County of Brant
Technical Tree Guidelines

Version 2025

Forward

These Technical Tree Guidelines provide technical standards and specifications regarding trees in the County of Brant. They serve as a roadmap providing technical direction for the County of Brant to pursue the four primary principles outlined in the Tree Protection and Enhancement Policy: To Plan, Protect, Maintain, and Enhance trees in the community forest.

These guidelines are provided for all interested parties as the County grows and develops. The guidelines are intended to work in conjunction with all divisions and departments of the County of Brant.

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1 Limitations

The County has the authority to adopt or utilize other applicable standards on a case-by-case basis. Where reference is made to the Ontario Provincial Standard Specification (OPSS), the Municipal specification (e.g., OPSS.MUNI), or any other related standard or law as they relate to the minimum requirement for trees, these technical tree guidelines are to be used as the governing specification to enhance those requirements and are to be used in consultation with the Forestry Supervisor or designate, as needed.

It must be understood that this document, The County of Brant Technical Tree Guidelines, is a living document and is intended to be reviewed at minimum every five (5) years. Conditions, regulations, research, etc. all change over time and this document must reflect the most optimal guidelines and industry standards based on the conditions of the day. These guidelines are deemed to be at the discretion of the General Manger of Community Services. **Bolded words** are defined.

2 Definitions

AIR SPADE / AIR KNIFE is a specialist excavation tool that uses compressed air to remove and break up soil with minimal damage to roots and underground utilities. It can be used for a variety of reasons including the alleviation of compaction, soil improvement, root inspection, and root location.

ARBORIST (Qualified) means a professional who possesses the technical competence gained through experience, related education, and training to provide for or supervise the management of trees and other woody plants in residential, commercial, and public landscapes, to the satisfaction of the County.

Related training or current certification shall be by one of the following:

- Certified Arborist' by the Ministry of Training, Colleges, and Universities (MTCU), or
- Certified Arborist or Tree Worker (for physical work) by the International Society of Arboriculture (ISA), or
- A person with similar proven qualifications and/or experience as approved, and under the County's sole discretion.

- Tree Risk Assessment Qualification (TRAQ, ISA) or equivalent is required for assessments that involve the identification of hazard trees / tree risk.

ARBORIST REPORT means the entire document to detail the subject tree(s) that includes the **Tree Inventory** and **Tree Preservation Plan** (if required).

ARBORIST SAFE WORK PRACTISES (ASWP) document is safe work guidelines, written by the industry, for the industry. The ASWP committee is a volunteer committee, established in 1999, whose purpose is to assist businesses, government agencies and safe workplace associations to improve the health and safety of the arboricultural industry.

BOULEVARD means the area between the curb and sidewalk.

BOUNDARY TREE means every tree whose trunk is growing on the boundary between adjoining lands is the common property of the owners of the adjoining lands." Ontario Forestry Act (Section 10.2.).

CAPITAL PROJECT means works within a municipal right of way or property undertaken or initiated by the County. This includes all new capital work, replacement, renewal, expansion, or rehabilitation works or other designated works related to municipal infrastructure needing expansion as per the Official Plan.

COMMUNITY FOREST is a term to describe all trees that exist within designed community boundaries. This can include trees/shrubs within forests, urban/rural roadsides, woodlots and woodlands, parks, cemeteries, municipal properties and greenspaces, and private properties.

COMPACTION means the process by which the porosity of a given form of sediment is decreased resulting from mineral grains being compressed together by the weight of overlying sediment, materials, or by mechanical means.

CONTRACTOR means the firm of Contractors, the company, or individual acting as the Contractor and having entered into a contract with the Developer/Owner/County.

COUNTY PROPERTY means any land or property owned by the County.

COUNTY TREE means any tree where any part of the Trunk Flare or trunk is entirely or partially located on **County Property** and includes any tree planted on **County Property** with or without the consent of the County.

CRITICAL ROOT ZONE (CRZ) means the area of soil around a tree where the minimum number of roots considered critical to the structural stability or health of the tree are located.

DIAMETER AT BREAST HEIGHT (DBH) means the diameter measurement taken at 1.4 meters (4.6 feet) above ground (unless otherwise noted for justified reasons).

DEVELOPMENT means the creation of a new lot, a change in land use, site alteration, the construction of buildings and structures requiring approval under the Planning Act, applications as defined with major development (OP, s2.7), or other works at the discretion of the County.

DRIP LINE means the imaginary line defined by the branch spread of a single plant or group of plants (ISA, 2015).

ENHANCE refers to strengthening the components of a natural area through management measures that increase stability, biodiversity, and long-term viability. In other contexts, it means to complement and strengthen the character of the County, community, neighborhood, site, or structure.

ESTABLISHMENT PERIOD means the time until a tree can survive without additional care, generally one year for every 2.5 cm of trunk diameter (ISA, 2015).

FORESTRY SUPERVISOR OR DESIGNATE means the Forestry Supervisor position within the Community Services department, or others designated by the **General Manager**.

GENERAL MANAGER means the General Manager of Community Services for the County of Brant and includes the General Managers alternate, designate, or successor.

GREEN INFRASTRUCTURE means an infrastructure asset consisting of natural or human-made elements that provide ecological and hydrological functions and processes and includes natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces, and green roofs. (Province of Ontario, 2018)

HAZARD(S) means a situation or condition that is likely to lead to a loss, personal injury, property damage, or disruption of activities; a likely source of harm. In relation to trees, a hazard is the tree part(s) identified as a likely source of harm by a **Qualified Person**.

HERITAGE TREE is a historical or culturally significant tree associated with a historic person, event, land, that is a tree designated under Part IV of the Ontario Heritage Act, or trees recognized as heritage trees by the Ontario Heritage Tree Program of Trees Ontario. This includes trees currently nominated to be a Heritage Tree by the County.

INJURY or injure means to harm, damage, or impair the above or below ground portions of a tree(s) and includes, but is not limited to, harm, damage, or impairment caused by changing grades around trees, compacting soil over root areas, severing roots, improper application of chemicals, improper or unapproved pruning, or the removal of branches and bark that would adversely affect the health or structure of a tree, and the failure to protect a tree.

LANDSCAPE PROFESSIONAL means a professional such as, but not limited to, a Landscape Architect or equivalent.

NATURAL HERITAGE SYSTEM means lands described and designated as Natural Heritage System in the County's Official Plan, as may be updated from time to time. The Natural Heritage System key natural heritage, key hydrologic features and supporting features including but is not limited to significant woodlands, significant wildlife habitat, wetlands, areas of natural and scientific interest, intermittent and permanent watercourses and vegetation protection zones.

PERSON means an individual, a corporation, a partnership, or an association.

POLICY means the Tree Protection and Enhancement Policy

PRESERVATION means the activity or process of keeping something valued alive, intact, or free from damage or decay.

PROTECTION means the act of protecting, or the state of being protected.

PROTECTED TREE means:

1. a County tree; or
2. a Significant or Heritage tree; or
3. a tree 10cm **dbh** or greater that is located on lands subject to **development** in the County.

QUALIFIED PERSON means an ISA Certified Arborist, ISA Board-Certified Master Arborist,

Ontario Qualified Arborist 444A, Registered Professional Forester, or verifiable skills and experience in arboriculture as deemed acceptable by the County.

ROOT PRUNING is the pruning of roots back to lateral roots to prevent root injury from construction/trenching activities within the root zone of the tree. Root pruning is also the process of pre-digging a root ball to increase the density of root development for transplanting.

RURAL AREAS means a system of lands within municipalities that may include **rural settlement areas**, countryside lands, rural lands, prime agricultural areas, **natural heritage system** features and areas, and resource areas.

RURAL SETTLEMENT AREAS refers to existing hamlets or similar existing small **settlement areas** that are long-established and identified in official plans. These communities are serviced by individual private on-site water and/or private wastewater systems, contain a limited amount of undeveloped lands that are designated for **development** and are subject to official plan policies that limit growth. All **settlement areas** that are identified as hamlets in the Greenbelt Plan, as rural settlements in the Oak Ridges Moraine Conservation Plan, or as minor urban centres in the Niagara Escarpment Plan are considered rural settlements for the purposes of these Guidelines, including those that would not otherwise meet this definition.

SIGNIFICANT TREE means a tree that is recognized because of its size, form, rarity of species, age, its association with a historical figure or event, and/or a tree that is distinctive in the community, or a combination of these criteria. These are trees that are not designated as Heritage trees. The largest tree(s) of each species could be considered significant with an acceptable level of risk.

SIGNIFICANT WEATHER EVENT means an approaching or occurring weather hazard with the potential to pose a significant danger to users of municipal properties, and highways within a municipality;

SITE PLAN CONTROL means lands subject to Site Plan Control under the authority of the Planning Act and as identified in the County’s Site Plan Control By-Law 14-23.

STRUCTURAL PRUNING is a pruning technique that proactively and gradually trains and establishes proper branching structure throughout a tree's crown. It uses a combination of

pruning techniques to selectively reduce (subordinate), redirect/train and gradually remove limbs and foliage to enhance tree vitality. Structural pruning is typically done on younger trees when it is most effective but can be applied to mature trees as well. When structural pruning is executed properly, it is proven to effectively reduce future branch and whole tree failures and maintenance costs.

THE COUNTY means the County of Brant

TREE means any species of woody perennial plant, including the root system, where the plant has reached or can reach a height of at least 4.5 metres at physiological maturity.

TREE CANOPY "tree canopy" means the collective cover of branches and foliage of all trees' crowns expressed as a percentage of the area of which they cover

TREE INVENTORY is a record of location, characteristics, and assessment of individual trees within a well-defined group. (ISA Best Management Practices: Tree Inventories)

TREE INVENTORY AND PROTECTION PLAN (TIPP) means a detailed plan that includes a map showing the surveyed subject trees (**Tree Inventory**) on a site plan. TIPP shows the proposed and existing structures (as required), preservation details, and all related information as outlined in section **6.2**.

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.

TREE RISK ASSESSMENT (TRA) is the systematic process used to identify, analyze, and evaluate tree risk.

UNACCEPTABLE RISK means a degree of risk that exceeds the tolerance of the owner, manager, or controlling authority.

UNSAFE CONDITION means a condition that poses or constitutes an undue or unreasonable hazard or risk to life, limb or health of any person on or about the property.

URBAN FOREST means the trees, forests, greenspace, and related abiotic, biotic and cultural components in areas extending from the urban core to the urban-rural fringe (Bardekjian, 2018). The County recognizes these areas to be the developed, developing, or '**settlement' areas** within the County of Brant.

SETTLEMENT AREAS means urban areas and rural settlements within municipalities (such

as cities, towns, villages and hamlets) that are:

1. built up areas where development is concentrated and which have a mix of land uses; and
2. lands which have been designated in an official plan for development in accordance with the policies of this Plan. Where there are no lands that have been designated for development, the settlement area may be no larger than the area where development is concentrated.

VETERAN TREE means a **Significant Tree** and are the three estimated eldest, largest, or most significant trees of a given species within the County Brant. These trees could be old, dilapidated, and well-aged trees that may have partially fallen but are still living with an acceptable level of risk.

WOODLANDS means forested areas, treed areas, and plantations that are at least 1.0 hectares or more in area with at least:

a) 1,000 trees of any size per hectare;
b) 750 trees, measuring over 5 cm at dbh, per hectare;
c) 500 trees, measuring over 12 cm at dbh, per hectare; or
d) 250 trees, measuring over 20 cm at dbh, per hectare.

A hedgerow or windbreak that meet the size and density criteria and which are at least 30 metres in width, are considered a woodland. A woodland does not include a tree located within a cultivated fruit or nut orchard, Christmas tree plantation, or plant nursery. For the purpose of the County's Good Forestry Practices By-Law, the boundary of a woodland shall be defined by the ecological limit of the canopy of the woodland and not by property boundaries. Where a woodland is dissected by an unforested corridor of less than 30 metres, the boundary of the woodland shall be deemed to cross the unforested corridor.

WOODLOT means forested areas, treed areas, and plantations that are at least 0.2 hectares and less than 1.0 hectares in area with at least:

a) 988 trees of any size per hectare;
b) 741 trees, measuring over 5 cm at dbh, per hectare;
c) 494 trees, measuring over 12.7 cm at dbh, per hectare; or
d) 247 trees, measuring over 20.3 cm at dbh, per hectare.

A hedgerow or windbreak that meets the size and density criteria, and which are at least 30 metres in width, are considered a woodlot. A woodlot does not include a tree located within a

cultivated fruit or nut orchard, Christmas tree plantation, or plant nursery. For the purpose of the County's Good Forestry Practices By-Law, the boundary of a woodlot shall be defined by the ecological limit of the canopy of the woodlot and not by property boundaries.

3 Introduction

The County of Brant, herein called 'the County', acknowledges the importance of trees as green infrastructure and their contributions to the community and environment. Fostering a resilient and biodiverse **Community Forest** throughout the County provides environmental benefits, promotes public health, enhances community well-being, contributes to a vibrant and livable community and enhances sustainability. By the County prioritizing the planning, protection, maintenance, and enhancement of its **tree canopy**, these efforts are recognized as crucial initiatives that highlight the benefits that trees provide to the community.

The County has determined an overall **tree canopy cover** of 26% as of 2022 and is continually working towards an increase to achieve and maintain a goal of 30% on all developed and developing lands within the County.

3.1 Purpose and Objectives

These guidelines were initiated following the development of the Tree Protection and Enhancement Policy and are designed to provide guidance and standards for all stakeholders relating to trees within the County. These guidelines are intended to apply to all **Protected Trees**, and to work in conjunction with other County policies, standards, and guidelines (e.g., Development and Engineering Standards, Official Plan, Environmental Impact Studies and Environmental Implementation Plans Terms of Reference Submission Guidelines). The objective of these **Technical Tree Guidelines** is to provide clarity related to detailed technical requirements on planning, preservation, maintenance, and enhancement of trees and tree canopy; and should be considered as the primary reference document solely with respect to technical matters.

3.2 Monitoring and Evaluation

The General Manager of Community Services, and their designates, will have the authority to make changes to these guidelines as recommended through consensus within the Community

Services, Operations, Planning, and Development Departments. These guidelines, Tree Enhancement and Protection Policy, Street Tree By-Law, and Good Forestry Practices By-law are recommended to be reviewed internally every five years.

It is suggested to have periodical tree protection meetings with the public, contractors, and developers. These meetings will be vital to express the importance of trees and to reinforce the preservation and compensation requirements including past goals met with notable achievements related to trees and natural vegetation. These meetings will also allow for concerns and conflicts that arise and require attention to be discussed and resolved.

4 County Tree Maintenance Guidelines

This section outlines tree maintenance standards and requirements for County-owned trees. These trees include, but are not limited to boulevard trees, trees within the right-of-way, park trees, cemetery trees, etc. All persons performing work under these guidelines shall work in accordance with the **Arborist Safe Work Practices** (ASWP).

4.1 Tree Removal

While tree preservation is preferred, it may not always be safe or reasonable to retain a tree.

