

Arborist Report

KIRWIN AVENUE AND LITTLE JOHN LANE SANITARY SEWER REPLACEMENT MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

prepared by

LGL Limited
environmental research associates

for

Arcadis

January 2024

LGL Project No. TA9334-02



**KIRWIN AVENUE AND LITTLE JOHN LANE SANITARY SEWER
REPLACEMENT MUNICIPAL CLASS ENVIRONMENTAL
ASSESSMENT**

ARBORIST REPORT

prepared by



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1.0 Introduction

LGL Limited (LGL) has been retained by Arcadis to provide arborist services for the Kirwin Avenue and Little John Lane Sanitary Sewer Replacement Municipal Class Environmental Assessment in the City of Mississauga, Region of Peel (**Figure 1**). The project is proceeding as a Schedule B Municipal Class Environmental Assessment study on behalf of the Region of Peel.

This Arborist Report documents the results of the tree inventory undertaken by LGL Limited (LGL) in the summer and winter of 2023, and the impact assessment which identifies trees to be removed, injured and retained based on the proposed design. The recommended general mitigation measures (including tree protection recommendations and mitigation for works within the minimum Tree Protection Zone (TPZ)) as well as an analysis of compensation required as a result of impacts to trees within the study area is also provided. The impact assessment provided herein is based on the proposed design provided to LGL from Arcadis in the winter of 2023.

