

556, 560 & 576 Conservation Dr. Waterloo

Tree Preservation Plan

Prepared for:

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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

556, 560 & 576 Conservation Dr. Waterloo

Tree Preservation Plan

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained as part of a team by 2115881 Ontario Limited to prepare a Tree Preservation Plan (TPP) for the proposed residential development of the subject property located on Conservation Drive in north Waterloo, Ontario. The subject property is approximately 28.64ha in area and is bounded to the south by Conservation Drive, Roy Schmidt Road to the east, agricultural fields and natural features to the west and north as shown on Map 1. Habitat within the subject property is comprised mainly of agricultural fields, with wetlands and woodlands associated with Beaver Creek along the western portion of the property.

The City of Waterloo formally refers to this planning area as the Beaver Creek Meadows District. Natural features within and adjacent to the subject property are Core Environmental Features in the Region of Waterloo's Official Plan (OP) (2015), Core and Supporting Natural Features in the City of Waterloo's OP (2022). The wetlands in the study area are designated as Provincially Significant Wetlands (PSW) and comprise a portion of the Sunfish Lake – Laurel Creek PSW Complex. The low-lying habitats along Beaver Creek are floodplain. Both the PSW, watercourses and their associated floodplain are regulated by the Grand River Conservation Authority (GRCA) and are subject to Ontario Regulation 41/24. The presence of these natural features, in addition to lands containing known and potential habitat for Species At Risk (SAR) that are afforded protection under the *Endangered Species Act* (ESA) (2007) triggered the requirement for an Environmental Impact Study (EIS), which NRSI completed and submitted to agency staff on October 30, 2023. A tree inventory was completed as part of the EIS; however, a TPP was not prepared for the Draft Plan at that time. An updated inventory of trees within and adjacent to the development footprint was completed by a NRSI Certified Arborist on November 18, 2024.

The following TPP has been prepared to satisfy the City of Waterloo comments on the Draft Plan of Subdivision submission package from the project team (March 3, 2023) that noted:

> *"Approval and implementation of a Tree Saving and Protection Plan that specifies measures for removal, retention and replacement using a 2:1 ratio that is coordinated with the design of the SWM facility."*

This TPP has also been prepared in accordance with Chapter 7 – The Greenlands Network in the Region of Waterloo's Official Plan (2015) (trees within the subject lands are not considered within Significant Woodland) and based on the guidelines provided in Chapter 8 of the City of Waterloo's Official Plan (OP): Environment and Energy, 8.2.9 Urban Forest (City of Waterloo 2022), which states:

> *"When considering development applications and site alteration permit applications, the City will require that only the trees that directly impede the proposed work be removed and that the applicant replace them in reasonable amount, with trees of sufficient maturity. The amount and maturity of replacement trees will be determined based on the amount, maturity, species, and health of the trees to be removed. A Tree Preservation Plan may be required to provide an inventory of all trees on the site, an assessment of their health and condition, recommendations regarding which trees should be saved and which will be removed, tree protection measures, and replacement trees."*

This report provides the updated findings of the tree inventory, and an analysis of the proposed development against the trees' overall health and structural integrity. The tree data and mapping has been compared to the proposed development plan and associated grading as prepared by Meritech Engineering (October 2024) and summarizes protection measures for trees to be retained and provides recommendations for mitigation and compensation.

2.0 Tree Inventory and Methodology

The EIS (NRSI 2023) included information on the tree inventories that were completed within the subject property in May 2016, March 2019 as well as further tree inventory work to refine the Significant Woodland limits at the west property boundary in July 2018. Due to the amount of time that has passed from the preliminary tree inventories to preparation of the development grading plans, an updated inventory of trees within and adjacent to the proposed limit of development was completed on November 18, 2024.

Inventoried trees and delineated natural features are shown on Maps 2a-2f. A complete list of the trees that were assessed and their overall health is included in Appendix I. The following information was recorded for inventoried trees:

- Tree location;
- Tag number/alphanumeric identifier;
- Species (common and scientific name);
- DBH (cm);
- Number of stems;
- Crown radius (metres);
- General health (excellent, good, fair, poor, very poor, snag);
- Potential for structural failure (Improbable, Possible, Probable, Imminent); and,
- General comments (i.e., disease, aesthetic quality, development constraints, prune to reduce structural failure, sensitivity to development, etc.).

The overall health of each tree and potential for structural failure was assessed based on the criteria outlined in Appendix II (Dunster 2009, Dunster et al. 2013). In carrying out these assessments, NRSI has exercised a reasonable standard of care, skill and diligence as would be customarily and normally provided in carrying out these assessments. The assessments have 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, 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 property and people. None of the trees examined were dissected, cored, probed or climbed and detailed root examinations involving excavation were not undertaken. The conditions for this assessment, including restrictions, professional responsibility and third-party liability can be found in Appendix III.

3.0 Summary of Tree Inventory Findings

In total, 95 trees were inventoried, comprising 15 species and 1 unidentifiable snag. Of the inventoried trees, 70 are native, 19 are non-native and 6 are unknown (i.e., snag or Hawthorn species). A complete list of inventoried trees is provided in Appendix I and tree locations within the subject property are shown on Maps 2a-f.

Appendix IV provides a list of tree species inventoried, whether they are native or non-native and their overall health. A summary of the overall health of inventories trees, along with their potential for structural failure can also be found in Appendix IV. A majority of the trees inventoried were in fair health with an improbable potential for structural failure.

3.1 Butternut

A single Butternut (*Juglans cinerea*) tree was observed along the east side of the subject property (Map 2e). Butternut is listed as Endangered (OMNRF 2024) under the provincial Endangered Species Act (ESA, 2007). Under the ESA and Section 23.7 of Ontario Regulation 242/08, it is an offence to kill, harm, or take a live Butternut tree that is not exempt from protection. Butternut specimens that may be exempt from protection under the ESA include genetic hybrids, cultivated individuals that were not planted as a condition of a permit under the ESA, and specimens severely impacted by the Butternut canker (*Ophiognomonia clavigignenti-juglandacearum*) (Government of Ontario 2014).

Although the tree inventory was completed outside of the leaf-on season required by the MECP to assess and determine the health category for Butternut, a preliminary assessment of the presence of Butternut canker (open/sooty) was completed and photos were taken. Only 2 small sooty canker were observed on the main stem and the tree was otherwise noted to be in good condition. To inform protection measures and potential compensation, a twig sample was collected on November 21, 2024 and submitted the NatureMetrics lab in Guelph, ON for genetic testing on November 22, 2024. Lab results were provided by NatureMetrics lab on December 5, 2024 and it was determined that the tree is a Butternut hybrid (*Juglans cinerea x J. ailantifolia*) and is therefore not afforded protection under the ESA. The tree is still regulated under the City's tree by-law and will be compensated for at a 2:1 ratio.

4.0 Tree Retention Analysis and Compensation

4.1 Retention Analysis

The tree removal and retention analysis in this report is based on the following considerations:

1. Trees identified as having a probable or imminent potential for structural failure or poor or very poor health and/or are dead may be identified for removal. The removal of these trees may be recommended for safety, especially where they may pose a safety risk to the adjacent development.
2. Trees that require removal based on the proposed development plan. This was determined by comparing the trees and their potential root systems to the location of components of the final plan of development as shown on Map 2.

Of the 95 trees inventoried, 66 are proposed for removal from within and adjacent to the subject property. Permission from the neighbouring property owner will be required prior to the removal of 16 trees (11 boundary trees and 5 off property trees) that are identified to be removed to allow for site grading, or will incur significant root damage.

In some cases, trees off property have been recommended for retention despite the expectation that a minor portion of the root system could be impacted by the proposed construction activities. This recommendation has been made with the intent of retaining as many existing trees as possible and anticipating that the affected trees will tolerate the proposed impacts associated with the trail and swale grading along the boundary of the property. Potential impacts to these trees will be limited to a small portion of the total root zone, and will be localized on one side of the root zones, and as such, these trees are expected to tolerate the disturbance. On-site presence of a Certified Arborist or Registered Professional Forester prior to and during tree removals and site grading is described below.

4.2 Compensation

Of the 66 trees to be removed, 48 are in Good to Fair condition and will be compensated at a 2:1 ratio for a total of 96 replacement trees. Compensation is not required for the 18 trees that were identified to be Dead, Very Poor or in Poor condition.

Table 1 provides a break-down of the retention/removal analysis and approach to compensation. Appendix I includes a list of trees inventoried, their overall health and potential for structural failure, recommended action (retain, remove, etc.), rationale for removal and compensation requirements. Retention and removals are shown on Maps 2a-2f.

Table 1. Retention & Removal Analysis and Compensation Summary

Proposed Action	Total
Trees to be Retained	
Retain	23
Retain / Confirm On-Site	2
Retain / Prune	4
Total Trees to be Retained	**29**
Trees to be Removed	
Remove	64
Remove / Confirm On-site	1
Remove / Retain Stump	1
Total Trees to be Removed	**66**
Trees to be removed not requiring compensation	18
Trees to be removed requiring compensation	48
Compensation plantings required (2:1)	**96**

It is anticipated that compensation plantings can be accommodated on-site along the west woodland edge and where feasible, within the buffer of the northwest woodland and wetland area. It is also recommended that the compensation be achieved by way of native trees and shrubs to encourage a more naturalized buffer zone. A high-level Stewardship plan was included as part of the EIS (NRSI 2023) that identifies restoration and enhancement areas throughout the subject property where native planting and urban canopy cover can be achieved. Native plantings (comprised of trees, shrubs and herbaceous cover) within the natural feature buffers will improve upon the existing agricultural edge conditions, increase the number of native species present and in-time, create a naturalized buffer from the adjacent development and pedestrian trail network. A detailed Rehabilitation and Enhancement Plan is to be prepared as a Condition of Approval for the overall development, which will include the details of the plantings, clean-up and management activities described in the EIS (NRSI 2023). An Invasive Species Management Plan will also be prepared as a Condition of Approval that will deal with on-site locations of problematic invasive species, such as Common Reed (*Phragmites australis*), European (*Rhamnus cathartica*) and Glossy Buckthorn (*Rhamnus frangula*) and White Poplar (*Populus alba*), as necessary.

