Planting Under or Around Powerlines & Electrical Equipment

Electrical Safety Authority

TABLE OF CONTENTS

LEGAL DISCLAIMER

This document contains AWARENESS ONLY material to assist members of the Public and Industry Professionals to select the correct tree and location to avoid conflicts with the overhead and/or underground powerlines.

This document does not have the force of the law. Where there is a conflict between this document and any Municipal, Regional and/or Township by-laws, legislation or regulation which may apply, the relevant law prevails.

Contact the local Municipality, Regional and/or Township offices to determine if permits are required to plant trees.

Contact your *Local Distribution Company* (*LDC)* to determine their requirements to plant trees and/or shrubs under or around powerlines and electrical equipment.

Introduction

The "Planting Under or Around Powerlines and Electrical Equipment" Guideline responds to the number of reports of powerline contact incidents associated with the trimming or removal of trees, shrubs and vines. This is one of two guidelines produced by the Electrical Safety Authority with the support of Ontario's *Local Distribution Companies (LDC)* and Corban and Goode Landscape Architecture and Urbanism to reduce electrical contact incidents and other electrical hazards when:

- ☐ Planting Under or Around Powerlines and Electrical Equipment
- ☐ Trimming Trees Around Powerlines

These guidelines provides information and insights to support landscape and arborist trades workers, maintenance workers, and homeowners. The guidelines share important information on potential electrical risks, how to avoid these risks, provincial standards, and best practices that, if followed, can decrease electrical incidents.

This guideline includes sections on:

- ☐ Electrical Issues and Hazards
- ☐ Avoiding Potential Hazards
  - Planning
  - Planting

A companion guideline has been created that focuses on avoiding electrical issues and hazards when trimming or removing of trees and/or shrubs under or around overhead powerlines.

We would like to acknowledge the insights and contributions of Corban and Goode Landscape Architecture and Urbanism. Through sharing their insights we have worked to produce easy to use Guidelines for audiences engaging in landscape planning.

ELECTRICAL ISSUES AND HAZARDS - PLANTING UNDER OR AROUND POWERLINES & ELECTRICAL EQUIPMENT

Individuals engaged in planning and/or planting under or around powerlines and electrical equipment, such as Landscape Architects, Landscapers, Municipalities or the public need to be aware of the electrical hazards associated with planting in the vicinity of powerlines or electrical equipment.

TREES

Some species grow at a rapid rate and at a height which directly interferes with overhead powerlines. Planting the wrong tree under or around overhead powerlines create hazards to members of the public and workers. These include:

- **Potential Hazard or Electrocution from:**
  - **direct contact** - when playing in or working around trees where powerlines are hidden by foliage.
  - **energized objects -** branches and limbs caught in the powerlines may unexpectedly become conductive.
  - **contact with powerlines -** during tree maintenance, trimming or removal, including direct contact by unqualified individuals and contact through tree trimming tools.
  - **downed powerlines –** when energized powerlines are pulled down to the ground by broken branches and limbs.
- **Potential Fires -** branches and limbs in close proximity to powerlines can lead to electrical arcing that can create fires.
- **Power interruptions –** resulting when branches and limbs that break damaging powerlines during storms or from disease.

When selecting trees for planting, it is important to consider location of overhead powerlines, the growth rate for specific varieties based on the environment and placement.

Qualified ***Utility arborists*** should do maintenance on trees near overhead powerlines. Any other Landscaper, Arborist, or homeowner should contact the *LDC* to arrange for power to be disconnected prior to starting work.

SHRUBS

Planting shrubs and other plant material near electrical equipment can:

- cause an obstruction for powerline maintenance workers;
- disguise potential hazards;
- cause damage to underground powerlines;
- contact energized components through the roots possibly becoming energized.

VINES

Planting vines at the base of a powerline pole or guy wire will eventually creep and come into contact with energized overhead powerlines or electrical equipment. Vines in contact with powerlines can become energized and be a hazard to the public, cause power interruptions, or fires.

Obstruction around a transformer

Pole growth contacting electrical equipment & powerlines

Guy-wire growth contacting electrical equipment & powerlines

GETTING STARTED - PLANNING & PLANTING TO AVOID POTENTIAL ELECTRICAL HAZARDS

Trees, shrubs and plant materials help homeowners and business owners create a property that they can enjoy and benefit from. Before starting, it is important to locate overhead and underground powerlines, and to understand the impact of landscape plans on the electrical infrastructure and electrical equipment. Up-front consideration of electrical powerlines and equipment can avoid potential electrical hazards that can occur from contact between trees, shrubs and roots, and electrical powerlines and equipment.

