

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 In	Thickness In	Hardness		Uncoated Steel	Concrete
003CD: Collinsville----	4-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
Bates-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
003EK: Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Clareson-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Moderate
003EO: Eram, eroded----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Gullied Land----	---	---	---	---	---	---	---
003EP: Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Talihina-----	10-20	Bedrock (paralithic)	---	Weakly cemented	---	High	Moderate
003OP: Olpe-----	---	---	---	---	---	High	Moderate
003SF: Summit-----	---	---	---	---	---	High	Low
003SH: Summit-----	---	---	---	---	---	High	Low
003WF: Woodson-----	---	---	---	---	Low	High	Moderate
011PA: Parsons-----	---	---	---	---	None	High	Moderate
011RC: Ringo-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	High	Low
Clareson-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Moderate
133BH: Bates-----	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Collinsville----	4-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
133LA: Lanton-----	---	---	---	---	---	High	Moderate
133SC: Shidler-----	4-20	Bedrock (lithic)	---	Indurated	---	Moderate	Low
Catoosa-----	20-40	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
207RD: Ringo-----	40-60	Bedrock (paralithic)	---	Weakly cemented	---	High	Low
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
Ba: Bates-----	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Bb: Bates-----	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Bc: Bates, eroded----	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
BOP: Borrow Pits----	---	---	---	---	---	---	---
Ca: Catoosa-----	20-40	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
Ch: Catoosa-----	20-40	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
Rock Outcrop----	---	---	---	---	---	---	---
Cc: Collinsville----	4-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
Bates-----	20-40	Bedrock (paralithic)	---	Moderately cemented	---	Low	Moderate
Da: Dennis-----	---	---	---	---	---	High	Moderate
Db: Dennis-----	---	---	---	---	---	High	Moderate
Dc: Dennis-----	---	---	---	---	---	High	Moderate
Kenoma-----	---	---	---	---	---	High	Moderate
Ea: Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Eb: Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Ec: Eram, eroded----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
GRP: Gravel Pits----	---	---	---	---	---	---	---
Ka: Kenoma-----	---	---	---	---	---	High	Moderate
La: Leanna, drained-	---	---	---	---	---	High	Moderate

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
Ma: Mason-----	---	---	---	---	---	Moderate	Moderate
MAL: Made Land-----	---	---	---	---	---	---	---
Na: Nowata-----	20-40	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
Oa: Olpe-----	---	---	---	---	---	High	Moderate
Ob: Osage-----	---	---	---	---	---	High	Moderate
Oc: Osage-----	---	---	---	---	---	High	Moderate
Qa: Quarry-----	---	---	---	---	---	---	---
Ta: Talihina-----	10-20	Bedrock (paralithic)	---	Weakly cemented	---	High	Moderate
Tb: Talihina-----	10-20	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Va: Verdigris-----	---	---	---	---	---	Low	Low
Vb: Verdigris-----	---	---	---	---	---	Low	Low
W: Water-----	---	---	---	---	Low	---	---
Wa: Woodson-----	---	---	---	---	---	High	Moderate
Za: Zaar-----	---	---	---	---	---	High	Moderate
ZAA: Zaar-----	---	---	---	---	---	High	Moderate
Zb: Zaar-----	---	---	---	---	---	High	Moderate