During development of landscape plans and Rehabilitation and Enhancement Plan, it is recommended that the recommendation in the EIS (NRSI 2023), as well as the following criteria be considered:

- The plan should be developed by, or reviewed and approved by an Ontario Landscape Architect (OLA), Certified Arborist/Registered Professional Forester or Restoration Specialist;
- Plantings installed as per specifications outlined in the planting plans prepared by an OAL, Certified Arborist or Registered Professional Forester;
- Planting plans for the stormwater management pond and overall development area to be prepared in accordance with the City of Waterloo Comprehensive Engineering and Landscape Manual (City of Waterloo 2023a);
- Plantings within naturalized areas are to be limited to native, non-invasive tree and shrub species indigenous to Waterloo Region that complement the surrounding natural features;
- Include hardy, native tree and shrub species where feasible that are known to thrive in more urban conditions when placed near to roads, front yards, etc. (i.e. compacted soil, drought, high salt tolerance);
- Include a diversity of trees from several genera to increase disease and pest tolerance and discourage monocultures (no more than 30% from a single genus, 10% from a single species);
- Where applicable, the outer extents of any natural feature buffers or boundary between buffers and development area should be comprised of a mix of native tree and shrub species in an attempt to naturalize the area, increase presence of native species, provide wildlife habitat and protect from adjacent development encroachment (i.e., human foot traffic, dumping);
- Tree and shrub species to be situated in close proximity to roads should be salt and drought tolerant;
- Avoid Ash (*Fraxinus* spp.) species due to the risk of the Emerald Ash Borer (*Agrilus planipennis*);
- Spacing of plant material should account for the ultimate size and form of the selected species and also the purpose of the planting, whether it be for screening, shade, naturalizing, rehabilitation, etc.;

  Special attention to location and height of trees in proximity to utilities and buildings, and;
- Ensure that there is sufficient soil volume for all plantings in accordance with the City of Waterloo Comprehensive Engineering and Landscape Manual (City of Waterloo 2023a).

5.0 Protection Measures and Recommended Mitigation

During the construction process, efforts will be made to protect the health and root systems of trees that have been assessed for retention in this plan. In compliance with the EIS (NRSI 2023) and MECP requirements, the following mitigation plan will also aim to protect the adjacent natural areas and discourage wildlife, specifically turtles, from traveling into the development area. The Client, or their designate (e.g. construction inspector or site manager), must ensure that all employees and contractors are informed of the meaning and importance of tree and wildlife protection measures and the ways in which trees and natural areas to be retained are identified. To ensure that the adjacent natural features, wildlife and trees identified for retention are protected throughout the development of the subject property, the following mitigation measures are recommended in addition to those outlined in the scoped EIS report prepared by NRSI (2023).

5.1 Prior to Construction and Site Alteration

Tree removal adjacent to the protected natural areas and trees identified to be retained along the north hedgerow/property boundary (Map 2) is proposed; therefore, the following steps are recommended to protect off property trees and trees identified for long-term retention:

- Prior to any on-site works, a Certified Arborist/Registered Professional Forester is to clearly mark trees identified for removal as per Maps 2a-2f, as well as any additional trees that may pose a safety concern to the future pedestrian trail users;
- Trees marked for removal are to be removed/felled by the contractor under the supervision of a Certified Arborist/Registered Professional Forester or qualified tree professional to ensure no adjacent trees and/or their roots are injured;
- After tree removals are complete, temporary Tree Protection Fence (TPF), combined with Erosion and Sediment Control (ESC) fence is to be installed along the limits of the natural feature setbacks as established through the EIS (NRSI 2023) and around trees identified for retention as shown on Maps 2a-2f;
- The location and installation of the TPF/ESC fencing, in addition to the grading within the vicinity of the retained trees and woodland driplines should be supervised by a qualified Certified Arborist/Registered Professional Forester or qualified other;
- TPF/ESC fencing is to be inspected by a qualified professional, with an inspection report circulated to the project team and the City prior to any on-site works to confirm natural features and retained trees are adequately protected.

Fencing is to be in accordance with Standard CW-701 for TPF in the CELM (City of Waterloo 2023a) and is to be comprised of 1200mm high paige-wire fencing secured to steel t-bars. Signage indicating the purpose of the protection fencing will be attached to the paige-wire fencing at a minimum spacing of 30m, and at least one sign shall be installed at each side of the tree protection zone in accordance with Standard CW-702 (City of Waterloo 2023a). For the pre- and during construction phases of the project, the TPF/ESC fencing will also function as temporary turtle barrier fencing.

5.1.1 Timing Windows

Migratory Birds Convention Act

The removal of trees and all vegetated areas (i.e., hedgerows) within the extent of the disturbance proposed for the development has the potential to disrupt nesting birds. The Migratory Birds Convention Act (MBCA, Government of Canada 1994) identifies a list of migratory bird species that are protected. It prohibits the destruction of nests, individuals and activities that would cause an adult bird to abandon a nest. Tree and vegetation removal is to occur outside of the core nesting period for migratory birds as established by the Canadian Wildlife Service (CWS) which extends from approximately April 1 – August 31 (Government of Canada 2018). Every developer, consultant, contractor, etc. is legally obliged to carry out due diligence to protect migratory birds from harm during all construction projects.

Historically, the implementation polices of the MBCA provided for biologists to conduct nest searches when vegetation removals were to occur during the nesting period. These provisions were revoked in 2014. One exception is for when removals are to occur in 'simple' habitats which are characterized in the MBCA (i.e., bridge structures, isolated trees, vacant lot). Based on the character of the main development area, the trees proposed to be removed can predominantly be classified as simple habitat.

Should vegetation/tree removal be required to occur within the peak breeding bird window, nest surveys may be conducted by qualified biologists within simple habitat just prior to the removal activity (less than 48 hours prior to) to ensure that nesting birds are not present. Should any nest be identified in a vegetated area or tree(s) to be removed, there shall be no removal or construction activity until sign-off is obtained from the qualified biologist that the nest is no longer active. Vegetated areas and tree(s) identified as having no nesting activity can be removed; however, removal is to occur within 48 hours of the nest search. If removal does not occur within this time frame, additional nest searches are to be conducted.

In the event a nest survey is conducted, a clearance letter is to be prepared by the qualified biologist that undertook the surveys. The letter will be submitted to the client and/or their contractor for their files in the event a record of due diligence is requested by the CWS.

Bat Roosting Habitat

To avoid unintentionally harming SAR bats during tree removal (thereby ensuring compliance with the ESA), tree removals are recommended to occur between October 1 and March 31, which is the period outside of the active bat season (generally April 1 to September 30). If tree removal is proposed within the bat active season, exit surveys are recommended to occur within 24hrs of tree removal to confirm the absence of SAR bats in the trees identified as potential roost sites.

5.2 During Construction

The recommended TPF/ESC is to be maintained by the Client or its agents during the entire construction period to ensure that the natural areas and trees being retained (including their root systems) are protected. The fencing is also to be maintained to ensure that it's effectively discouraging wildlife from entering the active construction zone.

Minor construction damage (e.g., damage to limbs or roots) to trees to be retained must be pruned using proper arboricultural techniques. Root pruning, if necessary, should be performed by a Certified Arborist or RPF using an appropriate implement to make proper pruning cuts and encourage callous root growth. Should any of the trees intended to be retained be seriously damaged or die as a result of construction activities, the City should be consulted to determine adequate steps, such as treatment or compensation.

Areas protected by TPF/ESC shall remain undisturbed and shall not be used for temporary storage, placement or excavation of fill or top soil, the storage of construction materials or equipment, or the storage of debris. Recognizing the root system of a tree often extends well beyond its dripline (i.e., outside the protected area), construction contaminants such as fuels, oils, etc. should be kept clear of areas protected by the TPF.

5.3 Post-Construction

It is recommended that the TPF/ESC fencing be removed upon completion of construction activities and adjacent areas are stabilized with a suitable vegetative cover to the satisfaction of a qualified professional. If disturbance occurs within the root zones of retained trees, these root

zones will be restored with native topsoil, and re-seeded. Revegetation, following removal of TPF/ESC, will permit increased root development for the remaining trees. A Certified Arborist or RPF must inspect all retained trees and their rooting area, and any concerns must be reported to the City. The Certified Arborist or RPF may recommend remediation work if conditions require it.

Permanent turtle barrier fencing is identified on Maps 2a-2f where applicable and is also shown on Meritech grading plans (2024). Installation of the permanent turtle barrier fencing is anticipated to be coordinated with temporary TPF/ESC fence removal and final site grading so that adjacent areas can be stabilized with a suitable vegetative cover following installation.

Following remediation activities, if needed, a final site inspection of trees retained should be completed to ensure all protocols were met. During and post-construction monitoring and inspection requirements associated with the permanent turtle barrier fencing, Rehabilitation and Enhancement Plan and Invasive Species Management Plan will be detailed under separate cover.