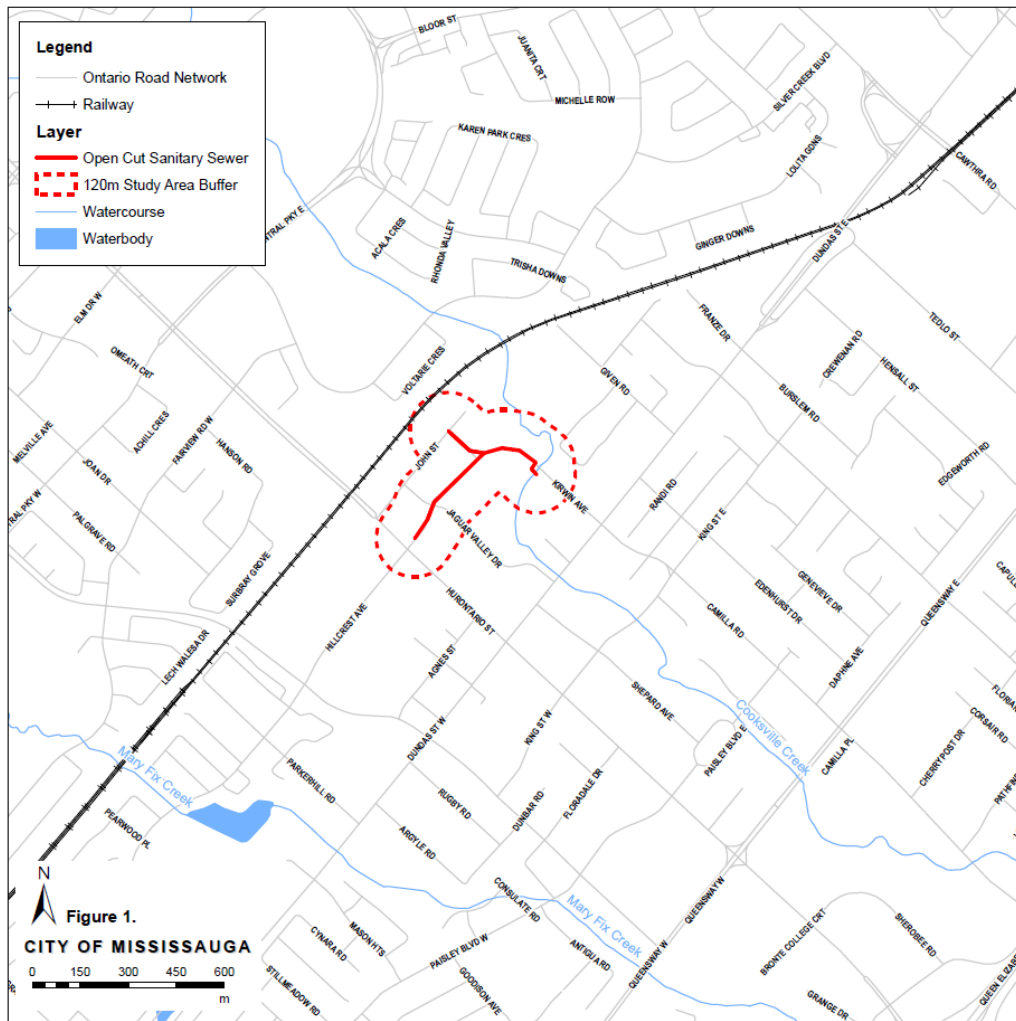


Figure 1. Key Map of Study Area

2.0 Methodology

An inventory of tree resources was conducted on July 20 and December 12, 2023, to identify tree constraints within the project limits. The inventory focused on trees within the Kirwin Avenue and Little John Lane right-of-way and up to 6 m beyond (study area), to the extent possible. Tree locations were captured using an EOS Arrow GPS 100 with an accuracy of ± 1 m. Attention was paid to canopy size and shape where tree canopies overhang the study area and may conflict with construction and machinery manoeuvring.

Trees with a diameter of 10 cm or greater were surveyed and the following information was collected: tree species (common and scientific name), diameter at breast height (DBH), radial dripline, tree condition assessed in a matrix of trunk integrity, crown structure, and crown vigour, and general comments as warranted. Surveyed trees at the study area were affixed with aluminum tree tags, each with a unique identification number.

Surveyed trees have been screened for rare species as referenced by the Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC), which includes classification of Endangered, Threatened, and Special Concern species both at a provincial and federal scale.

2.1 City of Mississauga Tree Protection By-laws

Tree resources located within the study area are regulated by the City of Mississauga *Public Tree By-Law No. 0020-2022* and *Private Tree Protection By-Law No. 0021-2022*. These bylaws regulate the injury and destruction of individual trees on public and private lands within the City of Mississauga. Trees located on private property with a diameter of 15 cm or greater are regulated and require a permit before removal. All trees located on public property require a permit prior to removal.

3.0 Results

