

Understanding the 2019 Ontario Landscape Tree Planting Guide

Darby McGrath
Glen Lumis

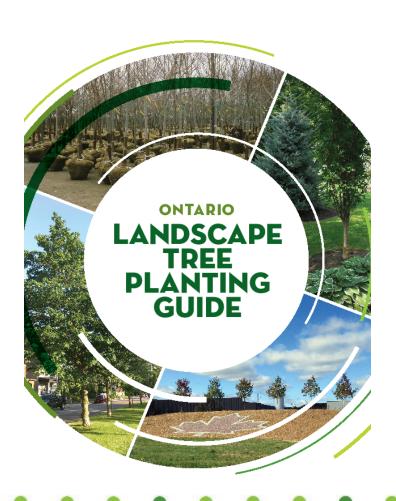


Introduction

- Released in September 2019
- Authored by Vineland's Greening Program research team
 - Darby McGrath
 - Jason Henry
 - Ryan Munroe
- Collaboration with industry steering committee
- 1.5 + year process to research and write it

Where to find the guide:

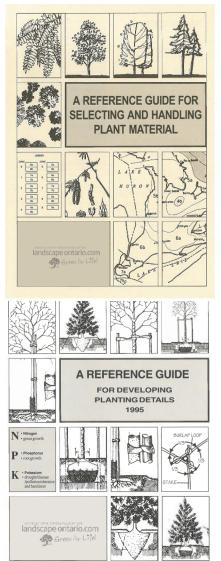
- <u>www.greeningcanadianlandscape.ca</u>
- www.landscapeontario.com



Background

Landscape Ontario documents from 1995

- Standardization and consistency
- Updating the Canadian Landscape Standard
- Municipal tree planting goals and canopy targets
 - Natural solutions opportunities
- Evidence-based practices
 - Getting research in the hands of practitioners
 - Resolving (where possible) conflicting information with empirical evidence

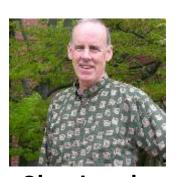


Guide Committee Structure

- Landscape Ontario contracted Vineland to revise the original manual
- Committee Structure



Tony DiGiovanni,Executive Director of Landscape Ontario



Glen Lumis
University of
Guelph,
emeritus



Ian Bruce
Bruce Tree
Expert Co.
Ltd



Sean JamesSean James
Consulting
and Design



Paul
DeGroot
NVK, Connon
Nurseries



Peter
Wynnyczuk
P & A Urban
Forestry
Consulting

Development Process

Drafts

Full review by committee

External Reviews

Review by Ontario College of Trades

Final Revisions

- Industry subsector groups of LO
- 2. Select international advisors (science and practitioners)
- Review by the planting committee of the Canadian Landscape Standard

Overview

- Research based 130 + publications included
- Chapters with key action items
 - Glossary defines words in text
- Field sheets to guide practice
- Planting details



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Format of the Guide & Agenda

Chapters

Environmental Site Assessment

Soil Assessment

Finalizing Tree Selection

Tree Procurement, Transport, Inspection & Handling

Tree Installation

Stabilization, Trunk Protection, Mulching & Irrigation

Field Sheets

Environmental Site Assessment

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Selecting Nursery Trees

Site Preparation

Tree Procurement,
Glen spection

Tree Installation

Tree Stabilization

Trunk Protection, Mulching & Irrigation Appendix A:
Post-Planting
&
Establishment
Care

Appendix B-Planting Details

Deciduous Balled & Burlapped/WB (Well-Drained Soil)

Deciduous Balled & Burlapped/ WB (Poorly-Drained Soil)

Conifer Balled & Burlapped/ WB (Well-Drained Soil)

Conifer Balled & Burlapped/ WB (Poorly-Drained Soil)

Deciduous Bare Root (Well-Drained Soil)

Deciduous Bare Root (Poorly-Drained Soil)

Deciduous Container-Grown (Well-Drained Soil)

Deciduous Container-Grown (Poorly-Drained Soil)

Chapter 1 - Environmental Site Assessment

The fixed variables in your landscape

- Hardiness zone
- ☐ Light levels
- □ Reflected heat
- ☐ Crown space requirements
- ☐ De-icing salts
- ☐ Root system space requirements
- ■Wind

Considerations for making informed species selections – you can't change these variables.

