

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				
015LS:							
Ladysmith-----	---	---	---	---	Moderate	High	Low
079CR:							
Crete-----	---	---	---	---	Low	Moderate	Low
079CT:							
Crete-----	---	---	---	---	Moderate	Moderate	Low
079DE:							
Detroit-----	---	---	---	---	Low	High	Low
079DU:							
Drummond-----	---	---	---	---	Low	High	High
079FA:							
Farnum-----	---	---	---	---	Low	Moderate	Low
079FE:							
Farnum-----	---	---	---	---	Low	Moderate	Low
079GD:							
Geary-----	---	---	---	---	High	Low	Low
079KA:							
Kaski-----	---	---	---	---	Low	Low	Low
079LA:							
Ladysmith-----	---	---	---	---	Low	High	Low
079LB:							
Ladysmith-----	---	---	---	---	Low	High	Low
079SM:							
Smolan-----	---	---	---	---	Low	Moderate	Low
095AD:							
Albion-----	---	---	---	---	Low	Low	Low
095LA:							
Lincoln-----	---	---	---	---	Low	Low	Low
095WA:							
Waldeck-----	---	---	---	---	Low	Moderate	Low
191BA:							
Bethany-----	---	---	---	---	None	High	Low
191BB:							
Bethany-----	---	---	---	---	None	High	Low
191DR:							
Dale-----	---	---	---	---	None	Moderate	Low
Reinach-----	---	---	---	---	None	Low	Low
191EA:							
Elandco-----	---	---	---	---	Low	Moderate	Low
191LO:							
Lesho-----	---	---	---	---	None	High	Low
1011:							
Albion-----	---	---	---	---	Low	Low	Low
Shellabarger----	---	---	---	---	Low	Low	Moderate
1070:							
Avans-----	---	---	---	---	Low	Moderate	Moderate
1071:							
Avans-----	---	---	---	---	Low	Moderate	Moderate
1072:							
Avans-----	---	---	---	---	Low	Moderate	Moderate
2204:							
Jamash-----	12-15	Bedrock (paralithic)	---	Moderately cemented	None	High	Low
Piedmont-----	32-36	Bedrock (paralithic)	---	Moderately cemented	None	High	Low
2205:							
Jamash-----	12-15	Bedrock (paralithic)	---	Moderately cemented	None	High	Low
Piedmont-----	32-36	Bedrock (paralithic)	---	Moderately cemented	None	High	Low
2207:							
Jamash-----	12-15	Bedrock (paralithic)	---	Moderately cemented	None	High	Low
2381:							
Kanza-----	---	---	---	---	Low	High	Moderate
Ninnescah-----	---	---	---	---	Low	High	Low
2587:							
Imano-----	---	---	---	---	Low	High	Low
2948:							
Nalim-----	---	---	---	---	Low	Moderate	Low
3052:							
Ost-----	---	---	---	---	Low	Moderate	Low
Clark-----	---	---	---	---	Low	Moderate	Low
3170:							
Penalosa-----	---	---	---	---	Low	High	Low
3171:							
Penalosa-----	---	---	---	---	Low	High	Low
3535:							
Shellabarger----	---	---	---	---	Low	Low	Moderate
Nalim-----	---	---	---	---	Low	Moderate	Low
3639:							
Taver-----	---	---	---	---	Low	High	Low
3966:							
Willowbrook----	---	---	---	---	Low	Moderate	Moderate
4004:							
Yaggy-----	---	---	---	---	Low	High	Low