BEFORE YOU START ANY LANDSCAPE PLANNING, CHECK FOR:

- ☑ MUNICIPAL, REGIONAL OR TOWNSHIP BY-LAWS that specify preferred tree species and locations for planting.
- ☑ *LDC* REQUIREMENTS regarding planting under or around the overhead powerlines or around underground equipment including underground powerlines.
- ☑ *EASEMENTS* THAT MAY BE ON THE PROPERTY. *Easements* may contain underground and/or overhead powerlines and electrical equipment which allows the *LDC* the legal right to access properties to install and maintain electrical services to the property and/or neighbourhood. A land title search will identify if there are existing *easements*.

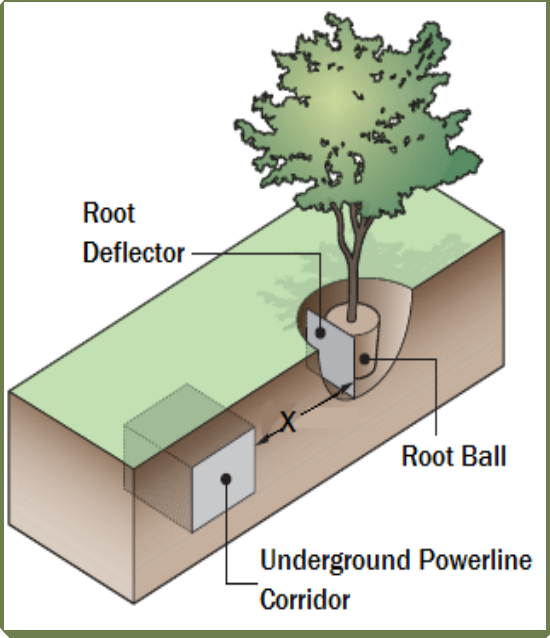
UNDERGROUND POWERLINES

- ☑ Underground powerlines exist in rural, urban and industrial environments and can be compromised when excavating if these powerlines have not been located prior to excavating. The *LDC* can provide a '*locate'* to identify the location of **their** powerline assets. If powerlines are privately owned, the property owner, and/or excavator or landscaper, will need to make special arrangements to locate underground powerlines. Also, contact other utilities, such as natural gas, water, cable, and telephone, to ensure you are aware of their underground equipment and clearance requirements.

  NOTE: driving stakes in the ground for tree support also requires *locates* also to be done.

  For locate request, call ahead and allow a minimum of 2 weeks to receive all *locates*. <u>All</u> *locates* must be received prior to excavation.

- Powerlines may be directly buried, or in conduit, and can be located at different depths depending on grade changes that may have occurred. When planting in the vicinity of underground powerlines, the minimum clearance required from the edge of the root ball to the edge of the underground powerline corridor is 1.0m (3 ft). The *LDC* can provide their clearance requirements from the underground powerlines to the root ball. If the determined distance cannot be achieved, the *LDC* may require the installation of a *root deflector* against the root ball.



ACKNOWLEDGEMENT-HYDRO OTTAWA

ELECTRICAL EQUIPMENT - ABOVE GROUND MOUNTED OR UNDERGROUND CHAMBER

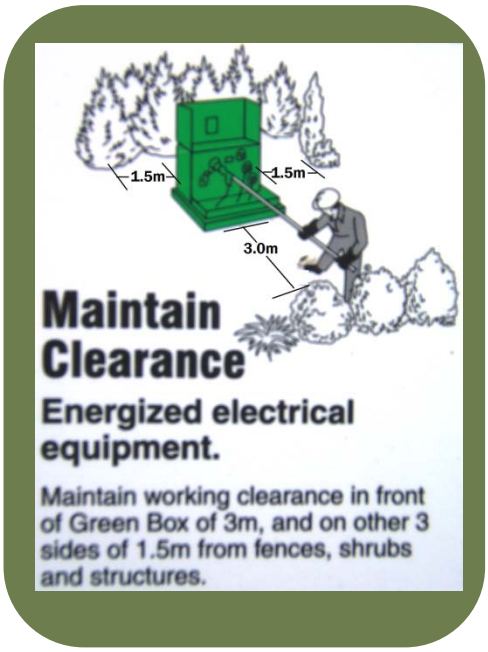
Depending on the *LDC,* electrical equipment such as a transformer or switchgear, may be above ground mounted on a concrete pad foundation (*pad mounted*) or in an underground chamber. *Pad mounted* electrical equipment, are typically green in color. Obstructions such as structures, fences, trees, shrubs or other vegetation should **not** be placed near the equipment. Clearance is required around the *pad mounted equipment* and underground cables for your safety and the safety of Utility workers who require access at all times.

Pad mounted transformer

Pad mounted switchgear

Underground Chamber

- Typically the *LDC* requires a minimum of 3.0 m (10 ft) in front of the pad mounted transformer door(s) and 1.5 m (4.9 ft) around the sides and back. The door(s) can be identified by the padlock. Pad mounted switchgears however requires a minimum of 3.0m (10 ft) in the front and at the back doors of the unit and 1.5 m (4.9 ft) at the sides.
- You should also be aware of the presence of a buried 'ground loop' that is installed approximately 1.0 m (3ft) around the perimeter of the foundation and the minimum of 2 ground rods located at the outside corners of this 'ground loop'. The 'ground loop' protects the public and workers from potential hazards associated with ***step and touch potential*** that can exist from fault conditions.



