URBAN TREE CANOPY PLAN

2024

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Introduction

The Urban Tree Canopy Plan (UTCP) provides the Town of Saugeen Shores with an Urban Tree Canopy management strategy that builds on the recommendations from the 2016 Urban Forestry Management and Operational Plan prepared by Kilgour and Associates. The UTCP will reflect the Town's vision, values, and corporate priorities. The Urban Tree Canopy Plan will be an important document that guides staff and residents in providing a healthy urban tree population that provides aesthetic, environmental, ecological and economic benefits to the Town of Saugeen Shores.

Tree Canopy is defined as the layer of tree leaves, branches and stems that cover the ground when viewed from above. This Plan applies to the Towns Urban Settlement Area or all area contained within the red boundary as shown in Figure 1. Together they function as the Urban Tree Canopy Plan and will provide guidance on canopy management strategies over the next ten (10) years with a reassessment planned for 2035.

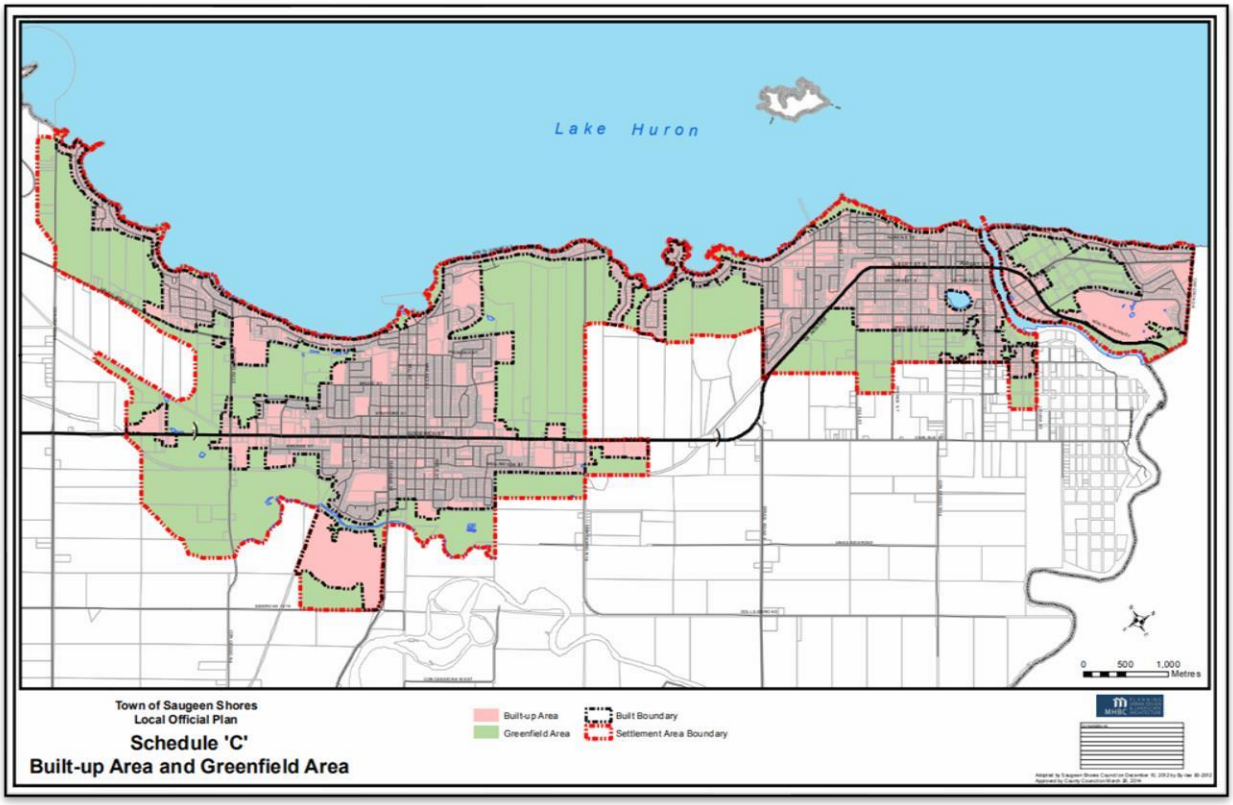


Figure 1 - Schedule 'C' Built-up Area and Greenfield Area of the Towns Official Plan

Executive Summary

This Urban Tree Canopy Plan (UTCP) builds on the recommendations from Saugeen Shores 2016 Urban Tree Canopy Plan (UTCP) and recommendations from the Environmental Stewardship Ad-hoc Committee (ESAC). ESAC identified the need to develop an Urban Tree Canopy Plan and Private Tree By-law and was based on broad and significant community input and support for such a Plan and by-law. Striking Committee, in prioritizing the ESAC recommendations, specifically included the preparation of an Urban Tree Canopy Plan and By-law. Ultimately, its inclusion in the 2024 Business Plan demonstrates the importance of having a coordinated and integrated Plan and By-law.

The Plan includes a background review and is further outlined in the Urban Tree Canopy Plan Discussion Paper found in Appendix A. This review provides background on the development of the plan including the review of how existing practices, policies and regulations affect the UTC, understanding the current condition of the UTC through assessments, development of the community engagement strategy and determining what procedures and policies are needed to maintain quality canopy cover in the Town of Saugeen Shores long-term. Key policies, by-laws and legislation affecting the Town Urban Tree Canopy were reviewed in addition to the assessment of the UTC, and general condition and maintenance as further discussed throughout this Plan.

The Urban Tree Canopy Plan Discussion Paper was presented to the Environmental Ad Hoc Committee in September, 2024 and to Council in October of 2024. Councils feedback was provided and considered into the final development of the Urban Tree Canopy Plan Discussion Paper. A Final Report was also presented by the Environmental Ad Hoc Committee to council on the implementation of the Urban Tree Canopy Plan. The Final Report identified the Committees support of the Draft Urban Tree Canopy Plan and its recommendations. The Final Report did also outline additional recommendations regarding the scope of the Tree Conservation By-law as well as rationale and are addressed further in this report.

The Urban Tree Canopy Plan will guide staff and residents in providing a healthy tree population in the Built-up Area as identified in Schedule ‘C’ of the Town’s Official Plan. It is also encouraged that the canopy management strategies and guidelines outlined in the Plan be considered in the remaining rural areas of Saugeen Shores.

As a result of the background review conducted, recommendations have been made in order to achieve the vision and objectives of this Plan. Recommendations in this Plan are categorized into short, medium and long term for time frame to achieve recommendations. Short Term means recommendations which can be carried out within the next one (1) to two (2) years. Medium term means recommendations which can be carried out over the next three (3) to five (5) years. Long term means recommendations which can be carried out over the next six (6) to ten (10) years or which require on-going implementation to achieve.

Similar to that of the time frame to achieve recommendations, priority types have also been assigned to recommendations being low, medium and high. The assigned priority type been assessed based on the time frame and ability to implement the recommendation as well as the recommendations impact on preserving and increasing canopy cover in Saugeen Shores.

The Urban Tree Canopy Plan outlines the background, recommendations and resources needed to address key components that have a significant impact in maintaining and increasing tree canopy cover in Saugeen Shores, including:

- Tree Maintenance;
- Tree Planting;
- Development Review;
- Awareness and Education; and
- Urban Tree Conservation By-law.

Overall, implementation of this Plan will occur over the next ten (10) years with a reassessment planned for 2030.

Consolidated Recommendations

The following recommendations are made and further discussed in this Plan.

Recommendation	Time frame to achieve recommendation	Priority
Tree Maintenance		
Recommendation 1: Continue to perform corrective pruning on younger trees (and older trees) in Saugeen Shores, particularly in removing codominant stems on younger trees.	Ongoing	High
Recommendation 2: Replace Town-owned Manitoba maple and ash trees with native species.	Long-term	Moderate
Recommendation 3: Update the Town-owned Tree inventory to provide a database that can be updated in live time to support tree management and inclusion of trees as green infrastructure in the Town Asset Management Plan.	Short-term	High
Recommendation 4: Maintain and update, as best practices change, its tree management practices to guide tree establishment, maintenance and removal per ANSI A300 Standards.	Mid-term	Moderate
Recommendation 5: Along trails and in natural areas on Town-owned land: - Control invasive plants such as buckthorn, garlic mustard and Manitoba maple - Plant additional trees and shrubs to occupy the open areas created by invasive species control, and replace the ash trees killed by the Ash Borer. - Shade tolerant trees should be planted in the understory of areas dominated by poplar to diversify the future forest.	Long-term	Moderate
Tree Planting		
Recommendation 6: Continue to diversify the urban forest by planting less common species of trees including, for example, oaks, sycamore, and hackberry where appropriate**.**	Long-term	Moderate
Recommendation 7: Continue to develop plans including funding to plant trees on municipal properties, such as road allowances, parks, and facilities where appropriate.	Long-term	High
Recommendation 8: Develop a plan to plant and/or reforest, including consideration of planting small high-density patches (i.e. Miyawaki or micro forests) on Town-owned lands, including the closed landfill in Port Elgin.	Mid-term	Moderate

