Hamilton

Forestry and Horticulture

Design and Preservation Manual for Assets on Public Property

Public Works Department

Environmental Services Division

Forestry and Horticulture Section

City of Hamilton
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Disclaimer

The information in this document is intended to provide guidance in addition to legislative and industry standard design for use within the City of Hamilton's public right-of-way (ROW) for Forestry and Horticulture projects.

There will be site specific circumstances where designs may conflict with the guidance provided in this document. The City acknowledges this and will ensure that all designs are reviewed to ensure quality and compliance. The City of Hamilton intends to review and revise this document periodically to ensure the guidance within the document aligns with current industry standard specifications and best management practices.

The City of Hamilton reserves the right to accept or refuse design submissions.

Document Control

Please access this manual through City of Hamilton website to ensure you are reviewing the most up to date document.

Revision History

Due to the nature of standards and guidelines, changes to this document will be tracked over time within this section.

Revision #	Revision Date	Description of Change(s)	Authored By	Approved By
1	*December 2024*	*Addition of details and specification, text updates*	*Katie Mayne and Louise Thomassin*	*Robyn Pollard*

Acknowledgments

The creation of this manual was made possible through the collaboration of City staff within the Public Works Department. The manual is based on a review of best management practices, design standards as well as multiple recent projects completed within Public Works which provided valuable insight.

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Introduction

In 2019, the City of Hamilton Council declared a Climate Emergency. The declaration resolved, among other things, the need to address gaps in current projects and programs, and that *"additional actions are to be taken to incorporate into existing plans and policies to achieve net zero carbon emissions by 2050."*

The Forestry and Horticulture Section recognizes the importance of strategic planning to address gaps, promote the urban forest, beautify public spaces, and improve green infrastructure.

In 2023, the Urban Forest Strategy was adopted by Council. The Urban Forest Strategy identifies the goal to increase the urban tree canopy cover to over 40% by 2050 and to promote and preserve a sustainable urban forest through diversity of tree species and age class, health management, and community awareness. Ensuring a healthy urban forest and robust green infrastructure, helps to promote a healthy community for all residents of Hamilton.

Horticulture's mandate is to elevate civic pride by transforming Hamilton's urban landscapes through horticultural excellence and innovative floral displays. The Forestry and Horticulture Section designs, installs, and maintains floral displays within public property, as well as maintains high-profile public garden spaces.

This Manual responds to the Climate Emergency and aims to successfully integrate Forestry and Horticulture assets into public spaces in accordance with best practices.

Scope

This Manual provides preservation standards and guidelines for:

- tree plantings in soft and hard surface areas and their associated infrastructure within the public Right of Way and parks and open spaces;
- garden bed installations in traffic islands, roundabouts, bump outs and gateways within the public Right of Way;
- garden beds in parks and open spaces; and,
- planters and hanging baskets within the public Right of Way.

This Manual is intended to be a resource for internal and external stakeholders to guide in the planning and implementation of urban forestry and horticultural projects. It outlines essential criteria to ensure public projects are constructed in accordance with industry standards and City design standards, thereby successfully contributing to the City's urban canopy and green infrastructure.

The purpose of this document is to address design considerations for public trees only. Tree protection guidelines for privately owned trees, intended for use by landowners

and developers, are available through the Planning and Economic Development Department. Private woodlands are governed by City of Hamilton By-law 14-212 and Region of Hamilton-Wentworth By-law R00-054. Various communities within the City of Hamilton have separate bylaws that govern work associated with trees on Private property, these include Ancaster Heritage Tree By-law 2000-118, Dundas Tree By-law 4513-99, Stoney Creek Tree By-law Stoney Creek 4401-96. The private tree bylaws are not addressed within this Manual.

This Manual is intended to be referenced in conjunction with all other applicable City of Hamilton policies, design standards / details, guidelines, by-laws as well as Provincial and Federal rules and regulations.

Support

To support stakeholders through the planning and implementation of urban forestry and horticultural projects the following resources, in addition to this Manual, are available:

Horticultural Contact: pwhort@hamilton.ca

Urban Forestry Contact: urbanforest@hamilton.ca

Additional information can be found at www.hamilton.ca

Definitions

In this Manual, the following terms are defined as:

Term	Definition
AODA standards	Refers to the Accessibility for Ontarians with Disabilities Act.
BIA	A Business Improvement Area or BIA represents a group of property and business owners within a defined geographic area who develop, promote, and protect the area's commercial viability.
City	City means the City of Hamilton.
Daylight Triangle	A triangular open area, typically where two streets meet, which provides an open area with the intention of increasing visibility for drivers and pedestrians.
Ditch	Refers to a sloped area with 3:1 or more difference in grade. Ditches are generally not considered suitable tree planting locations.

Drip Line	The area defined by the outermost circumference of a tree canopy.
Forestry and Horticulture	Forestry and Horticulture means the Forestry and Horticulture Section of the City of Hamilton.
Gateway	Landscape or architectural features; can be marked in different ways, including a sign and landscape features at the side of a roadway, or an architectural landmark (such as an archway) over the roadway.
ISA Certified Arborist	ISA Certified Arborists hold a valid certification through the International Society of Arboriculture (ISA).
Landscape Architect	A Landscape Architect is a full member with seal in good standing with the Ontario Association of Landscape Architects (OALA).
Low Impact Development (LID)	Design solution intended to manage stormwater runoff.
MTCU Qualified Arborist	MTCU Qualified Arborists hold a valid certification through the Ministry of Training Colleges & Universities in Ontario.
Order	Order to Comply issued through Municipal Licensing and Enforcement.
Private Tree	Any tree which has greater than 50% of its trunk diameter, measured at ground level, on private property.
Public Right-of-Way (ROW)	Also known as the municipal road allowance, refers to the city owned land that includes the roadway, sidewalks, and the section of land used for utilities.
Public Tree	Means any tree which has greater than or equal to 50% of its trunk diameter, measured at ground level, on public property.
Soil Cell	A modular system installed below hard surfaces to provide trees with access to uncompacted soil.
Soil Trench	A continuous trench of uncompacted planting soil with a suspended structural concrete slab above to bridge the trench.
Swale	Sloped area with a 3:1 or less width-to-height ratio. Swales

	are generally considered acceptable tree planting locations.
Tree Protection Zone	Means a restricted area around the base of a tree 1m from the dripline, which serves to protect a tree and its root zone, as established by the Director or authorized designate in accordance any applicable City by-law or policy.
UFHT	Refers to Urban Forest Health Technician staff situated within the Forestry and Horticulture Section.
Visibility Triangle	See daylight triangle.

Tree Permits & Fees

The following section addresses the requirements to obtain a permit to Remove or Damage Trees on Public Property, and the methodology used by City Staff to appraise the ecological and monetary value of public trees.

Permit to Remove or Damage a Public Tree

All trees on municipal lands and within the public right-of-way are City property and important assets of our green infrastructure. Significant value is associated with the urban and rural tree canopy and Council has adopted the goal of increasing our urban tree canopy.

Prior to initiating any work within the vicinity of public trees, the City of Hamilton By-law 15-125 – To Regulate Trees on or Affecting Public Property, the Public Tree Preservation and Sustainability Policy, and specification Section 01 33 00.01 – Public Tree Permitting must be reviewed and understood. All three resources can be found in the Supplemental Documents of this Manual and on the city's webpage.

A completed Application to Remove or Damage Trees on Public Property, including the applicable fees and supporting documentation, must be submitted, and approved by Forestry for any actions involving all public trees. To apply for a permit contact UrbanForest@Hamilton.ca.

Forestry staff will assist with ensuring that efforts to preserve healthy trees are in place to ensure they are protected from both subsurface and above grade damage that could negatively impact their health and longevity. Refer to the Tree Management Plan for a detailed list of protective requirements.

Unauthorized Tree Removal or Damage

Failure to obtain a Permit to Remove or Damage Trees on Public Property prior to beginning work on or around public trees may result in an Order to comply being issued against the person(s) responsible. The order will require that the responsible parties pay

associated inspection fees, and loss of canopy fees, and/or the responsible parties will be required to take corrective action and will be responsible for all associated costs.

Should revisions to an approved Tree Management Plan and/or Permit to Remove or Damage Trees on Public Property be required after issuance, authorization must be provided by the Manager of Forestry and Horticulture prior to the implementation of approved plans. Any alterations required after approval will be subject to a subsequent review and approval process and may be subject to a permit fee.

Standard Conditions for Tree Removal

Conditions of Approval are outlined on all Permits to Remove or Damage Trees on Public Property and must be adhered to, along with specification Section 31 11 00 – Selective Public Tree Removal.