OVERHEAD POWERLINES

☑ Considering overhead powerlines is critical in the planning and planting of large trees and shrubs. The *LDC* can assist in identifying the type of powerline:
- Primary distribution and transmission powerlines – these are typically non-insulated **bare** conductors and carry high voltage power.
- Secondary distribution powerlines – these may be insulated and carry low voltage power.

☑ Planting under or around powerlines requires caution to ensure:
- Delivery of Plant Materials - trees that are being planted should not be delivered under or around the powerlines. Delivery equipment such as a boom truck can come into contact with the overhead wires. The same for digging with equipment such as a high hoe, the equipment can also come into contact with the overhead wires.
- Trees do not come in contact with overhead powerlines when unloading.

☑ A careful review of the tree planting zone in which your landscape project is in will assist in determining the type of trees that can be considered. Tree planting is categorized in 3 different zones; Low, Medium and Tall. Factoring these zones into landscape plans will ensure that the tree at full maturity doesn't come into contact with the overhead powerlines, and will not compromise powerlines if branches and limbs are broken during extreme weather.

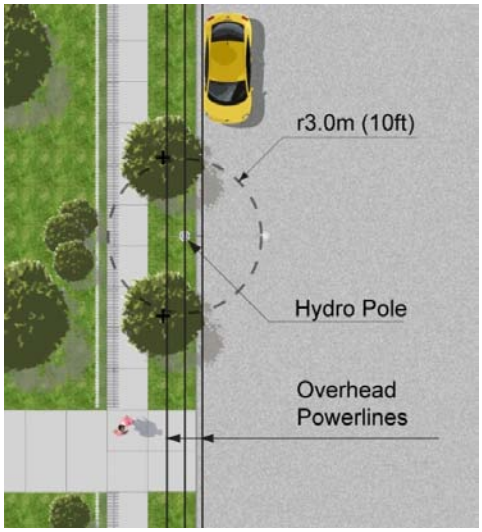
☑ To ensure accuracy determining the height and width at maturity, it is important to consider the *Plant Hardiness Index* accompanied with the *Plant Hardiness Geographical Map (*Appendix A). This will confirm where you can plant the specie of tree in proximity to overhead powerlines.

Low Zone - is the area under the power lines and extends to 4.5 m (15 ft) on either side. Trees and/or shrubs planted in this zone should have a maximum mature height and spread of 4.5 m (15 ft).

Medium Zone- extends from the edge of the outer edge of the Low Zone to a distance of 7.6 m (25 ft) on either side of the power line. The maximum mature height and spread of trees planted in this zone should be 7.6 m (25 ft).

Tall Zone – extends from the outer edge of the Medium Zone extending greater than 7.6 m (25 ft) from the power lines. Any strong and healthy tree may be planted in this zone.

Base Zone near the Hydro Pole - Trees and/or shrubs should not be placed closer than 3.0 m (10 ft) from the base of a hydro pole.



