



**LAKESHORE TRANSPORTATION STUDIES -
LAKESHORE BUS RAPID TRANSIT (BRT) STUDY
ARBORIST REPORT
MISSISSAUGA, ONTARIO**

Prepared for:
HDR CORPORATION

Prepared by:
MATRIX SOLUTIONS INC.

Version 1.0
June 2023
Mississauga, Ontario


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Prepared for HDR Corporation, June 2023



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Restoration Specialist, EIT**



**reviewed by
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DISCLAIMER

Matrix Solutions Inc. certifies that this report is accurate and complete and accords with the information available during the project. Information obtained during the project or provided by third parties is believed to be accurate but is not guaranteed. Matrix Solutions Inc. has exercised reasonable skill, care, and diligence in assessing the information obtained during the preparation of this report.

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VERSION CONTROL

Version	Date	Issue Type	Filename	Description
V0.1	10-Nov-2021	Draft	33023-512 Lakeshore BRT Study Arborist R 2021-11-10 draft V0.1.docx	Issued to client for review
V0.2	16-Feb-2022	Draft revised 1	33023-512 Lakeshore BRT Study Arborist R 2022-02-16 draft V0.2.docx	Revisions issued to client for review
V0.3	28-Apr-2023	Draft revised 2	33023-512 Lakeshore BRT Study Arborist R 2023-04-28 draft V0.3.docx	Revisions issued to client for review
V1.0	06-June-2023	Final	33023-512 Lakeshore BRT Study Arborist R 2023-06-06 final V1.0.docx	Issued to client

TABLE OF CONTENTS

1	INTRODUCTION.....	1
1.1	Study Area.....	1
2	POLICY REQUIREMENTS.....	5
3	METHODOLOGY.....	5
3.1	Tree Condition Ranking.....	6
4	TREE INVENTORY RESULTS.....	7
5	TREE PRESERVATION MEASURES.....	8
5.1	Protection Barrier.....	8
5.2	Pruning.....	8
6	IMPACT OFFSETTING.....	9
7	RECOMMENDATIONS.....	10
8	NEXT STEPS.....	11
9	DISCLAIMER.....	11
9.1	Limitations of Assessment.....	11
9.2	Restrictions of Assessment.....	12
9.3	Professional Responsibility.....	12
10	REFERENCES.....	12

IN-TEXT FIGURES

FIGURE 1	Tree Inventory Study Area.....	2
FIGURE 2a	Areas Requiring Additional Tree Inventory During Detailed Design.....	3
FIGURE 2b	Areas Requiring Additional Tree Inventory During Detailed Design.....	4

IN-TEXT TABLES

TABLE 1	Guidelines used to Determine Ranking for Trunk Integrity, Crown Vigor, and Crown Structure.....	6
TABLE 2	Summary of Tree Species Identified in the Part A Study Area.....	7
TABLE 3	Compensation Results for Estimated Tree Removals within Toronto and Region Conservation Authority Jurisdiction.....	9
TABLE 4	Compensation Results for Estimated Tree Removals within CVC Jurisdiction.....	10

APPENDICES

APPENDIX A	Ontario Ministry of the Environment, Conservation and Parks Species at Risk Communication
APPENDIX B	Detailed Tree Inventory
APPENDIX C	Tree Protection Detail
APPENDIX D	Tree Preservation Plan

1 INTRODUCTION

HDR Corporation and the City of Mississauga (the City) retained Matrix Solutions Inc. to conduct a detailed arborist investigation to aid in the preliminary design phase and prepare an arborist report and tree preservation plan as part of the Lakeshore Transportation Studies. The studies include three infrastructure projects in the Lakeview, Port Credit, and Clarkson communities that build from the 2019 Lakeshore Connecting Communities Transportation Master Plan. These studies include the Lakeshore Bus Rapid Transit (BRT) Study, Lakeshore Complete Street Study, and the New Credit River Active Transportation (AT) Bridge Study.

As part of the Lakeshore Transportation Studies, HDR is developing the preliminary design and completing the Transit Project Assessment Process for the Lakeshore BRT study area.

This arborist report outlines the trees that will likely be impacted by the road widening design for the BRT study area as well as mitigation measures and tree protection recommendations. Trees likely impacted as part of the Lakeshore Complete Street Study and the Lakeshore New Credit River AT Bridge Study will be discussed in separate reports.

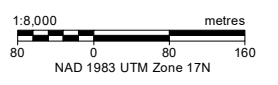
1.1 Study Area

The study area for BRT includes the City-owned right-of-way (RoW) along Lakeshore Road East extending from East Avenue on the western end to Etobicoke Creek on the eastern end. The RoW along side streets were not apart of the study area for inventory. Based on client provided mapping, a total of 2 km of street required a tree inventory. Most of the BRT study area is commercial and residential land use with corresponding boulevards, with a smaller portion being parkland and vacant land. Figure 1 displays the extent of the BRT study area. Over time the design and limit of disturbance became further defined, and there are several small areas that will require additional tree inventory during detailed design (Figures 2a and 2b).



- Watercourse
- Railway
- Highway
- Road
- Right-of-Way
- Bus Rapid Transit Study Alignment

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HDR Corporation
Lakeshore Bus Rapid Transit Study

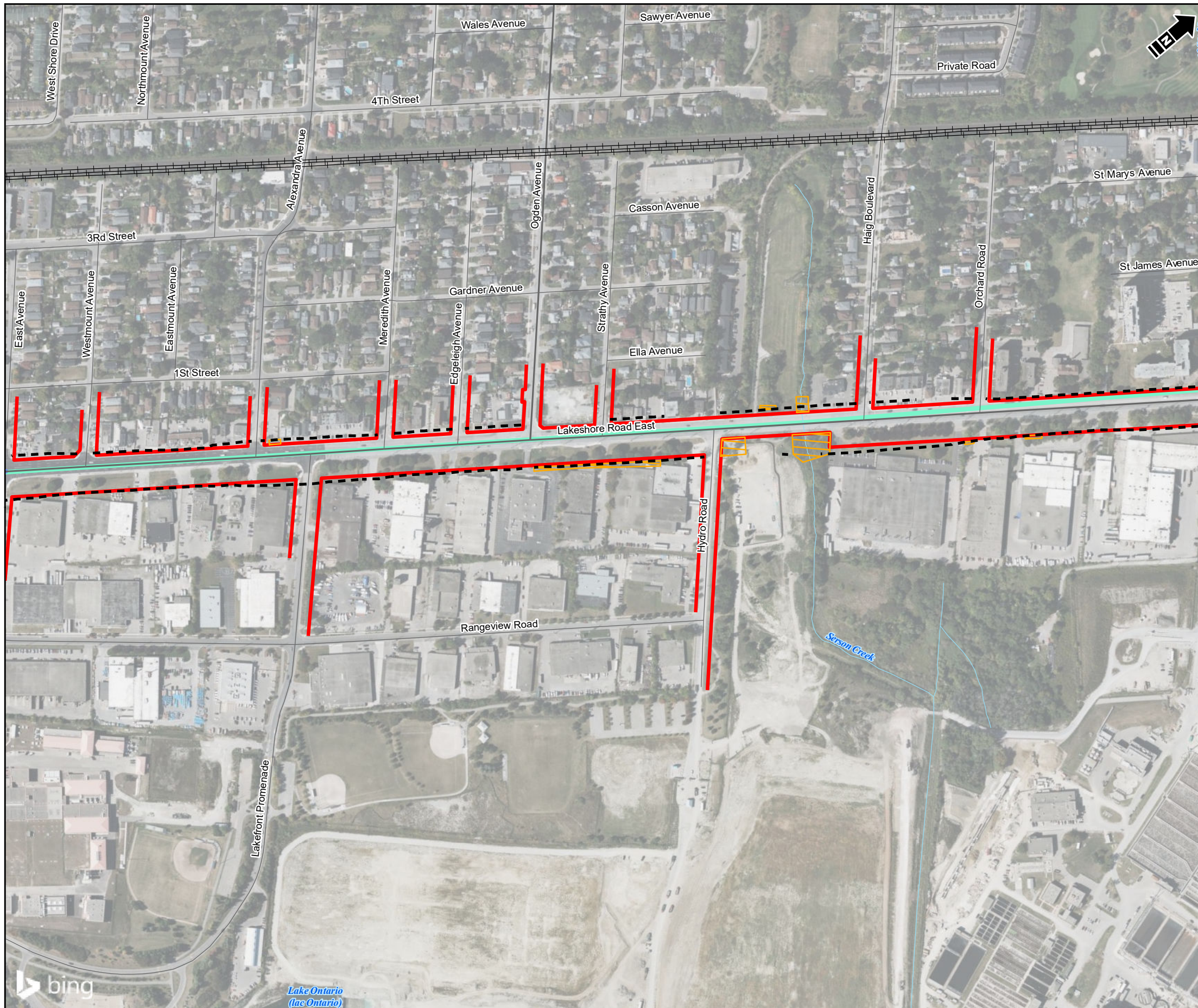
Tree Inventory Study Area

Date: November 2021 | Project: 33023 | Submitter: E. Wilkinson | Reviewer: R. Leppington

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- Additional Area of Tree Inventory Required
- Watercourse
- Railway
- Highway
- Road
- Right-of-Way
- Bus Rapid Transit Study Alignment
- Part B
- Plan Prop Boundary Construction Limits

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1:5,000 metres
 50 0 50 100
 NAD 1983 UTM Zone 17N



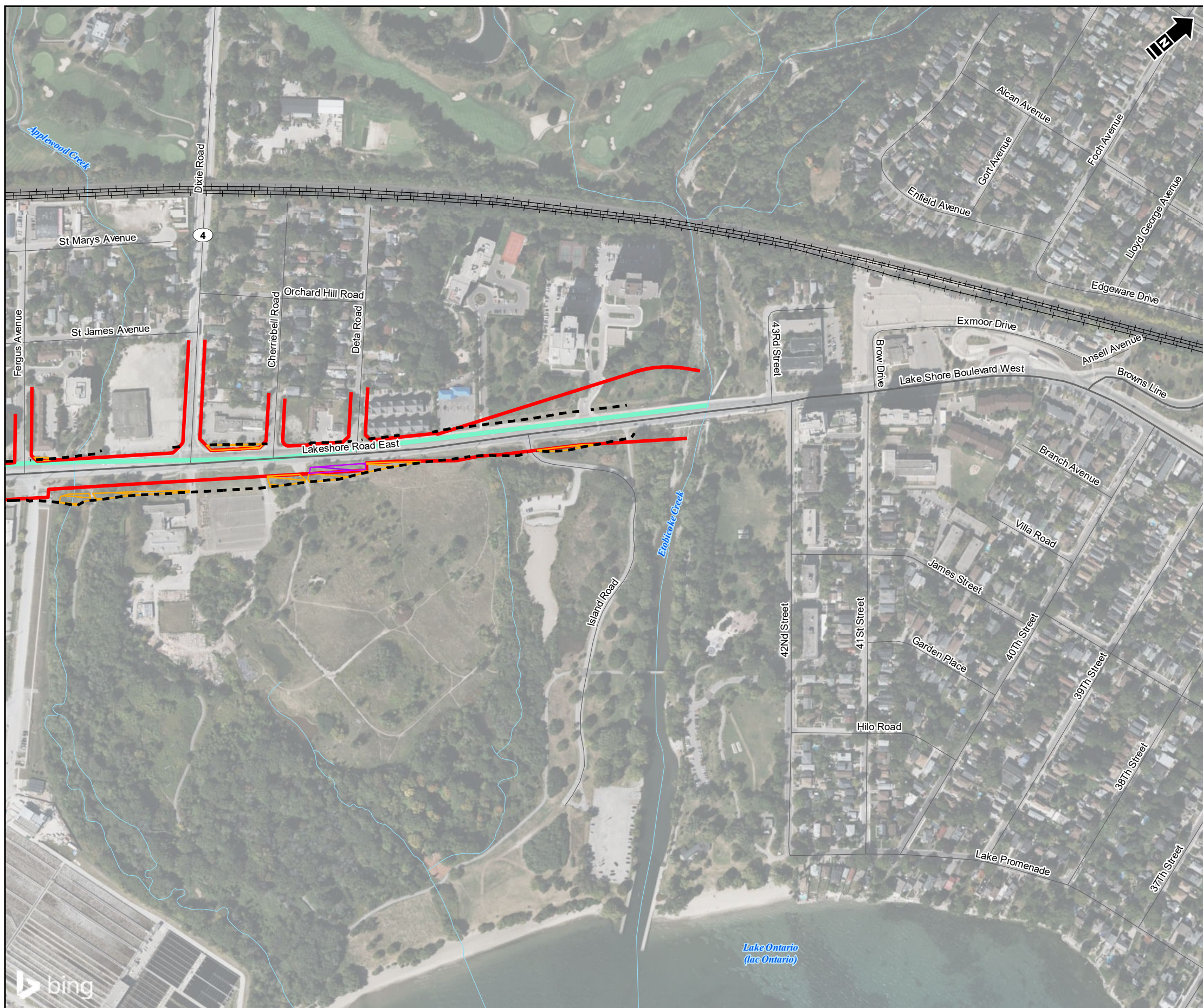
HDR Corporation
 Lakeshore Bus Rapid Transit Study