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Appendix I
Tree Inventory Data

556, 560 & 576 Conservation Drive Tree Protection Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	DBH 4 (cm)	DBH 5 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
001	Trembling Aspen	*Populus tremuloides*	Native	1	10					1.3	Improbable	Fair	W Hedgerow	Remove	Road/SWM Grading	2:1	Stem competition with buckthorn and riverbank grape; minor evidence of decay on lower stem.
002	Trembling Aspen	*Populus tremuloides*	Native	1	26					2.0	Improbable	Fair	W Hedgerow	Remove	Road/SWM Grading	2:1	Lower stem competition with buckthorn and riverbank grape; some crown dieback.
003	Trembling Aspen	*Populus tremuloides*	Native	1	25					1.0	Possible	Poor	W Hedgerow	Remove	Road/SWM Grading	No	Lower stem competition with buckthorn and riverbank grape; history of branch failure; reduced crown with dieback.
004	Trembling Aspen	*Populus tremuloides*	Native	1	26					3.0	Improbable	Fair	W Hedgerow	Remove	Road/SWM Grading	2:1	Asymmetrical crown due to competition with adjacent trees; some crown dieback.
005	Trembling Aspen	*Populus tremuloides*	Native	1	32.5					2.0	Possible	Poor	W Hedgerow	Remove	Road/SWM Grading	No	Sunken bark with evidence of decay; reduced crown with dieback; lower stem competition with buckthorn and riverbank grape.
006	Trembling Aspen	*Populus tremuloides*	Native	1	33.5					0.0	Probable	Dead	W Hedgerow	Remove	Road/SWM Grading	No	Missing crown; draped in riverbank grape.
007	White Ash	*Fraxinus americana*	Native	1	25.5					2.0	Improbable	Fair	Woodland	Retain			Competition with buckthorn and riverbank grape; asymmetrical crown with dieback; small galleries.
008	Trembling Aspen	*Populus tremuloides*	Native	1	39					3.0	Improbable	Fair	Woodland	Retain			Asymmetrical crown with some dieback.
009	White Ash	*Fraxinus americana*	Native	1	15.5					2.0	Probable	Very Poor	Woodland	Retain			Epicormic growth only; galleries; extensive dieback.
010	Trembling Aspen	*Populus tremuloides*	Native	1	24					3.0	Improbable	Fair	Woodland	Retain			Asymmetrical crown due to competition with adjacent trees; self pruning up main stem; lower stem competition with riverbank grape.
011	White Ash	*Fraxinus americana*	Native	2	12	10				2.0	Improbable	Fair	NW Hedgerow - Off property	Retain			Minor crown dieback; some evidence of galleries.
012	White Ash	*Fraxinus americana*	Native	1	11.5					1.0	Improbable	Fair	NW Hedgerow - Off property	Retain			Narrow crown due to competition with adjacent trees; galleries.
013	White Ash	*Fraxinus americana*	Native	4	11	10	9	9		1.0	Possible	Poor	NW Hedgerow - Off property	Retain			Crown dieback; galleries.
014	Sweet Cherry	*Prunus avium*	Non-native	1	12					1.0	Improbable	Good	NW Hedgerow - Off property	Retain			Growing on slight angle; otherwise vigorous tree.
015	American Elm	*Ulmus americana*	Native	1	16					3.0	Improbable	Fair	NW Hedgerow - Off property	Retain			Asymmetrical crown due to competition with adjacent tree; narrow root flare.
016	Sweet Cherry	*Prunus avium*	Non-native	1	13					3.0	Improbable	Fair	NW Hedgerow - Off property	Retain			Asymmetrical crown due to competition with adjacent trees; some dieback.
017	Sweet Cherry	*Prunus avium*	Non-native	1	11					1.5	Improbable	Fair	NW Hedgerow - Off property	Retain			Phototrophic growth towards other property; lower scaffold dieback.
018	American Elm	*Ulmus americana*	Native	1	13					2.0	Improbable	Fair	NW Hedgerow - Off property	Retain			Lower scaffold competition with riverbank grape; some dieback.
019	Manitoba Maple	*Acer negundo*	Native	2	14	10.5				3.0	Improbable	Fair	NW Hedgerow - Off property	Retain			1 upper branch snapped; some crown dieback.
020	Common Hackberry	*Celtis occidentalis*	Native	1	21.5					3.0	Improbable	Fair	NW Hedgerow - Off property	ain / Confirm On			Crown still relatively healthy; however a lot of competition with riverbank grape; 1 extended lateral scaffold branch.
021	Common Pear	*Pyrus communis*	Non-native	1	11					1.0	Possible	Poor	NW Hedgerow - Off property	Retain			Asymmetrical crown due to competition with adjacent tree; draped in riverbank grape.
022	Black Walnut	*Juglans nigra*	Native	1	11					3.0	Possible	Poor	E Hedgerow	Remove	Site Grading	No	Some decay and staining on main stem; suppressed crown with riverbank grape throughout.
023	Hawthorn sp.	*Crataegus sp.*	**	3	45	26.5	17			5.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Small cavities with evidence of decay; some crown dieback.
024	Hawthorn sp.	*Crataegus sp.*	**	1	10.5	10				3.0	Improbable	Poor	E Hedgerow	Remove	Site Grading	No	Suppressed crown due to adjacent tree; dieback; stem still solid.
025	Hawthorn sp.	*Crataegus sp.*	**	3	28	15	12			3.0	Possible	Poor	E Hedgerow	Remove	Site Grading	No	Relatively extensive decay up larger stem; crown competition with riverbank grape.
026	Black Walnut	*Juglans nigra*	Native	2	29	17				4.5	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Minor branch competition; relatively vigorous crown.
027	Manitoba Maple	*Acer negundo*	Native	1	11.5					2.5	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Phototrophic lean; asymmetrical crown due to competition with adjacent tree.
028	Black Walnut	*Juglans nigra*	Native	1	30	17.5	15.5			5.0	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Some branch competition; crown otherwise vigorous; slightly asymmetrical with crown extending further over Roy Schmidt Road.
029	Black Walnut	*Juglans nigra*	Native	1	17.5	10				3.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Epicormic growth; evidence of some decay at root flare.
030	Manitoba Maple	*Acer negundo*	Native	6	11.5	10	9	9	9	2.0	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Relatively full crown with minor dieback.
031	Black Walnut	*Juglans nigra*	Native	1	25					3.0	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Well balanced, open growth crown; solid main stem.
032	Black Walnut	*Juglans nigra*	Native	1	15					2.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Slightly asymmetrical crown due to competition with adjacent tree; minor dieback.
033	Black Walnut	*Juglans nigra*	Native	1	15.5					2.5	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Relatively full, vigorous crown.

556, 560 & 576 Conservation Drive Tree Protection Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	DBH 4 (cm)	DBH 5 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
034	Black Walnut	*Juglans nigra*	Native	1	19.5					3.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Asymmetrical crown due to competition with adjacent tree; minor dieback.
035	Black Walnut	*Juglans nigra*	Native	1	18.5					3.5	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Asymmetrical crown due to competition with adjacent tree; minor dieback.
036	Black Walnut	*Juglans nigra*	Native	1	11.5					2.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Asymmetrical crown due to competition with adjacent tree; lower scaffold dieback.
037	Black Walnut	*Juglans nigra*	Native	1	11.5					1.5	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Crown competition with adjacent tree; some dieback.
038	Black Walnut	*Juglans nigra*	Native	1	11.5					1.5	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Some crown competition with adjacent tree, otherwise vigorous.
039	Black Walnut	*Juglans nigra*	Native	1	13.5					3.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Asymmetrical crown due to competition with adjacent tree; some dieback.
040	Black Walnut	*Juglans nigra*	Native	1	25.5					4.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Asymmetrical crown due to competition with adjacent tree; some dieback.
041	Black Walnut	*Juglans nigra*	Native	2	11.5	10				2.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Asymmetrical crown due to competition with adjacent tree; stem wound with evidence of decay; some dieback.
042	Manitoba Maple	*Acer negundo*	Native	1	35					4.0	Possible	Poor	E Hedgerow	Remove	Site Grading	No	Relatively extensive dieback throughout lower scaffold branches; vertical crack on main stem.
043	Black Walnut	*Juglans nigra*	Native	1	18.5					3.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Asymmetrical, slightly suppressed crown due to competition with adjacent tree; some dieback.
044	Black Walnut	*Juglans nigra*	Native	1	21					3.0	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Dead branch from adjacent maple laying in branch union; crown relatively vigorous.
045	Manitoba Maple	*Acer negundo*	Native	2	44	41.5				6.0	Possible	Poor	E Hedgerow	Remove	Site Grading	No	Extensive decay between stem unions; history of branch failure; crown dieback.
046	Manitoba Maple	*Acer negundo*	Native	2	52	48				6.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Some history of branch failure; 1 small cavity with decay; crown dieback.
047	Black Locust	*Robinia pseudoacacia*	Non-native	1	86					4.0	Possible	Fair	E Hedgerow	Remove	Site Grading	2:1	Likely on verge of poor as decay between 2 upper stems and fruiting bodies on 1 large upper scaffold; woodpecker damage; history of branch failure; large wire wrapped around main stem.
048	Black Locust	*Robinia pseudoacacia*	Non-native	2	42	30.5				5.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Response growth from old prune cuts; some dieback.
049	Trembling Aspen	*Populus tremuloides*	Native	1	23					3.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Asymmetrical crown due to competition with adjacent tree; minor epicormic growth.
050	Trembling Aspen	*Populus tremuloides*	Native	1	21					4.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Asymmetrical crown due to competition with adjacent tree; epicormic growth out of old branch stump.
051	Trembling Aspen	*Populus tremuloides*	Native	1	35					3.0	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Minor crown competition with adjacent trees; crown otherwise vigorous.
052	Trembling Aspen	*Populus tremuloides*	Native	1	23					3.0	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Asymmetrical crown due to competition with adjacent tree; otherwise relatively healthy.
053	Black Locust	*Robinia pseudoacacia*	Non-native	1	16.5					1.5	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Full, vigorous crown.
054	Black Locust	*Robinia pseudoacacia*	Non-native	2	22	18				3.0	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Minor crown competition with minimal dieback.
055	Black Locust	*Robinia pseudoacacia*	Non-native	1	19.5					3.0	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Asymmetrical crown due to competition with adjacent tree; crown otherwise vigorous with solid main stem.
056	Black Walnut	*Juglans nigra*	Native	1	15.5					3.0	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Relatively vigorous crown with minor competition with riverbank grape.
057	Black Walnut	*Juglans nigra*	Native	1	11					2.0	Improbable	Good	E Hedgerow	Remove	Site Grading	2:1	Relatively vigorous crown; some competition with riverbank grape.
058	Black Walnut	*Juglans nigra*	Native	2	42	12.5				5.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Response growth in upper crown; minor canker; vigorous crown.
1601	Common Pear	*Pyrus communis*	Non-native	6	27	26	25	16.5	16	4.0	Possible	Poor	NW Hedgerow	Retain / Prune			Epicormic growth; extensive crown dieback; draped in riverbank grape.
1602	Black Cherry	*Prunus serotina*	Native	1	64					2.5	Possible	Poor	NW Hedgerow - Off property	ove / Confirm Ol	Site Grading / Safety	No	Large scaffold dieback; decay at root flare; draped in riverbank grape.
1604	Common Apple	*Malus pumila*	Non-native	3	52	40.5	40			6.0	Possible	Fair	NW Hedgerow - boundary tree	Remove	Site Grading	2:1	Decay in branches and main stem; epicormic growth; history of branch failure; some dieback.
1606	American Elm	*Ulmus americana*	Native	1	31					5.0	Improbable	Good	NW Hedgerow	Remove	Site Grading	2:1	Slightly asymmetrical crown due to competition with adjacent tree; crown otherwise vigorous.
1607	Sweet Cherry	*Prunus avium*	Non-native	1	27.5					3.0	Possible	Poor	NW Hedgerow - boundary tree	Remove	Site Grading / Safety	No	Asymmetrical, suppressed crown with relatively extensive dieback.
1608	Black Cherry	*Prunus serotina*	Native	1	27.5					5.0	Possible	Poor	NW Hedgerow - Off property	nove / Retain St	Site Grading / Safety	No	Evidence of minor decay at root flare; history of branch failure; some dieback throughout.
1609	Sweet Cherry	*Prunus avium*	Non-native	1	20					2.0	Improbable	Fair	NW Hedgerow - Off property	Retain			Minor gumosis; lower scaffold dieback.