APPENDIX A: PLANT HARDINESS INDEX

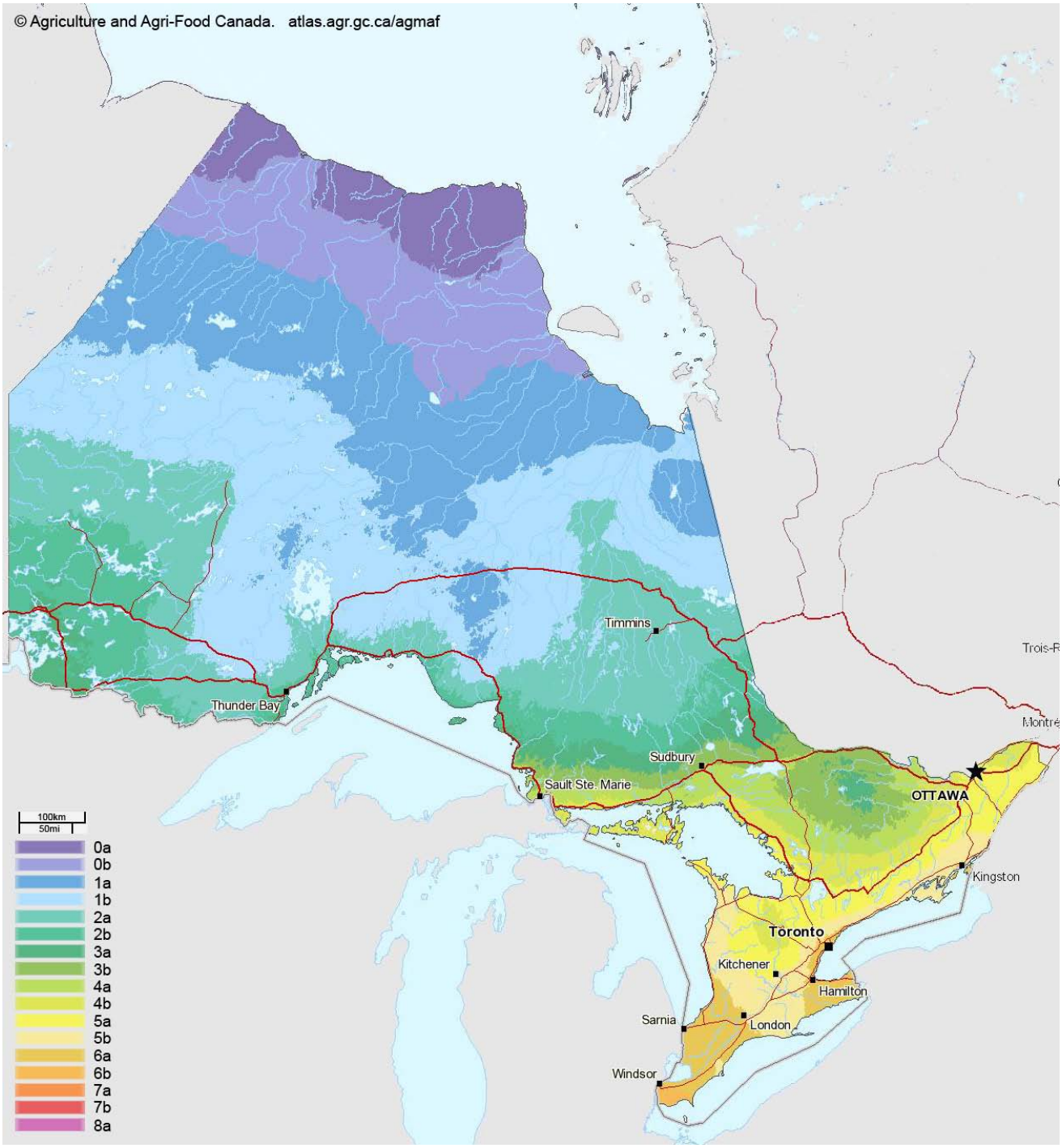
Geographical Area														LOW ZONE – SMALL TREES		
														***Latin Name* Common Name**	**SPREAD**	**HEIGHT**
0a	0b	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b		(m)	(m)
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Acer ginnala*, Amur Maple	4.5	4.5
								✓	✓	✓	✓	✓	✓	*Amelanchier laevis* Allegheny Serviceberry, Tree Form	4.0	4.5
								✓	✓	✓	✓	✓	✓	*Cornus kousa,* Chinese Flowering Dogwood Tree Form	3.5	4.5
										✓	✓	✓	✓	*Cornus florida 'Rubra',* Pink Flowering Dogwood Tree Form	4.5	4.5
								✓	✓	✓	✓	✓	✓	*Magnolia Stellata,* Star Magnolia Tree Form	4.0	3.0
								✓	✓	✓	✓	✓	✓	*Malus cultivars,* Crab Apple varieties	2.5 - 4.0	4.5
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Prunus virginiana 'Schubert',* Schubert Chokecherry Tree Form	4.0	4.5
														MEDIUM ZONE – MEDIUM TREES		
Geographical Area														***Latin Name* Common Name**	**SPREAD**	**HEIGHT**
0a	0b	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b		(m)	(m)
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Acer ginnala*, Amur Maple 'Flame'	7.0	7.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Aesculus glabra,* Ohio Buckeye	7.0	7.5
								✓	✓	✓	✓	✓	✓	*Amelanchier canadensis*, Shadblow Serviceberry/Juneberry, Tree Form	3.0	7.5
								✓	✓	✓	✓	✓	✓	*Amelanchier x grandiflora 'Autumn Brilliance' (PP5717)*, Tree Form	5.0	7.5
										✓	✓	✓	✓	*Cercis Canadensis,* Eastern Redbud Tree Form	7.0	7.5
						✓	✓	✓	✓	✓	✓	✓	✓	*Crataegus phaenopyrum, Washington Hawthorn Tree Form*	7.0	7.5
												✓	✓	*Koelreauteria paniculata,* Golden Rain Tree	7.0	7.5
								✓	✓	✓	✓	✓	✓	*Malus cultivars,* Crab Apple varieties	5.0 - 7.0	7.0
								✓	✓	✓	✓	✓	✓	*Malus 'Robinson',* Robinson Crab Apple	7.5	7.5
								✓	✓	✓	✓	✓	✓	*Malus 'Selkirk',* Selkirk Crab Apple	7.5	7.5
								✓	✓	✓	✓	✓	✓	*Malus 'Winter Gold',* Winter Gold Crab Apple	6.0	7.5
								✓	✓	✓	✓	✓	✓	*Prunus sargentii 'Rancho',* Columnar Sargent Cherry	3.0	7.5
										✓	✓	✓	✓	*Prunus serrulata 'Kwanzan',* Kwanzan Oriental Cherry	5.0	7.0
										✓	✓	✓	✓	*Pyrus calleryana 'Aristocrat' (PP3193),* Aristocrat Callery Pear	7.0	7.5
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Syringa reticulatata 'Ivory Silk',* Ivory Silk Tree Lilac	5.0	7.5
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Viburnum lentago,* Nannyberry Tree Form	7.5	7.5

