

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.

SOIL FEATURES--Continued
Jefferson County, Kansas

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				
005SH: Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
005SM: Shelby, eroded--	---	---	---	---	Moderate	Moderate	Moderate
005VS: Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
013WN: Wymore-----	---	---	---	---	High	High	Moderate
045VM: Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Martin-----	---	---	---	---	High	High	Low
085MC: Martin-----	---	---	---	---	High	High	Low
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
085WB: Wymore-----	---	---	---	---	High	High	Moderate
177SM: Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
601GT: Grundy-----	---	---	---	---	High	High	Moderate
601SH: Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
601SM: Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
AED: Arents, Earthen Dam-----	---	---	---	---	---	---	---
Be: Bismarckgrove---	---	---	---	---	High	Low	Low
Kimo-----	---	---	---	---	High	High	Low
Bp: Belvue-----	---	---	---	---	High	Low	Low
Bx: Bourbonais-----	---	---	---	---	High	High	Low
Bismarckgrove---	---	---	---	---	High	Low	Low
By: Bourbonais-----	---	---	---	---	High	High	Low
Bismarckgrove---	---	---	---	---	High	Low	Low
Eb: Eudora-----	---	---	---	---	High	Low	Low
Bismarckgrove---	---	---	---	---	High	Low	Low
Ec: Eudora-----	---	---	---	---	High	Low	Low
Bismarckgrove---	---	---	---	---	High	Low	Low
Ed: Eudora-----	---	---	---	---	High	Low	Low
Eg: Eudora-----	---	---	---	---	High	Low	Low
Fu: Fluvaquents-----	---	---	---	---	High	High	Low
Gb: Grundy-----	---	---	---	---	High	High	Moderate
Gc: Grundy-----	---	---	---	---	High	High	Moderate
GRP: Pits-----	---	---	---	---	Low	Low	Low
Gy: Gymer-----	---	---	---	---	Moderate	Moderate	Moderate
Hc: Haig-----	---	---	---	---	High	High	Moderate
Kb: Kennebec-----	---	---	---	---	High	Moderate	Low
Kc: Kennebec-----	---	---	---	---	High	Moderate	Low
Ki: Kimo-----	---	---	---	---	High	High	Low
Km: Kimo-----	---	---	---	---	High	High	Low
Kv: Konawa-----	---	---	---	---	---	Moderate	Moderate
M-W: Miscellaneous Water-----	---	---	---	---	---	---	---
Mb: Martin-----	---	---	---	---	High	High	Low
Mc: Martin-----	---	---	---	---	High	High	Low
Mh: Martin, eroded--	---	---	---	---	High	High	Low
Mo: Martin-----	---	---	---	---	High	High	Low
Oska-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	Moderate	Moderate
MR: Morrill-----	---	---	---	---	Moderate	Moderate	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
Mu: Muscotah-----	---	---	---	---	Moderate	High	Low
Mv: Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
Oc: Oska-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	Moderate	Moderate
Pb: Pawnee-----	---	---	---	---	High	High	Low
Pc: Pawnee-----	---	---	---	---	High	High	Low
PE: Pawnee, eroded--	---	---	---	---	High	High	Low
Ph: Pawnee, eroded--	---	---	---	---	High	High	Low
Pt: Pits, Quarries--	---	---	---	---	---	---	---
QUA: Quarries-----	---	---	---	---	---	---	---
Re: Reading-----	---	---	---	---	High	Moderate	Low
Rs: Rossville-----	---	---	---	---	High	Moderate	Low
Sa: Stonehouse-----	---	---	---	---	Low	Low	Low
Eudora-----	---	---	---	---	High	Low	Low
Sc: Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
Pawnee-----	---	---	---	---	High	High	Low
So: Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
Pawnee-----	---	---	---	---	High	High	Low
Ss: Sibleyville----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
Sv: Sibleyville----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
Sw: Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Vc: Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Vo: Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Vx: Rock Outcrop----	0-0	Bedrock (lithic)	---	---	---	---	---
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
W: Water-----	---	---	---	---	Low	---	---
Wc: Wabash-----	---	---	---	---	Moderate	High	Moderate
Wh: Wabash-----	---	---	---	---	Moderate	High	Moderate