Recommendation 9: Diversify the tree age and size profile of the Annual Tree Sale.	Short-term	Moderate
Recommendation 10: Limit purchases for the Town's Annual Tree Sale program to native trees and selected non-invasive exotic species as outlined in Appendix C and guide residents to plant trees according to the specifications in Appendix B.	Short-term	Moderate
Development Review		
Recommendation 11: Revise the Development Guide to increase the number of replacement trees to be planted as the size of the tree to be removed increases.	Short-term	High
Recommendation 12: Add policy to Section 2.6 Environmental Features of the Town Official Plan that would increase the number of replacement trees to be planted as the size of the tree to be removed increases.	Short-term	Moderate
Recommendation 13: The Town should amend its Official Plan to recognize the public tree (i.e., Town-owned trees) as green infrastructure and inclusion in the Asset Management Policy as non-core, biologic assets.	Short-term	Moderate
Recommendation 14: Expand requirements for compensation of tree removals in planning documents beyond special policy areas to include all of the Settlement Area such that the ratio of planted trees to removed trees should increase with tree diameter.	Short-term	High
Recommendation 15: Align tools that are intended to ensure tree cover is maintained at each step of the development process, particularly the woodlands/heavily treed areas along the shores of Lake Huron and Saugeen River.	Short-term	Moderate
Recommendation 16: The Town should continue to confirm the qualifications for professionals who author or approve Tree Protection Plans, Tree Retention Plans and Hazard Tree Assessment reports.	Short-term	Moderate
Awareness and Education		
Recommendation 17: Engage with and support private and commercial landowners to plant trees on their properties through communications and education campaigns, logistical/technical support.	Short-term	Moderate
Recommendation 18: Consider forming a staff working group that includes representatives from all teams that are involved with the Urban Tree Canopy to harmonize planning for trees in developments/construction, planting, tending, protecting, replacing and benefitting from trees.	Long-term	Moderate
Recommendation 19: Designate a staff person as the Town Urban Forest Manager to review and coordinate urban forest management activities and staff working group that foster communication among departments, the community and Council.	Long-term	Moderate

Recommendation 20: If the Town forms a citizen-based environmental committee, consider including promotion of Town tree canopy initiatives in the Committee's mandate.	Mid-term	Moderate
By-laws		
Recommendation 21: The Town develop a Tree Conservation By-law built on the following objectives: 1. Active enforcement to protect municipal trees and plants from illegal interference. 2. On privately owned lands: a. protection at the woodlot level by focusing on stands of trees as defined by a Town policy such as woodlots and significant woodlands; and b. for individual trees on smaller lots, focus on preservation education and incentivization through expanding existing subsidized tree planting programs that address public and private lands	Short-term	High
Recommendation 22: Consider amending the Property Standards By-law (or Clean Yards By-law) to include hazardous trees in Treed Areas.	Short-term	High

Vision and Objectives

Vision

The Town of Saugeen Shores recognizes and values the environmental, social, cultural, and economic contribution of the urban tree canopy to our community. The Town will, in partnership with its residents, and businesses work to conserve and, where sensible, increase urban tree canopy coverage that is diverse, healthy and a sustained asset for future generations.

Objectives

The objectives of this Plan are the following:

1. Protect existing public trees and encourage the retention of private trees.
2. Increase the canopy cover over 10 years to help mitigate the effects of climate change through tree protection, planting, and maintenance.
3. Increase tree planting with native species that enhances biodiversity and ecological connectivity.
4. Encourage the creation of beautifully treed places for people to enjoy.
5. Increase awareness and education about the benefits of increasing urban tree canopy coverage.
6. Understand the role tree canopy plays in generating economic activity and enhance economic activity where possible.
7. Explore partnership opportunities that promote stewardship of the tree canopy.
8. Ensure good tree management practices to keep municipal trees healthy and safe.

Recommendations

Recommendations outlined in this Plan will achieve the vision and objectives of this Plan. Recommendations in this Plan are categorized into short, medium and long term. Similar to that of the time frame to achieve recommendations, priority types have also been assigned to recommendations being low, medium and high. Implementation of this Plan will occur over the next ten (10) years with a reassessment planned for 2030.

Tree Maintenance

It has been found that the Town of Saugeen Shores generally has a good tree maintenance program. A survey conducted in Saugeen Shores noted that the maintenance needs were preventative in nature. Most outstanding tree maintenance issues were related to the removal of dead trees which were either scheduled to be dealt with or were being monitored, the pruning of deadwood, crown raising and tree planting to ensure a continuous urban canopy over time.

An analysis also confirmed that while the tree inventory data is currently updated when trees are maintained or removed, it is likely that there are periods when the inventory was not updated to reflect tree maintenance, removals or planting.

Recommendations

Recommendations to improve tree maintenance in Saugeen Shores are provided below.

Recommendation 1: Continue to perform corrective pruning on younger trees (and older trees) in Saugeen Shores, particularly in removing codominant stems on younger trees.

Recommendation 2: Replace Town-owned Manitoba maple and ash trees with native species.

Recommendation 3: Update the Town-owned Tree inventory to provide a database that can be updated in live time to support tree management and inclusion of trees as green infrastructure in the Town Asset Management Plan.

Recommendation 4: Maintain and update, as best practices change, its tree management practices to guide tree establishment, maintenance and removal per ANSI A300 Standards.

Recommendation 5: Along trails and in natural areas on Town-owned land:

- Control invasive plants such as buckthorn, garlic mustard and Manitoba maple
- Plant additional trees and shrubs to occupy the open areas created by invasive species control, and replace the ash trees killed by the Ash Borer.
- Shade tolerant trees should be planted in the understory of areas dominated by poplar to diversify the future forest.

Tree Planting

Since 2000, the Town has planted relatively few trees on road allowances and other Town property. This observation is supported through the analysis of the Public Tree Inventory, which showed that while Saugeen Shores had good numbers of the medium and largest trees, there were fewer smaller trees. A lot of smaller trees are required for there to be some larger trees in 60 or 100 years. The larger numbers of mid-sized trees likely resulted from the rapid increase in residential development.

The Public Tree Inventory showed that Saugeen Shores has a good number of medium and large trees while there are significantly fewer small trees. With Saugeen Shores experiencing a growth in commercial and residential development, it is detrimental that continued tree planting take place to ensure canopy cover is maintained and increased. Various Municipal Tree Planting Programs have been explored and the following should be considered by the Town for implementation:

1. Municipal Tree Planting Program

   Program focused on the planting of trees on road allowances and maintained areas of parks and facilities, where appropriate and increasing over time.
2. The 10,000 Trees program

   The 10,000 Trees Program would focus on the planting of 1,000 trees on Municipal lands every year over the next 10 years.
3. Volunteer Tree Tracking Inventory

   Online resident initiative where residents can locate and identify locations of private trees in the Town.
4. Tree Sale Day Program

   The Town continue its sponsorship of the Annual Tree Sale Program operating since 2013, working with community groups and local nurseries. Improvements to the program will be made to limit species type to native and selected non-invasive exotic species as well as support smaller sized trees that are lighter, easier to plant and are more affordable.

Educating the community and community groups about the value of tree planting and Tree Canopy and supporting landowners with technical and material support or supplying trees is of high importance to the Town to enable greater tree planting and maintenance of existing trees.

Funding opportunities for tree planting will also be explored including the new Growing Canada's Community Canopies (GCCC) through Tree Canada.

Recommendations

Recommendations related to improve tree planting and opportunities in Saugeen Shores are provided below.

Recommendation 6: Continue to diversify the urban forest by planting less common species of trees including, for example, oaks, sycamore, and hackberry where appropriate**.**

Recommendation 7: Continue to develop plans including funding to plant trees on municipal properties, such as road allowances, parks, and facilities where appropriate.

Recommendation 8: Develop a plan to plant and/or reforest, including consideration of planting small high-density patches (i.e. Miyawaki or micro forests) on Town-owned lands, including the closed landfill in Port Elgin.

Recommendation 9: Diversify the tree age and size profile of the Annual Tree Sale.

Recommendation 10: Limit purchases for the Town's Annual Tree Sale program to native trees and selected non-invasive exotic species as outlined in Appendix C and guide residents to plant trees according to the specifications in Appendix B.

Development Review Process

With the fastest growing population in Bruce County, the Town of Saugeen Shores has seen a growth in commercial and residential development, resulting in a perceived loss of tree canopy by the public. As development pressures increase in Saugeen Shores, it will be important to prioritize woodland retention in development proposals to maintain canopy cover, particularly in the heavily treed areas along the shore of Lake Huron, and to increase canopy in developed areas. Policies to maintain canopy cover in urban areas (e.g., Urban Tree Conservation By-law) should be developed and implemented.

Important components such as education opportunities should also be reviewed and developed to bring awareness to developers and commercial landowners in the community about the importance of preserving, maintaining and increasing tree canopy where possible to ensure greatest benefits for all residents and visitors in Saugeen Shores.

Recommendations

Recommendations to maintain and improve canopy cover through the development review process are provided below.

Recommendation 11: Revise the Development Guide to increase the number of replacement trees to be planted as the size of the tree to be removed increases.

Recommendation 12: Add policy to Section 2.6 Environmental Features of the Town Official Plan that would increase the number of replacement trees to be planted as the size of the tree to be removed increases

Recommendation 13: The Town should amend its Official Plan to recognize the public tree (i.e., Town-owned trees) as green infrastructure and inclusion in the Asset Management Policy as non-core, biologic assets.

Recommendation 14: Expand requirements for compensation of tree removals in planning documents beyond special policy areas to include all of the Settlement Area such that the ratio of planted trees to removed trees should increase with tree diameter.