* Malus cultivars come in a variety of species. Select the specie's maximum height for the specific planting zone

APPENDIX A: PLANT HARDINESS INDEX-CONT'D

Geographical Area														TALL ZONE – TALL TREES *Latin Name* Common Name	SPREAD (m)	HEIGHT (m)
0a	0b	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b			
										✓	✓	✓	✓	*Acer campestre,* Hedge Maple	10.0	10.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Acer x freemanii 'Armstrong',* Armstrong Maple	8.0	15.0
								✓	✓	✓	✓	✓	✓	*Acer x freemanii 'Jeffersred' (PP4864),* Autumn Blaze Maple	13.0	16.0
								✓	✓	✓	✓	✓	✓	*Acer x freemanii 'Celzam' (PP7279),* Celebration Maple	8.0	15.0
								✓	✓	✓	✓	✓	✓	*Acer x freemanii 'Scarsen',* Scarlet Sentinel Maple	8.0	15.0
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Acer negundo*, Manitoba Maple [f]	15.0	13.0
								✓	✓	✓	✓	✓	✓	*Acer nigrum,* Black Sugar Maple	12.0	15.0
										✓	✓	✓	✓	*Acer platanoides*, Norway Maple	10.0	13.0
											✓	✓	✓	*Acer pseudoplatanus,* Sycamore Maple	8.0	13.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Acer rubrum*, Red Maple	15.0	16.0
								✓	✓	✓	✓	✓	✓	*Acer rubrum 'Karppick'*, Karpick Red Maple	7.0	12.0
					✓	✓	✓	✓	✓	✓	✓	✓	✓	*Acer saccharinum,* Silver Maple	15.0	18.0
										✓	✓	✓	✓	*Aesculus hippocastanum,* Common Horse Chestnut	16.0	18.0
										✓	✓	✓	✓	*Carpinus betulus,* European Hornbeam	13.0	20.0
										✓	✓	✓	✓	*Carpinus betulus 'Fastigiata',* Pyramidal European Hornbeam	4.0	12.0
								✓	✓	✓	✓	✓	✓	*Catalpa speciosa,* Northern Catalpa	6.0	12.0
										✓	✓	✓	✓	*Cladrastis lutea,* Yellowwood	10.0	12.0
								✓	✓	✓	✓	✓	✓	*Crataegus crus-galli var. inermis,* Thornless Cockspur Hawthorn Tree Form	10.0	10.0
				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*Celtis occidentalis,* Common Hackberry	18.0	20.0
										✓	✓	✓	✓	*Celtis occidentalis 'Prairie Pride',* Prairie Pride Hackberry	12.0	12.0
								✓	✓	✓	✓	✓	✓	*Cercidiphyllum japonicum,* Katsura Tree	7.0	15.0
										✓	✓	✓	✓	*Corylus colurna,* Turkish Hazel	8.0	15.0
								✓	✓	✓	✓	✓	✓	*Fagus grandifolia,* American Beech	20.0	30.0
								✓	✓	✓	✓	✓	✓	*Fagus sylvatica,* European Beech	12.0	15.0
								✓	✓	✓	✓	✓	✓	*Ginkgo biloba*, Maidenhair Tree	11.0	17.0
								✓	✓	✓	✓	✓	✓	*Ginkgo biloba 'Autumn Gold'*, Autumn Gold Maidenhair Tree	10.0	10.0
								✓	✓	✓	✓	✓	✓	*Ginkgo biloba 'JFS-UGAZ'*, Golden Colannade™ Maidenhair Tree	8.0	15.0
								✓	✓	✓	✓	✓	✓	*Ginkgo biloba 'Princeton Sentry',* Princeton Sentry Maidenhair Tree	5.0	13.0
								✓	✓	✓	✓	✓	✓	*Gleditsia triacanthos var. inermis*, Common Thornless Honeylocust	13.0	17.0
								✓	✓	✓	✓	✓	✓	*Gleditsia triacanthos var. inermis "Impcole'*, Imperial Honeylocust	10.0	10.0
								✓	✓	✓	✓	✓	✓	*Gymnocladus dioicus*, Kentucky Coffee Tree	13.0	17.0
										✓	✓	✓	✓	*Liquidambar styraciflua,* Sweetgum	12.0	15.0
										✓	✓	✓	✓	*Liriodendron tulipifera,* Tulip Tree	15.0	25.0
										✓	✓	✓	✓	*Liriodendron tulipifera 'Fastigiatum',* Columnar Tulip Tree	5.0	15.0
								✓	✓	✓	✓	✓	✓	*Magnolia x galaxy,* Galaxy Magnolia Tree Form	6.0	12.0
								✓	✓	✓	✓	✓	✓	*Magnolia x loebneri 'Merrill',* Merrill Magnolia Tree Form	10.0	13.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Nyssa sylvantica,* Black-Gum	10.0	16.0
								✓	✓	✓	✓	✓	✓	*Phellodendron amurense,* Amur Cork Tree	9.0	13.0
										✓	✓	✓	✓	*Platanus x acerfolia 'Bloodgood',* London Plane Tree	13.0	16.0
										✓	✓	✓	✓	*Pyrus calleryana 'Bradford',* Bradford Callery Pear	7.0	13.0
										✓	✓	✓	✓	*Pyrus calleryana 'Capital,* Capital Callery Pear	4.0	11.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Quercus macrocarpa,* Burr Oak	13.0	18.0
								✓	✓	✓	✓	✓	✓	*Quercus palustris,* Pin Oak	13.0	25.0
										✓	✓	✓	✓	*Quercus robur,* English Oak	13.0	18.0
								✓	✓	✓	✓	✓	✓	*Quercus rubra,* Red Oak	15.0	16.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Robina pseudoacacia 'Bessoniana',* Bessoniana Black Locust	6.0	10.0
								✓	✓	✓	✓	✓	✓	*Robina pseudoacacia 'Frisia',* Frisia Black Locust	8.0	13.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Tilia americana,* Basswood	13.0	25.0
								✓	✓	✓	✓	✓	✓	*Tilia americana 'Redmond',* American Linden	10.0	20.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Tilia cordata 'Greenspire',* Greenspire Littleleaf Linden	12.0	16.0
								✓	✓	✓	✓	✓	✓	*Tilia tomentosa,* Silver Linden	15.0	23.0
						✓	✓	✓	✓	✓	✓	✓	✓	*Ulmus Americana 'Princeton',* Princeton Hybrid Elm	16.0	23.0
										✓	✓	✓	✓	*Ulmus 'Frontier',* Frontier Hybrid Elm	10.0	13.0
										✓	✓	✓	✓	*Ulmus parvifolia,* Chinese Elm or Lacebark	10.0	13.0
								✓	✓	✓	✓	✓	✓	*Ulmus x 'Pioneer',* Pioneer Hybrid Elm	15.0	25.0
										✓	✓	✓	✓	*Zelcova serrata*, 'Musashino' Zelkova	5.0	15.0
										✓	✓	✓	✓	*Zelcova serrata*, Green Vase Zelkova (PP5080)	13.0	16.0