- Trees will be removed due to their non-correctable, unacceptable level of risk.
- Trees shall not be removed due to complaints about any non-threatening natural occurrence including but not limited to falling leaves, seeds, fruit, small twigs, or for other reasons such as growing grass, exposed roots, etc.
- Requests for removal by residents will be assessed by **Qualified Person** on a case-by-case basis and will be subject to compensation as per the County's Fees and Charges By-law.
- Removals shall only be conducted by an **Arborist, Qualified Person**, or qualified County staff.
- All trees are to be removed in accordance with ISA Best Management Practices.
- All stumps shall be cut as low to the ground as possible, in preparation for potential stump grinding. It should be anticipated due to the nature and location of these trees that they may contain foreign material (i.e. fenceline, nails, etc.).
- Upon completion of tree removal, pruning or chipping; all branches and wood chips shall be removed from the site and the area shall be raked and swept clean.

4.2 Tree Risk Assessment and Inspections

Tree Risk Assessment (TRA) is the systematic process to identify, analyze, and evaluate tree risk (ISA). TRA is used in a municipality to determine if a tree requires removal, or other risk mitigation measures.

- Tree risk assessments (TRA) may only be performed by qualified **Arborists** with a valid Tree Risk Assessment Qualification (TRAQ) or equivalent under the sole discretion of the **Forestry Supervisor or Designate.**

- Tree Risk Assessments, when performed on County trees, should use a default one to three (1 to 3) year timeframe unless otherwise justified.
- County trees will be pruned to mitigate risk as a first option before removal is considered. However, if after pruning or other mitigation, with a residual unacceptable risk assessment of “High” or “Extreme”, the tree shall be removed as soon as possible.
- Level 1 (drive-by) risk assessments should be performed after **significant weather events** for mature and overmature treed areas.
- Level 1 (drive-by) assessments will be the primary assessment level for Right-of-way trees outside of **settlement areas.**
- Tree inspections may be conducted by individuals not trained in TRA, but individuals not trained in TRA shall only inspect trees for works that do not require evaluating tree risk such as for dead trees, clearance pruning, sightline issues, inventory updates, and stumping.
- The County’s tree inventory shall be updated every seven to ten years, or when work is performed on a tree, including inspections.
- Inspections shall be conducted on each **County Tree** (outside of woodlands) at a minimum of once every seven years. When applicable, inspections may be carried out simultaneously with Block Pruning (Section 4.4).
- Inspections for resident complaints must be conducted within 48 hours of the complaint being received. Work will be prioritized based on the level of risk assessed by the **Forestry Supervisor** or Designate.

4.3 Pruning

Pruning refers to the controlled removal of branches and/or tree parts to meet the following specific objectives while adhering to established arboricultural standards:

- To enhance and maintain the health of the tree
- To remove limbs and branches that interfere with structures, street lighting, pedestrian and vehicle traffic, utility lines, and traffic signals or signs

- To support the natural growth pattern of the tree species
- To remove dead, damaged, and decayed branches
- To maintain the tree's structural stability and balance

Pruning tasks involve the removal of dead, dying, diseased, decayed, damaged, or overcrowded branches from the tree's crown, as well as the removal of unwanted growth from the lower trunk that may obstruct sightlines. Additionally, proper pruning on new trees aims to train, establish, and enhance the tree's structure to improve long term health and stability.

Trees require specific pruning needs based on the species, age of the tree, and based on its surroundings. As such, County trees must only be pruned by trained professionals with training and education in tree pruning with a minimum of requiring an **Arborist** to oversee any tree pruning operation.

4.3.1 General Pruning Requirements

- All pruning activities should follow proper arboricultural practices in accordance with the American National Standards Institute (ANSI) A300 (Part 1)-2008, ISA Best Management Practices for pruning (2019), and requirements outlined in section 4.5.
- All pruning works shall be overseen by an **Arborist.**
- Prune trees to remove dead, dying, decaying, and interfering limbs.
- Prune trees to satisfy clearance requirements as outlined in **section 4.3.2.**
- No more than 20% of the canopy shall be removed within one growing season.
- The pruning of Oak trees shall be avoided during the growing months to prevent Oak Wilt. If pruning is unavoidable, pruning paint shall be used to seal pruning cuts.
- Trees shall not be pruned with the use of a flail mower/brusher unit or other mechanical device other than a chainsaw, pole-saw, or pruning saws.
- Any limbs over homes, roadways, fences and flower beds, etc. that cannot be handled and dropped safely, will be carefully roped and lowered by hand using accepted industry practices.
- Inspect trees for health, defects etc. and update the County’s tree inventory as tree

pruning activities occur.

- Trees that are found to have a high likelihood of whole tree or part failure, require removal, further assessment, or pruning outside the scope of work shall be reported immediately to the Forestry Supervisor or Designate.
- Where trees are known to be diseased, pruning tools will be disinfected with alcohol or an approved substitute between trees where there is a known danger of transmitting the disease on tools.
- Any sightings of invasive insects will be promptly reported, captured specimen if possible.
- Topping, heading, tipping, or rounding over refers to the indiscriminate widespread application of heading cuts, inter-node cuts and/or the cutting of branches to lateral branches that are not large enough to assume the terminal role and shall be prohibited in this contract unless otherwise approved in writing.
- Lion's Tailing, the excessive removal or thinning of the inner portion of the crown or branches such that the outermost branches or foliage is retained. shall be prohibited unless otherwise approved in writing.

4.3.2 Clearance Pruning Requirements

- Roads: 4.0 to 6.0 metres (m) (13-20 feet) of clearance depending on location.
    - 4.0 m for residential roads
    - 5.0 to 6.0 m for arterial roads
- Sidewalks and pathways: 2.5 to 3.0 m (8 to 10 feet).
- Structures (buildings): 3.0 m (10 feet)
- Traffic signals and signal lights: no less than 2.5 m (8 feet) around light and provide visibility in accordance with applicable legislation, policies and guidelines.
- Traffic signs and signals should have a minimum of 30.0 m of unimpeded view for approaching vehicles.
- Regulatory and warning signs: shall be cleared to provide visibility in accordance with

applicable legislation, policies and guidelines

- Street Name Signs: shall be cleared to provide visibility from 15.0 m (50 feet) from street
- Streetlights shall be cleared to permit maximum illumination of roadways and sidewalks while maintaining the natural form of the tree species. Branch shortening or pruning to direct growth to provide the minimum clearances shall be favoured over branch removal if retention of the branch does not conflict with the other pruning objectives
- Over public walkways, clearance will exceed 2.5 m (8 feet)
- On residential properties no branches overhanging walkways, drives, or patios will be lower than 2.0 m (6.6 feet)
- Hydro services: shall be cleared to minimum industry standards
- Phone, cable and other non-conductive utility lines: no less than 0.5 m (1.6 feet) clearance around the wires
- Where a deciduous tree is less than 10.0 m tall the minimum clearance shall be no more than 25% the total height of the tree
- Prune trees to maintain an unobstructed 3.0 m radius around fire hydrants
- When trees are pruned for clearance, the canopy does not need to be balanced on all sides.

4.4 Block Pruning

Block pruning is a proactive maintenance strategy intended to consolidate work on **County Trees** to enhance efficiency, reduce risk, and minimize the amount of tree defects in the long-term to increase tree longevity and canopy coverage. Block pruning is to be conducted within the County's **settlement areas** and will include the pruning of boulevard trees, trees within the municipal right-of-way, park trees, and trees that exist on other municipal properties. Trees requiring pruning will be prioritized and scheduled accordingly.

- Planned pruning operations should occur in the late winter or early spring before trees flower (February to June). Pruning can be completed anytime but avoid larger pruning

cuts on trees after July/August to allow for optimal wound closure.

- Pruning of Oak trees must be avoided between April and November to reduce the risk of Oak Wilt. If this is not possible, application of pruning paint is required.
- All trees within a “block” shall be inspected at the time of pruning for defects, disease, and overall health. Not all trees will require pruning, but all trees shall be inspected.
- The County’s tree inventory shall be updated at time of pruning and/or inspections.
- Block pruning shall be scheduled so that trees are pruned/inspected every 7 years within settlement areas.
- Trees shall be pruned and inspected in adherence with industry standards and requirements outlined in section **4.2** and **4.3,** and by requirements set out in section **4.5.**

4.5 Tree Maintenance Requirements by Age Class

1. New Trees (0-3 years after planting)

New trees in their establishment period experience the most stress. Their needs vary based on factors such as species, soil type, and health, which may require additional care (e.g., watering, pruning, mulching) to ensure they survive and thrive with minimal assistance after this establishment period. Typically, all work is performed from the ground.

- Interval One: Typically, the first year after installation.
    - If under warranty and not assumed by the County of Brant (new subdivisions), trees shall only be maintained by contractor / developer.
    - Trees shall be mulched to extend to or just beyond root ball (**drip line**).
    - Trees shall be watered within one week of planting and throughout the establishment period at a minimum of 4 times per growing season (ideally 8-10 times), or weekly pending natural rainfall and resources with 20-40 litres of water each time.
    - Water bags or watering aids/systems are to be utilized where necessary.
    - Stakes and rodent guards (if present) are removed after 2 years pending stability of tree.
- Interval Two: Typically, the third year after planting or recently out of warranty.
    - Structural pruning is to be performed to establish one strong central leader, small

branch to trunk ratios, and lowest permanent branch**. Subordinate**[1] pruning or **leader**[2] definition as needed if tree has good **vitality**[3]**.**

- Pruning dose can be as high as 50% if tree has good vigour and vitality.
- Mulch is encouraged to be loosened and added to the dripline if required.
- Watered as needed. Water required if still stressed (e.g., low vitality, new apical growth is less than 4cm throughout canopy, poor reaction wood).
- Waterbags (if installed) should be removed after two or three-years post planting.

[1] Subordinate – prune to reduce the size and ensuring growth of a branch in relations to other branches or leaders.

[2] Leader - Primary terminal shoot or trunk of a tree.

[3] Vitality – Overall health. Ability of a plant to deal effectively with stress.

2. Young Trees (4 to 17 years after planting)

Young trees are typically trees that have completed their establishment period. They are generally up to 7 meters tall, less than 20 cm **DBH**, and usually up to 20 years old or 20% of their life expectancy. These guidelines may vary depending on species, soil type, and health.

- Interval Three
  - 7-10 years after planting – <10cm **dbh**
  - Prune for structure, lowest permanent branch identification, subordinate limbs >50% of stem.
  - Mulch to be loosened and topped up.
- Interval Four
  - 14-17 years after planting – 10-15cm **dbh**
  - Prune for structure, clearance, subordinate limbs >50% of stem, and deadwood.

3. Mature Trees

Mature trees are established specimens typically ranging from 7 to 25 meters in height, usually with a **dbh** of 20 to 80cm. Work shall be conducted or supervised by **Arborist**s, using aerial bucket trucks, or climbing **Arborist**s, if required. These trees are pruned every 5-7 years on a rotational basis.

- Trees shall be pruned to satisfy County Road and sidewalk clearance requirements and County pruning standards as outlined in Section **4.3.**

- Pruning dose for older trees are typically limited to removing deadwood and weight reduction as needed.
- Pruning dose can be up to 25% of canopy depending on species.
- Trees are to be inspected for defects at this time by the contractor using a level 3 **TRAQ** inspection.

4. Veteran Trees

- Veteran trees are typically over 80cm **DBH** and/or have cultural or historical significance.
- Trees shall be pruned and/or inspected every 5-7 years on a rotational basis, however the pruning dose shall be limited to work that is absolutely necessary.
- Work shall be conducted or supervised by **Arborists**, using aerial bucket trucks, or climbing **Arborists**, if required.
- Cable support system may be prescribed as needed.
- Retrenchment pruning, mulching, and other tree preservation methods may be prescribed.
- Trees with historical significance may be designated as a Heritage tree

4.6 Private Trees

- Trees located completely on private property are the responsibility of the property owner. The County does not perform maintenance work on privately owned trees.
- Where private trees impact public lands, the County may prune privately owned trees according to good arboricultural standards to clear tree parts from interfering with street lighting, pedestrian and vehicular traffic, and any County-owned pathway or publicly used roadway.
- Trees, shrubs and the branches, limbs and parts thereof on private property which create an Unsafe Condition due to decay, disease, or being damaged may be in violation of the County's Property Standards By-Law #205-02. An order to correct the unsafe condition may be issued.

4.7 Boundary Trees

- Trees on the property line (i.e., **boundary trees**, or **trees common property**) of private properties shall not be injured without written approval from the abutting property owner (i.e., co-tree owner) as per the Ontario Forestry Act.
- In situations where the tree is growing close to a property line shared between the County and the private property owner, the maintenance responsibility may be determined by the location of the base of the tree.
- Any tree where any part of the tree trunk or trunk flare is entirely or partially located on County property, and includes any tree planted on County property with or without the consent of the General Manager, is deemed a **County Tree** and is the responsibility of the County to maintain.

5 Tree Planting Details and Criteria

The following details outline the requirements for the planting and establishment of trees for County owned lands and lands subject to development.

All plant material shall be nursery grown and meet the horticultural standards for grading and quality according to the Canadian Standards for Nursery Stock. Only nursery stock that has been propagated vegetatively or from seed shall be utilized. Native plant material collected from the natural environment shall not be accepted.

Tree planting operations should reference the Ontario Landscape Tree Planting Guide published by the Landscape Ontario Horticultural Trades Association (2019, https://landscapeontario.com/ontario-landscape-tree-planting-guide). All tree planting must adhere to the practices prescribed for planting trees as referenced in this guide. In addition to those details to install trees, design criteria listed below must be adhered to for all trees planted on County property:

5.1 Tree Planting Specifications

For species selection, refer to **Appendix 1 – County of Brant Approved Tree Species**

Refer to **Appendix 5** for the County's Tree Planting Details.

- The County must be notified 48 hours prior to tree planting commencing.
- Accept and Reject Criteria at end of warranty shall be adhered to as found in Appendix 2 and 3
- In order to maximize species diversity, a diversity rule of 30:20:10 (Family:Genus:Species) is required for all tree planting projects.
- No more than five of any one species or variety is to be planted in a row. Trees species should be matched either side of the street for a maximum of 10 matched trees to provide a 'closed canopy' effect at maturity.
- The County's Landscape Designer reserves the right to provide feedback on proposed species selected based on the current County Tree Inventory, approved Species List (Appendix A), and current industry trends and patterns as it relates to disease and pests.

- Planting must be completed within dates below:
  - Spring – April 1 through to June 30.
    - Watering bags or Tree Diaper® required to be installed for spring plantings.
  - Fall – September 1 through to November 15.
- Hardier trees, tolerant of aerosol salts, are recommended for east and south sides of roads exposed to prevailing winds.
- Some nut trees (black walnut, European horse-chestnut), fruit trees, and Lindens are to be avoided next to driveways or prolonged parked vehicles due to potential damage from falling nuts and/or sap secretion.
- Trees must be watered at the time of planting, during the warranty period, and until established.
- Trunk flare must be visible near, at, or above grade at end of warranty.
- The wire basket top ring shall be removed from the top of root ball at time of planting.
- Natural fiber burlap and ties are to be removed from trunk of tree, and half of the root ball at time of planting.
- **All** synthetic burlap and ties shall be removed from the entire root ball and removed from planting hole.
- No material shall be on the trunk except for ties related to staking if needed.
- Soil within the planting hole must be turned/loosened to a minimum of 20 cm beyond the root ball.
- Mulch (10 cm thick) shall extend out to the dripline while being kept away from the trunk. Mulch shall be shredded bark, free from twigs, leaves, branches and other foreign material.
- Trunk to be straight/plumb with no defects.
- Wooden stakes and pliable/biodegradable ties are to be used.
- New tree acceptance requires 4 cm of new growth, through 80% of canopy or upon

sole discretion of the County.