A total of 131 trees were identified and assessed during the tree inventory. Trees within the Study Area range in size from 3 to 65 cm DBH and are generally in good to fair condition. Out of the 131 surveyed trees, 110 trees are regulated under the Mississauga Preservation By-laws. A detailed summary of all trees surveyed is presented in **Appendix A - Tree Inventory** and the locations of each tree (by identifier number) are presented in **Figure 2**.

No Federal or Provincially listed Threatened, Endangered or Special Concern tree species were identified within the Study Area.

4.0 Impact Assessment

A tree impact assessment was completed to determine impacts to tree resources as a result of the proposed works. The impact assessment was completed by comparing the extent of tree dripline and tree protection zones with the proposed disturbance limits provided in the design drawings. Trees recommended for removal include trees within or outside the disturbance limits that would not be able to withstand construction related impacts. Trees identified as injured may require root and/or canopy pruning where encroachment occurs, however, impacts will be minor and the trees are considered retainable. In addition, trees identified as retained are considered to be not affected and will be protected through mitigation measures. Note that this impact assessment is an estimate based on the information available at the time of report preparation and some assumptions have been made since the exact machine type and dimension, limits of disturbance, and roots zones are not identified at this time. A summary of the results of the impact assessment is provided below. Additionally, the results of the impact assessment are summarized in the **Appendix A - Tree Inventory** and illustrated in **Figure 2**.

4.1 Trees Identified for Removal

Seventeen (17) trees are identified for removal. Compensation requirements for removed trees are provided in **Section 5** and these trees are described in further detail in the **Appendix A - Tree Inventory**.

