

**PART 1 – GENERAL**

- 1.1 RELATED SECTIONS .1 Section 310099 - Earthworks for Minor Works  
.2 Section 329223 - Sodding  
.3 Section 329310 - Trees, Shrubs and Ground cover Planting.
- 1.2 BASIS OF PAYMENT .1 There is no measurement for payment for this item that is included in Item L-003 Sodding, Item L-004: Deciduous Trees, Item L-005: Evergreen Trees, and Item L-006: Evergreen Shrubs, including all labour, materials and equipment.
- 1.3 DEFINITIONS .1 COMPOST: A mixture of soil and decomposing organic matter used as a fertilizer, mulch, or soil conditioner. Compost is processed organic matter containing 40% or more organic matter as determined by the Walkley-Black or LOI test. Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below (25) (50)), and contain no toxic or growth inhibiting contaminants. Composed bio-solids must meet the requirements of the Guidelines for Compost Quality, Category (A) (B) produced by the Canadian Council of the Ministers of the Environment (CCME), January 1996.
- 1.4 DATA SHEETS AND TEST REPORTS .1 Submit technical data sheets and test reports in compliance with General Requirements of current book of specifications:  
.1 The data sheet for each type of soil mixture describing:  
.1 The composition of the mixture;  
.2 Organic matter content;  
.3 Sand content;  
.4 Clay content;  
.5 Ph, nitrogen, phosphorus, and potassium content;  
.6 Recommendations for improvement from a forestry engineer.
- 1.5 SOURCE QUALITY CONTROL.1 Soil testing is to be supplied by the contractor, and provided to the Departmental Representative (Consultant) for review and approval. Contractor is responsible for amendments to supply topsoil as specified.  
.2 Notify Departmental Representative of proposed supply sources for different soil mixtures 7 days prior to undertaking the work. It is forbidden to provide a topsoil from a cultivated field nearby, to avoid any introductions of undesirable plant species.  
.3 Soil testing by recognized testing facility for PH, P and K, and organic matter.

**PART 2 – PRODUCTS**

- 2.1 TOPSOIL
- .1 For trees and shrubs : Homogeneous mixture of topsoil, sand, and 2 years old manure or compost with following content:
    - .1 PH : 6 to 7 (PH control method- Determination of water PH)
    - .2 Dry organic matter based on: 8 to 12 % (control method MA-1, Determination of organic carbon (modified Walkley-Black) or MA-2, Determination of the organic matter through incineration);
    - .3 Cation exchange capacity (CEC) : minimum 10 meq/100g (control method CA-1, Exchangeable cations– Ammonium acetate (calcium, magnesium, potassium and sodium) ;
    - .4 Salinity or electrical conductivity: less than 3,5 mS/cm (control method SS-1, Greenhouse soil analysis – Method SSE);
    - .5 Mineral elements including analysis ME-3 / (control method Mehlich-3) corresponds to :
      - Phosphorus avail. : 150-200kg/ha;
      - Potassium exch. : 300-800 kg/ha;
      - Calcium exch. : 4 000-9 000 kg/ha;
      - Magnesium exch. : 250-700 kg/ha.
    - .6 Soil tests should include recommendations for amendment products.
    - .7 Soil mixture must be sifted, exempt of any contaminants (pesticide, hydrocarbons or other) debris and stones greater than 25 mm diameter, coarse vegetative material seeds, roots, or rhizomes of weed species.
  - .2 For sodding : use a homogeneous mixture of topsoil and sand with following content:
    - .1 PH : 6 to 7 (PH control method- Determination of water PH)
    - .2 Dry organic matter based on: more than 3% (control method MA-1, Determination of organic carbon (modified Walkley-Black) or MA-2, Determination of the organic matter through incineration);
    - .3 Cation exchange capacity (CEC) : minimum 7 meq/100g (méthode de contrôle CA-1, 100g (control method CA-1, Exchangeable cations– Ammonium acetate (calcium, magnesium, potassium and sodium) ;
    - .4 Salinity or electrical conductivity: less than 3,5 mS/cm (control method SS-1, Greenhouse soil analysis – Method SSE);
    - .5 Mineral elements including analysis ME-3 / (control method Mehlich-3) corresponds to :
      - Phosphorus avail. : 50-150 kg/ha;
      - Potassium exch. : 250-350 kg/ha;
      - Calcium exch. : 6 000-9 000 kg/ha;
      - Magnesium exch. : 250-350 kg/ha.

