

The following 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.

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, permeability, 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.

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
		In	In				
073CS:							
Clime-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	High	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
125BF:							
Bates-----	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Collinsville----	4-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
125BG:							
Bates-----	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Collinsville----	4-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
125ET:							
Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	High	Moderate
Talihina-----	10-20	Bedrock (paralithic)	---	Weakly cemented	---	High	Moderate
125OD:							
Olpe-----	---	---	---	---	---	High	Moderate
Dennis-----	---	---	---	---	---	High	Moderate
133EB:							
Eram-----	20-41	Bedrock (paralithic)	---	Weakly cemented	---	High	Moderate
133ED:							
Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	High	Moderate
Ae:							
Apperson-----	40-60	Bedrock (lithic)	---	---	---	High	Low
AED:							
Arents, Earthen Dam-----	---	---	---	---	---	---	---
Ba:							
Bates-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
Bc:							
Bates-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
Bh:							
Bates-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
Collinsville----	4-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
Bo:							
Bates-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
Collinsville----	4-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
Ca:							
Catoosa-----	20-40	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
Dn:							
Dennis-----	---	---	---	---	---	High	Moderate
Do:							
Dennis-----	---	---	---	---	---	High	Moderate
Dp:							
Dennis, eroded--	---	---	---	---	---	High	Moderate
Dw:							
Dennis-----	---	---	---	---	---	High	Moderate
Dwight-----	---	---	---	---	Moderate	High	Moderate
Eb:							
Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	High	Moderate
Ec:							
Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	High	Moderate
Ef:							
Eram, eroded----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	High	Moderate
Gr:							
Girard-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Low
Iv:							
Ivan-----	---	---	---	---	Moderate	Low	Low
Ke:							
Kenoma-----	---	---	---	---	---	High	Moderate
Ko:							
Kenoma-----	---	---	---	---	---	High	Moderate
Olpe-----	---	---	---	---	---	High	Moderate
La:							
Lanton-----	---	---	---	---	---	High	Moderate
M-W:							
Miscellaneous Water-----	---	---	---	---	---	---	---
Ma:							
Mason-----	---	---	---	---	---	Moderate	Moderate
Nd:							
Niotaze-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	High	Moderate
Darnell-----	10-20	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top In	Thickness In	Hardness		Uncoated Steel	Concrete
Or:							
Osage-----	---	---	---	---	---	High	Moderate
Os:							
Osage-----	---	---	---	---	---	High	Moderate
Pe:							
Prue-----	---	---	---	---	---	High	Moderate
Pt:							
Pits, Quarries--	---	---	---	---	---	---	---
Rn:							
Ringo-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	High	Low
Rs:							
Ringo-----	---	Bedrock (paralithic)	---	Weakly cemented	---	High	Low
Shidler-----	---	Bedrock (lithic)	---	Indurated	---	Moderate	Low
Sc:							
Shidler-----	---	Bedrock (lithic)	---	Indurated	---	Moderate	Low
Catoosa-----	---	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
Sf:							
Steedman-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Moderate	Moderate
Sm:							
Stephenville----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Moderate	Moderate
Darnell-----	10-20	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Sp:							
Stephenville----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Moderate	Moderate
Darnell-----	10-20	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Vc:							
Verdigris-----	---	---	---	---	---	Low	Low
Vf:							
Verdigris-----	---	---	---	---	---	Low	Low
W:							
Water-----	---	---	---	---	Low	---	---
Wo:							
Woodson-----	---	---	---	---	---	High	Moderate
Za:							
Zaar-----	---	---	---	---	---	High	Moderate
Zb:							
Zaar-----	---	---	---	---	---	High	Moderate