Table 1. summarizes the size classifications of trees identified for removal.

Table 1. Summary of Trees Identified for Removal

DBH Class (cm)	Number of Public Trees Removed	Number of Private Trees Removed
0 - 10	3	-
11 - 20	11	1
21 - 30	2	-
31 - 40	-	-
41 - 50	-	-
51 - 60	-	-
61 - 70	-	-
71 - 80	-	-
> 81 cm	-	-
Total	16	1

4.2 Trees Identified for Injury

No trees have been identified for injury.

4.3 Trees Identified for Retention

One hundred-fourteen (114) trees are recommended for retention with no injury and hoarding specifications are included in **Appendix A - Tree Inventory** and illustrated in **Figure 2**.

5.0 Tree Removal Compensation

The City of Mississauga requires replacement for all trees that are removed on public land and replacement for trees over 15 cm that are removed on private property. The requirements for replacement tree planting are:

- Replacement tree is at least 1.8 m tall if coniferous or at least 6 cm in diameter if deciduous.
- One replacement tree is required for every 15 cm of the public or private tree removed.

Table 1 outlines Mississauga’s tree replacement policy, and the compensation numbers for removed trees in the Study Area.

Table 2. Tree Removal Replacement Requirements

DBH Class	Replacement Trees	Number of Removed in the Study Area	Number of Required Replacement Trees
0 - 14 cm	0	12	0
15 - 29 cm	1	5	5
30 - 44 cm	2	-	-
45 - 59 cm	3	-	-
60 - 74 cm	4	-	-
75 - 90 cm	5	-	-
	Total	17	5

Based on Mississauga’s tree replacement policy, it has been determined that five trees are to be planted to replace the 17 trees removed as a result of construction.

6.0 Common and Potential Impacts

The following section details common and potential impacts to trees that may occur during construction and staging activities. These impacts typically include physical injury, severing of roots, and root zone compaction.

Physical injury (cutting, tearing or damage) to the main stem, branches or roots of a tree will occur if construction equipment is permitted to operate close to the tree. This can be avoided using the approved mitigation techniques outlined in **Section 7**.

Root cutting is a type of injury that can significantly affect the health of a tree. Root systems are responsible for nutrient uptake, carbohydrate storage, and structural anchorage. The majority of tree roots are found within in the upper 30 to 60 cm of soil thus any form of substrate excavation may tear or break tree roots if occurring within the dripline of trees. Trees can also become destabilized and may fall if structural root supports are severed. A preferred method of mitigating impacts is to employ hydrovac excavation which utilizes water pressure to loosen soil, which is then vacuumed from the pit, or, air-spading which utilizes pressurized air to excavate. These techniques result in a method of excavation that avoids tearing, ripping, or breaking roots typical of traditional bucket excavators, and allows for clean hand-sawn root pruning which is less damaging, or preferably avoidance altogether. This method of excavation should be considered where trees are in proximity of works.

Compaction of the soil in which tree roots grow is one of the leading causes of decline for trees. Soil compaction primarily occurs due to vehicle and machinery traffic, material stock piling and general movement across the root zone. Soil compaction causes the reduction of pore space in the soil, which is detrimental to root growth. Without space available for oxygen and water transport, tree roots will suffocate, and the decline of the tree will follow. Impacts may not be immediate, and the decline could take up to five years to become evident.

Designation of a tree protection zone (TPZ) is imperative for the protection of trees (roots, trunks, branches) adjacent to construction works. The TPZ will restrict construction related machinery and activities from damaging trees identified for retention. Physical protection (plywood hoarding, Fast Fence, or other as approved by the City) shall be considered for all trees in proximity to construction. Protection distances are listed in **Appendix A - Tree Inventory**. Note that site specific deviations from the City's standards may be required, particularly to alleviate conflicts with pedestrian and vehicle traffic and private Study Area.