Identifying and evaluating challenges in the landscape

- Texture and drainage
- Compaction
- Soil organic matter
- pH
- Soil volume



Cobourg, ON planting site - Highway of Heroes 2018

Compaction example

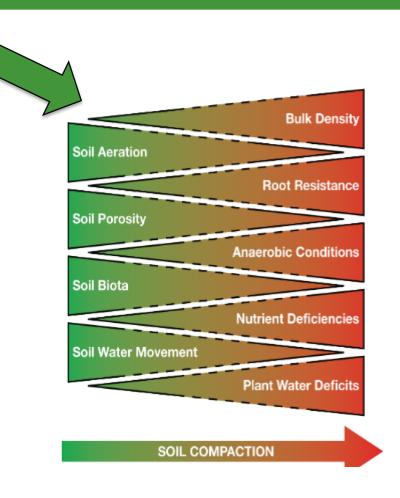
Action Items

- Refer to probing wire test compaction results from Field Sheet 2.
- Based on the compaction severity of the site soil, consult Table 8 for potential interventions.

The **Action Items** direct guide-users to the tables/figures that will help them answer questions which will be based in the field sheet.

Key contemporary **research** is summarized in the chapters & resources are **referenced**

- Tree roots experience resistance to their growth as a result of the force required to push past soil particles
- Resistance to root growth increases as the soil becomes more compact and/or drier
- This resistance to root penetration can ultimately influence root elongation and distribution, which in turn influences the above ground growth of the tree



Figures and **photos** contributed by experts from around the world.

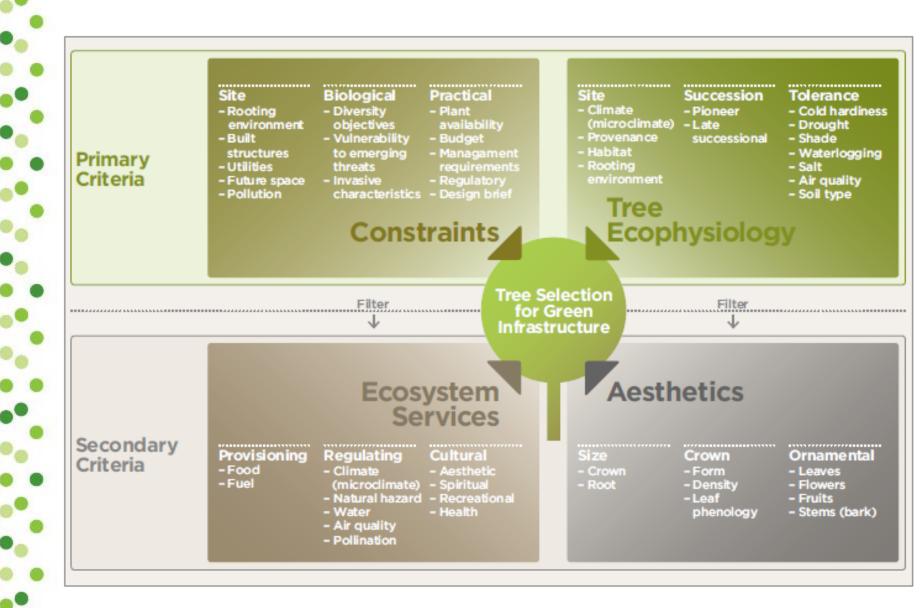
Soil Compaction Assessment

Assessment tools and tests are based on contemporary research findings and are practical to implement.

Soil compaction can be assessed using simple resistance measures, such as the 'probing wire test' (Table 8).

Compaction level indicated by probing	Potential interventions	
y wire test	i oteritiat interventions	
Severe – wire probe will not penetrate soil	Mechanical de-compaction (subsoil	
beyond	and/or backhoe method) and organic	
10 cm deep	amendments should be used in	
	combination	
	(Field Sheet 4 – Site Preparation).	
Moderate – wire probe will penetrate soil with	Mechanical de-compaction and organic	
difficulty 10-30 cm deep	amendments are likely required	
· ·	(Field Sheet 4 – Site Preparation)	
Acceptable – wire probe will penetrate soil	Follow recommended tree installation	
easily to 30 cm deep and below	(Field Sheet 6 – Tree Installation)	

Chapter 3 - Finalizing Tree Selection



Species Selection Resources

Tree Species Selection for Green Infrastructure

A Guide for Specifiers

Written by:

