

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				
017RA: Reading-----	---	---	---	---	High	Moderate	Low
017TU: Tully-----	---	---	---	---	Moderate	High	Low
035LE: Labette-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
035MA: Martin-----	---	---	---	---	High	High	Low
035MB: Martin-----	---	---	---	---	High	High	Low
035SD: Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
049CK: Clime-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	High	Low
049FM: Florence-----	40-60	Bedrock (lithic)	---	Indurated	Moderate	Moderate	Low
Martin-----	---	---	---	---	High	High	Low
073LS: Labette-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
073MB: Martin-----	---	---	---	---	High	High	Low
079DE: Detroit-----	---	---	---	---	Low	High	Low
079GC: Geary-----	---	---	---	---	Low	Low	Low
079GD: Geary-----	---	---	---	---	Low	Low	Low
079GE: Geary-----	---	---	---	---	Low	Low	Low
079HO: Hobbs-----	---	---	---	---	Low	Low	Low
115CH: Chase-----	---	---	---	---	High	High	Low
115CS: Clime-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	High	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
115LG: Labette-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
115VC: Verdigris-----	---	---	---	---	---	Low	Low
115WB: Wells-----	---	---	---	---	Moderate	Low	Moderate
173EA: Elandco-----	---	---	---	---	Low	Moderate	Low
173EC: Elandco-----	---	---	---	---	Low	Moderate	Low
173VC: Vanoss-----	---	---	---	---	Low	Moderate	Moderate
AED: Arents, Earthen Dam-----	---	---	---	---	---	---	---
Be: Benfield-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	High	Low
Labette-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
BOP: Borrow Pits-----	---	---	---	---	---	---	---
Br: Brewer-----	---	---	---	---	None	High	Moderate
Cs: Clime-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	High	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
Dt: Dwight-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Moderate
Dw: Dwight, eroded--	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Moderate
Fc: Florence-----	40-60	Bedrock (lithic)	---	Indurated	Moderate	Moderate	Low
FLL: Florence-----	40-60	Bedrock (lithic)	---	Indurated	Moderate	Moderate	Low
Labette-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
Go: Goessel-----	---	---	---	---	Moderate	High	Low
GRP: Gravel Pits-----	---	---	---	---	Low	---	---
Gs: Goessel-----	---	---	---	---	Moderate	High	Low
Ic: Irwin-----	---	---	---	---	Moderate	High	Low
Id: Irwin-----	---	---	---	---	Moderate	High	Low

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
Ie:		In	In				
Irwin-----	---	---	---	---	Moderate	High	Low
If:							
Irwin, eroded---	---	---	---	---	Moderate	High	Low
INT:							
Aquolls-----	---	---	---	---	Low	---	---
IVC:							
Ivan-----	---	---	---	---	Moderate	Low	Low
IVF:							
Ivan-----	---	---	---	---	Moderate	Low	Low
La:							
Labette-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
Lb:							
Labette, eroded-	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
Lc:							
Labette-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
Ld:							
Labette-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
Dwight-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Moderate
Le:							
Labette-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	High	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
Ls:							
Ladysmith-----	---	---	---	---	Moderate	High	Low
M-W:							
Miscellaneous	---	---	---	---	---	---	---
Water-----							
No:							
Norge-----	---	---	---	---	---	Moderate	Low
Nr:							
Norge-----	---	---	---	---	---	Moderate	Low
Ns:							
Norge-----	---	---	---	---	---	Moderate	Low
Nt:							
Norge, eroded---	---	---	---	---	---	Moderate	Low
Od:							
Oil-Waste Land--	---	---	---	---	---	---	---
On:							
Olpe-----	---	---	---	---	---	High	Moderate
Norge-----	---	---	---	---	---	Moderate	Low
Os:							
Osage-----	---	---	---	---	---	High	Moderate
QUA:							
Quarries-----	---	---	---	---	---	---	---
Ro:							
Rosehill-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	High	Low
So:							
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
Ts:							
Tully-----	---	---	---	---	Moderate	High	Low
Tt:							
Tully, eroded---	---	---	---	---	Moderate	High	Low
Tu:							
Tully-----	---	---	---	---	Moderate	High	Low
Va:							
Vanoss-----	---	---	---	---	---	Moderate	Moderate
Vb:							
Vanoss-----	---	---	---	---	---	Moderate	Moderate
Vd:							
Verdigris-----	---	---	---	---	---	Low	Low
Ve:							
Verdigris-----	---	---	---	---	---	Low	Low
W:							
Water-----	---	---	---	---	Low	---	---

