

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
007AE:							
Albion-----	---	---	---	---	None	Low	Low
Shellabarger----	---	---	---	---	None	Low	Moderate
007AS:							
Clairemont-----	---	---	---	---	None	High	Low
007FU:							
Farnum-----	---	---	---	---	None	Moderate	Low
007KA:							
Kanza-----	---	---	---	---	None	High	Moderate
095AD:							
Albion-----	---	---	---	---	Low	Low	Low
095DA:							
Dillwyn-----	---	---	---	---	Low	Low	Low
Plevna-----	---	---	---	---	Low	High	Low
095LA:							
Lincoln-----	---	---	---	---	Low	Low	Low
095NB:							
Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	Low	Low	Low
Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	Low	Moderate	Low
095SA:							
Shellabarger----	---	---	---	---	Low	Low	Moderate
095SC:							
Shellabarger----	---	---	---	---	None	Low	Moderate
095SD:							
Shellabarger----	---	---	---	---	None	Low	Moderate
095ZA:							
Zenda-----	---	---	---	---	Low	High	Low
191EA:							
Elandco-----	---	---	---	---	None	Moderate	Low
191EC:							
Elandco-----	---	---	---	---	None	Moderate	Low
191LS:							
Lincoln-----	---	---	---	---	None	Low	Low
191OP:							
Wellsford-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	High	Low
Elandco-----	---	---	---	---	None	Moderate	Low
191PD:							
Pond Creek-----	---	---	---	---	None	Moderate	Moderate
191RA:							
Renfrow-----	---	---	---	---	None	High	Low
Grainola-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	High	Low
191TA:							
Tabler-----	---	---	---	---	None	High	Low
191US:							
Ustifluvents----	---	---	---	---	None	---	---
1439:							
Crisfield-----	---	---	---	---	None	Low	Low
An:							
Kaski-----	---	---	---	---	None	Low	Low
At:							
Attica-----	---	---	---	---	None	Low	Low
Be:							
Bethany-----	---	---	---	---	None	High	Low
Bh:							
Bethany-----	---	---	---	---	None	High	Low
Bm:							
Lincoln-----	---	---	---	---	None	Low	Low
Bo:							
Gerlane-----	---	---	---	---	None	Low	Low
Bp:							
Woodward-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
Port-----	---	---	---	---	None	Moderate	Low
Br:							
Broken Alluvial Land-----	---	---	---	---	None	Low	Low
Ca:							
Carwile-----	---	---	---	---	None	High	Moderate
Cc:							
Case-----	---	---	---	---	None	Moderate	Low
Clark-----	---	---	---	---	None	Moderate	Low
Ce:							
Corbin-----	---	---	---	---	None	High	Low
Cf:							
Corbin-----	---	---	---	---	None	High	Low
Fa:							
Farnum-----	---	---	---	---	None	Moderate	Low
Fm:							
Farnum-----	---	---	---	---	None	Moderate	Low
Fn:							
Farnum-----	---	---	---	---	None	Moderate	Low
Fu:							
Farnum-----	---	---	---	---	None	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
Ge: Gerlane-----	---	In	In	---	None	Low	Low
Gn: Grant-----	40-60	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
Gr: Grant-----	40-60	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
GRP: Gravel Pits----	---	---	---	---	None	---	---
Gs: Grant-----	40-60	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
INT: Aguolls-----	---	---	---	---	Moderate	---	---
Ka: Kanza-----	---	---	---	---	None	High	Moderate
Kk: Kaski-----	---	---	---	---	None	Low	Low
Km: Kirkland-----	---	---	---	---	None	High	Low
Kr: Kirkland-----	---	---	---	---	None	High	Low
Renfrow-----	---	---	---	---	None	High	Low
Kw: Kirkland-----	---	---	---	---	None	High	Low
Renfrow-----	---	---	---	---	None	High	Low
Mc: Minco-----	---	---	---	---	None	Low	Low
Mn: Minco-----	---	---	---	---	None	Low	Low
Mo: Minco-----	---	---	---	---	None	Low	Low
Na: Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
Ne: Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
Nh: Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
Nn: Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
No: Norge-----	---	---	---	---	None	Moderate	Low
Pc: Pond Creek-----	---	---	---	---	None	Moderate	Moderate
Pd: Pond Creek-----	---	---	---	---	None	Moderate	Moderate
Pe: Pond Creek-----	---	---	---	---	None	Moderate	Moderate
Pg: Pond Creek-----	---	---	---	---	None	Moderate	Moderate
Ph: Dale-----	---	---	---	---	None	Moderate	Low
Pk: Port-----	---	---	---	---	None	High	Moderate
Pm: Pratt-----	---	---	---	---	None	Low	Moderate
Pn: Pratt-----	20-40	Bedrock (paralithic)	---	---	None	Low	Moderate
Po: Pratt-----	---	---	---	---	None	Low	Moderate
Carwile-----	---	---	---	---	None	High	Moderate
Pt: Pratt-----	---	---	---	---	None	Low	Moderate
Tivoli-----	---	---	---	---	None	Low	Low
Qa: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
Qn: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
Qu: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
Rc: Renfrow-----	---	---	---	---	None	High	Low
Vernon-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	High	Low
Re: Ruella-----	8-20	Bedrock (paralithic)	---	Moderately cemented	None	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
Rh: Ruella-----	8-20	In Bedrock (paralithic)	---	Moderately cemented	None	Low	Low
Ru: Ruella-----	8-20	Bedrock (paralithic)	---	Moderately cemented	None	Low	Low
Sa: Lesho-----	---	---	---	---	None	High	Low
Sb: Shellabarger----	---	---	---	---	None	Low	Moderate
Se: Shellabarger----	---	---	---	---	None	Low	Moderate
Sf: Shellabarger----	---	---	---	---	None	Low	Moderate
Sg: Shellabarger----	---	---	---	---	None	Low	Moderate
Sh: Zellmont-----	20-39	Bedrock (paralithic)	---	Moderately cemented	None	Low	Moderate
SHH: Shellabarger----	---	---	---	---	Low	Low	Moderate
Sk: Zellmont-----	20-39	Bedrock (paralithic)	---	Moderately cemented	None	Low	Moderate
Sm: Zellmont, eroded	20-39	Bedrock (paralithic)	---	Moderately cemented	None	Low	Moderate
Sn: Shellabarger----	---	---	---	---	None	Low	Moderate
So: Shellabarger----	---	---	---	---	None	Low	Moderate
Albion-----	---	---	---	---	None	Low	Low
Sp: Drummond-----	---	---	---	---	None	High	High
Ta: Tabler-----	---	---	---	---	None	High	Low
Th: Tivoli-----	---	---	---	---	None	Low	Low
Vr: Vernon-----	---	---	---	---	None	High	Low
Renfrow-----	---	---	---	---	None	High	Low
W: Water-----	---	---	---	---	None	---	Low
Wa: Kingman-----	---	---	---	---	None	High	Low
Wd: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
Woodward-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
We: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
Woodward-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
Ww: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
Woodward-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
Za: Canadian-----	---	---	---	---	None	Low	Low
Zf: Zenda-----	---	---	---	---	None	High	Low