**Areas Requiring Additional tree Inventory
 During Detailed Design Phase**

Date: April 2023 | Project: 33023 | Submitter: E. Wilkinson | Reviewer: R. Leppington

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- Additional Area of Tree Inventory Required
- Additional Area of Tree Inventory Required- Within ROW behind fence
- Watercourse
- Railway
- Highway
- Road
- Right-of-Way
- Bus Rapid Transit Study Alignment
- Plan Prop Boundary Construction Limits

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1:5,000 metres
50 0 50 100
NAD 1983 UTM Zone 17N



HDR Corporation
Lakeshore Bus Rapid Transit Study

Areas Requiring Additional tree Inventory During Detailed Design Phase

Date: November 2021 Project: 33023 Submitter: E. Wilkinson Reviewer: R. Leppington

Disclaimer: The information contained herein may be compiled from numerous third party materials that are subject to periodic change without prior notification. While every effort has been made by Matrix Solutions Inc. to ensure the accuracy of the information presented at the time of publication, Matrix Solutions Inc. assumes no liability for any errors, omissions, or inaccuracies in the third party material.

2 POLICY REQUIREMENTS

The following documents and policies were reviewed and used in decision making for the analysis and completion of this project:

- *Mississauga Official Plan* (City of Mississauga 2021)
- *The Corporation of the City of Mississauga Private Tree Protection By-law 254-12* (City of Mississauga 2012)
- *Tree Preservation & Protection Standards* (City of Mississauga 2019)

3 METHODOLOGY

An International Society of Arboriculture (ISA)-certified arborist conducted the tree inventory and assessment on June 1 and 10, 2021. The purpose of the tree inventory was to document tree resources within the Lakeshore Road East RoW along the full extent of the BRT study area. Trees that are not located within the Lakeshore Road East RoW but have a portion of the canopy hanging within the Lakeshore Road East RoW were also collected. Data collected as part of the tree inventory will be used to inform project planning and design to minimize the need for tree removal and injury. As per the Request for Proposal, all trees 10 cm or greater in diameter at breast height (DBH) were included in the inventory, and the following information was collected for each tree:

- genus or species identification based on physical characteristics of each tree
- measurement of DBH which is the diameter of the trunk at 1.4 m above the ground (City of Mississauga 2019)
- radial dripline estimation based on spread of canopy from trunk to limit of overhead branches:
 - ✦ Radial dripline often extends beyond the limit of branches or can be limited by infrastructure such as curbs and sidewalks. Radial dripline is used as a starting point to determine the minimum limits of a tree protection zone (TPZ) for a particular tree as part of tree protection planning.
- general rating (“Good,” “Fair,” “Poor”) of trunk integrity, crown structure, and crown vigour based on observations of overall physical appearance of tree, such as existing defects or injuries, leaf colour and quantity, as well as general health
 - ✦ No detailed structural assessments of roots, trunk, or branches were conducted.
- condition observations including presence of multiple or codominant stems, percentage of crown dieback, lean direction, presence or absence of pathogens (fungus or rot), insect pests, epicormics growth, cavities or wounds, and other physical anomalies (i.e., Emerald Ash Borer)

- other general comments relating to unique conditions or surrounding growing conditions

Dead trees were included in the inventory (if greater than 10 cm DBH); their presence within the site was noted and used to assess wildlife habitat. Further information on wildlife habitat related to dead trees can be found in the report titled *Lakeshore Transportation Studies - Bus Rapid Transit Study (BRT), Natural Environment Assessment, Mississauga, Ontario* (Matrix 2021).

As requested, no physical tags were used on the trees within the study area; therefore, an arbitrary tag number system was used. For the BRT study area, the tree tags range from 1 to 269 and 5000 to 5028.

Trees were surveyed using a TopCon HiPer SR GPS receiver through real-time network technology. This model is able to collect data with sub-centimeter accuracy under ideal conditions. Due to interference from the urban landscape (tall buildings, concrete walls, etc.) conditions were sometimes less than ideal. Recognizing the technology’s limitations, Matrix field staff decreased the accuracy tolerance from a fixed solution to a fixed or float solution. This change allowed the field staff to collect data in the range of 1 cm to approximately 1 m, with the majority of points falling into the range of 1 to 30 cm.

A species at risk (SAR) information request was submitted to the Ontario Ministry of the Environment, Conservation and Parks (MECP) on May 27, 2021, with a response received on June 3, 2021 (Appendix A). There were no SAR tree species included in the response from MECP, just an agreeance that Butternut, as recorded in the Natural Heritage Inventory Centre database, may be found in the study area. No SAR were found during the tree inventory of the BRT study area.

3.1 Tree Condition Ranking

As part of the detailed investigation, the general condition of each tree was collected to gain an understanding of its overall health and the impact that may be experienced if that tree was proposed for removal or injury. Table 1 presents the detailed guidelines used for the general rating of trunk integrity, crown structure, and crown vigour.

TABLE 1 Guidelines used to Determine Ranking for Trunk Integrity, Crown Vigor, and Crown Structure

Rating	Guidelines
Good	Minimal to no wounds on trunk and branches; ≤10% crown dieback; crown structure is appropriate for tree species and is not influenced by infrastructure.
Fair	Wound on trunk or branches that has little impact on integrity; 11% to 30% crown dieback; crown structure is potentially impacted by infrastructure or is naturally not appropriate for tree species (i.e., trunk has inappropriate lean angle).
Poor	Extensive wounds on trunk or branches that has an impact on integrity; >31% crown dieback; crown structure is impacted by infrastructure (i.e., pruned to avoid hydro lines) or is naturally not appropriate for tree species.

4 TREE INVENTORY RESULTS

A master inventory table of all trees collected during the field program for the BRT study area can be found in Appendix B.

A total of 298 trees were collected within the Lakeshore Road East RoW on both the south and north sides of Lakeshore Road. This includes 18 different genus and 30 different species. They range in size from 8 to 120 cm DBH, and the dripline ranges from 1 to 9 m.

TABLE 2 Summary of Tree Species Identified in the Part A Study Area

Species Common Name	Species Scientific Name	Quantity
American Elm	<i>Ulmus americana</i>	4
Amur Maple	<i>Acer ginnala</i>	3
Apple sp.	<i>Malus sp.</i>	34
Ash sp.	<i>Fraxinus sp.</i>	8
Basswood	<i>Tilia americana</i>	12
Blue Spruce	<i>Picea pungens</i>	1
Cherry sp.	<i>Prunus sp.</i>	1
Elm sp.	<i>Ulmus sp.</i>	1
Fir sp.	<i>Abies sp.</i>	4
Freeman's Maple	<i>Acer x freemanii</i>	9
Ginkgo	<i>Ginkgo biloba</i>	1
Hackberry	<i>Celtis occidentalis</i>	4
Honey Locust	<i>Gleditsia triacanthos</i>	7
Norway maple 'King Crimson'	<i>Acer platanoides 'King Crimson'</i>	24
Lilac sp.	<i>Syringa sp.</i>	4
Little Leaf Linden	<i>Tilia cordata</i>	4
Manitoba Maple	<i>Acer negundo</i>	21
Northern Catalpa	<i>Catalpa speciosa</i>	1
Norway Maple	<i>Acer platanoides</i>	84
Red Oak	<i>Quercus rubra</i>	8
Red Pine	<i>Pinus resinosa</i>	17
Scots Pine	<i>Pinus sylvestris</i>	8
Siberian Elm	<i>Ulmus pumila</i>	2
Silver Maple	<i>Acer saccharinum</i>	17
Sugar Maple	<i>Acer saccharum</i>	1
Tulip	<i>Liriodendron tulipafera</i>	1
White Birch	<i>Betula Papyifera</i>	1
White Spruce	<i>Picea glauca</i>	1
Willow sp.	<i>Salix sp.</i>	4
Unknown species	<i>Unknown species</i>	11
	TOTAL	298

As stated earlier, the alignment and construction limits have become more defined as the project has progressed since the inventory took place. As a result, several small areas both the north and south of Lakeshore Road within the Lakeshore Road East RoW will require tree inventory during the detailed design phase.

Based on the proposed limit of disturbance due to road widening, a general understanding of tree impacts can be gained. Of the 298 trees that were inventoried, an estimate of 229 trees will require removal and 12 trees will be potentially injured, while the remaining 57 trees will not be impacted. These impacts will need to be reassessed during the detailed phase to evaluate the potential for lessened impact.

5 TREE PRESERVATION MEASURES

Tree preservation is an important aspect of all construction activity within Mississauga, as it aids in maintaining the current tree canopy cover that provides essential ecological functions. Protection barriers are important in preventing injuries to trees during construction. They prevent mechanical injuries to the trunk and branches, as well as impacts to the roots from compaction. By using proper pruning techniques, the tree will not be negatively affected; however, branches that are fractured or experience uneven breaks due to construction equipment may cause long-term negative effects.

5.1 Protection Barrier

Two options of protective barrier can be used throughout the study area to provide sufficient protection of trees during the construction phases of the project. Orange plastic fencing framed with solid top and bottom rail shall be utilized in the protection of trees throughout this project. If required, a second option is to use plywood barriers. Preferably, the protection barrier should encompass the entire TPZ; however, at a minimum the protection barriers should encompass the dripline to provide sufficient protection. Details on the construction and installation of both protection barrier types can be found in Appendix C.

A tree preservation plan has been created showing the recommended placement of tree protection fencing for the BRT study area (Appendix D). The tree preservation plan presented in this report is preliminary and will need to be finalized during detailed design. At detailed design, the details and plans should be updated to incorporate the additional areas that were not surveyed in 2021 (Figures 2a and 2b) and updated to reflect any changes to the disturbance limits for the BRT.

5.2 Pruning

Pruning is to be conducted by a certified arborist or a qualified employee of the City Forestry Department. Pruning should be conducted according to ISA standards. The minimum amount of pruning should be conducted to avoid negative effects to the structure and integrity of the tree. Pruning may include both the branches and roots depending on the extent of the dripline. Extra care should be taken when pruning roots so as to not impact the structure of the tree or its ability to uptake water and nutrients.