Tree removals may also be subject to the requirements and provisions of other legislation, regulations or bylaws, such as the *Migratory Birds Convention Act (MBCA)*, *Conservation Authorities Act*, *Endangered Species Act*, or the *Fisheries Act*. For planning purposes vegetation removals should not occur during the breeding season or the maternity bat roost season (March 30th – September 30st) to avoid nesting birds and roosting bats. If construction during this timing window is deemed necessary, a nest survey is required, and the results may dictate consultation with Environment Canada. Other approvals or due diligence with respect to tree removals are outside of the scope of this assessment.

7.0 Mitigation

The following section outlines mitigation measures that should be implemented to ensure no impacts occur to those trees identified for retention.

- Prior to the start of any site work, the Contractor shall supply and install tree protection barriers around each tree designated for protection;
- The protective barrier is to comply with City specifications for tree protection;
- No fill, machinery, chemicals, fuel or materials are to be placed within the protective barrier; heavy machinery is not to be operated within the TPZ);
- No re-grading, including filling or excavation, is to take place within the TPZ unless permitted by the City;
- Soil compaction mitigation includes application of wood chips/mulch to a depth of 100mm and overlaying steel or plywood wood sheeting to dissipate the weight of machinery driven overtop.
- All tree and shrub protection must be removed upon completion of construction activities;
- No signs or objects should be displayed or affixed to any retained trees;
- Signs shall be affixed to the TPZ fence to inform workers that entry is not permitted;
- Backfilling should occur as soon as possible and should occur with clean native uncontaminated topsoil; and,
- Tree clearing shall ensure compliance of the Migratory Bird Convention Act (MBCA). The study area is within Environment and Climate Change Canada's Nesting Zone C2 (Nesting Period: April 1–August 31). Should this not be possible, a nesting bird survey will be undertaken by a qualified avian biologist no more than 48 hours before any vegetation clearing.

8.0 Summary and Conclusion

An inventory of tree resources within the Study Area was conducted in July and December of 2023 by an ISA Certified Arborist. An impact assessment of tree resources in Study Area has determined the following:

Removals – Seventeen trees (17) are to be removed.

Injury – No trees have been identified for injury.

Retain – One hundred-fourteen trees (114) are to be retained and protected.

Tree replacement requirements for removed trees has been determined and described in **Section 5**. Five replacement trees are required as per City of Mississauga guidelines. Replacement trees must be at least 1.8 m tall if coniferous or at least 6 cm in diameter if deciduous.

9.0 References

City of Mississauga. 2022. *Public Tree Protection By-law 0020-2022*.

City of Mississauga. 2022. *Private Tree Protection By-law 0021-2022*.

10.0 Disclaimer

10.1 Limitations of this Assessment

This Assessment is based on the circumstances and observations as they existed at the time of the site inspection of the Client's Study Area and the trees situated thereon and upon information provided by the Client to LGL Limited. The opinions in this Assessment are given based on observations made and using generally accepted professional judgment; however, because trees and plants 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 testing, observations and analysis took place and no guarantee, warranty, representation or opinion is offered or made as to the length of the 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.

10.2 Restriction of Assessment

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

10.3 Professional Responsibility

In carrying out this Assessment, LGL Limited and any Assessor appointed for and on behalf of LGL Limited to perform and carry out the Assessment has exercised a reasonable standard of care, skill and diligence as would be customarily and normally provided in carrying out this Assessment. The Assessment has been made using accepted arboricultural techniques. These include a 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 degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of Study Area and people. Except where specifically noted in the Assessment, none of the trees examined on the Study Area were dissected, cored, probed, or climbed and detailed root crown examinations involving excavation were not undertaken.

While reasonable efforts have been made to ensure that the trees recommended for retention are healthy, no guarantees are offered, or implied, that these trees, or all parts of them will remain standing. It is professionally impossible to predict with absolute certainty the behaviour of any single tree or group of trees, or all their component parts, in all given circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential to fall, lean, or otherwise pose a danger to Study Area and persons in the event of adverse weather conditions, and this risk can only be eliminated if the tree is removed.

