



# LANDTECH SOILS

## Urban Greening Solutions

### Specification:- Cu-Structural Tree Soil

### A New System to Integrate Trees and Pavement

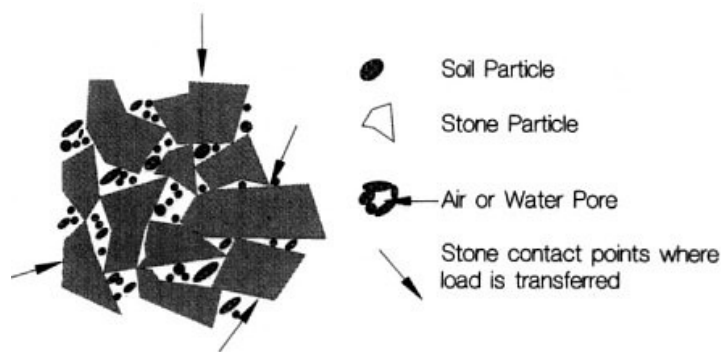
#### Description & Specification

CU-Structural Tree Soil is a designed tree rootzone growing medium which can meet or exceed Engineering pavement design and installation requirements while remaining root penetrable and supportive of tree growth. It was developed as a result of years of testing by UHI (Cornell's Urban Horticulture Institute) and is focused on combining the essential Engineering, as well as horticultural properties, as required for both the trees and the pavement.

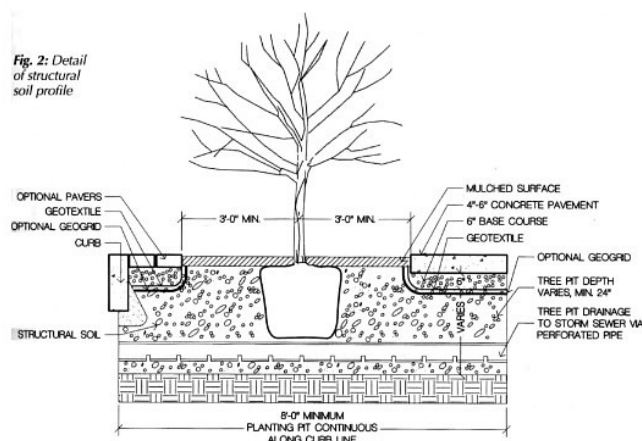
#### Materials:

CU-Soil is a gap-graded aggregate which is made up of crushed stone, clay loam, and a hydrogel stabilizing agent. For proper installation the materials must be compacted to meet the relevant pavement design requirements, yet allow for sustainable tree root growth. The new system essentially forms a rigid, load bearing stone lattice and partially fills the lattice voids with soil (Figure 1).

CU-Structural Soil provides a continuous base course under pavements while providing a material for tree root growth. This shifts the design of a tree planting scheme away from individual tree pits to an integrated, root penetrable, high strength pavement system. This system consists of a 100-150mm (4" – 6") rigid pavement surface, with a pavement opening large enough to



*Fig. 1: The stone lattice bears loading while the soil particle partially fills the lattice voids.*



*Fig. 2: Detail of structural soil profile*

Find Out More At  
[www.landtechsoils.ie](http://www.landtechsoils.ie)

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The opening could also consist of concentric rings of interlocking pavers designed for removal as the buttress roots meet them. Below that, a conventional base course could be installed and compacted with the material meeting normal regional pavement specifications for the traffic they are expected to experience. The base course will also act as a root exclusion zone from the pavement surface.

### General

Although field tests show that tree roots naturally tend to grow away from the pavement surface in CU-Structural Soil, a water permeable geotextile may be used to segregate the base course of the pavement from the structural soil. Gap-graded, CU-Structural Soil has been proven to allow root penetration when fully compacted CU-Soil should be compacted to not less than 95% Proctor density (AASHTOT-99) and possess a California Bearing Ratio (CBR) greater than 40 [Grabosky and Bassuk 1995,1996].

### Installation

The installation depth of CU-Structural soil will depend on the designed site specific depth to the subgrade, with the preferred recommended depth being up to 1 metre (39"). This depth of excavation is negotiable, but a minimum depth of 600mm (24") is seen as essential for the tree rooting zone.

The subgrade should be excavated to parallel the finished grade level. Subject to the permeability of the subgrade, under-drainage, if required, conforming to the approved site specific engineering standards for the region should be provided beneath the CU-Structural Soil material.

CU-Structural soil material is designed as follows. The three components of the structural soil are mixed in the specified proportions by weight, crushed stone, clay loam and Gelscape hydrogel. Total moisture at mixing should be 10% (AASHTO T-99 optimum moisture). The crushed stone (granite or hard limestone) is narrowly graded from 20 – 40mm (3/4" - 1 1/2"), highly angular with no fines.

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The clay loam should conform to the USDA soil classification system (gravel < 5%, sand 25-30%, silt 20-40%, clay 25-40%). Organic matter should range between 2% and 5%. The hydrogel, a potassium copolymer is added in a small amount to act as a tackifier, preventing separation of the stone and soil during mixing and installation.

CU-Structural Soil is then installed and compacted in 150mm (6") lifts. For a street tree installation of CU-Soil, the potential rooting zone may extend from building face to kerb, and where possible should run for the entire length of the street planting zone. This would ensure an adequate volume of soil to meet the long term needs of the tree. Where this entire sub pavement excavation is not feasible, an acceptable minimum should be a trench, running continuous and parallel to the kerb, ideally up to 3 metres (9') wide and 1 metre (3') deep should be considered as the minimum adequate for continuous street tree planting, that will ensure long term successful tree growth.

In order to ensure moisture recharge and free gas exchange throughout the root zone, this requirement can be met by the installation of an adequately sized irrigation/aeration duct surrounding the rootball which should be installed within the structural soil rootzone, with an inlet connected to the surface, adjacent to trunk flair opening. Other permeable surface treatments will also provide additional moisture recharge, as is provided by traditional irrigation.

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### SuDS & CU-Soil

CU-Soil, when used as a structural rootzone material for urban tree planting, has the secondary benefit of being an effective storm water attenuation area. With up to 40% macro-pore spaces within the material, if the on-site space allows, the attenuation area can be sized to accommodate the rainfall run-off of even a 50 year rain fall event. This attenuation area can extend under most of the site, as it also forms a structural base for car parking areas, access roads and footpaths as well as the tree planting spaces.

When used in conjunction with a porous surface material CU-Soil is particularly effective for reducing the run-off burden on urban storm water facilities. CU-Soil can be an important element in helping to meet SuDS requirements in an urban development. For further information – please consult our website on [www.landtechsoils.co.uk](http://www.landtechsoils.co.uk)

### General:

- CU-Structural Tree Soil is fully recyclable, and can be re- used without the need for any treatment.
- There are no special requirements for handling or using CU-Soil.

For Further Information about this material and its use, please contact us, see below for details.

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