

PART 1 - GENERAL

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| <u>1.1 RELATED REQUIREMENTS</u> | .1 | Section 32 91 19.13 - Topsoil Placement and Grading. |
| <u>1.2 REFERENCES</u> | .1 | Definitions: |
| | .1 | Mycorrhiza: association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils. |
| | .2 | Reference Standards: |
| | .1 | Agriculture and Agri-Food Canada (AAFC). |
| | .1 | Plant Hardiness Zones in Canada-2000. |
| | .2 | Canada Green Building Council (CaGBC) |
| | .1 | LEED Canada-NC-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations. |
| | .3 | Canadian Nursery Landscape Association (CNLA) |
| | .1 | Canadian Standards for Nursery Stock-2006. |
| | .4 | Health Canada/Workplace Hazardous Materials Information System (WHMIS) |
| | .1 | Material Safety Data Sheets (MSDS). |
| | .5 | Washington State Department of Ecology. |
| | .1 | Stormwater Management Manual for Western Washington, Volume II, Construction Pollution Prevention (2015 edition). |
| <u>1.3 ADMINISTRATIVE REQUIREMENTS</u> | .1 | Scheduling: obtain approval from Departmental Representative of schedule 10 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 Dates. |

1.4 ACTION AND
INFORMATIONAL
SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for trees, shrubs, ground cover, fertilizer, mycorrhiza, anti-desiccant, anchoring equipment, and mulch and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit electronic copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Samples:
 - .1 If requested, submit samples of mulch, mycorrhiza and other requested components.
- .4 Sustainable Design Submittals:
 - .1 LEED Canada Submittals: in accordance with Section 01 35 21 - LEED Requirements.
- .5 Regional Materials:
 - .1 Submit evidence that project incorporates required percentage 30% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacturer, and total cost of materials for project.

1.5 QUALITY
ASSURANCE

- .1 Qualifications:
 - .1 Landscape Contractor: to be a Member in Good Standing of locally recognized Landscaping and Horticultural Trades Association or equivalent.
 - .2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.
 - .3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Ornamental Maintenance designation.

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1.6 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .1 Protect plant material from frost, excessive heat, wind and sun during delivery.
 - .2 Protect plant material from damage during transportation:
 - .1 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 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.
- .3 Storage and Handling Requirements:
 - .1 Immediately store and protect plant material which will not be installed within 1 hour in accordance with supplier's written recommendations and after arrival at site in storage location approved by Departmental Representative.
 - .2 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 fibre pots.
 - .3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.
 - .3 Store and manage hazardous materials in accordance with manufacturer's written instructions.

1.6 DELIVERY,
STORAGE AND
HANDLING
(Cont'd)

- .4 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 35 21 - LEED Requirements.
- .5 Packaging Waste Management: remove for reuse or return of pallets, crates, padding, banding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements.

1.7 WARRANTY

- .1 For plant material over 75 mm caliper, plant material as itemized on plant list the 12 months warranty period is extended to 24 months.
- .2 End-of-warranty inspection will be conducted by Departmental Representative.
- .3 Departmental Representative 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.
- .4 All warranty maintenance activities to be carried out by Landscaping Contractor. this contractor to provide required materials.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

- .1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.
 - .1 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.

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| 2.1 PLANT MATERIAL
(Cont'd) | .3 | Trees: with straight trunks, well and characteristically branched for species. |
| | .4 | Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown. |
| | .5 | Collected stock: maximum 40 mm in caliper, with well developed crowns and characteristically branched; no more than 40% of overall height may be free of branches. |
| | .1 | During collection, ensure 10% maximum seed crop (or plants) are collected from healthy population of many individuals, and from several plants of same species. |
| | .2 | Leave remainder for natural dispersal and as food for dependent organisms. |
| 2.2 WATER | .1 | Free of impurities that would inhibit plant growth. |
| 2.3 STAKES | .1 | T-bar, galvanized steel, 40 x 40 x 5 x 2440 mm. |
| 2.4 WIRE TIGHTENER | .1 | Type 1: contractor's standard. |
| | .2 | Type 2: turnbuckle, galvanized steel, 9.5 mm diameter with 270 mm open length. |
| 2.5 GUYING WIRE | .1 | Type 1: steel, 3 mm galvanized wire. |
| | .2 | Type 2: 1.5 mm diameter multi-wire steel cable. |
| | .3 | Type 3: 3 mm diameter multi-wire steel cable. |
| 2.6 CLAMPS | .1 | U-bolt: galvanized, 13 mm diameter, c/w curved retaining bar and hex nuts. |
| | .2 | Crimp type. |

2.7 ANCHORS

- .1 Wood:
 - .1 Type 1: 38 x 38 x 460 mm.
 - .2 Type 2: 38 x 67 x 600 mm.
- .2 Drive-in type.
 - .1 Type 1: 13 mm diameter x 75 mm long, aluminum.
 - .2 Type 2: 18 mm diameter x 120 mm long, aluminum.
- .3 Screw-in type:
 - .1 Type 1: 100 mm diameter steel disc.