6 IMPACT OFFSETTING

As stated in Section 4, tree impacts (i.e., removals and potential injuries) can only be estimated at this stage (i.e., preliminary design) in the project. At this time, it is estimated that 229 trees will require removal and 12 trees will be potentially injured. Based on these estimates, estimated compensation can be calculated. Compensation will allow for the restoration of an area that has undergone tree removals or that experiences tree injuries. Replacing trees will aid in the goal of increasing the canopy cover in the Mississauga to reach the target of 15% to 20% urban forest cover by 2033 (City of Mississauga 2014). Trees play a crucial part to the quality of life in the urban setting of Mississauga and a proactive approach is required to upkeep this important asset.

Both Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC) have habitat compensation guidelines that can be applied to this project. The TRCA *Guideline for Determining Ecosystem Compensation* (TRCA 2018) provides two options for tree compensation, depending on whether trees impacted are part of a forested vegetation community or whether they are individual street and park trees. Forested vegetation communities use basal area to calculate compensation, whereas individual street and park trees are compensated based on a set ratio depending on DBH. Due to all proposed tree removals being individual street/park trees, the set compensation ratio will be used (Table 3). The CVC *Ecosystem Offsetting Guidelines* (CVC 2020) provides two options for tree compensation, depending on whether tree coverage is greater or less than 35%. For a linear infrastructure project, the compensation ratios that apply are to areas with less than 35% tree coverage (Table 4) are applicable.

Table 3 and Table 4 summarize the compensation requirements according to tree size within the TRCA and CVC jurisdictions, respectively. The estimated compensation required for the BRT study area is 3201 trees.

TABLE 3 Compensation Results for Estimated Tree Removals within Toronto and Region Conservation Authority Jurisdiction

Diameter at Breast Height (cm)	Compensation Ratio	Quantity Being Removed	Compensation Requirement
0 - 10	1:1	5	5
10.1 – 20	1:3	19	57
20.1 – 30	1:10	6	60
30.1 - 40	1:15	4	60
40.1 - 50	1:20	2	40
50.1 - 60	1:30	2	60
60.1 - 70	1:40	1	40
70.1 +	1:50	1	50
ESTIMATED TOTAL COMPENSATION			372

TABLE 4 Compensation Results for Estimated Tree Removals within CVC Jurisdiction

Diameter at Breast Height (cm)	Compensation Ratio	Quantity	Compensation Requirement
0 - 10	1:1	6	6
10.1 – 20	1:3	16	48
20.1 – 30	1:10	61	610
30.1 - 40	1:15	47	705
40.1 - 50	1:20	33	660
50.1 - 60	1:30	17	510
60.1 - 70	1:40	6	240
70.1 +	1:50	1	50
ESTIMATED TOTAL COMPENSATION			2829

It is highly recommended that compensation plantings be installed within the site where trees were removed, to aid in returning that ecosystem community back to existing conditions. If the quantity of compensation plantings can not be accommodated onsite, offsite planting is an option and should be discussed with each respective conservation authority for appropriate locations. If onsite and offsite planting can not accommodate the quantity of required plantings cash-in-lieu will be accepted.

7 RECOMMENDATIONS

In addition to City tree by-laws, it is expected that all tree removals and pruning will be conducted in accordance with the *Migratory Birds Convention Act*. It is recommended that all removals are avoided during the breeding bird season, which extends from the beginning of April to the end of August (ECCC 2018). If it is necessary to work during the breeding bird season, then mitigation measures to avoid incidental harm to migratory birds must be in place.

The following site-specific recommendations are as follows:

- The construction site supervisor shall be familiar with City by-laws and understand the purpose and function of TPZ.
- Prior to commencement of any construction or site activity, all tree protection measures specified on the plan must be installed to the satisfaction of City Forestry Department.
- Tree protection measures, once installed, should be inspected and approved by the City Forestry Department.
- No construction activities are permitted within the TPZ as displayed on the plans. Altering of grade, excavating, trenching, dumping, disturbances of any kind, or storage of equipment/soil is prohibited within the TPZ.

- Areas of a TPZ that may be encroached upon should receive a layer of wood chips (6 to 10 inches), unless already disturbed by pavement, to aid in mitigating the potential for soil compaction. Plywood should be placed on top to help dissipate compressive forces. Once the encroachment is eliminated, the plywood should be removed, and the wood chips should be spread around so the layer is 2 to 4 inches thick.
- All tree protection measures must remain in place for the entire duration of the project, including demolition, construction, and restoration phases. They will not be removed or altered until authorization is given by the City Development and Design Division.
- Should any additional, incidental, or accidental tree injuries occur throughout the duration of the construction activity, a qualified arborist or City Forestry Department employee should be consulted to determine if further protective measures should be put in place.
- All pruning of branches and roots must be completed in accordance with good arboricultural practices and be completed by a qualified arborist or City Forestry Department employee.

8 NEXT STEPS

The tree inventory, this arborist report, and the tree preservation plan (Appendix D) are preliminary and will need to be updated and finalized during detailed design. At detailed design, the details and plans should be updated to incorporate the additional areas that were not surveyed in 2021 (Figures 2a and 2b) and updated to reflect any changes to the disturbance limits for the Lakeshore BRT study area.

9 DISCLAIMER

9.1 Limitations of Assessment

This assessment is based on the circumstances and observations as they existed at the time of the site inspection of the study area and the trees situated thereon and upon information provided by the client to Matrix. The opinions in this assessment are given based on observations made and using generally accepted professional judgement, however, because trees are living organisms and subject to change, damage and disease, the results, observations, recommendations, and analysis as set out in this assessment are valid only as at the date any such observations and analysis took place and no guarantee, warranty, representation, or opinion is offered or made as to the length of validity of the results, observations, recommendations, and analysis contained within this assessment. As a result, the client shall not rely upon this assessment, save and except for representing the circumstances and observations, analysis, and recommendations that were made as at the date of such inspections. It is recommended that the trees discussed in this assessment should be re-assessed periodically.

9.2 Restrictions of Assessment

The assessment carried out was restricted to the study area provided by the client. No assessment of any other trees or plants has been undertaken by Matrix. Matrix is not legally liable for any other trees or plants within the study area except those expressly discussed herein. The conclusions of this assessment do not apply to any areas, trees, plants, or any other property not covered or referenced in this assessment.

9.3 Professional Responsibility

In carrying out this assessment, Matrix has exercised a reasonable standard of care, skill, and diligence as would customarily and normally be provided in carrying out this assessment. The assessment has been made using accepted arboricultural techniques. These include visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, discoloured foliage, the condition of any visible root structures, the direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people.

10 REFERENCES

- City of Mississauga. 2021. *Mississauga Official Plan*. Mississauga, Ontario. 8 April 2021.
<https://www.mississauga.ca/projects-and-strategies/strategies-and-plans/mississauga-official-plan/>
- City of Mississauga. 2019. *Tree Preservation & Protection Standards*. The Urban Tree Management Group. Original dated May 15, 2018, revised July 15, 2019. Mississauga, Ontario. 15 July 2019.
- City of Mississauga. 2014. *Urban Forest Management Plan*. Mississauga, Ontario. January 2014.
http://www7.mississauga.ca/Departments/Rec/parks/nhufs/pdf/FINAL_ufmp.pdf
- City of Mississauga. 2012. *The Corporation of the City of Mississauga Private Tree Protection By-law 254-12*. Enacted and Passed on December 12, 2012.
<http://www.mississauga.ca/file/COM/treeprotection.pdf>
- Credit Valley Conservation (CVC). 2020. *Ecosystem Offsetting Guidelines*. 13 March 2020.
- Environment and Climate Change Canada (ECCC). 2018. *General Nesting Periods of Migratory Birds in Canada*. Modified on October 30, 2018. <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html>
- Matrix Solutions Inc. (Matrix). 2021. 'Lakeshore Transportation Studies - Bus Rapid Transit (BRT) Study, Natural Environment Assessment, Mississauga, Ontario'. Version 0.1. Draft prepared for HDR Corporation. Mississauga, Ontario. 10 November 2021.

Toronto and Region Conservation Authority (TRCA). 2018. *Guideline for Determining Ecosystem Compensation (after the decision to compensate has been made)*. June 2018.

APPENDIX A
Ontario Ministry of the Environment, Conservation and
Parks Species at Risk Communication

From: [Snell, Shamus \(MECP\)](#)
To: [Erica Wilkinson](#)
Subject: [External] MECP SARB Review: SAR Information Request
Date: June 3, 2021 2:06:25 PM
Attachments: [image003.jpg](#)
[image005.png](#)

Hi Erica

The Ministry of Environment, Conservation and Parks (MECP) Species at Risk Branch (SARB) has conducted review of Lakeshore Road, and the areas adjacent to it and has detected the following additional Species at Risk (SAR) occurrences which were not already identified in the species list below.

- American Chestnut (*Castanea dentata*);
- Short-eared Owl (*Asio flammeus*);
- Louisiana Waterthrush (*Parkesia motacilla*);
- Eastern Small-footed Myotis (*Myotis leibii*);
- Little Brown Myotis (*Myotis lucifugus*);
- Northern Myotis (*Myotis septentrionalis*);

While this review represents MECP's best currently available information, it is important to note that a lack of information for a site does not mean that SAR or their habitat are not present. There are many areas where the Government of Ontario does not currently have information, especially in areas not previously surveyed. On-site assessments will need to be performed to verify site conditions, identify and confirm presence of species at risk and/or their habitats.

It is the responsibility of the proponent to ensure that SAR are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the proposed activities to be carried out on the site. If the proposed activities can not avoid impacting protected species and their habitats then the proponent will need to apply for a authorization under the Endangered Species Act (ESA).

Regards,

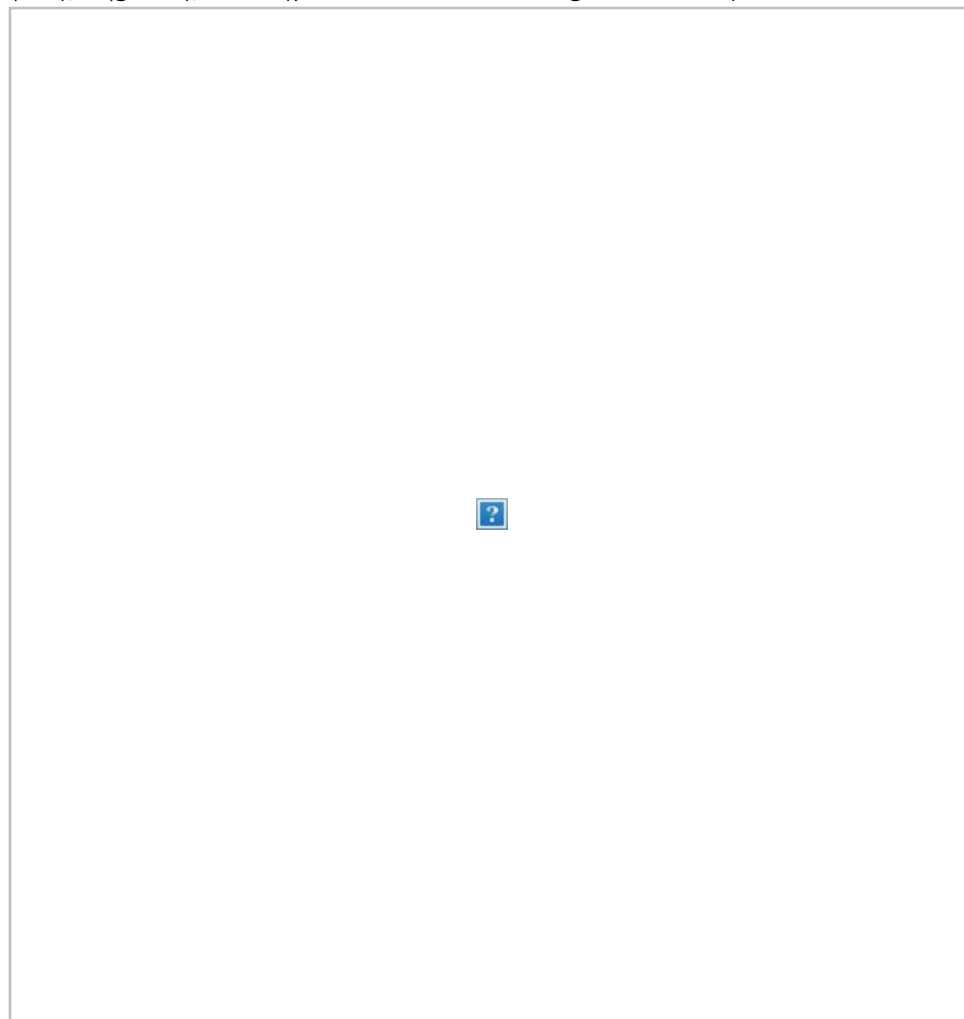
Shamus Snell
A/ Management Biologist
Species at Risk Branch
Ministry of Environment, Conservation and Parks
Email: shamus.snell@ontario.ca

From: Erica Wilkinson <ewilkinson@matrix-solutions.com>
Sent: May 27, 2021 2:22 PM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: SAR Information Request

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hello,

I am helping out with the natural heritage portion of the Lakeshore EA being conducted by the City of Mississauga. The study area stretches approximately 12 kms and incorporates approximately 50 m on each side of the road (100 m width total). The study area shown below is split into three parts; A (red), B (green), and C (yellow area surrounding Credit River).



