Be sure to include Facilities Maintenance and Operations in the review of all landscaping drawings and specs for Tenders at facilities that they maintain.

# General

## Section includes

* + 1. Soil Preparation.
		2. Planting of trees, shrubs and groundcovers.
		3. Bedding.
		4. Fertilizing.
		5. Wrapping, staking, guying.
		6. Pruning.
		7. Mulching.
		8. Protection.
		9. Maintenance.

## Definitions

* + 1. “Preliminary Acceptance” shall be given to all plant material showing well developed foliage, healthy growth and bud formation at the time of completion inspection. This acceptance shall include mulch, tree supports, wooden stakes and the topsoil.
		2. “Final Acceptance” shall be given to all plant material meeting conditions specified for Preliminary Acceptance, at one year after Preliminary Acceptance has been granted.

## Reference standards

* + 1. Canadian Nursery and Landscape Association (CNLA); Canadian Standards for Nursery Stock; Latest Edition.
		2. Landscape Ontario Horticultural Trades Association; Landscape Guidelines; Latest edition

## Administration requirements

* + 1. Coordination:
			1. Coordinate with other work having a direct bearing on work of this section.
			2. When applicable, install plants after, and coordinate with, installation of underground irrigation system piping and watering heads.
		2. Scheduling
1. Perform planting during suitable periods with respect to weather conditions and locally accepted practice, as determined by the Consultant.

## Quality assurance

* + 1. Contractor performing work of this Section shall have at least 3 years’ experience in performing work of similar scope and shall have been a member in good standing of Landscape Ontario for a minimum of 3 years.
		2. Lead staff of the contractor performing the work of this Section shall have proven experience and either a degree or diploma in horticulture, landscaping or similar discipline from a recognized university or college.
		3. Plant material only after acceptance and approval by the Consultant after delivery to the project site.

## Delivery, storage and handling

* + 1. Protect rootballs, trunks, branches and leaves of all trees and shrubs from sun and wind while in transit and until planted.
		2. Thoroughly spray all deciduous trees which have broken bud and all coniferous trees with an approved anti‑desiccant in accordance with manufacturer's instructions prior to delivery to the site.
		3. Co-ordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting. Deliver balled and burlapped material not more than forty-eight (48) hours prior to planting unless permission is granted by the Consultant.
		4. Tie branches of trees and shrubs securely and protect plant material against abrasion, exposure and extreme temperature change during transit. Avoid binding of planting stock with rope or wire which would damage bark, break branches or destroy natural shape of plant. Give full support to root ball of large trees during lifting.
		5. Cover plant foliage with breathable tarpaulin and protect bare roots by means of dampened straw, peat moss, saw dust or other acceptable material to prevent loss of moisture during transit and storage.
		6. Remove broken and damaged roots with clean sharp pruning shears.
		7. Keep roots moist and protected from sun and wind. Heel‑in trees and shrubs, which cannot be planted immediately, in shaded areas and provide an ample amount of water.
		8. If plant storage is necessary, protect plants with soil or a similar material to prevent drying out and keep moist until planted.

## Warranty

* + 1. Provide a labour, equipment and material warranty on all work and plant materials for a period of one year from “Preliminary Acceptance”.
		2. Extend warranty period an additional one year for plant materials if leaf development and growth is not sufficient to ensure future survival.
		3. A plant is considered acceptable when it is:
			1. Structurally sound.
			2. Well furnished with living foliage.
			3. Has normal colour.
			4. Shows adequate annual growth and formation of buds.
			5. Free from blight of any description.
		4. Plant material which has severely "died back" and has regrown from a bud or shoot shall be considered dead and unacceptable.
		5. Replace dead and unacceptable plants with new plants of same size and species as specified.
		6. As soon as possible, consistent with the allowable planting season, replace, at no cost to the Owner, all plants that have died during the plant warranty period.
		7. Complete replacement planting within one week of notification.
		8. Provide a one-year warranty on all plants replaced during warranty period commencing on date of replacement.
		9. Remove and dispose of dead plant material replaced under warranty.
		10. Replacement of materials broken or damaged due to circumstances beyond the Contractor's control after planting shall not be an obligation under this warranty.