556, 560 & 576 Conservation Drive Tree Protection Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	DBH 4 (cm)	DBH 5 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
1610	Sweet Cherry	*Prunus avium*	Non-native	1	36					4.0	Improbable	Fair	NW Hedgerow - boundary tree	Remove	Site Grading	2:1	On verge of poor; history of branch failure; asymmetrical crown due to competition with adjacent trees; lower scaffold dieback.
1611	Sugar Maple	*Acer saccharum*	Native	2	24.5	10.5				2.5	Improbable	Fair	NW Hedgerow - boundary tree	Remove	Site Grading	2:1	Irregular growth curve in lower stem that's corrected itself over time; healthy crown.
1612	White Ash	*Fraxinus americana*	Native	1	16					2.0	Possible	Poor	NW Hedgerow - boundary tree	Remove	Site Grading / Safety	No	Epicormic growth only; galleries.
1613	Common Apple	*Malus pumila*	Non-native	2	26.5	15.5				4.0	Improbable	Fair	NW Hedgerow - boundary tree	Remove	Site Grading	2:1	Epicormic growth; asymmetrical crown due to competition with adjacent trees.
1614	Common Apple	*Malus pumila*	Non-native	1	35					5.0	Improbable	Fair	NW Hedgerow - boundary tree	Remove	Site Grading	2:1	Epicormic growth; some crown dieback with minor evidence of decay.
1616	Hawthorn sp.	*Crataegus sp.*	**	1	16					4.0	Improbable	Fair	NW Hedgerow - boundary tree	Remove	Site Grading	2:1	Asymmetrical crown due to competition with adjacent trees; some riverbank grape in crown.
1617	Sweet Cherry	*Prunus avium*	Non-native	1	26					4.0	Improbable	Fair	NW Hedgerow	Remove	Site Grading	2:1	Riverbank grape in crown; minor staining.
1618	White Ash	*Fraxinus americana*	Native	1	22.5					2.5	Possible	Poor	NW Hedgerow - boundary tree	Remove	Site Grading / Safety	No	Galleries; crown dieback; competition with riverbank grape.
1619	Sweet Cherry	*Prunus avium*	Non-native	1	28					3.0	Improbable	Good	NW Hedgerow	ain / Confirm On			Relatively vigorous crown and solid main stem; tree tag swallowed.
1623	White Ash	*Fraxinus americana*	Native	1	23.5					3.0	Possible	Poor	NW Hedgerow	Retain / Prune			Epicormic growth; galleries; crown dieback; leaning towards other property.
1624	White Ash	*Fraxinus americana*	Native	1	16					2.0	Possible	Poor	NW Hedgerow - Off property	Retain / Prune			Reduced crown with dieback; galleries.
1625	White Ash	*Fraxinus americana*	Native	1	16.5					2.5	Possible	Poor	NW Hedgerow - Off property	Retain / Prune			Some crown dieback; galleries up main stem.
1627	American Elm	*Ulmus americana*	Native	1	41					5.0	Improbable	Fair	NW Hedgerow - Off property	Remove	Site Grading	2:1	Some crown dieback; competition with riverbank grape.
1628	White Ash	*Fraxinus americana*	Native	1	16					3.0	Probable	Very Poor	NW Hedgerow	Remove	Site Grading / Safety	No	Epicormic growth only; draped in riverbank grape.
1629	Manitoba Maple	*Acer negundo*	Native	5	86	72	68	52	24	8.5	Possible	Poor	NW Hedgerow	Remove	Swale/Trail Grading	No	Decay at base of main stem; crown snapped on 1 side branch; epicormic growth; history of branch failures.
1633	American Basswood	*Tilia americana*	Native	1	21					2.0	Improbable	Fair	NW Hedgerow - Off property	Retain			Crown competition with riverbank grape; main stem in good condition.
1635	Manitoba Maple	*Acer negundo*	Native	1	43					4.0	Improbable	Fair	NW Hedgerow - Off property	Retain			Slightly unbalanced crown with riverbank grape throughout; epicormic growth; tag partially swallowed by tree.
1638	Hawthorn sp.	*Crataegus sp.*	**	3	26	25	20.5			3.0	Improbable	Fair	NW Hedgerow - Off property	Remove	Swale Grading	2:1	Largest stem dead; crown competition with riverbank grape; fence through 1 stem.
1639	Manitoba Maple	*Acer negundo*	Native	1	24.5					3.0	Improbable	Fair	NW Hedgerow - Off property	Remove	Swale Grading	2:1	A few wounds with compartmentalization; riverbank grape and some wild cucumber in crown.
1640	Snag		**	1	27					0.0	Possible	Dead	NW Hedgerow - Off property	Retain			
1641	White Ash	*Fraxinus americana*	Native	1	11					2.0	Probable	Very Poor	NW Hedgerow - boundary tree	Remove	Site Grading	No	Epicormic growth only; draped in riverbank grape; galleries.
1642	White Ash	*Fraxinus americana*	Native	1	16					2.5	Improbable	Fair	NW Hedgerow - Off property	Retain			Minor crown dieback; lower scaffold competition with riverbank grape.
1643	White Ash	*Fraxinus americana*	Native	1	11.5					1.0	Possible	Poor	NW Hedgerow - Off property	Retain			Dead tree leaning on main stem; galleries; crown dieback.
1644	White Ash	*Fraxinus americana*	Native	1	21					2.0	Possible	Poor	NW Hedgerow - boundary tree	Remove	Site Grading	No	Asymmetrical, reduced crown with dieback and competition with riverbank grape; galleries.
1645	Black Cherry	*Prunus serotina*	Native	2	20.5	17				4.0	Improbable	Fair	NW Hedgerow	Remove	Site Grading	2:1	Asymmetrical crown; some crown competition with riverbank grape; decay in side branch that's parallel to ground.
1646	American Elm	*Ulmus americana*	Native	1	28					3.0	Improbable	Fair	NW Hedgerow - Off property	Retain			Minor loose bark on 1 small area of main stem; crown competition with riverbank grape; tree tag swallowed.
1647	American Elm	*Ulmus americana*	Native	1	21					0.0	Possible	Dead	NW Hedgerow	Remove	Site Grading	No	Crown snapped off.
1648	American Elm	*Ulmus americana*	Native	1	29.5					4.0	Improbable	Fair	NW Hedgerow - Off property	Retain			Relatively vigorous crown; however competition with riverbank grape; stem still solid.
No tag	Manitoba Maple	*Acer negundo*	Native	3	19	14.5	14			4.0	Improbable	Fair	NW Hedgerow - Off property	Retain			1 stem snapped; remaining 2 stems in good condition; compartmentalization. Tree located off property with crown approximately at the property line.

556, 560 & 576 Conservation Drive Tree Protection Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	DBH 4 (cm)	DBH 5 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
No tag	Butternut Hybrid	*Juglans cinerea x J. ailantifolia*	Non-native	1	35.5					6.0	Improbable	Fair	E Hedgerow	Remove	Site Grading	2:1	Asymmetrical crown due to competition with adjacent tree; solid main stem with only 2 sooty canker present and no open canker at time of assessment; self corrected root flare. Sample submitted to lab November 20, 2024 and confirmed to be Hybrid December 5, 2024.