Without limiting the foregoing, no liability is assumed by LGL or its directors, officers, employers, contractors, agents or Assessors for:

- a) any legal description provided with respect to the Study Area;
- b) issues of title and or ownership respect to the Study Area;
- c) the accuracy of the Study Area line locations or boundaries with respect to the Study Area;
- d) the accuracy of any other information provided to LGL by the Client or third parties;
- e) any consequential loss, injury or damages suffered by the Client or any third parties, including but not limited to replacement costs, loss of use, earnings and business interruption; and,
- f) the unauthorized distribution of the Assessment.











10.4 General

Any plans and/or illustrations in this Assessment are included only to help the Client visualize the issues in this Assessment and shall not be relied upon for any other purpose.

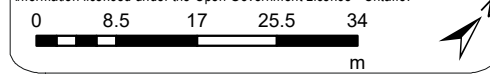
Tree Resource Figures



LEGEND

-  Open Cut Sanitary Sewer Alignment
-  Right-of-Way
-  Property Line
-  Watercourse (LIO)
-  Tree to be Retained
-  Tree to be Removed
-  Disturbance Area/Open Cut
-  Tree Protection Fencing
-  Dripline
-  Tree Protection Zone

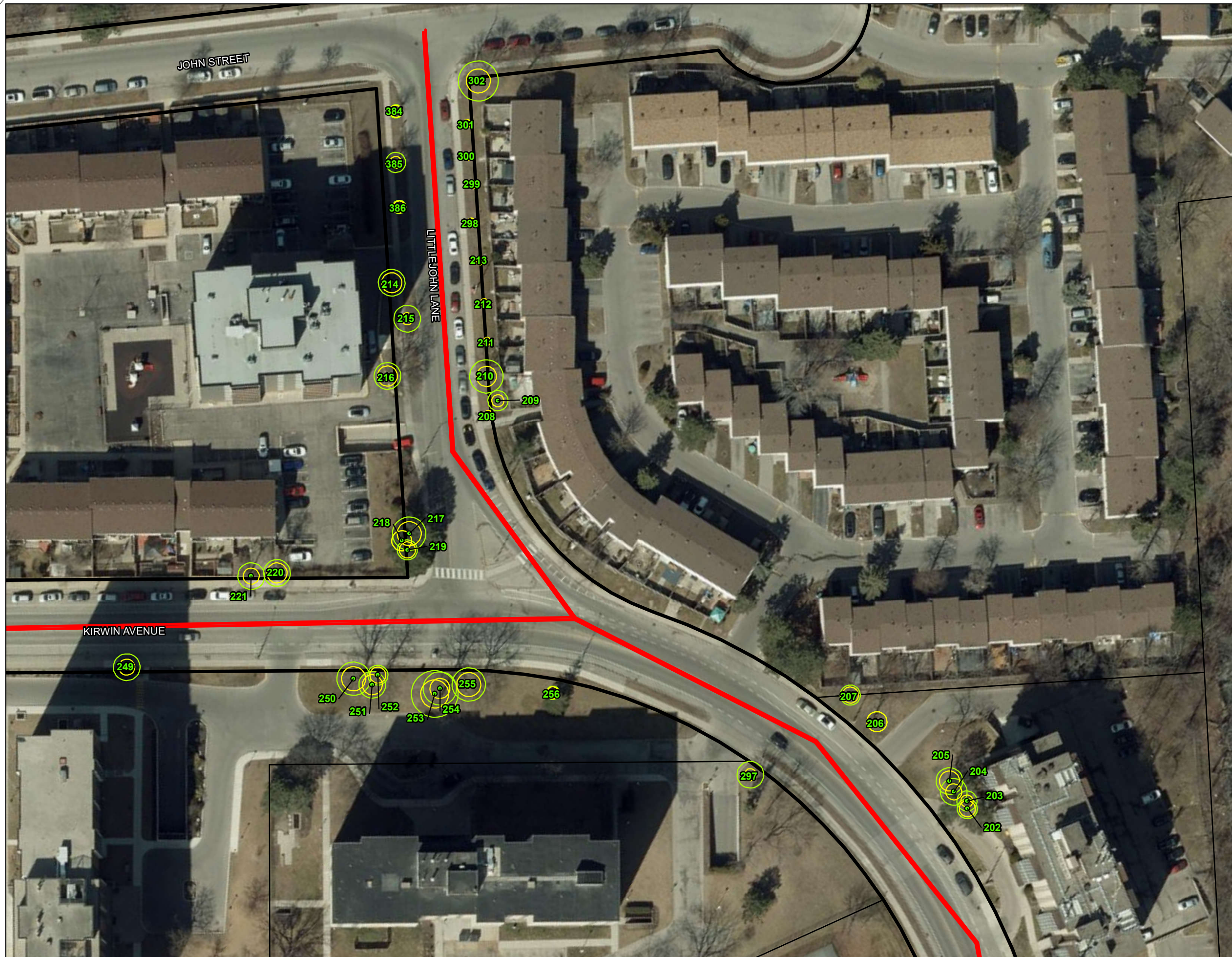
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**KIRWIN AVENUE SEWER
TREE RESOURCES**



