

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
045OE:		In	In				
Oska-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	Moderate	Moderate
045SV:							
Sibleyville----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
045SX:							
Rock Outcrop----	0-0	Bedrock (lithic)	---	---	---	---	---
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
045VM:							
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Martin-----	---	---	---	---	High	High	Low
045WS:							
Woodson-----	---	---	---	---	High	High	Moderate
085KB:							
Kennebec-----	---	---	---	---	High	Moderate	Low
085MC:							
Martin-----	---	---	---	---	High	High	Low
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
085ZA:							
Zook-----	---	---	---	---	High	High	Moderate
087EC:							
Eudora-----	---	---	---	---	High	Low	Low
Bismarckgrove---	---	---	---	---	High	Low	Low
087HC:							
Haig-----	---	---	---	---	High	High	Moderate
087KV:							
Konawa-----	---	---	---	---	---	Moderate	Moderate
087RS:							
Rossville-----	---	---	---	---	High	Moderate	Low
087SO:							
Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
Pawnee-----	---	---	---	---	High	High	Low
087WC:							
Wabash-----	---	---	---	---	Moderate	High	Moderate
139ED:							
Elmont-----	40-60	Bedrock (paralithic)	---	Weakly cemented	High	Moderate	Low
149KM:							
Kimo-----	---	---	---	---	High	High	Low
197IB:							
Irwin-----	---	---	---	---	Moderate	High	Low
197IV:							
Ivan-----	---	---	---	---	Moderate	Low	Low
197IX:							
Ivan-----	---	---	---	---	Moderate	Low	Low
197MR:							
Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
197MS:							
Morrill, very stony-----	---	---	---	---	Moderate	Moderate	Moderate
197SA:							
Sarpy-----	---	---	---	---	Low	Low	Low
197WF:							
Wamego-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	Moderate	Moderate
197WY:							
Wymore-----	---	---	---	---	High	High	Moderate
2797:							
Morrill, stony--	---	---	---	---	Moderate	Moderate	Moderate
AED:							
Arents, Earthen Dam-----	---	---	---	---	---	---	---
An:							
Kennebec-----	---	---	---	---	High	Moderate	Low
Bk:							
Martin-----	---	---	---	---	High	High	Low
Kennebec-----	---	---	---	---	High	Moderate	Low
BOA:							
Borrow Areas----	---	---	---	---	---	---	---
Br:							
Fluents-----	---	---	---	---	---	---	---
Dm:							
Dwight-----	---	---	---	---	Moderate	High	Moderate
Martin-----	---	---	---	---	High	High	Low
Ds:							
Dwight-----	---	---	---	---	Moderate	High	Moderate
Dw:							
Dwight-----	---	---	---	---	Moderate	High	Moderate
El:							
Elmont-----	40-60	Bedrock (paralithic)	---	Weakly cemented	High	Moderate	Low
Em:							
Elmont, eroded--	40-60	Bedrock (paralithic)	---	Weakly cemented	High	Moderate	Low

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
En: Elmont-----	40-60	In Bedrock (paralithic)	In ---	Weakly cemented	High	Moderate	Low
EO: Elmont, eroded--	40-60	Bedrock (paralithic)	---	Weakly cemented	High	Moderate	Low
EP: Elmont, eroded--	40-60	Bedrock (paralithic)	---	Weakly cemented	High	Moderate	Low
Dwight-----	---	---	---	---	Moderate	High	Moderate
ES: Eudora-----	---	---	---	---	High	Low	Low
ET: Eudora-----	---	---	---	---	High	Low	Low
EU: Eudora-----	---	---	---	---	High	Low	Low
EV: Eudora-----	---	---	---	---	High	Low	Low
Kimo-----	---	---	---	---	High	Low	Low
Kimo-----	---	---	---	---	High	High	Low
Ew: Eudora-----	---	---	---	---	High	Low	Low
Kimo-----	---	---	---	---	High	High	Low
Gm: Gymer-----	---	---	---	---	Moderate	Moderate	Moderate
Gy: Gymer-----	---	---	---	---	Moderate	Moderate	Moderate
INL: Aquolls-----	---	---	---	---	Moderate	---	---
Kb: Kennebec-----	---	---	---	---	High	Moderate	Low
Kc: Chase-----	---	---	---	---	High	High	Low
KF: Kennebec-----	---	---	---	---	High	Moderate	Low
Km: Kimo-----	---	---	---	---	High	High	Low
Ko: Kimo-----	---	---	---	---	High	High	Low
Ks: Kipson-----	7-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
Ku: Konawa-----	---	---	---	---	Moderate	Moderate	Moderate
Kw: Konawa-----	---	---	---	---	Moderate	Moderate	Moderate
La: Ladette-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
Lb: Ladette-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
Lc: Ladette, eroded--	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
Ld: Ladysmith-----	---	---	---	---	Moderate	High	Low
LIQ: Limestone Quarry	---	---	---	---	---	---	---
Lm: Ladysmith-----	---	---	---	---	Moderate	High	Low
Ls: Ladysmith, eroded-----	---	---	---	---	Moderate	High	Low
Ma: Made Land-----	---	---	---	---	---	---	---
Mb: Martin-----	---	---	---	---	High	High	Low
Mc: Martin-----	---	---	---	---	High	High	Low
Me: Martin, eroded--	---	---	---	---	High	High	Low
Mf: Martin-----	---	---	---	---	High	High	Low
Mh: Martin, eroded--	---	---	---	---	High	High	Low
Mk: Martin-----	---	---	---	---	High	High	Low
Mm: Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
Mn: Morrill, eroded--	---	---	---	---	Moderate	Moderate	Moderate
Mo: Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
MOO: Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
Mp: Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
Gravelly Land--	---	---	---	---	Moderate	High	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				
Mr:							
Muir-----	---	---	---	---	Moderate	Low	Moderate
MRR:							
Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
Pa:							
Pawnee-----	---	---	---	---	High	High	Low
Pc:							
Pawnee-----	---	---	---	---	High	High	Low
Pe:							
Pawnee, eroded--	---	---	---	---	High	High	Low
Pn:							
Pawnee-----	---	---	---	---	High	High	Low
RD:							
Reading-----	---	---	---	---	High	Moderate	Low
Re:							
Reading-----	---	---	---	---	High	Moderate	Low
Rv:							
River Wash-----	---	---	---	---	---	---	---
Sa:							
Sarpy-----	---	---	---	---	Low	Low	Low
SAP:							
Sand Pit-----	---	---	---	---	---	---	---
Se:							
Sarpy-----	---	---	---	---	Low	Low	Low
Eudora-----	---	---	---	---	High	Low	Low
Sg:							
Sharpsburg-----	---	---	---	---	High	Moderate	Moderate
Sh:							
Sharpsburg-----	---	---	---	---	High	Moderate	Moderate
Sk:							
Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
Sm:							
Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
Sn:							
Shelby, eroded--	---	---	---	---	Moderate	Moderate	Moderate
So:							
Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
Sp:							
Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
Sr:							
Morrill, eroded--	---	---	---	---	Moderate	Moderate	Moderate
Ss:							
Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
St:							
Sibleyville-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
Su:							
Sibleyville-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
Sv:							
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Sw:							
Stony Steep Land	---	---	---	---	---	---	---
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Vn:							
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
W:							
Water-----	---	---	---	---	Low	---	---
Wa:							
Wabash-----	---	---	---	---	Moderate	High	Moderate
Wb:							
Wabash-----	---	---	---	---	Moderate	High	Moderate
We:							
Welda-----	---	---	---	---	Moderate	Moderate	Moderate