# Products

## Materials

* + 1. Materials shall be of uniform quality, and be subject to inspection, quality interpretation and acceptance by the Consultant.

## Topsoil

* + 1. Fertile, friable, sandy natural loam material with a pH of 6.0 to 7.5 and containing not less than 5% organic material.
		2. Free of roots, vegetation or other debris that prevents proper placement, and free of stones and clods over 20 mm in any dimension.
		3. Imported topsoil meeting the requirements of this specification shall be screened prior to delivery to the site.
		4. Native topsoil is acceptable provided it meets or is augmented to meet the quality standards specified in this Section.

## Planting soil mixture

* + 1. Planting mixture to consist of:
			1. 6 parts good quality topsoil,
			2. 2 parts well-rotted cow manure, and
			3. 1 part peat moss
		2. Add 0.58 kg (1 lb.) of bonemeal per cubic yard of soil mixture.

## Fertilizer

* + 1. A controlled release, water soluble fertilizer suitable for the species.
		2. Fertilizer shall be delivered to the site in standard weatherproof containers, labeled to indicate their weight, analysis and manufacturer. Fertilizer shall be stored in such a manner that it is kept dry and its effectiveness is not impaired.
		3. Tree fertilizer to be 21 g Agriform tablets or reviewed equivalent.

## Stakes

* + 1. Tree Support Stakes: wood, 25 x 40 x 2400 mm long or as shown on Drawings.
		2. Turnbuckle: galvanized steel, 9 mm diameter with 250 mm open length. Painted fluorescent orange.
		3. Guying wire: galvanized steel, 3 mm wire or 3 mm diameter multi-wire steel cable.
		4. Anchors:
			1. Wood: 50 mm x 50 mm x 600 mm.
			2. Steel: T-bar, 600 mm.
		5. Guying collar: 13 mm diameter nylon reinforced plastic tube, rubber hose or approved commercial equivalent.

## Wire

* + 1. Wire used for staking the trees shall be No. 9 galvanized steel wire, new and free from bends or kinks.

## Hose

* + 1. Hose used for shielding wire bracing around tree trunks shall be new 13 mm diameter rubber hose. The hose shall be cut to a length sufficient to loosely encircle the tree trunk as indicated on the planting details and in Subsection 3.8 of this specification.

## Anti-Desiccant

* + 1. Anti‑desiccant emulsion shall be a product specifically manufactured to provide a flexible surface film to reduce transpiration yet not impede passage of carbon dioxide and oxygen.

## Mulching material

* + 1. Shredded bark not exceeding 80 mm in length. Consultant to approve the mulching material prior to its application.

## Tree wrap

* + 1. Crinkled paper tree wrap, 100 mm wide, in rolls.

## Rodent protection/tree guards

* + 1. Commercial corrugated PVC tree guard. Consultant to approve the tree guard material prior to its installation.

## Plant material

* + 1. All plant material shall meet the specifications for size, height, spread, quality and nomenclature as set out in the Standards for Nursery Stock by the Canadian Nursery Landscape Association.
		2. Collected material dug from native stands or established woodlots shall not be accepted unless prior approval has been granted by the Owner.

Tree height and caliper to be specified by landscape architect for each project.

* + 1. Trees of 3 m height (minimum 40 mm caliper) and larger and all conifers to be balled and burlapped or as specified in the planting list. Plants which have been cut back from larger sizes to meet these specifications will not be accepted.
		2. All plant material shall be true to type and structurally sound, be well‑branched, healthy, vigorous and free of disease, insect infestation, rodent damage, sun scald, frost cracks and any other abrasions or scars to the bark.
		3. Plant materials grown in more moderate hardiness zones than those in this contract will not be accepted.
		4. Prior to removal from ground, mark the north side of all trees.
		5. Prior to shipment to site, clearly label all plants identifying species, size and supplier.

