

Engineering Interpretations

Soil Features

This table gives estimates of several important soil features which are used in land use planning that involves engineering considerations. Soil features which are covered include bedrock depth and hardness, cemented pan depth and hardness, subsidence, potential frost action, and risk of corrosion for uncoated steel or for concrete.

DEPTH TO BEDROCK - This value is given if bedrock is with a depth of 60 inches. The depth is based on many soil borings and observations made during soil mapping. The rock is specified as either soft or hard. If the rock is soft, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

CEMENTED PAN - Cemented pan is a nearly continuous layer of indurated or strongly cemented material having a hard, brittle consistency because the particles are held together by cementing substances such as, calcium carbonate, or oxides of silicon, iron, or aluminum. These layers are identified when they occur within a depth of 60 inches. Pans are classified as "thin" or "thick." "Thin" cemented pans are thin enough so that excavations can be made with trenching machines, backhoes, or small rippers and other equipment common to construction of pipelines, sewer lines, cemeteries, and the like. "Thick" cemented pans are sufficiently thick or massive to require blasting or special equipment beyond which is considered normal in excavating for this type of construction.

SUBSIDENCE - Subsidence potential is the maximum possible loss of surface elevation from the drainage of wet soils having organic layers or semi-fluid mineral layers. Estimates of the depth of subsidence (in inches) that takes place soon after drainage (initial subsidence) and after oxidation (total subsidence) are given for soils that are likely to subside.

POTENTIAL FROST ACTION - This is the likelihood of upward or lateral movement of soil by the formation of segregated ice lenses (frost heave) and the subsequent loss of soil strength upon thawing. The following classes are used in regions where frost action is a potential problem: (1) Low -- soils are rarely susceptible to the formation of ice lenses, (2) Moderate -- soils are susceptible to the formation of ice lenses, resulting in frost heave and subsequent loss of soil strength, and (3) High -- soils are highly susceptible to the formation of ice lenses, resulting in frost heave and subsequent loss of soil strength.

RISK OF CORROSION - Various metals and other materials corrode when on or in the soil, and some metals and materials corrode more rapidly when in contact with specific soils than when in contact with others. Corrosivity ratings are given for two of the common structural materials, uncoated steel and concrete. The risk of corrosion classes are low, moderate, and high.

This subsection includes:

- **(a) Soil Features**

Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion		
	Kind	Depth	Hardness		Uncoated steel	Concrete	
		to top					Thickness
		In	In				
66014: Haymond-----	---	---	---	---	High	Low	Low
70028: Moko-----	Bedrock (lithic)	4-20	---	Indurated	Moderate	Low	Low
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	---
73013: Lowassie-----	---	---	---	---	High	High	High
73032: Gatewood-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	High	Moderate
73039: Glensted-----	Abrupt textural change	6-10	16-34	Noncemented	High	High	Moderate
73053: Lily-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	Moderate	High
Bender-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	High	High
73066: Bender-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	High	High
73067: Bender-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	High	High
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	---
73080: Alred-----	Strongly contrasting textural stratification	15-39	41-65	Noncemented	Moderate	Moderate	Moderate
Bardley-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	Moderate	Moderate
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	---
73087: Celt-----	Fragipan	20-36	8-24	Noncemented	Moderate	High	High
73089: Rueter-----	---	---	---	---	Moderate	Low	High
73094: Gatewood-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	High	Moderate
73098: Plato-----	Fragipan	20-36	8-28	Noncemented	Moderate	High	High
73135, 73136: Union-----	Fragipan	18-36	9-25	Noncemented	Moderate	High	High
73159: Yelton-----	Fragipan	18-27	16-40	Noncemented	Moderate	Moderate	High

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion		
	Kind	Depth	Thickness		Hardness	Uncoated steel	Concrete
		to top In					
73160: Hobson-----	Fragipan	18-27	6-24	Noncemented	Moderate	Moderate	High
73161, 73162: Alred-----	Strongly contrasting textural stratification	15-39	41-65	Noncemented	Moderate	Moderate	Moderate
Rueter-----	---	---	---	---	Moderate	Low	High
73163: Bardley-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	Moderate	Moderate
Alred-----	Strongly contrasting textural stratification	15-39	41-65	Noncemented	Moderate	Moderate	Moderate
Gasconade-----	Bedrock (lithic)	4-20	---	Indurated	Moderate	High	Low
73164: Bender-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	High	High
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	---
73165: Knobby-----	Bedrock (lithic)	4-20	---	Indurated	Low	Low	Low
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	---
Bardley-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	Moderate	Moderate
73166: Viburnum-----	---	---	---	---	Moderate	High	Moderate
Tonti-----	Fragipan	18-25	10-36	Noncemented	Moderate	High	High
73168: Swiss-----	Dense material	40-80	0-40	Noncemented	Moderate	High	High
73169, 73170: Beemont-----	Bedrock (lithic)	40-60	---	Indurated	Moderate	High	High
Gatewood-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	High	Moderate
73171: Plato, eroded-----	Fragipan	20-36	8-30	Noncemented	Moderate	High	High
73172: Rosati-----	Fragipan	20-35	7-22	Noncemented	Moderate	High	High
73173, 73174: Lily-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	Moderate	High
Yelton-----	Fragipan	18-27	16-40	Noncemented	Moderate	Moderate	High
73175: Poynor-----	Strongly contrasting textural stratification	15-39	41-65	Noncemented	Moderate	Moderate	High

Soil Features--Continued

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
73175: Bendavis-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	Moderate	High
73176: Bendavis-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	Moderate	High
Poynor-----	Strongly contrasting textural stratification	15-39	41-65	Noncemented	Moderate	Moderate	High
73178: Bendavis-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	Moderate	High
73179: Viraton-----	Fragipan	18-33	10-30	Noncemented	Moderate	Moderate	High
Wilderness-----	Fragipan	15-29	6-28	Noncemented	Moderate	Moderate	High
73180: Gatewood-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	High	Moderate
Gasconade-----	Bedrock (lithic)	4-20	---	Indurated	Moderate	High	Low
73181: Useful-----	Bedrock (lithic)	40-60	---	Indurated	Moderate	Moderate	Moderate
Gatewood-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	High	Moderate
73182: Lebanon-----	Fragipan	18-26	6-25	Noncemented	Moderate	Moderate	High
73183: Scholten-----	Fragipan	18-27	6-18	Noncemented	Moderate	Moderate	High
Tonti-----	Fragipan	18-25	10-36	Noncemented	Moderate	High	High
73184: Knobby-----	Bedrock (lithic)	4-20	---	Indurated	Low	Low	Low
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	---
73186: Bardley-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	Moderate	Moderate
Alred-----	Strongly contrasting textural stratification	15-39	41-65	Noncemented	Moderate	Moderate	Moderate
Gasconade-----	Bedrock (lithic)	4-20	---	Indurated	Moderate	High	Low
73187: Bender-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	High	High
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	---
73188: Bendavis-----	Bedrock (lithic)	20-40	---	Indurated	Moderate	Moderate	High