- New tree acceptance requires no more than 25% die-back in the canopy.
    - Trees are to be put on an additional one-year warranty until acceptable health is achieved, or
    - A replacement tree is required if the above standards are not met within established acceptance timelines.
    - The trees to be replaced must be replaced within 20 days of written notification, or at the discretion of the County.

5.2 Spacing and Offsets

Trees should be planted in conformance with the following minimum offsets (spacing) which are to be included on the Landscape Plans. Root barriers may be required to be installed as practicable at infrastructure edge during **development** and/or at the time of planting when a tree is planted closer than the minimum offset to infrastructure to prevent root conflicts. Refer to Appendix 9 – Example for Tree Root Barriers.

- Plant per ESA Guidelines - only Small trees shall be planted under or within 4.5 metres of high voltage overhead utility lines or poles. Small or Medium trees are permitted to be planted between 4.5 metres to 7.6 metres from lines or poles. Small, Medium, and Large trees may be planted 7.6 metres or farther from overhead lines or poles.
- No tree is to be planted closer than 3.6 metres to the doors or 1.5 metres from the sides of an above ground hydro vault (transformer).
- Trees may be planted 0.5 metres (measured horizontally) from buried street light cable, not closer than 0.9 metres (measured horizontally) from other buried electric cables and not closer than 0.3 metres (measured horizontally) from buried telephone and/or TV service cables where their location is known.
- No tree is to be planted closer than 2.0 metres to a driveway or 0.5 metres from a lead sidewalk going into a property
- No tree is to be planted closer than 4.0 metres to the front and sides of a fire hydrant.
- No tree is to be planted closer than 0.3 metres (measured horizontally) to a water main,

or 0.7 metres from a shutoff.

- No tree is to be planted closer than 2.0 metres (measured horizontally) to a gas line.
- No tree may be planted closer than 2.0 metres (measured horizontally) to a sanitary sewer.
- No tree shall be planted closer than 4.0 metres to a street light pole
- No tree is to be planted closer than 10.0 metres in line of sight to a stop sign or Railway Crossing Sign on a residential street only (i.e. not a collector or arterial road).
- No tree is to be planted closer than 20.0 metres in line of sight to a stop sign or traffic signal light or Railway Crossing Sign on any collector or arterial road.

5.2.1 Minimum spacing for new trees

- Large trees – 10.0 metres
- Medium trees – 7.0 metres
- Small trees – 5.0 metres
- Boulevards less than 9.0 metres in length are to have one large growing tree centered.

5.3 Soil Requirements

Soil quality, volume, and depth play a crucial role in the development of trees, alongside other important factors such as proper drainage, sufficient water, and nutrient availability.

- The topsoil that trees are planted in must be a fertile, natural loam with organic matter content of at least 4% for clay loam soils and 2% for sandy loam soils, to a maximum of 25% by volume.
- Planting Mix is created by mixing topsoil from on-site with compost and superphosphate in the following ratio per cubic metre:
    - Topsoil 0.7 (m^3)
    - Compost 0.3 (m^3)
    - Superphosphate 0.6 (kg)
- Compost shall be derived from organic matter or cow or sheep manure and shall have a

minimum 10% to maximum 20% organic matter.

- The topsoil should be loose, friable, and free of subsoil, clay lumps, stones, roots, or any other undesirable material. It must also be devoid of litter and harmful substances that could impede plant growth, and should not contain sod clumps, crabgrass, couch grass, or other noxious weeds.
- The pH of the topsoil should range from 6.0 to 7.5.
- Soil amendments may be required on sites with poor quality soil or lack of sufficient parent soils.
- Fertilizer used at the time of planting shall be granular form, dry, free flowing, free of lumps and shall consist of superphosphate, with minimum content of 20% phosphoric acid.
- All fertilizer shall be supplied in bags bearing the manufacture's label indicating mass and chemical composition.
- The County may request soil testing be conducted by the contractor / project manager.
- A minimum topsoil depth of 900 mm is required for tree planting, provided that the root ball is placed on a compacted base where the root collar is flush with finished grade. A lesser depth may be acceptable at the discretion of the County.
- A minimum soil volume of 30 m^3 is necessary to support the healthy growth of a tree that will ultimately reach a trunk diameter of 40 cm **dbh.**
- For smaller tree species or in situations where root zones are shared and trees can be planted more closely together, a recommended minimum soil volume is 15 m^3.

6 Plans and Compensation

This section outlines the plans and requirements for preserving and protecting trees and tree canopy during **Development** projects that may affect **protected trees** that are on or adjacent to lands subject to development or construction in the County of Brant. The primary industry guideline for tree preservation is the ANSI A300 – Management of Trees and Shrubs During Site Planning, Site Development, and Construction. This guideline is to be used alongside the County's Street Tree Bylaw, Good Forestry Practices By-Law, and the County of Brant Tree Protection Guide, which provide additional information and protective measures.

6.1 Development Requirements

1. No person shall injure or remove a **Protected Tree** without written approval from the County.
2. Any **Development** that may have an impact on **Protected Trees** is required to submit an arborist report, which shall include a **Tree Inventory and Protection Plan (TIPP),** unless otherwise stated by the County. The report and plan shall be prepared in accordance with the criteria found in section **6.2 Tree Inventory and Protection Plan Requirements** within the Tree Guidelines.
3. **Protected Trees** permitted to be removed shall have compensation valued based on the methods using the Tree Compensation Table found in section **6.4.1.**
4. **Protected Trees** injured or damaged shall be compensated for at a rate of 50% of the County's Tree Compensation rates, or at the sole discretion of the County.
5. The County may require a security deposit (submitted as a Letter of Credit or other accepted methods such as credit card, certified cheque, or bank draft) in an amount sufficient to ensure the protection of County trees and/or the replanting of trees required as a condition of development. The County may hold this security deposit until the completion of the work or the planting of the trees. The deposit will be released once the trees are confirmed to be healthy and in a state of vigorous growth after the specified period, typically two years.
6. A **Tree Conservation worksheet** will be required for all building permit applications and will determine if a Tree Preservation and Protection Plan is required.

- If there are no Protected Trees within six metres of construction or limits of disturbance, a Tree Declaration letter (e.g., email), based on the work and plans, is required to validate the claim.

7. If previous or current property owner removes or has removed **Protected Trees** within 2 years before a development application, a private independent Arborist or **Qualified Person** shall be retained to prepare a report to best determine the appropriate tree compensation based on (but not limited to) stumps, historical “Google” photo interpretation, referencing the Tree Compensation methods found in this document. All compensation costs are the responsibility of the current property owner.
8. In instances where the replacement or relocation of trees cannot be reasonably accommodated on the development site, the owner/development applicant shall pay tree compensation (i.e., cash-in-lieu) to the County at a rate approved in the County’s Fees and Charges By-Law for trees identified in the environmental impact study, environmental implementation plan and/or arborist report and tree preservation plan, as those that cannot be preserved.
9. Trees on the property line (i.e., boundary tree, trees common property) of private properties shall not be injured without written approval from the abutting property owner (i.e., co-tree owner) as per the Ontario Forestry Act.
10. County-initiated capital projects shall re-plant trees within the project area as space is available, or on County land off-site. Cash-in-lieu compensation is recommended but not required.
11. All development applications with Tree Protection requirements must have a pre-construction meeting with their arborist to detail the preservation requirements.
12. Plans for subdivisions, site plans, and capital projects for infrastructure improvements where trees are to be preserved or protected, will have a pre-construction meeting with the Constructor and the County. Consent applications where there could be an impact to the **Natural Heritage System** may also require a construction meeting.
13. On large properties or on properties where a portion of the land is to be developed, where Protected Trees do not include trees that are part of a **Natural Heritage**

System or Woodland, a TIPP or Arborist Report will not be required if the tree is at least 10 metres from the construction limit or area.

14. Trees identified for removals are subject to conditions of provincial and federal Acts including but not limited to the Migratory Birds Convention Act, and Endangered Species Act.
15. Wherever possible, existing vegetation should be preserved and incorporated into new development areas.
16. Tree inventories, observations, and/or subsequent updates for protection or compensation, must be made within 18 months of the proposed work.
17. Detailed information and direction on trees in **Natural Heritage Systems** is provided in the County Environmental Impact Study (EIS) and Environmental Implementation Plan (EIP) Terms of Reference Submissions Guidelines. A Study and/or Plan in accordance with these guidelines may be required to be submitted and approved by the County's Policy Planning Unit of Development Services, prior to injuring or removing any trees within these areas.

6.2 Tree Inventory and Protection Plan

A Tree Inventory and Protection Plan (TIPP) is required to be completed by a **Qualified Person** and submitted to the County for review and approval by Forestry staff prior to the start of construction or **Development** works.

The TIPP should include, but is not limited to:

- Arborist Report
- A Complete Tree Inventory and Protection Plan on a current property survey
- Compensation Plan
- Where applicable, an overview of an EIS and/or EIP completed for the subject **Development**.

6.2.1 Arborist Report

The Arborist Report must contain the following components and be formatted as a PDF:

- Title page including:

- Property Address
- Applicant's Name
- Author's Name, Title, Qualifications and Company Name
- Date

- Scope of Project including:
  - Project type
  - Number of trees on property and number of trees affected by project
- Comments including:
  - Site condition and tree condition in general
  - Mitigation and preservation procedures such as compaction alleviation techniques or root exploration and pruning methods
  - Proposed tree work requirements
  - Any flora or fauna species at risk observed, such as Butternut or Redheaded Woodpecker, or lack thereof
- Summary and Conclusion including
  - Number of trees removed and/or affected by project
  - Signed letter of consent by both owners for any shared or Boundary Trees to be removed

6.2.2 Tree Inventory and Protection Plan (TIPP)

A **TIPP** is a record of the attributes (location and characteristics) of individual trees within a defined geographic area. The premise for a tree inventory is trees are considered assets and are to be managed as such. The TIPP must contain the following components and be formatted as a PDF.

A document in table format (Excel) showing:

- All inventoried trees on the subject site, as well as on adjacent properties within 6.0 meters of the subject property limits.

- Species Name in both common and botanical forms
- Size (dbh 1.4m above ground)
- Size of TPZ (Tree Protection Zone in meters)
- Tree Ownership – private, County, boundary tree.
- Health, Structure, and Overall Condition (ratings to be used: Good, Fair, Poor, and Dead)
- Recommendations – retain, relocate, remove
- Site Comments (e.g., cavity, pests and diseases, hanger)
- Preservation Comments (e.g. root exploration and pruning using Air Spade or hydro vac, etc.)
- Future tree management or monitoring recommendations
- Compensation – monetary figure and/or number of trees (as required, can be submitted in a separate table or document). See **section 7.3** for compensation requirements

A map showing:

- All inventoried trees, numbered on plan with a unique identifier that must correspond with the tree inventory.
- Entire plan must be overlaid on a current survey or recent aerial photograph with proposed project shown for reference.
- All removals to be marked with an X or by colour clearly identified on the plan.
- All Tree Protection Zones (TPZ) noted along with minimum distances measured from the outside edge of trunk.
- Any additional ground protection that is required
- Designated travel corridors and storage compounds, portable rooms/buildings, and any other facilities for on-site work for both workers and equipment
- Existing structures and grading information if applicable (original grades, proposed grades, extent of cut and fill areas, areas of potential disruption to surface drainage).
- Heritage trees
- Natural Heritage Features, forested areas (Woodlands and Woodlots) regulated under

the Good Forestry Practices By-Law including any applicable vegetation protection zones

6.3 Street Tree Plan

In certain circumstances, street trees may be the primary or sole tree establishment component of a site development project. This may be the case during streetscape renovation, large-scale utility works or other capital projects.

All Street Tree Plans must be prepared and stamped by an OALA. Street Tree Plans must, at a minimum:

- Provide a list of proposed street tree plantings using the County of Brant Approved Trees (Appendix 1)
- All plantings shall be included in a Planting List. The Planting list shall contain the following information for all plantings:
    - quantity, symbol, botanical name, common name, size, minimum spacing, sun requirements, species composition, native to North America (Y/N), and any additional information as required by the County.
- A diversity composition of no more than 10% of one species, 20% of the same genus, and 30% of the same family shall be achieved.
- All trees used for plantings shall be first-quality, nursery grown stock of minimum 50mm caliper for all trees, balled and burlapped.
- Outline a warranty and maintenance schedule for street trees.
- Street Tree Plans are considered landscape requirements and are not to be a part of Tree Compensation for tree removals on the site.
- The estimated cost of implementing proposed tree plantings must also be outlined.
- All Street Tree Plans shall contain and clearly display the following information:
    - Proper street names; lot configuration and lot numbers;
    - Key map (full key on overall drawings);
    - Title block including: north arrow; original drawing date; date of any and all revisions; scale of drawing (bar scale and written scale); name, address, phone number and e-mail of person or firm preparing the plan;
    - All municipal services, gas, telecom & hydro;

  - Locations and tree species proposed;
  - References to applicable standard drawings;
- Location Requirements:
  - At least one tree shall be planted within or along the frontage of each semi-detached and single-family lot, and two trees per flankage.
  - For multi-family lots, blocks, and parkland one tree shall be planted for every 500m^2. For townhomes or rowhouses, one tree shall be planted for every 2 units, or one tree for every 500m^2, whichever is greater,
    - Tree compensation locations for area requirements (1 per 500m^2) that cannot be accommodated on site shall be coordinated with a County Representative.
  - For all other boulevards, street trees shall be consistently spaced along their respective frontages using approved spacing requirements.
  - If conflict exists between planting locations and utility infrastructure so that the standard tree per frontage cannot be achieved, the developer shall either plant the displaced trees in an alternative location within the subject lands, on alternative lands approved by the County, or as a cash-in-lieu payment to the County's Replacement Tree Planting Fund.

The County may require a letter of credit to secure the implementation of the STP and may draw upon the letter of credit to conduct tree planting and/or subsequent inspections.

6.4 Tree Compensation Plan and Securities

Where replacement of trees and vegetation is required, such as for the removal of **Protected Trees** or trees regulated by the County's Good Forestry Practices By-Law, the applicant shall submit a Compensation Plan. The Compensation Plan can be integrated into other plans such as a Tree Inventory and Protection Plan, Environmental Information Study, or Arborist Report. Compensation can be in the form of re-planting on the lands subject to the removal, as a cash-in-lieu payment to the County's Replacement Tree Planting Fund, or a combination of both. Cash-in-lieu for replacement trees shall be based on a value approved by the County's Fees and Charges By-Law and/or a cost estimate for the planting and maintenance of all replacement trees and vegetation for a minimum period of two years. Tree compensation

requirements differ depending on the location of the trees:

6.4.1 Individual Trees

For individual trees that are removed outside of a **woodlot** or **woodland**, the larger the diameter at breast height of the tree removed, the greater number of replacement trees are required. Refer to the table below for compensation amounts as approved in the County of Brant Official Plan. Replacement trees would not be required for dead, dying or hazardous trees, or other trees considered to be a noxious weed (i.e. Buckthorn).