Loss of Canopy Fees for Removal of Public Trees

Loss of canopy fees are applied to public trees that have been approved for removal. Loss of canopy fees are determined in accordance with industry standard methodology; the Reproduction Method of the Trunk Formula Method (TFM), as per the Guide for Plant Appraisal, 10th Edition, Revised by the Council of Tree and Landscape Appraisers. The Reproduction Method of the TFM Appraisal provides a valuation based on reproducing an exact replica of the subject tree.

The following parameters must be used when appraising public trees. The Unit Cost and Land Use are fixed values and are determined by the City of Hamilton Forestry Section.

Unit Cost: To ensure consistency, the City of Hamilton Forestry Section will provide the current Unit Cost based on yearly actual street tree supply costs. For current Unit Costs, please contact UrbanForest@hamilton.ca

Land Use: To ensure consistency, the City of Hamilton Forestry Section assigns Land Use values to Land Use types, and are as follows:

1. Street = 75%
2. Park = 85%
3. Hardscape = 95%
4. Facilities = 65%
5. Naturalized = 70%

Cash in Lieu for Tree Planting

Cash in lieu for replacement tree plantings are based on City of Hamilton Council approved user fees.

Plan Requirements

Plans are required for all development applications and capital construction projects regardless of whether trees are present on the subject site. This section provides details on the types of plans and their respective requirements.

Tree and Soil Management Plan

Tree protection is a measure to preserve existing trees during the planning and construction of new developments, infrastructure enhancements, utility upgrades, residential improvements, etc.

Soil protection is a measure to preserve future plant-able spaces from compaction during staging and construction. Protecting existing uncompacted soil preserves the ability of the soil to support vigorous, healthy tree growth.

The Forestry and Horticulture Section requires that a Tree and Soil Management Plan be prepared by a Ministry of Training, Colleges and Universities Qualified Arborist, an ISA Certified Arborist, or a Landscape Architect.

All trees that are within the proposed development area, extending to 6m beyond the proposed work area, must be surveyed, identified, and accurately plotted on the plan to determine ownership. The plan must also identify whether each tree is planned for removal or retention.

All future areas that are to receive planting must be identified, along with the proposed method of protection, such as soil protection fencing. If future areas to receive planting must be used as a staging area or are subject to proposed changes during construction, then measures to mitigate the compacted soils must be performed in accordance with the City's specifications.

All proposed surface treatment changes within individual tree driplines, property lines, building footprints, driveways, limit of grading or disturbance, utility construction corridors and temporary access roads must also be accurately depicted on the submission.

The Tree and Soil Inventory Analysis Table on the Tree and Soil Management Plan is not considered complete without the following data and recommended action for each tree.

- Species by botanical and common name;
- Appraised value as per Reproduction Method of the Trunk Formula Method (TFM), as per the Guide for Plant Appraisal, 10th Edition, Revised by the Council of Tree and Landscape Appraisers;
- Diameter at breast height in centimeters or millimeters;
- Ownership (> 50% @ ground level = ownership) – municipal or private;

- Biological health;
- Structural condition;
- Proposed grade changes within individual driplines;
- Proposed utility construction within individual driplines;
- Proposed removals or relocations;
- Proposed trees to be preserved;
- Proposed preservation techniques (i.e. tree protection zones, soil protection zones); and,
- Identification of any hazardous trees.

Existing trees proposed for preservation must be protected in accordance with the Public Tree Preservation and Sustainability Policy and include a tree protection detail design with appropriate preservation techniques noted on the submission drawings.

If it is determined that special measures are to be taken for preservation, such as root zone decompaction or horizontal mulching, this must be identified on the Tree and Soil Management plan and must include details. The Contract Documents must reference the City's specification and must be approved by the Manager of Forestry and Horticulture.

It is the responsibility of the applicant to determine ownership of all trees that are within the designated work area and 6 meters beyond. Any civil issues which may exist or arise between property owners with respect to trees, must be resolved by the applicant.

Healthy trees that cause a conflict with development plans and can not be retained may be approved for removal and are subject to a loss of canopy fee as outlined in the Public Tree Preservation and Sustainability Policy, the City's user fees, and By-Law 15-125.

Upon approval of the Tree and Soil Management Plan by the Manager of Forestry and Horticulture, all applicable fees will be identified and must be received prior to the issuance of the permit.

Landscape Plan

The Forestry and Horticulture Section requires a Landscape Plan and associated details prepared by a Landscape Architect. The plan must include the locations of all existing and proposed trees and shrubs / perennials on City property, and the subject private land.

The City of Hamilton's Public Tree Preservation and Sustainability Policy, in conjunction with the Tree By-law 15-125, requires new developments to provide payment, as per Council-approved user fees, for street trees to be planted in the road allowance.

All street tree plantings will be carried out by the City of Hamilton, following approval through the review of a proposed street tree planting plan. All trees within municipal

road allowances shall be identified as trees to be planted by the City of Hamilton Forestry Section. The locations to receive street tree plantings must be prepared through the development in accordance with Forestry Sections specifications, including, but not limited to topsoil placement, and soil mitigation. Forestry is not responsible for preparing the site for plantings, only for planting the trees.

Urban Forest Health Technicians in the Forestry Section shall be notified post-construction when the final grade has been achieved to facilitate the scheduling of street tree planting(s).

The Landscape Plan must outline, at a minimum, the following design requirements:

- All horticultural features (e.g. garden beds and planters) shall be identified and species specified.
- Species of trees, shrubs, grasses, and perennials on City property should promote biodiversity within the landscape, where reasonable, by using native and near-native species and in review of existing vegetation.
- A table corresponding with the Landscape Plan that identifies species to be planted, including the size (e.g. 50mm tree), quantity and type (i.e. ball and burlap, etc.) must be included. Species selection should consider cultivars (fruitless, thornless etc.), salt and heat tolerance, mature size, public visibility, daylight triangles, and potential pest concerns.
- Proposed soil volumes must be identified for each tree.
- Identification of all hard surface and soft surface areas on the site.
- All proposed private tree plantings should be located and must have species denoted.
- All proposed surface treatments, existing and proposed underground utilities, proposed grading changes, property lines, buildings, limit of grading and disturbances, egress, and ingress, staging areas and easements.

Forestry staff will determine if a tree species is permitted, and the Landscape Plan shall reflect that decision by denoting the following on the plan: "*City of Hamilton Forestry and Horticulture to determine species*".

No coniferous tree plantings are permitted on City of Hamilton road allowances. There may be exceptions; however, and approval must be obtained by the Manager of Forestry and Horticulture.

Any horticulture features identified on the Landscape Plan, such as shrubs and perennial beds, must be submitted to the Superintendent of Horticulture for review prior to acceptance.

An Approved Species List is available through the City of Hamilton's website. Additional species will be considered for approval based on the site-specific environmental conditions.

Subdivision Planting Design Requirements

- One tree per lot and three trees per corner lot.
- Provide cash in lieu for all parks, open spaces, stormwater management ponds, and ROW locations at a rate of 1 tree per 8.00m of ROW frontage.
- Blocks identified on the plan that are not parks, open spaces or stormwater management ponds will be reviewed through Site Plan, during which landscape conditions will be required.
- Roundabout features require details on the Landscape Plan for staff to review the proposed plant material.

When a new subdivision is being developed, and native topsoil is stripped and stockpiled on-site for reuse, it must be tested prior to re-use to ensure that the soil meets the city's specifications and O. Reg. 406/19 On-Site and Excess Soil Management. Subject to soil test results, amendment recommendations for the existing soil stockpiles must be submitted to Forestry for acceptance and / or new topsoil must be imported in accordance with specification Section 32 93 10 – Public Tree Planting in Soft Scape.

Where new trees are being planted, soils must be remediated in accordance with specification Section 32 93 10 – Public Tree Planting in Soft Scape, which includes soil decompaction requirements for all areas to receive new tree plantings, except where existing preserved trees will be impacted.

Specifications and Details

Forestry and Horticulture have developed specifications and details that must be used for all development that will impact existing public tree assets or horticultural assets and / or is proposing new public tree assets or horticultural assets.

The specifications and details are identified in the Supplemental Documents section of this manual and the latest versions are available free of charge online at the City of Hamilton's website at www.hamilton.ca. Alternatively, contact UrbanForest@hamilton.ca for access.

Forestry and Horticultures specifications and details must be reviewed within the context of each specific project and coordinated with projects Contract Documents. The City of Hamilton is not liable for any errors or omissions contained within these specification Sections.

