

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 within 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**

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(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				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
10: ACKMORE-----	---	---	---	---	0	0	High	High	Low
11B: ARISBURG-----	---	---	---	---	0	0	High	High	Moderate
11B2: ARISBURG-----	---	---	---	---	0	0	High	High	Moderate
11C2: ARISBURG-----	---	---	---	---	0	0	High	High	Moderate
13B: JEMERSON-----	---	---	---	---	0	0	High	Moderate	Moderate
15D2: NEWCOMER-----	Bedrock (paralithic)	28-60	---	---	0	0	Moderate	Low	Moderate
15F: NEWCOMER-----	Bedrock (paralithic)	24-60	---	---	0	0	Moderate	Low	Moderate
17C2: BLUELICK-----	---	---	---	---	0	0	Moderate	High	High
17D2: BLUELICK-----	---	---	---	---	0	0	Moderate	High	High
17E2: BLUELICK-----	---	---	---	---	0	0	Moderate	High	High
20: BREMER-----	---	---	---	---	0	0	High	Moderate	Moderate
25A: CHAUNCEY-----	---	---	---	---	0	0	High	High	High

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	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
27B: CLAFORK-----	---	---	---	---	0	0	Moderate	High	Moderate
27B2: CLAFORK-----	---	---	---	---	0	0	Moderate	High	Moderate
27C2: CLAFORK-----	---	---	---	---	0	0	Moderate	High	Moderate
28A: DAMERON-----	---	---	---	---	0	0	Moderate	Low	Low
29: DARWIN-----	---	---	---	---	0	0	Moderate	High	Low
30: DOCKERY-----	---	---	---	---	0	0	High	Moderate	Low
32A: CRESTMEADE-----	---	---	---	---	0	0	High	High	Moderate
32B2: CRESTMEADE-----	---	---	---	---	0	0	High	High	Moderate
33: EUDORA-----	---	---	---	---	0	0	High	Low	Low
34D: ELDON-----	---	---	---	---	0	0	Moderate	Moderate	Moderate
35A: FREEBURG-----	---	---	---	---	0	0	High	High	High
35B: FREEBURG-----	---	---	---	---	0	0	High	High	High

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Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
38B2: GLENSTED-----	---	---	---	---	0	0	High	High	Moderate
40C: GOSS-----	---	---	---	---	0	0	Moderate	Moderate	Moderate
40D: GOSS-----	---	---	---	---	0	0	Moderate	Moderate	Moderate
40F: GOSS-----	---	---	---	---	0	0	Moderate	Low	Moderate
41: GRABLE-----	---	---	---	---	0	0	Low	Low	Low
46: HAYNIE-----	---	---	---	---	0	0	High	Low	Low
47: HAYNIE-----	---	---	---	---	0	0	High	Low	Low
WALDRON-----	---	---	---	---	0	0	High	High	Low
48B: HIGGINSVILLE-----	---	---	---	---	0	0	High	Moderate	Moderate
50C: BUNCETON-----	---	---	---	---	0	0	Moderate	Moderate	Moderate
50C2: BUNCETON-----	---	---	---	---	0	0	Moderate	Moderate	Moderate
50D2: BUNCETON-----	---	---	---	---	0	0	Moderate	Moderate	Moderate
51C2: KNOX-----	---	---	---	---	0	0	High	Low	Low

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Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
52C2: LADOGA-----	---	---	---	---	0	0	Moderate	Moderate	Moderate
53: BUCKNEY-----	---	---	---	---	0	0	Low	Low	Low
54A: LESLIE-----	---	---	---	---	0	0	High	High	Moderate
54B: LESLIE-----	---	---	---	---	0	0	High	High	Moderate
54B2: LESLIE-----	---	---	---	---	0	0	High	High	Moderate
56: LETA-----	---	---	---	---	0	0	High	High	Low
60F: LINDLEY-----	---	---	---	---	0	0	Moderate	Moderate	Moderate
64B: MCGIRK-----	---	---	---	---	0	0	High	High	High
66C: MENFRO-----	---	---	---	---	0	0	High	Low	Moderate
66C2: MENFRO-----	---	---	---	---	0	0	High	Low	Moderate
66D2: MENFRO-----	---	---	---	---	0	0	High	Low	Moderate
66F: MENFRO-----	---	---	---	---	0	0	High	Low	Moderate

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Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
67C2: MENFRO-----	---	---	---	---	0	0	High	Low	Moderate
70C: MOKO-----	Bedrock (lithic)	10-12	---	---	0	0	None	Low	Low
ROCK OUTCROP-----	---	---	---	---	---	---	---	---	---
70F: MOKO-----	Bedrock (lithic)	10-12	---	---	0	0	None	Low	Low
ROCK OUTCROP-----	---	---	---	---	---	---	---	---	---
72: MONITEAU-----	---	---	---	---	0	0	High	High	High
75: SHANNONDALE-----	---	---	---	---	0	0	High	Low	Moderate
76: MOTARK-----	---	---	---	---	0	0	High	Low	Low
80B: PERSHING-----	---	---	---	---	0	0	High	High	Moderate
80B2: PERSHING-----	---	---	---	---	0	0	High	High	Moderate
80C2: PERSHING-----	---	---	---	---	0	0	High	High	Moderate
82: SARPY-----	---	---	---	---	0	0	Low	Low	Low
86: SPEED-----	---	---	---	---	0	0	High	High	Moderate

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	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
87A: SPEED-----	---	---	---	---	0	0	High	High	Moderate
88: STURKIE-----	---	---	---	---	0	0	None	Low	Low
90B: WAKENDA-----	---	---	---	---	0	0	High	Low	Moderate
90C2: WAKENDA-----	---	---	---	---	0	0	High	Low	Moderate
92: WALDRON-----	---	---	---	---	0	0	High	High	Low
93B: COTTON-----	---	---	---	---	0	0	Moderate	High	Moderate
93B2: COTTON-----	---	---	---	---	0	0	Moderate	High	Moderate
93C2: COTTON-----	---	---	---	---	0	0	Moderate	High	Moderate
93D2: COTTON-----	---	---	---	---	0	0	Moderate	High	Moderate
94B: WELLER-----	---	---	---	---	0	0	High	High	High
94B2: WELLER-----	---	---	---	---	0	0	High	High	High
94C2: WELLER-----	---	---	---	---	0	0	High	High	High