Appendix II

Tree Health and Potential for Structural Failure Assessment Criteria

Tree Health Assessment Criteria

Assessment Criteria	Definition[1]
Excellent	Represents a tree in near perfect form, health, and vigour. This tree would exhibit no deadwood, no decline, and no visible defects.
Good	Represents a tree ranging from a generally healthy tree to a near perfect tree in terms of health, vigour and structure. This tree exhibits a complete, balanced crown structure with little to no deadwood and minimal defects as well as a properly formed root flare.
Fair	Represents a tree with minor health, balance or structural issues with minimal to moderate deadwood. Branching structure shows signs of included bark or minor rot within the branch connections or trunk wood. The root flare shows minimal signs of mechanical injury, decay, poor callusing, or girdling roots. Trees in the category require minor remedial actions to improve the vigour and structure of the tree.
Poor	Represents a tree that exhibits a poor vigour, reduced crown size (<30% of crown typical of species caused by overcrowding or decline), extreme crown imbalance, or extensive rot in the branching and trunk wood. Fungus could be seen from these rotting areas, suggesting further decay. These trees have extensive crown die back with a large amount of deadwood, and possibly dead sections. These weakened areas can lead to a potential failure of tree sections. Rooting zones show signs of extensive root decay or damage (fruiting bodies or mechanical damage) or girdling roots. Trees in this category require more extensive actions to prevent failure. A tree identified as poor would be a candidate for removal in the near future.
Very Poor	Represents a tree that exhibits major health and structural defects. Quite often the defects or diseases affecting this tree will be fatal. Large quantities of fungus, large dead sections with possible cavities and bark falling off all are signs that a tree is in a major state of decline and would be identified as very poor. These trees have a probable or imminent potential for structural failure. These trees should be identified for removal.
Dead	Represents a tree that exhibits no sign of new growth, including buds, foliage, or shoot growth. These trees have a probable or imminent potential for structural failure. These trees should be identified for removal.

[1] (Dunster 2009)

Potential for Structural Failure Assessment Criteria

Assessment Criteria*	Definition[1]
Improbable	The tree or branch is not likely to fail during normal weather conditions and may not fail in many severe weather conditions within the specified time frame.
Possible	Failure could occur, but it is unlikely during normal weather conditions within the specified time frame.
Probable	Failure may be expected under normal weather conditions within the specified time frame.
Imminent	Failure has started or is most likely to occur in the near future, even if there is no significant wind or increased load. This is a rare occurrence for an assessor to encounter, and it may require immediate action to protect people from harm.
*A specified time frame of 1 year will be used when assessing potential for structural failure.	

[1] (Dunster et al. 2013)

Appendix III
Conditions of Tree Assessment

Conditions of Tree Assessment

Limitations

This tree inventory and assessment is based on the circumstances and observations by Natural Resource Solutions Inc. (NRSI) as they existed at the time of the site inspection(s) of the 556, 560 & 576 Conservation Drive, Waterloo property as described in this report (the "Property") and the trees situated thereon, and upon information provided by the Client to NRSI. The opinions in this assessment are given based on observations made and using generally accepted professional judgment, 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 at the date any such observations and analysis took place. No guarantee, warranty, representation or opinion is offered or made by NRSI 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 at the date of site inspection(s), and the analysis and recommendations made in relation to the proposed undertaking. It is recommended that the inventoried trees discussed in this assessment should be re-assessed periodically, where required (i.e., after 2 years).

Further Services

Neither NRSI, nor any assessor employed or retained by NRSI (the "Assessor") for the purpose of preparing or assisting in the preparation of this assessment shall be required to provide any further consultation or services to the Client including, without limitation, acting as an expert witness or witness in any court in any jurisdiction unless the Client has first made specific arrangements with respect to such further services, including providing payment of the Assessor's regular hourly billing fees.

NRSI accepts no responsibility for the implementation of all or any part of this report, unless specifically requested to examine the implementation of such activities recommended herein. Any request for the inspection or supervision of all or part of the implementation shall be made in writing and the details agreed to in writing by both parties.

Assumptions

The Client is hereby notified that where any of the information set out and referenced in this assessment are based on assumptions, facts or information provided to NRSI, NRSI will in no way be responsible for the veracity or accuracy of any such information. Further, the Client acknowledges and agrees that NRSI has, for the purposes of preparing their assessment, assumed that the Property is in full compliance with all applicable federal, provincial, municipal and local statutes, regulations, by-laws, guidelines and other related laws. NRSI explicitly denies any legal liability for any and all issues with respect to non-compliance with any of the above-referenced statutes, regulations, by-laws, guidelines and laws as it may pertain to or affect the Property.

Restriction of Assessment

The assessment carried out was restricted to the areas as described in this report. NRSI is not legally liable for any other trees except those expressly discussed herein. The conclusions of this assessment do not apply to any areas, trees, or any other property not covered or referenced in this assessment.

Professional Responsibility

In carrying out this assessment, NRSI and any Assessor appointed for and on behalf of NRSI to perform and carry out the assessment has exercised a reasonable standard of care, skill and diligence. 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, discolored foliage (during the leaf-on period), 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 property and people. Except where specifically noted in the assessment, none of the trees examined on the property were dissected, cored, probed, or climbed, and detailed root crown examinations involving excavation were not undertaken.

No guarantees are offered, or implied, that trees recommended for retention, 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 property and persons in the event of extreme weather conditions, and this risk can only be eliminated if the tree is removed.

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

a) Any legal description provided with respect to the Property;

b) Issues of title and/or ownership with respect to the Property;

c) The accuracy of the Property line locations or boundaries with respect to the Property; and

d) The accuracy of any other information provided to NRSI 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.

Third Party Liability

This assessment was prepared by NRSI for the Client. The data collected reflect NRSI's best assessment of the inventoried trees situated on the Property with the information available at the time of observation. Data analysis and the assessment of potential impacts to inventoried trees is specific to the proposed undertaking as described in this report. NRSI accepts no responsibility for any damages or loss suffered by any third party or by the Client as a result of decisions made or actions based upon the use of this assessment for purposes unrelated to the proposed undertaking.

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.

This report shall be considered as a whole, no sections are severable, and the assessment shall be considered incomplete if any pages are missing.

Appendix IV
Tree Data and Summary Tables

Summary of Inventoried Trees

Common Name	Scientific Name	Good	Fair	Poor	Very Poor	Dead	Total
Native Species							
American Basswood	*Tilia americana*		1				1
American Elm	*Ulmus americana*	1	5			1	7
Black Cherry	*Prunus serotina*		1	2			3
Black Walnut	*Juglans nigra*	8	11	1			20
Common Hackberry	*Celtis occidentalis*		1				1
Manitoba Maple	*Acer negundo*	1	6	3			10
Sugar Maple	*Acer saccharum*		1				1
Trembling Aspen	*Populus tremuloides*	2	7	2		1	12
White Ash	*Fraxinus americana*		4	8	3		15
Total		**12**	**37**	**16**	**3**	**2**	**70**
Non-Native Species							
Black Locust	*Robinia pseudoacacia*	3	2				5
Butternut Hybrid	*Juglans cinerea x J. ailantifolia*		1				1
Common Apple	*Malus pumila*		3				3
Common Pear	*Pyrus communis*			2			2
Sweet Cherry	*Prunus avium*	2	5	1			8
Total		**5**	**11**	**3**	**0**	**0**	**19**
Hawthorn sp.	*Crataegus* sp.		3	2			5
Snag	n/a					1	1
Total		**0**	**3**	**2**	**0**	**1**	**6**
Overall Total		**17**	**51**	**21**	**3**	**3**	**95**

Overall Health of Trees Inventoried

Potential for Structural Failure Rating	Overall Condition					Total
	Good	Fair	Poor	Very Poor	Dead	
Improbable	17	49	1			**67**
Possible		2	20		2	**24**
Probable				3	1	**4**
Imminent						**0**
Total	**17**	**51**	**21**	**3**	**3**	**95**

Maps

Map 1

556, 560 & 576 Conservation Dr, Waterloo

Study Area and Natural Features



Legend

- Subject Property
- ESPA #80 (Region of Waterloo, 2015)
- Natural Heritage System (from NWSSS 2013, Updated 2016)
- Permanent Watercourse
- Provincially Significant Wetland (PSW)
- Other Wetland (Non-PSW)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

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Imagery: First BaseSolutions Inc. (2022).

Project: 1506 Date: December 5, 2024	NAD83 - UTM Zone 17 Size: 11x17" **1:4,000**

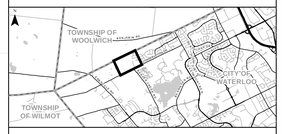
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Map 2

556, 560 & 576 Conservation Dr, Waterloo

Tree Inventory & Preservation Plan



Retaining wall to act as permanent turtle barrier fencing

Permission from neighbouring property owner required prior to the removal or injury of any off property/boundary trees due to grading for the site, trail and swale. Ownership to be confirmed by land survey.

Permanent Turtle barrier fence along Conservation Drive responsibility of the City of Waterloo. Fencing to be coordinated with development lands

Conservation Drive

Legend

- Subject Properties
- Tree to be Retained (Crown to Scale)
- Tree to be Retained / Confirm On-Site (Crown to Scale)
- Tree to be Retained / Pruned (Crown to Scale)
- Tree to be Removed (Crown to Scale)
- Tree to be Removed / Confirm On-Site (Crown to Scale)
- Tree to be Removed / Retain Stump (Crown to Scale)
- Proposed Site Plan
- Proposed Grading
- Proposed Services
- Proposed Retaining Wall
- Contour (0.5m)
- Permanent Watercourse
- Intermittent Watercourse
- Floodline
- Woodland Dripline Boundary, Surveyed (NRSI May 2016)
- Wetland Boundary, Surveyed (MNRF & GRCA Confirmed September 2015)
- Wetland Boundary, Surveyed (GRCA Confirmed November 2015)
- Wetland Boundary, Surveyed (NWSS, Ecoplans et al. 2013)
- Tree Protection Signage

Prior To / During Construction Fence

- TPF / Heavy-Duty ESC and Turtle Barrier Fencing
- ESC Fencing

Post Construction Fence

- Permanent Turtle Barrier Fencing
- Future Turtle Barrier Fencing (City of Waterloo)
- Chainlink Fence

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

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Project: 1506
Date: December 5, 2024

NAD83 - UTM Zone 17
Size: 24x36"
1:950

0 10 20 30 40 50 60 Meters

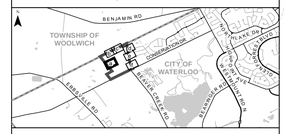
N

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Species at Risk (SAR) Bat Habitat
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4. Any vegetation removal that has the potential to impact SAR bat habitat requires prior correspondence with the Ministry of Environment, Conservation and Parks (MECP).