We have conducted a preliminary SAR search through various databases (NHIC, OBBA, OBA, ORA, DFO mapping). Below is a table of what we have found to date.

Species	ESA	SARA
Shortnose Cisco	Endangered	Endangered
Redside Dace	Endangered	Endangered
American Eel	Endangered	-

Lake Sturgeon	Threatened	-
Deepwater Sculpin	-	Special Concern
Henslow's Sparrow	Endangered	Endangered
Barn Swallow	Threatened	Threatened
Bobolink	Threatened	Threatened
Wood Thrush	Special Concern	Threatened
Chimney Swift	Threatened	Threatened
Eastern Meadowlark	Threatened	Threatened
Bank Swallow	Threatened	Threatened
Peregrine Falcon	Special Concern	Not at Risk
Eastern Wood-pewee	Special Concern	Special Concern
Least Bittern	Threatened	Threatened
Common Nighthawk	Special Concern	Threatened
Northern Bobwhite	Endangered	Endangered
Butternut	Endangered	Endangered
Midland Painted Turtle	-	Special Concern
Snapping Turtle	Special Concern	Special Concern
Blanding's Turtle	Threatened	Threatened
Northern Map Turtle	Special Concern	Special Concern
Eastern Musk Turtle	Special Concern	Special Concern
Eastern Milksnake	-	Special Concern
Eastern Ribbonsnake	Special Concern	Threatened
Jefferson Salamander (2005 observation date)	Endangered	Endangered
Mottled Duskywing	Endangered	-
Monarch	Special Concern	Special Concern
Butternut	Endangered	Endangered

I was hoping you would be able to provide any additional information that was not recorded in the database search. Thank you in advance for your time and help in this matter.

Thanks,

Erica Wilkinson, B.A., ERPG

Ecologist

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Environment & Engineering

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APPENDIX B
Detailed Tree Inventory

TAG#	Species Scientific Name	Species Common Name	DBH (cm)	Additional Stems	TI	CS	CV	Radial Dripline (m)	Co-dominant stem	CDB (%)	Included Bark	Lean, Dir.	Fungus	Insects	Cavity	Rot	Wound	Frost Crack	Epicormic	EAB	Canker	Suppressed	Private Yard	Tree Type	Street Name	Side of Street (NESW)	TPZ (m)- City of Mississauga	Unimpacted	Protection	Potential Injury	Removal		
26	Quercus rubra	Red oak	29.0		G	G	G	4																Street/Park	Lakeshore Rd	S	1.80				x		
27	Quercus rubra	Red oak	26.0		G	G	G	5		5															Street/Park	Lakeshore Rd	S	1.80				x	
28	Quercus rubra	Red oak	26.0		G	G	G	4																	Valley	Lakeshore Rd	S	1.80				x	
29	Quercus rubra	Red oak	29.0		G	G	G	5		5															Valley	Lakeshore Rd	S	1.80				x	
30	Acer saccharinum	Silver Maple	38.0		G	F	F	7		20		E			X										Valley	Lakeshore Rd	S	2.40				x	
31	Acer saccharinum	Silver Maple	51.0		G	G	G	7		10					X										Street/Park	Lakeshore Rd	S	3.60				x	
32	Acer saccharinum	Silver Maple	25.0		G	G	G	7	X																Valley	Lakeshore Rd	S	1.80				x	DBH 25/25
33	Acer saccharinum	Silver Maple	27.0		G	G	F	7		15															Valley	Lakeshore Rd	S	1.80				x	
34	Gleditsia triacanthos	Honey locust	20.0		G	G	G	4																	Street/Park	Lakeshore Rd	S	1.50				x	Shademaster.
35	Gleditsia triacanthos	Honey locust	29.0		G	G	G	6																	Street/Park	Lakeshore Rd	S	1.80				x	Shademaster.
36	Salix sp.	Willow sp.	34.0	3	G	G	G	7																	Valley	Lakeshore Rd	S	2.40				x	DBH 34/29/32, W of Creek
37	Malus sp.	Apple sp.	14.0		G	G	G	2																	Street/Park	Lakeshore Rd	S	1.50				x	W of Creek
38	Malus sp.	Apple sp.	14.0		G	G	G	2		10															Street/Park	Lakeshore Rd	S	1.50				x	W of Creek
39	Malus sp.	Apple sp.	21.0		G	G	G	2																	Street/Park	Lakeshore Rd	S	1.80				x	W of Creek
40	Malus sp.	Apple sp.	36.0		G	G	G	2												X					Street/Park	Lakeshore Rd	S	2.40				x	In front of 1260 Lakeshore Rd
41	Malus sp.	Apple sp.	25.0		G	G	P	2		50															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1260 Lakeshore Rd
42	Malus sp.	Apple sp.	30.0		G	G	G	3																	Street/Park	Lakeshore Rd	S	1.80				x	
43	Acer platanoides	Norway Maple	41.0		G	G	G	5		5															Street/Park	Lakeshore Rd	S	3.00				x	
44	Gleditsia triacanthos	Honey locust	48.0		G	G	G	5		10															Street/Park	Lakeshore Rd	S	3.00				x	Shademaster.
45	Acer platanoides	Norway Maple	47.0		G	G	G	6																	Street/Park	Lakeshore Rd	S	3.00				x	
46	Gleditsia triacanthos	Honey locust	48.0		G	G	F	5		25															Street/Park	Lakeshore Rd	S	3.00				x	Shademaster.
47	Acer platanoides	Norway Maple	45.0		G	G	G	7																	Street/Park	Lakeshore Rd	S	3.00				x	
48	Malus sp.	Apple sp.	26.0		G	G	G	2		10															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1260 Lakeshore Rd
49	Malus sp.	Apple sp.	27.0		G	G	F	2		15															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1260 Lakeshore Rd
50	Malus sp.	Apple sp.	26.0		G	G	G	2		10															Street/Park	Lakeshore Rd	S	1.80				x	DBH 26/12, In front of 1260 Lakeshore Rd
51	Acer negundo	Manitoba Maple	37.0		G	F	F	8		15															Street/Park	Lakeshore Rd	S	2.40				x	DBH 37/35
52	Acer negundo	Manitoba Maple	45.0		G	F	F	8		15															Street/Park	Lakeshore Rd	S	3.00				x	
53	Gleditsia triacanthos	Honey locust	50.0		G	G	P	7		30															Street/Park	Lakeshore Rd	S	3.00				x	
54	Malus sp.	Apple sp.	28.0		G	G	F	2		20															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1260 Lakeshore Rd
55	Acer saccharinum	Silver Maple	35.0	1	F	F	P	8		30					X										Street/Park	Lakeshore Rd	S	2.40				x	DBH 35/24, broken branches
56	Acer negundo	Manitoba Maple	20.0		G	G	G	6												X					Street/Park	Lakeshore Rd	S	1.50				x	
57	Acer negundo	Manitoba Maple	24.0	1	G	G	P	4		40															Street/Park	Lakeshore Rd	S	1.80				x	DBH 24/19
58	Acer negundo	Manitoba Maple	24.0		G	F	P	8		50		SW			X										Street/Park	Lakeshore Rd	S	1.80				x	
59	Acer negundo	Manitoba Maple	28.0	1	F	F	F	8		15		N					X								Street/Park	Lakeshore Rd	S	1.80				x	DBH 28/26, Peeling bark.
60	Gleditsia triacanthos	Honey locust	33.0		G	G	F	5		15															Street/Park	Lakeshore Rd	S	2.40				x	
61	Gleditsia triacanthos	Honey locust	35.0		G	G	G	6		5															Street/Park	Lakeshore Rd	S	2.40				x	
62	Acer negundo	Manitoba Maple	24.0		G	G	F	3		20															Street/Park	Lakeshore Rd	S	1.80				x	Peeling bark.
63	Acer negundo	Manitoba Maple	28.0		G	G	F	6		20		N								X					Street/Park	Lakeshore Rd	S	1.80				x	
64	Malus sp.	Apple sp.	28.0		G	G	G	3		10															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1260 Lakeshore Rd
65	Malus sp.	Apple sp.	29.0		G	G	G	3		10															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1260 Lakeshore Rd
66	Malus sp.	Apple sp.	26.0		G	G	P	2		30															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1258 Lakeshore Rd
67	Fraxinus sp.	Ash sp.	33.0		F	G	P	4		40				X						X	X				Street/Park	Lakeshore Rd	S	2.40				x	
68	Acer platanoides	Norway Maple	33.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	2.40				x	
69	Fraxinus sp.	Ash sp.	30.0		G	G	G	5		5															Street/Park	Lakeshore Rd	S	1.80				x	No EAB evidence.
70	Malus sp.	Apple sp.	34.0	2	G	G	G	3		10															Street/Park	Lakeshore Rd	S	2.40				x	DBH 34/19/11. In front of 1258 Lakeshore
71	Malus sp.	Apple sp.	30.0		G	G	F	2		15															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1258 Lakeshore Rd
72	Acer saccharinum	Silver Maple	42.0	1	G	G	G	6																	Street/Park	Lakeshore Rd	S	3.00				x	DBH 42/30
73	Acer platanoides	Norway Maple	31.0		G	G	G	4																	Street/Park	Lakeshore Rd	S	2.40				x	
74	Acer platanoides	Norway Maple	54.0		G	G	G	8																	Street/Park	Lakeshore Rd	S	3.60				x	
75	Acer platanoides	Norway Maple	32.0		G	G	G	6																	Street/Park	Lakeshore Rd	S	2.40				x	

