

## **PART 1 - GENERAL**

### **1.1 Summary**

- .1 Section Includes:
  - .1 Materials and installation for plant material, accessories, mulch, planting, tree support, mulching and maintenance.
- .2 Related Sections:
  - .1 Section 01 33 00 - Submittal Procedures.
  - .2 Section 32 91 21 - Topsoil Placement and Fine Grading.

### **1.2 References**

- .1 Agriculture and Agri-Food Canada (AAFC).
  - .1 Plant Hardiness Zones in Canada-2000.
- .2 Canadian Nursery Landscape Association (CNLA).
  - .1 Canadian Standards for Nursery Stock-2001.
- .3 Department of Justice Canada (Jus).
  - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
  - .2 Transportation of Dangerous Goods Act (TDGA), 1992, c.34.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).

### **1.3 Submittals**

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit product data for:
  - .1 Fertilizer.
  - .2 Anti-desiccant.
  - .3 Guying assembly including clamps, collar, guying wire, anchors and wire tightener.
  - .4 Mulch.
- .3 Submit samples for:
  - .1 Mulch.

### **1.4 Source Quality Control**

- .1 Provide Consultant and/or Owner's Representative of plant material source prior to digging.
- .2 Receipt of plant material source does not prevent rejection on site prior

to or after planting operations.

- .3 Imported plant material must be accompanied with necessary permits and import licenses. Conform to federal and provincial regulations.

### **1.5 Storage and Protection**

- .1 . Protect plant material from frost, excessive heat, wind and sun during delivery.
- .2 Immediately store and protect plant material which will not be installed within 1 hour after arrival at site in storage location approved by Consultant and/or Owner's Representative.
- .3 Protect plant material from damage during transportation:
  - .1 When delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.
  - .2 When delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.
  - .3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.
- .4 Protect stored plant material from frost, wind and sun and as follows:
  - .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in sand or topsoil and watering to full depth of root zone.
  - .2 For pots and containers, maintain moisture level in containers. Heel-in fiber pots.
  - .3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

### **1.6 Waste Management and Disposal:**

- .1 Separate waste materials for reuse and recycling in accordance with project Waste Management Plan and Section 01 74 11 Cleaning.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
- .4 Separate for reuse and recycling and place in designated containers Steel Metal Plastic waste in accordance with WMP.
- .5 Place materials defined as hazardous or toxic in designated containers.

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- .6 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
  - .7 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant and/or Owner's Representative.
  - .8 Fold up metal and plastic banding, flatten and place in designated area for recycling.
  - .9 Divert discarded plastic plant containers materials from landfill to plastic recycling facility approved by Consultant and/or Owner's Representative.
  - .10 Dispose of unused fertilizer at official hazardous material collection site approved by Consultant and/or Owner's Representative.
  - .11 Dispose of unused anti-desiccant at official hazardous material collections site approved by Consultant and/or Owner's Representative.
  - .12 Divert unused wood and mulch materials from landfill to recycling composting facility approved by Consultant and/or Owner's Representative.

### **1.7 Scheduling**

- .1 Obtain approval from Consultant of schedule 7 days in advance of shipment of plant material.
- .2 Schedule to include:
  - .1 Quantity and type of plant material.
  - .2 Shipping dates.
  - .3 Arrival dates on site.
  - .4 Planting / Transplanting Dates.

### **1.8 Warranty**

- .1 The Contractor hereby warrants that all plant material as itemized on plant list will remain free of defects for 2 full growing seasons.
  - .1 Plant material replacement to be done during optimal growing conditions.
- .2 End-of-warranty inspection will be conducted by Consultant and/or Owner's Representative.
- .3 Consultant reserves the right to extend Contractor's warranty responsibilities for an additional one year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.

## **PART 2 - PRODUCTS**

### **2.1 Plant Material**

- .1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.
  - .1 Source of plant material: grown in Zone in accordance with Plant Hardiness Zones in Canada.
  - .2 Plant material must be planted in zone indicated as appropriate for its species.
  - .3 Plant material in location appropriate for its species.
- .2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.
- .3 Trees: with straight trunks, well and characteristically branched for species except where specified otherwise.
- .4 Trees larger than 200 mm in caliper: half root pruned during each of two successive growing seasons, the latter at least one growing season prior to arrival on site.
- .5 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.
- .6 Collected stock: of cedar clumps only after approval of Consultant and/or Owner's Representative.
- .7 Plant material shall be acceptable when it is structurally sound, conforms to species growth characteristics is well furnished with living foliage, has normal colour, shows adequate annual growth and formation of buds and free from disease, insect infestations, rodent damage, sunscald, frost cracks and other abrasions or scars to the bark. Plant material that does not meet this condition or has "died back" and has regrown from a shoot or bud shall be considered unacceptable.

### **2.2 Water**

- .1 Water: The Contractor shall be responsible to obtain any permits or certificates for water usage.
- .2 Free of impurities that would inhibit plant growth.
- .3 Tanks: Tanks(s) used for storage, mixing or application of water shall be clean and free of any contaminates which may be hazardous to the growth and development of trees and shrubs or to the environment in general.
- .4 Pumps: For watering trees and shrubs shall be capable of reaching the limits of the right-of-way. The outlet end of the hose(s) shall be 25 mm

in diameter with a quick shut-off valve connected to a functioning water injection pipe.