Map 2a

556, 560 & 576 Conservation Dr, Waterloo
Tree Inventory & Preservation Plan



Legend
- Subject Properties
- Tree to be Retained (Crown to Scale)
- Tree to be Retained / Confirm On-Site (Crown to Scale)
- Tree to be Retained / Pruned (Crown to Scale)
- Tree to be Removed (Crown to Scale)
- Tree to be Removed / Confirm On-Site (Crown to Scale)
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- Tree Protection Signage

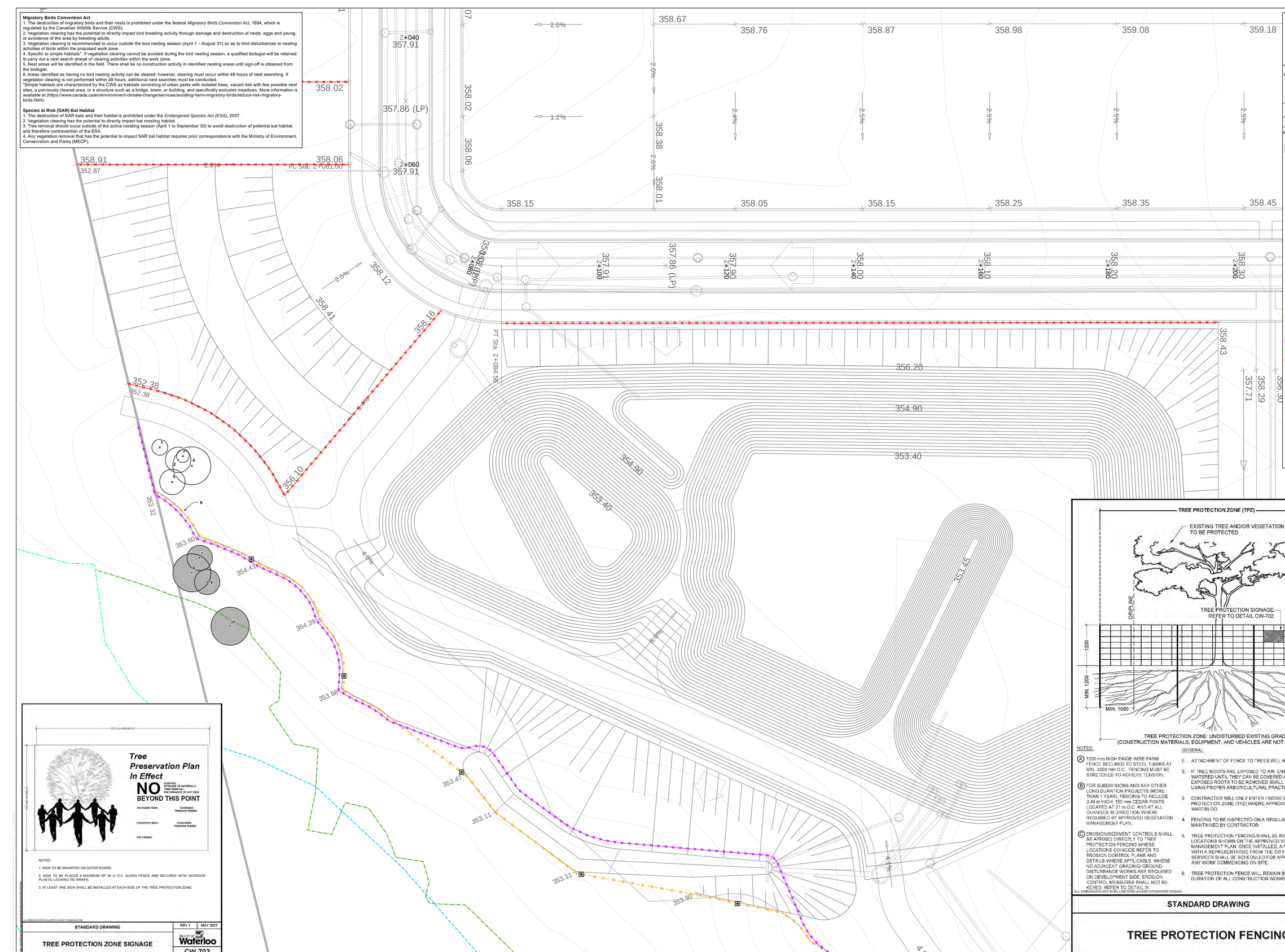
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Project: 1506
Date: December 5, 2024
NAD83 - UTM Zone 17
Size: 24x36"
1:250
0 2 4 6 8 10 12 14 16 Meters



TREE PROTECTION ZONE (TPZ)

NOTES:

(A) 1200 mm HIGH PAIGE WIRE FARM FENCE SECURED TO STEEL T-BARS AT MIN. 3000 mm O.C. FENCING MUST BE STRETCHED TO ACHIEVE TENSION.

(B) FOR SUBDIVISIONS AND ANY OTHER LONG DURATION PROJECTS (MORE THAN 1 YEAR), FENCING TO INCLUDE 2.44 m HIGH, 150 mm CEDAR POSTS LOCATED AT 21 m O.C. AND AT ALL CHANGES IN DIRECTION WHERE REQUIRED BY APPROVED VEGETATION MANAGEMENT PLAN.

(C) EROSION/SEDIMENT CONTROLS SHALL BE AFFIXED DIRECTLY TO TREE PROTECTION FENCING WHERE LOCATIONS COINCIDE REFER TO EROSION CONTROL PLANS AND DETAILS WHERE APPLICABLE. WHERE NO ADJACENT GRADING/ GROUND DISTURBANCE WORKS ARE REQUIRED ON DEVELOPMENT SIDE, EROSION CONTROL MEASURES SHALL NOT BE KEYED. REFER TO DETAIL 'A'.

GENERAL:

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2. IF TREE ROOTS ARE EXPOSED TO AIR, ENSURE ROOTS ARE WATERED UNTIL THEY CAN BE COVERED AGAIN. ANY EXPOSED ROOTS TO BE REMOVED SHALL BE HAND PRUNED USING PROPER ARBORICULTURAL PRACTICES.
3. CONTRACTOR WILL ONLY ENTER / WORK WITHIN THE TREE PROTECTION ZONE (TPZ) WHERE APPROVED BY THE CITY OF WATERLOO.
4. FENCING TO BE INSPECTED ON A REGULAR BASIS AND MAINTAINED BY CONTRACTOR.
5. TREE PROTECTION FENCING SHALL BE INSTALLED PER THE LOCATIONS SHOWN ON THE APPROVED VEGETATION MANAGEMENT PLAN. ONCE INSTALLED, A SITE INSPECTION WITH A REPRESENTATIVE FROM THE CITY'S ENGINEERING SERVICES SHALL BE SCHEDULED FOR APPROVALS PRIOR TO ANY WORK COMMENCING ON SITE.
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TABLE 1.0
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TRUNK DIAMETER (DBH AT 1.4m)	MINIMUM PROTECTION DISTANCES REQUIRED
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NOTE:
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ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

STANDARD DRAWING	REV 1	MAY 2023
TREE PROTECTION FENCING	THE CITY OF Waterloo	CW-701

Tree Preservation Plan In Effect

NO CLEARING, STORAGE OF MATERIALS, TREE REMOVAL, DISTURBANCE OF ANY KIND **BEYOND THIS POINT**

Developers Name: Developers Telephone Number:
Consultants Name: Consultants Telephone Number:
City Contact:

NOTES:
1. SIGN TO BE MOUNTED ON GATOR BOARD.
2. SIGN TO BE PLACED A MAXIMUM OF 30 m O.C. ALONG FENCE AND SECURED WITH OUTDOOR PLASTIC LOCKING TIE-WRAPS.
3. AT LEAST ONE SIGN SHALL BE INSTALLED AT EACH SIDE OF THE TREE PROTECTION ZONE.

STANDARD DRAWING	REV 1	MAY 2023
TREE PROTECTION ZONE SIGNAGE	THE CITY OF Waterloo	CW-702

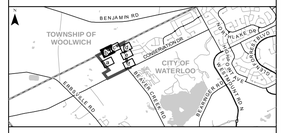
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Map 2b

556, 560 & 576 Conservation Dr, Waterloo

Tree Inventory & Preservation Plan



Legend

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- Proposed Grading
- Proposed Services
- Proposed Retaining Wall
- Contour (0.5m)
- Tree Protection Signage

Prior To / During Construction Fence
- TPF / Heavy-Duty ESC and Turtle Barrier Fencing
- ESC Fencing

Post Construction Fence
- Permanent Turtle Barrier Fencing
- Future Turtle Barrier Fencing (City of Waterloo)
- Chainlink Fence