Table 1: County of Brant Replacement Tree Compensation Chart

Size of tree to be destroyed	Number of Replacement Trees
< 10 cm diameter at breast height	None
11 to 29 cm diameter at breast height	2
30 to 39 cm diameter at breast height	3
40 to 49 cm diameter at breast height	4
50 to 59 cm diameter at breast height	5
> 60 cm diameter at breast height	6 +1 replacement tree per every 10 cm of diameter removed

6.4.2 Woodlands & Woodlots

Trees located in Natural Heritage Features and areas such as **Woodlots and Significant Woodlands** are regulated by the County of Brant's Good Forestry Practices By-Law #70-21 and must obtain a permit prior to tree removal. Some development processes are exempt from the Good Forestry Practices By-Law #70-21 which is stated under section 4, exemptions:

"The provision of this By-Law shall not apply to the following:

- *The injuring or destruction of trees imposed after December 31, 2002, as a condition to the approval of a site plan, a plan of subdivision or a consent under Section 41, 51 or 53, respectively, of the Planning Act or as a requirement of a site plan agreement or subdivision agreement entered into under those sections.*
- *The injuring or destruction of trees imposed after December 31, 2002, as a condition to a development permit authorized by regulation made under Section 70.2 of the Planning Act or as a requirement of an agreement entered into under the regulation."*

In these cases, applicants must adhere to other processes administered by County's Policy Planning Unit of Development Services.

6.4.3 Security Deposit

Compensation shall be paid and collected and held as a security deposit before any permit (undertaking and release) is approved. The security deposit will be returned two years after the work is completed or when verified that the replacement trees are planted and in acceptable condition. The property owner is responsible for requesting and collecting this deposit upon approval from County staff.

7 Tree Protection During Development

There are many impacts from construction and development that may cause permanent negative damage to trees within the construction / excavation areas, along staging and lay-down areas, and construction access routes. Proper planning and implementing tree protection measures before, during and after construction and/or development is crucial to minimize negative impacts from related activities.

Types of Tree Damage

There are many impacts from construction and development that may cause permanent negative damage to trees within the construction zone, along staging and lay-down areas and construction access routes. Considerations for activities that could cause these types of damage are identified in this section.

- Construction machinery can cause physical injury to the roots, trunk and crown of a tree when they are operated near a tree.
- Poor pruning practices may also result in tree injury. Broken branches, trunk wounds, or other physical wounds are permanent and may be fatal to the tree.
- Root cutting from excavation can occur when digging within the dripline of the tree. Root cutting can significantly impact the health and stability of a tree. Most tree roots are found in the upper 30 to 60 cm of soil. If anchorage roots over 10cm in diameter are damaged the tree may become destabilized and fall over. If cutting tree roots is unavoidable, a certified arborist must approve and oversee the root cutting. Fibrous roots, which are responsible for the uptake of nutrients and water, found in the top 30 cm of soil, are easily severed during construction. Hand digging, low pressure hydro-vac, or air spade exploratory digging will aid in determining the extent of the root system and what steps will need to be taken to minimize impacts.
- Soil compaction happens when storage of materials or operation of vehicles or machinery cross over the rooting area, especially when the soil is wet, and is one of the leading causes of tree decline. Compaction reduces pore space in the soil which contains the water and air necessary for tree growth. This

reduces soil function with the potential to cause a decline in the health of the tree, killing off many of the feeder roots which sustain the tree.

7.1 The Tree Protection Zone

The **Tree Protection Zone (TPZ)** is the setback required to maintain the overall physiological health of the tree and the structural integrity of the tree's roots, based on generally accepted arboricultural principles. If trees are protected to the appropriately sized TPZ considering species, vigour, and tolerance, then the tree's root structure is expected to be maintained. The purpose of the TPZ is to prevent physical damage and mechanical injury to trees and to prevent soil compaction where trees' roots are growing and have the potential to grow. This zone is calculated and sometimes modified by the arborist in consideration of infrastructure and through the understanding of tree physiology.

The **Critical Root Zone (CRZ)** is the area of soil around a tree within the TPZ where the minimum number of roots considered critical to the structural stability or health of the tree are located. This zone is usually about half the TPZ distance. The CRZ is sometimes referred to as the structural root zone.

- Every effort should be made to prevent soil compaction of native soils with or without trees.
- No unauthorized activities may take place within the defined TPZ of a tree under any municipal permit process or agreement. Infractions may include, but are not limited to, work stoppage with immediate remediation of the work at the sole discretion of the County; all costs are borne by the contractor or the property owner.
- Some construction requirements (e.g., access roads, trees, and site conditions) may require irregular or a greater setback at the Arborist's discretion and in accordance and reference with the most current edition of ANSI A300 Construction Management Standard Part – 5, and as approved by the County.
- Any work within this defined TPZ and especially the CRZ requires tree preservation techniques or comments as to the impacts to the tree as recommended by the Arborist.

7.1.1 Tree Protection Zone Distances

Tree roots extend beyond their driplines, and because each species varies in its tolerance to

disturbances as well as in age, vigor, and vitality, a progressively expanding tree protection zone should be established. Tree roots need air, water, soil, and organic matter in balanced proportions. If these proportions are disrupted trees may become stressed and could enter a mortality spiral leading to death. Trees often do not exhibit signs or symptoms from construction impacts until years after the work is completed. If work is required within the **TPZ**, especially within the Critical Root Zone (**CRZ**), the arborist must assess the impacts on the tree and provide guidance on preservation methods, root pruning procedures, and protection measures. Tree protection distances are measured in meters from the outermost edge of the tree trunk in all directions, unless otherwise specified by the arborist.

It should be noted that above and beyond Tree Protection Zone distances, the County's Official Plan specifies minimum vegetation protection zones for features in the **Natural Heritage System**. For example, a minimum setback of 10 metres is required for significant woodlands and 30 metres for wetlands and watercourses. Additional setbacks could be required where necessary to protect species and risk and wildlife habitat. Lands within and adjacent to the Natural Heritage System will often require an Environmental Impact Study and Environmental Implementation Plan. Where appropriate the requirements in this document may be combined with the environmental studies.

7.1.2 Calculating Optimal Tree Protection Zones

- Measuring Diameter at Breast Height - Diameter at breast height must be measured at 1.4m from the ground using a calibrated tool such as a caliper, diameter tape or a tool designed to measure diameter.

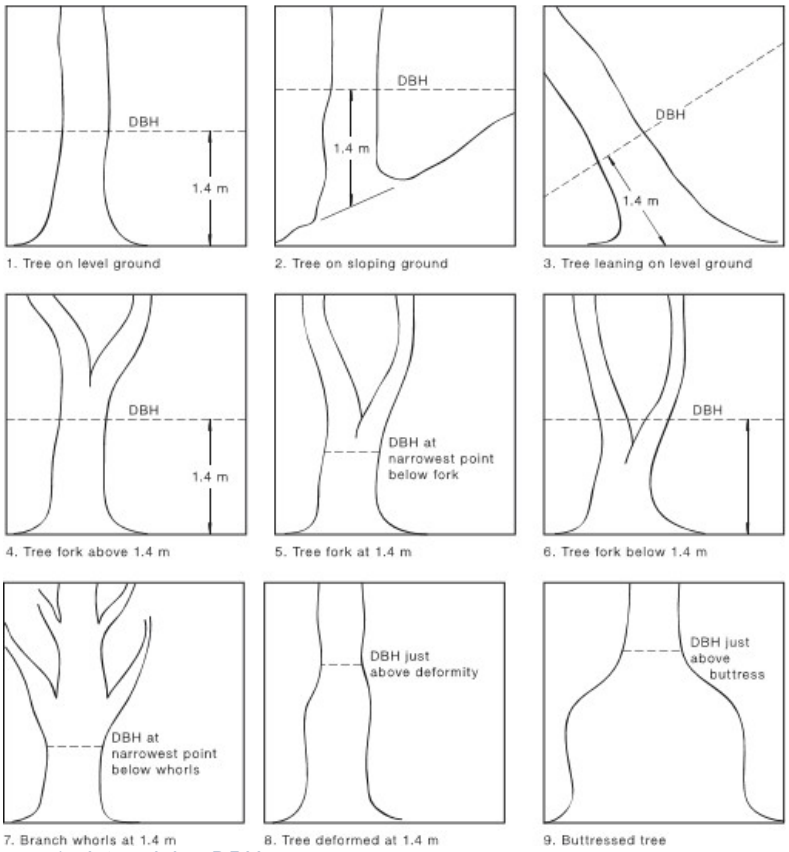


Figure 1: determining DBH

7.1.3 Minimum Tree Protection Zones for Individual Trees

Once the diameter at breast height is determined, the following table must be used to determine the minimum Tree Protection Zone (for trees outside of the **Natural Heritage System)**. Barriers will not be placed within the TPZ rather on the outside of the predetermined area. These minimum distances provide the minimum protection for anchor and traverse roots; however, there can still be significant damage to lateral roots which are important for the tree's biological function. For this reason, the County reserves the right for larger tree protection zones than the minimum.

Table 2: Minimum Tree Protection Zone Distances

Trunk Diameter (DBH)	Minimum Tree Protection Distances Required for Protected Trees
	Whichever of the two is greater:
< 10cm	The drip line or 1.2 m
10-29 cm	The drip line or 1.8 m
30-40 cm	The drip line or 2.4 m
41-50 cm	The drip line or 3.0 m
51-60 cm	The drip line or 3.6 m
61-70 cm	The drip line or 4.2 m
71-80 cm	The drip line or 4.8 m
81-90 cm	5.4 m
91-100 cm	6.0 m
>100 cm	**8cm protection for each 1 cm diameter**

7.1.4 Exceptions

An exception to the minimum distance of the **TPZ** may be granted when the tree is flanked by a curb, sidewalk, and or asphalt road. In such cases the barrier may be limited to the furthest extent of the grassed boulevard area. However, root pruning using approved methods must be incorporated to reduce impacts on tree roots due to ripping or tearing of roots. See section 7.5.8 – Root Pruning.

7.2 Tree Protection Barriers (Hoarding) and Signage

The tree protection barrier detail, sometimes called fencing or hoarding, is found in **Appendix 6** - Tree Protection Barriers (Hoarding).

All barriers must be erected, secure, and complete with signage posted prior to the commencement of any site activities. The applicant shall notify the appropriate County department in writing prior to commencing any such activities to confirm that the tree protection barriers are in place. Materials must comply with all barrier specifications, as well as all supports and bracing used to secure the barrier should be located outside the TPZ. All supports and bracing shall be located as to minimize damage to roots. Tree protection barriers may be inspected by County staff to ensure they have been installed

correctly and remain in place throughout all construction and development activities.

Tree Protection Barrier Specifications

- Height shall be 1.2 m (4'), visibility on boulevards must be maintained
- T-Bar Posts are to be used for support
- 2''x4''s are to be used for top rails
- Spacing between vertical posts to be no further apart than 2.4 m (8')
- Structure must be sturdy with posts driven firmly into the ground
- Continuous plastic mesh screening (e.g. orange snow fencing) is to be used
- Signage must be posted; sign must be a minimum of 40cm x 60cm and waterproof. Refer to **Appendix 7** - Tree Protection Sign.
- Where some fill has to be temporarily located near tree protection barrier, plywood must be used to ensure no material enters the Tree Protection Zone

7.2.1 Prohibited Activities Within Tree Protection Zones

Except where authorized by Forestry staff from the County of Brant, the following activities are prohibited within the TPZ:

- Construction of any kind
- Altering of grade by adding fill, excavating, trenching, scraping, dumping or disturbance of any kind
- Storage of construction materials, equipment, soil, construction waste or debris wash facilities, portable rooms/buildings
- Disposal of any liquids e.g. concrete sleuth, gas, oil, paint, etc.
- Movement of vehicles, equipment or pedestrians
- Parking or storage of vehicles or machinery

- Directional micro-tunneling, boring, and other activities may be permitted within the limits of the TPZ subject to approval from the County

7.3 Root Management

The preservation of tree roots during construction projects is critical for maintaining the health and longevity of trees. The effects of root damage are often not evident for years after construction activities are completed. This section outlines protection strategies and ensures that construction projects can proceed without compromising the health and integrity of tree roots.

Root systems are vulnerable to damage from construction activities. The two main types of damage that roots are subject to are root cutting (from excavation, grading, and trenching), and soil compaction.

- Root cutting from excavation can occur when digging within the dripline of the tree. Root cutting can significantly impact the health and stability of a tree. Most tree roots are found in the upper 30 to 60 cm of soil. If anchorage roots over 10cm in diameter are damaged the tree may become destabilized and fall over. If cutting tree roots is unavoidable, a certified arborist must approve and oversee the root cutting. Fibrous roots, which are responsible for the uptake of nutrients and water, found in the top 30 cm of soil, are easily severed during construction. Hand digging, low pressure hydro-vac, or air spade exploratory digging will aid in determining the extent of the root system and what steps will need to be taken to minimize impacts.
- Soil compaction happens when storage of materials or operation of vehicles or machinery cross over the rooting area, especially when the soil is wet, and is one of the leading causes of tree decline. Compaction reduces pore space in the soil which contains the water and air necessary for tree growth. This reduces soil function with the potential to cause a decline in the health of the tree, killing off many of the feeder roots which sustain the tree.

7.3.1 Root Protection Matting

In specific situations where the required full minimum tree protection zone (TPZ) cannot be provided, root protection matting (RPM) or as sometimes referred to as horizontal (on grade) root protection measures, prescribed and designed by the consulting arborist, may be

considered. RPM can be prescribed and provided where excavation is not required, but construction access over a TPZ is required. Refer to **Appendix 8** - Root Protection Matting. RPM can consist of but is not limited to:

- Plywood on grade for constant foot traffic; or
- For heavier traffic, a combination of:
- Non-woven geotextile fabric on grade, with 10cm of course aggregate, or 20cm of coarse wood chips.
- For heavy traffic, ¾" plywood, doubled plywood, or steel road plates on top of the aggregate or wood chips, on top of fabric.

7.3.2 Root Excavation and Pruning

Traditional trenching methods and excavation within the trees TPZ should be avoided when feasible as they cause significant damage to tree roots which can result in decline, disease, mortality, and stability issues. Often, the effects of root damage on a tree are not observed for months or years after construction is completed. Alternative methods such as directional drilling (for utility installation) should be used, as well as hand digging, low pressure hydro-vac or Supersonic Air Tool (SSAT) such as an AirSpade® to uncover roots for pruning or avoidance by an arborist to a depth which will meet the construction requirements. This operation is only to be done with the approval of the County, following best practices outlined in ANSI A300 Part 8: Root Management.