- .5 Hoses: Hoses used for watering plant material shall be capable of reaching the limits of the contract area. The outlet end of the hose(s) shall be 25 mm in diameter with a suitable adjustable nozzle(s) and a quick shut-off valve.

### **2.3 Stakes**

- .1 T-bar, steel, 40 x 40 x 5 x 1300 mm or wood, 50 x 50 x 1500mm.

### **2.4 Trunk Protection**

- .1 Burlap: clean, minimum 2.5 kg/m<sup>2</sup> mass and 150 mm wide, and twine fastener.

### **2.5 Mulch**

- .1 Shredded cedar or pine bark (coarse): varying in size from 25 to 125 mm in length.
- .2 Sample to be approved by Consultant.

### **2.6 Fertilizer**

- .1 Fertilizer containing a minimum of 35% slow release nitrogen, ratio 3:2:1.

### **2.7 Anti-desiccant**

- .1 Wax-like emulsion.

### **2.8 Flagging Tape**

- .1 Fluorescent, colour. To be used on any tree near the playgrounds and play areas.

## **PART 3 - EXECUTION**

### **3.1 Pre-Planting Preparation**

- .1 Ensure plant material acceptable to Consultant.
- .2 Remove damaged roots and branches from plant material.
- .3 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

### **3.2 Excavation and Preparation of Planting Beds**

- .1 Preparation of planting beds is specified in Section 32 91 21 - Topsoil Placement and Finish Grading.
- .2 Topsoil parameters are specified in Section 32 91 21 - Topsoil Placement and finish Grading.
- .3 Planting Medium:
  - .1 Trees and shrub beds: planting medium as specified in Section, see 32 91 21 - Topsoil Placement and Finish Grading.
- .4 For individual planting holes:
  - .1 Stake out location and obtain approval from Consultant and/or Owner's Representative prior to excavating.
  - .2 Excavate to depth and width as indicated.
  - .3 Remove subsoil, rocks, roots, debris and toxic material from excavated material that will be used as planting soil for trees and individual shrubs. Dispose of excess material.
  - .4 Provide opening in the geotextile for rootball.
  - .5 Scarify sides of planting hole.
  - .6 Remove water which enters excavations prior to planting. Notify Consultant if water source is ground water.

### **3.3 Planting**

- .1 For bare root stock, place 50 mm backfill soil in bottom of hole. Plant trees and shrubs with roots placed straight out in hole.
- .2 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball. Do not pull burlap or rope from under root ball.
- .3 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.
- .4 Plant vertically in locations as indicated. Orient plant material to give best appearance in relation to structure, roads and walks.
- .5 For trees and shrubs:
  - .1 Backfill soil in 150 mm lifts. Tamp each lift to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade.
  - .2 Form watering saucer as indicated.
- .6 Water plant material thoroughly.
- .7 After soil settlement has occurred, fill with soil to finish grade.

- .8 Dispose of burlap, wire and container material off site.

### **3.4 Trunk Protection**

- .1 Install trunk protection on deciduous trees as indicated.
- .2 Install trunk protection prior to installation of tree supports when used.

### **3.5 Tree Supports**

- .1 Install tree supports as indicated.
- .2 Use single stake tree support for deciduous trees less than 3 m and evergreens less than 2 m.
  - .1 Place stake on prevailing wind side and 150 mm from trunk.
  - .2 Drive stake minimum 150 mm into undisturbed soil beneath roots. Ensure stake is secure, vertical and unsplit.
  - .3 Install 150 mm long guying collar 1500 mm above grade.
  - .4 Thread Type 1 guying wire through guying collar tube. Twist wire to form collar and secure firmly to stake. Cut off excess wire.
- .3 Flagging tape
  - .1 Install flagging tape and rubber hose to tree stakes on any tree near the playgrounds and play areas.
- .4 After tree supports have been installed, remove broken branches with clean, sharp tools.

### **3.6 Pruning**

- .1 After tree supports have been installed, remove broken branches with clean, sharp tools.
- .2 The natural shape or habit of the plant shall not be changed.
- .3 Pruning shall be carried out according to size and species in accordance with accepted arboricultural practice.
- .4 Coniferous trees shall be pruned only to remove dead, broken or injured branches.

### **3.7 Mulching**

- .1 Ensure soil settlement has been corrected prior to mulching.
- .2 Spread mulch as indicated.

### **3.8 Maintenance During Establishment Period**

- .1 Perform following maintenance operations from time of planting to acceptance by Consultant and/or Owner's Representative.

- .1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.
  - .1 For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.
  - .2 Remove weeds monthly.
  - .3 Replace or respread damaged, missing or disturbed mulch.
  - .4 For non-mulched areas, cultivate as required to keep top layer of soil friable.
  - .5 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Consultant and/or Owner's Representative prior to application.
  - .6 Remove dead or 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 replacements in same manner as specified for original plantings.