TAG#	Species Scientific Name	Species Common Name	DBH (cm)	Additional Stems	TI	CS	CV	Radial Dripline (m)	Co-dominant stem	CDB (%)	Included Bark	Lean, Dir.	Fungus	Insects	Cavity	Rot	Wound	Frost Crack	Epicormic	EAB	Canker	Suppressed	Private Yard	Tree Type	Street Name	Side of Street (NESW)	TPZ (m)- City of Mississauga	Unimpacted	Protection	Potential Injury	Removal		
76	Acer platanoides	Norway Maple	49.0		G	G	G	7																Street/Park	Lakeshore Rd	S	3.00				x		
77	Acer platanoides	Norway Maple	31.0		G	G	G	6									X								Street/Park	Lakeshore Rd	S	2.40				x	
78	Acer platanoides	Norway Maple	62.0		G	G	G	8																	Street/Park	Lakeshore Rd	S	4.20				x	
79	Malus sp.	Apple sp.	30.0		G	G	G	3																	Street/Park	Lakeshore Rd	S	1.80				x	In front of 1230 Lakeshore Rd.
80	Pinus sylvestris	Scots Pine	35.0		G	G	G	4																	Street/Park	Lakeshore Rd	S	2.40				x	In front of 1230 Lakeshore Rd.
81	Pinus sylvestris	Scots Pine	32.0		G	G	G	4																	Street/Park	Lakeshore Rd	S	2.40				x	In front of 1230 Lakeshore Rd.
82	Pinus sylvestris	Scots Pine	34.0		G	G	G	4																	Street/Park	Lakeshore Rd	S	2.40				x	In front of 1230 Lakeshore Rd.
83	Malus sp.	Apple sp.	30.0		G	G	G	3		10															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1230 Lakeshore Rd.
84	Malus sp.	Apple sp.	30.0		G	G	G	3		10															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1230 Lakeshore Rd.
85	Malus sp.	Apple sp.	29.0		G	G	G	3		10															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1230 Lakeshore Rd.
86	Malus sp.	Apple sp.	30.0		P	G	P	3		40								X							Street/Park	Lakeshore Rd	S	1.80				x	In front of 1230 Lakeshore Rd.
87	Malus sp.	Apple sp.	28.0		F	G	P	3		40								X							Street/Park	Lakeshore Rd	S	1.80				x	In front of 1230 Lakeshore Rd.
88	Malus sp.	Apple sp.	43.0		G	G	F	3		15															Street/Park	Lakeshore Rd	S	3.00				x	In front of 1230 Lakeshore Rd.
89	Malus sp.	Apple sp.	31.0		G	G	G	4		5															Street/Park	Lakeshore Rd	S	2.40				x	In front of 1230 Lakeshore Rd.
90	Malus sp.	Apple sp.	31.0		G	G	F	3		15									X						Street/Park	Lakeshore Rd	S	2.40				x	In front of 1230 Lakeshore Rd.
92	Acer platanoides	Norway Maple	31.0		G	G	G	4																	Street/Park	Lakeshore Rd	S	2.40				x	
93	Acer platanoides	Norway Maple	41.0		G	G	G	5		10															Street/Park	Lakeshore Rd	S	3.00				x	
94	Fraxinus sp.	Ash sp.	31.0		F	G	P	4		40				X						X					Street/Park	Lakeshore Rd	S	2.40				x	
95	Fraxinus sp.	Ash sp.	43.0		F	G	F	6		25				X						X					Street/Park	Lakeshore Rd	S	3.00				x	
96	Quercus rubra	Red Oak	30.0		G	G	P	6		30															Street/Park	Lakeshore Rd	S	1.80				x	Dead branches
97	Malus sp.	Apple sp.	25.0		G	G	F	3		15															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1200 Lakeshore Rd
98	Malus sp.	Apple sp.	26.0		G	G	G	3		10															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1200 Lakeshore Rd
99	Malus sp.	Apple sp.	17.0		F	G	P	3		60							X								Street/Park	Lakeshore Rd	S	1.50				x	In front of 1200 Lakeshore Rd
100	Malus sp.	Apple sp.	26.0		G	G	G	3		10									X						Street/Park	Lakeshore Rd	S	1.80				x	In front of 1200 Lakeshore Rd
101	Malus sp.	Apple sp.	32.0	1	G	G	G	3		10															Street/Park	Lakeshore Rd	S	2.40				x	DBH 32/13, In front of 1200 Lakeshore Rd
102	Malus sp.	Apple sp.	23.0		F	G	P	3		75															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1200 Lakeshore Rd
103	Malus sp.	Apple sp.	29.0		G	G	G	3																	Street/Park	Lakeshore Rd	S	1.80				x	In front of 1200 Lakeshore Rd
104	Acer platanoides	Norway Maple	38.0		G	G	F	5		15															Street/Park	Lakeshore Rd	S	2.40				x	
105	Quercus rubra	Red Oak	20.0		G	G	G	4		15															Street/Park	Lakeshore Rd	S	1.50				x	
106	Fraxinus sp.	Ash sp.	32.0		F	G	P	4		40				X						X					Street/Park	Lakeshore Rd	S	2.40				x	
107	Fraxinus sp.	Ash sp.	29.0		G	G	P	4		40				X				X		X					Street/Park	Lakeshore Rd	S	1.80				x	
108	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	37.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	2.40				x	
109	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	29.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	1.80				x	
110	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	33.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	2.40				x	
111	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	33.0		G	G	G	5											X						Street/Park	Lakeshore Rd	S	2.40				x	
112	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	26.0		G	G	G	5									X	X							Street/Park	Lakeshore Rd	S	1.80				x	
113	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	41.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	3.00				x	
114	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	39.0		G	G	G	5		5															Street/Park	Lakeshore Rd	S	2.40				x	
115	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	39.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	2.40				x	
116	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	40.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	2.40				x	
117	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	40.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	2.40				x	
118	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	35.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	2.40				x	
119	Acer platanoides	Norway Maple	41.0		G	G	F	5		15															Street/Park	Lakeshore Rd	S	3.00				x	
120	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	26.0		G	G	G	5											X						Street/Park	Lakeshore Rd	S	1.80				x	
121	Acer platanoides	Norway Maple	31.0		G	G	G	6																	Street/Park	Lakeshore Rd	S	2.40				x	
122	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	28.0		G	G	F	4		20															Street/Park	Lakeshore Rd	S	1.80				x	In front of 1180 Lakeshore Rd
123	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	30.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	1.80				x	In front of 1180 Lakeshore Rd
124	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	26.0		F	G	G	5		10									X						Street/Park	Lakeshore Rd	S	1.80				x	In front of 1180 Lakeshore Rd
125	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	29.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	1.80				x	In front of 1180 Lakeshore Rd
126	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	23.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	1.80				x	In front of 1180 Lakeshore Rd
127	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	30.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	1.80				x	In front of 1180 Lakeshore Rd

TAG#	Species Scientific Name	Species Common Name	DBH (cm)	Additional Stems	TI	CS	CV	Radial Dripline (m)	Co-dominant stem	CDB (%)	Included Bark	Lean, Dir.	Fungus	Insects	Cavity	Rot	Wound	Frost Crack	Epicormic	EAB	Canker	Suppressed	Private Yard	Tree Type	Street Name	Side of Street (NESW)	TPZ (m)- City of Mississauga	Unimpacted	Protection	Potential Injury	Removal	
128	Acer platanoides	Norway Maple	54.0		G	G	G	6																Street/Park	Lakeshore Rd	S	3.60				x	
129	Acer platanoides	Norway Maple	62.0		P	G	F	6		15							X							Street/Park	Lakeshore Rd	S	4.20				x	
130	Tilia americana	Basswood	10.0		G	G	G	2											X					Street/Park	Lakeshore Rd	S	1.50				x	
131	Tilia americana	Basswood	12.0		G	G	G	2		5														Street/Park	Lakeshore Rd	S	1.50				x	Broken branch.
132	Tilia americana	Basswood	13.0		G	G	G	2																Street/Park	Lakeshore Rd	S	1.50				x	
133	Tilia americana	Basswood	14.0		G	G	G	2																Street/Park	Lakeshore Rd	S	1.50				x	
134	Tilia americana	Basswood	14.0		G	G	G	3																Street/Park	Lakeshore Rd	S	1.50				x	
135	Tilia americana	Basswood	9.0		G	G	G	2																Street/Park	Lakeshore Rd	S	1.20				x	
136	Acer platanoides	Norway Maple	52.0		G	G	G	6																Street/Park	Lakeshore Rd	S	3.60				x	
137	Pinus resinosa	Red Pine	35.0		G	F	G	4		10														Street/Park	Lakeshore Rd	S	2.40				x	
138	Pinus resinosa	Red Pine	33.0		G	G	G	4		10														Street/Park	Lakeshore Rd	S	2.40				x	
139	Acer platanoides	Norway Maple	45.0		G	G	G	7																Street/Park	Lakeshore Rd	S	3.00				x	
140	Pinus resinosa	Red Pine	28.0		G	G	G	4																Street/Park	Lakeshore Rd	S	1.80				x	
142	Pinus resinosa	Red Pine	37.0		G	G	G	4																Street/Park	Lakeshore Rd	S	2.40				x	
143	Acer platanoides	Norway Maple	54.0		G	G	G	8																Street/Park	Lakeshore Rd	S	3.60				x	Girdling roots.
144	Acer platanoides	Norway Maple	51.0		G	G	G	7																Street/Park	Lakeshore Rd	S	3.60				x	
145	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	47.0		G	G	G	6																Street/Park	Lakeshore Rd	S	3.00				x	
146	Acer platanoides	Norway Maple	40.0		G	G	G	7																Street/Park	Lakeshore Rd	S	2.40				x	
147	Acer platanoides	Norway Maple	43.0		G	G	G	6																Street/Park	Lakeshore Rd	S	3.00				x	
148	Acer platanoides	Norway Maple	51.0		G	G	F	6		15							X							Street/Park	Lakeshore Rd	S	3.60				x	
149	Pinus resinosa	Red Pine	58.0		G	G	G	5																Street/Park	Lakeshore Rd	S	3.60				x	
150	Betula papyrifera	White Birch	38.0		G	G	G	5		5														Street/Park	Lakeshore Rd	S	2.40				x	
151	Pinus resinosa	Red Pine	55.0		G	G	G	4																Street/Park	Lakeshore Rd	S	3.60				x	
152	Acer platanoides	Norway Maple	31.0		G	G	G	3		10														Street/Park	Lakeshore Rd	S	2.40				x	
153	Acer platanoides	Norway Maple	28.0		G	G	F	3		15														Street/Park	Lakeshore Rd	S	1.80				x	
154	Acer platanoides	Norway Maple	37.0		G	G	F	5		20								X						Street/Park	Lakeshore Rd	S	2.40				x	
155	Ginkgo biloba	Ginkgo	22.0		G	G	G	3																Street/Park	Lakeshore Rd	S	1.80				x	
156	Picea pungens	Blue Spruce	47.0		G	G	G	4																Street/Park	Lakeshore Rd	S	3.00				x	
157	Acer platanoides	Norway Maple	31.0		G	G	G	5																Street/Park	Lakeshore Rd	S	2.40				x	
158	Pinus resinosa	Red Pine	29.0		G	G	G	3																Street/Park	Lakeshore Rd	S	1.80				x	
159	Acer platanoides	Norway Maple	47.0		G	G	G	6																Street/Park	Lakeshore Rd	S	3.00				x	
160	Acer platanoides	Norway Maple	47.0		G	G	G	5																Street/Park	Lakeshore Rd	S	3.00				x	
161	Tilia cordata	Little Leaf Linden	54.0		G	G	G	4																Street/Park	Lakeshore Rd	S	3.60				x	
162	Acer platanoides	Norway Maple	46.0		P	G	G	4								X	X							Street/Park	Lakeshore Rd	S	3.00				x	
165	Acer platanoides	Norway Maple	47.0		G	G	G	5																Street/Park	Lakeshore Rd	S	3.00				x	
166	Acer platanoides	Norway Maple	37.0		G	G	F	5		20														Street/Park	Lakeshore Rd	S	2.40				x	
167	Acer platanoides	Norway Maple	43.0		G	G	G	5		5														Street/Park	Lakeshore Rd	S	3.00				x	
168	Acer platanoides	Norway Maple	38.0		G	G	G	5		10														Street/Park	Lakeshore Rd	S	2.40				x	
169	Pinus resinosa	Red Pine	43.0		G	G	G	4																Street/Park	Lakeshore Rd	S	3.00				x	
170	Pinus resinosa	Red Pine	42.0		G	G	G	4																Street/Park	Lakeshore Rd	S	3.00				x	
171	Pinus resinosa	Red Pine	42.0		G	F	G	4		10														Street/Park	Lakeshore Rd	S	3.00				x	
175	Pinus sylvestris	Scots Pine	42.0		G	G	F	3		15														Street/Park	Lakeshore Rd	S	3.00				x	
176	Pinus sylvestris	Scots Pine	30.0		G	G	F	3		15														Street/Park	Lakeshore Rd	S	1.80				x	
177	Acer platanoides	Norway Maple	31.0		G	G	F	4		15														Street/Park	Lakeshore Rd	S	2.40				x	
179	Acer platanoides	Norway Maple	38.0		G	G	G	4		15														Street/Park	Lakeshore Rd	S	2.40				x	
180	Acer platanoides	Norway Maple	43.0		G	G	G	5																Street/Park	Lakeshore Rd	S	3.00				x	
181	Acer platanoides	Norway Maple	44.0		G	G	G	5		5					X		X							Street/Park	Lakeshore Rd	S	3.00				x	
182	Acer platanoides	Norway Maple	43.0		G	G	G	5																Street/Park	Lakeshore Rd	S	3.00				x	
183	Acer platanoides	Norway Maple	54.0		G	G	G	5																Street/Park	Lakeshore Rd	S	3.60				x	
184	Tilia cordata	Little Leaf Linden	34.0		G	G	F	4		25														Street/Park	Lakeshore Rd	S	2.40				x	East of Tim Hortons
186	Acer platanoides	Norway Maple	46.0		F	G	F	6		15							X							Street/Park	Lakeshore Rd	S	3.00				x	