Dr Andrew Hirons and Dr Henrik Siöma

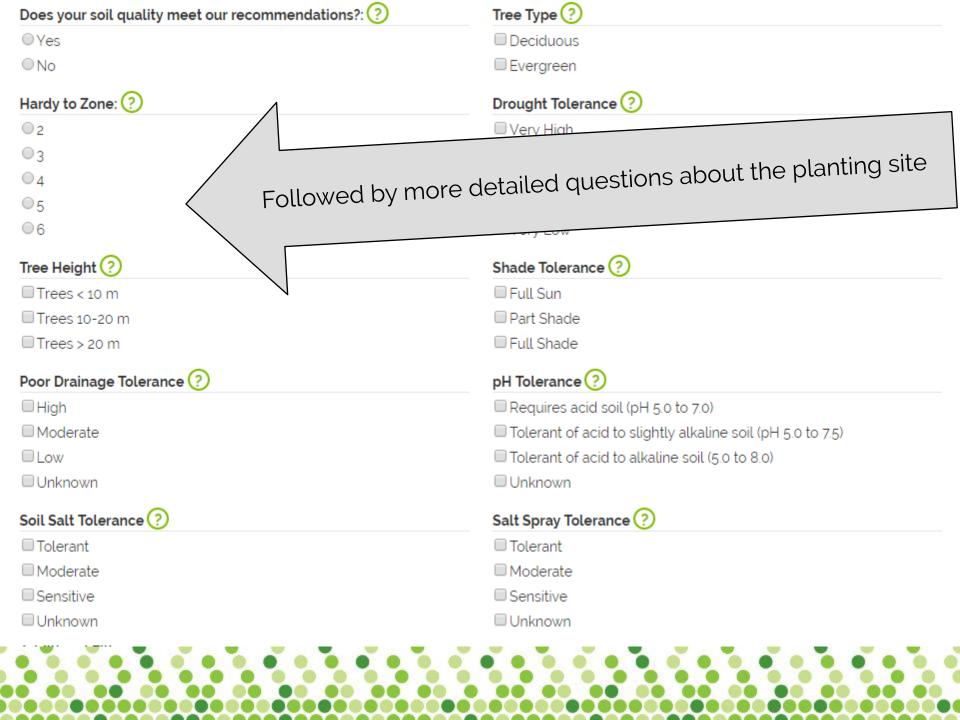












Botanical Name: Common Name(s): Planting Site: (?) A list of suitable species **Botanical Name** ■ Naturalization is generated Parks Abies alba Highway Abies balsamea Residential /hite Fir. Concolor Fir Abies concolor ■ Wide Median Abies fraseri raser Fir Restricted Urban Site Voble Fir Abies procera Does your soil quality meet our Acer buergerianum Trident Maple recommendations?: (?) Yes ○ No Hedge Maple, Field Maple Acer campestre Acer ginnala Amur Maple Tree Type ? Acer griseum Paperbark Maple Deciduous Evergreen Acer miyabei Miyabe Maple Hardy to Zone: (?) Acer negundo Manitoba Maple, Box-elder, Ashleaf Maple 02 \bigcirc 3 Acer nigrum Black Maple, Black Sugar Maple \bigcirc 4 05 Acer palmatum Japanese Maple 06 Acer pensylvanicum Striped Maple, Moosewood, Moose Maple



Red Maple, Swamp Maple, Soft Maple

Tree Characteristics

Leaves: Deciduous

Height: 12 - 20m

Width: 9 - 20m

Growth Rate: Fast

Tree Tolerances

USDA Plant Hardiness 3

Zone:

Shade Tolerance: Full Sun Part Shade

pH Tolerance: Tolerant of acid to slightly alkaline soil (pH

5.0 to 7.5)

Drought Tolerance: Moderate

Flooding Tolerance: High

Salt Spray Tolerance: Sensitive

Soil Salt Tolerance: Sensitive

Planting site and Native Range

Planting Site: Naturalization, Parks, Residential, Wide

Median, Restricted Urban Site

Native to Ontario: Yes

Native to North America: Yes













Insects and Diseases

No serious or common issues in the urban environment. Verticillium wilt can be an issue, which can cause branch/ limb death and severe cases can cause tree mortality.

Management Notes

- Can develop chlorosis in alkaline soils
- · Surface roots may heave pavement
- Thin bark is sensitive to injury

Chapter 4 – Site Preparation

Action Items

- Ensure locates are completed and set-backs are followed prior to site preparation.
- If using one or more of the site preparation methods, use Field Sheet
 4 and the information below to provide guidance.

