

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
001CB: Catoosa----- Rock Outcrop----	20-40 ----	Bedrock (lithic) ----	--- ---	Indurated ---	--- ---	Moderate ---	Moderate ---
001CC: Collinsville----	4-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
Bates-----	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
037MD: Kanima-----	---	---	---	---	---	Moderate	Low
107CM: Clareson----- Rock Outcrop----	20-40 ----	Bedrock (lithic) ----	---	Indurated ---	--- None	High ---	Moderate ---
107EF: Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Lebo-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
107SN: Summit-----	---	---	---	---	---	High	Low
107SO: Summit-----	---	---	---	---	---	High	Low
107VC: Verdigris-----	---	---	---	---	---	Low	Low
133EC: Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	High	Moderate
133SC: Shidler----- Catoosa-----	4-20 20-40	Bedrock (lithic) Bedrock (lithic)	---	Indurated Indurated	---	Moderate Moderate	Low Moderate
AED: Arents, Earthen Dam-----	---	---	---	---	---	---	---
Ba: Bates-----	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Bc: Bates-----	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Bd: Bates-----	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Bh: Bolivar-----	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Hector-----	10-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
Ca: Catoosa-----	20-40	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
Cs: Clareson-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Moderate
De: Dennis-----	---	---	---	---	---	High	Moderate
Df: Dennis-----	---	---	---	---	---	High	Moderate
Ec: Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	High	Moderate
Collinsville----	4-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
Ke: Kenoma-----	---	---	---	---	---	High	Moderate
La: Lanton-----	---	---	---	---	None	High	Moderate
Le: Leanna-----	---	---	---	---	---	High	Moderate
Ma: Mason-----	---	---	---	---	---	Moderate	Moderate
No: Nowata-----	20-40	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
Or: Orthents-----	---	---	---	---	None	Moderate	Low
Os: Osage-----	---	---	---	---	---	High	Moderate
Pa: Parsons-----	---	---	---	---	None	High	Moderate
Pt: Pits, Quarries--	---	---	---	---	---	---	---
Rc: Ringo-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	High	Low
Clareson-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Moderate
Ta: Tamaha-----	---	---	---	---	---	High	High
Ve: Verdigris-----	---	---	---	---	---	Low	Low
Vf: Verdigris, channeled-----	---	---	---	---	---	Low	Low

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
W:		In	In				
Water-----	---	---	---	---	Low	---	---
Za:							
Zaar-----	---	---	---	---	---	High	Moderate
ZAA:							
Zaar-----	---	---	---	---	---	High	Moderate
Zb:							
Zaar-----	---	---	---	---	---	High	Moderate