Recommendation 15: Align tools that are intended to ensure tree cover is maintained at each step of the development process, particularly the woodlands/heavily treed areas along the shores of Lake Huron and Saugeen River.

Recommendation 16: The Town should continue to confirm the qualifications for professionals who author or approve Tree Protection Plans, Tree Retention Plans and Hazard Tree Assessment reports.

Awareness and Education

Important components such as education opportunities should also be reviewed and developed to bring awareness to developers and commercial landowners in the community about the importance of preserving, maintaining and increasing tree canopy where possible to ensure greatest benefits for all residents and visitors in Saugeen Shores.

An important component of this plan is to bring awareness to developers and commercial landowners in the community about the importance of preserving, maintaining and increasing tree canopy where possible to ensure greatest benefits for all residents and visitors in Saugeen Shores. Opportunities to generate continues engagement strategies will be supported and coordinated through the development of a formalized Environmental Committee, an internal staff working group with the assistance of the Town Urban Forest Manager.

Recommendations

Recommendations to increase awareness and improve educational opportunities are provided below.

Recommendation 17: Engage with and support private and commercial landowners to plant trees on their properties through communications and education campaigns, logistical/technical support.

Recommendation 18: Consider forming a staff working group that includes representatives from all teams that are involved with the Urban Tree Canopy to harmonize planning for trees in developments/construction, planting, tending, protecting, replacing and benefitting from trees.

Recommendation 19: Designate a staff person as the Town Urban Forest Manager to review and coordinate urban forest management activities and staff working group that foster communication among departments, the community and Council.

Recommendation 20: If the Town forms a citizen-based environmental committee, consider including promotion of Town tree canopy initiatives in the Committee's mandate.

By-laws

A principal goal of this project is to develop an understanding of the Urban Tree Canopy in Saugeen Shores, and how it can be protected or enhanced. There is currently limited regulation of tree removals and it was deemed important that there should be tools to prevent arbitrary tree removals without going through some assessment and perhaps replacement processes, while not interfering with reasonable property-management. The objectives of the By-law framework are to:

In alignment with the Environmental Ad-Hoc Committee Final Report, while the value of trees is recognized, it is also recognized that there are practical limitations of enforcement and property rights as well as the need to avoid duplication/overlap with Planning Act regulations. An Urban Tree Conservation By-Law is needed to provide the Town with more control over the public and private tree canopy through a combination of preservation, incentivization and educational initiatives.

Recommendations

Recommendations related to the implementation of a Tree By-law are provided below.

Recommendation 21: The Town develop a Tree Conservation By-law built on the following objectives:

1. Active enforcement to protect municipal trees and plants from illegal interference;
2. On privately owned lands:
    a. protection at the woodlot level by focusing on stands of trees as defined by a Town policy such as woodlots and significant woodlands; and
    b. for individual trees on smaller lots, focus on preservation education and incentivization through expanding existing subsidized tree planting programsthat address public and private lands

Recommendation 22: Consider amending the Property Standards By-law (or Clean Yards By-law) to include hazardous trees in Treed Areas.

Appendix A – Urban Tree Canopy Plan Discussion Paper

Not include in this document. Will be added when finalized

Appendix B- Tree Protection and Planting Guidelines

C.1 Protection of Existing Trees

The *Minimum Tree Protection Zone* (TPZ) is the minimum setback required to maintain the structural integrity of the tree's anchor roots, based on generally accepted arboricultural principles. The *Root Protection Zone* (RPZ), also called *Critical Root Zone*, is defined as a circle on the ground corresponding to the dripline of the tree. While the TPZ (below) will protect a tree's anchor root structure, the protected area should be larger to protect the soils surface and root integrity, protected through the construction project.

A TPZ for individual trees that are isolated from denser treed areas should be established using distances between the minimum MTPZ and the RPZ, both specified below. The appropriate Tree Protection Measures would protect the TPZ with similar hoarding/fencing as discussed above. RPZ is an area slightly larger than crown diameter, which includes the most important rooting area for the tree. Usually, the TPZ fencing is somewhere between the minimum TPZ and RPZ. The best is a larger area, but design specs, affected by construction requirements often encroach on those areas.

No unauthorized activities may take place within the TPZ of a tree covered under any municipal permit process or agreement. The following chart shows the TPZ (Niagara Parks). Some trees and site conditions may require a greater setback at the Town's discretion.

Table C. 1 - Minimum Tree Protection Zones

Trunk Diameter (DBH)	Minimum Tree Protection Zone (MTPZ) Distances Required	Root Protection Zone (RPZ) Distances Required
<10 cm	1.8 m	1.8 m
11 – 40 cm	2.4 m	4.0 m
41 – 50 cm	3.0 m	5.0 m
51 – 60 cm	3.6 m	6.0 m
61 – 70 cm	4.2 m	7.0 m
71 – 80 cm	4.8 m	8.0 m
81 – 90 cm	5.4 m	9.0 m
91 – 100+ cm	6.0 m	10.0 m

For trees over 100 cm. DBH, add 10 cm. to the TPZ for each centimeter of DBH.

1. Roots can extend from the trunk to 2-3 times the distance of the drip line.
2. Diameter at breast height (DBH) trunk diameter at 1.37 meters above ground.
3. Tree Protection Zone distances are to be measured from the outside edge of the tree base towards the drip line and may be limited by an existing paved surface, provided the existing paved surface remains intact throughout the construction work.

C.2 Planting Specifications

Archeological Consideration

An archeological assessment of potential tree planting sites should be considered, especially in new projects, with consideration for Indigenous archaeological importance/interest. This would be especially prudent in areas close to Lake Huron or natural water ways.

C.2.1 Locations Specifications

C.2.1.1 Soil Volume – New Projects

Adequate available soil volume is a critical factor for good tree growth and long-term viability. The soil volume available for root growth must be sufficient to support the expected tree size and, should the provided soil volumes be inadequate, design expectations for mature tree size and longevity must be appropriately reduced.

For new tree plantings, 30.0 m^3 of good quality topsoil, with a minimum depth of 750 mm to a maximum depth of 900 mm, should be provided. Trees in common planting areas may share soil volume to a maximum of 15.0 m^3 each.

C.2.1.2 Engineered Soils – CU Structural Soil

CU-Structural Soil™ is a planting medium consisting of 80 percent crushed limestone and 20 percent soil and has been designed for use in areas that need to or will be compacted. Because of the size of the aggregate, engineered soil always provides large soil pore space which is good for tree roots and allows for ready water drainage. Mycorrhizal or other inocula could also be used to enhance soil biology and help with tree establishment and growth.

Engineered soils can also be used with conventional planting techniques. If possible, pavement openings should be expandable (via removable pavers or using a mulched area) for the sake of the anticipated buttress roots of maturing trees. Engineered soils can be used right up to the surface grade down to a minimum of one meter depth. One problem that has been attributed to engineered soil is that it lacks real soil volume to sustain tree growth over an expected life span because it is 20 percent soil and 80 percent crushed limestone by volume. However, engineered soil is also an option for creating break-out zones under pavement for trees in narrow tree lawns to allow roots to travel to adjacent soft landscapes. Anecdotal evidence suggests that coarse aggregate used as backfill around utility trenches or subdrains functions similarly to engineered soil in that it provides a rooting environment or allows roots to travel to other soil volumes. For these reasons, it would be appropriate to use under sidewalks to create a break-out zone for boulevard trees to access soil volumes in front yard areas. Due to the large amount of aggregate contained in engineered soil, only 20% of its total volume will be credited towards the minimum soil volume requirements.

C.2.1.3 Soil Cells

Soil cells is designed to secure adequate tree habitat, support sidewalks and other hard surface treatments and provide on-site stormwater management. Soil cell systems are installed below grade, backfilled with topsoil, and are capped with a hard surface. For example, a sidewalk becomes, in effect, a floating roof over the rooting space. The modular framework provides uncompacted soil volumes for large tree growth and (potentially) unlimited access to healthy soil - a critical component of tree growth in urban environments - allowing them to manage stormwater, reduce heat-island effect, and improve air quality. In some situations, “caged/PVC” structures (like Silva Cell) use may be prescribed for use only under sidewalks or driveways, as a bridge or link for tree roots to grow into ‘breakout’ areas with greater soil volumes such as lawns or other soft surface areas.