APPENDIX A: PLANT HARDINESS GEOGRAPHICAL MAP



DEFINITIONS

Easement - a right granted to a *LDC* on property owned by others to use their property to support the distribution of electricity. Easements may contain underground and/or overhead powerlines and electrical equipment which requires the *LDC* to have legal access to property for maintenance and installation of electrical services.

Limits of Approach - specifies the required distance between workers and equipment to energized overhead electrical lines and conductors with a nominal phase-to-phase voltage rating set. The *LDC* should be contacted to define the voltage rating for overhead powerlines where work is being done.

Local Distribution Company (LDC) – A Distributor who is licensed under the Ontario Energy Board (OEB) responsible for transmitting electricity to municipal infrastructure including general public and public area.

Locates- Requesting of information from a facility owner identifying all their underground facilities by the use of surface markings such as coloured spray paint or flag identifiers, maps or drawings.

Pad mounted Equipment- Electrical equipment approved to be installed above ground on a concrete foundation.

Plant Hardiness Index- is a geographically defined area in which a specific category of plant life is capable of growing, as defined by climatic conditions, including its ability to withstand the minimum temperatures of the geographical area.

Root Deflector- Is a mechanical barrier placed between the tree roots and the electrical cables to prevent damage to the cables. A root deflector can be made from 6.5 mm (1/4") rigid plastic, fibreglass or non-degradable material.

Step Potential- Is the voltage entering a person from one foot through the body and exiting the other foot standing near an energized ground object.

