

## Soil Specification for Tree Planting- Knoxville Tennessee

**Soil Volume-** Unless specified by the Knoxville Urban Forester, the minimum soil volume for small, medium, and large maturing trees shall be 400, 600, and 800 cubic feet respectively. When calculating soil volume only the first three feet of soil depth should be used for calculations. Alternatively, contiguous growing areas for small, medium, and large maturing trees should be 130, 200, and 250 square feet. The use of pervious pavements, root paths, structured soil, and Silva cells can be used to reach recommended soil volumes.

**Soil Depths-** Trees must have at least 3 feet of soil depths to accommodate root growth. The use of top soil and subsoil can be used to reach the recommended soil depth. Subsoil shall be installed in 10 to 12 inch lifts, and soil should be stratified between each lift.

**Soil Texture-** The recommended soil texture will vary based on the location and species of trees being installed. The top soil and subsoil should be consistent and range from a loam to sandy loam (85% to 90%) in texture. Large clay clods greater than 1 inch in length should not make up over 10% of the soil volume and large clods over 5 inches should be avoided. Do not screen the soil to allow for aeration within the soil.

**Soil Debris and Contaminants-** Soil used for tree planting shall be free of heavy metals, toxins, and debris including brick, concrete, wood, glass, metal, stones, and plastic. **Never shall an area designated for tree planting be used as a washout area for concrete or other construction material.** Unless approved by the urban forester, no stones, rocks and gravel shall exceed 5% of the soil volume and be larger than 1 inch. The use of limestone is strictly prohibited without the approval of the urban forester.

**Organic Matter-** The top soil should have 5% organic matter by weight. Compost, wood chips, and pine bark with a pH less than 7 may be used to increase organic matter. The subsoil should have at least 1% organic matter by volume.

**Soil Density-** The density of the soil may be variable based on applications. Target soil density is typically compacted 78 to 85% based on application and location of soil in the profile. Soil should be compacted in 12 inch lifts based on application.

**Drainage-** Water should be readily drained from the soil. The use of drainage pipes should be used if percolation tests show drainage rate less than 1 inch per hour. Target percolation rate is 1 to 3 inches per hour based on species of trees being planted. 4" drainage tiles surrounded by sand can be used to drain difficult locations such as tree wells.

**Soil pH-** The pH of the soil is an absolute must when determining an acceptable soil. The general pH range for trees is 5.8 to 7.4. **Never shall the pH of the soil test higher than 7.0 without the consent from the urban forester.** Soil will be tested by the urban forester and soil that does not meet the recommended pH range will need to be replaced.