

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
007AE:		In	In				
Albion-----	---	---	---	---	None	Low	Low
Shellabarger----	---	---	---	---	None	Low	Moderate
007FA:							
Farnum-----	---	---	---	---	None	Moderate	Low
077KA:							
Kanza-----	---	---	---	---	None	High	Moderate
077KR:							
Kirkland-----	---	---	---	---	None	High	Low
Renfrow-----	---	---	---	---	None	High	Low
077NN:							
Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
077PC:							
Pond Creek-----	---	---	---	---	None	Moderate	Moderate
077RC:							
Renfrow-----	---	---	---	---	None	High	Low
Vernon-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	High	Low
077SB:							
Shellabarger----	---	---	---	---	None	Low	Moderate
077SE:							
Shellabarger----	---	---	---	---	None	Low	Moderate
077SF:							
Shellabarger----	---	---	---	---	None	Low	Moderate
077SG:							
Shellabarger----	---	---	---	---	None	Low	Moderate
077SH:							
Shellabarger----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
151AO:							
Albion-----	---	---	---	---	Low	Low	Low
151CN:							
Clark-----	---	---	---	---	Low	Moderate	Low
151CO:							
Clark-----	---	---	---	---	Low	Moderate	Low
Ost-----	---	---	---	---	Low	Moderate	Low
151KP:							
Kanza-----	---	---	---	---	Low	High	Moderate
Plevna-----	---	---	---	---	Low	High	Low
151ND:							
Naron-----	---	---	---	---	Low	Low	Low
151NF:							
Naron-----	---	---	---	---	Low	Low	Low
151OC:							
Ost-----	---	---	---	---	Low	Moderate	Low
151OS:							
Ost-----	---	---	---	---	Low	Moderate	Low
151PN:							
Pratt-----	---	---	---	---	Low	Low	Moderate
151SE:							
Shellabarger----	---	---	---	---	Low	Low	Moderate
151ZS:							
Drummond-----	---	---	---	---	Low	High	High
Zenda-----	---	---	---	---	Low	High	Low
173MA:							
Milan-----	---	---	---	---	Low	Moderate	Low
173PB:							
Plevna-----	---	---	---	---	Low	High	Low
173RA:							
Renfrow-----	---	---	---	---	None	High	Low
173RC:							
Renfrow-----	---	---	---	---	None	High	Low
Wellsford-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	High	Low
173TA:							
Tabler-----	---	---	---	---	Low	High	Low
191RA:							
Renfrow-----	---	---	---	---	None	High	Low
Grainola-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	High	Low
990:							
Abbyville-----	---	---	---	---	Low	High	Low
991:							
Abbyville, rarely flooded-	---	---	---	---	Low	High	Low
Kisiwa, occasionally flooded-----	---	---	---	---	Low	High	Low
1004:							
Albion-----	---	---	---	---	Low	Low	Low
1005:							
Albion-----	---	---	---	---	Low	Low	Low
1006:							
Albion-----	---	---	---	---	Low	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
1011: Albion----- Shellabarger----	---	---	---	---	Low Low	Low Low	Low Moderate
1017: Shellabarger, Eroded----- Albion-----	---	---	---	---	Low Low	Low Low	Moderate Low
1061: Arents, Earthen Dam-----	---	---	---	---	---	---	---
1359: Clark----- Ost-----	---	---	---	---	Low Low	Moderate Moderate	Low Low
1555: Dillhut----- Plev-----	---	---	---	---	Low Low	Low High	Moderate Moderate
1728: Farnum----- Funmar-----	---	---	---	---	Low Low	Moderate Moderate	Low Low
2205: Jamash-----	12-15	Bedrock (paralithic)	---	Moderately cemented	None	High	Low
Piedmont-----	32-36	Bedrock (paralithic)	---	Moderately cemented	None	High	Low
2381: Kanza----- Ninnescah-----	---	---	---	---	Low Low	High High	Moderate Low
2390: Kaskan-----	---	---	---	---	Low	Moderate	Low
2556: Langdon-----	---	---	---	---	Low	Low	Low
2812: Mahone-----	---	---	---	---	Low	Low	Low
2948: Nalim-----	---	---	---	---	Low	Moderate	Low
3051: Ost-----	---	---	---	---	Low	Moderate	Low
3052: Ost----- Clark-----	---	---	---	---	Low Low	Moderate Moderate	Low Low
3170: Penalosa-----	---	---	---	---	Low	High	Low
3171: Penalosa-----	---	---	---	---	Low	High	Low
3180: Pratt-----	---	---	---	---	Low	Low	Moderate
3181: Pratt----- Turon-----	---	---	---	---	Low Low	Low Low	Moderate Moderate