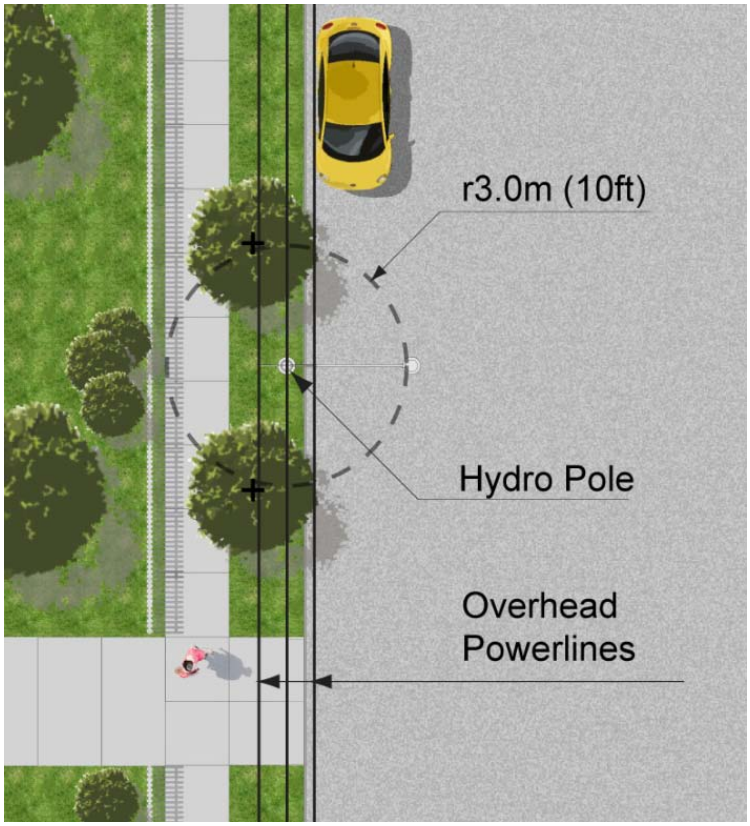
Touch Potential- Is the voltage entering a person and exiting the body through the feet while contacting an energized object.

Utility Arborist - HAVE COMPLETED THE UTILITY ARBORIST APPRENTICESHIP PROGRAM UNDER THE MINISTRY OF TRAINING COLLEGES AND UNIVERSITIES 444B CERTIFICATE OF QUALIFICATION - AND ARE AUTHORIZED TO PRUNE, CLEAR VEGETATION, FELL OR REMOVE TREES WITHIN THE ONTARIO OCCUPATIONAL HEALTH & SAFETY ACT (ONT. OH&S ACT) DEFINED '***LIMITS OF APPROACH***'.

REFERENCE CHART A: TREE PLANTING ZONES
REFERENCE CHART B: BASE ZONE NEAR HYDRO POLES

TREE PLANTING ZONES

BASE ZONE NEAR HYDRO POLES



QUICK REFERENCE GUIDE: LANDSCAPE & ARBORIST TRADES

'LOOK UP! LOOK OUT!' TO AVOID POTENTIAL ELECTRICAL HAZARDS

- ☑ **LOCATE OVERHEAD POWERLINES AND FOLLOW ONT. OH&S ACT'S LIMITS OF APPROACH**
- ☑ **LOCATE ALL UNDERGROUND SERVICES PRIOR TO EXCAVATING**

Allow a minimum of 2 weeks to receive all *locates*. <u>All</u> *locates* must be received prior to excavation.

- ☑ **CHECK MUNICIPAL, REGIONAL AND TOWNSHIP BY-LAWS FOR SPECIFICATIONS**
- ☑ **CHECK WITH THE *LDC* FOR THEIR PLANTING REQUIREMENTS UNDER OR AROUND POWERLINES AND ELECTRICAL EQUIPMENT INCLUDING UNDERGROUND POWERLINES**
- ☑ **SELECT LANDSCAPE MATERIALS AND DESIGNS THAT MEET CLEARANCE REQUIREMENTS UNDER OR AROUND POWERLINES AND ELECTRICAL EQUIPMENT, SPECIFICALLY:**
  - ☑ **UNDERGROUND POWERLINES** - THE MINIMUM CLEARANCE REQUIRED FROM THE EDGE OF THE ROOT BALL TO THE EDGE OF THE UNDERGROUND POWERLINE CORRIDOR IS 1.0 M (3FT.)
  - ☑ **ELECTRICAL EQUIPMENT** - WHEN PLANTING NEAR *PAD MOUNTED EQUIPMENT*:
    - **TRANSFORMERS** - 3.0 M (10 FT.) IS REQUIRED IN FRONT OF THE DOOR(S) AND 1.5M (4.9 FT.) ON THE SIDES AND BACK
    - **SWITCHGEAR** - 3.0 M (10 FT.) IS REQUIRED IN THE FRONT AND BACK DOORS AND 1.5M (4.9 FT.) ON THE SIDES
  - ⇨ **OVERHEAD POWERLINES** – 'LOOK UP! LOOK OUT!'
    1. **CONSIDER REQUIRED DISTANCES BETWEEN POWERLINES AND TREES OR SHRUBS WHEN SELECTING SPECIES.**
       - ⇨ LOW ZONE - IS THE AREA UNDER THE POWER LINES AND EXTENDS TO 4.5 M (15 FT) ON EITHER SIDE. TREES AND/OR SHRUBS PLANTED IN THIS ZONE SHOULD HAVE A MAXIMUM MATURE HEIGHT AND SPREAD OF 4.5 M (15 FT).
       - ⇨ MEDIUM ZONE - EXTENDS FROM THE OUTER EDGE OF THE LOW ZONE TO A DISTANCE OF 7.6 M (25 FT) ON EITHER SIDE OF THE POWER LINE. THE MAXIMUM MATURE HEIGHT AND SPREAD OF TREES PLANTED IN THIS ZONE SHOULD BE 7.6 M (25 FT).
       - ⇨ TALL ZONE – EXTENDS FROM THE OUTER EDGE OF THE MEDIUM ZONE EXTENDING GREATER THAN 7.6 M (25 FT) FROM THE POWER LINES. ANY STRONG AND HEALTHY TREE MAY BE PLANTED IN THIS ZONE.
       - ⇨ BASE ZONE NEAR HYDRO POLES - TREES AND/OR SHRUBS SHOULD NOT BE PLACED CLOSER THAN 3.0 M (10 FT) FROM THE BASE OF A HYDRO POLE.
    2. **DELIVERY OF PLANT MATERIALS** - UNLOADING OF THE TREE(S) **IS NOT** TO BE DONE UNDER OR AROUND THE OVERHEAD POWERLINES. DELIVERY EQUIPMENT SUCH AS A BOOM TRUCK CAN COME INTO CONTACT WITH THE OVERHEAD WIRES. THE SAME FOR DIGGING WITH EQUIPMENT SUCH AS A HIGH HOE, THE EQUIPMENT CAN ALSO COME INTO CONTACT WITH THE OVERHEAD WIRES.