TAG#	Species Scientific Name	Species Common Name	DBH (cm)	Additional Stems	TI	CS	CV	Radial Dripline (m)	Co-dominant stem	CDB (%)	Included Bark	Lean, Dir.	Fungus	Insects	Cavity	Rot	Wound	Frost Crack	Epicormic	EAB	Canker	Suppressed	Private Yard	Tree Type	Street Name	Side of Street (NESW)	TPZ (m)- City of Mississauga	Unimpacted	Protection	Potential Injury	Removal		
187	Acer saccharinum	Silver Maple	64.0		G	F	P	7		30														Street/Park	Lakeshore Rd	S	4.20				x	Tim Hortons	
188	Acer platanoides	Norway Maple	31.0		G	G	G	7									X								Street/Park	Lakeshore Rd	S	2.40				x	Tim Hortons
189	Acer platanoides	Norway Maple	43.0		G	G	G	6		10															Street/Park	Lakeshore Rd	S	3.00				x	Tim Hortons
190	Acer platanoides	Norway Maple	27.0		G	G	G	6																	Street/Park	Lakeshore Rd	S	1.80				x	Tim Hortons
191	Tilia americana	Basswood	27.0		G	G	G	5																	Street/Park	Lakeshore Rd	S	1.80				x	Tim Hortons
192	Tilia americana	Basswood	27.0		G	G	F	4		20															Street/Park	Lakeshore Rd	S	1.80				x	Tim Hortons
193	Tilia americana	Basswood	21.0		G	G	G	3																	Street/Park	Lakeshore Rd	S	1.80				x	Tim Hortons
194	Quercus rubra	Red Oak	15.0		G	G	G	3																	Street/Park	Lakeshore Rd	S	1.50				x	
195	Liriodendron tulipifera	Tulip Tree	17.0		G	G	G	3																	Street/Park	Lakeshore Rd	S	1.50				x	
196	Acer platanoides	Norway Maple	62.0		G	G	G	7																	Street/Park	Lakeshore Rd	S	4.20				x	
198	Acer platanoides	Norway Maple	57.0		G	G	G	6																	Street/Park	Lakeshore Rd	S	3.60				x	
199	Acer platanoides	Norway Maple	55.0		G	G	G	6																	Street/Park	Lakeshore Rd	S	3.60				x	
200	Acer platanoides	Norway Maple	59.0		G	G	G	6																	Street/Park	Lakeshore Rd	S	3.60				x	
201	Acer ginnala	Amur Maple	29.0		G	G	G	2																	Street/Park	Lakeshore Rd	S	1.80				x	
202	Acer negundo	Manitoba Maple	11.0		G	G	G	1										X							Street/Park	Lakeshore Rd	N	1.50				x	
203	Acer negundo	Manitoba Maple	28.0	1	G	P	G	5																	Street/Park	Lakeshore Rd	N	1.80				x	DBH 28/16
204	Acer platanoides 'King Crimson'	Norway maple 'King Crimson'	19.0		G	G	G	3									X								Street/Park	Lakeshore Rd	N	1.50				x	
205	Acer x freemanii	Freeman's Maple	10.0		G	G	G	1																	Street/Park	Lakeshore Rd	N	1.50				x	
206	Unknown species	Unknown species	10.0		D	D	D	1																	Street/Park	Lakeshore Rd	N	1.50				x	
207	Unknown species	Unknown species	9.0		D	D	D	1																	Street/Park	Lakeshore Rd	N	1.20				x	
208	Tilia americana	Basswood	23.0		G	G	G	3																	Street/Park	Lakeshore Rd	N	1.80				x	
209	Acer saccharinum	Silver Maple	64.0		P	F	F	7		15							X								Street/Park	Lakeshore Rd	N	4.20				x	Large wound.
210	Acer saccharinum	Silver Maple	28.0		G	G	G	4																	Street/Park	Lakeshore Rd	N	1.80				x	One trunk cut.
211	Acer saccharinum	Silver Maple	95.0		G	G	F	7		25															Street/Park	Lakeshore Rd	N	6.00				x	
212	Ulmus Americana	American Elm	19.0		G	G	G	5																	Street/Park	Lakeshore Rd	N	1.50				x	
213	Acer negundo	Manitoba Maple	34.0		P	P	P	4		75					X		X	X							Street/Park	Lakeshore Rd	N	2.40				x	Trunk cut, almost dead.
214	Acer saccharinum	Silver Maple	68.0		F	G	G	6		10							X								Street/Park	Lakeshore Rd	N	4.20				x	E of Orchard Rd
215	Acer saccharinum	Silver Maple	52.0		G	G	F	6		20															Street/Park	Lakeshore Rd	N	3.60				x	E of Orchard Rd
217	Acer platanoides	Norway Maple	50.0		G	G	G	8																	Street/Park	Lakeshore Rd	N	3.00				x	E of Orchard Rd
219	Ulmus Americana	American Elm	60.0		F	F	P	8		90															Street/Park	Lakeshore Rd	N	3.60				x	
220	Acer negundo	Manitoba Maple	19.0		G	F	G	4																	Street/Park	Lakeshore Rd	N	1.50				x	
221	Acer platanoides	Norway Maple	40.0		G	G	G	5																	Street/Park	Lakeshore Rd	N	2.40				x	
222	Acer platanoides	Norway Maple	27.0		G	G	F	4		15															Street/Park	Lakeshore Rd	N	1.80				x	
223	Acer platanoides	Norway Maple	28.0		G	G	G	3																	Street/Park	Lakeshore Rd	N	1.80				x	
224	Catalpa speciosa	Northern Catalpa	56.0		G	G	P	6		60					X										Street/Park	Lakeshore Rd	N	3.60				x	
225	Acer platanoides	Norway Maple	38.0		G	G	G	4																	Valley	Lakeshore Rd	N	2.40				x	E of Creek, W of Dixie Rd
226	Syringa sp.	Lilac	10.0		G	G	F	1		20															Street/Park	Lakeshore Rd	N	1.50				x	E of Creek, W of Dixie Rd

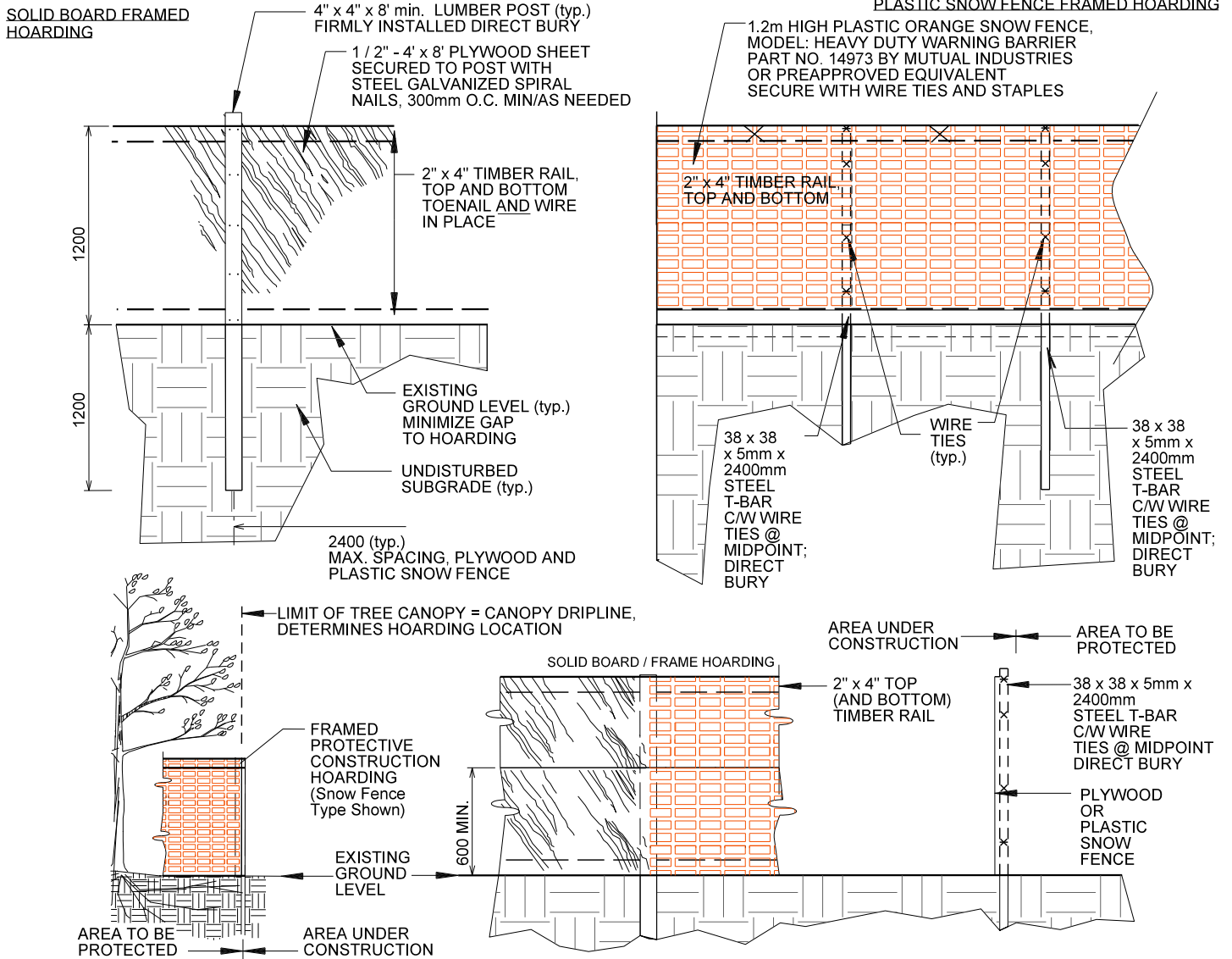
Legend		Condition	
DBH (cm)	Diameter at breast height	G	Good
TI	Trunk Integrity	F	Fair
CS	Crown Structure	P	Poor
CV	Crown Vigour	D	Dead
DL (m)	Drip Line	L	Light
CDB	Crown Dieback	M	Moderate
EAB	Emeral Ash Borer	H	Heavy
ESA/SARA	Species at Risk	E	East
TPZ	Tree Protection Zone	W	West
Lean Dir.	Lean Direction	N	North
		S	South

APPENDIX C
Tree Protection Detail

02830-6

Hoarding Framed Protective Construction Hoarding Solid Board- Plastic Snow Fence

NOTE:
TO BE USED AS A GUIDELINE ONLY.
NOT TO SCALE. REMOVE CITY TITLE BLOCK
AND REDRAW TO REPRESENT SITE SPECIFIC
CONDITIONS. ALL SITE SPECIFIC CONDITIONS
ARE TO BE CONFIRMED BY THE PROJECT
CONSULTANT.