Root pruning can alleviate stress in trees with root damage, stimulate the growth of new fine and feeder roots, and prevent the spread of decay. This procedure should be performed by or under the supervision of an Arborist before any planned root sensitive excavation, or immediately afterward if damage was unexpected. Proper pruning is crucial to preserve the water and nutrient-absorbing root hairs attached to the larger roots and should not involve ripping roots with machinery. The guidelines for root pruning are as follows:

- Only clean hand tools, such as hand pruners or loppers, should be used for pruning roots. Shovels, picks, or other construction tools are not suitable.
- Roots should be pruned similarly to branches, ensuring the root bark ridge remains intact.
- Roots under 2 cm in diameter can be pruned with sharpened tools like hand pruners or

a sharpened spade under an Arborist supervision.

- Roots between 2 and 8 cm in diameter should be pruned by an Arborist using sharp tools such as a handsaw, hand pruners, or loppers.
- Roots over 8 cm in diameter must be assessed by the Project Arborist before pruning unless the on-site Arborist determines the removal will not harm the tree. This must be documented and reported to the Project Arborist immediately.
- Exposed roots should be covered with wet burlap or soil as soon as possible and watered regularly to prevent drying out.

Construction within the Critical Root Zone (CRZ) of any tree to be retained requires root exploration using a Supersonic Air Tool or low-pressure hydro-vac to remove soil and expose roots. An Arborist must be present during initial excavation to provide tree preservation recommendations. If significant damage occurs, the Arborist must immediately inform the Project Arborist.

When using a Supersonic Air Tool, trenches should be backfilled with the same excavated soil, possibly mixed with new topsoil or compost at a ratio of no more than 10%. Protective hoarding should be installed along the trench to safeguard the remaining roots.

7.4 Construction Impact Mitigation

Before starting construction, several measures can be taken to minimize the impact on trees. Tree pruning, following Good Arboricultural Practices, should be performed to remove branches that may interfere with on-site operations, reducing risks to workers. Watering and mulching can help improve tree health, retain moisture, and reduce soil compaction. These measures shall be implemented by the contractor if requested by the County.

7.5 Damage or Loss of Protected Trees to Remain

Any trees designated to remain, and which are damaged by the Contractor shall be compensated for by the Contractor at their own expense.

- Trees shall be replaced with a tree of similar species and of equal size or 50mm caliper, whichever is less, or be compensated for at a rate of 50% of the County's Tree Compensation rates, or at the sole discretion of the County.
- All trees shall be installed per the requirements detailed in section 5 - Planting.

- Trees that are damaged shall be considered as requiring replacement or appraisal if the damage affects more than 25 % of the crown, 25% of the trunk circumference, or root protection area, or the tree is damaged in such a manner that the tree could develop into a potential hazard.
- Trees and shrubs to be replaced shall be removed by the Contractor at their own expense.
- Any tree that is determined to be dead, damaged or potentially hazardous by the County shall be immediately removed by the Contractor at no additional expense to the County.
- Tree removal shall include all clean-up of all wood parts and grinding of the stump to a depth sufficient to plant a replacement tree, removal of all chips from the stump site and filling the resulting hole with topsoil.
- Any remedial work on damaged existing trees recommended by a Qualified Person shall be completed by the Contractor at no cost to the County. Remedial work shall include but is not limited to: soil compaction remediation and vertical mulching, pruning and or cabling, compensatory watering, additional mulching, and could include application tree growth regulators (TGR).
- Remedial work may extend up to two years following the completion of construction to allow for any requirements of multiple applications or the need to undertake applications at required seasons of the year.

7.6 Onsite Arborist Requirements

When work is required within the **Tree Protection Zone (TPZ)**, an **arborist** must be present and performing or supervising the work at hand.

8 Heritage Tree Designation and Protocol

As per section 5.2.3 of the Tree Management Policy, the County shall recognize, develop, and adopt protection and enhancement guidelines for **Heritage Trees** within the County. Heritage Trees can be protected under the Ontario Heritage Act - Section 29 and has the same process for designation as a heritage property.

Trees can be registered under Forests Ontario's heritage tree program, which is done by nominating a tree.

- The County will recognize Heritage trees as **Protected Trees.**
- Anyone can submit a request for specific tree designation into this program, Forestry staff will conduct an inspection and assessment.
- Once inspected, Forestry staff will present the tree to the County's Heritage Committee for approval.
- A tree plaque to be installed on or near the tree indicating the species, date installed, and the Significance met to achieve its status.
- Significant or Heritage Trees can be on private or County property.

9 Appendices

Appendix 1 – County of Brant Approved Trees

County OF BRANT APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Acer campestre** Hedge Maple	Non-Continental	Boulevard	Compact form/trunk suckers require extra maintenance.	Large	Rounded	7
Acer x freemanii Hybrid Soft Maple	Native to Ontario	Boulevard	Caution: Many cultivars of *Acer rubrum* and *A. saccharinum* exist under the name Freemanii, each with different characteristics	Large	Oval-Rounded	Autumn Fantasy, Indian Summer and Morgan all 1.Autumn Blaze 7
Acer nigrum Black Maple	Native to Ontario	Boulevard Park	Lots of seed for winter interest/rare/needs moist soil	Large	Oval	~7 (assumed to be same as sugar maple)
Acer pennsylvanicum Striped Maple	Native to Ontario	Boulevard Park	Specify single stem.	Medium	Rounded	6
Acer pseudoplatanus ** Sycamore Maple	Non-Continental	Boulevard	Very pollution and salt tolerant Cankers cause high maintenance	Large	Oval-Rounded	8
Acer rubrum Red Maple **8** 'October Glory' **9** 'Red Sunset'	Native to Ontario	Boulevard Park	Green summer foliage & yellow to red fall colour tolerates wet soil	Large	Oval-Rounded	*1 *1
Acer saccharinum Silver Maple	Native to Ontario	Boulevard Park	Fast growing softwood maple; Maintenance issues as tree nears maturity due to weak wood.	Large	Oval-Rounded	Males: 9 Females: *1
Acer saccharum *Sugar Maple*	Native to Ontario	Boulevard Park	Upright form/fall colour varies/prefers good drainage/shallow roots/salt sensitive	Large	Oval-Rounded	7
Aesculus glabra Ohio Buckeye	Native to Ontario	Boulevard	Untested in Brant and may suffer winter problems. Likes moist soil. *For use in limited circumstances*	Medium	Oval	7
Aesculus hippocastanum Horsechestnut 'Baumannii'	Non-Continental	Boulevard	Good spring flower with no fruit/limit use due to disease susceptibility	Large	Rounded	7

COUNTY OF BRANT APPROVED TREES

Tree Species	Native Range	Use	Comments and Notes	Size	Form	OPALS Rating[7]
Amelanchier Arborea Downy Serviceberry	Native to Ontario	Boulevard Park	Showy flower & fruit/ tolerant of wet & dry soil	Medium	Rounded	Not available
Amelanchier laevis Smooth Serviceberry	Native to Ontario	Boulevard Park	Multi-stem specimens by prior approval only	Small	Rounded	3
Asimina triloba Pawpaw	Native to Ontario	Park	Large fruit has food value to humans	Large	Rounded	
Betula alleghaniensis Yellow Birch	Native to Ontario	Parks	Interesting bark features and good fall colour	Large	Rounded-Spreading	7 (but only has a short blooming period)
Betula papyrifera White Birch	Native to Ontario	Parks	Interesting bark features and good fall colour	Large	Rounded-Oval	7
Carpinus betulus European Hornbeam 'Fastigiata'	Non-Continental	Boulevard	Difficult to transplant Keep away from road salt & spray	Medium	Pyramidal-Oval	8
Carpinus caroliniana Blue beech or Musclewood	Native to Ontario	Boulevard Parks	Difficult to transplant/keep away from road salt & spray/likes wet soil/thin bark and sculptured trunk	Medium	Rounded	8 (Rating for genus only)
Carya cordiformis Bitternut Hickory	Native to Ontario	Parks	Difficult to transplant due to large tap root, messy fruit	Large	Oval-Vase	8-10* (Rating for genus only)
Carya glabra Pignut Hickory	Native to Ontario	Parks	Difficult to transplant due to large tap root, messy fruit	Large	Oval-Vase	8-10*
Carya laciniosa Big Shellbark Hickory	Native to North America	Parks	Difficult to transplant due to large tap root, messy fruit	Large	Oval-Vase	8-10*
Carya ovata Shagbark Hickory	Native to Ontario	Parks	Difficult to transplant due to large tap root, messy fruit	Large	Oval-Vase	10
Catalpa Speciosa Northern catalpa	Native to Ontario	Boulevard Park	Hardy tree that prefers full sun	Large	Rounded	5
Celtis Occidentalis Common Hackberry	Native to Ontario	Boulevard Park	Requires pruning for general form. Very tolerant.	Large	Vase	8

COUNTY OF BRANT APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Cercidiphyllum japonicum Katsura Tree	Non-Continental	Boulevard	Multi-stem by prior approval only. Difficult to transplant. Thin bark. Needs supplemental water.	Large	Rounded	Males: 8 Females: *1
Cercis canadensis Redbud	Native to Ontario	Boulevard Park	Seeds readily. Suitable for lawns but not formal boulevard due to low branching.	Medium	Vase-Rounded	5
Cladrastis kentukea (lutea) Yellowwood (Single Stem Only)	Native to North America	Boulevard	Few problems/use local seed sources or stock only/prune early	Large	Rounded	5
Cornus alternifolia Alternate-leaf Dogwood	Native to Ontario	Boulevard Park	Use local winter hardy material only Specify single stem	Medium	Rounded	5
Cornus florida Flowering dogwood	Native to Ontario	Park	Specify single stem only. Use local winter hardy material only/ good flower/ specify single stem Can be very sensitive. Prefers acid soil, Limited use only.	Small	Rounded	5
Corylus colurna Turkish Hazel	Non-Continental	Boulevard	Good form/ difficult to transplant/ winter interest/ needs supplemental water	Large	Pyramidal	8
Crataegus (varieties) Hawthorns	*(Dependent on species)*	Boulevard Park	Thornless & disease resistant varieties only. * For use in limited circumstances *Crataegus monogyna* is invasive*	Medium	Rounded	4
Fagus sylvatica European Beech	Non-Continental	Park	Needs moist soil/different leaf colours with varieties/sensitive to activity within root zone/leaves persist through winter/thin bark	Large	Oval-Rounded	7
Fagus orientalis Oriental beech	Non-Continental	Park		Large	Oval-Rounded	7
Ginkgo biloba Maidenhair tree (Male cultivar only)	Non-Continental	Boulevard	Good yellow fall colour/thin bark/tolerant of city conditions & pollution/slow growing but very large at maturity/virtually pest and disease free	Large	Pyramidal Spreading	Males: 7 Females: *2

COUNTY OF BRANT APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Gleditsia triacanthos* var. *inermis Thornless Honey Locust ▪ 'Shademaster' ▪ 'Skyline'	Native to North America	Boulevard	Provides a filtered shade/susceptible to defoliation by leafhopper/susceptible to canker and other pests and diseases	Large	Spreading	Males: 7 Females: *1 Bisexual: 4
Gymnocladus dioicus Kentucky Coffee tree	Native to Ontario	Park	Male variety only in boulevard **For limited circumstances*	Large	Oval	Males: *9 Females: *1
Halesia tetraptera Carolina Silverbell	Native to North America	Park	Low branched tree with broad, rounded crown/reserve for lawn areas	Medium	Large	3
Koelreuteria paniculata Goldenrain tree	Non-Continental	Boulevard Park	Good yellow flower & fruit/susceptible to winter damage/weak	Medium	Rounded	4
Liquidambar styraciflua Sweetgum	Native to Eastern Europe & North America	Boulevard Park	Borderline hardy – good for sheltered locations, lawn areas **For limited circumstances*	Large	Rounded	7
Liriodendron tulipifera Tulip tree	Native to Ontario	Boulevard Park	Good flowers and yellow fall colour/local sources/moist well drained soil/very large tree most appropriate for lawn areas/somewhat weak wooded	Large	Rounded	4
Maackia amurensis** Amur Maackia	Non-Continental	Boulevard	Small, round headed tree/slow growing/summer flowering/bronze coloured bark	Small	Rounded	3
Magnolia acuminata Cucumber tree	Native to Ontario	Boulevard Park	Status: Endangered	Medium	Oval-Rounded	Deciduous:6 Evergreen: 5
***Malus* (most)** ** Flowering & Domestic Crab Apple:	*(Dependent on species)*	Boulevard	Maintenance problems/disease & insect problems/tolerates most soils Choose persistent fruit- holding, or poorly-fruiting types.	Small to Medium	Rounded-Spreading	4

COUNTY OF BRANT APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Nyssa sylvatica Black Gum	Native to Ontario	Park	Difficult to transplant due to tap root, interesting summer and fall foliage, not for heavily polluted areas	Medium	Rounded -Oval	Males: 9 Females: 1
Ostrya virginiana Hop Hornbeam or Ironwood	Native to Ontario	Boulevard Park	Mainly an understory species	Medium	Oval	7
Phellodendron amurense Amur corktree	Non-Continental	Boulevard	Good winter texture in bark/lots of black berries/use in protected areas	Medium	Spreading	Males: 8 Females: 1
Pinus strobus White Pine	Native to Ontario	Park	Quick growing. Tolerates different moisture levels. Grows best in sand or sandy loam	Large	Pyramidal	4
Platanus x acerifolia London Planetree	Hybrid of *Platanus occidentalis* (N. America) and *Platanus orientalis (Europe)*, so has no native range[11]	Boulevard	Frost cracks on trunk/attractive peeling bark/fruit can cause problems/very large at maturity – reserve for large lots and lawn areas	Large	Spreading	9
Platanus occidentalis *Sycamore*	Native to Ontario	Boulevard Park	Frost cracks on trunk/attractive peeling bark/fruit can cause problems/very large at maturity – reserve for large lots and lawn areas	Large	Spreading	9
Populus ssp. Balsam Poplar, Eastern Cottonwood, Large-tooth Aspen, Trembling Aspen	Balsam Poplar, Eastern Cottonwood, Large-tooth Aspen: Native to Ontario Trembling Aspen: (TBD)	Park. Not permitted in Boulevard	Wood is light, soft and weak, breaks easily in storms, drops flowers, fruit, twigs and branches	Large	Pyramidal – Vase and Spreading	Males: 9 Females: 1

