

## 1.0 **GENERAL**

### 1.1 **Scope**

- .1 This guideline addresses the materials, and equipment necessary for the supply, placement, and amendment of the growing medium.

### 1.2 **Related Work:**

- .1 Section 32 93 00 Plants
- .2 Section 32 93 05 Relocation of Existing Plant Material

### 1.3 **Definitions**

- .1 For the purpose of this guideline, the term "Growing Medium" shall mean a mixture of mineral particulates, microorganisms and organic matter which provides suitable medium for supporting intended plant growth. Commercially available landscape soils or native site soils, if proposed for use, will also be subject to landscape soil assessment analysis.
- .2 "On-Site Topsoil" refers to topsoils (native or commercially processed) on location at project site, or reallocated, stockpiled and transported from elsewhere on UBC Campus lands. On-Site Topsoil may be excavated, stockpiled, protected and amended in-situ as required by the project. If proposed for project use, On-Site Topsoil will also be subject to landscape soil assessment analysis and amendment.
- .3 "Soil Consultant" refers to the professional Agrologist with training in landscape soil analysis and interpretation, who is responsible for laboratory services and recommendations.
- .4 "Contractor" refers to the Contractor responsible for the Landscape Works on a project, whether this is the General Contractor, a Landscape Contractor, or a Landscape Sub-Contractor, or a combination of Contractors and Sub-Contractors.

## 2.0 **MATERIALS AND DESIGN REQUIREMENTS**

### 2.1 **Existing Conditions**

- .1 On-site topsoil designated to remain undisturbed in-situ, must be assessed, tested, amended, protected from compaction and weed infestation, and otherwise managed for the duration of the project as required and/or directed according to project drawings, specifications, soil test results or as directed by the Project Landscape Architect in consultation with UBCO Facilities Manager of Landscape and Building Services.
- .2 On-site topsoil infested with pernicious perennial weeds such as horsetail, vetch or morning glory etc. shall be excavated to depth necessary to prohibit future recurrence and removed from UBCO Campus. Alternative remedial strategies must be presented in writing and reviewed and approved by the Project Landscape Architect in consultation with UBCO Facilities Manager of Landscape and Building Services.
- .3 On-site topsoil intended for use as growing medium, or as component of growing medium, shall be protected against contamination from invasive or pernicious weeds, insect pests, plant pathogenic organisms and other extraneous and non-organic materials and environmental toxins or contaminants.
- .4 Onsite subsoil must not be used as a component of growing medium unless endorsed by Soil Consultant and whereby it can be amended to meet requirements of growing medium.

- .5 Following rough grading, examine existing sub-grade conditions and signify acceptance in writing to the Project Landscape Architect.
- .6 Ascertain the size and location of all existing services and sub-grades prior to the work.
- .7 Repair any damage resulting from failure to exercise such precautions immediately at no cost to UBC.

## 2.2 Testing

- .1 The Contractor who is responsible for supply of growing media and/or conservation of on-site topsoil should be responsible for the testing of the growing media. Testing shall be carried out by Pacific Soil Analysis Inc., at #5 - 11720 Voyageur Way, Richmond, B.C. (Ph. 604 - 273-8226), or an equal approved prior to closing of tender.
- .2 Separate tests and analysis shall be conducted for the following:
  - .1 All distinct types of growing media used on the project including imported soil, retained on-site topsoil, relocated or mixed on-site media, any other distinct formulated soil substitute or mixture.
  - .2 All media formulated or designated for a special purpose including but not limited to planting, lawns, sports fields, on-slab, extensive or intensive green roofs, living walls, structural soils for street tree planting.
- .3 The test shall determine the characteristics and quantity of the amendments to be used to bring the growing media and/or on-site topsoil to a satisfactory chemical and physical condition.
- .4 Sand shall be tested for sieve size analysis.
- .5 Before adjusting the growing media and/or on-site topsoil as required by the soils testing, submit soils analysis to the Project Landscape Architect and UBCO Facilities Manager of Landscape and Building Services for approval. The Project Landscape Architect shall confirm in writing the growing media and/or on-site topsoil amendments and fertilizer to be applied. The Contractor is responsible for amendment of the growing media and/or on-site topsoil as per the confirmed recommendations.
- .6 Soil testing must be completed and recommendations approved by Project Landscape Architect prior to installation of any plant material. Failure to do so may result in the rejection of the growing media and/or retained topsoil, removal of growing media or retained topsoil from the site at no cost to UBCO, and replacement with approved growing media as required.

## 2.3 Product Handling and Storage

- .1 All materials to be handled and adequately protected to prevent damage or contamination.
- .2 Stockpile materials in bulk form in paved area(s) approved by Project Landscape Architect. Take all precautions to prevent contamination of basic materials from wind blown soil particles, weed seeds and from insects. Contamination of the ingredients may result in their rejection for use. Where paved surfaces are not available prevent contamination of on-site soil or sub-soil or construction materials.
- .3 Store fertilizer and chemical ingredients in the manufacturer's original containers.
- .4 Store growing medium and/or excavated topsoil in a dry area or covered and protected from weed infestation, contamination, damage, water saturation, compaction or erosion.

