

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
Republic 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
029AA: Hobbs-----	---	In	In	---	Low	Low	Low
029AR: Armo-----	---	---	---	---	Low	Low	Low
029BA: Hastings-----	---	---	---	---	Moderate	Moderate	Low
Hobbs-----	---	---	---	---	Low	Low	Low
029CT: Crete-----	---	---	---	---	Moderate	Moderate	Low
029GE: Geary-----	---	---	---	---	High	Low	Low
029GS: Geary-----	---	---	---	---	Moderate	Low	Low
029LH: Lancaster-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
Hedville-----	4-20	Bedrock (lithic)	---	Strongly cemented	Low	Low	Moderate
029LN: Longford-----	---	---	---	---	Moderate	High	Low
029SA: Inavale-----	---	---	---	---	Low	Moderate	Low
029TO: Tobin-----	---	---	---	---	Moderate	Low	Low
089AR: Armo-----	---	---	---	---	Low	Low	Low
089BA: Bogue-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Low	High	Moderate
Armo-----	---	---	---	---	Low	Low	Low
089BB: Bogue-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Low	High	Moderate
089GN: Gibbon-----	---	---	---	---	High	High	Low
089HB: Harney-----	---	---	---	---	Low	High	Low
089HC: Harney-----	---	---	---	---	Low	High	Low
089HF: Harney-----	---	---	---	---	Low	High	Low
089HS: Holdrege-----	---	---	---	---	Moderate	Low	Low
Geary-----	---	---	---	---	High	Low	Low
089HU: Hord-----	---	---	---	---	Moderate	High	Low
089MC: Mccook-----	---	---	---	---	Moderate	Low	Low
089NC: New Cambria-----	---	---	---	---	Low	High	Low
089ND: Nibson-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Low	Low	Low
089NR: Nuckolls-----	---	---	---	---	Moderate	High	Low
Roxbury-----	---	---	---	---	Moderate	Low	Low
089RB: Roxbury-----	---	---	---	---	Moderate	Low	Low
089RC: Roxbury-----	---	---	---	---	Moderate	Low	Low
201CS: Crete-----	---	---	---	---	Moderate	Moderate	Low
201KP: Kipson-----	7-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Low
201LC: Lancaster-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
201TY: Tully-----	---	---	---	---	Moderate	High	Low
201WE: Wells-----	---	---	---	---	Moderate	Low	Moderate
Bk: Geary-----	---	---	---	---	High	Low	Low
Hobbs-----	---	---	---	---	Moderate	Low	Low
BOP: Borrow Pits-----	---	---	---	---	---	---	---
Bu: Butler-----	---	---	---	---	High	High	Low
Ca: Cozad-----	---	---	---	---	Low	Low	Low
Cass-----	---	---	---	---	Low	Moderate	Low
Ce: Crete-----	---	---	---	---	Moderate	Moderate	Low
Cf: Crete-----	---	---	---	---	Moderate	Moderate	Low
Ch: Crete-----	---	---	---	---	Moderate	Moderate	Low

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
Cr:							
Crete-----	---	---	---	---	Moderate	Moderate	Low
Dt:							
Detroit-----	---	---	---	---	Low	High	Low
Ed:							
Eudora-----	---	---	---	---	High	Low	Low
Eu:							
Eudora-----	---	---	---	---	High	Low	Low
Gc:							
Geary-----	---	---	---	---	High	Low	Low
Gr:							
Geary-----	---	---	---	---	High	Low	Low
Ha:							
Hastings-----	---	---	---	---	Moderate	Moderate	Low
Hb:							
Hastings-----	---	---	---	---	Moderate	Moderate	Low
Hc:							
Hastings-----	---	---	---	---	Moderate	Moderate	Low
Hd:							
Hastings-----	---	---	---	---	Moderate	Moderate	Low
He:							
Hastings-----	---	---	---	---	Moderate	Moderate	Low
Hf:							
Hastings-----	---	---	---	---	Moderate	Moderate	Low
Ortello-----	---	---	---	---	Moderate	Moderate	Low
Ho:							
Hastings-----	---	---	---	---	Moderate	Moderate	Low
Ortello-----	---	---	---	---	Moderate	Moderate	Low
Hp:							
Hastings-----	---	---	---	---	Moderate	Moderate	Low
Hobbs-----	---	---	---	---	Moderate	Low	Low
Hs:							
Hobbs-----	---	---	---	---	Moderate	Low	Low
Ht:							
Humbarger-----	---	---	---	---	Moderate	Low	Low
Hu:							
Humbarger-----	---	---	---	---	Moderate	Low	Low
Ke:							
Kenesaw-----	---	---	---	---	Moderate	Moderate	Low
Kn:							
Kenesaw-----	---	---	---	---	Moderate	Moderate	Low
Kp:							
Kipson-----	7-20	Bedrock (paralithic)	---	---	Moderate	Low	Low
La:							
Wells-----	---	---	---	---	Moderate	Low	Moderate
Lc:							
Wells-----	---	---	---	---	Moderate	Low	Moderate
Lh:							
Lancaster-----	20-40	Bedrock (paralithic)	---	---	Moderate	Low	Moderate
Hedville-----	4-20	Bedrock (lithic)	---	---	Moderate	Low	Moderate
LOO:							
Longford, eroded	---	---	---	---	Moderate	High	Low
Mr:							
Muir-----	---	---	---	---	Moderate	Low	Moderate
Mu:							
Muir-----	---	---	---	---	Moderate	Low	Moderate
Ro:							
Coly-----	---	---	---	---	Moderate	High	Low
Sa:							
Inavale-----	---	---	---	---	Low	Moderate	Low
SAN:							
Sand And Gravel Pits-----	---	---	---	---	---	---	---
Sd:							
Inavale-----	---	---	---	---	Low	Moderate	Low
Tu:							
Tully-----	---	---	---	---	Moderate	High	Low
Ty:							
Tully-----	---	---	---	---	Moderate	High	Low
W:							
Water (republican)---	---	---	---	---	---	---	---
Wa:							
Saltine-----	---	---	---	---	High	High	High