COUNTY OF BRANT APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Prunus Americana American plum	Native to Ontario	Park	Somewhat thorny. Untested in boulevard.	Small	Rounded	2
Prunus nigra Canada plum	Native to Ontario	Park	Thorny. Untested in boulevard.	Medium	Rounded	3
Prunus pensylvanica Pin Cherry	Native to Ontario	Park	Excellent flowers with no fruit/single stem to be specified/weeping cankers * For use in limited circumstances	Small	Oval	5
Prunus serotina Black Cherry	Native to Ontario	Boulevard Park	Interesting bark, messy fruit; Better in lawns than in formal boulevard.	Large	Oval	5 (Genus only)
***Prunus* (flowering varieties)** Kwanzan Cherry Other small Cherries	*(Dependent on species; most popular flowering cherries are non-continental)*	Boulevard	Weeping cankers; prone to fungal infections *** For use in limited circumstances ***	Small	Vase	
Prunus virginiana Choke Cherry	Native to Ontario	Boulevard Park	green spring foliage & red in summer/bark tends to split	Small	Rounded	6
Ptelea trifoliata Hop-tree	Native to Ontario	Boulevard Park	Adaptable to wide range of growing conditions. Easily grown in average, dry to medium, well drained soils in part shade to full shade. Tolerates full sun. One of two native larval host plants for the rare Giant Swallowtail butterfly.	Medium	Rounded	Males: 7 Females: 1
Quercus alba White Oak	Native to Ontario	Boulevard Park	Needs moist soil/fruit maintenance/needs large space at maturity	Large	Rounded	8
Quercus bicolour Swamp White Oak	Native to Ontario	Boulevard Park	Grows in wetter conditions with acidic soils	Large	Rounded	8
Quercus ellipsoidalis Northern Pin Oak	Native to Ontario	Boulevard Park	Needs sandy loam soil/difficult to transplant. and faster growing than other oaks	Large	Rounded	8

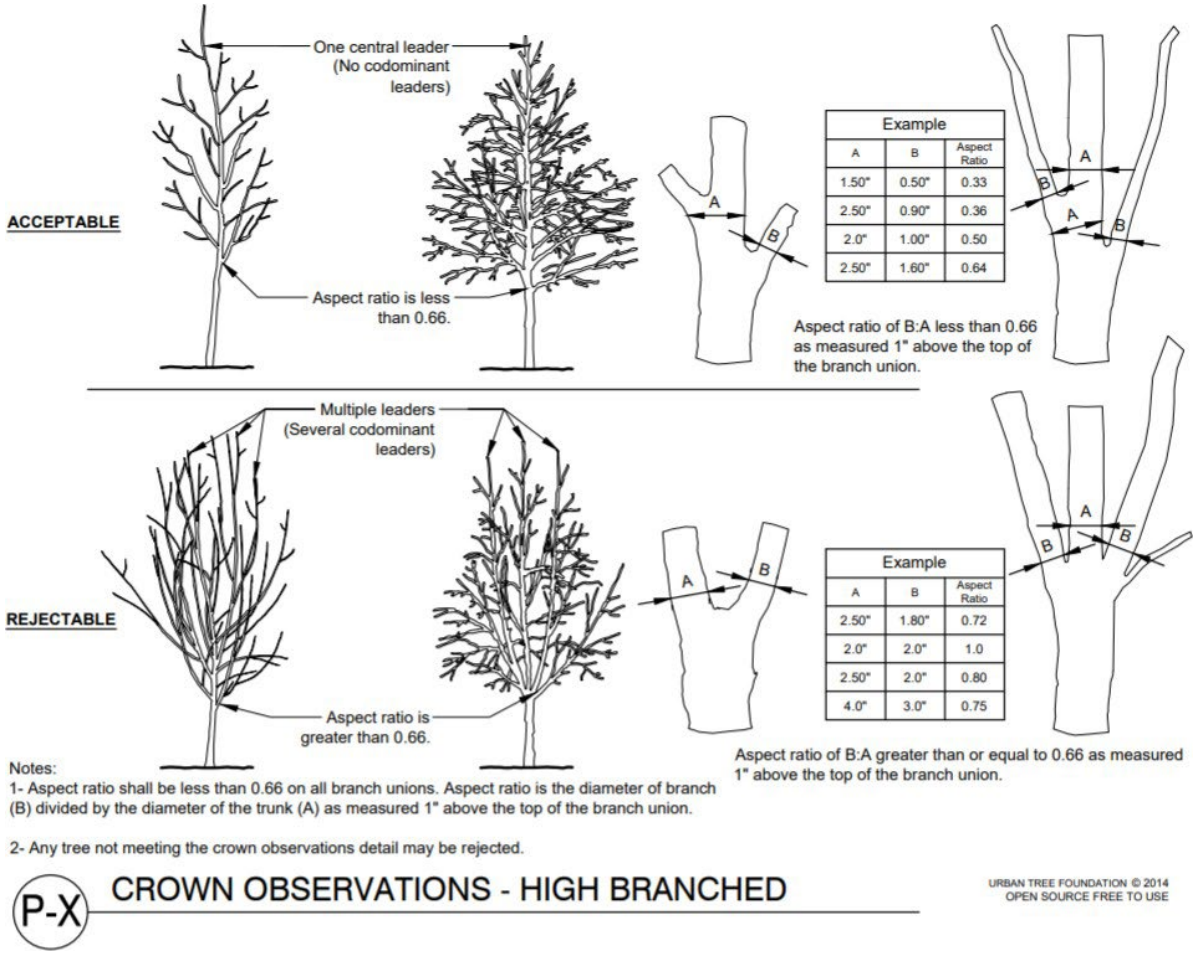
COUNTY OF BRANT APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Quercus macrocarpa Bur Oak	Native to Ontario	Boulevard Park	Large size at maturity – reserve for large lots and lawn areas/fruit drop/difficult to transplant/requires good soils	Large	Rounded	8
Quercus muhlenbergii Chinquapin Oak	Native to Ontario	Boulevard Park	Attractive tree, especially in old age	Medium	Rounded	8
Quercus robur 'Fastigata' Fastigate English Oak	Non-Continental	Boulevard	Needs well drained soil/holds leaves through the winter/ difficult to transplant/very upright in form – reserve for sites with specific need for this form	Large	Columnar	8
Quercus robur English Oak	Non-Continental	Boulevard Park	Needs well drained soil/difficult to transplant/large size at maturity	Large	Rounded	8
Quercus rubra Red Oak	Native to Ontario	Boulevard Park	Needs sandy loam soil/difficult to transplant/more salt tolerant and faster growing than other oaks	Large	Rounded	8
Quercus velutina Black Oak	Native to Ontario	Boulevard Park	Needs well drained soil/difficult to transplant/large size at maturity	Large	Rounded	8
Rhus ssp. Staghorn Sumac, Smooth Sumac	Native to	Boulevard Park	Spreads quick, freely suckers from roots creating wide spreading colonies. Tolerates dry sterile soils	Small	Rounded - Spreading	Males: 10 Females: 7
Sassafrass albidum Sassafrass	Native to Ontario	Boulevard Park	Prefers sandy soils			Males: 7 Females: 1
Sophora japonica Japanese Pagoda Tree	Non-Continental	Boulevard	Excellent white flower/green stem when young/limit use due to messy characteristics	Large	Spreading	5

COUNTY OF BRANT APPROVED TREES						
Tree Species	**Native Range**	**Use**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Syringa reticulata Japanese Tree Lilac ▪ 'Ivory Silk'	Non-Continental	Boulevard	Good white summer flower/excellent small specimen. Prone to over-use	Small	Rounded	6
Tilia americana Basswood	Native to Ontario	Boulevard Park	Prefers deep moist fertile soil/will grow on drier heavier soil/needs large space	Large		7
Tilia cordata Littleleaf Linden ▪ 'Glenleven' ▪ 'Greenspire' ▪ 'Greenglobe'	Non-Continental	Boulevard	Aphid & borer problems; suckers from base; messy species Weak root systems – **not construction tolerant – Remove if roots to be cut**	Medium	Pyramidal	7
Tilia tomentosa Silver Linden	Non-Continental	Boulevard	Heat and drought tolerant.	Medium	Pyramidal-Oval	7
Ulmus americana Elm ▪ 'Homestead' ▪ 'Pioneer' ▪ 'Sapporo Autumn Gold'	*Specific cultivars hybrydized for disease resistance*	Boulevard	Choose with care. Cultivars vary in resistance to Dutch elm disease and elm leaf beetle.	Large	Vase	8
Zelkova serrata Japanese Zelkova ▪ 'Green Vase' ▪ 'Village Green'	Non-Continental	Boulevard	Rapid growth/narrow branch angles promote fork split/frost susceptibility when young	Large	Vase	*10

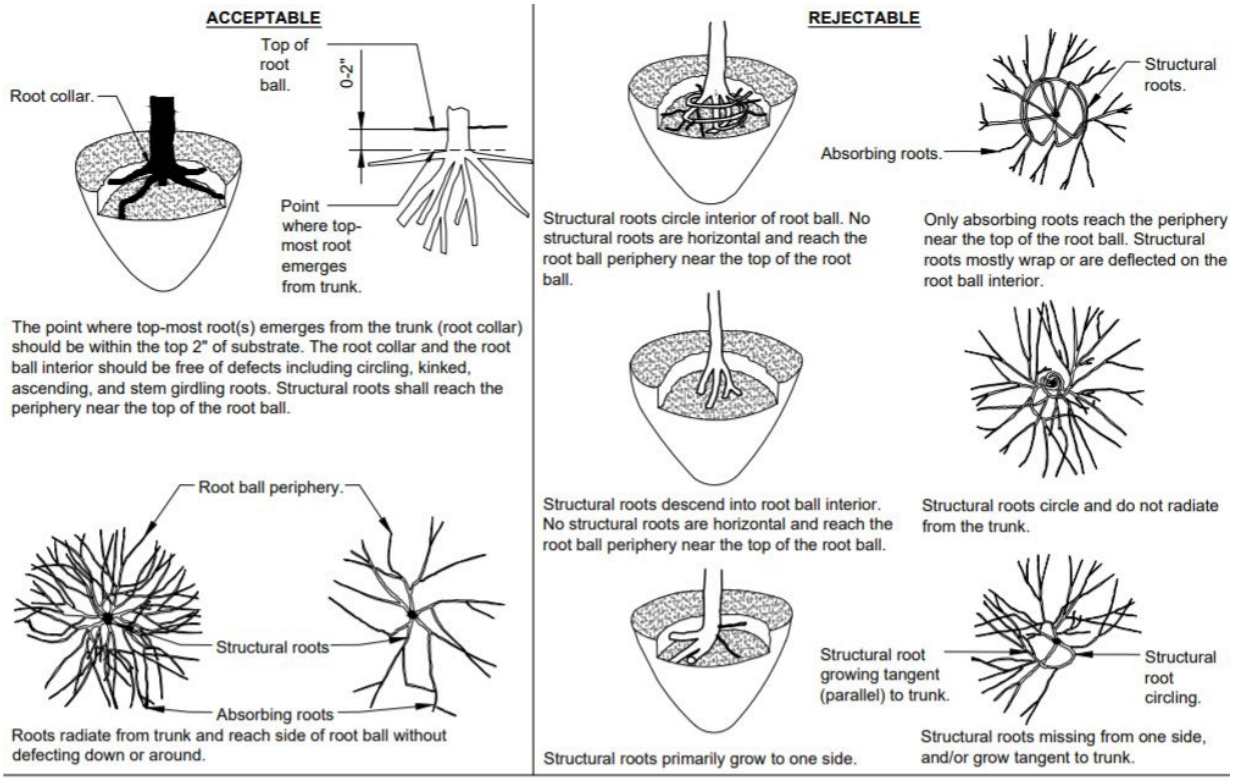
SPECIES NOT PERMITTED FOR USE					
Tree Species	**Native Range**	**Comments and Notes**	**Size**	**Form**	**OPALS Rating[7]**
Acer platanoides *Norway Maple (many cultivars)*	*Non-Continental*	*Surface roots conflict with and turf/girdling roots/aphid and wilt problems.*	*Medium*	*Various Forms*	*8*
Ailanthus altissima *Tree of Heaven*	*Non-Continental*				
Alnus glutinosa *European Alder (Single Stem Only)*	*Non-Continental*	*Tolerant of wet & dry soil. Invasive tendencies checked by dry sites.*	*Medium*	*Pyramidal*	*9*
Caragana arborescens	*Non-Continental*	*Toxic*	*Small*	*Varies*	
Eleagnus angustifolia *Russian Olive*	*Non-Continental*				
Maackia amurensis *Amur Maackia*	*Non-Continental*	*Small, round headed tree/slow growing/summer flowering/bronze coloured bark*	*Small*	*Rounded*	*3*
Paulownia spp.	*Non- Continental*				
Pyrus calleryana *Callery Pear* *'Chanticleer'* *'Bradford'*	*Non-Continental*	*Fireblight problems* *Graft incompatibility problems with some rootstocks. Poor branch attachments and form. Objectionable smell.*	*Small*	*Pyramidal*	*Ornamentals:4* *Fruiting: 3*
Sorbus aria *Whitebeam Mountain Ash*	*Non- Continental*		*Medium*	*Pyramidal-Oval*	*4*

Sorbus aucuparia *European Mountain Ash*	*Non-Continental*	*Scab disease & insect problems; Limit use due to fruit and other problems.*	*Medium*	*Oval*	*4*
Sorbus x thuringiaca *Oakleaf Mountain Ash*	*Non- Continental*		*Small*	*Rounded*	*4*

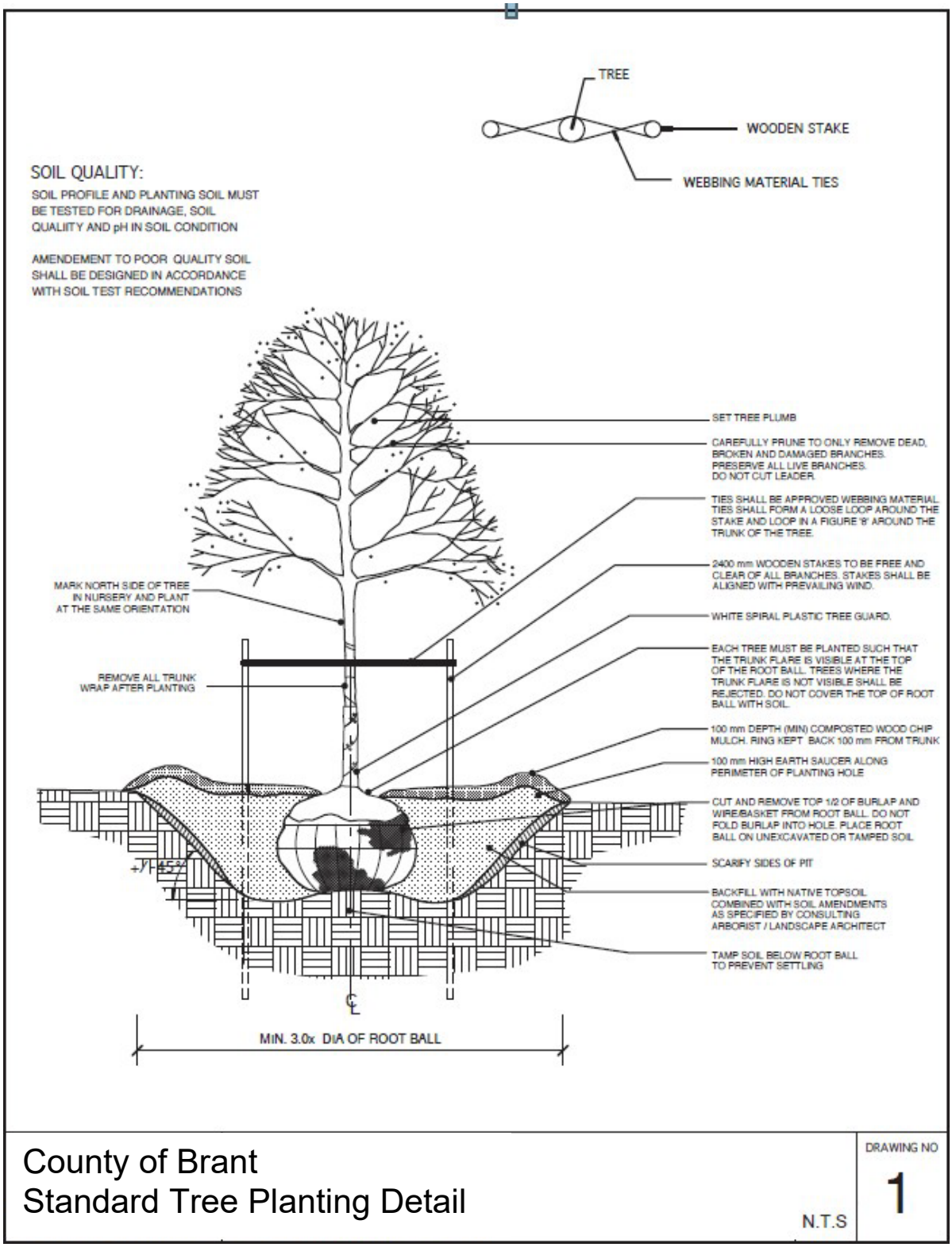
Appendix 2 - New Tree Accept/Reject Pruning Detail