Permitting and Design

Projects that will impact existing public tree assets or horticultural assets and / or will be planting new public trees assets or horticultural assets must adhere to the Forestry and Horticultures specifications and details, and the standards identified in this Manual. This includes, but is not limited to:

- Identification of existing public tree assets that will be preserved;
- Identification of protection measures and extent of protection measures for existing public tree assets;
- Identification of any Work that will occur within the dripline of an existing public tree that will be preserved and proposed mitigation techniques during and post-construction, such as air spading and horizontal mulching, horizontal hoarding and staged vertical hoarding;
- Identification of soil areas for protection that will receive future tree plantings to and proposed protection measures to protect against compaction and other negative effects due to construction;
- Identification of mitigation measures to de-compact areas that will receive future tree plantings, if adequate soil protection during construction can not be achieved; and,
- Identification of future tree planting species and soil volumes.

Construction

The construction requirements, including the review of shop drawings, submittals, mock-ups, tree protection measures, and the requirements for mitigation and preservation techniques such as air spading, mulching etc. are outlined in Forestry and Horticultures specifications and details, and the standards identified in this Manual.

The Manager of Forestry and Horticulture, City of Hamilton or authorized designate reserves the right to require mitigation and preservation techniques during construction that were not identified during the design and permitting phase, or due to unforeseen circumstances. Mitigation and preservation techniques include, but are not limited to:

- Air spading and horizontal mulching;
- Horizontal mulching;
- Horizontal and / or vertical hoarding; and,
- Decompaction and enhancement of existing soil to receive future tree planting.

For any projects that affect existing public tree assets and / or are planting new public tree assets, the Manager of Forestry and Horticulture, City of Hamilton or authorized designate must attend, at minimum the following meetings:

- The pre-construction meeting;
- Progress meetings, where Works related to Public Trees will be discussed; and,

- Close-out meeting.

The Manager of Forestry and Horticulture, City of Hamilton or authorized designate must be notified a minimum of 5 working days in advance of any meeting, other than emergency meetings.

Commissioning

The commissioning requirements for hard surface tree installations that include suspended concrete slab systems or soil cell systems, including, but not limited to, testing and City staff training requirements are outlined within Forestry and Horticultures specifications and details, and the standards identified in this Manual.

Close-out

The close-out procedures and submittal requirements, including, but not limited to, as-built drawings, operations and maintenance manuals, spare parts, etc. are outlined within Forestry and Horticultures specifications and details, and the standards identified in this Manual.

Acceptance and Warranty

Warranty shall occur for a period of two (2) years starting from the date of final acceptance. The warranty requirements, including, but not limited to, maintenance requirements during the warranty period, roles and responsibilities, replacements during the warranty period are outlined within Forestry and Horticultures specifications and details, and the standards identified in this Manual.

Planting Guidelines

All Landscape Planting Plans must consider the following guidelines to ensure that projects are planned and executed in a manner that adheres to best practices, successfully integrates green infrastructure, and provides plants with an environment conducive to maturation.

Guidelines for New or Existing Park Development (excluding Subdivisions)

To expand tree canopy cover, the number of trees planned for park developments should provide 40% canopy cover, unless the park is designated as a “sports park”. The number of trees should be based on size at maturity. Preference shall be given to large canopy shade trees when space allows.

The number of trees required to reach the canopy target is based on the average canopy spread of common species:

- Shade trees = 200m^2
- Ornamental trees = 50m^2

Guidelines for Horticultural Installations

In the absence of the below criteria, traffic islands, medians, bump outs, and roundabouts do not fit within the parameters of the Horticulture program. Final confirmation of suitability will be provided by the Manager of Forestry and Horticulture.

Approvals, designs, and confirmation of maintenance must be arranged with the Forestry and Horticulture Section to ensure that assets are funded and maintained, and provide the beautification intended by installing green infrastructure.

General Guidelines for Horticultural Installations

- Soils must meet the criteria identified in the Guidelines for Soil Requirements section of this Manual.
- Plant quantities, species, sizes, quality, and locations must align with the approved Landscape Plan.
- All plants must be installed at the correct level relative to the finish grade. The root flare of woody plants shall be 2.5cm to 5cm above the finish grade.
- All plants to be installed must be healthy and free of disease, insect pests, and invasive or noxious plant species.
- All areas to be planted are prepared prior to planting and are free of visible weeds, invasive and noxious plant species, and free of underground weed parts.
- Plants must be watered immediately after planting to the depth of their root systems.
- Watering must be carried out when required and in volumes relative to the specific plant needs and growing medium type to maintain sufficient moisture through the root zone.
- Growing media must be settled prior to mulch installation.
- Mulch installation should be tapered at the base of grasses, shrubs, and perennials; mulch should not be installed within 5cm of the plant base.
- Mulch should not be installed if the growing media surface is saturated; the media must be allowed to dry prior to mulch installation.

Guidelines Specific to Traffic Islands (Conversions and New Installations)

- The minimum width of the island is 1.10m from the inside edge to the inside edge of the curb.
- The finished elevation of planting medium, including the depth of mulch, must not be more than 12mm from the top, and no greater than 50mm from the top elevation of the curb.
- Minimum installed depths from ground level up must include 100mm of clear gravel, landscape fabric, a minimum of 300mm of approved soil, and 100mm of cedar shredded mulch. Soil depth requirements increase to 450mm for shrub plantings and 900mm for tree plantings.
- The soil and aggregate base must provide adequate soil volume and drainage to ensure plant vitality.
- Preference is given to locations where a left turning lane exists for lane closure during maintenance. Do not install where lane closure for bed maintenance will adversely affect traffic flow.

Figure 1: Example of raised traffic island.

- Preference is given to raised islands (see Figure 1) in locations where road salt could affect plant vitality. It should be designed to a minimum height of 300mm and to a maximum of 600mm from the road surface while ensuring the median does not negatively affect the pedestrian and vehicular traffic.
- A clear line of sight for motorists approaching the median must be incorporated. Provide clear sightlines between vertical heights of 0.75m and 2.40m at plant maturity.
- Do not place vegetated traffic islands on steep hills or near underpasses.
- Traffic islands should be designed to incorporate irrigation, unless otherwise approved by the Manager of Forestry and Horticulture.
- Irrigation installation must be in accordance with By-law 10-103 Respecting the Prevention of Backflow into the Water Distribution System of the City of Hamilton, Commercial Water and Sewer requirements, Water Meter Installation requirements, and any other applicable by-laws and guidelines.
- Irrigation systems must be designed and constructed to maximize water efficiency, rainfall and runoff.

- Irrigation systems must be designed and installed in accordance with the Forestry and Horticulture irrigation installation specifications.
- Specific requirements for traffic islands with turf:
  - Medians measuring 1.10m to 3.00m in width must be installed with sod from curb to curb.
  - Medians 3.00m and greater in width must ensure where sod is installed that it is the width of at least a standard mower deck (600mm / 24” width) to ensure access is feasible for maintenance.
  - Beds greater in length than 4.00m should be designed to accommodate a combination of sod and garden beds.
- Designs must ensure the integrity of traffic signs are maintained within the median.
- Refer to Forestry and Horticultures Approved Plant Lists for plant materials to be installed.

Guidelines Specific to Garden Beds

- Garden beds must be protected from snow melting agents, unless due to existing conditions it is not considered practical. Acceptable approaches include galvanized aluminum edging, raised curbs, or raised planters. Refer to Hard Surface Details Type 1-2 for various applications, available on the city’s webpage.
- Minimizing locations that require irrigation is preferred, and efforts should be made to reduce the need for irrigation or manual watering where practical.
- In applications where irrigation has been approved, By-law 10-103 Respecting the Prevention of Backflow into the Water Distribution System of the City of Hamilton, Commercial Water and Sewer requirements, Water Meter Installation requirements, and any other applicable by-laws and guidelines must be adhered to.
- Irrigation systems must be designed and constructed to maximize water efficiency, rainfall and runoff.
- Refer to Approved Plant Lists for plant materials to be installed. Where the bed is located more than 4m from the road allowance, any plants that are suitable to the environmental conditions may be proposed and will be reviewed by city staff for suitability.
- Installations of garden beds must not negatively impact existing adjacent trees, including but not limited to excavation of planting beds, an increase in grade within the dripline, or amendments in proximity to the trunk.
- Soil test results must be included with the submission of the landscape plan to determine soil amendment or replacement requirements.

Guidelines Specific to Roundabouts

- Minimum installed depths from ground level up must include 100mm of clear gravel, landscape fabric, a minimum of 300mm of approved soil, and 100mm of

cedar shredded mulch. Soil depth requirements increase to 450mm for shrub plantings and 900mm for tree plantings.