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
Aa:							
Albion-----	---	---	---	---	Low	Low	Low
Shellabarger----	---	---	---	---	Low	Low	Moderate
Ab:							
Albion-----	---	---	---	---	Low	Low	Low
Shellabarger----	---	---	---	---	Low	Low	Moderate
AED:							
Arents, Earthen Dam-----	---	---	---	---	---	---	---
Ba:							
Blanket-----	---	---	---	---	None	High	Low
Bb:							
Blanket-----	---	---	---	---	None	High	Low
BRR:							
Brewer-----	---	---	---	---	None	High	Moderate
Ca:							
Canadian-----	---	---	---	---	Low	Low	Low
Cb:							
Canadian-----	---	---	---	---	Low	Low	Low
Waldeck-----	---	---	---	---	Low	Moderate	Low
Cc:							
Carwile-----	---	---	---	---	Low	High	Moderate
Cd:							
Clark-----	---	---	---	---	Low	Moderate	Low
Ost-----	---	---	---	---	Low	Moderate	Low
Ce:							
Clime-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Low	High	Low
Ea:							
Elandco-----	---	---	---	---	Low	Moderate	Low
Eb:							
Elandco-----	---	---	---	---	Low	Moderate	Low
Ec:							
Elandco-----	---	---	---	---	Low	Moderate	Low
Fa:							
Farnum-----	---	---	---	---	Low	Moderate	Low
Fb:							
Farnum-----	---	---	---	---	Low	Moderate	Low
Fc:							
Farnum-----	---	---	---	---	Low	Moderate	Low
Ga:							
Goessel-----	---	---	---	---	Low	High	Low
Gb:							
Goessel-----	---	---	---	---	Low	High	Low
Ia:							
Irwin-----	---	---	---	---	Low	High	Low
Ib:							
Irwin-----	---	---	---	---	Low	High	Low
Ic:							
Irwin-----	---	---	---	---	Low	High	Low
INT:							
Aquolls-----	---	---	---	---	Low	---	---
KAA:							
Kaski-----	---	---	---	---	Low	Low	Low
La:							
Lesho-----	---	---	---	---	Low	High	Low
Lb:							
Lincoln-----	---	---	---	---	Low	Low	Low
M-W:							
Miscellaneous Water-----	---	---	---	---	---	---	---
Ma:							
Milan-----	---	---	---	---	Low	Moderate	Low
Mb:							
Milan-----	---	---	---	---	Low	Moderate	Low
Mc:							
Milan-----	---	---	---	---	Low	Moderate	Low
Na:							
Naron-----	---	---	---	---	Low	Low	Low
Oc:							
Wellsford-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	High	Low
Od:							
Wellsford-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	High	Low
Rock Outcrop----	---	---	---	---	None	---	---
Pa:							
Pits-----	---	---	---	---	---	---	---
Pb:							
Plevna-----	---	---	---	---	Low	High	Low
Pc:							
Pratt-----	---	---	---	---	Low	Low	Moderate
Pd:							
Pratt-----	---	---	---	---	Low	Low	Moderate
Tivoli-----	---	---	---	---	Low	Low	Low
Ra:							
Renfrow-----	---	---	---	---	None	High	Low

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
Rb: Renfrow-----	---	---	---	---	None	High	Low
Rc: Renfrow-----	---	---	---	---	None	High	Low
Wellsford-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	High	Low
Rd: Rosehill-----	20-40	Bedrock (paralithic)	---	---	Low	High	Low
Sa: Shellabarger----	---	---	---	---	Low	Low	Moderate
Sb: Shellabarger----	---	---	---	---	Low	Low	Moderate
Sc: Shellabarger----	---	---	---	---	Low	Low	Moderate
Ta: Tabler-----	---	---	---	---	Low	High	Low
Tb: Tabler-----	---	---	---	---	Low	High	Low
Drummond-----	---	---	---	---	Low	High	High
Ua: Urban Land-----	---	---	---	---	---	---	---
Canadian-----	---	---	---	---	Low	Low	Low
Ub: Urban Land-----	---	---	---	---	---	---	---
Elandco-----	---	---	---	---	None	Moderate	Low
Uc: Urban Land-----	---	---	---	---	---	---	---
Farnum-----	---	---	---	---	Low	Moderate	Low
Ud: Urban Land-----	---	---	---	---	---	---	---
Irwin-----	---	---	---	---	None	High	Low
Ue: Urban Land-----	---	---	---	---	---	---	---
Tabler-----	---	---	---	---	Low	High	Low
Va: Vanoss-----	---	---	---	---	Low	Moderate	Moderate
Vb: Vanoss-----	---	---	---	---	Low	Moderate	Moderate
Vc: Vanoss-----	---	---	---	---	Low	Moderate	Moderate
Vd: Vanoss-----	---	---	---	---	Low	Moderate	Moderate
Ve: Vernon-----	---	---	---	---	None	High	Low
Vf: Vernon-----	---	---	---	---	None	High	Low
W: Water-----	---	---	---	---	Low	---	---
Wa: Waldeck-----	---	---	---	---	Low	Moderate	Low
Wb: Waurika-----	---	---	---	---	Low	High	Moderate