2.8 GUYING COLLAR

- .1 Tube: plastic, 13 mm diameter, nylon reinforced.

2.9 TRUNK
PROTECTION

- .1 Wire mesh: galvanized, electrically welded 1.4 mm wire with 25 x 25 mm mesh and fastener.
- .2 Plastic: perforated spiralled strip.
- .3 Burlap: clean 2.5 kg/m² minimum mass and 150 mm minimum wide, and twine fastener.
- .4 Tar impregnated crepe paper and twine fastener.

2.10 MULCH

- .1 Bark chip: varying in size from 25 to 50 mm lengths, from bark of coniferous trees.
- .2 Wood chip: varying in size from 50 mm to 75 mm and 5 to 20 mm thick, free of bark, small branches and leaves.
- .3 Shredded wood: varying in size from 25 to 125 mm in length, from coniferous trees.
- .4 Synthetic or inorganic mulch.

- 2.11 FERTILIZER .1 Synthetic commercial type as recommended by manufacturer.
.1 Ensure new root growth is in contact with mycorrhiza.
.2 Use mycorrhiza as recommended by manufacturer's written recommendations.

- 2.12 ANTI-DESICCANT .1 Wax-like emulsion.

- 2.13 FLAGGING TAPE .1 Fluorescent, red colour.

- 2.14 SOURCE QUALITY CONTROL .1 Obtain approval from Departmental Representative of plant material prior to planting.
.2 Imported plant material must be accompanied with necessary permits and import licenses. Conform to Federal regulations.

PART 3 - EXECUTION

- 3.1 EXAMINATION .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for planting installation in accordance with manufacturer's written instructions.
.1 Visually inspect substrate in presence of Departmental Representative.
.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

- 3.2 PRE-PLANTING PREPARATION
- .1 Proceed only after receipt of written acceptability of plant material from Departmental Representative.
 - .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.
 - .4 Locate and protect utility lines.
 - .5 Notify and acquire written acknowledgment from utility authorities before beginning excavation of planting pits for trees and shrubs.
 - .6 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control Civil drawings.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- 3.3 EXCAVATION AND PREPARATION OF PLANTING BEDS
- .1 Establishment of sub-grade for planting beds in accordance as indicated.
 - .2 Preparation of planting beds in accordance with Section 32 91 19.13 - Topsoil Placement and Grading.
 - .3 For individual planting holes:
 - .1 Stake out location and obtain approval from Departmental 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

- 3.3 EXCAVATION AND PREPARATION OF PLANTING BEDS (Cont'd)
- .3 For individual planting holes: (Cont'd)
- .3 (Cont'd)
- will be used as planting soil for trees and individual shrubs. Dispose of excess material.
- .4 Scarify sides of planting hole.
- .5 Remove water which enters excavations prior to planting. Notify Departmental Representative if water source is ground water.
- 3.4 PLANTING
- .1 For bare root stock, place 50 mm backfill soil in bottom of hole.
- .1 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.
- .1 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.
- .1 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.
- .1 Tamp each lift to eliminate air pockets.
- .2 When two thirds of depth of planting pit has been backfilled, fill remaining space with water.
- .3 After water has penetrated into soil, backfill to finish grade.
- .2 Form watering saucer as indicated.
- .6 For ground covers, backfill soil evenly to finish grade and tamp to eliminate air pockets.
- .7 Water plant material thoroughly.