- For roundabout beds with no irrigation, only drought tolerant plants are acceptable and weekly watering is required for the first growing season.

Figure 2: Example of a roundabout.

Guidelines Specific to Planters and Hanging Baskets

- Hanging Baskets installations are preferred within active BIAs. The installation, and maintenance is at the expense of the BIA, unless otherwise agreed upon by the Manager of Forestry and Horticulture.
- Hanging Baskets and Planters must not obstruct traffic signs, street furniture, minimum sidewalk widths, vehicular/pedestrian traffic, or access.
- Hanging basket brackets must be rated to hold 45kg (100lbs).
- Brackets that are to be affixed to a utility pole must be approved by the utility owner prior to installation.
- Proposed locations for new planters and hanging baskets must be approved by the Manager of Forestry and Horticulture prior to installation.

Tree Planting Layout Guidelines

- Property boundaries must be established prior to planting to ensure that public tree planting occurs only on public property.
- To provide a ‘closed canopy’ effect at maturity, efforts should be made to match one side of the street to the other while also ensuring species diversity.
- The minimum width of a boulevard to support tree planting is 1.75m. For more specific application scenarios please refer to the Hard Surface tree planting detail designs.

- **Boulevard planting curb setback** - tree plantings in boulevards shall be placed with a minimum setback from the boulevard side of the curb of 75cm for turf applications, and 1.75m for garden beds and tree grate applications. Refer to Hard Surface Detail designs for various applications.
- **Driveway setbacks** - tree plantings shall be placed with a minimum setback of 1.50m for large species and 1.00m for small species from driveways and alleyway entrances.
- **Ditch, swale and LID setbacks** – ditches that have a 3:1 grade or more require a setback of 1m from the top of the ditch. Ditches, swales and low impact development with a grade of less than 3:1 require a minimum 1.5m offset from the centerline.

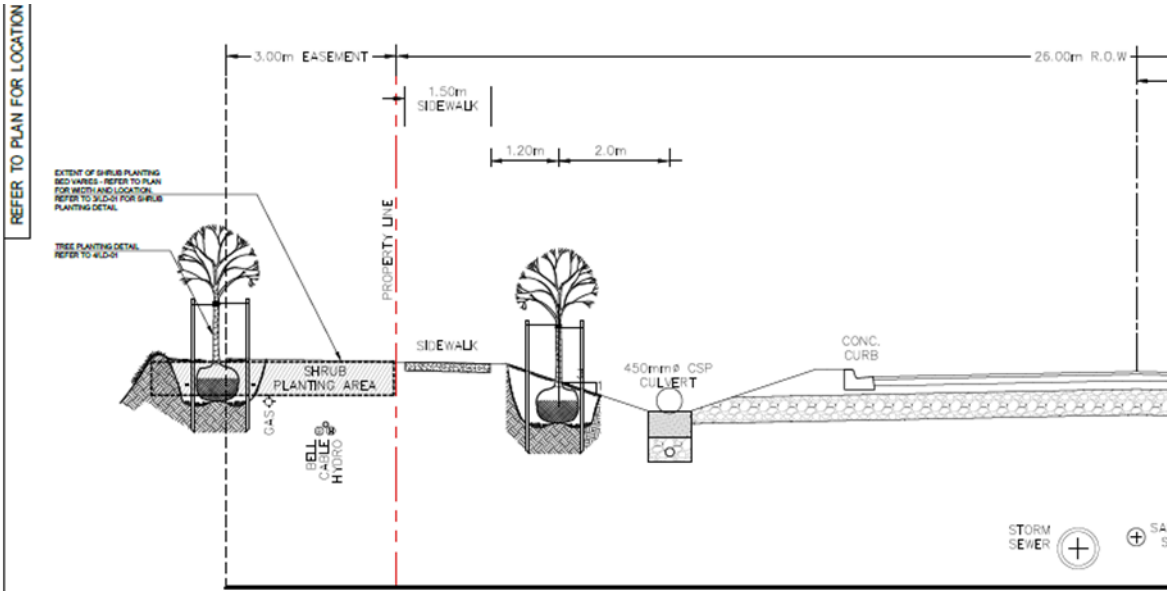

Figure 3: Example Swale Setback.

- **Building setbacks** - tree plantings must be placed with a minimum setback of 3.00m from any building or structure. Tree species proposed near buildings or structures must consider size at maturity to ensure no future conflicts.
- **Stop sign and traffic signal setbacks -** no tree shall be placed closer than 6.00m in line of sight to a stop sign on a residential street, and no closer than 15.00m in line of sight to a stop sign or traffic signal light on any collector or arterial road. To maintain open sightlines, tree species with high-branching canopies should be proposed in these locations.
- **Tree spacing:**
  - Street trees with an anticipated DBH ≥ 40cm at maturity shall be spaced 8.00m - 10.00 m apart.

- Ornamental trees shall be spaced 4.00m - 7.00m apart.
- Tree spacing minimums may be modified at the discretion of the Manager of Forestry and Horticulture.

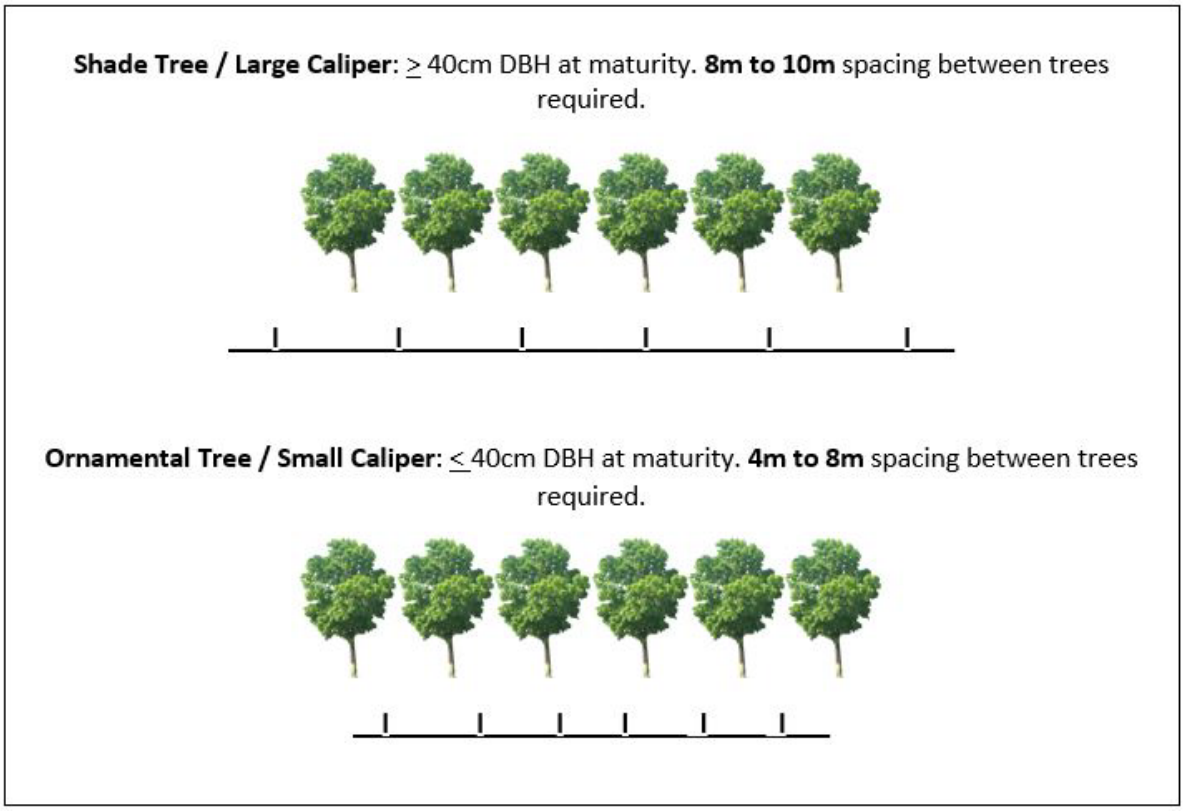

Figure 4: Tree Spacing Diagram - Ornamental and Shade Trees.