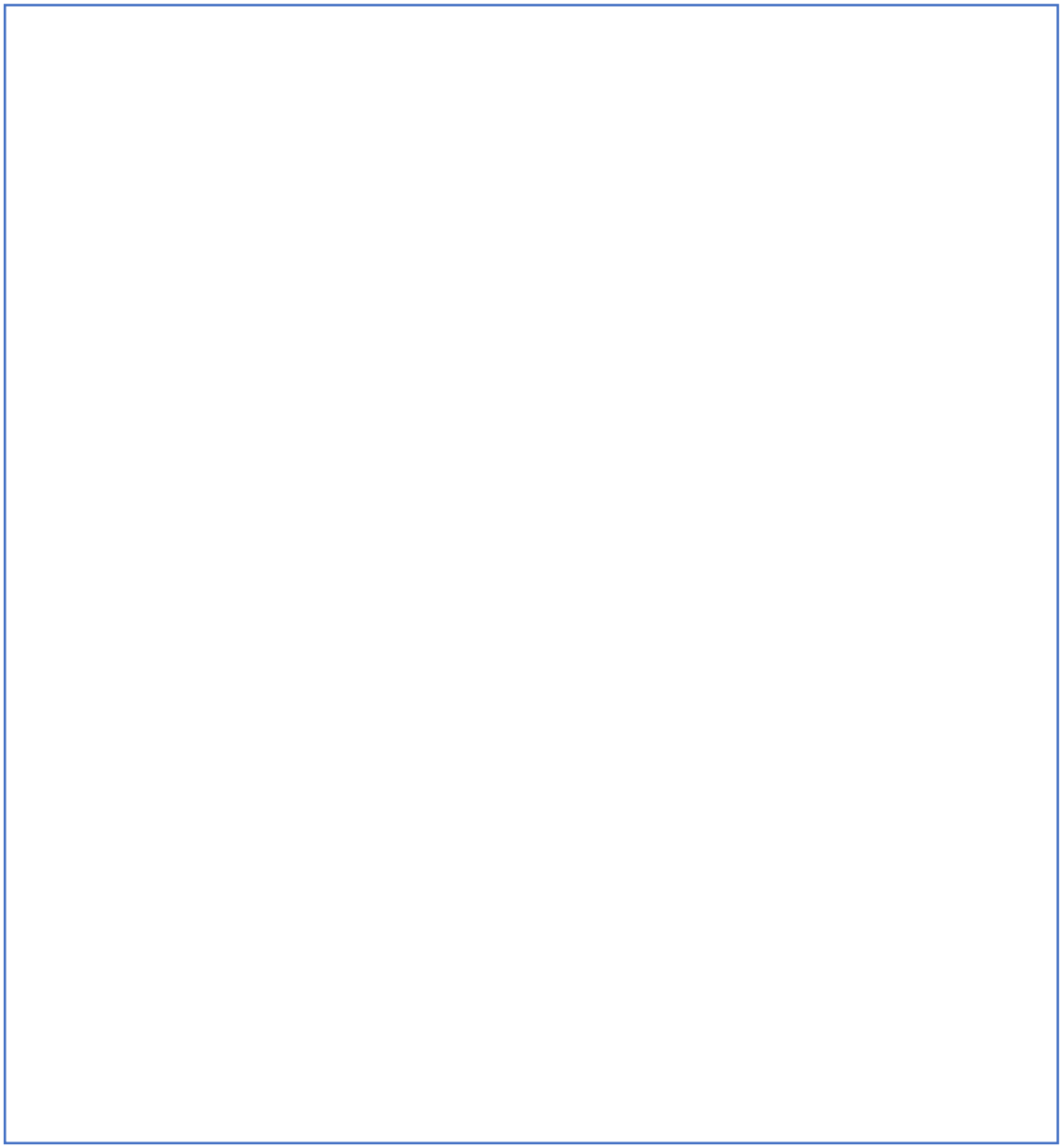


Figure C.1 - Silva Cell Caged/PVC Structures

C.2.1.4 Setbacks and Inter-Tree Spacing

Setbacks when siting plant material on streets and active parks should ensure adequate space be provided to accommodate normal long-term growth both above and below ground. Consider the potential negative impacts of providing insufficient space, such as injury to pedestrians, damage to property, increased maintenance expenses, and poor landscape performance.

Tree spacing should reflect the projected canopy size based on the species selected and its growing environment:

Table C.2. Tree species stature and minimum spacing for street trees

Stature Size	Minimum Spacing (m)	Stature Adjacent
Large Stature	8m	Large Stature

Large Stature	6m	Medium Stature
Large Stature	6m	Small Stature
Medium Stature	6m	Large Stature
Medium Stature	6m	Medium Stature
Medium Stature	6m	Small Stature
Small Stature	6m	Large Stature
Small Stature	6m	Medium Stature
Small Stature	6m	Small Stature

To accommodate the base of the tree, space should be provided for tree openings that are at least:

A. 3.0 m wide for a large stature tree
B. 2.5 m wide for a medium stature tree
C. 2.0 m wide for a small stature tree

These minimums could be reduced if enhanced rooting techniques are employed that mitigate possible damage to the surrounding landscape while providing for the long-term growth of the tree.

Where underground services or utilities are present/proposed, consider the potential negative impacts to the base of the tree should future maintenance require soil excavation near the tree.

To mitigate this and other risks, trees should not be planted within:

A. 1.0 m of the edge of a utility or service easement that is 3.0 m in width or greater.
B. 2.5 m of any underground utility or service, where space permits. However, at a main and lateral intersection a 2.0 m setback should be maintained.
C. 3.0 m of a transformer or hydrant

Local utility companies should be contacted for further information when planting, or proposing other works, near utilities.

To respect the crown of the tree, trees should not be planted:

A. within 10 m of a stop sign
B. where the growing canopy may contact buildings, structures, or fencing.
C. where growing canopy may come within 3.0 m of a primary power line or within 1.0 m of a secondary power line or communication asset.
D. overhanging pedestrian areas if it is a species that drop fruit or seed pods/nuts.

Table C.3 – Tree Setbacks

TREE SETBACKS	
FACILITY	***DISTANCE (M)***

DRIVEWAYS	***1.0 - 1.5***
STORM/ SANITARY CONNECTIONS	***1***
RLCB LEADS	***1***
CURB OR WALKWAY	***1***
FIRE HYDRANTS	***3***
PAD MOUNTED TRANSFORMERS	***3***
STREETLIGHTS	***5 FOR LARGE STATURE, 3 FOR SMALL STATURE***
BUS STOPS	***3***
REGULATORY SIGNS	***3***
STOP SIGNS	***10***

Daylight Triangle Maintain the 10m distance from corner of intersection to respect the Daylight Triangle and ensure proper clearance for traffic.

Hydro Lines Species selection under hydro lines is critical to avoid long term management challenges and higher than average pruning requirements. Refer to Appendix A for estimated heights at maturity per species.

Heights at maturity should leave at least a 1m buffer from lowest electrical line height, unless offset from under the line by half the mature canopy width.

C.2.2 Layout

The final planting location is to be marked on site for “field approval” by the Town. With utility or development project, it is the Constructor’s responsibility to obtain utility locates prior to marking final planting locations.

C.3 Planting Materials Specifications

3.3.1 Species and Standards of Trees

Species and cultivars of trees, as well as the standard for that species and cultivar, should conform to the Canadian Standards for Nursery Stock, Canadian Nursery Landscape Association, as revised.

C.3.2 Species Selection (Diversity)

The amount of species variation will depend on the number of trees to be planted.

Utilize the 5-10-15 guideline to increase species diversity. No more than 5% of any one species, 10% of any one genus, or 15% of any family.

A minimum of 30% of the trees planted on a site should be native tree species. Refer to Appendix A. Locally rare native species may be accepted on a case-by-case basis. Cultivars of native trees should not be credited towards the minimum 30% requirement.

Invasive species should not be planted, especially near natural areas. Refer to Appendix B.

Species selection should reflect the site conditions, such as soil and light conditions, drainage, slope, aspect, moisture level and salt exposure. Use of locally sourced plant material is recommended.

Species selection and arrangement should consider ecosystem function and health and provide visual interest through diversity and seasonal variety.

Artificial plant materials are not recommended.

C.3.3 Stature

Tree stature (i.e., small, medium, large) by species is based on projected canopy spread. This does not account for differing forms, such as columnar or fastigiate, that are being increasing used on the landscape. This can result in an over- or under-estimate of potential canopy contribution, because of not fully recognizing the species characteristics.

Appendix A includes the stature value assigned to species and cultivars/varieties when appropriate. This value assigned is based on estimated canopy volume.

C.3.4 Origin and Hardiness Zones

The geographical origin (seed zone) of where seed or cuttings used to produce the trees should be considered when developing planting plans. If the plant material is from an area that is climatically different than Port Colborne, it should be refused.

C.3.5 Planting Specifications

Planting spots should be marked two-weeks in advance to allow for required locates.

Consideration for Indigenous archaeological importance/interest. This would be especially prudent in areas close to current or historical navigable water ways.

C.3.5.1 Residential Street Trees

Large-stature trees should not be planted in boulevards with less than 1.75 m between sidewalk and curb.

Trees should be planted house side of the road allowance, midway between the sidewalk and property line or 1-m from the property line.

Planting locations should be marked by the Project Manager or designate with spray paint in the form of a "T" or "T2" etc., on the sidewalk and an “X” where the tree is to be.

"T2" indicates a distance of 2.0 meters etc. from the mark for tree planting.

- On streets without sidewalks, planting locations should be indicated with spray paint in the form of a “T” or T2” etc. on the curb.

- If there is no sidewalk or curb, the planting locations should be marked with "T" indicates on the spot for the tree to be planted.

C.3.5.2 Park Trees / Naturalization Planting

Planting location maps to be supplied, and locations marked in the field with the appropriate method. Trees to be planted in the parks, pond and retention pond, woodlot rehabilitation plantings etc. should be on a GIS map and given to the planting foreman planting. Planting locations of caliper stock should be spray painted with an “X” for each tree location.

C.3.5.3 Planting Holes

For residential street trees, the planting hole must be at least 30 cm from the edge of

the ball/container.

- The depth of the hole should be dependent not only on the depth of the ball/container, but also on soil conditions.
- For park trees / naturalization planting, the planting hole must be at least 60 cm from the edge of the ball/container.
- The depth of the hole should be dependent not only on the depth of the ball/container, but also on soil conditions.

