CORPORATION OF THE CITY OF BURLINGTON

SPECIFICATIONS

INDEX FOR

TREE PLANTING AND TRANSPLANTING (SPEC. NO. SS2)

INDEX		**PAGE**
1.	Work Included	SS2-1
2.	Examination	SS2-1
3.	Qualifications	SS2-1
4.	Substitution	SS2-1
5.	Inspection	SS2-1
6.	Guarantee	SS2-2
7.	Replacements	SS2-2
8.	Maintenance	SS2-2
9.	Digging of Plants	SS2-2
10.	Handling of Plants	SS2-3
11.	Materials	SS2-4
12.	Planting Pits	SS2-6
13.	Plant Installation	SS2-6
14.	Tree Wrapping	SS2-7
15.	Tree Support	SS2-7
16.	Pruning	SS2-7

CORPORATION OF THE CITY OF BURLINGTON

SPECIFICATION

FOR

TREE PLANTING AND TRANSPLANTING

1. Work Included

a) The work included under these specifications shall consist of supplying all materials, labour and equipment necessary for planting and transplanting trees. All work shall be done in accordance with these specifications or as directed by the Contract Administrator.

2. Examination

a) Report to the Contract Administrator, in writing, of any conditions or defects encountered on the site during or before construction upon which the work of this section depends and which may adversely affect its performance.

b) Do not commence work until such conditions or defects have been investigated and corrected.

c) Commencement of work shall imply acceptance of surfaces and conditions and no claim for damages or extras resulting from such conditions or defects will be accepted thereafter, except in cases where such conditions cannot be known prior to or during the course of construction.

3. Qualifications

All planting work described in the Section shall be executed by experienced personnel under the direction of a skilled foreman.

4. Substitution

a) All plants shall be supplied as specified on the Plant List. Substitution will not be allowed unless approved in writing by the Contract Administrator.

b) Give timely notice in writing to the Contract Administrator when applying for substitutions.

c) The contractor must, at the signing of the contract, verify to the Contract Administrator, the availability and source of the specified plant material.

5. Inspection

a) Make plant materials available for inspection at source of supply when requested in writing by the Contract Administrator.

b) Give timely notice in writing to the Contract Administrator when such materials are available for inspection.

c) Approval of plant materials at source of supply will not impair the right of the Contract Administrator or City Arborist to inspect plants upon arrival on the site or during the course of construction and reject plants which have been damaged or which, in any way, do not conform to the Specifications.

d) At the time of inspection, all plants shall be alive and in a healthy, satisfactory growing conditions.

6. Guarantee

All plant materials shall be guaranteed for a period of two (2) year commencing on the date of inspection for acceptance of the planting.

7. **Replacements**

a) All plant materials found dead, or not in a healthy, satisfactory growing condition or which, in any other way, do not meet the requirements of the Specifications, shall be replaced by the Contractor at his own expense.

b) The cost of replacements resulting from theft, vandalism, carelessness or neglect on the part of others, or any causes due to circumstances beyond the control of the Contractor, shall be borne by the Owner.

c) All required replacement shall be by plants of the same size and species as specified on the plant list and shall be supplied and planted in accordance with the Drawings and Specifications.

8. **Maintenance**

a) The maintenance of plant materials during the guarantee period shall be the responsibility of the Contractor.

b) Such maintenance shall include all measures necessary to establish and maintain all plants in an acceptable, vigorous and healthy growing conditions including cultivating and weeding, watering when required, pruning, maintenance of all accessories in good condition.

c) At time of inspection for acceptance to begin the maintenance period, all planting beds and tree pits shall be freshly cultivated, free of weeds, leaves, broken branches and rubbish, and shall be in a neat and tidy condition.

9. **Digging of Plants**

a) All plants shall be dug and delivered to the site as specified on the Plant List, or in the case of relocation of existing plant material on the site, dug according to the following specification.

b) Plants specified "B/R" shall be moved with bare roots. They shall be dug and moved while dormant, with the major portion of the fibrous root system provided.

c) Immediately after digging, the root system shall be wrapped or puddled and shall be kept moist to prevent drying out until planted on the site.

d) All plants specified "B & B" shall be moved with solid balls wrapped in burlap.

e) No plant shall be used when the ball of earth surrounding the roots has been cracked or broken preparatory to or during the process of planting, or when the burlap and ropes holding the soil ball have been removed prior to planting.

f) The sizes of root balls for trees shall be as specified below. Ball sizes are minimum and shall be adjusted according to growth habits of plants, and shall be sufficiently large to contain at least 75% of the fibrous root system.