- **Day lighting triangles:**
  - Visual obstruction of the intersection must be avoided by ensuring that trees planted within the daylight triangle have a canopy height of at least 2.40m at the lowest branch point.
  - Herbaceous plant material and shrubs must have a mature height of less than 50cm to be planted within a sight triangle, measuring 9.1m x 9.1m along the boundary of each of the intersecting roadways measured from the point of intersecting curb lines.
  - Exemptions may exist in mature neighbourhoods where historical locations of horticultural features and trees pre-date the current standard.
- As per local hydro utility guidelines, a setback of 3.00m is required from the door of the hydro box to allow for suitable access for maintenance.
  - To improve environmental and aesthetic benefit, groupings of trees proposed as naturalized or formal landscapes should be considered where reasonable.

Spacing requirements may be reduced by up to 30% where groupings of the same species of trees are proposed.

- Tree plantings must achieve a minimum setback of 1.5m from fire hydrants, light standards, utility pedestals, transformers, or water valves.
- No tree shall be planted closer than 1.5m to the access doors or within 1.5m from the sides of an above ground hydro vault (transformer). Setbacks for tree plantings must be confirmed by the utility provider.

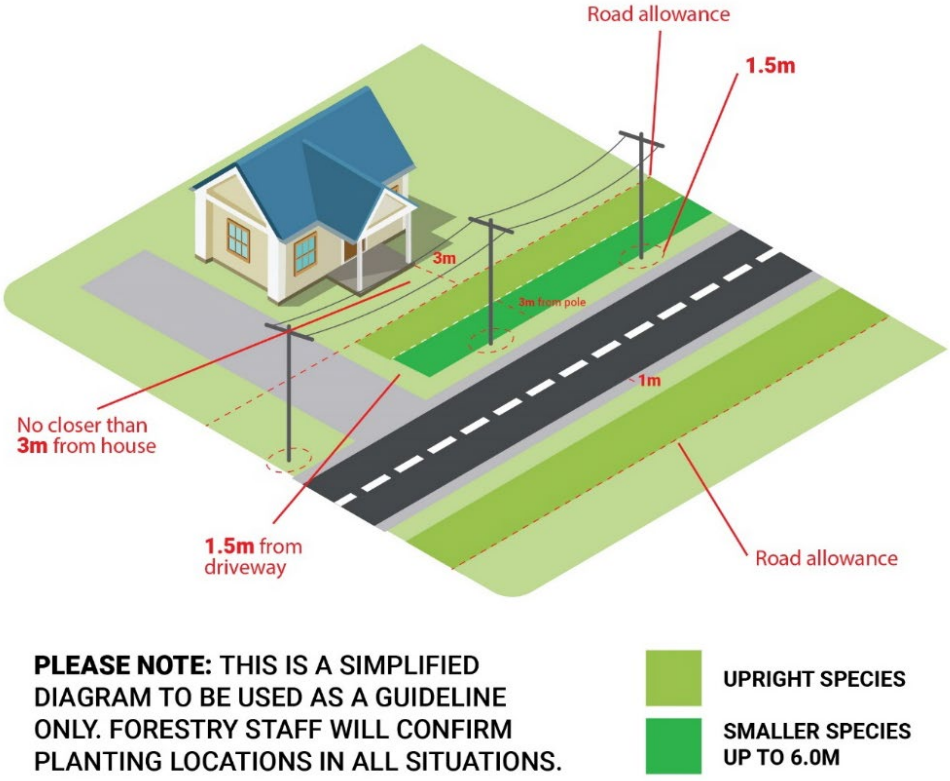

Figure 5: Setback Diagram.

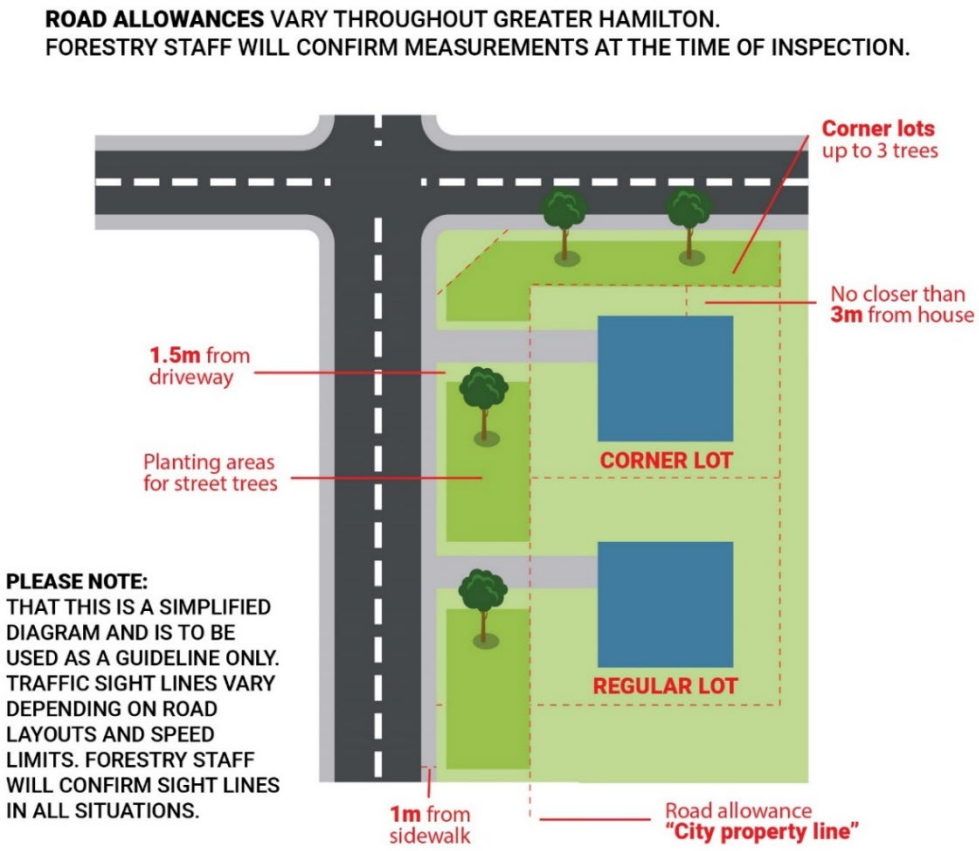

Figure 6: Setback Diagram – Corner lot and regular lot.

Guidelines for Trees in Soft Surface Locations

- Open planting beds / areas are the preferred design and must be implemented, unless otherwise approved by the Manager of Forestry and Horticulture.
- Soil cells can be incorporated into an open planting bed / area as a hybrid approach, if required, to meet minimum soil volume specifications. For example, use of modular soil cells to provide root access under sidewalk to available soil outside of boulevard.
- Minimum boulevard width or soft surface area opening width is 1.75m, and the under-planting is to be hardy groundcover, mulch, or in boulevards sod and approved by the Manager of Forestry and Horticulture.
- Soil volumes must comply with City of Hamilton soil volume requirements.
- Refer to the City's tree planting details available in the Supplemental Documents section of this Manual and specification Section 32 93 10 – Public Tree Planting in Soft Scape for the full list of requirements.

Installation of Trees in Soft Surface

Proper planting is essential for the successful establishment of trees. Tree installation must comply with the following guidelines.

Mulching

Mulching is one of the most beneficial practices to ensure the long-term health of a tree. Mulch can improve the soil's water retention, minimize weeds, protect the tree from mechanical damage, alleviate compaction, increase mycorrhizal fungi, and improve soil structure.

Mulching must comply with detail PK 1101.01 Mulching Existing Trees Details and the city's specifications.

Watering

One of the benefits of suitable soil volumes is the improved ability of the soil to filter and retain water, and to restore some natural ecological functions to the soil in the urban environment. Harvesting water runoff and directing it into the soil provides water to newly planted trees and reduces runoff.

Fertilization

Newly planted trees generally do not regularly require fertilization. If there are concerns about the nutrient availability within a planting zone, a soil test should be completed to determine deficiencies. Trees should only be fertilized after review of the soil test results.

Guidelines for Trees in Hard Surface Locations

To ensure a healthy and robust urban canopy, and to support the goals of the Urban Forest Strategy, designs within hard surfaces should incorporate storm water harvesting, integrated drainage systems, and adequate air exchange.

The City of Hamilton has an order of preference for the design standard of hardscape tree plantings, and is as follows:

- Open planting bed with curb;
- Open planting bed with curb and a soil trench or soil cells to achieve required soil volumes (hybrid option);
- Open planting bed with raised planter (mounted bench can be incorporated);
- Open planting bed with raised planter and a soil trench or soil cells to achieve required soil volumes (hybrid option); and, as a last possible option,
- Tree grate and soil trench or soil cells to achieve required soil volumes.