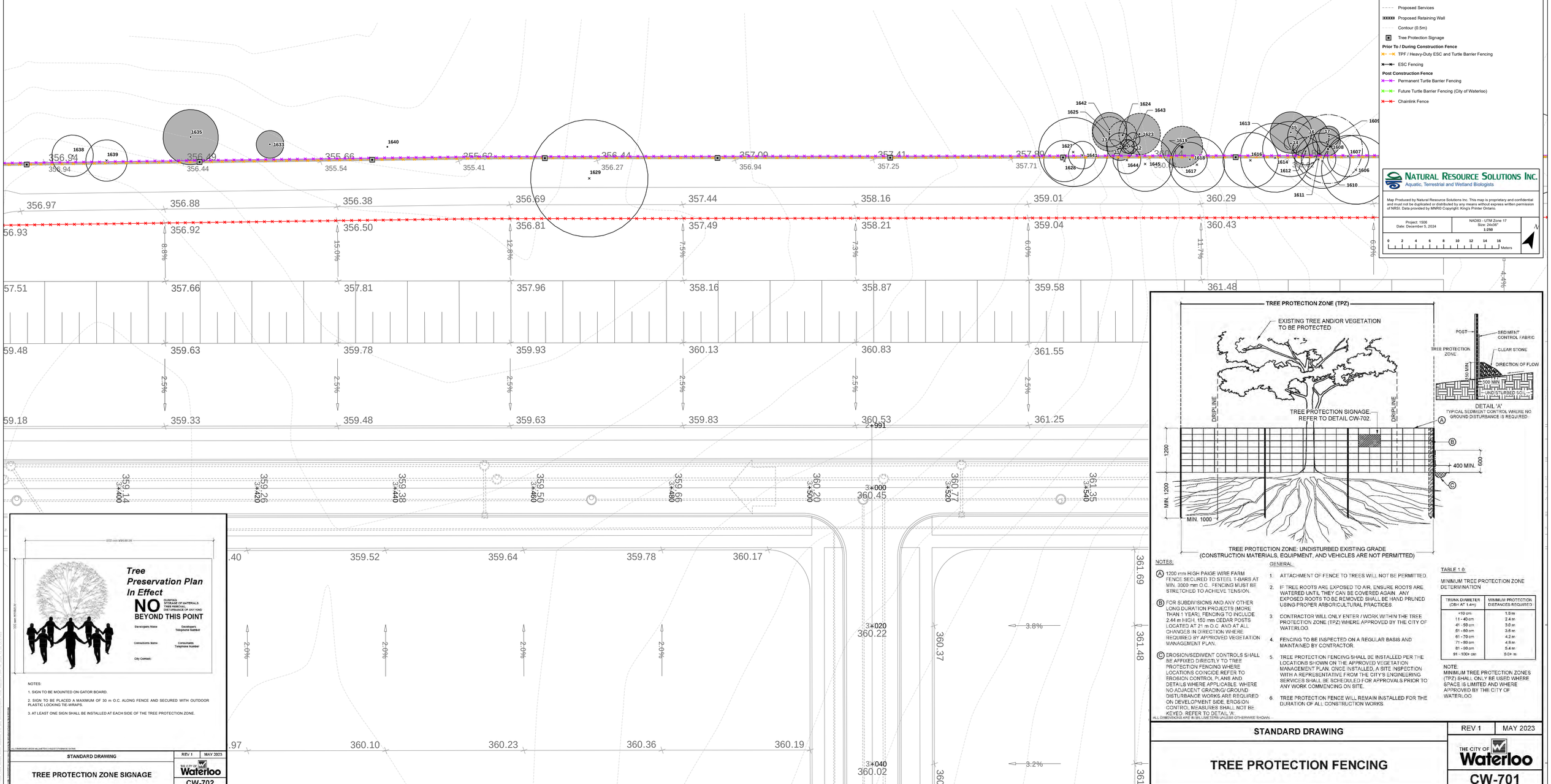
NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

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Project: 1506
Date: December 5, 2024

NAD83 - UTM Zone 17
Size: 24x36"
1:250

0 2 4 6 8 10 12 14 16 Meters



NOTES:
1. SIGN TO BE MOUNTED ON GATOR BOARD.
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3. AT LEAST ONE SIGN SHALL BE INSTALLED AT EACH SIDE OF THE TREE PROTECTION ZONE.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

STANDARD DRAWING	REV 1	MAY 2023
TREE PROTECTION ZONE SIGNAGE	THE CITY OF Waterloo	CW-702

NOTES:

(A) 1200 mm HIGH PAIGE WIRE FARM FENCE SECURED TO STEEL T-BARS AT MIN. 3000 mm O.C.. FENCING MUST BE STRETCHED TO ACHIEVE TENSION.

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STANDARD DRAWING	REV 1	MAY 2023
TREE PROTECTION FENCING	THE CITY OF Waterloo	CW-701

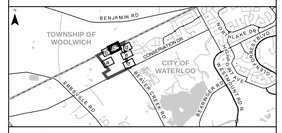
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Map 2c

556, 560 & 576 Conservation Dr, Waterloo

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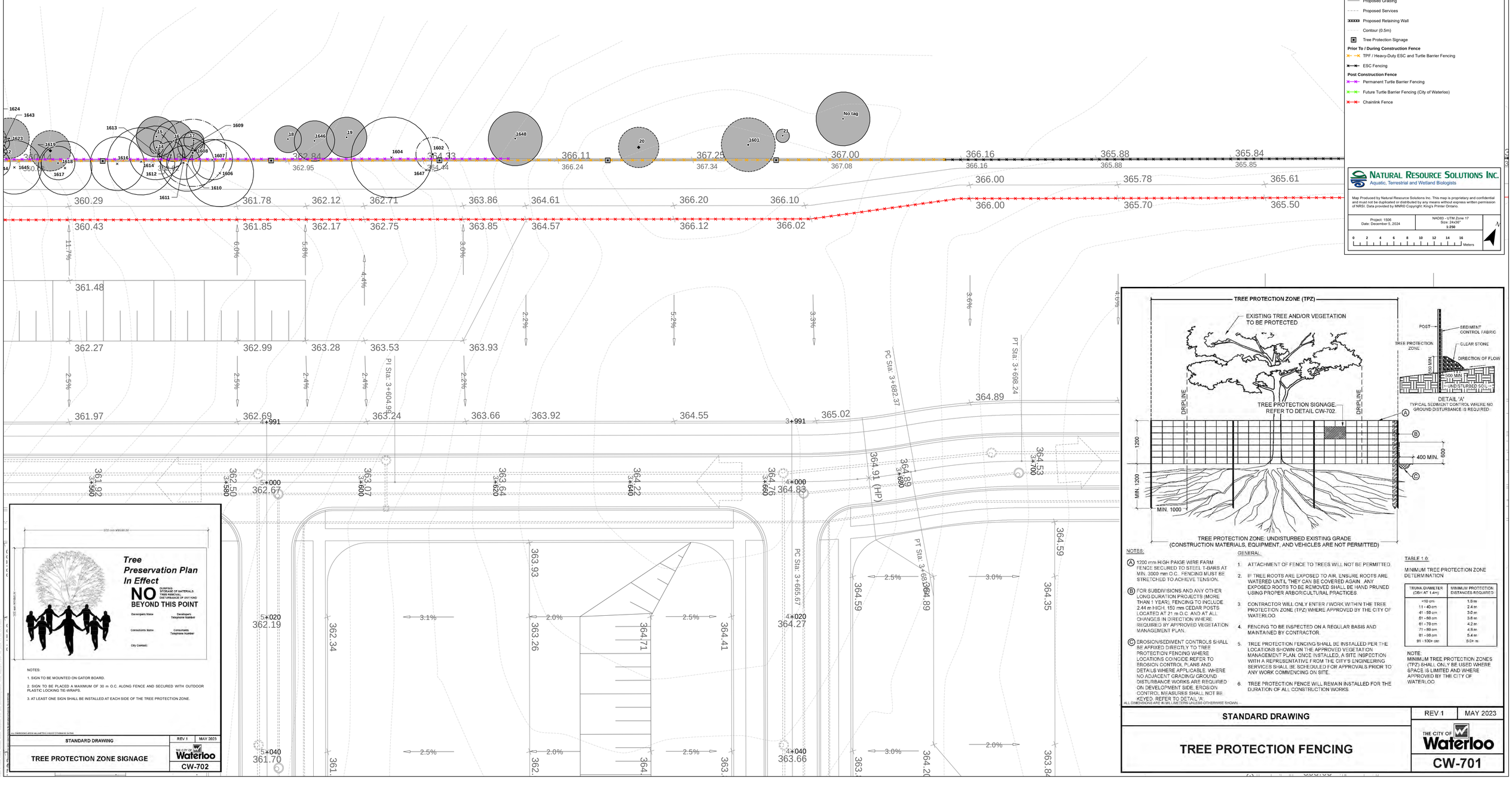
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Project: 1506
Date: December 5, 2024
NAD83 - UTM Zone 17
Size: 24x36"
1:250
0 2 4 6 8 10 12 14 16 Meters



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STANDARD DRAWING	REV 1	MAY 2023
TREE PROTECTION ZONE SIGNAGE	THE CITY OF Waterloo	CW-702

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STANDARD DRAWING	REV 1	MAY 2023
TREE PROTECTION FENCING	THE CITY OF Waterloo	CW-701

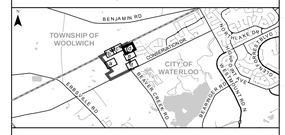
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Map 2d

556, 560 & 576 Conservation Dr, Waterloo

Tree Inventory & Preservation Plan

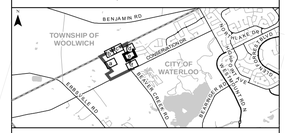

BENJAMIN RD
TOWNSHIP OF WOOLWICH
CONSERVATION DR
CITY OF WATERLOO
ERBSVILLE RD
ERBSVILLE RD
WESTMOUNT RD N
WESTMOUNT RD N
ALLEN DR
ALLEN DR
ALLEN DR

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- Tree to be Removed / Confirm On-Site (Crown to Scale)
- Tree to be Removed / Retain Stump (Crown to Scale)
- Proposed Site Plan
- Proposed Grading
- Proposed Services
- Proposed Retaining Wall
- Contour (0.5m)
- Tree Protection Signage

Prior To / During Construction Fence
- TPF / Heavy-Duty ESC and Turtle Barrier Fencing
- ESC Fencing

Post Construction Fence
- Permanent Turtle Barrier Fencing
- Future Turtle Barrier Fencing (City of Waterloo)
- Chainlink Fence

