark ridge. Root should be pruned back to native soil; root stubs must not be left upon completion of root pruning.
3. Prolonged exposure of tree roots must be avoided – exposed roots should be covered and kept moist with soil, mulch, irrigation, or at least moistened burlap if they are to be exposed for longer than 3 hours. All cut roots should be covered with soil or excavated trenches should be backfilled with native material as soon as possible following root pruning.

5.2.1.6 Crown Pruning

During the course of project works, the branches of retained trees may interfere with project works, including site access, materials storage, and new construction. Where any project works present an unavoidable conflict with the branches of retained trees, appropriate clearance crown pruning shall be performed in the manner outlined below:

1. Wherever possible, branches found to be in conflict with construction and equipment should be temporarily tied back, using non-constricting knots to secure the branch. If branches cannot be safely tied back without causing branch damage, including breaking or bark stripping, pruning should be performed, as required.
2. No branches larger than 10 cm in diameter shall be removed, and no more than 20% of the total live crown volume shall be removed from the tree.

3. Crown pruning shall be conducted by an ISA Certified Arborist in accordance with good arboricultural practice, as detailed in the pruning standard *ANSI A300 Part 1 – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices, Pruning*, and in the ANSI Z133.1 safety standard.

5.2.2 Post-construction Care

The following recommendations should be implemented upon completion of construction to ensure that the health and condition of retained and newly-planted trees is maintained and improved.

5.2.2.1 Retained Trees

1. Trees which have been retained through the construction process should be regularly monitored by an ISA Certified Arborist for signs of construction-induced stress, which may not be apparent until 3-6 years after site disturbance.
2. Wherever possible, root zone amelioration including watering and mulching should be undertaken. However, treatments such as fertilization should be avoided unless directly specified by the project consulting arborist.
3. Any physical damage to retained trees should be assessed by the project consulting arborist and properly mitigated, as required. If necessary, broken limbs or exposed roots should be pruned, damaged bark should be traced, and soil decompaction and/or decontamination should be undertaken by an ISA Certified Arborist. Stability of trees with significant root zone disturbance should be assessed, and advanced stability assessment or mitigation should be implemented if necessary.

5.2.2.2 New Trees

1. All newly planted trees and shrubs should be provided with a bed of composted woodchip mulch 10-15 cm thick, extending to at least the dripline of the plant. Mulch should be periodically replaced as it decomposes, and weeds should be removed from the mulch bed manually. The mulch must not touch the bark of the tree and under no circumstances should it be mounded up against the stem in a “volcano” style. This is especially damaging for young trees with thin bark.
2. All new plantings should be watered at least once per week during the growing season within the first two years after planting. Watering intensity should be increased during periods of drought. Watering should be deep and slow, ensuring that water penetrates to deep roots. Trees should not be watered directly adjacent to the trunk, but rather in a circular pattern extending from the trunk to at least the dripline. The soil should be allowed to dry in between watering periods to allow air to reach the roots.
3. Minimal pruning should be undertaken in the first two years after planting. Foliage should be retained to allow for the roots to establish. Only dead, crossing and broken branches should be pruned back to an appropriate pruning point at the time of planting.

APPENDIX 6 – LIMITATIONS OF ASSESSMENT

It is the policy of Urban Forest Innovations to attach the following clause regarding limitations. We do this to ensure that the client is aware of what is technically and professionally realistic in assessing and retaining trees.

The assessment(s) of the tree(s) presented in this report has been made using accepted arboricultural techniques. These may include, among other factors, a visual examination of: the above-ground parts of the tree(s) for visible structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of pests or pathogens, discoloured foliage, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the proximity of property and people. Except where specifically noted, the tree(s) was not cored, probed, climbed or assessed using any advanced methods, and there was no detailed inspection of the root crown(s) involving excavation.

Notwithstanding the recommendations and conclusions made in this report, it must be recognized that trees are living organisms, and their health and vigour constantly change over time. They are not immune to changes in site or weather conditions, or general seasonal variations. Weather events such as wind or ice storms may result in the partial or complete failure of any tree, regardless of assessment results.

While reasonable efforts have been made to accurately assess the overall condition of the subject tree(s), no guarantee or warranty is offered, expressed or implied, that the tree(s) or any of its parts will remain standing or in stable condition. It is both professionally and practically impossible to predict with absolute certainty the behaviour of any single tree or its component parts, regardless of the assessment methodology implemented. Inevitably, a standing tree will always pose some level of risk. Most trees have the potential for failure under adverse weather conditions, and the risk can only be eliminated if the tree is removed.

Although every effort has been made to ensure that this assessment is reasonably accurate, the tree(s) should be re-assessed periodically. The assessment presented in this report is only valid at the time of inspection.

Respectfully submitted by,



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