- .5 Maintain all stockpiled growing medium, excavated topsoil and all related amendments free of weed infestation prior to installation and throughout the duration of the project.

## 2.4 Inspection

- .1 The UBCO Facilities Manager of Landscape and Building Services should be notified prior to soil placement to inspect growing medium.

## 2.5 Samples

- .1 Samples should be submitted for any amendments that are to be used:
  - .1 Sample size will be approximately 2 litres volume and be representative of the stockpile (properly sampled).
  - .2 Samples must be submitted, tested, and approved by the UBCO Facilities Manager of Landscape and Building Services in writing before the growing medium is amended. Failure to do so may result in the rejection of the growing medium, removal of the growing medium from the site at no cost to UBCO, and replacement with approved growing medium.

## 2.6 Growing Media for Standard Applications

- .1 All growing media must conform to the Canadian Landscape Standard Current addition as well as the following guidelines and specifications applicable to projects on UBC Campus.
- .2 The following guidelines apply to standard applications where media are formulated for use on-grade, over sub-soil, and designated for application to on-grade lawns, trees and plantings as per Canadian Landscape Standard, Table 6-2: Properties of Growing Medium for Level 1 "Well Groomed" Area.
- .3 Growing medium shall be composed of proportions of mushroom manure or mushroom manure / peat moss mix, silts and clays, and sand, which provides suitable medium for supporting intended plant growth. Amendments shall be required based on the soil analysis.
- .4 Growing medium shall be free of pernicious weeds or their roots, sticks, building materials, wood chips, chemical pollutants and other substances at levels toxic to plants, and other extraneous materials which detract from the desirable physical and chemical properties for landscaping purposes. Death of plants during the first year which may be attributed to nematodes or toxic materials in the growing medium did not meet this requirement at the time of installation, and may result in a requirement that the Contractor remove and replace dead plants and faulty growing medium. Excessive growth of weeds (as determined by the Project Landscape Architect) in a growing medium may be an indication that unacceptable levels of weed seeds or weed parts were present in the growing medium at the time of installation. Such a determination may result in a requirement that the Contractor remove and replace all affected medium and/or all weeds and weed roots and reduce the growth of weeds to acceptable levels.
- .5 Organic matter: mushroom manure, composts, or mixtures of manure, compost or peat will be considered for organic matter amendment. Provide samples to Pacific Soil Analysis (or pre-approved equal), for testing and approval. Approved sample shall be standard throughout.
- .6 Pump river sand: sand shall be pumped from a river and free of salt, debris, weeds and toxic chemicals. Sand shall be minimum 50% medium (< 0.5 mm and > .25 mm). Provide sample to Pacific Soil Analysis (or pre-approved equal) for inspection and approval. Approved sample shall be standard throughout.

Sand must be mixed into growing medium prior to placement. Rototilling of sand into installed

- growing medium is not acceptable.
- .7 Growing medium shall require not more than 0.5 kg / sq. m. (100 lb. / 1,000 sq. ft.) of dolomite lime to reach the required pH level.
  - .8 Organic content shall be within the ranges as per Canadian Landscape Standard, Table 6-2: Properties of Growing Medium for Level 1 “Well Groomed” Area, for the intended application. This requirement may be met by mixing growing medium components or by topdressing and Rototilling in an approved type of organic matter, based on the recommendation from the soil testing laboratory. (See Section 32 93 00 Plants, 3.6.2 - Fertilizer Application and Soil Amendments).
  - .9 Drainage of growing medium can be measured only after the growing medium is in place. Mixing and handling of growing medium shall be done in such a manner that the minimum saturated hydraulic conductivity as per Canadian Landscape Standard, Table 6-2: Properties of Growing Medium for Level 1 “Well Groomed” Area is achieved. Areas with compacted soil after installation must be cultivated to restore the uncompacted nature found throughout the project.