Soil trenches using a suspended concrete slab and soil cells should only be used where an open planting bed can not achieve the required soil volume. The City prefers to use these technologies as a hybrid system in combination with open planting beds, and the use of tree grates and soil cells or soil trench only is strongly discouraged and must receive approval by the Manager of Forestry and Horticulture.

Construction details and specifications of all the above noted design standards are available in the Supplemental Documents of this Manual.

In addition to the above, designs of hard surface tree plantings must ensure that:

- The Tree Planting Layout section of this Manual are followed.
- Trees are provided with adequate soil moisture, adequate drainage, and adequate air exchange.
- Minimum soil volume is achieved. Soil depth may exceed 1.00m, however depths greater than 1.00m cannot be used in calculation of total soil volume.
- Tree openings must provide a preferred opening of 1.75m at the surface, and 1.2m minimum.
- Designs adhere to all City of Hamilton Design guidelines (i.e. *City of Hamilton Barrier Free Design Guidelines*, and *City of Hamilton Corridor Planning Principles and Design Guidelines).*

Soil Cells and Soil Trenches

Soil cells and soil trenches are designed to provide trees in hard surfaces with sufficient soil volume where space is limited. Soil cells are modular, structural, cellular system, designed to be filled with planting soil for tree rooting, stormwater management, and support of loaded pavements, including vehicles, if required. The term can be used to refer to a single soil cell or a stack of soil cells. The approved manufacturers for use within Public Property are identified in Section 32 93 10.03 – Public Tree Planting, Soil Cells. Refer to the Supplemental Documents of this Manual.

Soil trenches through the use of suspended concrete slabs are designed to be suspended over planting soil to permit a continuous soil trench beneath pavement to achieve required soil volumes to support the healthy, and vigorous growth of trees in hard surface areas.

Designs for soil cell and soil trench systems must include essential components to ensure that trees can thrive, including:

- Stormwater management and drainage;
- Sufficient root space that maintains appropriate soil strength; and,
- Adequate air exchange to ensure soil supports tree growth.

Tree Grates

Tree grates must be installed at the time of construction of the sidewalk.

Tree grates must:

- Be square or rectangular on the outer perimeter;
- Be offset a minimum of 500mm from the boulevard side of curb;
- Provide an internal diameter grate opening of 600mm;
- Accommodate a typical root ball diameter of 0.75m plus 0.30m around sides;
- Sit flush with the surrounding surface to not pose a tripping hazard; and,
- Refer to specification Section 32 33 00 – Site Furnishings for approved tree grates.

Figure 7: Tree grate with large inner ring and square outer perimeter.

Watering, Air Exchange & Drainage

Directing water to hard surface trees can be achieved through surface water harvesting systems that direct water into sills, trench drains, or inlets, and hybrid systems that combine parts of each approach.

The type and volume of soil used has an impact on the amount of water required to maintain adequate soil moisture and can also impact the amount of water that can be retained by the soil. Larger soil volumes require, and can retain, larger amounts of water.

Sandy soils, sand-based soil mixes, and bio retention soils can accept larger volumes of water, but also need more regular infusions of water to support tree roots due to their tendency to dry out between water applications. Heavier loam soils, including most locally harvested soils, need less frequent watering due to their water holding capacity, but they can become waterlogged if too much water is applied.

Stormwater harvesting has many environmental benefits and can help to protect urban infrastructure from damaging rain events. Therefore, where underground watering systems are applicable, integrated stormwater runoff systems should be prioritized over irrigation systems. Where integrated storm water runoff systems are not reasonable due to limiting factors, irrigation systems may be proposed. Where irrigation systems are proposed, they must ensure that proper drainage is incorporated into the design and must comply with the Forestry and Horticulture Irrigation Specifications and Details.

Guidelines for Soil and Mulch Requirements

Soil is the most critical component for successful plant establishment. The following section provides requirements for soil quality and management to ensure that plant establishment, and to maximize environmental and aesthetic benefits to the urban forest and the city's green spaces.

All projects must comply with the soil and mulch requirements identified in specification Section 32 93 10 – Public Tree Planting in Soft Scape and Section 32 93 10.01 – Public Tree Planting in Hardscape.

Soil Quality and Testing

- Protection of native site soil is important and should be taken into consideration in locations where the soil has been tested and shown as a quality growing medium, and preservation of the soil is feasible.
- Native site soil that has been stockpiled or altered must be protected from contamination and compaction.
- Site soil may require amendments to de-compact or to improve fertility, aeration, and drainage. Amendments should only be used if soil testing has indicated a deficiency.
- The origin of all sourced soils must be certified.

Soil Volumes

Adequate soil volume is required to yield large, healthy trees. The amount of soil installed will influence the maximum size that a tree can achieve during its lifespan.

The City of Hamilton has identified the following soil volumes as minimum requirements for public trees:

Tree Planting Medium	Ornamental Trees / Small Caliper ≤ 40cm DBH (at maturity)	Shade Trees / Large Caliper ≥ 40cm DBH (at maturity)
Single tree planting, Minimum soil volume per tree	15m^3	21m^3
Multiple tree plantings in shared soil volume, Minimum soil volume per tree	10m^3	16m^3

Minimum soil volume and spacing guidelines are based on the mature size of trees. The Forestry and Horticulture Section has no specific soil volume requirements for shrubs, perennials, annuals, grasses, or turf. Soil must be installed to a volume that will provide sufficient root space for plants to establish and mature.

Guidelines for Plant Selection

To promote a healthy and sustainable growth, urban environment plants must be able to withstand difficult and extreme growing conditions. Therefore, careful selection of species is imperative to survivability, and needs to consider both the present, and future site conditions. Trees installed on public lands must comply with the most recent edition of the Ontario Landscape Tree Planting Guide published by Landscape Ontario.

Factors to consider when selecting plant species for use on public property:

- Use of native species, suitable for site conditions including salt tolerance and soil temperature, is preferred.
- Invasive species are not permitted. Refer to the latest information available from the Hamilton Conservation Authority and the Ontario Invasive Plant Council for lists for species classified as invasive within Ontario. Priority will be given to Hamilton Conservation Authority.
- All species submitted for approval for planting on public lands must comply with Forestry and Horticultures “Approved Species List” for the appropriate application.
- Plant species that are considered regionally rare according to the Hamilton Natural Areas Inventory should not be selected to avoid introducing non-local genetics to the local gene pool. Refer to the Hamilton Natural Areas Inventory for more information.

Factors that must be considered when selecting plant species include, but are not limited to:

- Site conditions:
  - Soil composition, moisture levels, and available volume
  - Microclimate
  - Aspect
  - Drainage
  - Traffic
  - Soil salinity
- Existing utilities
- Anticipated benefits (environmental, social, and economic) for the site and adjacent areas
- Existing trees
- Land use
- Species characteristics:
  - Light, moisture, and soil requirements
  - Adverse characteristics (e.g. fruit, thorns, heavy seed production, allelopathic effects etc.)
  - Size and form at maturity
  - Aesthetic appeal and surrounding urban design

- Maintenance requirements
- Hardiness zone
- Overall species composition to maintain species diversity
- Deciduous vs coniferous
- Resistance to pests / diseases
- Tolerance to salt, wind exposure, soil compaction, and urban pollution

Diversity Guidelines

The Forestry and Horticulture Section has developed these guidelines to ensure Hamilton's urban forest and greenspaces promote resilience against pests, diseases, and stresses attributed to the urban environment such as soil compaction, road salt, heat islands, air pollution, drought, shading, competition, soil volumes, wind tunnels etc.

The following provides a guideline for encouraging biodiversity and determining tree species composition for right-of-way and developments sites:

# of Trees to be Established	Maximum % of Genus
1-5	No restriction
5-20	50%
21-100	20%
100+	10%

Some circumstances may warrant deviating from diversity guidelines due to various reasons (heritage properties, etc.). In these circumstances, deviation from the guidelines must be approved by the Manager of Forestry and Horticulture.

Sourcing Nursery Stock

Plant quality is critical for successful establishment. All plant material installed on public lands must comply with the most recent edition of the Canadian Nursery Stock Standard published by the Canadian Nursery Landscape Association.

In addition to the Canadian Nursery Stock Standards, the Forestry and Horticulture Section has developed the following guidelines to ensure successful establishment of plant material.

Guidelines for Sourcing Trees

Refer to Section 32 93 10 – Public Tree Planting in Soft Scape and Section 32 93 10.01 – Public Tree Planting in Hardscape, see the Supplemental Documents Section of this Manual.

Guidelines for Sourcing Shrubs, Perennials, Grasses, and Turf

- Plant material shall be of standard quality, true to name and type, and be a first-class representative of the species or variety.

