



United States
Department of
Agriculture

Soil
Conservation
Service

Columbia,
Missouri



Urban Conservation Tips



Soils

Introduction

The success of a construction project often is related directly to the proper interpretation of the soil. Rapid population growth and increasing mobility have placed more people in situations where soil conditions directly affect them. This is especially true in rural-urban fringe areas where people move to enjoy country living. A lack of knowledge and understanding for the soil has resulted in many costly mistakes.

Soil Properties

All land users should consider the importance of soils, whether they are working with an existing residential or commercial area or developing land for a particular purpose. Knowledge of soil types and their features can help the land user solve current problems and avoid future problems. The most important soil features are drainage characteristics, shrink-swell potential and erodibility. These features can determine whether a soil is suitable for a particular use.

Texture: Soil particles vary in size. From coarse to fine, they are classified as sand, silt or clay. The percentage of each in any given soil determines its texture. Soil texture partly controls other soil properties. These include permeability, rate of runoff, available water capacity and soil drainage.

Permeability: How easily water, air or roots can travel through soil is a measure of its permeability.

Permeability is influenced by soil texture, structure, compaction and the presence or absence of cementing agents.

Depth to High Water Table: Soil below groundwater is saturated. The groundwater or water table may be high year round or just during heavy rains. How high the water table rises, and how long it stays there, will affect what can be done on the soil. High water tables near a home or building can create wet basements, cause septic systems to fail and restrict landscape plant selection.

Slope: The percent slope of land is

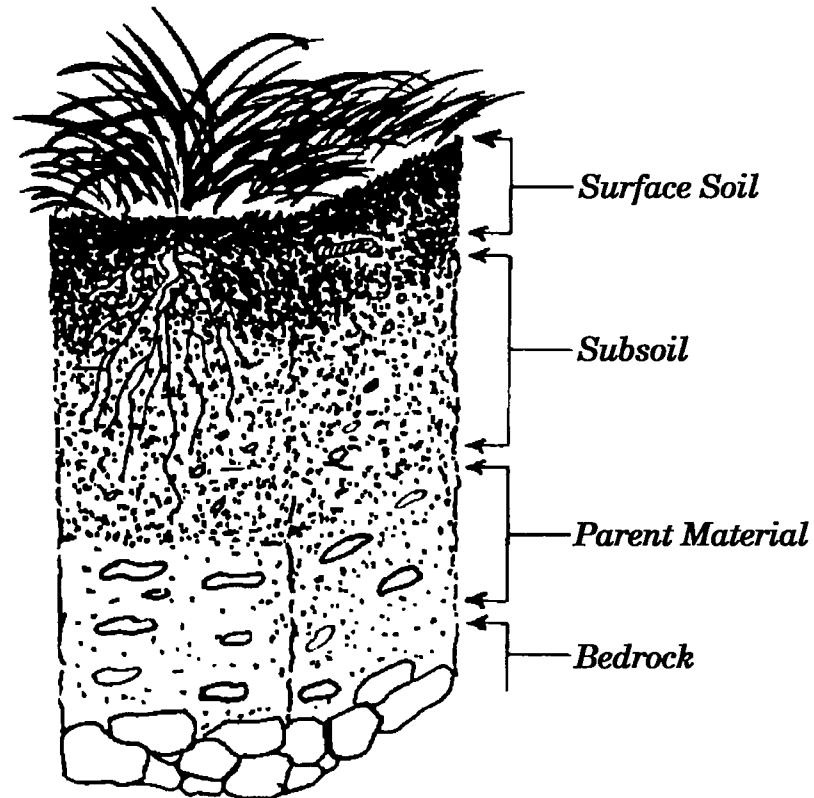
the measurement of the vertical rise or fall of the surface in 100 feet.

Depth to Bedrock: The depth from the soil surface to bedrock influences the soil's potential uses.

Stones and Rock Fragments: The size of surface rock fragments and the percentage of ground they cover are important to land use planning.

Flooding and Ponding: Periodic floodwater, from either overflowing streams or runoff from nearby slopes, make such sites

(over)



Soil Profile

risky for construction.

Shrink-Swell Potential: This refers to the relative change in soil volume to expect when the soil moisture changes. The soil shrinks when it dries, and swells when it gets wet. Shrinking or swelling of soils may damage building foundations, roads and other structures.

Potential Frost Action: This is the likelihood of upward or lateral movement of soil (frost heave) by the formation of ice layers and the subsequent loss of strength upon thawing.

The soil property-land use table below shows how land uses are affected by a particular soil property.

Soil Survey

Most land users cannot determine the potentials and limitations of the soils of a specific area without assistance. A valuable reference to help land use planners, developers or landowners match the soil with its potential uses is a soil survey.

A soil survey is an inventory of the soil in a county or other area of interest. It indicates what soils are in the area, how much of each soil there is and where the individual soils are located.

Soil surveys provide physical and chemical information about soils, along with a discussion of their suitability, limitations and management for specific uses. Soil scientists observe soil color; texture; abundance and size of roots and pores; acidity; the steepness, length and shape of slopes; position of the landscape;

depth of the seasonal high water table; and kinds of native plants and other features that help characterize and identify soils.

After soil scientists have located and identified different soils in an area, they produce soil maps by drawing boundaries on aerial photographs. The dominant soils of an area are identified on the maps. Aerial photographs show trees, fields, buildings, streams and roads, all of which help in locating soil boundaries.

Where To Get Help

For more information about soils, or to get a copy of a soil survey for your county, contact your local Soil Conservation Service office. It is listed in the telephone directory under "U.S. Government, Department of Agriculture."

Soil Property	Selected Land Use					
	Septic Tank Absorption Fields	Sanitary Landfill (Trench)	Sanitary Landfill (area)	Buildings	Local Roads and Streets	Lawns and Landscaping
Wetness	*	*	*	*	*	*
Permeability	*	*	*			
Depth to Rock	*	*		*	*	*
Slope	*	*	*	*	*	*
Surface Texture						*
Subsurface Texture		*		*	*	
Small Stones						*
Large Stones	*	*		*	*	*
Flooding	*	*	*	*	*	*

* Indicates that a particular land use could be affected by a specific soil property