## Source quality control

* + 1. Obtain approval of plant material at source.
		2. Notify Consultant of source of material at least 7 days in advance of shipment. No work under this Section is to proceed without approval.
		3. Acceptance of plant material at its source does not prevent rejection on site prior to or after planting operations.
		4. Test proposed topsoil prior to shipment to the site and provide Consultant with a copy of test results confirming conformance with the requirements of this Section.

# Execution

## Examination

* + 1. Verify existing conditions before starting work.
		2. Verify that prepared subsoil is ready to receive work.
		3. Saturate soil with water to test drainage.

## Layout and marking

* + 1. Layout and mark locations of trees and outlines of planting areas with wooden stakes or tree planting flags.
		2. Commence excavation only after the Consultant's inspection and approval of layout.

## Preparation of subsoil

* + 1. Prepare subsoil to eliminate uneven areas. Maintain profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
		2. Remove foreign materials, rocks, weeds and undesirable plants and their roots. Remove and dispose of contaminated subsoil.
		3. Scarify subsoil to a depth of 150 mm where plants are to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.
		4. Dig pits and beds 150 mm larger and deeper than plant root system.

## Excavation of plating pits

* + 1. Locate all underground utilities and services prior to digging.
		2. Excavate planting pits to the depth to allow for at least 150 mm of planting soil mixture below rootball except at center of pit.
		3. Protect the bottom of all planting pits from freezing.
		4. Scarify bottom and sides of planting pits so that water and roots can penetrate readily.
		5. Dispose of surplus excavated material off site.

## Fertilizing planting beds

* + 1. Apply fertilizer to manufacturer's written instructions.
		2. Apply after initial raking of topsoil.
		3. Mix thoroughly into upper 50 mm of topsoil.
		4. Lightly water to aid the dissipation of fertilizer.

## Tree fertilizing

* + 1. Place two tree fertilizer tablets for each 25 mm of trunk diameter as shown on tree planting detail and according to the manufacturer’s recommendations.

## Planting and watering

* + 1. Place plants to provide the best appearance and relationship to adjacent objects and surroundings as directed by the Consultant.
		2. Set plants vertical.
		3. Remove non-biodegradable root containers.
		4. For shrubs delivered in fibre pots, slit the sides of the pot vertically in several locations immediately prior to planting. Remove the rim and sides of the fibre pot after placement in the planting pit.
		5. Cut and remove burlap, ropes, wire, ties, etc., from at least the top half of the rootball. Ensure all string ties are cut.
		6. Set plants in pits or beds partly filled with planting soil mixture, at a minimum depth of 150 mm under each plant except at center of rootball which shall be on unexcavated soil.
		7. Place bare root plant materials so roots lie in a natural position.
		8. Backfill pit with a mixture of 70% topsoil and 30% native soil.
		9. Backfill tree pits in layers of 150 mm depth, firmly tamped as applied. Soak the soil mixture thoroughly with water when the hole is two-thirds filled. Eliminate all air pockets when backfilling. Apply final backfill layers and form a 100 mm high soil saucer around the entire planting pit area to retain water over the root area. Where the pit is on a slope, build up the lower edge of soil saucer to catch and hold water without eroding.
		10. Saturate soil with water when the pit or bed is half full of topsoil and again when full.

## Staking

Provide a planting detail or revise this paragraph

* + 1. Stake all trees immediately following planting in accordance with the planting detail.
		2. Provide rubber hose as cover over wire to protect tree bark from damage. Cut rubber hose to a sufficient length (minimum 300 mm) to loosely encircle the tree trunk and provide the necessary support.

## Pruning

* + 1. Upon the completion of planting of each deciduous or coniferous tree, or deciduous shrub, carry out pruning to remove dead or broken branches.
		2. Carry out pruning in accordance with good arboricultural practice. Perform pruning to the satisfaction of the Consultant.