- .6 Soil tests should include recommendations for amendment products.
- .7 Soil mixture must be sifted, exempt of any contaminants (pesticide, hydrocarbons or other) debris and stones greater than 25 mm diameter, coarse vegetative material seeds, roots, or rhizomes of weed species.

2.4 SOIL AMENDMENTS

- .1 Sand: washed coarse silica sand, medium to course textured.
- .2 Organic matter: compost Category B, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements
- .3 Limestone: apply according to analyses and recommendations of soil tests.
  - .1 Ground agricultural limestone
  - .2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .4 Non-animal derived fertilizer, type 1-2,5-1 and mycorrhizal inoculants applied on plant roots and soil. Designated Representative must approve mixture. Contractor will pay for cost of tests

**PART 3 – EXECUTION**

3.1 PREPARATION OF EXISTING GRADE

- .1 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .2 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which protrudes more than 75mm above surface. Dispose of removed material off site. Comply with the current standards for the removal of contaminated if any is found.
- .3 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.
- .4 Dig tree pits as to be well coordinated with the delivery of plants so that both operations take place at the same time.
- .5 Indicate the location of planting beds using wood stakes. Staking must be approved by Departmental Representative before proceeding with work.
- .6 Protect roots and trunks of existing trees.
- .7 Excavate soil following depths indicated in drawings. Plant in individual pits.

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- .8 The diameter of planting pit must be 2 to 3 times larger than the diameter of the root ball or large enough to allow for roots to spread 300 mm or more in all directions.
  - .9 Dig planting pits to allow for the necessary space to insuring enough soil to reach beneath and around the roots.
- 3.2 PLACING AND SPREADING TOPSOIL/ PLANTING SOIL
- .1 Place topsoil after Departmental Representative has accepted subgrade. Spread topsoil in uniform layers not exceeding 150 mm. Make sure that the bottom is not frozen and free of any stagnant water.
  - .2 Apply agricultural lime at recommended rate.
  - .3 Form a groove around planting bed to facilitate water retention and mulch laying.
- 3.3 EARTHWORK
- .1 Before installing sod:
    - .1 Grade to eliminate rough spots and low areas and ensure positive drainage.
    - .2 Place soil on ground in layers 150 mm thick, up to the finished grade minus thickness of sodding.
    - .3 Loosen soil to depth of 150 mm.
  - .2 Spread topsoil to reach height defined for planting beds.
  - .3 Apply agricultural lime at recommended rate.
  - .4 Apply Mycorrhizal inoculant at rate 2 kg/100 m<sup>2</sup> before laying sod.
  - .5 Leave surfaces smooth, uniform and well closed so that it is not deep tracks under the weight of a person.
  - .6 Incorporate a natural fertilizer of origins other than animal and for which the ratio corresponds to 1 - 2,5 - 1, in the first 100mm.
  - .7 Leave surfaces smooth, uniform and well compacted so that no deep tracks can form under the weight of a person.
- 3.4 SOIL AMENDEMENTS
- .1 For planting and sodding, apply soil amendments and mix thoroughly within topmost 50 mm layer of soil, in the proportions specified soil tests.
- 3.5 FINAL GRADING
- .1 Grade to eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.
  - .2 Consolidate topsoil to required bulk density using equipment approved by Departmental Representative. Leave surfaces smooth, uniform and firm.
- 3.6 SURPLUS MATERIAL
- .1 Dispose of materials except topsoil not required Departmental Representative off site.

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| 3.7 | <u>STORAGE AREAS</u> | .1 | Repair sites used for storage purposes to the satisfaction of the Departmental Representative.   |
| 3.8 | <u>APPROVAL</u>      | .1 | Departmental Representative will review and determine if products, amendments, soil types, soil thickness, finish grades correspond to the requirements of the current book of specifications. |
| 3.9 | <u>CLEANING</u>      | .1 | Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.  |

**\*\*\* END OF SECTION \*\*\***