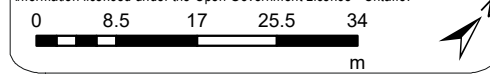
Project: TA9334	Figure: 2-A
Date: January, 2024	Prepared By: VLG
Scale: 1:800	Checked By: JPB



LEGEND

-  Open Cut Sanitary Sewer Alignment
-  Right-of-Way
-  Property Line
-  Watercourse (LIO)
-  Tree to be Retained
-  Tree to be Removed
-  Disturbance Area/Open Cut
-  Tree Protection Fencing
-  Dripline
-  Tree Protection Zone

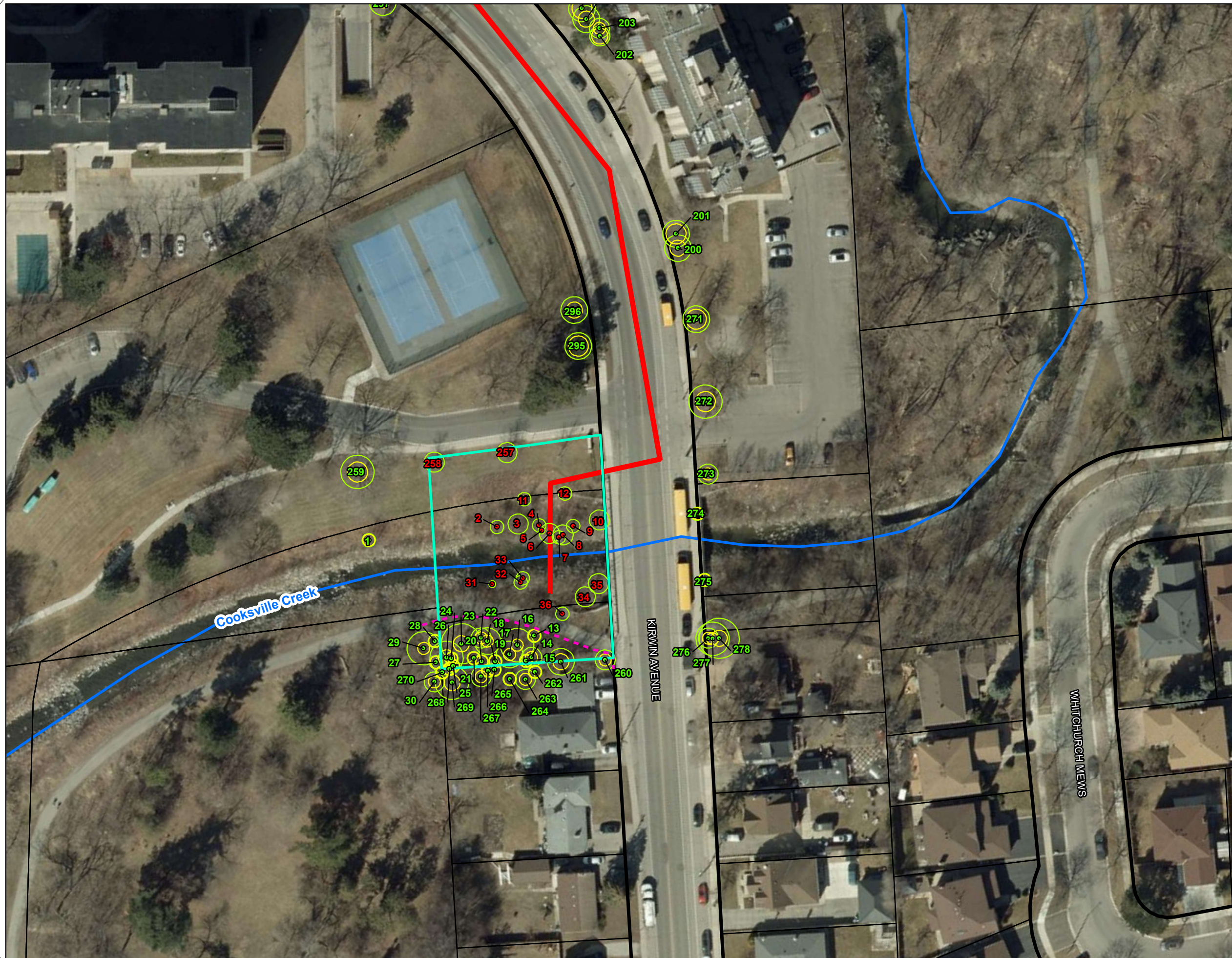
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**KIRWIN AVENUE SEWER
TREE RESOURCES**