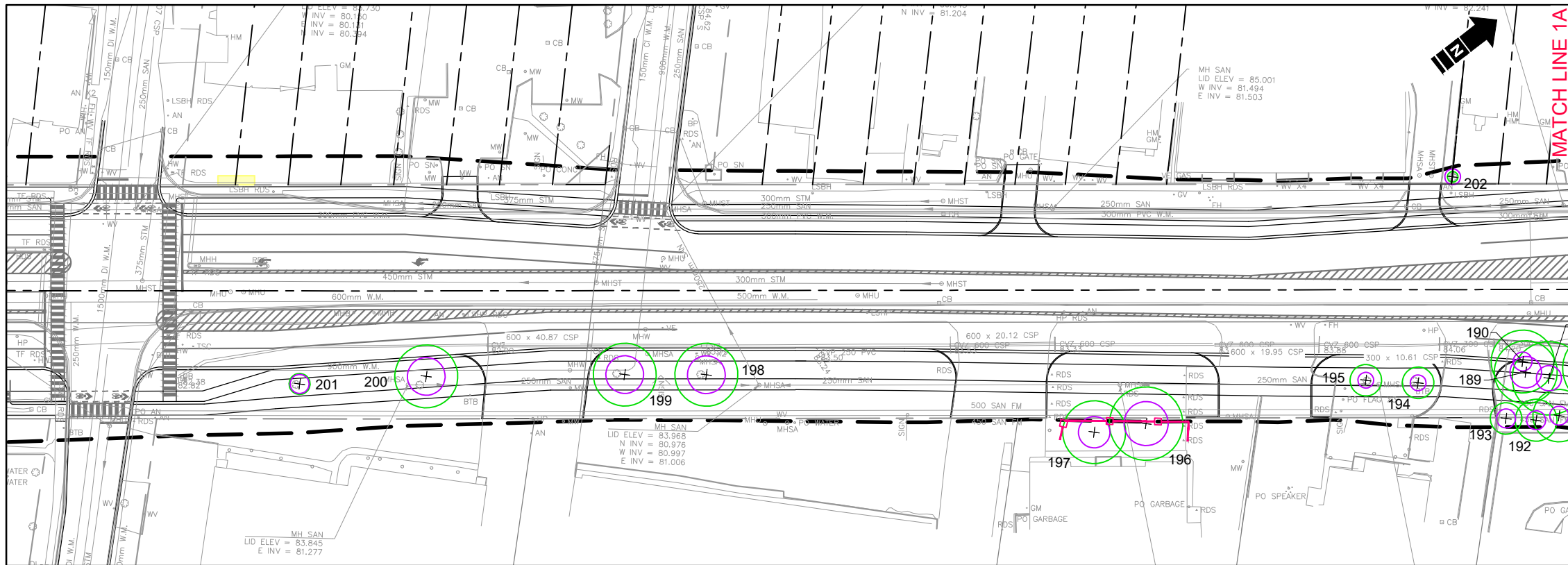


NOTES:

1. HOARDING LOCATION AS PER DRAWINGS. HOARDING INSTALLATIONS ARE TO INCLUDE WOVEN GEOTEXTILE FABRIC FOR SEDIMENT CONTROL.
2. NO MOBILIZATION OR CONSTRUCTION WORK TO OCCUR UNTIL HOARDING HAS BEEN INSPECTED AND APPROVED BY COMMUNITY SERVICES PROJECT MANAGER (CSPM). CONTRACTOR TO ARRANGE FOR A HOARDING INSPECTION WITH (CSPM), 48 HOUR NOTICE REQUIRED.
3. HOARDING TO BE SUPPLIED, INSTALLED AND MAINTAINED BY THE CONTRACTOR THROUGH ALL PHASES OF WORK ON SITE.
4. THE CONTRACTOR IS TO REMOVE AND DISPOSE THE HOARDING OFF SITE WHEN DIRECTED BY THE (CSPM).
5. ALL WOOD PRODUCTS TO BE NEW AND LUMBER KILN DRIED SPF.
6. ALL FASTENERS TO BE NEW GALVANIZED STEEL AND SECURELY INSTALLED. WIRE TIES MIN 3.5mm DIA. GALVANIZED STEEL.
7. DO NOT ALLOW WATER TO COLLECT AND/OR POND ON EITHER SIDE OF THE HOARDING.
8. WHEN INSTALLING DIRECT BURY TIMBER POSTS AND T-BARS, TAKE CARE TO AVOID VISIBLE AND ASCERTAINABLE TREE ROOTS.
9. PLACE HOARDING AT LIMIT OF TREE CANOPY DRIP LINE OR BEYOND (E.G. FURTHER AWAY FROM TRUNK) OF TREE.
10. HOARDED OFF AREA TO REMAIN UNDISTURBED. NO STOCKPILING, STAGING OR MOVEMENT OF VEHICLES TO OCCUR WITHIN PROTECTED AREA.
11. FOR PROTECTION OF TREE'S AND ROOT SYSTEM, CONTRACTOR MAY BE REQUIRED TO PROVIDE WATERING, MULCHING, FERTILIZING, PRUNING OR OTHER ACTIVITIES TO ENSURE THE HEALTH OF THE TREE(S).
12. ALL MEASUREMENTS IN MILLIMETRES UNLESS NOTED OTHERWISE (E.G. DIMENSIONAL LUMBER).
13. CONTRACTOR RESPONSIBLE FOR LOCATES

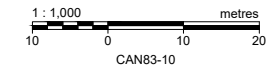
N.T.S.

APPENDIX D
Tree Preservation Plan

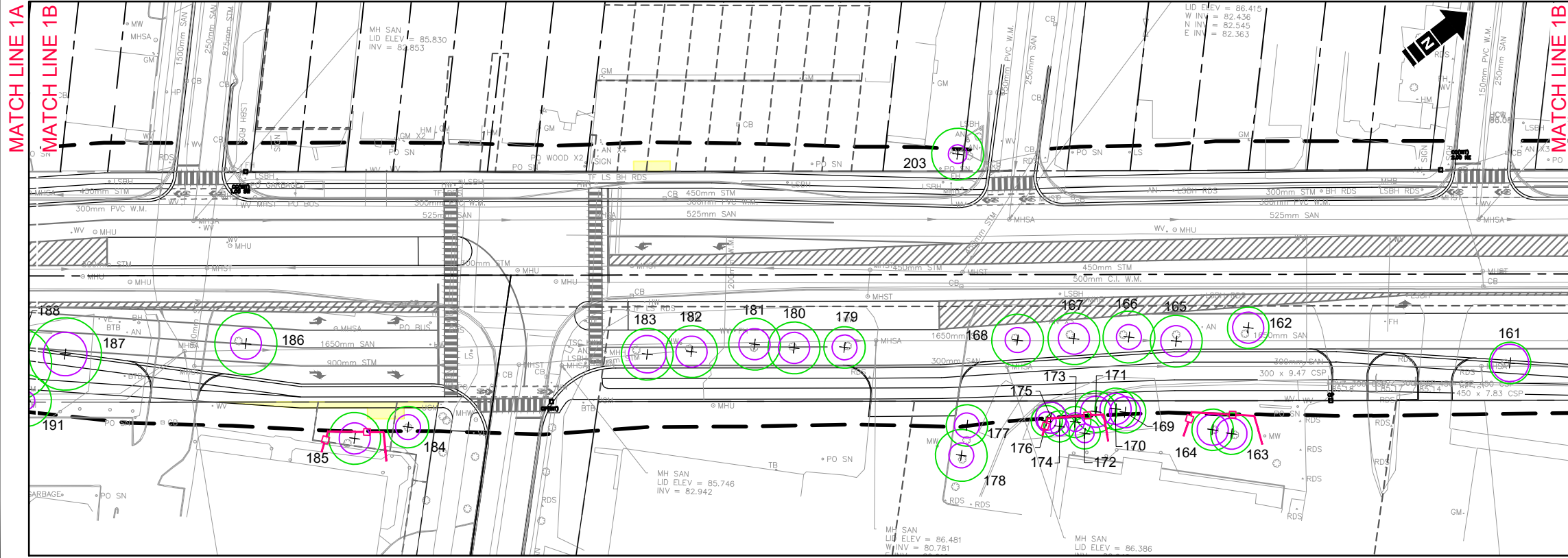


PLAN - 1A
SCALE 1:1000

- LEGEND**
- PROPERTY LINE
 - LIMIT OF CONSTRUCTION
 - LAND TO BE ACQUIRED
 - × 277 TREE ID
 - TREE DRIPLINE
 - TREE PROTECTION
 - TREE PROTECTION FENCING



REFERENCE:
 1. BASE PLAN DERIVED FROM DGN FILES RECEIVED FROM HDR, DATE: OCTOBER 12, 2021.
 2. TREE INVENTORY COMPLETED BY MATRIX SOLUTIONS INC. DATE: JUNE 1 & 10, 2021



PLAN - 1B
SCALE 1:1000

FOR REVIEW

MATRIX SOLUTIONS INC.
CERTIFICATE OF AUTHORIZATION
 No.: 100187406
 Professional Engineers Ontario

REVISION				
No.	DATE	DESCRIPTION	BY	CHK. DRN.
A	2021-01-??	ISSUED FOR REVIEW	EW	RL KW

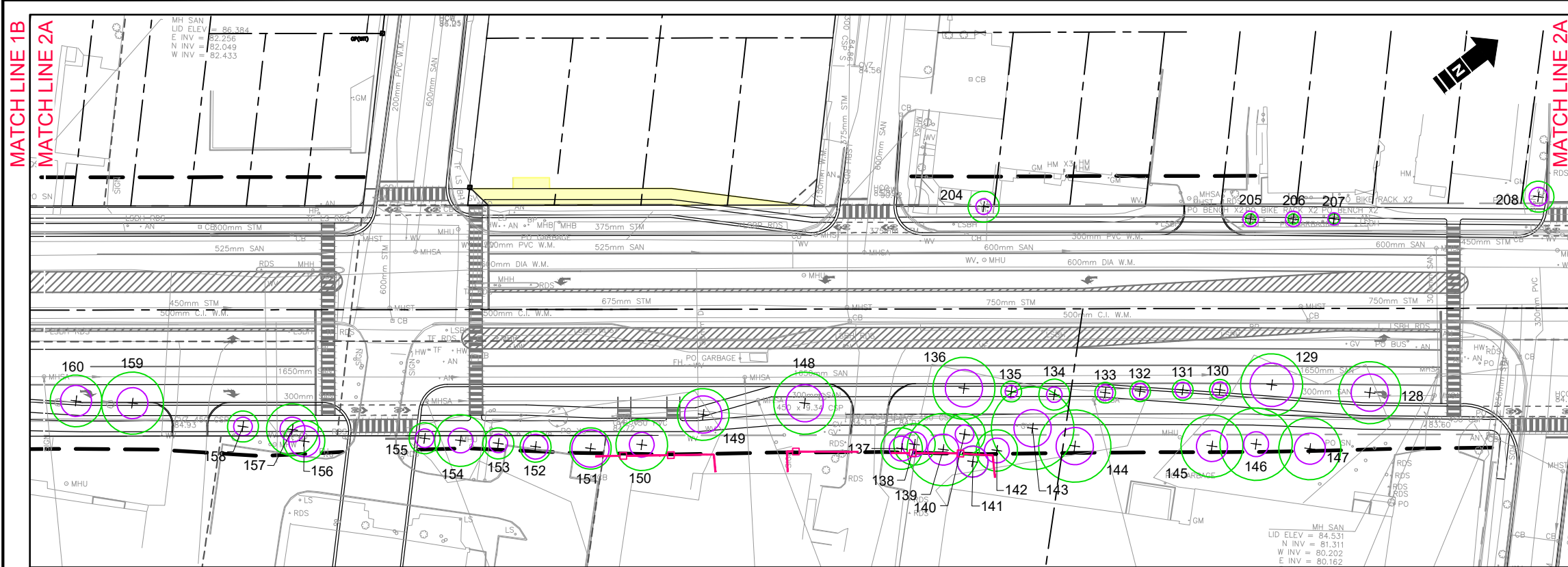


HDR
 PART A - LAKESHORE BUS RAPID TRANSIT

TREE PRESERVATION PLAN 1

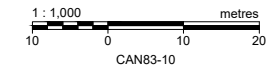
DATE: NOVEMBER 2021	TECHNICAL: E. WILKINSON	REVIEWER: R. LEPPINGTON	DRAWN: K. WEILER
PROJECT: 33023	REVISION: A	DRAWING: 1	