Deciduous Trees

Caliper	Root Ball Diameter

25mm - 40mm	0.60m
50mm	0.75m
75mm	0.90m
100mm	1.05m
125mm	1.35m
150mm	1.50m
200mm	1.80m
250mm	2.50m

Coniferous Trees

Height	Root Ball Diameter
1.8m - 2.4m	0.75m
2.4m - 3.0m	0.90m
3.0m - 3.6m	1.05m
3.6m - 4.6m	1.20m
4.6m - 5.4m	1.35m

For deciduous trees with a caliper of more than 250mm and for coniferous trees over 5.4m in height, the diameter of the root ball shall be increased 150mm for every additional 25mm in caliper, or every 300mm in height.

g) The ball depth-ratio for "B & B" deciduous and coniferous trees shall be not less than as follows:

Root Ball Diameter	Depth
Up to 0.60m	Not less than 0.45m
0.6m to 1.35m	Not less than 0.45m to 0.75
1.35m and Over	Not less than 50% of ball diameter

h) All root balls less than 0.45m in diameter shall be burlapped with 140 grams Hessian burlap or approved equal. Balls from 0.45m to 0.75m in diameter shall be double burlapped. Balls 0.90m and larger in diameter shall be double burlapped and drum laced with 6.35mm rope at 200mm spacing.

i) Plants relocated on site with a Vermeer or similar Tree Spade shall be moved and planted as soon as possible after digging a pre-dug hole.

j) Root balls requiring a wire basket shall have the burlap liner drawn tight and fastened by sowing or clamps prior to transportation out of the field.

10. **Handling of Plants**

a) All plants shall be well protected against damage and drying out from the time of digging until they are planted on the site.

b) All roots shall be cleanly cut; split roots are not acceptable. Where combing is not practised, the roots shall be evenly cut at the edges of the ball. The cut ends of all roots 25mm in diameter and larger shall be painted with asphalt emulsion.

c) Plants shall be transported with care taken to prevent damage. Branches shall be carefully tied in such a manner so as not to break or damage trunks. Points of contact with equipment shall be padded.

d) Plants with broken or abraded trunks or branches are not acceptable.

e) Root balls, trunks, branches and leaves shall be protected from sun and wind desiccation.

11. **Materials**

a) Topsoil

All top soil, where supplied by the Contractor, shall be fertile, friable natural loam containing 4% organic matter for clay loams and 2% minimum organic matter for sandy loams with acidity range of 6.5pH to 7.5pH and be capable of sustaining vigorous plant growth. It shall be free of any admixture or subsoil, clay lumps and shall be free from stones and roots over 50mm in diameter and other extraneous matter.

b) Peat Moss

Peat Moss shall be of partially decomposed fibrous or cellular stems and leaves with a texture varying from porous fibrous to spongy fibrous, fairly elastic and substantially homogenous with a pH value of not less than 4.5 and not greater than 6.0. It shall be baled and free of decomposed colloidal residue, wood, sulphur andiron, be brown in colour and finely shredded, suitable for horticultural purposes. Shredded particles shall not exceed 6 mm in size.

c) Fertilizer

i) The Contractor shall be prepared to provide all necessary fertilizers to eliminate any chemical deficiencies as indicated by a soil analysis report of imported top soil.

ii) Where top soil is supplied by the Contractor, the quantities of fertilizers required shall be based on the following minimum rates and shall be included in the Contract sum.

10-6-4 @ 36g/l mm cal. for trees
12-6-4 @ 890g/m^3 of top soil for shrubs

iii) Fertilizers shall be complete, commercial fertilizers containing not less than 60% ureaformaldehyde and the following percentages by weight:

Nitrogen	Phosphoric Acid	Potash
10	6	4
12	6	6

d) Plant Material

i) All plant materials shall meet the horticultural standards of the Canadian Nursery Trades Association with respect to grading and quality.

ii) They shall be nursery grown, under proper cultural practices as recommended by the Canadian Nursery Trades Association.

iii) Nomenclature of specified plants shall conform to the International Code of Nomenclature for Cultivated Plants and shall be in accordance with the approved scientific names given in the latest edition of Standardized Plant Names. The names of varieties not named therein are generally in conformity with the name accepted in the nursery trade.

iv) Any plants dug from nature stands, wood lots, orchards or neglected nurseries and which have not received proper cultural maintenance as advocated by the Canadian Nursery Trades Association shall be designated as "collected plants".

v) The use of "collected plants" will not be permitted unless approved, in writing, by the Contract Administrator and City Forester.

vi) Plants shall be true to type and structurally sound, well-branched, healthy and vigorous and free of disease, insect infestations, rodent damage, sun scald, frost cracks, and other abrasions or scars to the bark. They shall be densely foliated when in leaf and have a healthy, well developed root system. Pruning wounds shall show vigorous bark on all edges and all parts shall be moist and show live, green cambium tissue when cut.

vii) All plant materials shall conform to the minimum measurements specified in the Plant List except that plants larger than specified may be used. The use of such plants shall not increase the Contract price. If larger plants are used, the ball of earth shall be increased in proportion to the size of the plant.

viii) All plants shall be measured when the branches are in their normal position. Height and spread dimensions specified refer to the main body of the plant and not from branch tip to root base or from branch tip to branch tip. Where trees are measured by caliper (cal.), reference is made to the diameter SS2-7 of the trunk measured 300mm above ground as the tree stands in the nursery.

e) Accessories

i) Wrapping material for tree trunks shall be a first quality burlap, not less than 150mm nor more than 250mm in width, or a heavy waterproof crepe paper 100mm or 150mm wide.