Project: TA9334	Figure: 2-B
Date: January, 2024	Prepared By: VLG
Scale: 1:800	Checked By: JPB




LEGEND

-  Open Cut Sanitary Sewer Alignment
-  Right-of-Way
-  Property Line
-  Watercourse (LIO)
-  Tree to be Retained
-  Tree to be Removed
-  Disturbance Area/Open Cut
-  Tree Protection Fencing
-  Dripline
-  Tree Protection Zone

Data Sources: Credit Valley Conservation (CVC) & Ministry of Natural Resources and Forestry (LIO). Produced by LGL Limited under Licence with the Ontario Ministry of Natural Resources © King's Printer for Ontario, 2023. Contains information licensed under the Open Government Licence - Ontario.

0 8.5 17 25.5 34
m



**KIRWIN AVENUE SEWER
TREE RESOURCES**



Project: TA9334	Figure: 2-C
Date: January, 2024	Prepared By: VLG
Scale: 1:800	Checked By: JPB

Appendix A Tree Inventory

Project: TA9334-02 Sanitary Sewer Replacement for Kirwin Ave and Little John Ln
 Client: Arcadis Date: July 20 and December 12, 2023
 Collectors: LMC, JPB Area: Kirwin Ave and Little John Ln, Missasauga



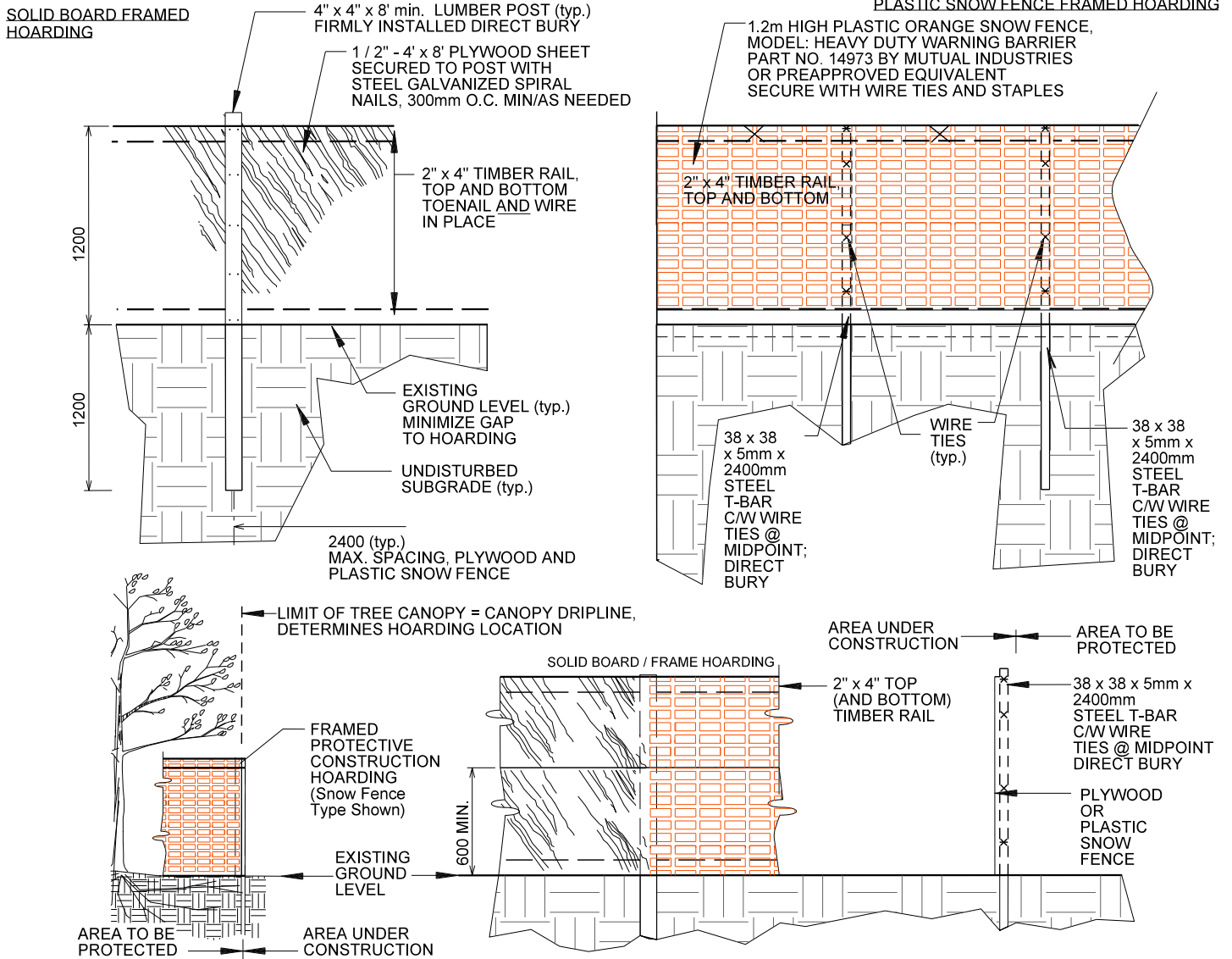
Tree #	Scientific Name	Common Name	DBH (cm)	Additional Stems	Estimation of DBH (x)	Radial Dripline (m)	Condition			Tree Protection Zone (TPZ)	Ownership (Private, Public, Boundary)	Impact Assessment			Tree Preservation Measures					Comments		
							TI	CS	CV			Remove	Retain	Impacted	Reason	Canopy Pruning	Protect with Hoarding	Root Pruning	Air-spade/hand dig pit		Open Trench Excavation	Trenchless Excavation
495	<i>Malus baccata</i>	Siberian crabapple	13.0	11		2.0	g	g	g	1.80	Private		x									epicormic shoots at base
496	<i>Acer negundo</i>	Manitoba maple	31.0	22, 21		5.0	g	g	g	2.40	Private		x									

Appendix B Tree Protection Specifications

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.