## 2.7 Special Purpose Media for Non-Standard Applications

- .1 Special Purpose Media includes all media for specialized application that requires formulation or amendment which diverges from the generalized specifications and tolerances shown above under Growing Media for Standard Applications and Canadian Landscape Standard, Table 6-2: Properties of Growing Medium for Level 1 “Well Groomed” Area. Special Purpose Media may include, but not be limited to: on-slab plantings, modular planters, extensive and intensive green roofs, living walls and street tree plantings in pavement.
- .2 Complete specifications and details for Special Purpose Media shall be developed collaboratively with the Project Landscape Architect following the recommendations of a Soil Consultant, Structural Engineer, and related project consultants as required before inclusion in contract specifications and drawings.
- .3 Specifications and details for Special Purpose Media shall be reviewed and approved by the Project Landscape Architect in consultation with UBCO Facilities Manager of Landscape and Building Services.
- .4 Structural Soils used for the installation of trees in urban pavements, plazas and streets will be the preferred planting medium for this type of tree planting. Alternatively, Structural Cell technologies and associated medium may be used if authorized by the Project Landscape Architect in consultation with UBCO Facilities Manager of Landscape and Building Services.
- .5 Specifications and details for Specialized Media shall be provided by Project Landscape Architect in contract documents congruent in scope and equivalent with specifications above detailing Growing Media for Standard Applications and Canadian Landscape Standard, Table 6-2: Properties of Growing Medium for Level 1 “Well Groomed” Area.

## 2.8 Growing Media Amendments

- .1 Required amendments for any landscape growing media or soils, will be the result of:
  - .1 Recommendations from Soil Consultant made after growing media testing and analysis.
  - .2 Availability of organic matter amendment.
  - .3 The presence or absence of an irrigation system.

- .4 The following amendment materials may be required to be added to the growing medium to conform to Soil Test findings.
  - .1 Organic matter: as per 2.6.8 above.
  - .2 Pump river sand: as per 2.6.6 above.
- .2 Fertilizer and Chemical Ingredients:

Fertilizer and chemical Ingredients may be required by the Project Landscape Architect based on growing media test results to be added to each growing medium to conform to the growing medium standards specified above, and/or as based on the Soil Testing findings as recommended by Soil Consultant.

  - .1 Fertilizers must be those detailed in the landscape soil analysis report. The Landscape Contractor will not make any substitutions or change of application rates unless having attained written approval of the Project Landscape Architect.
  - .2 Fertilizers and liming ingredients will be delivered to the site in their original manufacturer's packaging. All materials will be dry and free flowing to facilitate uniform distribution.
  - .3 Mulch: refer to Section 32 93 00 Plants.
  - .4 Drainage and Filter Fabric:
    - .1 Drain rock: 3/4" - 1" diameter round rock washed free of all fines and organic materials.
    - .2 Filter fabric: heat bonded, rot-proof, non-woven fabric, or approved equal.

## 2.9 Preparation of Existing Grade

- .1 Verify that grades are correct. If discrepancies occur, notify Project Landscape Architect and do not commence work until instructed by Project Landscape Architect.
- .2 Eliminate uneven areas and low spots, ensuring positive and free drainage.

## 2.10 Placement

- .1 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 25 mm above surface. Dispose of removed material off site, at no expense to UBC.
- .2 Scarify entire area which is to receive growing medium to depth of 100 mm. Scarify those areas where equipment used for hauling and spreading has compacted soil.
- .3 No growing medium shall be loaded, transported or spread when it is so wet that its structure is likely to be altered, or risk of compaction exists.
- .4 Spread growing medium with adequate moisture in uniform layers over approved, unfrozen subgrade, where sodding and planting is indicated.
- .5 Manually spread growing medium to achieve final grades around trees, shrubs and obstacles.
- .6 Installed growing medium to 25 mm above design grades to allow for settlement.

- .7 Place the growing medium to the following dimensions (Refer to Canadian Landscape Standard Table 6-5 Current Edition):
  - .1 Trees – Min. 600mm (24") deep and twice the diameter of the rootball around each tree.
  - .2 Shrubs – Min 450mm (18") depth.
  - .3 Groundcover - Min 300mm (12") depth.
  - .4 (Low and High Traffic) Lawns – Min 150mm (6") depth.

### **2.11 Finish Grading**

- .1 Leave surfaces smooth, uniform and firm against deep foot printing.
- .2 Fine grade growing medium to 25 mm above finished grades shown on drawings. Eliminate rough spots and low areas to ensure positive drainage. Prepare loose, friable beds by means of cultivation and subsequent raking. Final grades to be approved by UBCO Facilities Manager of Landscape and Building Services prior to further work proceeding.
- .3 After planting, spread 75 mm layer of specified approved mulch evenly over all exposed growing medium finished grades, to the satisfaction of the UBCO Facilities Manager of Landscape and Building Services. Refer to Section 32 93 00 Plants for guidelines on mulch specification.

### **2.12 Acceptance**

- .1 UBCO Facilities Manager of Landscape and Building Services will inspect growing medium in place and determine acceptance of material, depth of growing medium and finish grading, prior to plant installation.
- .2 Approval of growing medium may be subject to soil testing and analysis if any doubt exists concerning its conformity to the requirements as per Canadian Landscape Standard, Table 6-2: Properties of Growing Medium for Level 1 "Well Groomed" Area, or any of the subparagraphs under paragraph 2.1 of this Section.

### **2.13 Surplus Material**

- .1 Dispose of materials not required by UBCO Facilities Management off site, at no cost to UBCO.

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