Based on the soil assessment (Chapter 2 and Field Sheet 2), determine if site preparation is necessary:

- Determine if mechanical de-compaction is required.
- Determine whether amendments are required.
- If the existing soil on-site is not adequate to support tree growth or is specified for replacement, then refer to the information on installing imported manufactured soil at the end of this chapter.

Soil Compaction Assessment





Compaction level indicated by probing wire test	Potential interventions
Severe – wire probe will not penetrate soil beyond 10 cm deep	Mechanical de-compaction (subsoil and/or backhoe method) and organic amendments should be used in combination (Field Sheet 4 – Site Preparation).
Moderate – wire probe will penetrate soil with difficulty 10-30 cm deep	Mechanical de-compaction and organic amendments are likely required (Field Sheet 4 – Site Preparation)
Acceptable – wire probe will penetrate soil easily to 30 cm deep and below	Follow recommended tree installation (Field Sheet 6 – Tree Installation)

Selecting Organic Amendments

Organic amendment type	Benefits	Limitations
Compost	 Widely available Improves soil fertility Improves soil structure Improves moisture retention Microbially active 	Variability by feedstock and among batchesWeed seeds may be present
organic mulches	 widety available Improves moisture retention Improves soil structure Slow release of nutrients Can be inexpensive 	into soil due to high carbon to nitrogen ratio
Biochar	 Improves moisture and nutrient retention Stable and persistent 	ExpensiveLimited availabilityMay not apply uniformly and can be dusty
Bio-solids	 Can improve soil structure through additions of organic matter Source of nutrients Can improve moisture retention Inexpensive 	 Controversial due to mixed public perception Concerns around presence of pathogens and/or metals Lack of landscape-grade products

Backhoe Turning

Site characteristics

- ☐ Compaction below 30 cm
- Less than 5 cm organic matter content
- ☐ Smaller to medium sized sites





Backhoe Turning

Addition of Organic Amendment



Scoop up soil and dump the bucket



Subsoiling & Incorporation

Site Characteristics

- ☐ Compaction below 30 cm
- ☐ Less than 5 cm organic matter content
- ☐ Larger sites (multiple trees)