Planting diagrams for conifer and broadleaf trees are in Figures A.2 and A.3.

C.3.5.4 Excavation

Remove subsoil, rocks, roots, debris, and toxic material from excavated material that should be used as planting soil for trees. Dispose of excess material. Scarify sides of planting hole to allow water flow and rooting access.

All Hydro-vac operations must be compliant with the safe practices prescribed for such equipment as published by the Electrical and Utilities Safety Association. The contractor is responsible for sub-contracting this function if required. The Town may make an exception and allow for sub-contracting of the trenchless technology; however, the sub-contractor is not permitted to plant trees.

Note: Regardless of the method used to dig, under no circumstances should equipment be permitted to be set up on residential driveways and front lawns. Access to planting sites is to be from the public boulevard or road.

C.3.5.5 Tree Placement

Place supplied trees within the excavated hole in the upright position.

- When clay subsoil or firmly packed subsoil (compacted and/or poorly drained) is encountered, at least 20 cm of excavated subsoil must be left between the bottom of the ball and the bottom of the planting hole.

- In moist, well-drained soils, set the root ball so that the root collar is exactly at finished grade. In sandy or droughty soils, set the root ball so that the root collar is slightly deeper than finished grade.
- The wire basket and burlap should be removed, unless otherwise approved in writing by the Project Manager or designate.

C.3.5.6 Backfilling and Initial Watering

Backfilled soil is to be placed to bring the top level of the root ball 8.0 cm higher than the existing surrounding grade to allow for settling.

- Backfill is to be placed in layers approximately 15 cm in depth and firmly tamped in place in such a manner that the tree retains its vertical position without support.
- Particular care is to be taken to ensure that no air pockets remain under or around roots and that damage does not occur to the root system.
- The fill shall be thoroughly watered immediately after planting. Water plant material thoroughly and in such a way as to prevent surface erosion.

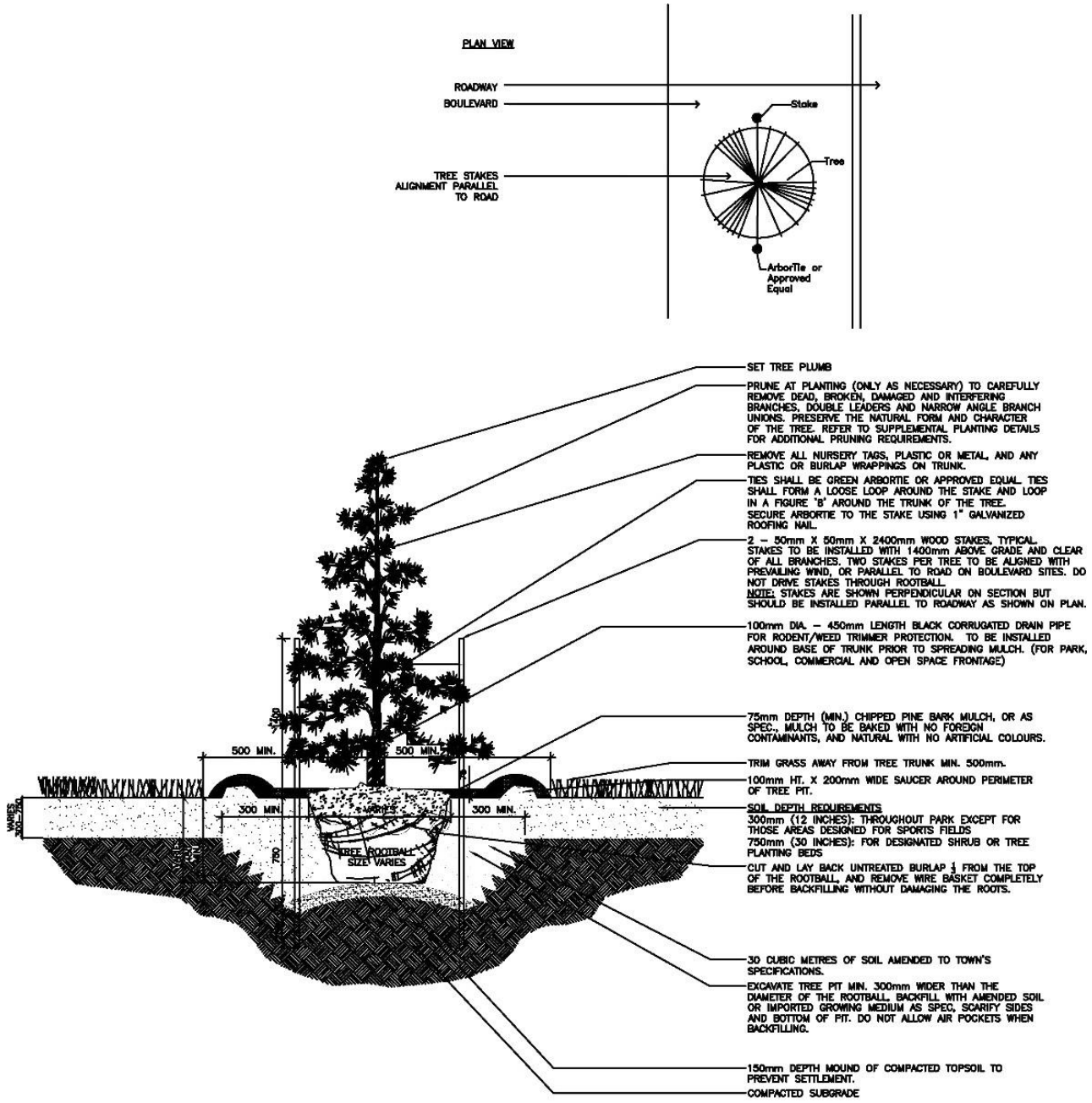
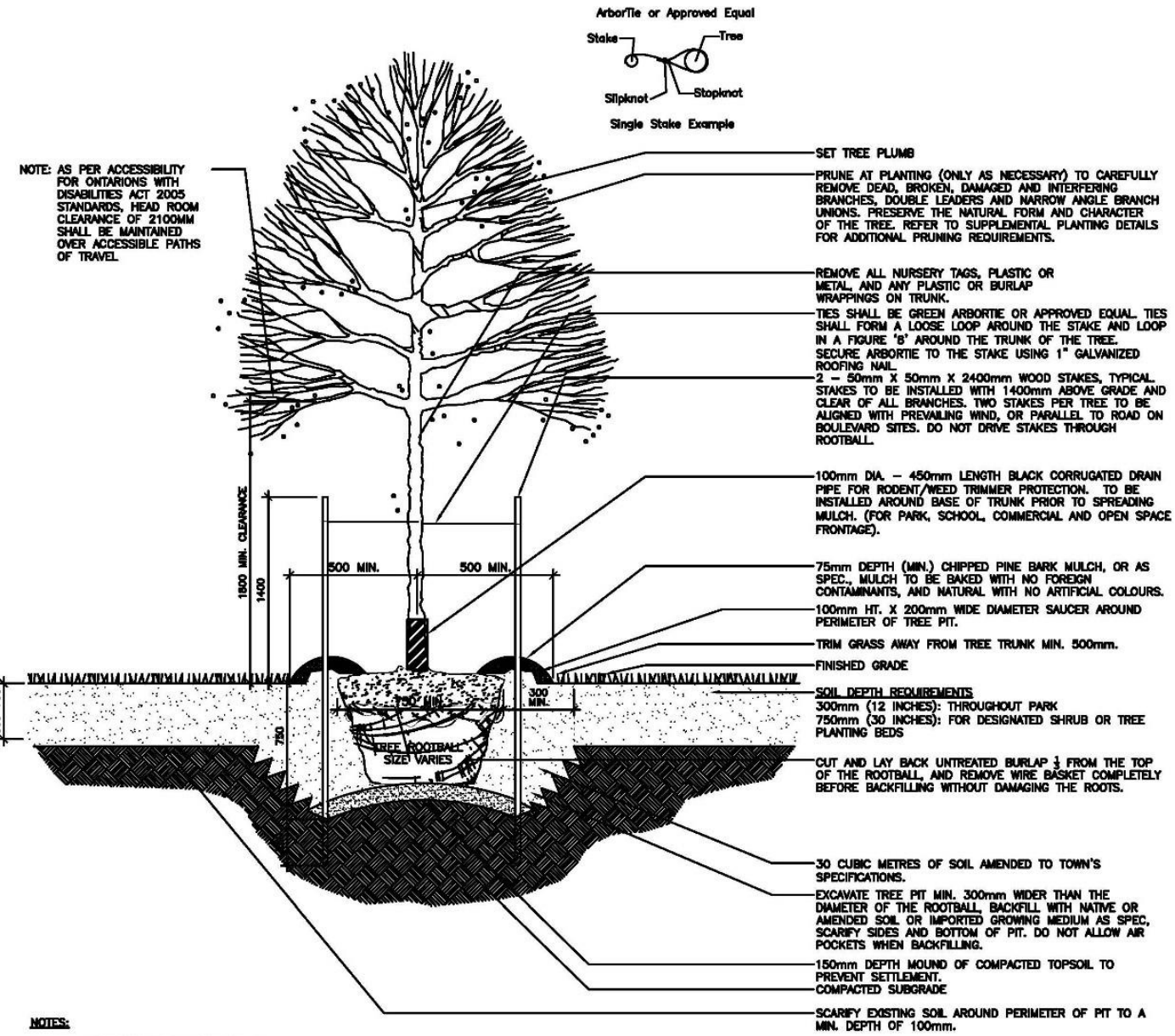


