

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				
059CM:							
Clareson-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Moderate
Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
059DC:							
Dennis-----	---	---	---	---	---	High	Moderate
059EC:							
Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Lula-----	40-60	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
059LN:							
Lebo-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
Rock Outcrop----	---	---	---	---	None	---	---
0910C:							
Oska-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	Moderate	Moderate
Martin-----	---	---	---	---	High	High	Low
1051:							
Arisburg-----	---	---	---	---	High	High	Moderate
1109:							
Bates-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
1112:							
Bates-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
1187:							
Bucyrus-----	60-80	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
1188:							
Bucyrus-----	60-80	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
1366:							
Clareson-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Moderate
Rock Outcrop----	0-0	Bedrock (lithic)	---	---	None	---	---
1516:							
Dennis-----	---	---	---	---	None	High	Moderate
1518:							
Dennis-----	---	---	---	---	None	High	Moderate
1639:							
Eram-----	20-40	Bedrock (paralithic)	---	Noncemented	None	High	Moderate
1641:							
Eram-----	20-40	Bedrock (paralithic)	---	Noncemented	None	High	Moderate
Shidler-----	4-20	Bedrock (lithic)	---	Indurated	None	Moderate	Low
1651:							
Eram-----	20-40	Bedrock (paralithic)	---	Noncemented	None	High	Moderate
Lebo-----	20-40	Bedrock (paralithic)	---	Noncemented	None	Moderate	Low
1953:							
Hepler-----	---	---	---	---	Low	High	Moderate
2326:							
Kenoma-----	---	---	---	---	---	High	Moderate
2541:							
Lebo-----	20-40	Bedrock (paralithic)	---	Noncemented	None	Moderate	Low
2700:							
Orthents-----	---	---	---	---	Low	High	Moderate
2741:							
Mason-----	---	---	---	---	None	Moderate	Moderate
3003:							
Okemah-----	---	---	---	---	None	High	Moderate
3026:							
Osage-----	---	---	---	---	None	High	Moderate
3028:							
Osage-----	---	---	---	---	None	High	Moderate
3494:							
Summit-----	---	---	---	---	None	High	Low
3495:							
Summit-----	---	---	---	---	None	High	Low
3815:							
Verdigris-----	---	---	---	---	---	Low	Low
3816:							
Verdigris-----	---	---	---	---	---	Low	Low
3929:							
Welda-----	---	---	---	---	Moderate	Moderate	Moderate
3951:							
Woodson-----	---	---	---	---	Low	High	Moderate
3971:							
Wagstaff-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Low
3972:							
Wagstaff-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Low
3973:							
Wagstaff-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Low
Summit-----	---	---	---	---	None	High	Low
3974:							
Wynona-----	---	---	---	---	---	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
Bb: Bates-----	20-40	In Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
Bc: Bates-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
Cb: Catoosa-----	20-40	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
Cm: Clareson-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Moderate
Rock Outcrop----	---	---	---	---	None	---	---
De: Dennis-----	---	---	---	---	---	High	Moderate
Df: Dennis-----	---	---	---	---	---	High	Moderate
Ec: Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Ed: Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Ef: Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Lebo-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
Gc: Grundy-----	---	---	---	---	High	High	Moderate
Hp: Hepler-----	---	---	---	---	---	High	Moderate
Ke: Kenoma-----	---	---	---	---	---	High	Moderate
La: Lanton-----	---	---	---	---	None	High	Moderate
Lb: Lebo-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
Lu: Lula-----	40-60	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
Mb: Mason-----	---	---	---	---	---	Moderate	Moderate
Nf: Newtonia-----	---	---	---	---	---	Moderate	Moderate
Ng: Newtonia-----	---	---	---	---	---	Moderate	Moderate
Nh: Newtonia-----	---	---	---	---	---	Moderate	Moderate
Oh: Okemah-----	---	---	---	---	---	High	Moderate
Ot: Osage-----	---	---	---	---	---	High	Moderate
Ov: Osage-----	---	---	---	---	---	High	Moderate
Pc: Parsons-----	---	---	---	---	---	High	Moderate
Po: Pits-----	---	---	---	---	---	---	---
Sn: Summit-----	---	---	---	---	---	High	Low
So: Summit-----	---	---	---	---	---	High	Low
Vb: Verdigris-----	---	---	---	---	---	Low	Low
Vc: Verdigris-----	---	---	---	---	---	Low	Low
We: Welda-----	---	---	---	---	Moderate	Moderate	Moderate
Wo: Woodson-----	---	---	---	---	Low	High	Moderate