Subsoiling & Incorporation

Deep-ripping



Addition of Organic Amendment



Incorporate

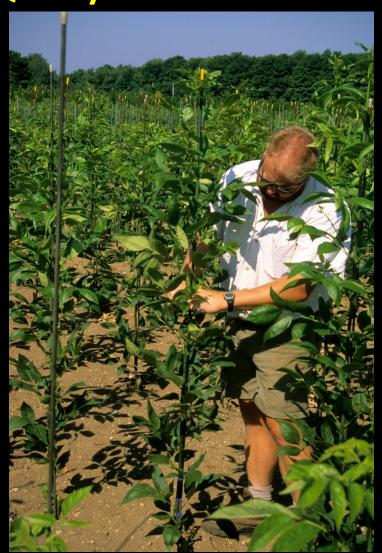








Quality trees - CANOPY



















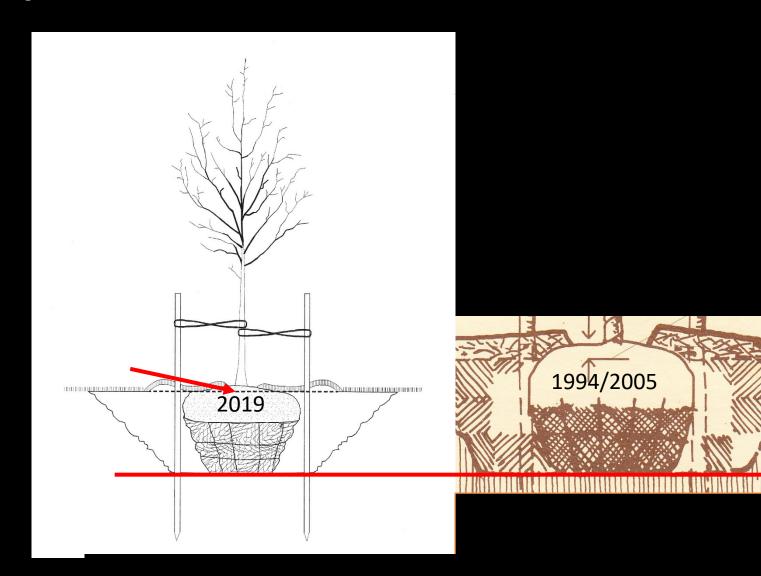


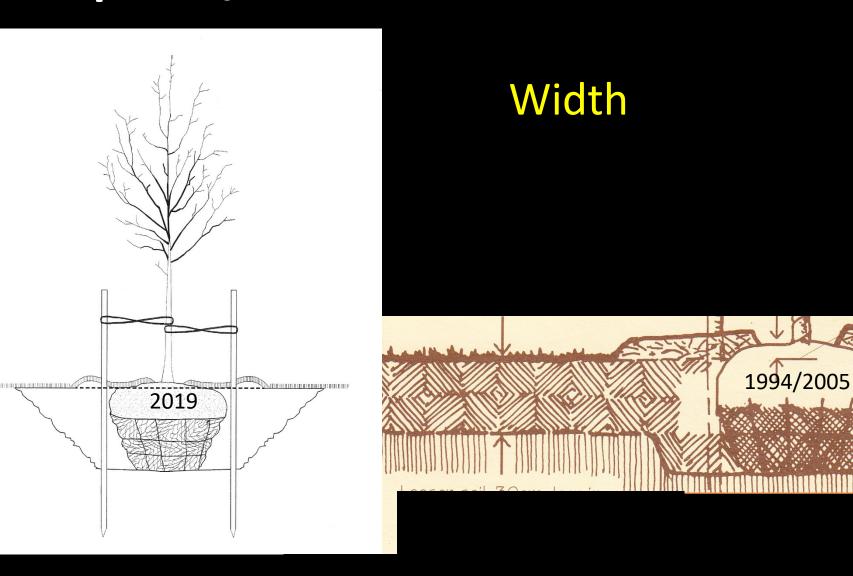


- Hole Depth
- Hole Width
- Tree Placement



Depth



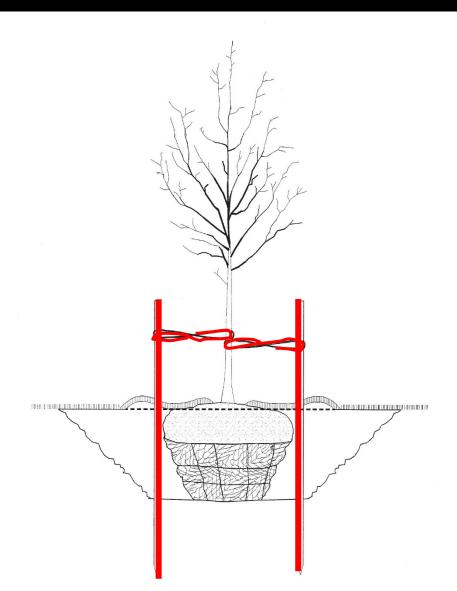




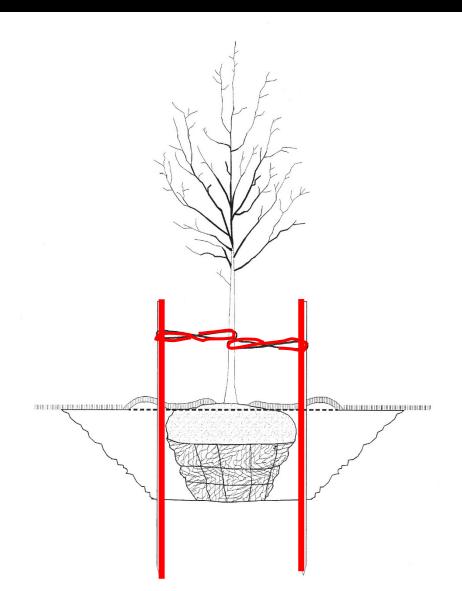




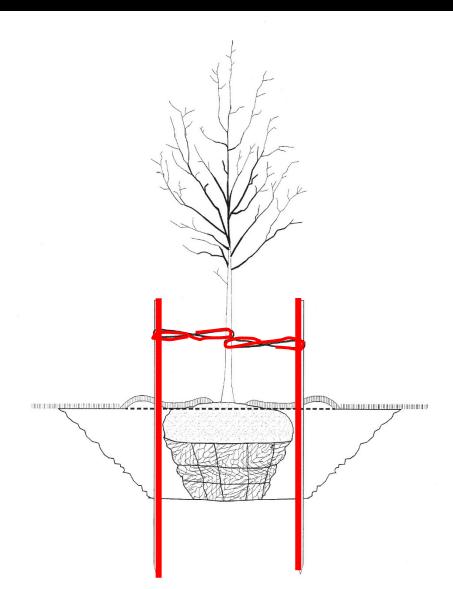




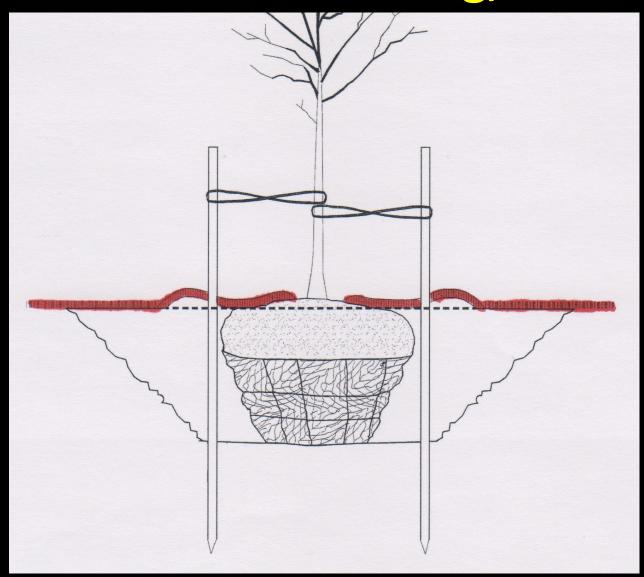
Needed/Required?



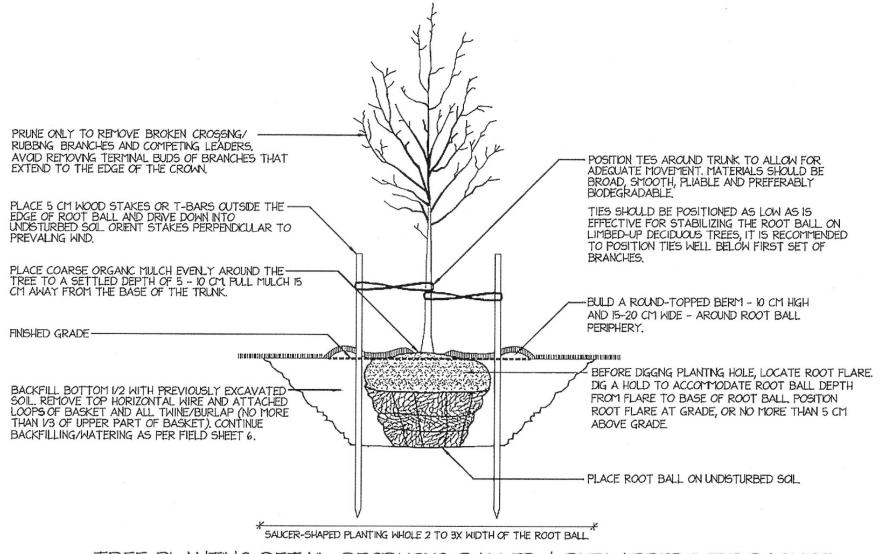
Needed/Required? staking guying root ball anchoring



tie height? material? how long?



AS SOME ASPECTS OF THE DETAIL MAY NOT APPLY TO THE REQUREMENTS OF A PARTICULAR PLANTING SITE. THIS PLANTING DETAIL SHOULD BE USED IN CONJUNCTION WITH THE CHAPTERS AND FIELD-SHEETS FROM THE ONTARIO LANDSCAPE TREE PLANTING GUIDE TO DETERMINE BEST PRACTICES. INFORMATION AND ASSOCIATED DETAILS MAY BE SUPERSEDED BY TENDER SPECIFICATIONS, THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING UTLITY LOCATES PRIOR TO COMMENCING WORK.