Figure C. 2 - Conifer Planting Diagram



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. DO NOT SCALE DRAWINGS.
3. TOPSOIL IN PLANTING AREAS SHOULD BE COMPACTED TO 75–80% SPD or 300 PSI (MAXIMUM 150mm LIFTS).
4. ALL PLANT MATERIAL TO BE COVERED DURING TRANSPORTATION AND AN ANTI–DESSICANT SHALL BE APPLIED PRIOR TO SHIPMENT TO PREVENT MOISTURE LOSS. ALL USE OF ANTI–DESSICANT IS SUBJECT TO TOWN APPROVAL.
5. MAXIMUM ALLOWABLE DEGREE OF LEAN FOR A TREE IS <25 DEGREES.
6. DAMAGED PLANT MATERIAL WILL NOT BE ACCEPTABLE. ALL TREES NOT MEETING TOWN OF OAKVILLE PLANTING REQUIREMENTS WILL BE REMOVED AND REPLACED AT NO EXPENSE TO THE TOWN OF OAKVILLE.
7. ALL TREATED OR SYNTHETIC BURLAP WRAPPINGS TO BE REMOVED COMPLETELY. ALL TWINE LEFT ON BURLAP TO BE BIODEGRADABLE.
8. CONTAINER GROWN STOCK SHALL HAVE AN INCREASED WATERING REGIMEN TO HELP PREVENT MOISTURE LOSS. CONTAINERS TO BE REMOVED IN FULL PRIOR TO INSTALLATION. SIDES TO BE LOOSENED UP SLIGHTLY PRIOR TO INSTALLATION TO ENCOURAGE ROOT GROWTH.
9. NO OPEN TREE PITS OR EXCAVATIONS, OR PLANT MATERIAL SHALL BE LEFT ON SITE OVERNIGHT.
10. ALL TREES 70mm CALIPER OR LESS SHALL BE STAKED. STAKES TO BE REMOVED AT THE CLOSE OF THE SECOND GROWING SEASON OR UPON THE EXPIRATION OF THE WARRANTY PERIOD.
11. SAUCER TO BE SOAKED WITH WATER AND MULCHED IMMEDIATELY FOLLOWING PLANTING.
12. CONTRACTOR TO TEST EXISTING AND EXCAVATED SOIL TO DETERMINE IF IT IS AN ACCEPTABLE GROWING MEDIUM, OR IF AMENDMENT IS REQUIRED PRIOR TO BACKFILLING, UNLESS OTHERWISE DIRECTED BY THE CONTRACT ADMINISTRATOR. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION ON TESTING REQUIREMENTS.
13. ALL TREES REQUIRE A MINIMUM OF 30 CUBIC METRES OF PLANTING SOIL.
14. SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS RELATED TO THIS DETAIL.

Figure C. 3 - Planting Diagram

- When using backfill, choose the appropriate backfill for the site's soil conditions i.e., in clay soils backfill with the clay-loam specifications, in sandy soils backfill with the sandy-loam specifications as listed below.

- At grade, a ridge of soil located at the edge of the planting hole shall be formed to a height of 9 cm, to act as a catch basin for any subsequent watering's and to retain mulch.
- All non-porous containers shall be removed, including the entire wire basket. If a fiber or peat pot remains, it must not be left above the soil surface as this promotes "wick" evaporation.

Backfill composition specifications are as follows:

Table C. 4 - Backfill Composition Specifications

Soil Texture	**Sand%**	**Silt%**		**Clay%**
Clay-loam	20-46	20 - 50		27- 40
Sandy-loam	55-80	5 - 28		0- 20

Clay soil contains minimum 4% organic matter.
Sandy soil contains minimum 2% organic matter.
Acidity of topsoil mixture to range between 6.0pH to 7.5pH.
Topsoil mixture to be free of sub-soil, stones, roots, and any foreign objects.

C.3.5.7 Pruning

- The crown of the tree shall be pruned from the bottom up at the time of planting to remove all dead and damaged branches.
- The terminal or leader is not to be pruned unless broken, leader shall not be removed. All cuts shall be made using approved standards and Guidelines for pruning set out by the ANSI A300 pruning standards (2001 Edition) as updated from time to time, and the Illustrated Guide to Pruning, 2nd Edition (2002 ISA) as updated from time to time, leaving no stubs.
- On all cuts over 2 cm in diameter and bruises or scars on the bark, the injured cambium shall be traced back to living tissue and removed.
- Pruning wounds shall be smoothed and shaped so as not to retain water. Only clean, sharp tools shall be used. All cuts shall be clean. Branches should be cut at the branch-collar, leaving no stubs.
- Large wounds produced by any means other than branch pruning may render the tree unacceptable, requiring replacement subject to the directions of the Project Manager or designate.
- Planted material may be found unacceptable and require replacement upon inspection by Project Manager or designate.

C.3.5.8 Staking

All balled and burlapped trees shall, immediately after planting, be supported by two wooden stakes, pointed on one end 5 cm x 5 cm x 15 cm (2 in x 2 in x 6 in) driven outside the ball parallel to the road.

- When staking in parks they must be in line with the direction of the prevailing wind (**west to east**).
- For balled and burlap trees, this type of tree, B/B, the stakes are to be driven at least 70 cm below grade line.
- The stakes must be driven deep enough that there is at least 5 cm between the top of the stakes and the first branch.
- Stake placement shall be such that no main roots are severed by the stake being driven into the ground. Metal stakes are prohibited.

C.3.5.9 Tree Ties (Guying Material)

- Ties shall be made from a flat polypropylene material (tree guying cable), approved by the Project Manager, or designate prior to the contract commencing.
- The guying must be intertwined around the tree and must be firmly secured to the wooden stake in a way to prevent them from coming loose or moving down the tree.
- An approved equivalent guying material can be utilized at the sole discretion of the Project Manager or designate.
- For B/B and container stock trees where the two stakes are driven into the ground outside the root ball, the tension must be such that the tree is firmly, but not too tightly, supported, remaining in a vertical position.

C.3.5.10 Mulching

- Non-shredded woodchips from tree and woody brush sources measuring between 2.5 cm and 5.0 cm in width and placed to a depth of between 5.0 cm to 7.5 cm spread the following distance from the root collar:
- Caliper (mm) Average radius from root collar (cm) 50 and greater 110 cm
- Mulch should form a flattened donut around the tree rather than a cone. Woodchips must be close, but not in contact with the tree trunk.
- Mulch must be applied no later than 48 hours after planting.
- Mulch should be a consistent and natural colour.

C.3.5.11 Tree Wrapping and Tree Guards

- The contractor is to remove all tree wrapping upon planting of the tree. The Contractor should:
- Install a plastic tree guard (in parks, median, berms and Blvd.) that is the appropriate height to prevent damage to the base of the tree i.e., from grass cutters and mowers.
- These tree guards should be made of plastic (black perforated corrugated drainpipe 15 cm diameter 30 cm in height (6-inch diameter 12 inches in height)) and be cut from one end to the other to allow the stem to grow.
- Tree guards are not required when planting on house side of the sidewalk.

C.3.5.12 Removal of excess tags and other material

All excess materials, such as nursery tags or other items attached to planting stock, should be removed immediately after planting.

C.3.5.13 Restoration

Any site damage should be restored to pre-construction condition to the satisfaction of the Project Manager or designate.

- All disposal of excess material, off site in an approved disposal site.
- Broom cleaning of pavement, concrete and sidewalks.
- Raking grass to ensure it is free of planting materials and/or loam.
- Leave site in a neat condition.

C.3.5.14 Disposal

Woody materials should be disposed of within Halton Region to limit the spread of Emerald Ash Borer (EAB) or other insect or disease pests.

C.3.6 Post Plant Care

C.3.6.1 Post Plant Watering

Watering shall be carried out when required and with enough water to prevent plants and underlying growing medium from drying out, until such time as approved by the Project Manager or designate.

C.3.6.2 Fertilizing

The Contractor should be required to add granular fertilizer before the mulch layer is applied. A granular fertilizer mixture (slow release) with a blend of 6-15-23 A.19 Mg 0.13B 0.5Zn should be used, unless approved by the Project Manager.

C.3.6.3 Additional Watering

The Project Manager may require that a watering schedule be implemented to supplement the work done by Town forestry staff using the following specification:

- 10 gallons of water per tree every week for trees located on sandy soils.
- Every 2 weeks for trees located on clay soils.
- Surface watering should be used rather than a watering probe.
- For additional watering over and above the scope of work outlined within this tender, additional watering requirements should be made to group to provide a reasonable daily volume of work.