## Mulching

* + 1. Immediately after planting and initial watering is completed, apply shredded bark mulch to a minimum compacted depth of 100 mm in a uniform, continuous blanket.
		2. Place mulch in a 1 m diameter circle over the surface area of each individual tree pit and 100 mm away from tree bark.
		3. Place mulch over the complete surface area of shrub planting beds, extending to the perimeter of the beds.

## Tree wrapping

* + 1. Prior to the first frost, wrap tree trunks with an approved tree wrap from top of ball to just above first branch.
		2. Remove and dispose of tree wrap after first winter.

## Tree guard / rodent protection

* + 1. Be responsible for the protection of all trees and shrubs from rodent injury for the duration of the plant warranty period.
		2. Place tree guards around all deciduous trees. Install tree guards prior to the application of shredded bark mulch, covering from top of the rootball to 500 mm above grade.
		3. Treat all shrubs and conifers with an approved rodent repellent liquid in accordance with the manufacturer's instructions to ensure protection over the winter months.

## Maintenance – General

* + 1. Provide maintenance of all planted materials and plant beds from date of planting until end of plant warranty period as defined in this Section.
		2. Owner will conduct periodic inspections during this period and advise Contractor of any unsatisfactory plant growth and bedding conditions.
		3. Advise the Consultant in advance when any maintenance operation is to be undertaken.
		4. Provide all maintenance procedures consistent with Landscape Ontario Horticultural Trades Association’s Landscape Guidelines to ensure normal, vigorous and healthy growth of all plant materials and planting beds placed under the Contract.
		5. Maintenance to include:
			1. Adequate watering sufficient to saturate root system.
			2. Fertilize all plant material in the Spring or Fall.
			3. Cultivation and weeding plant beds and tree pits.
			4. Applying herbicides for weed control in accordance with manufacturer's written instructions. Remedy damage resulting from use of herbicides.
			5. Disease and insect pest control. Remedy damage from use of insecticides.
			6. Pruning, including removal of dead or broken branches, and treatment of pruned areas or other wounds.
			7. Maintaining wrapping, guys, turnbuckles and stakes. Adjust turnbuckles to keep guy wires tight. Repair or replace accessories when required.
			8. Replacement of mulch.
		6. Shrubs and Trees:
			1. Provide care for shrubs and trees according to good horticultural practice including winter protection based on the geographic location, hardiness and site conditions (e.g. burlapping, wrapping, mulching, protection from salt spray, etc.).
			2. Maintain tree staking and supports throughout the plant warranty period.
			3. Remove all staking and supports at end of plant warranty period.
		7. Restore the site to original conditions from damage arising out of maintenance operations.

## Maintenance – Prior to Preliminary Acceptance

* + 1. Perform following maintenance operations from time of planting to Preliminary Acceptance by Consultant.
		2. Water and maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion. Water in early morning, late afternoon, early evening or when weather is cool to minimize water evaporation by sun and humidity.
		3. Remove weeds.
		4. Replace or re-spread damaged, missing or disturbed mulch.
		5. Report to Consultant any pesticides or disease inflicting any plant material. Apply pesticides in accordance with Federal, Provincial and Municipal regulations as and when required to control insects, fungus, and disease. Obtain product approval from consultant prior to application.
		6. Remove dead and broken branches from plant material.
		7. Keep trunk protection and guy wires in proper repair and adjustment.
		8. Remove and replace dead plants and plants not in healthy growing condition. Make replacement in same manner as specified for original plantings.
		9. Provide adequate protection against damage caused by rodents.