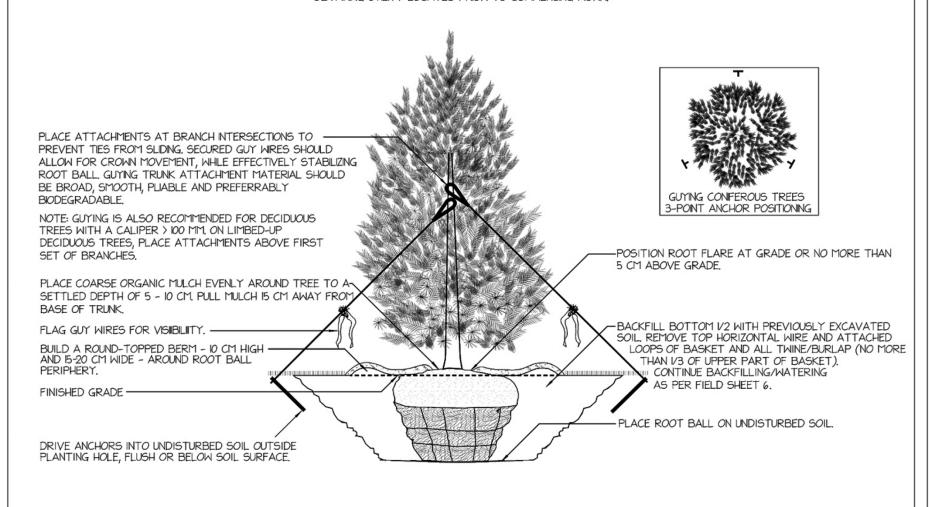


TREE PLANTING DETAIL: DECIDUOUS BALLED & BURLAPPED/WIRE BASKET

TYPICAL INSTALLATION - WELL-DRAINED SOIL - NOT TO SCALE

Version 1 2019

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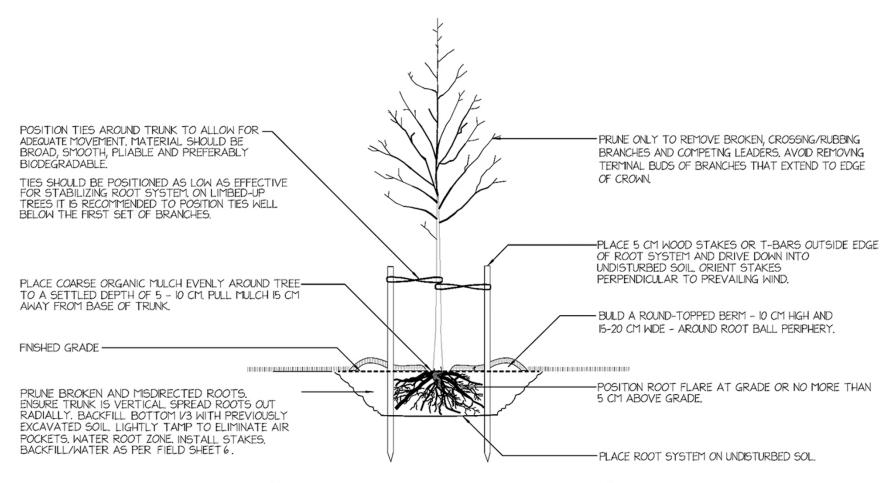


SAUCER-SHAPED PLANTING HOLE 2 TO 3X WIDTH OF THE ROOT BALL.

TREE PLANTING DETAIL: CONIFEROUS BALLED AND BURLAPPED/WIRE BASKET (TALLER THAN 300 CM)

TYPICAL INSTALLATION - WELL-DRAINED SOIL - NOT TO SCALE

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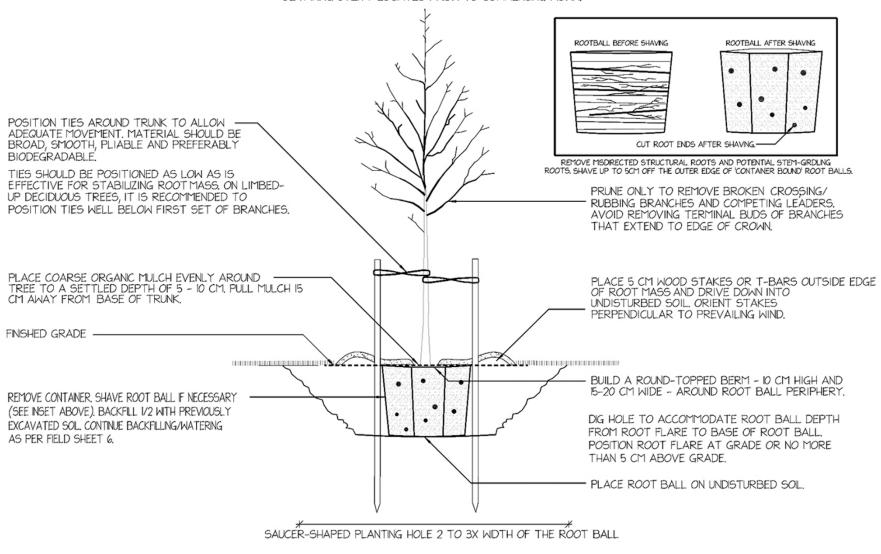