Appendix C- Tree Planting List and Species Preference

Common Name	Cultivars	Genus	Species	Native	Roads	Parks	Est. Height (m) at Maturity	Est. Width (m) at Maturity	Stature
Apple, common		*Malus*	*pumila*	No	X	Y	7	7	Small
Aspen, Large-toothed		*Populus*	*grandidentata*	Yes	X	Y	18	12	Large
Aspen, Trembling		*Populus*	*tremuloides*	Yes	X	Y	10	5	Small
Basswood		*Tilia*	*americana*	Yes	X	Y	27	13	Large
Beech, Blue		*Carpinus*	*caroliniana*	Yes	X	Y	8	6	Small
Beech, Dawyck Gold	'Dawyck Gol	*Fagus*	*sylvatica*	No	X	Y	16	2	Small
Beech, Dawyck Purple	'Dawyck Pur	*Fagus*	*sylvatica*	No	X	Y	8	2	Small
Beech, European		*Fagus*	*sylvatica*	No	X	Y	15	12	Large
Beech, Purple Fountain	'Purple Foun	*Fagus*	*sylvatica*	No	X	Y	6	4	Small
Beech, Red Obelisk	'Red Obelisk	*Fagus*	*sylvatica*	No	X	Y	13	4	Small
Beech, Tri-colour	'Rosea-Marg	*Fagus*	*sylvatica*	No	X	Y	13.5	8	Medium
Birch, Cherry		*Betula*	*lenta*	Yes	X	Y	15	12	Large
Birch, European White		*Betula*	*pendula*	No	X	Y	15	10	Medium
Birch, Gray		*Betula*	*populifolia*	Yes	X	Y	10	6	Small
Birch, River		*Betula*	*nigra*	Yes	X	Y	13	10	Medium
Birch, White (Paper)		*Betula*	*papyrifera*	Yes	X	Y	18	10	Large
Birch, Yellow		*Betula*	*alleghaniensis*	Yes	X	Y	18	15	Large
Black Gum		*Nyssa*	*sylvatica*	Yes	v	Y	13.5	8.5	Medium
Buckeye, Ohio		*Aesculus*	*glabra*	Yes	v	Y	13.5	13.5	Large
Catalpa, Northern		*Catalpa*	*speciosa*	Y-USA	X	Y	12	6	Small
Cedar, Black	'Nigra'	*Thuja*	*occidentalis*	Yes	X	Y	5	1.5	Small
Cedar, Eastern Red Hills	'Hillspire'	*Juniperus*	*virginiana*	Yes	X	Y	12	4	Small
Cedar, Eastern White		*Thuja*	*occidentalis*	Yes	X	Y	20	3	Small
Cedar, Emerald	'Emerald'	*Thuja*	*occidentalis*	Yes	X	Y	4	1	Small
Cherry, Black		*Prunus*	*serotina*	Yes	X	Y	15	6	Medium
Cherry, Choke		*Prunus*	*virginiana*	Yes	X	Y	5	5	Small
Cherry, Kwanzan	'Kwanzan'	*Prunus*	*serrulata*	No	X	Y	7	5	Small
Cherry, Pin		*Prunus*	*pensylvanica*	Yes	X	Y	8	8	Medium
Chestnut, Amercian		*Castanea*	*dentata*	Yes	X	Y	18	18	Large
Cottonwood, Black		*Populus*	*trichocarpa*	Y-USA	X	Y	27	21	Large
Cottonwood, Eastern		*Populus*	*deltoides*	Yes	X	Y	27	21	Large
Crabapple	'Prairie Fire'	*Malus*		No	X	Y	7	7	Small
Crabapple	'Royal Raind	*Malus*		No	X	Y	7	7	Small
Crabapple	'Sargent'	*Malus*		No	X	Y	7	7	Small
Crabapple	'White Angel'	*Malus*		No	X	Y	7	7	Small
Cucumber Tree		*Magnolia*	*acuminata*	Yes	X	Y	16	16	Large
Cypress, Bald		*Taxodium*	*distichum*	Y-USA	X	Y	20	8	Medium

Common Name	Cultivars	Genus	Species	Native	Roads	Parks	Est. Height (m) at Maturity	Est. Width (m) at Maturity	Stature
Elm, Accolade	wilsoniana	*Ulmus*	*japonica*	No	**v**	**Y**	23	20	Large
Elm, White	'Princeton'	*Ulmus*	*americana*	Yes	**v**	**Y**	21	15	Large
Elm, White	'Valley Forge'	*Ulmus*	*americana*	Yes	**v**	**Y**	21	21	Large
Fir, Balsam		*Abies*	*balsamea*	Yes	**X**	**Y**	15	6	Medium
Fir, Douglas		*Pseudotsuga*	*menziesii*	Y-BC	**v**	**Y**	20	5	Medium
Fir, White		*Abies*	*concolor*	Y-USA	**v**	**Y**	14	6	Medium
Ginkgo (Maidenhair)		*Ginkgo*	*biloba*	No	**v**	**Y**	17	11	Large
Ginkgo, Autumn Gold	'Autumn Gol	*Ginkgo*	*biloba*	No	**v**	**Y**	10	10	Medium
Ginkgo, Golden Colonad	'JFS-UGA2'	*Ginkgo*	*biloba*	No	**v**	**Y**	13	7.5	Medium
Ginkgo, Princeton Sentry	'Princeton Se	*Ginkgo*	*biloba*	No	**v**	**Y**	13	5	Small
Hackberry		*Celtis*	*occidentalis*	Yes	**v**	**Y**	20	18	Large
Hazelnut, Turkish		*Corylus*	*colurna*	No	**v**	**Y**	15	8	Medium
Hemlock, Eastern		*Tsuga*	*canadensis*	Yes	**X**	**Y**	20	5	Medium
Hickory, Bitternut		*Carya*	*cordiformis*	Yes	**X**	**Y**	25	20	Large
Hickory, Pignut		*Carya*	*glabra*	Yes	**X**	**Y**	17	8	Medium
Hickory, Shellbark		*Carya*	*laciniosa*	Yes	**X**	**Y**	23	15	Large
Hop tree		*Ptelea*	*trifoliata*	Yes	**X**	**Y**	5	5	Small
Hornbeam, Euro. Pyrami	'Fastigiata'	*Carpinus*	*betulus*	No	**X**	**Y**	12	5	Small
Hornbeam, European		*Carpinus*	*betulus*	No	**X**	**Y**	17	12	Large
Horsechestnut		*Aesculus*	*hippocastanum*	No	**Y**	**Y**	12	12	Medium
Horsechestnut, Double		*Aesculus*	*baumannii*	No	**Y**	**Y**	15	12	Large
Horsechestnut, Red	'Briotii'	*Aesculus*	*x carnea*	No	**Y**	**Y**	12	12	Medium
Ironwood (hop-hornbeam)	*Ostrya*	*virginiana*	Yes	**Y**	**Y**	12	8	Medium	
Katsura, Japanese		*Cercidiphyllum*	*japonicum*	No	**X**	**Y**	15	4	Small
Kentucky Coffee Tree	'Expresso'	*Gymnocladus*	*dioicus*	Yes	**Y**	**Y**	15	10	Medium
Kentucky Coffee Tree		*Gymnocladus*	*dioicus*	Yes	**Y**	**Y**	17	13	Large
Larch, European		*Larix*	*decidua*	No	**X**	**Y**	15	7	Medium
Lilac, Japanese Tree	'Ivory Silk'	*Syringa*	*reticulate*	No	**Y**	**Y**	8	4	Small
Linden, Little-leaf		*Tilia*	*cordata*	No	**X**	**Y**	17	20	Large
Locust, Honey	Streetkeeper	*Gleditsia*	*triacanthos*	Yes	**Y**	**Y**	15	7	Medium
Locust, Honey	Shademaste	*Gleditsia*	*triacanthos*	Yes	**Y**	**Y**	17	10	Medium
Locust, Honey	Skylilne	*Gleditsia*	*triacanthos*	Yes	**Y**	**Y**	15	13	Large
Locust, Honey	Sunburst	*Gleditsia*	*triacanthos*	Yes	**Y**	**Y**	15	13	Large
Locust, Honey		*Gleditsia*	*triacanthos*	Yes	**Y**	**Y**	17	10	Medium
Maple, Amur	Ruby Slippe	*Acer*	*ginnala*	No	**Y**	**Y**	6	6	Small
Maple, Armstrong	'Armstrong'	*Acer*	*rubrum*	Yes	**Y**	**Y**	20	5	Medium