## Preliminary acceptance

* + 1. No plant material planted after leaf fall will be reviewed for Preliminary Acceptance until leaf show the following year.
		2. Consultant will accept plant material and planting beds and provide a Preliminary Acceptance Certificate provided:
			1. All plant material exhibits good structure, healthy vigorous growing conditions, free of insects, disease and fungal organisms.
			2. All planting and shrub beds and tree wells are free of weeds and are mulched.
			3. All planting beds are neat and tidy.
			4. All maintenance prior to Preliminary Acceptance carried out.
			5. All deficiencies have been carried out.
		3. Remove all labelling following Preliminary Acceptance of plant material by Consultant.
		4. **The one (1) year maintenance program will start from the date of Preliminary Acceptance.**

## Maintenance after Preliminary Acceptance

* + 1. Perform following maintenance operations on trees, plants and planting beds, for a period of one year from the date of Preliminary Acceptance. Notify Consultant and Owner in writing a minimum forty-eight (48) hours in advance of each maintenance visit.
		2. Spring (May) - two (2) visits:
			1. Water to maintain soil moisture condition for optimum establishment, growth and health of plant material without causing erosion.
			2. Plant winter replacement planting in same manner as specified for original plantings.
			3. Remove all weeds.
			4. Prune plant material according to good horticultural practices.
			5. Remove dead or broken branches prior to leaf budding.
			6. Remove trunk protection after first year of warranty and keep tree stake and guy wires in proper repair and adjustment.
			7. Cultivate and edge tree pit edges.
			8. Cultivate planting beds.

For each project, confirm if weekly visits during the summer is appropriate. Revise as necessary.

* + 1. Summer (June 1 to October 30) - weekly visits:
			1. Water to maintain soil moisture condition for optimum establishment, growth and health of plant material without causing erosion.
			2. Apply fertilizer for plants during first August visit.
			3. Edge tree pits, planting beds and remove weeds.
			4. Remove dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings in the Fall.
			5. Clear away any litter/rubbish from tree pits and planting beds.
			6. Remove dead and broken branches according to good horticultural practices.
			7. Keep trunk stakes and guy wires in proper repair and adjustment.
			8. Apply pesticides in accordance with Federal, Provincial and Municipal regulations, as and when required to control insects, fungus and disease.
		2. End of Season (November/December) – two (2) visits:
			1. Water coniferous plants if required, to maintain soil moisture condition, for optimum establishments, growth and health of plant material without causing erosion.
			2. For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.
			3. Replace or re-spread damaged, missing or disturbed mulch.
			4. Cultivate and edge tree wells and planting beds.
			5. Prune, remove dead or broken branches according to good horticultural practices.
			6. Provide adequate protection against winter damage, including damage caused by rodents.
			7. Remove leaves from planting beds.
			8. Clear away and dispose of any litter/rubbish from planting beds.
			9. Remove and record dead plants for replacement in the spring.
		3. End of Winter (April) – one (1) visit:
			1. At appropriate time, remove winter protection from coniferous trees.
			2. Prune and remove dead or broken branches according to good horticultural practices.
			3. Remove dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings in the spring.
			4. Clear away and dispose of any litter/rubbish from planting beds.
			5. Cultivate and edge tree wells and planting beds.
			6. Replace or spread damaged, missing or disturbed mulch.
			7. Remove and dispose of tree stakes and guy wire eyebolts at end of maintenance period.
		4. Maintenance Reports:
1. Submit to the Consultant a Maintenance Report stating date of maintenance visits and work undertaken.

## Final Acceptance

* + 1. Plant material will be reviewed for Final Acceptance at the end of the plant maintenance period.
		2. Consultant will accept plant material and provide a Final Acceptance Certificate provided:
			1. All plant material exhibits good structure, healthy vigorous growing conditions, free of insects, disease and fungal organisms.
			2. Trees are good structural shape and any pruning that has occurred has not deformed the tree.
			3. All tree wells and planting beds are free of weeds, litter, and debris, and mulch layer is replenished.
			4. Tree trunk wrap, tree stakes and guy wires eyebolts have been removed.
			5. Planting beds are edged and cultivated.
			6. Planting beds are free of all litter and debris.
			7. All labels have been removed.

End of section