

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				
131BS:							
Burchard-----	---	---	---	---	Moderate	Moderate	Low
Steinauer-----	---	---	---	---	Moderate	High	Low
149BF:							
Benfield-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	High	Low
Florence-----	40-60	Bedrock (lithic)	---	Indurated	Moderate	Moderate	Low
149CS:							
Clime-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	High	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
149PS:							
Paxico-----	---	---	---	---	High	High	Low
149WB:							
Wabash-----	---	---	---	---	Moderate	High	Moderate
201CR:							
Crete-----	---	---	---	---	Moderate	Moderate	Low
201CS:							
Crete-----	---	---	---	---	Moderate	Moderate	Low
201CT:							
Crete-----	---	---	---	---	Moderate	Moderate	Low
201CX:							
Crete, eroded---	---	---	---	---	Moderate	Moderate	Low
201EU:							
Eudora-----	---	---	---	---	High	Low	Low
201HO:							
Hobbs-----	---	---	---	---	Moderate	Low	Low
201KS:							
Kipson-----	7-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
201MC:							
Mayberry-----	---	---	---	---	High	High	Low
201MH:							
Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
600BF:							
Benfield-----	22-39	Bedrock (paralithic)	---	---	Moderate	High	Low
Florence-----	24-39	Bedrock (lithic)	---	Indurated	Moderate	Moderate	Low
600CS:							
Clime-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	High	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
600MA:							
Mayberry-----	---	---	---	---	High	High	Low
AED:							
Arents, Earthen Dam-----	---	---	---	---	---	---	---
Ea:							
Eudora-----	---	---	---	---	High	Low	Low
Ga:							
Geary-----	---	---	---	---	Low	Low	Low
Ka:							
Kennebec-----	---	---	---	---	High	Moderate	Low
Kb:							
Kennebec-----	---	---	---	---	High	Moderate	Low
Kc:							
Kipson-----	7-20	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
La:							
Ladysmith-----	---	---	---	---	Moderate	High	Low
Ma:							
Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
Mb:							
Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
Mc:							
Morrill, eroded---	---	---	---	---	Moderate	Moderate	Moderate
Me:							
Muir-----	---	---	---	---	Moderate	Low	Moderate
Na:							
Nodaway-----	---	---	---	---	High	Moderate	Low
Oa:							
Olmitz-----	---	---	---	---	Moderate	Moderate	Moderate
Ob:							
Ortello-----	---	---	---	---	Moderate	Moderate	Low
Pa:							
Pawnee-----	---	---	---	---	High	High	Low
Pb:							
Pawnee-----	---	---	---	---	High	High	Low
Pc:							
Pawnee, eroded---	---	---	---	---	High	High	Low
Pd:							
Pits-----	---	---	---	---	---	---	---
Sa:							
Shelby-----	---	---	---	---	Moderate	Moderate	Moderate

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				
Sb: Steinauer-----	---	---	---	---	Moderate	High	Low
Sc: Steinauer-----	---	---	---	---	Moderate	High	Low
Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
Ta: Tully-----	---	---	---	---	Moderate	High	Low
Tb: Tully, eroded---	---	---	---	---	Moderate	High	Low
W: Water-----	---	---	---	---	Low	---	---
Wa: Wabash-----	---	---	---	---	Moderate	High	Moderate
Wb: Wymore-----	---	---	---	---	High	High	Moderate
Wc: Wymore, eroded--	---	---	---	---	High	High	Moderate