- Plants shall have normal, well-developed, and vigorous root systems. They shall be healthy, vigorous plants, free from defects, decay, sunscald injuries, insects, pests and all forms of infestation or objectionable disfigurements. See Canadian Nursery Stock Standard for detailed specifications.
- Plants shall have a well-established root system, reaching the sides of the container to maintain a firm ball when removed from the container, but shall not be root bound. Plants in containers shall not be grown in the same container for longer than two (2) growing seasons.
- The root mass of the plant shall be suitable to hold the medium together when removed from the container. Root circling and other root abnormalities must be corrected before planting to encourage proper root development and establishment and may be rejected.
- All plants shall be specified by both plant size and container size.

Handling & Transporting Plant Material

- To protect against abrasion, wind, exposure, extreme temperature, or moisture changes during transit to the planting site, plant material shall be protected by mesh tarpaulin or shade cloth to avoid damage during transport.
- Root balls shall be kept in a moist condition. All plants shall be held in a protection zone and guarded against damage, extreme temperatures, and desiccation. Prior to planting, all plants shall be kept well-watered and protected from extremes in temperatures.
- Plant material shall be handled in a manner to ensure the least amount of damage during the planting process.
- Trees and shrubs shall always be handled by the root ball or container. Under no circumstance should they be dragged, lifted, or pulled by the woody or foliage parts in a manner that will loosen the roots of the ball.
- Plants should never be thrown or bounced off a truck / loader to the ground.
- Tree trunks must be protected with wrap or padding, to be removed after planting is complete.
- Any abrasions of the tissue during delivery and site handling, caused in the planting operation, shall be corrected immediately. Such plants may be refused on site at time of delivery, or after installation.
- Broken limbs or abrasions caused in the planting operations shall be repaired immediately, and such plants may be refused on site at time of installation.
- No plant shall be harvested or transported from the time of bud break until the newly formed leaves are fully developed and matured. Any plant to be planted after the emergence of leaves, shall be harvested prior to bud break, and stored in a partially shaded area protected from winds.

Approved Tree Species

Trees proposed for planting within the right-of-way must adhere to Forestry and Horticultures Approved Plant List. All Landscape Plans and proposed species will be reviewed by the city.

Approved Perennials, Shrubs and Grasses

Perennials, shrubs, and grasses proposed for planting within public land must be taken from Forestry and Horticultures Approved Plant List.

Planting Season

Planting should only be performed when weather and soil conditions are suitable, in accordance with best practices.

Spring and fall are the preferred seasons to plant. Planting during the hot summer months should be avoided unless exceptional care is taken to prevent desiccation, and adequate water can be provided before, during, and after planting. These are general guidelines and planting seasons may be longer or shorter, dependant on weather conditions.

Unless otherwise approved by the Manager of Forestry and Horticulture, plant materials should be installed as follows:

- Turf, Grasses, Shrubs and Perennials – from April 15 to November 15.
    - Consideration should be made for wrapping conifers in roundabouts with burlap for 2 seasons after installation to reduce winter damage.
- Deciduous Trees – from March 1 to November 15.
- Transplanted Deciduous Trees – from March 1 to June 15.

Tree Protection During Construction

Every effort must be made to preserve healthy trees and to protect them from construction activities.

Tree protection in the City of Hamilton is shared between private and public land, however this manual addresses public trees only. Tree protection guidelines for privately owned trees for use by landowners and developers, are available through the Community Planning and Design Section of the Planning Division and available on the city's webpage.

Tree Removal, Transplanting and Pruning

As per By-law 15-125 and the City of Hamilton's Public Tree Preservation and Sustainability Policy; removal, transplanting, and pruning of public trees is prohibited without an approved permit.

To reduce the likelihood of damages to preserved trees, permitted tree removals must only be completed once approved tree protection has been installed.

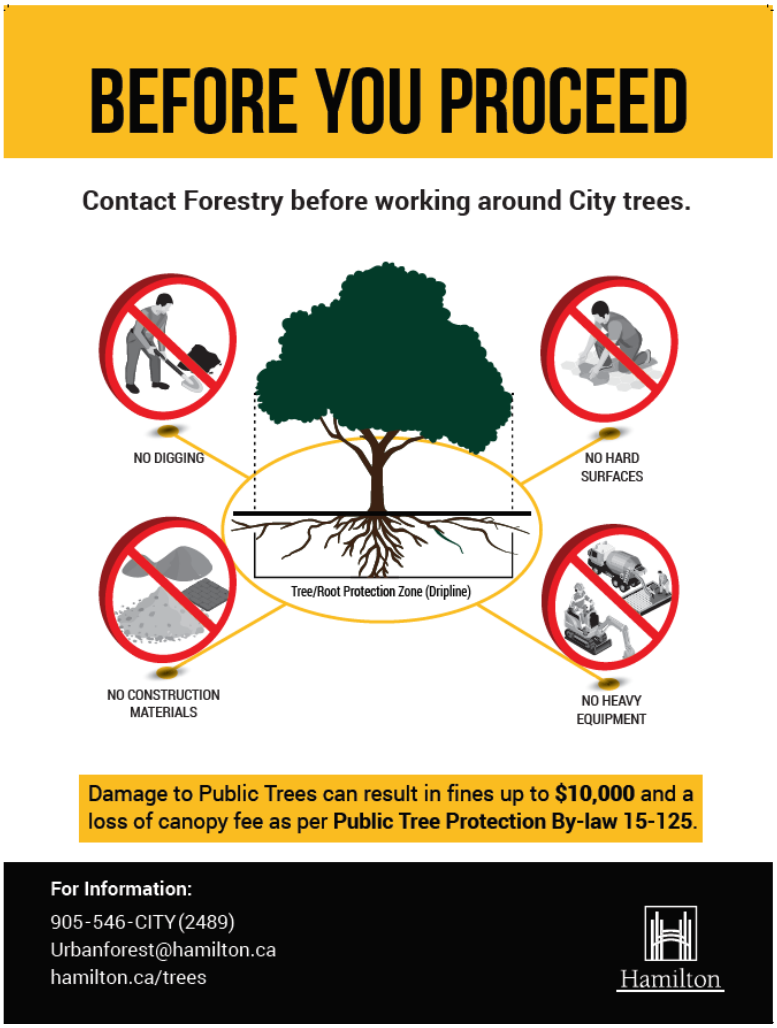

Figure 8: Public tree notice.

Transplanting trees is not recommended within the right-of-way due to utility conflicts. Transplanting must consider the time of year (see Planting Season section for timing), species characteristics, site conditions, tree size, tree structure, and the health and vigour of the tree.

Tree pruning must follow good arboricultural practice and be completed by a qualified Arborist (Ministry of Training, Colleges, and Universities), or by a certified Arborist with the International Society of Arboriculture (ISA). Public trees are maintained by the Forestry and Horticulture Section, therefore, any maintenance pruning would be completed by Forestry staff. In some cases, pruning is required to reduce the likelihood of injury to trees throughout construction.

Pruning should be considered during the design phase to ensure trees are pruned to provide adequate clearance for construction vehicles, access, and proposed structures and pre-pruning activities must be approved by an Urban Forest Health Technician through the issuance of a permit.

All pruning works must adhere to specification Section 32 01 90.23 - Public Tree Pruning.

Potential Remedial Action for Trees Impacted by Construction

Retained trees that are impacted by construction must be immediately reported to the Forestry and Horticulture Section by contacting urbanforest@hamilton.ca mitigation efforts will be identified by the Urban Forest Health Technician assigned to the file.

Impacts include, but are not limited to, any of the following:

- Scrapes / abrasions to the above ground tree parts (trunk and limbs);
- Broken limbs; and / or,
- Exposed or severed roots.

Mitigation for trees impacted by construction may include any of the following, or a combination, and must be completed by a Certified Arborist:

- Decompaction / aeration of soil using pneumatic aeration tools;
- Mulching of the drip line or critical root zone;
- Pruning of damaged branches;
- Bark tracing around stem wounds;
- Root pruning;
- Fertilization;
- Other treatments, as deemed necessary; or,
- Removal of the tree if mitigation is not reasonable.

Refer to specification Section 02 50 00 – Soil Mitigation for Existing Public Trees for a complete list of requirements.

Hoarding

Review the City of Hamilton Standard Details PK-1100.01 – Tree Hoarding, Streets and PK 1100.02 – Tree Hoarding, Parks, and specification Section 32 01 90.33 - Public Tree Preservation and Protection.

Watering and Mulching

Refer to specification Section 32 01 90.33 - Public Tree Preservation and Protection for watering and mulching requirements during the construction period and warranty period.