Common Name	Cultivars	Genus	Species	Native	Roads	Parks	Est. Height (m) at Maturity	Est. Width (m) at Maturity	Stature
Maple, Autumn Spire	'Autumn Spi	*Acer*	*rubrum*	Yes	**Y**	**Y**	16	8	Medium
Maple, Black		*Acer*	*nigrum*	Yes	**Y**	**Y**	20	15	Large
Maple, Celebration	'Celebration'	*Acer*	*x Freemanii*	Yes	**Y**	**Y**	14	6	Medium
Maple, 'Columnar'	'Columnare'	*Acer*	*rubrum*	Yes	**Y**	**Y**	15	5	Small
Maple, Freemanii		*Acer*	*x Freemanii*	Yes	**Y**	**Y**	16	13	Large
Maple, Freemanii	'Jeffersred'	*Acer*	*x Freemanii*	Yes	**Y**	**Y**	16	13	Large
Maple, Hedge		*Acer*	*campestre*	No	**Y**	**Y**	10	10	Medium
Maple, Paperbark		*Acer*	*griseum*	No	**Y**	**Y**	7	5	Small
Maple, Red	'Brandywine'	*Acer*	*rubrum*	Yes	**Y**	**Y**	10	4	Small
Maple, Red		*Acer*	*rubrum*	Yes	**Y**	**Y**	16	15	Large
Maple, Red Sunset	'Red Sunset	*Acer*	*rubrum*	Yes	**Y**	**Y**	18	12	Large
Maple, Scarlet Sentinal	'Scarlet Sen	*Acer*	*rubrum*	Yes	**Y**	**Y**	15	8	Medium
Maple, Silver	'Silver Queen	*Acer*	*Saccharinum*	Yes	**Y**	**Y**	16	13	Large
Maple, Silver		*Acer*	*saccharinum*	Yes	**Y**	**Y**	18	15	Large
Maple, Sugar	'Green Moun	*Acer*	*saccharum*	Yes	**Y**	**Y**	22	17	Large
Maple, Sugar		*Acer*	*saccharum*	Yes	**Y**	**Y**	20	15	Large
Maple, Sugar 'Columnar'	'Columnare'	*Acer*	*saccharum*	Yes	**Y**	**Y**	20	4	Small
Maple, Tartarian		*Acer*	*tataricum*	No	**Y**	**Y**	5	6	Small
Maple, Tartarian	Hotwings'	*Acer*	*tataricum*	No	**Y**	**Y**	7	6	Small
Mountain-Ash, American	*Sorbus*	*americana*	Yes	**X**	**Y**	6	6	Small	
Mountain-Ash, Showy		*Sorbus*	*decora*	Yes	**X**	**Y**	7	6	Small
Mulberry, Red		*Morus*	*rubra*	Yes	**X**	**Y**	12	12	Medium
Mulberry, white		*Sorbus*	*alba*	Yes	**X**	**Y**	12	12	Medium
Oak, Black		*Quercus*	*velutina*	Yes	**Y**	**Y**	20	20	Large
Oak, Bur		*Quercus*	*macrocarpa*	Yes	**Y**	**Y**	18	13	Large
Oak, Chinquapin		*Quercus*	*muehlenbergii*	Yes	**Y**	**Y**	15	15	Large
Oak, English	'Skinny Gene	*Quercus*	*robur*	No	**Y**	**Y**	15	3	Small
Oak, English		*Quercus*	*robur*	No	**Y**	**Y**	18	13	Large
Oak, English	'Skyrocket'	*Quercus*	*robur*	No	**Y**	**Y**	20	5	Medium
Oak, English Pyramidal	'Fastigiata'	*Quercus*	*robur*	No	**Y**	**Y**	15	5	Small
Oak, Pin		*Quercus*	*palustris*	Yes	**Y**	**Y**	20	13	Large
Oak, Red		*Quercus*	*rubra*	Yes	**Y**	**Y**	16	15	Large
Oak, Red Kindred Spirit	'Bicolor Nadl	*Quercus*	*rubra*	Yes	**Y**	**Y**	10	2	Small
Oak, Shumard		*Quercus*	*shumardii*	Yes	**Y**	**Y**	12	12	Medium
Oak, Swamp White		*Quercus*	*bicolor*	Yes	**Y**	**Y**	15	15	Large
Oak, White		*Quercus*	*alba*	Yes	**Y**	**Y**	20	20	Large
Orange, Osage		*Maclura*	*pomifera*	Y-USA	**X**	**Y**	12	12	Medium
Orange, Osage	'White Shield	*Maclura*	*pomifera*	Y-USA	**X**	**Y**	12	12	Medium

Pagoda Tree, Japanese		*Sophora*	*japonica*	No	X	Y	22	20	Large
Pawpaw		*Asmina*	*triloba*	Yes	X	Y	6	4.5	Small
Pear		*Pyrus*		No	X	y	9	9	Medium
Pine, Austrian		*Pinus*	*nigra*	No	X	Y	18	15	Large
Pine, Eastern White		*Pinus*	*strobus*	Yes	Y	Y	24	11	Large
Pine, Eastern White	Pyramidal 'F	*Pinus*	*strobus*	Yes	X	Y	15	2.5	Small
Pine, Red		*Pinus*	*resinosa*	Yes	Y	Y	20	10	Large
Planetree, Exclamation	'Morton Circle	*Platanus*	*x acerifolia*	No	Y	Y	16	10	Medium
Planetree, London		*Platanus*	*x acerifolia*	No	Y	Y	20	20	Large
Planetree, London	'Bloodgood'	*Platanus*	*x acerifolia*	No	X	Y	16	13	Large
Poplar, Balsam		*Populus*	*balsamifera*	Yes	Y	Y	13	6	Medium
Redbud		*Cercis*	*canadensis*	Yes	Y	Y	9	9	Medium
Redbud, Forest Pansy	'Forest Pans	*Cercis*	*canadensis*	Yes	Y	Y	9	9	Medium
Redbud, Silver Cloud	'Silver Cloud'	*Cercis*	*canadensis*	Yes	Y	Y	8	9	Medium
Redbud, Texas White	'Texas White'	*Cercis*	*canadensis*	Yes	Y	Y	8	9	Medium
Redwood, Dawn		*Metasequoia*	*glyptostroboides*	No	Y	Y	15	8	Medium
Sassafras		*Sassafras*	*albidum*	Yes	Y	Y	8	8	Medium
Serviceberry, Downy		*Amelanchier*	*arborea*	Yes	Y	Y	5	5	Small
Serviceberry, Smooth		*Amelanchier*	*laevis*	Yes	Y	Y	6	4.5	Small
Spruce, Blue		*Pigea*	*pungens*	Y-USA	Y	Y	20	4.5	Small
Spruce, Blue Hoopsi	'Hoopsii'	*Pigea*	*pungens*	Y-USA	Y	Y	15	6	Medium
Spruce, Blue Pyramidal	'Fastigiata'	*Pigea*	*pungens*	Y-USA	Y	Y	6	2.5	Small
Spruce, Norway		*Picea*	*abies*	No	Y	Y	25	10	Large
Spruce, White		*Picea*	*glauca*	Yes	Y	Y	25	4.5	Medium
Sweetgum		*Liquidambar*	*styraciflua*	Y-USA	Y	Y	16	15	Large
Sweetgum		*Liquidambar*	*styraciflua*	No	Y	12	20	4.5	Small
Sweetgum, Moraine	'Moraine'	*Liquidambar*	*styraciflua*	Y-USA	Y	Y	13	8	Medium
Sweetgum, Slender Silhouette	*Liquidambar*	*styraciflua*	Y-USA	Y	Y	Y	12	Medium	
Sycamore		*Platanus*	*occidentalis*	Yes	Y	Y	27	27	Large
Tamarack		*Larix*	*laricina*	Yes	Y	Y	12	11	Medium
Tulip Tree		*Liriodendron*	*tulipifera*	Yes	Y	Y	25	15	Large
Tulip Tree, Arnold	'Arnold'	*Liriodendron*	*tulipifera*	No	X	Y	18	6	Medium
Tulip Tree, Pyramidal	'Fastigiatum'	*Liriodendron*	*tulipifera*	No	X	Y	16	5	Small
Walnut, Black		*Juglans*	*nigra*	Yes	X	Y	18	18	Large
Willow, Black		*Salix,*	*nigra*	Yes			10	5	Small
Willow, Corkscrew	'Totuosa'	*Salix,*	*matsudana*	No			10	7	Medium
Willow, Golden Weeping	Tristis'	*Salix*	*alba*	No			20	20	Large

Common Name	Cultivars	Genus	Species	Native	Roads	Parks	Est. Height (m) at Maturity	Est. Width (m) at Maturity	Stature
Willow, Peach leaf		*Salix*	*amygdaloides*	Yes	X	Y	9	6	Small
Yellowwood		*Cladrastis*	*Kentukea*	No	X	Y	14	14	Large
Zelkova, Japanese	'Gold Falls'	*Zelkova*	*serrata*	No	X	Y	11	7	Medium
Zelkova, Japanese		*Zelkova*	*serrata*	No	X	Y	15	15	Large

Appendix D- Invasive Species Not to be Planted

Common Name	Cultivars	Genus	Species	Native	Invasive	Roads	Parks	Est. Height (m) at Maturity	Est. Width (m) at Maturity	Stature
Cork, Amur		Phellodendr	amurense	No	Invasive	X	X	13	9	Medium
Locust, Black		Robina	pseudoacacia	Y-USA	Invasive	X	X	13	9	Medium
Maple, Amur		Acer	ginnala	No	Invasive	X	X	6	6	Small
Maple, Manitoba		Acer	negundo	Yes	Invasive	X	X	9	9	Medium
Maple, Norway	'Columnare'	Acer	platanoides	No	Invasive	X	X	14	4	Small
Maple, Norway (all species)		Acer	platanoides	No	Invasive	X	X	15	11	Medium
Maple, sycamore		Acer	pseudoplatanus	No	Invasive	X	X	12	11	Medium
Maple, sycamore	'Regal Petticoat'	Acer	pseudoplatanus	No	Invasive	X	X	12	11	Medium
Mountain-Ash, European		Sorbus	Aucuparia	No	Invasive	X	X	6	6	Small
Olive, autumn		Elaeagnus	umbellata	No	Invasive	X	X	8	6	Small
Olive, Russian		Elaeagnus	angustifolia	No	Invasive	X	X	8	6	Small
Pear, callery		Pyrus	calleryana	No	Invasive	X	X	9	9	Medium
Pine, Scots		Pinus	sylvestris	No	Invasive	X	X	15	9	Medium
Poplar, White		Populus	alba	No	Invasive	X	X	12	12	Medium
Tree of Heaven		Ailanthus	altissima	No	Invasive	X	X	15	11	Medium