

329113S01 Soil Profile Rebuilding

1. PURPOSE AND DESCRIPTION

1.1 Purpose

Soil Profile Rebuilding is an appropriate soil restoration technique for sites where topsoil has been completely or partially removed and subsoil layers have been compacted (graded and/or trafficked by construction equipment). It may also be used with some modifications if topsoil is present. This is not an appropriate technique in sites with surface compaction only (6 inches or less), although this situation is rare on construction sites. This technique is not appropriate within the root zones of trees that are to be protected. Soil Profile Rebuilding can improve physical and biological characteristics of soil to allow for revegetation.

1.2 Description of Procedure

The procedure includes a bucket subsoiling method, addition of organic matter in the form of compost, replacement or addition of topsoil, and subsequent planting with trees and large woody plants. Soil Profile Rebuilding puts the components in place for restoration to characteristics similar to undisturbed soils.

1.3 Expected Outcomes

Soil Profile Rebuilding may improve vegetation establishment, increase tree growth rates, increase soil permeability, enhance formation of aggregates in the subsoil, and enhance long-term soil carbon storage.

2. PROCEDURE

2.1 Location

Profile Rebuilding shall occur on all soil areas that are to be vegetated by trees and large woody plants and will be disturbed by trafficking or grading during construction as determined by the Landscape Architect and University Grounds Manager. The Landscape Architect shall provide a site map as part of the Construction Bid Documents delineating area to be treated and these areas shall be approved by the UK Project Manager and University Grounds Manager before grading or construction begins.

Verify the area to be treated is free of any buried utilities.

2.2 Sequencing

Profile Rebuilding shall occur after site disturbance is complete, including all vehicle and equipment trafficking, but before replacement of topsoil. Once profile rebuilding is complete, all construction traffic and equipment or materials storage on treated areas is prohibited.

2.3 Remove foreign materials

Remove all foreign materials resulting from construction operations, including oil drippings, stone, gravel, and other construction materials from the existing soil surface.

329113S01 Soil Profile Rebuilding

2.4 Application of Compost

Spread mature, stable compost to a 4 inch depth over compacted subsoil within zones to be treated.

Compost feedstock shall be leaves, yard waste, or food waste. Biosolid-based composts shall not be used. A compost sample with analysis shall be submitted to Landscape Architect and UK Grounds Manager for approval before application.

Compost shall also be:

1. Free of weed seeds
2. Free of heavy metals or other deleterious contaminants
3. Have an Electrical Conductivity (EC) of less than 4.0 mmhos/cm

2.5 Subsoiling

Subsoiling in this case utilizes an excavator bucket to break up and blend compost and soil. This work may be performed when soil is neither wet nor dry. If a shovel cannot be forced into the soil, it is too dry. If the surface is sticky or muddy, it is too wet. Use an excavator or similar equipment with a tined bucket to break up the compacted soil and incorporate the compost. This subsoiling is to be done within the boundaries as outlined in construction bid documents.

Work backwards away from excavated soils so that treated soil is not trafficked by the equipment. Insert the bucket through the compost layer and into the subsoil to a depth of 24 inches and raise a bucket of soil at least 24 inches above the soil surface. Tip the bucket and allow soil to fall. Repeat this procedure until no clumps of compacted soil larger than 12 inches in diameter remain. The tines of the bucket can be used to break apart larger clumps if necessary. 50% of the soil shall be in clumps 6 inches or smaller. No clumps shall be greater than 18" in diameter. The subsoiling is not intended to homogenize the compost and soil, but rather loosen the soil to a 24-inch depth and create veins of compost down to that depth as well. To ensure that subsoiling reached the appropriate depth, a push tube soil sampler shall be used to verify compost is present at 24-inch depth. Third party, to provide push tube sampling. Sampling shall be included in special inspection contract scope of work. Samples are to be taken on grid at 10 ft. intervals.

Upon approval from University Grounds Manager that site has been properly subsoiled, site should be tilled to a depth of 6" to break up any large clods prior to adding topsoil.

329113S01 Soil Profile Rebuilding

2.6 Replacement of Topsoil

Stockpiled topsoil, or additional topsoil if none is available from the site, shall be returned to the site to a 4 inch minimum depth. If soil was severely disturbed (regraded lower than 14 inches from original elevation), a 6-8 inch minimum shall be replaced. Greater depths may be required based on Landscape Architect design. Imported topsoil shall be approved by Landscape Architect and University Grounds Manager and:

1. Be friable and well drained
2. Have a pH between 5.2 and 7.5 (a narrower range may be specified for particular plant material)
3. Have an organic matter content not less than 3%
5. Be free of debris, stones, gravel, trash, large sticks, heavy metals, and other deleterious contaminants.

3. SUBMITTALS

3.1 Compost

A compost sample with analysis certifying it is stable, mature, from acceptable feedstocks and free of contaminants and weed seeds shall be submitted for approval by the UK Project Manager, Landscape Architect, and the University Grounds Manager prior to application.

3.2 Topsoil

A topsoil sample with analysis and verification of source shall be submitted for approval to the UK Project Manager, Landscape Architect, and the University Grounds Manager. Separate documentation is required for each 100 cubic yards of topsoil unless otherwise approved