Soil Compaction

Trees require adequate soil compaction to provide support for root systems; however, overly compacted soil reduces soil health, available root space, air and water exchange

capacity, nutrient uptake capacity, water retention capacity and can damage existing roots.

To avoid soil compaction, ensure construction and development, including ingresses and egresses, and all staging areas, are kept outside of the critical root zone of existing trees and future planned trees.

Soil protection methods must be utilized in areas adjacent to tree protection zones, where temporary access or work must occur within the critical root zone of existing trees to remain, and to reduce soil compaction for future trees and plants.

The installation of soil compaction protection must be reviewed and approved by the Urban Forest Health Technician assigned to the file.

Soil Compaction Protection Methods may include, but is not limited to:

- Limiting site traffic;
- Identify site ingress and egress and storage / staging areas;
- Root curtain systems; and,
- Installation of temporary protection layer to disperse weight of equipment, building materials and / or stocked materials (soil).

Refer to specification Section 32 01 90.33 – Public Tree Preservation and Protection and specification Section 02 50 00 – Soil Protection for Public Trees for all soil protection requirements.

Excavation

Any required excavation within the dripline of a tree that has been approved by an Urban Forest Health Technician must be conducted utilizing a non-invasive excavation method, such as directional boring, pneumatic excavation (Air-Spade), hydro-vac, or hand-digging with the objective of root preservation.

Excavation using directional boring is the preferred method of utility installation. Minimum depth of cover is 1.00m – 1.50m, dependant on level of disturbance.

Refer to specification Section 32 01 90.33 – Public Tree Preservation and Protection.

Root Pruning

Root pruning must be done in advance of any excavation within 1m of a tree protection zone. Pruning must be done through a non-invasive excavation method outside the area of disturbance to proactively prune roots that could be damaged by the excavation.

Where roots have been injured, if the root(s) are greater than 20mm in diameter, the Urban Forest Health Technician assigned to the file must be consulted immediately.

If excavation within the tree dripline is required, Forestry and Horticulture approval must be obtained prior to commencing work, and root pruning must be done by, or under the supervision of, a certified Arborist. Root pruning should comply with the Arboricultural Best Practices (ANSI A300 – 2013 Root Management Standard or equivalent).

Refer to specification Section 32 01 90.33 – Public Tree Preservation and Protection for the full list of requirements for all root pruning works.

Warranty Period and Assumption of Assets

Newly installed public assets are subject to a two (2) year warranty period. Prior to the commencement of the warranty period, the Manager of Forestry and Horticulture, or authorized designate must have completed the required inspections and received the required documents, in accordance with specification Section 01 77 00 – Closeout Submittals and Procedures and Section 01 91 13 – Commissioning Requirements.

The owner is responsible to maintain and operate the public assets until the completion of the warranty period. Specific requirements during the warranty period are identified within the respective specification sections.

The requirements identified are to ensure a smooth transition of asset ownership, ensure that assets are documented within the city's geographic information system (GIS) and ensure that all assets are maintained according to best practices and that the city has assigned staff to complete the maintenance work.

For projects that include Horticulture assets:

- Contact the Superintendent of Horticulture during the design phase to ensure the project is reviewed;
- Prior to soil installation, ensure the Superintendent of Horticulture has reviewed soil test results;
- The Superintendent of Horticulture must inspect the project site during the installation of soil, irrigation systems (including water meter and backflow), plant materials and mulch; and,
- Upon project completion, the Superintendent of Horticulture must inspect the project site.

SUPPLEMENTAL DOCUMENTS

Bylaws Refer to City of Hamilton By-Law webpage: https://www.hamilton.ca/city-council/by-laws-enforcement/search-by-laws
Public Trees By-law 15-125
(Private) Ancaster Tree By-law 2000-118
(Private) Dundas Tree By-law 4513-99
(Private) Stoney Creek Tree By-law 4401-96
(Private) Woodlot By-law 14-212
(Private) Woodland Conservation R00-054
City of Hamilton User Fees and Charges By-Law (updated annually)
Prevention of Backflow into the Water Distribution System of the City of Hamilton By-Law 10-103, Website Link

Policy
City of Hamilton Public Tree Preservation and Sustainability Policy

Permit
Application to Remove or Injure Trees on Public Property

Construction Specifications (Forestry)
Section 00 01 10 – Table of Contents
Section 01 33 00 – Submittal Procedures
Section 01 33 00.01 – Public Tree Permitting
Section 01 77 00 – Closeout Submittals and Procedures
Section 01 91 13 – Commissioning Requirements
Section 02 50 00 – Soil Mitigation for Existing Public Tree Planting in Soft Surfaces
Section 02 50 00.01 – Soil Protection for Public Trees

Section 03 10 00 – Concrete Forming and Accessories, Curbed Planter Bed, Raised Planter Bed and Suspended Concrete Slab
Section 03 20 00 – Concrete Reinforcing, Raised Planter Bed and Suspended Concrete Slab
Section 03 30 00 – Cast-in-Place Concrete, Curbed Planter Bed, Raised Planter Bed and Suspended Concrete Slab
Section 31 11 00 – Selective Public Tree Removal
Section 32 01 90.23 – Public Tree Preservation and Protection
Section 32 33 00 – Site Furnishings
Section 32 93 10 – Public Tree Planting in Soft Scape
Section 32 93 10.01 – Public Tree Planting in Hardscape
Section 32 93 10.02 – Public Tree Planting, Suspended Concrete Slab
Section 32 93 10.03 – Public Tree Planting, Soil Cells

Construction Details (Forestry)
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PK 1100.02 – Tree Hoarding – Parks
PK 1101.01 Mulch Existing Trees
PK 1105.03 – Deciduous Tree Planting
PK 1105.04 – Tree Planting
PK 1105.05 – Deciduous Tree Planting with Stakes revised
PK 1110.02 – Coniferous Tree Planting
PK 1140.01 – Planting Bare Root Shrub
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FH 501 – Sodded Boulevard (Plan View)

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FH 503.03 – Open Planting Bed with Curb, Soil Trench (Section View – c)
FH 504 – Open Planting Bed with Curb, Soil Cells (Plan View)
FH 504.01 – Open Planting Bed with Curb, Soil Cells (Section View)
FH 505 – Open Planting Bed in Raised Planter (Plan View)
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FH 506 – Open Planting Bed with Tree Grate, Soil Trench or Soil Cells (Plan View)
FH 506.01 – Open Planting Bed with Tree Grate, Soil Trench (Section View)
FH 506.02 – Open Planting Bed with Tree Grate, Soil Cells (Section View)

Construction Specifications (Horticulture)
Irrigation Installation Specifications
SP 800 Horticulture Soil Specification

Construction Details (Horticulture)
PK 1141.01 – Planting Potted Shrub
City of Hamilton Backflow Prevention Program, Website Link
Standard Water Main Drawing Index (WM 207.01 & WM 207.03), Website Link

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- Canadian Landscape Standards, 2nd edition, 2023: https://www.csla-aapc.ca/standard
- Canadian Nursery Stock Standard, 9th Edition: https://cnla.ca/training/cnss
- City of Guelph Tree Technical Manual https://guelph.ca/city-hall/planning-and-development/how-to-develop-property/development-applications-guidelines-fees/treetechnicalmanual/
- City of Hamilton Right-of-Way Utility Installation and Permit Manual https://www.hamilton.ca/sites/default/files/media/browser/2015-04-22/right-of-way-manual.pdf
- Growing Medium Specifications (Soil Requirements): https://www.toronto.ca/wp-content/uploads/2017/11/89e9-ecs-specs-roadspecs-TS_5.10_Apr2014.pdf
- Guide for Plant Appraisal, 10th Edition, 2020, Revised by the Council of Tree and Landscape Appraisers: https://wwv.isa-arbor.com/store/product/4390
- Hamilton Natural Areas Inventory Project, 3rd Edition, 2014. Available from Hamilton Conservation Authority, 838 Mineral Springs Rd, Ancaster, ON L9G 4X1.
- Invasive Plants Ontario: https://www.eddmaps.org/ontario/
- Ontario Landscape Standard, 2004: https://landscapeontario.com/attach/1246977850.Landscape_Guidelines.pdf
- Ontario Landscape Tree Planting Guideline, 2019: https://landscapeontario.com/ontario-landscape-tree-planting-guide
- Protected Species List Ontario: https://www.ontario.ca/page/species-risk-ontario#section-8
- Tree Planting Solutions in Hard Boulevard Surfaces Best Management Practices https://issuu.com/dtah/docs/iii-iv_best-practices-manual_append