3445: Shellabarger, Moderately Eroded-----	---	---	---	---	Low	Low	Moderate
3510: Saltcreek----- Funmar----- Farnum-----	---	---	---	---	Low Low Low	Moderate Moderate Moderate	Low Low Low
3530: Shellabarger, Eroded----- Albion-----	---	---	---	---	Low Low	Low Low	Moderate Low
3531: Shellabarger, Moderately Eroded----- Nalim-----	---	---	---	---	Low Low	Low Moderate	Moderate Low
3532: Shellabarger----	---	---	---	---	Low	Low	Moderate
3533: Shellabarger----	---	---	---	---	Low	Low	Moderate
3534: Shellabarger----	---	---	---	---	Low	Low	Moderate
3535: Shellabarger----	---	---	---	---	Low Low	Low Moderate	Moderate Low
3926: Water-----	---	---	---	---	Low	---	---
3966: Willowbrook-----	---	---	---	---	Low	Moderate	Moderate
4005: Yaggy----- Saxman-----	---	---	---	---	Low Low	High Low	Low High
4110: Zellmont-----	20-39	Bedrock (paralithic)	---	Moderately cemented	Low	Low	Moderate
Poxmash-----	48-53	Bedrock (paralithic)	---	---	Low	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
		In	In				
Aa: Albion-----	---	---	---	---	None	Low	Low
Ab: Albion-----	---	---	---	---	None	Low	Low
Ac: Albion-----	---	---	---	---	None	Low	Low
Ad: Albion-----	---	---	---	---	None	Low	Low
AED: Arents, Earthen Dam-----	---	---	---	---	None	---	Low
Ba: Blanket-----	---	---	---	---	None	High	Low
Bb: Blanket-----	---	---	---	---	None	High	Low
Bc: Blanket-----	---	---	---	---	None	High	Low
Ca: Canadian-----	---	---	---	---	None	Low	Low
Cb: Carwile-----	---	---	---	---	Low	High	Moderate
Cc: Case-----	---	---	---	---	Low	Moderate	Low
Clark-----	---	---	---	---	Low	Moderate	Low
Cd: Case-----	---	---	---	---	Low	Moderate	Low
Clark-----	---	---	---	---	Low	Moderate	Low
Ce: Clark-----	---	---	---	---	Low	Moderate	Low
Cf: Clark-----	---	---	---	---	Low	Moderate	Low
Da: Dillwyn-----	---	---	---	---	Low	Low	Low
Plevna-----	---	---	---	---	Low	High	Low
Fa: Farnum-----	---	---	---	---	Low	Moderate	Low
Fb: Farnum-----	---	---	---	---	Low	Moderate	Low
Fc: Farnum-----	---	---	---	---	Low	Moderate	Low
Fd: Farnum-----	---	---	---	---	Low	Moderate	Low
Fe: Farnum-----	---	---	---	---	Low	Moderate	Low
Ff: Farnum-----	---	---	---	---	Low	Moderate	Low
Natrustolls-----	---	---	---	---	Low	Low	---
Ka: Kaski-----	---	---	---	---	Low	Low	Low
Kb: Kingman-----	---	---	---	---	Low	High	Low
La: Lincoln-----	---	---	---	---	Low	Low	Low
Ma: McLain-----	---	---	---	---	Low	High	Low
Na: Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	Low	Low	Low
Nb: Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	Low	Low	Low
Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	Low	Moderate	Low
Oa: Owens-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	Low	High	Low
Pa: Pond Creek-----	---	---	---	---	Low	Moderate	Moderate
Pb: Pratt-----	---	---	---	---	Low	Low	Moderate
Pc: Pratt-----	---	---	---	---	Low	Low	Moderate
Carwile-----	---	---	---	---	Low	High	Moderate
Pd: Pratt-----	---	---	---	---	Low	Low	Moderate
Tivoli-----	---	---	---	---	Low	Low	Low
Qa: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	Low	Moderate	Low
Qb: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	Low	Moderate	Low
Ra: Renfrow-----	---	---	---	---	Low	High	Low
Rb: Ruella-----	9-20	Bedrock (paralithic)	---	Moderately cemented	Low	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
Rc:		In	In				
Ruella-----	9-20	Bedrock (paralithic)	---	Moderately cemented	Low	Low	Low
Rock Outcrop----	---	---	---	---	None	---	---
Sa:							
Shellabarger----	---	---	---	---	Low	Low	Moderate
Sb:							
Shellabarger----	---	---	---	---	None	Low	Moderate
Sc:							
Shellabarger----	---	---	---	---	None	Low	Moderate
Sd:							
Shellabarger----	---	---	---	---	None	Low	Moderate
Ta:							
Tivoli-----	---	---	---	---	Low	Low	Low
W:							
Water-----	---	---	---	---	None	---	Low
Wa:							
Waldeck-----	---	---	---	---	Low	Moderate	Low
Za:							
Zenda-----	---	---	---	---	Low	High	Low