Appendix 3 - New Tree Accept/Reject Root Ball Detail

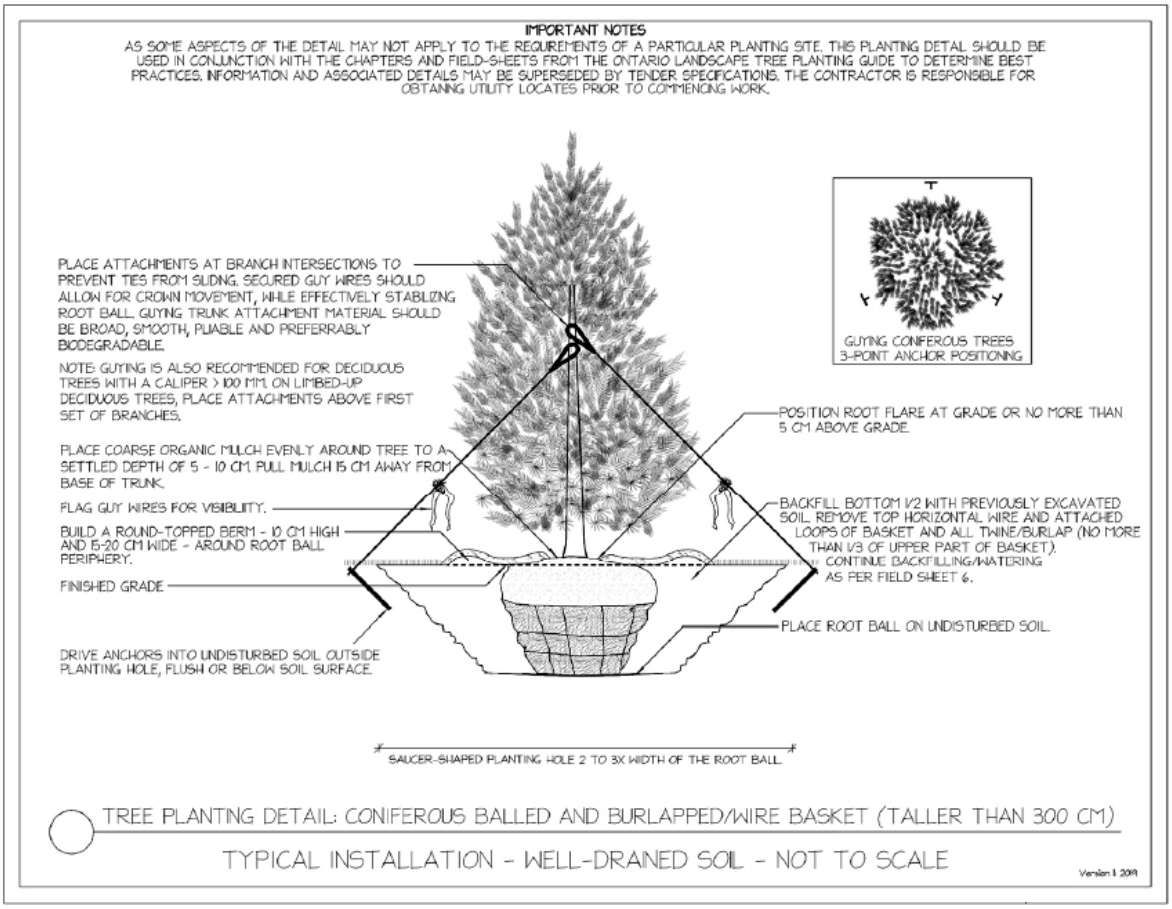


Appendix 5 - Tree Planting Detail



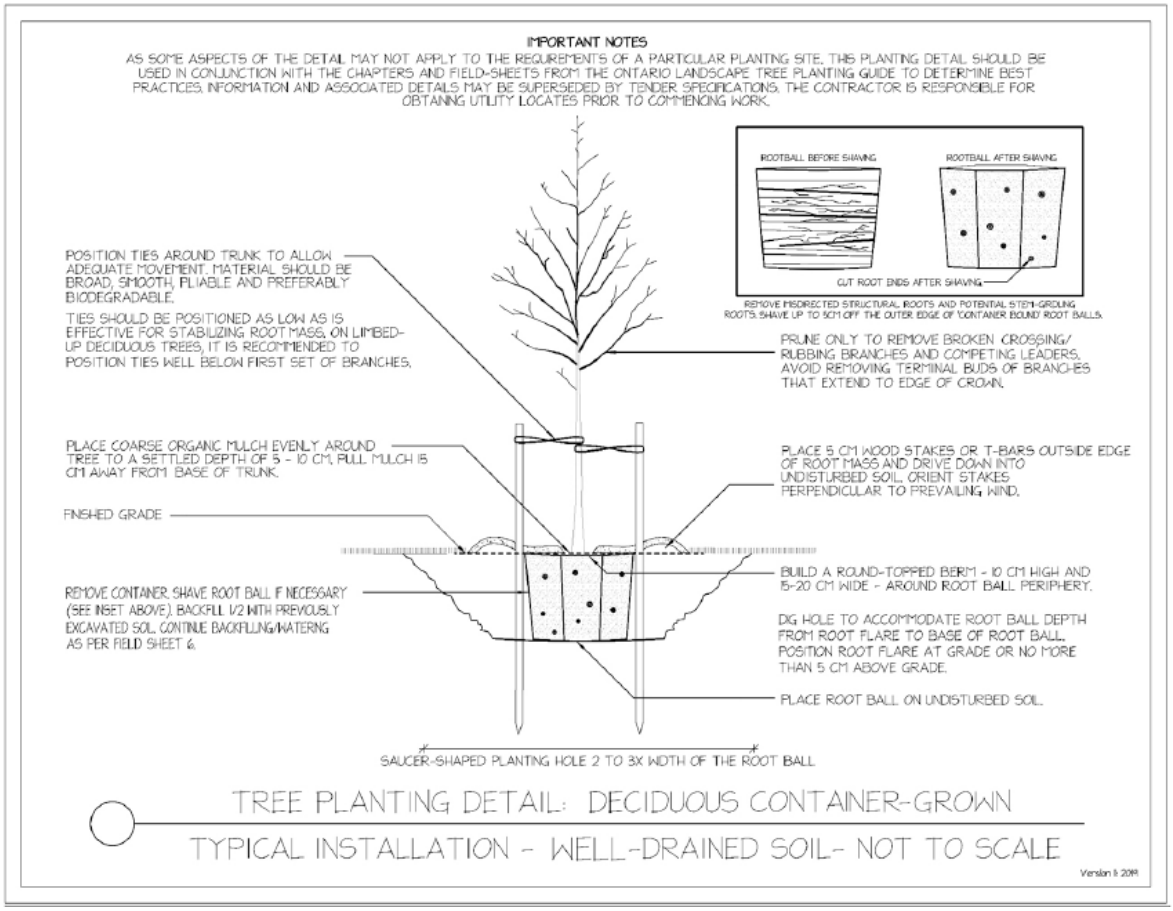
Appendix 5a – Conifer Balled And Burlapped (Well-Drained)

Conifer Balled & Burlapped/Wire Basket (Well-Drained Soil)

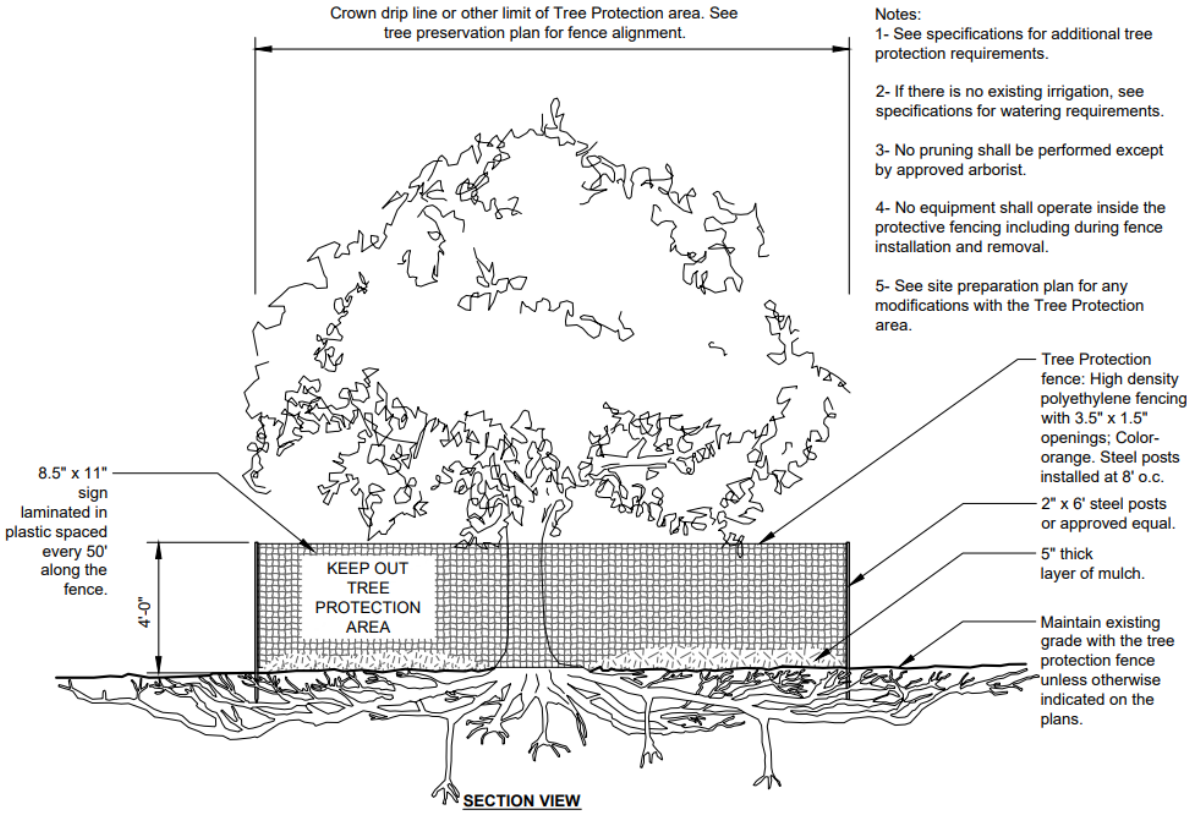


Appendix 5b – Deciduous Container-Grown (Well-Drained)

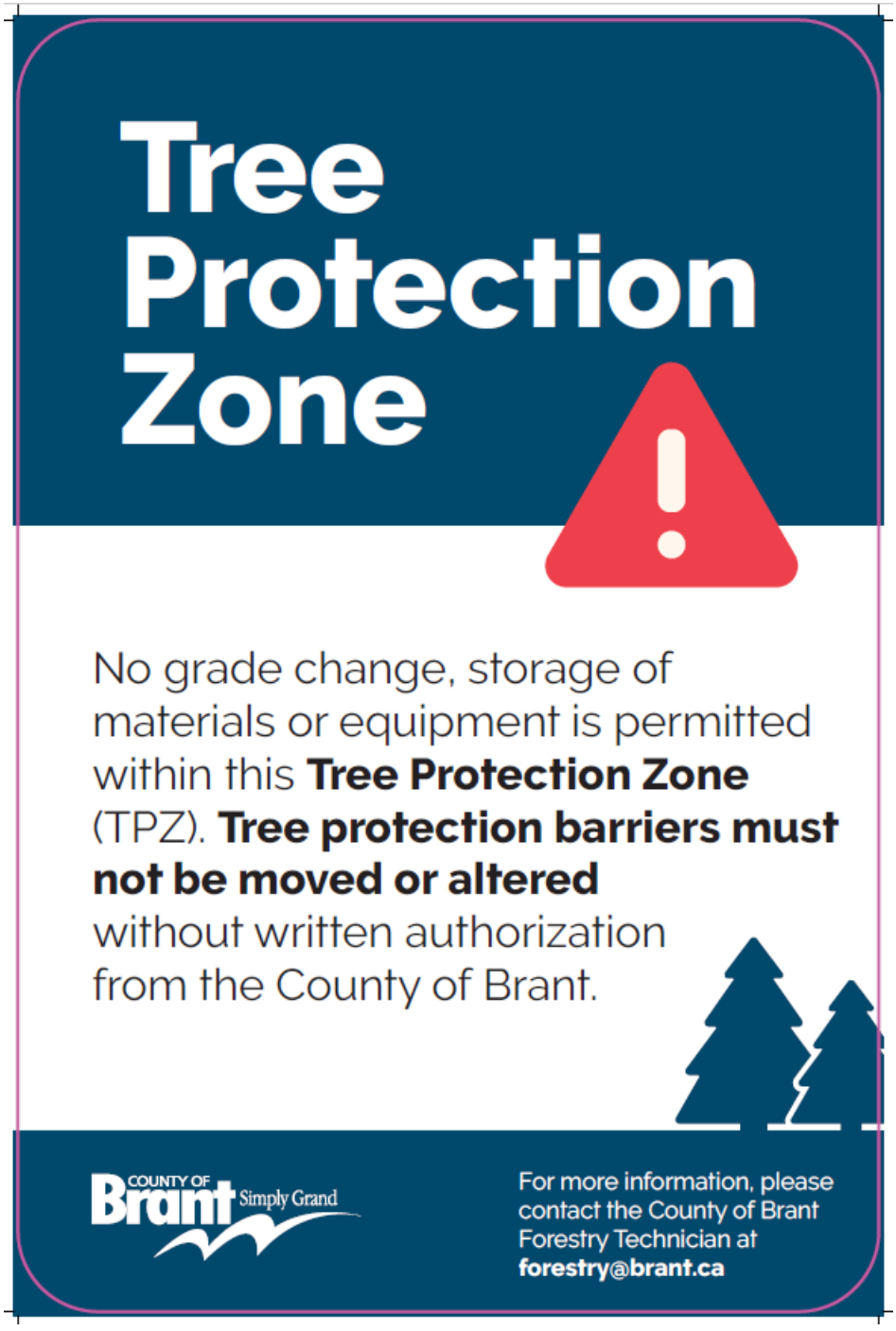
Deciduous Container-Grown (Well-Drained Soil)