ii) Anchors required for the support of large shrubs and trees shall be wooden stakes, or approved equal, 0.75m in length.

iii) Cables, eye bolts and turnbuckles required for supporting trees shall be zinc-coated and of sufficient strength to withstand any wind pressure. Turnbuckles shall have a 150mm long opening with a 9.53mm diameter threaded opening for tightening of turnbuckle for trees exceeding 75mm in caliper and over. For smaller trees, the opening shall be 75mm long with a 6.35mm diameter threaded opening.

iv) Wires for fastening to anchors shall be pliable #9 gauge minimum galvanized iron wire for trees 75mm in caliper and over, and #11 gauge for smaller trees. Cables shall be used for all trees over 150mm in caliper and over.

v) New black rubber hose, two-ply, reinforced and 12.7mm in diameter, or approved equal, shall be used to encase wires where they circle the trunk or branches.

vi) Two wooden stakes shall be placed on either side of the tree, located parallel with the road. The stakes shall be 50 mm square with a height of 1.75 m.

12. **Planting Pits**

a) Planting pits for trees and large shrubs shall be excavated to the following minimum sizes.

Deciduous Trees

Root Ball Diameter	Planting Pit Sizes
0.60m	120 mm clearance around root ball
0.75m	230 mm clearance around root ball
0.90m	300 mm clearance around root ball
1.05m	380 mm clearance around root ball
1.35m	460 mm clearance around root ball
1.50m	460 mm clearance around root ball
1.80m	610 mm clearance around root ball
2.25m	610 mm clearance around root ball

Coniferous Trees

Root Ball Diameter	Planting Pit Sizes
0.75m	300 mm clearance around root ball
0.90m	300 mm clearance around root ball
1.05m	460 mm clearance around root ball
1.20m	460 mm clearance around root ball
1.35m	600 mm clearance around root ball

Pits shall be deep enough to allow a minimum depth of 150mm of planting soil mixture under the root ball.

b) The location of all planting pits shall be staked by the Contractor, and approved by the Public Works Engineer prior to excavation.

13. **Plant Installation**

a) Planting shall be done during periods suitable with respect to weather conditions and locally accepted practice. Plants shall be set plumb in the centre of the pits and at the same relation to grade as originally grown, after settlement has taken place.

b) Plants shall be set in partly filled pits or beds of prepared soil mixture at which time all burlap, ropes, wires, etc. shall be pulled away from the top of the ball. Root ball using a wire basket shall have the top 30cm of the basket cut away prior to planting. A layer of loose unfrozen soil mixture at least 150mm deep shall be placed under each plant. Bare root plants shall be placed so that their roots lie in their natural position. Soil mixture shall be backfilled in layers not exceeding 1.50mm in depth. Each layer shall be firmly tamped in place in such a manner that the plant retains its vertical position. Particular care shall be taken to ensure that no air pockets remain under or around the roots. The soil mixture shall be thoroughly watered when the hole is half full, and again when full.

c) Each plant other than those in planting beds shall have an earth saucer at its base which shall have a diameter as large as the excavated area. The saucer shall be constructed so as to retain water around the roots of the plant. The saucer shall be filled to a minimum of 50mm depth with approved hardwood chips.

d) The planting soil mixture for the filling of planting pits and planting beds shall consist of five (5) parts top soil and one (1) part peat moss. To the soil mixture shall be added otherwise commercial fertilizers at rates as indicated in the specifications.

e) All ingredients shall be thoroughly mixed prior to backfilling. Top soil shall not be mixed while in a frozen or muddy condition.

14. **Tree Wrapping**

The main stem of each tree having a caliper of 50mm or greater shall be wrapped. The wrapping shall be applied in a spiral manner with overlap, each time starting at grade and extending upwards to just above the second branches. All wrapping shall be neat and snug and held in place by suitable cord. For borer protection, the trunks shall be sprayed with a wettable powder of a long residual insecticide before applying the wrapping.

15. **Tree Support**

a) Trees shall be braced upright in position by three guys fastened to anchors. A turnbuckle shall be inserted in each guy in such a manner that the guy can easily be kept taut. Cables shall be covered with pieces of rubber hose at points of contact with the bark. Guys shall be placed around the trunk at a point higher than the lowest branches of the trees in such a manner that branches will not be subject to undue strain.

b) Anchors shall be equally spaced around the tree pit and at a distance from the tree trunk not less than 0.6m outside the edge of the tree pit with the top being not less than 50mm below finished grade.

c) Two wooden stakes,50 mm square and 1.75 m in length shall be place on either side of the tree and be located parallel with the road.

16. **Pruning**

All plants shall be pruned after planting. The amount of pruning shall be limited to the minimum necessary to remove dead or injured branches and to compensate for the loss of roots as a result of transplanting operations. Pruning shall be done in such a manner as to preserve the natural character of the plants. Leaders shall not be removed. Only clean, sharp tools shall be used. All cuts shall be clear and flush leaving no stubs. Cuts, bruises or scars on the bark shall be traced back to living tissue and removed. The affected areas shall be shaped so as not to retain water.