

# Soil Features

Madison County, Tennessee

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
Ar:		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
Arents	---	---	---	---	---	---	None	Moderate	Moderate
Urban land	---	---	---	---	---	---	None	---	---
Ca:									
Calhoun	---	---	---	---	---	---	None	High	Moderate
Henry	Fragipan	18-37	---	---	---	---	None	High	Moderate
Co:									
Calloway	Fragipan	18-30	---	---	---	---	None	High	Moderate
Cs:									
Collins	---	---	---	---	---	---	None	Moderate	Moderate
DuB:									
Dulac	Fragipan	---	---	---	---	---	None	Moderate	High
DuB3:									
Dulac	Fragipan	---	---	---	---	---	None	Moderate	High
DuC3:									
Dulac	Fragipan	---	---	---	---	---	None	Moderate	High
DuD3:									
Dulac	Fragipan	---	---	---	---	---	None	Moderate	High
EuE:									
Eustis	---	---	---	---	---	---	None	Low	High

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Fa:		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
Falaya	---	---	---	---	---	---	None	High	Moderate
GrA:									
Grenada	Fragipan	---	---	---	---	---	None	Moderate	Moderate
GrB:									
Grenada	Fragipan	---	---	---	---	---	None	Moderate	Moderate
GrB3:									
Grenada	Fragipan	---	---	---	---	---	None	Moderate	Moderate
GrC3:									
Grenada	Fragipan	---	---	---	---	---	None	Moderate	Moderate
lu:									
luka	---	---	---	---	---	---	None	Moderate	High
LeB:									
Lexington	---	---	---	---	---	---	None	Moderate	Moderate
LeB3:									
Lexington	---	---	---	---	---	---	None	Moderate	Moderate
LeC:									
Lexington	---	---	---	---	---	---	None	Moderate	Moderate
LeC3:									
Lexington	---	---	---	---	---	---	None	Moderate	Moderate

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		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
LeD:									
Lexington	---	---	---	---	---	---	None	Moderate	Moderate
LeD3:									
Lexington	---	---	---	---	---	---	None	Moderate	Moderate
LeE:									
Lexington	---	---	---	---	---	---	None	Moderate	Moderate
LgC:									
Lexington	---	---	---	---	---	---	None	Moderate	Moderate
Urban land	---	---	---	---	---	---	None	---	---
LmE3:									
Lexington	---	---	---	---	---	---	None	Moderate	Moderate
Smithdale	---	---	---	---	---	---	None	Low	Moderate
LoB:									
Loring	Fragipan	---	---	---	---	---	None	Moderate	Moderate
LoB3:									
Loring	Fragipan	---	---	---	---	---	None	Moderate	Moderate
LoC3:									
Loring	Fragipan	---	---	---	---	---	None	Moderate	Moderate
Ma:									
Mantachie	---	---	---	---	---	---	None	High	High

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MeA:		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
Memphis	---	---	---	---	---	---	None	Moderate	Moderate
MeB:									
Memphis	---	---	---	---	---	---	None	Moderate	Moderate
MeB2:									
Memphis	---	---	---	---	---	---	None	Moderate	Moderate
MeC3:									
Memphis	---	---	---	---	---	---	None	Moderate	Moderate
Oc:									
Ochlockonee	---	---	---	---	---	---	None	Low	High
PrB:									
Providence	Fragipan	18-38	---	---	---	---	None	Moderate	Moderate
PrC3:									
Providence	Fragipan	18-38	---	---	---	---	None	Moderate	Moderate
PrD3:									
Providence	Fragipan	18-38	---	---	---	---	None	Moderate	Moderate
SmE:									
Smithdale	---	---	---	---	---	---	None	Low	Moderate
SmF:									
Smithdale	---	---	---	---	---	---	None	Low	Moderate

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SwD:		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
Sweatman	---	---	---	---	---	---	None	High	High
SwE:									
Sweatman	---	---	---	---	---	---	None	High	High
Vk:									
Vicksburg	---	---	---	---	---	---	None	Low	Moderate
Wa:									
Waverly	---	---	---	---	---	---	None	High	Moderate
Wf:									
Waverly	---	---	---	---	---	---	None	High	Moderate

## Soil Features

This table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. "Depth to top" is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

"Subsidence" is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

"Potential for frost action" is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as "low," "moderate," or "high," is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as "low," "moderate," or "high." It is based on soil texture, acidity, and amount of sulfates in the saturation extract.