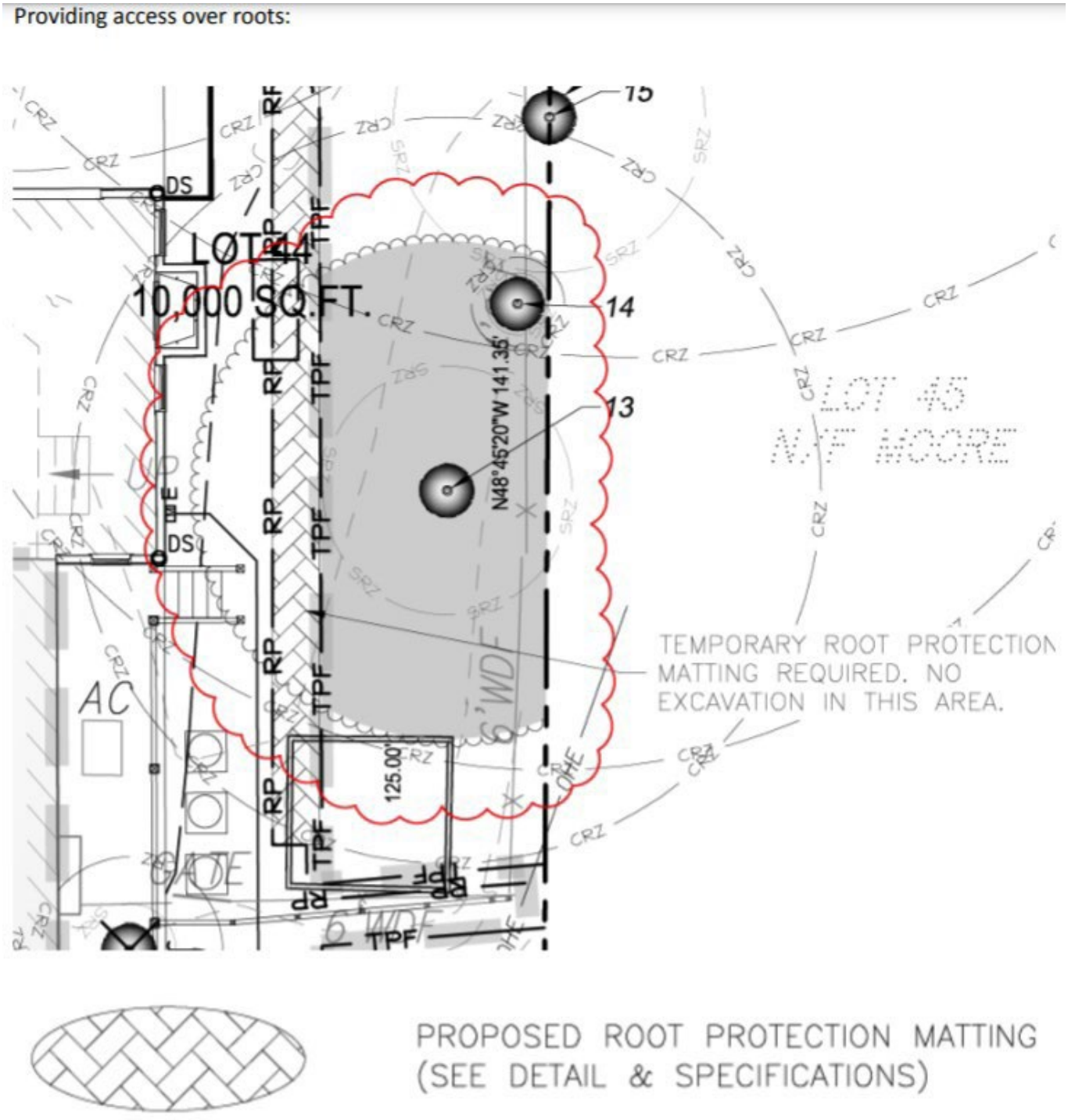
Appendix 6 - Tree Protection Barriers (Hoarding)



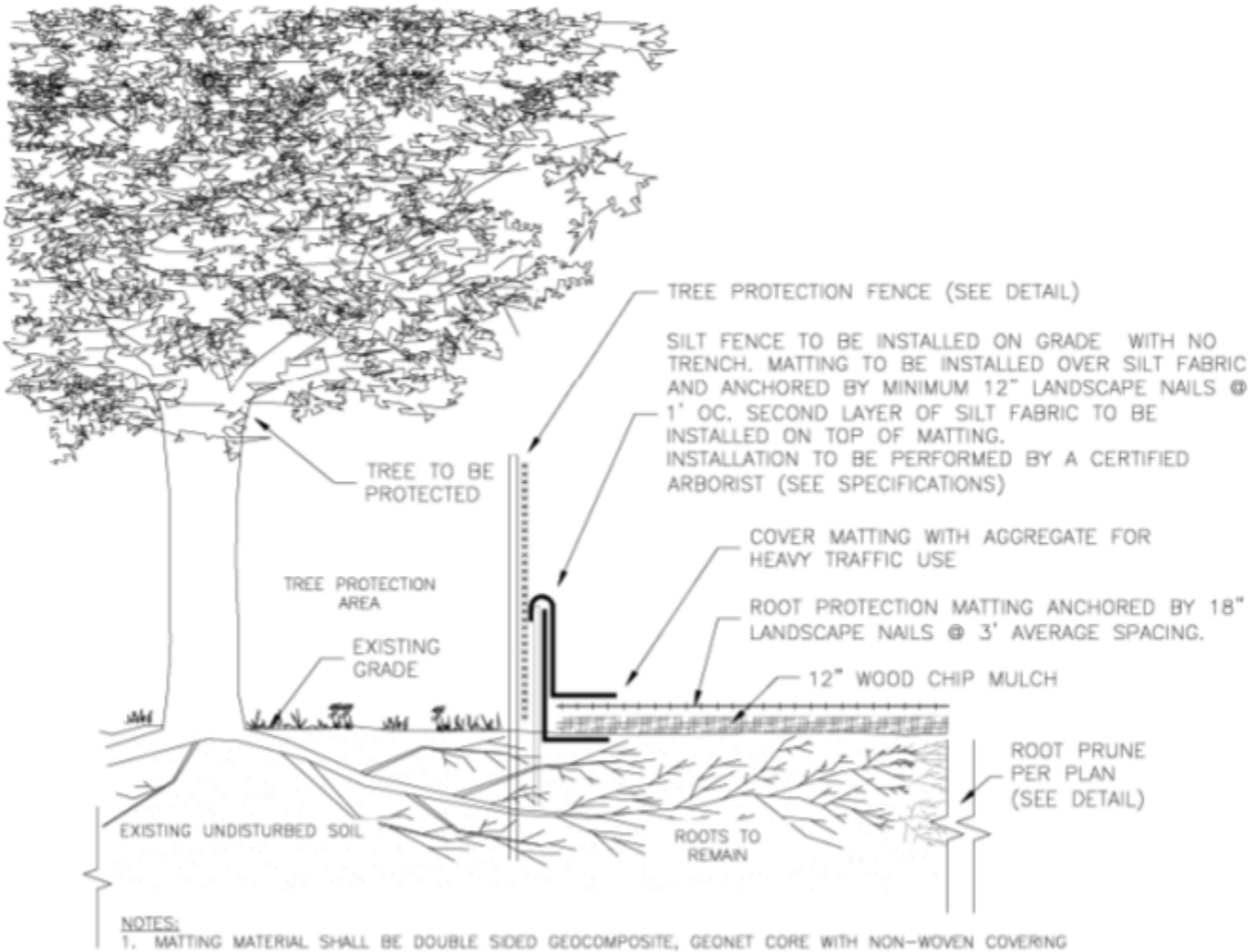
Appendix 7 - Tree Protection Sign



Appendix 8 - Root Protection Matting (Example)



Appendix 8a - Root Protection Matting (Example)



NOTES:
1. MATTING MATERIAL SHALL BE DOUBLE SIDED GEOCOMPOSITE, GEONET CORE WITH NON-WOVEN COVERING (SUCH AS TENAX TENDRAIN 770/2) OR APPROVED EQUIVALENT.
2. RPM SHALL BE INSTALLED BY A CERTIFIED ARBORIST.
3. TO BE USED FOR DESIGNATED TEMPORARY CONSTRUCTION ACCESS AND STOCKPILE AREAS.
4. MATTING SHALL BE PLACED ON 12" WOOD CHIP MULCH UNLESS OTHERWISE DIRECTED.
5. FOR HEAVY TRAFFIC AREAS, MATTING SHALL BE COVERED WITH 6-8" WELL GRADED CRUSHED AGGREGATE. ADDITIONAL LAYERS OF GEOTEXTILE MAY BE NEEDED.

3 / LJ501 TEMPORARY ROOT PROTECTION MATTING (TYPICAL)
SCALE: NTS

Appendix 9 – Example For Tree Root Barriers

UB 24-2 Specifications
24" DeepRoot® Tree Root Barrier

Specified tree root barrier is a mechanical barrier and root deflector used to prevent tree roots from damaging hardscapes and landscapes. Assembled in 24" (609 mm) long modules to create varying lengths for linear applications, or perimeter surround applications in varying sizes.

A. Materials

1. The contractor shall furnish and install tree root barrier as specified. The tree root barrier shall be either product #UB 24-2 as manufactured by DeepRoot® Green Infrastructure, LLC, 530 Washington Street, San Francisco, CA, www.deeproot.com (800.458.7668).

2. Root barrier shall be recyclable, black, injection molded panels with 0.80" (2.03 mm) wall thickness in modules 24" (609 mm) long and 24" (609 mm) deep.

3. Root barrier shall be manufactured with 75% reprocessed polypropylene with added ultraviolet inhibitors.

4. Root barrier shall be comprised of 24" (60.96 cm) panels. Each panel shall have no less than four (4) Molded Integral Vertical Root Directing Ribs of a minimum 0.075" (1.90 mm) thickness, protruding 1/2" (12.7 mm) at 90° from interior of the barrier panel, spaced 6" (152.4 mm) apart. (See Details A & D)

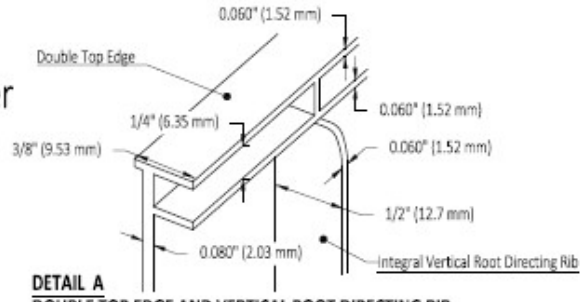
5. Root barrier shall have a Double Top Edge consisting of two parallel, integral, horizontal ribs at the top of the panel at 0.060" (1.52 mm) thickness, 3/8" (9.53 mm) wide and 1/4" (6.35 mm) apart with the lower rib attached to the vertical Root Directing Ribs (See Detail A).

6. Root barrier shall have a minimum of twelve (12) Anti-Lift Ground Lock Tabs consisting of integral horizontal ridges of minimum 0.075" (1.90 mm) thickness in the shape of a segment of an oblong, the 2" (50.8 mm) chord of the segment joining the panel wall and the segment, protruding 3/8" (9.53 mm) from the panel. The twelve ground locks on each panel shall be about equally spaced between each of the vertical root directing ribs (Four (4) between each set of ribs, see Details B & D).

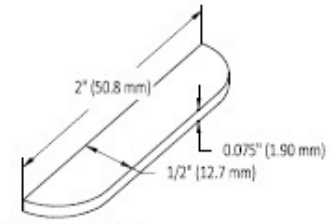
7. Root barrier shall have an integrated Zipper Joining System for assembly by sliding one panel into another (See Detail C).

U.S. Patents: 5,305,549; and 5,528,857. Other Patents Pending.

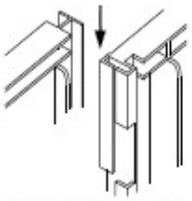
Properties	Typical Value	ASTM Test Method
Tensile strength @ yield - Wall	2.354 PSI	D638
Tensile strength @ yield - Hinge	2.846 PSI	D638
Yield Elongation - Wall	7.44%	D638
Yield Elongation - Hinge	7.01%	D638
Flexural Modulus	119.625 PSI	D790B
Notched Izod Impact - Wall	3.84 (ft-lbs)	D256A
Rockwell Hardness r. scale - Wall	84.4	D785A



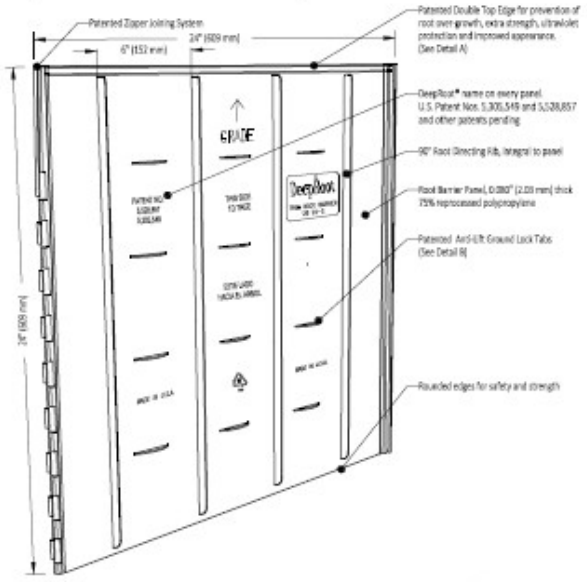
DETAIL A
DOUBLE TOP EDGE AND VERTICAL ROOT DIRECTING RIB



DETAIL B -
ANTI-LIFT GROUND LOCK TAB



DETAIL C - ZIPPER JOINING SYSTEM



DETAIL D - TREE ROOT BARRIER PANEL

deeproot

Appendix 10 - Related Laws, By-Laws, Policies

The following are related bylaws, laws, or documents to be referenced with these guidelines:

9.12.1 ARBORIST SAFE WORK PRACTISES (2016)

9.12.2 ENGINEERING DESIGN CRITERIA AND STANDARDS (2021)

9.12.3 FEES AND CHARGES BY-LAW

9.12.4 GOOD FORESTRY PRACTISES BY-LAW #70-21

9.12.5 MUNICIPAL ACT, 2001, S.O. 2001, C.25; (Government of Ontario, 2021)

9.12.6 ONTARIO LANDSCAPE TREE PLANTING GUIDE (2019)

9.12.7 PLANNING ACT R.S.O. 1990, C. P.13; (Government of Ontario, 2021)

9.12.8 THE COUNTY OF BRANT OFFICIAL PLAN

9.12.9 THE ELECTRICITY ACT, 1998; (Government of Ontario, 2021)

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