### **3.9 Maintenance During Warranty Period**

- .1 The Contractor shall provide maintenance immediately after each planting bed is completed and continue throughout the period of warranty to the satisfaction of the Contract Administrator.
- .2 The Contractor shall perform the following maintenance operations:
- .3 Watering:
  - .1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
  - .2 During the first and second year of the warranty period, between May 15 and September 15 of each year, watering of all planting beds shall be carried out no less than twelve, (12) times, in accordance with the watering schedule to be determined by the Contract Administrator.
  - .3 Water shall be uniformly applied to each reforestation bed at a low rate to avoid dislocating mulch, soil, plant material and run offs. Ensure a minimum penetration of 200 mm depth.
- .4 Rodent repellent:
  - .1 Rodent repellent shall be a liquid, formulated to contain 12% Thiram, coloured as to remain visible for a minimum of twenty-four hours after application.
  - .2 Acceptable product is "Scoot" or approved equal.
  - .3 The Contractor shall be responsible to monitor plant material

throughout the winter and for re-applying rodent repellent as required.

- .5 Fertilizing:
  - .1 Apply fertilizer in early spring as indicated by soil test.
  - .2 Fertilizer shall be a complete commercial type. Formulation and application rate to be determined by soil tests. For estimating purposes, use 10-52-10 applied at a rate of:
    - .1 0.9 kg for each 25 mm of tree caliper (water soluble)
    - .2 0.9 kg per cubic metre of topsoil for planting/shrub beds (granular form)
- .6 Standard Maintenance Requirements:
  - .1 Reform damaged watering saucers.
  - .2 Remove weeds 3 times per year.
  - .3 Replace or respread damaged, missing or disturbed mulch.
  - .4 For non-mulched areas, cultivate monthly to keep top layer of soil friable.
  - .5 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Consultant and/or Owner's Representative prior to application.
  - .6 Remove dead, broken or hazardous branches from plant material.
  - .7 Keep trunk protection and tree supports in proper repair and adjustment. In the autumn and spring of each warranty year, the Contractor shall re-position or replace rodent guards to meet the specifications. Rodent guards shall originate from the same source as the initial approved product.
  - .8 In the autumn of the first warranty year, the Contractor shall ensure that all stakes are secure and functioning properly.
  - .9 Remove trunk protection, tree supports and level watering saucers at end of warranty period.
  - .10 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.
  - .11 Submit monthly written reports to Consultant and/or Owner's Representative:
    - .1 Maintenance work carried out.
    - .2 Development and condition of plant material.
    - .3 Preventative or corrective measures required which are outside Contractor's responsibility.

### **3.10 Acceptance**

- .1 Planting will be accepted by Consultant and/or Owner's Representative 30 days after planting operation is completed provided that plant material exhibits healthy growing condition and is free from disease,

insects and fungal organisms.

### **3.11 Warranty Period**

- .1 Warranty will commence upon date of acceptance by Consultant and/or Owner's Representative. Warranty maintenance will take place during this two, (2) year period.

### **3.12 Interim Replacement of Plant Material**

- .1 Throughout the extended maintenance and warranty period, units of plant material that are found to be unacceptable will be replaced by the Contractor within the same growing period.
- .2 At the discretion of the Consultant and/or Owner's Representative, plant material that is identified as dead or in a poor or diseased condition shall be immediately removed from the site.
- .3 All replacement plant material shall be as per the size indicated on the drawings. These sizes are the minimum allowable.

### **3.13 Warranty Inspections**

- .1 A warranty inspection will take place at the end of the first year of the warranty period.
  - .1 First year inspection to ascertain progress of plantings and maintenance procedures and interim replacement of plant material.
- .2 A final warranty inspection of all plant material shall be carried out by the Consultant and/or Owner's Representative upon completion of the extended maintenance and warranty period.
  - .1 Plant material shall be acceptable when it meets the quality requirements of this specification for plant material. All beds, and other areas worked by the Contractor shall be free of weeds and in good order, including the removal of all stakes.
  - .2 Plant material shall be unacceptable when it does not meet this quality standard.
  - .3 Units of plant material that are found to be unacceptable will be replaced by the Contractor at the earliest opportunity in accordance with this specification for plant material. The Consultant and/or Owner's Representative reserves the right to extend the Contractor's maintenance and warranty responsibilities for an additional one-year for replacement plant material.
  - .4 In the event that this inspection is satisfactory to the Contract Administrator, and that there are no outstanding commitments to

the contracted works, the Contractor will be given final approval of the maintenance and warranty requirements.

**3.14 Cleaning**

- .1 Leave Work area clean at end of each day.
- .2 At the completion of planting operations, all areas disturbed or damaged from execution of this work shall be restored to their original condition, including, but not restricted to clean-up, regrading and seeding and mulching.
- .3 Dispose of unused fertilizer, anti-desiccant and all potentially hazardous materials to approved hazardous material collection site.
- .4 Divert unused wood and mulch materials from landfill to composting facility approved by Consultant and/or Owner's Representative.

**END OF SECTION**