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- 3.4 PLANTING (Cont'd)
- .8 After soil settlement has occurred, fill with soil to finish grade.
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- 3.5 TRUNK PROTECTION
- .1 Install trunk protection on deciduous trees as indicated.
- .2 Install trunk protection before installation of tree supports.
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- 3.6 TREE SUPPORTS
- .1 Install tree supports as indicated.
- .2 All stakes to penetrate undisturbed soil at least 300 mm.
- .3 Use single stake tree support for deciduous trees less than 3 m in height and evergreens less than 2 m in height.
- .1 Place stake on prevailing wind side and 150 mm minimum from trunk.
- .2 Drive stake 150 mm minimum into undisturbed soil beneath roots.
- .1 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.
- .1 Twist wire to form collar and secure firmly to stake. Cut off excess wire.
- .4 Use 3 guy wires and anchors for deciduous trees greater than 3 m in height and evergreens greater than 2 m in height.
- .1 Use Type 2 guying wire with clamps for trees less than 75 mm in diameter and Type 3 guying wire with clamps for trees greater than 75 mm in diameter.
- .2 Use Type 1 anchors for trees less than 75 mm in diameter and Type 2 anchors for trees greater than 75 mm in diameter.
- .3 Install guying collars above branch to prevent slipping at approximately 2/3 height for evergreens and 1/2 height for deciduous trees. Collar mounting height not to exceed 2.5 m above grade.
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| 3.6 TREE SUPPORTS
(Cont'd) | .4 | (Cont'd) |
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- .4 Guying collars to be of sufficient length to encircle tree plus 50 mm space for trunk clearance. Thread guy wire through collar encircling tree trunk and secure to lead wire by clamp or multi-wraps; cut wire ends close to wrap. Spread lead wires equally proportioned about trunk at 120 degrees.
 - .5 Install anchors at equal intervals about tree and away from trunk so guy wire will form 45 degree angle with ground. Install anchor at angle to achieve maximum resistance for guy wire.
 - .6 Attach guy wire to anchors. Tension wire and secure by installing clamps.
 - .7 Install wire tightener ensuring that guys are secure and leave room for slight movement of tree.
 - .8 Drive anchors flush with grade. Do not penetrate root balls.
 - .9 Install flagging tape to guys as indicated.
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| | .5 | Ensure that tree stabilization methods do not damage trees. |
| | .6 | After tree supports have been installed, remove broken branches with clean, sharp tools. |
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| 3.7 MULCHING | .1 | Ensure soil settlement has been corrected prior to mulching. |
| | .2 | Spread mulch as indicated. |
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| 3.8 MAINTENANCE DURING ESTABLISHMENT PERIOD | .1 | Perform following maintenance operations from time of planting to acceptance by Departmental Representative. |
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- .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.

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- 3.8 MAINTENANCE .1 (Cont'd)
DURING .1 (Cont'd)
ESTABLISHMENT .2 Remove weeds monthly.
PERIOD .3 Replace or respread damaged,
(Cont'd) 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
Departmental 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 .1 From time of acceptance by Departmental
DURING WARRANTY Representative to end of warranty period,
PERIOD perform following maintenance operations.
.1 Water to maintain soil moisture
conditions for optimum growth and health of
plant material without causing erosion.
.2 Reform damaged watering saucers.
.3 Remove weeds monthly.
.4 Replace or respread damaged, missing or
disturbed mulch.
.5 For non-mulched areas, cultivate monthly
to keep top layer of soil friable.
.6 If required to control insects, fungus
and disease, use appropriate control methods
in accordance with Federal, Provincial and
Municipal regulations. Obtain product approval
from Departmental Representative prior to
application.
.7 Apply fertilizer in early spring as
indicated by soil test.
.8 Remove dead, broken or hazardous
branches from plant material.
.9 Keep trunk protection and tree supports
in proper repair and adjustment.
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3.9 MAINTENANCE .1 (Cont'd)

DURING WARRANTY PERIOD

(Cont'd)

.10 Remove trunk protection, tree supports and level watering saucers at end of warranty period.

.11 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

.12 Submit monthly written reports to Departmental Representative identifying:

.1 Maintenance work carried out.

.2 Development and condition of plant material.

.3 Preventative or corrective measures required which are outside Contractor's responsibility.

.13 All warranty activities to be carried out by this contractor. Contractor to provide required materials.

.14 Check that ties/supports are adjusted so that no damage occurs to tree trunks.

3.10 VERIFICATION .1 Verification requirements in accordance with Section 01 35 21 - LEED Requirements, include:

.1 Materials and resources.

.2 Storage and collection of recyclables.

.3 Construction waste management.

.4 Local/regional materials.

3.11 CLEANING .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements.

3.11 CLEANING
(Cont'd)

- .3 Waste Management: (Cont'd)
- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
 - .2 Divert discarded burlap, wire and plastic plant containers materials from landfill to plastic recycling facility approved by Departmental Representative.
 - .3 Dispose of unused fertilizer at official hazardous material collection site approved by Departmental Representative.
 - .4 Dispose of unused anti-desiccant at official hazardous material collections site approved by Departmental Representative.
 - .5 Divert unused wood and mulch materials from landfill to recycling facility approved by Departmental Representative.

3.12 CLOSEOUT
ACTIVITIES

- .1 Submit maintenance reports for trees, shrubs, and other plantings.