QUICK GUIDE & CONTACT INFORMATION: HOMEOWNERS

'LOOK UP! LOOK OUT!' TO AVOID POTENTIAL ELECTRICAL HAZARDS

☑ **LOCATE OVERHEAD POWERLINES –** AVOID POTENTIAL ELECTRICAL RISKS FROM:

1. **DIRECT CONTACT** - WHEN WORKING AROUND TREES WHERE POWERLINES ARE HIDDEN BY FOLIAGE
2. **ENERGIZED OBJECTS** - BRANCHES AND LIMBS CAUGHT IN THE POWERLINES MAY UNEXPECTEDLY BECOME CONDUCTIVE
3. **PLANTING TREES AND SHRUBS TOO CLOSE TO POWERLINES** - WHEN SELECTING SPECIES, A LANDSCAPE PROFESSIONAL CAN PROVIDE ADVICE ON INDENTIFYING THE BEST SPECIES OF TREES OR SHRUBS FOR LANDSCAPE PROJECTS NEAR POWERLINES.
4. **DELIVERY OF PLANT MATERIALS** - UNLOADING OF THE TREE(S) IS NOT TO BE DONE UNDER OR AROUND THE OVERHEAD POWERLINES. DELIVERY EQUIPMENT SUCH AS A BOOM TRUCK CAN COME INTO CONTACT WITH THE OVERHEAD WIRES. THE SAME FOR DIGGING WITH EQUIPMENT SUCH AS A HIGH HOE, THE EQUIPMENT CAN ALSO COME INTO CONTACT WITH THE OVERHEAD WIRES.

☑ **LOCATE UNDERGROUND POWERLINES** PRIOR TO DIGGING OR EXCAVATING TO PLANT TREES BY CONTACTING YOUR *LDC* TO IDENTIFY THEIR UNDERGROUND POWERLINES. THE MINIMUM CLEARANCE REQUIRED FROM THE EDGE OF THE ROOT BALL TO THE EDGE OF THE UNDERGROUND POWERLINE CORRIDOR IS 1.0 M (3FT.) ALSO, CONTACT OTHER UTILITIES, SUCH AS NATURAL GAS, WATER, CABLE AND TELEPHONE, TO ENSURE YOU ARE AWARE OF THEIR UNDERGROUND EQUIPMENT AND CLEARANCE REQUIREMENTS.

Allow a minimum of 2 weeks to receive all *locates*. <u>All</u> *locates* must be received prior to excavation.

☑ **ELECTRICAL EQUIPMENT** - MINIMUM CLEARANCE WHEN PLANTING NEAR *PAD MOUNTED EQUIPMENT*:

- TRANSFORMERS - 3.0 M (10 FT.) IS REQUIRED IN FRONT OF THE DOOR(S) AND 1.5M (4.9 FT.) ON THE SIDES AND BACK
- SWITCHGEAR - 3.0 M (10 FT.) IS REQUIRED IN THE FRONT AND BACK DOORS AND 1.5M (4.9 FT.) ON THE SIDES

☑ **CHECK MUNICIPAL ,REGIONAL AND TOWNSHIP BY-LAWS FOR SPECIFICATIONS**

☑ **CHECK WITH THE *LDC* FOR THEIR PLANTING REQUIREMENTS UNDER OR AROUND OVERHEAD POWERLINES AND ELECTRICAL EQUIPMENT INCLUDING UNDERGROUND POWERLINES**

☑ **CHECK WITH THE *LDC* TO IDENTIFY *EASEMENTS* THAT MIGHT APPLY**