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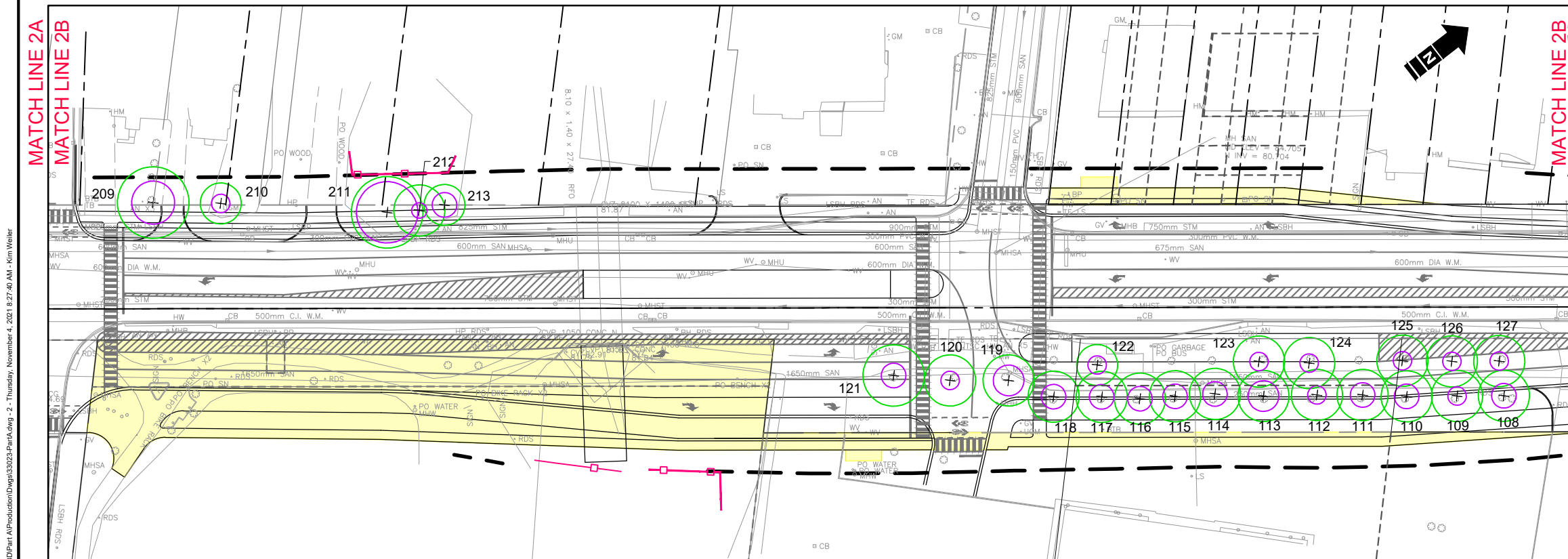


PLAN - 2A
SCALE 1:1000

- LEGEND**
- PROPERTY LINE
 - LIMIT OF CONSTRUCTION
 - LAND TO BE ACQUIRED
 - × 277 TREE ID
 - TREE DRIPLINE
 - TREE PROTECTION
 - TREE PROTECTION FENCING



REFERENCE:
1. BASE PLAN DERIVED FROM DGN FILES RECEIVED FROM HDR, DATE: OCTOBER 12, 2021.
2. TREE INVENTORY COMPLETED BY MATRIX SOLUTIONS INC. DATE: JUNE 1 & 10, 2021



PLAN - 2B
SCALE 1:1000

FOR REVIEW

MATRIX SOLUTIONS INC.
CERTIFICATE OF AUTHORIZATION
No.: 100187406
Professional Engineers Ontario

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A	2021-01-??	ISSUED FOR REVIEW	EW	RL KW

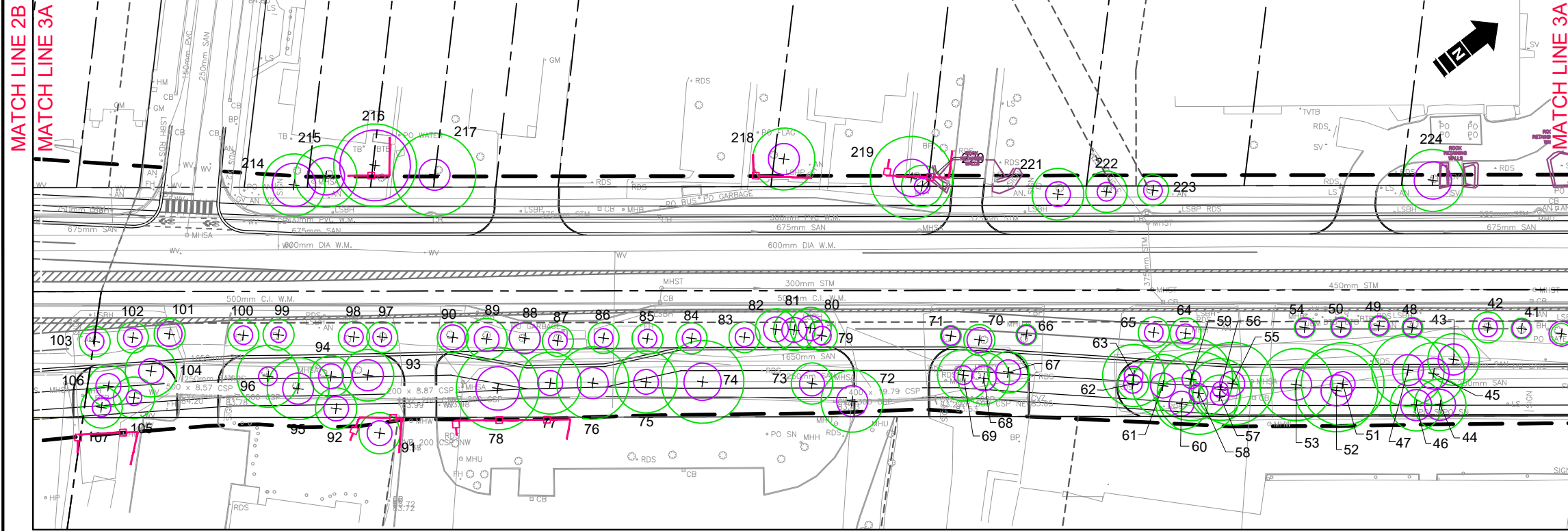


HDR
PART A - LAKESHORE BUS RAPID TRANSIT

TREE PRESERVATION PLAN 2

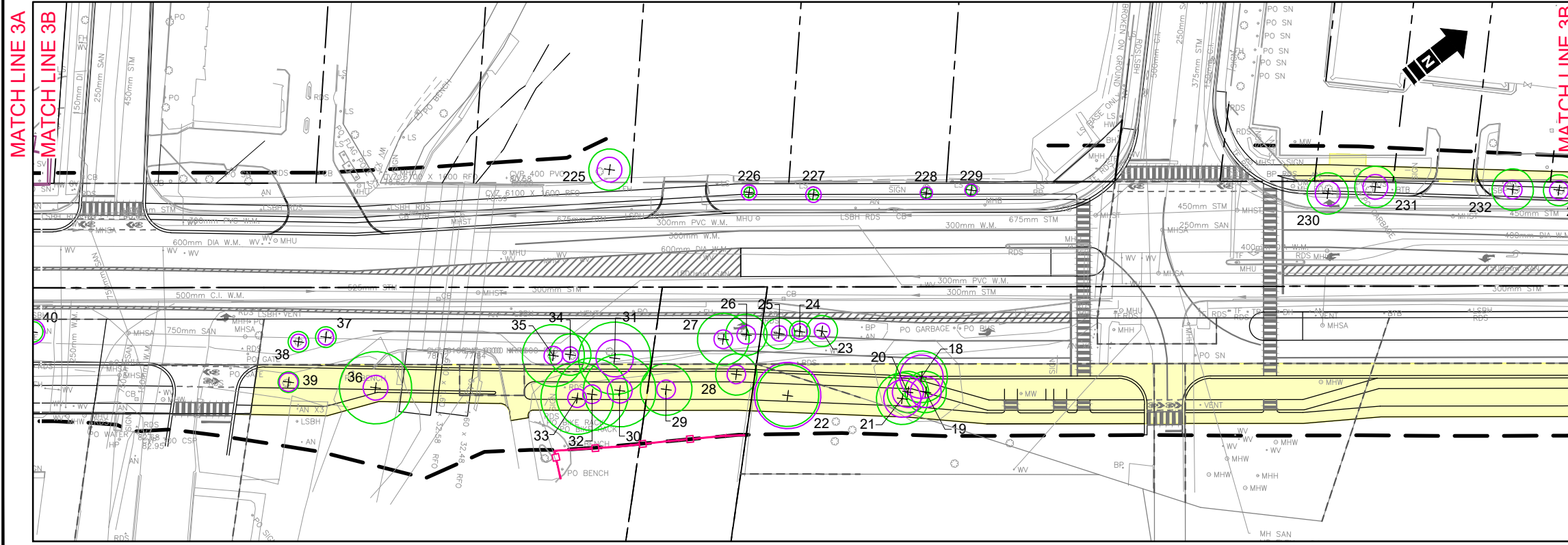
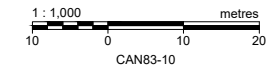
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PROJECT: 33023	REVISION: A	DRAWING: 2	

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PLAN - 3A
SCALE 1:1000

- LEGEND**
- PROPERTY LINE
 - LIMIT OF CONSTRUCTION
 - LAND TO BE ACQUIRED
 - × 277 TREE ID
 - TREE DRIPLINE
 - TREE PROTECTION
 - TREE PROTECTION FENCING



PLAN - 3B
SCALE 1:1000

REFERENCE:
1. BASE PLAN DERIVED FROM DGN FILES RECEIVED FROM HDR, DATE: OCTOBER 12, 2021.
2. TREE INVENTORY COMPLETED BY MATRIX SOLUTIONS INC. DATE: JUNE 1 & 10, 2021

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PART A - LAKESHORE BUS RAPID TRANSIT

TREE PRESERVATION PLAN 3

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PROJECT: 33023	REVISION: A	DRAWING: 3	

FOR REVIEW