 $^{\prime}$ SAUCER-SHAPED PLANTING HOLE 2 TO 3X WIDTH OF ROOT SYSTEM. $^{\prime}$

TREE PLANTING DETAIL: DECIDUOUS BARE ROOT

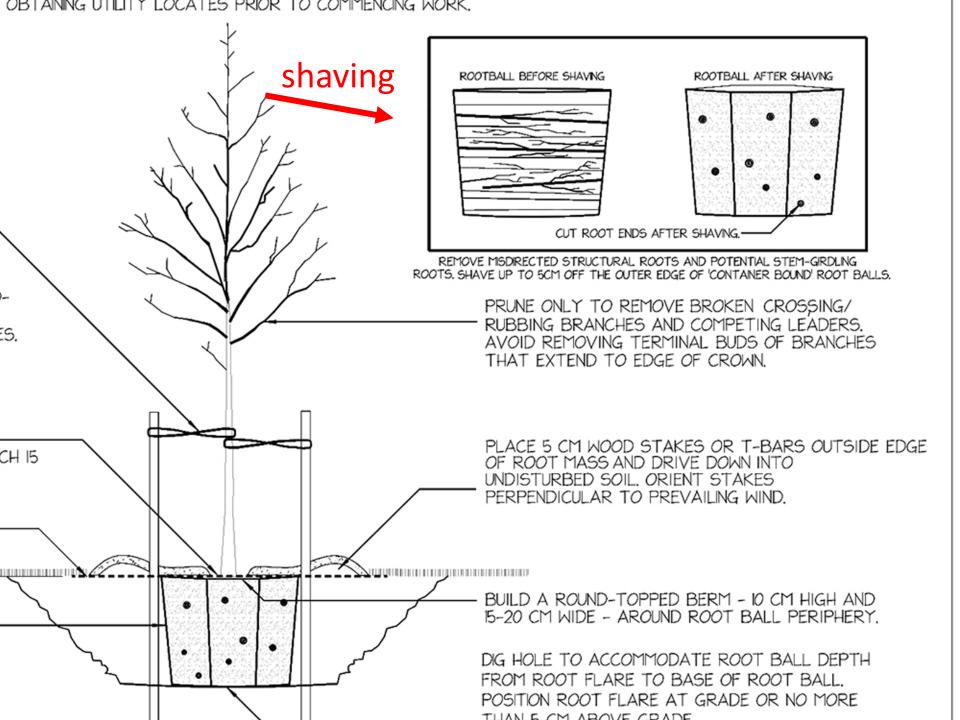
YPICAL INSTALLATION - WELL-DRAINED SOIL- NOT TO SCALE

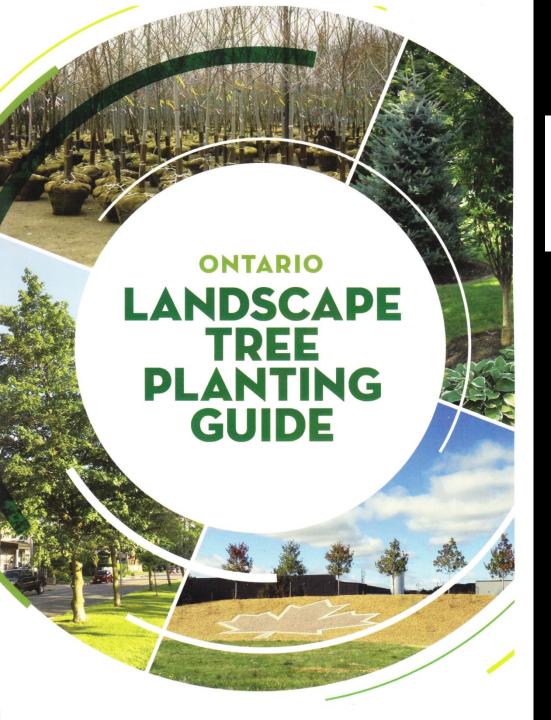
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TREE PLANTING DETAIL: DECIDUOUS CONTAINER-GROWN

TYPICAL INSTALLATION - WELL-DRAINED SOIL- NOT TO SCALE





Where to find the guide:

www.greeningcanadianlandscape.ca www.landscapeontario.com

Thank-you

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