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

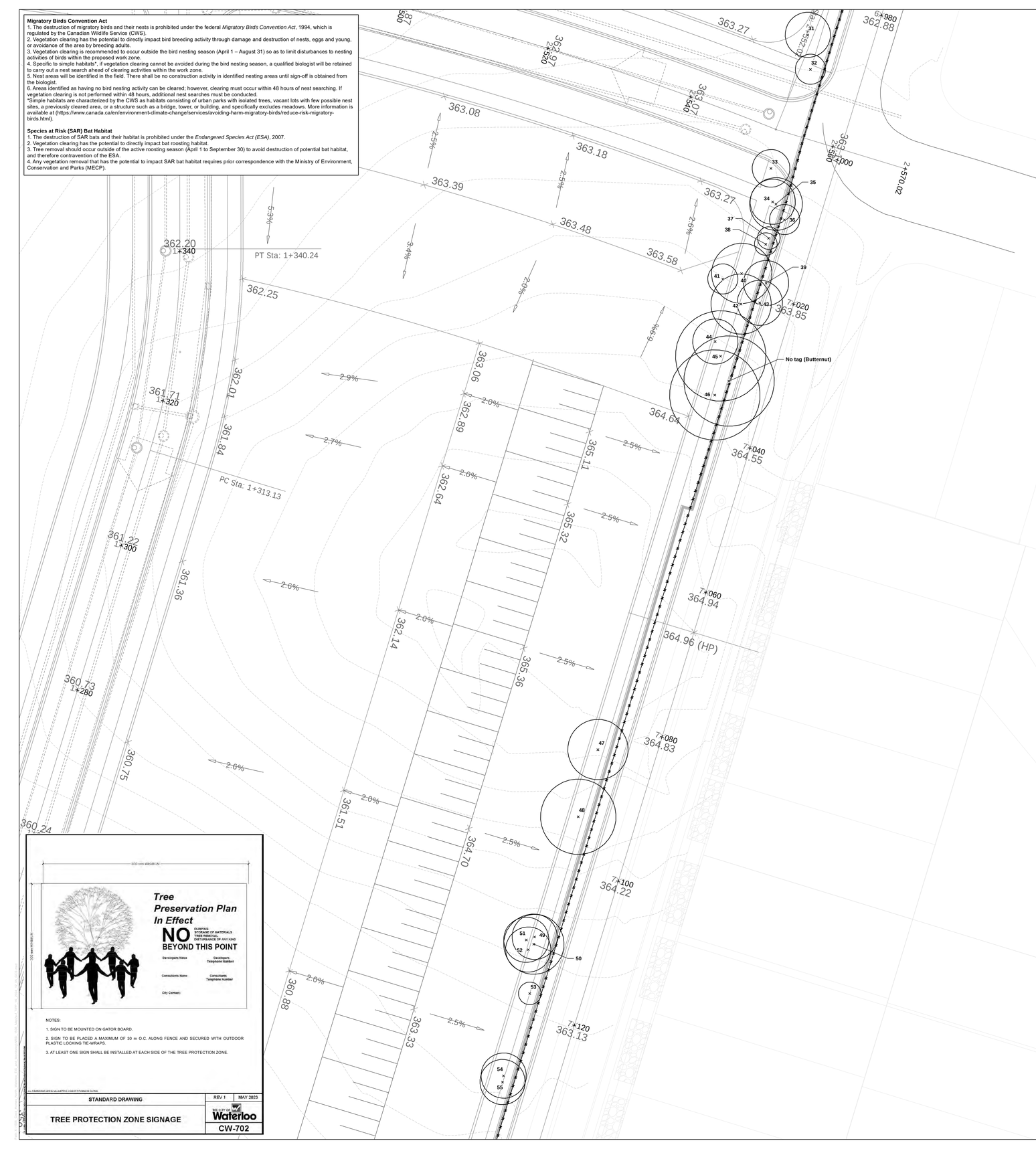
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Project: 1506
Date: December 5, 2024

NAD83 - UTM Zone 17
Size: 24x36"
1:250

0 2 4 6 8 10 12 14 16 Meters

N



NOTES:
1. SIGN TO BE MOUNTED ON GATOR BOARD.
2. SIGN TO BE PLACED A MAXIMUM OF 30 m O.C. ALONG FENCE AND SECURED WITH OUTDOOR PLASTIC LOCKING TIE-WRAPS.
3. AT LEAST ONE SIGN SHALL BE INSTALLED AT EACH SIDE OF THE TREE PROTECTION ZONE.

STANDARD DRAWING	REV 1	MAY 2023
TREE PROTECTION ZONE SIGNAGE	THE CITY OF Waterloo	CW-702

NOTES:

(A) 1200 mm HIGH PAIGE WIRE FARM FENCE SECURED TO STEEL T-BARS AT MIN. 3000 mm O.C. FENCING MUST BE STRETCHED TO ACHIEVE TENSION.

(B) FOR SUBDIVISIONS AND ANY OTHER LONG DURATION PROJECTS (MORE THAN 1 YEAR), FENCING TO INCLUDE 2.44 m HIGH, 150 mm CEDAR POSTS LOCATED AT 21 m O.C. AND AT ALL CHANGES IN DIRECTION WHERE REQUIRED BY APPROVED VEGETATION MANAGEMENT PLAN.

(C) EROSION/SEDIMENT CONTROLS SHALL BE AFFIXED DIRECTLY TO TREE PROTECTION FENCING WHERE LOCATIONS COINCIDE.REFER TO EROSION CONTROL PLANS AND DETAILS WHERE APPLICABLE. WHERE NO ADJACENT GRADING/ GROUND DISTURBANCE WORKS ARE REQUIRED ON DEVELOPMENT SIDE, EROSION CONTROL MEASURES SHALL NOT BE KEYED. REFER TO DETAIL 'A'.

GENERAL:

1. ATTACHMENT OF FENCE TO TREES WILL NOT BE PERMITTED.
2. IF TREE ROOTS ARE EXPOSED TO AIR, ENSURE ROOTS ARE WATERED UNTIL THEY CAN BE COVERED AGAIN. ANY EXPOSED ROOTS TO BE REMOVED SHALL BE HAND PRUNED USING PROPER ARBORICULTURAL PRACTICES.
3. CONTRACTOR WILL ONLY ENTER / WORK WITHIN THE TREE PROTECTION ZONE (TPZ) WHERE APPROVED BY THE CITY OF WATERLOO.
4. FENCING TO BE INSPECTED ON A REGULAR BASIS AND MAINTAINED BY CONTRACTOR.
5. TREE PROTECTION FENCING SHALL BE INSTALLED PER THE LOCATIONS SHOWN ON THE APPROVED VEGETATION MANAGEMENT PLAN. ONCE INSTALLED, A SITE INSPECTION WITH A REPRESENTATIVE FROM THE CITY'S ENGINEERING SERVICES SHALL BE SCHEDULED FOR APPROVALS PRIOR TO ANY WORK COMMENCING ON SITE.
6. TREE PROTECTION FENCE WILL REMAIN INSTALLED FOR THE DURATION OF ALL CONSTRUCTION WORKS

TABLE 1.0

MINIMUM TREE PROTECTION ZONE DETERMINATION

TRUNK DIAMETER (DBH AT 1.4m)	MINIMUM PROTECTION DISTANCES REQUIRED
<10 cm	1.8 m
11 - 40 cm	2.4 m
41 - 50 cm	3.0 m
51 - 60 cm	3.6 m
61 - 70 cm	4.2 m
71 - 80 cm	4.8 m
81 - 90 cm	5.4 m
91 - 100+ cm	9.0+ m

NOTE:
MINIMUM TREE PROTECTION ZONES (TPZ) SHALL ONLY BE USED WHERE SPACE IS LIMITED AND WHERE APPROVED BY THE CITY OF WATERLOO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

STANDARD DRAWING	REV 1	MAY 2023
TREE PROTECTION FENCING	THE CITY OF Waterloo	CW-701

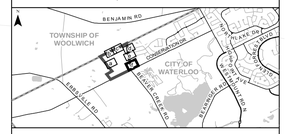
Migratory Birds Convention Act
1. The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act*, 1994, which is regulated by the Canadian Wildlife Service (CWS).
2. Vegetation clearing has the potential to directly impact bird breeding activity through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults.
3. Vegetation clearing is recommended to occur outside the bird nesting season (April 1 – August 31) so as to limit disturbances to nesting activities of birds within the proposed work zone.
4. Specific to simple habitats*, if vegetation clearing cannot be avoided during the bird nesting season, a qualified biologist will be retained to carry out a nest search ahead of clearing activities within the work zone.
5. Nest areas will be identified in the field. There shall be no construction activity in identified nesting areas until sign-off is obtained from the biologist.
6. Areas identified as having no bird nesting activity can be cleared; however, clearing must occur within 48 hours of nest searching. If vegetation clearing is not performed within 48 hours, additional nest searches must be conducted.
*Simple habitats are characterized by the CWS as habitats consisting of urban parks with isolated trees, vacant lots with few possible nest sites, a previously cleared area, or a structure such as a bridge, tower, or building, and specifically excludes meadows. More information is available at (https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html).

Species at Risk (SAR) Bat Habitat
1. The destruction of SAR bats and their habitat is prohibited under the *Endangered Species Act (ESA)*, 2007.
2. Vegetation clearing has the potential to directly impact bat roosting habitat.
3. Tree removal should occur outside of the active roosting season (April 1 to September 30) to avoid destruction of potential bat habitat, and therefore contravention of the ESA.
4. Any vegetation removal that has the potential to impact SAR bat habitat requires prior correspondence with the Ministry of Environment, Conservation and Parks (MECP).

Map 2f

556, 560 & 576 Conservation Dr, Waterloo

Tree Inventory & Preservation Plan


BENJAMIN RD
TOWNSHIP OF WOOLWICH
CONSERVATION DR
CITY OF WATERLOO
ERBSVILLE RD
ERBSVILLE RD
ALLEN DR
ALLEN DR
ALLEN DR