

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			
66014: Haymond-----	---	---	---	---	0	0	Moderate	Low	Moderate
70028: Moko-----	Bedrock (lithic)	4-20	---	Indurated	0	0	Moderate	Low	Low
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	0	0	None	---	---
73012: Gravois-----	Dense material	18-40	10-35	Noncemented	0	0	Moderate	Moderate	High
73032: Gatewood-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	High	Moderate
73035: Gravois-----	Dense material	18-40	10-35	Noncemented	0	0	Moderate	Moderate	High
73039: Glensted-----	Abrupt textural change	6-19	---	Noncemented	0	0	Moderate	High	High
73053: Lily-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High
Bender-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High
73066: Bender-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High
73067: Bender-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	---	---	---
73089: Rueter-----	---	---	---	---	0	0	Moderate	High	High

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	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
73094: Gatewood-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	High	Moderate
73098: Plato-----	Fragipan	20-36	8-28	Noncemented	0	0	Moderate	High	High
73135: Union-----	Fragipan	18-36	9-25	Noncemented	0	0	Moderate	High	High
73136: Union-----	Fragipan	18-36	9-25	Noncemented	0	0	Moderate	High	High
73159: Yelton-----	Fragipan	18-27	16-40	Noncemented	0	0	Moderate	Moderate	High
73162: Alred-----	Strongly contrasting textural stratification	15-39	41-65	Noncemented	0	0	Moderate	Moderate	High
Rueter-----	---	---	---	---	0	0	Moderate	Moderate	High
73164: Bender-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	---	---	---
73166: Viburnum-----	---	---	---	---	0	0	Moderate	High	High
Tonti-----	Fragipan	18-25	10-36	Noncemented	0	0	Moderate	High	High
73168: Swiss-----	Dense material	40-80	0-40	Noncemented	0	0	Moderate	High	High

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	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
73169: Beemont-----	Bedrock (lithic)	40-60	---	Indurated	0	0	Moderate	High	High
Gatewood-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	High	Moderate
73170: Beemont-----	Bedrock (lithic)	40-60	---	Indurated	0	0	Moderate	High	High
Gatewood-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	High	Moderate
73171: Plato, eroded-----	Fragipan	20-36	8-30	Noncemented	0	0	Moderate	High	High
73172: Rosati-----	Fragipan	20-35	7-22	Noncemented	0	0	Moderate	High	High
73173: Lily-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High
Yelton-----	Fragipan	18-27	16-40	Noncemented	0	0	Moderate	Moderate	High
73174: Lily-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High
Yelton-----	Fragipan	18-27	16-40	Noncemented	0	0	Moderate	Moderate	High
73175: Poynor-----	Strongly contrasting textural stratification	15-39	41-65	Noncemented	0	0	Moderate	Moderate	High
Bendavis-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High

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	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
73176: Bendavis-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High
Poynor-----	Strongly contrasting textural stratification	15-39	41-65	Noncemented	0	0	Moderate	Moderate	High
73181: Useful-----	Bedrock (lithic)	40-60	---	Indurated	0	0	Moderate	Moderate	Moderate
Gatewood-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	High	Moderate
73200: Sonsac-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High
73210: Goss-----	---	---	---	---	0	0	Moderate	Moderate	High
73214: Moko-----	Bedrock (lithic)	4-20	---	Indurated	0	0	Moderate	Low	Low
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	0	0	None	---	---
73215: Crider-----	---	---	---	---	0	0	Moderate	Moderate	Moderate
73271: Moko-----	Bedrock (lithic)	4-20	---	Indurated	0	0	Moderate	Low	Low
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	0	0	None	---	---
73272: Hildebrecht-----	Fragipan	24-36	10-30	Noncemented	0	0	Moderate	Moderate	High

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	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
73273: Coulstone-----	Bedrock (lithic)	61-80	---	Indurated	0	0	Moderate	Moderate	High
Bender-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High
73274: Scholten-----	Fragipan	18-27	6-36	Noncemented	0	0	Moderate	Moderate	High
73275: Gravois-----	Dense material	18-40	10-35	Noncemented	0	0	Moderate	Moderate	High
Goss-----	---	---	---	---	0	0	Moderate	Moderate	High
73276: Rueter-----	---	---	---	---	0	0	Moderate	Moderate	High
Hildebrecht-----	Fragipan	24-36	10-30	Noncemented	0	0	Moderate	Moderate	High
73277: Goss-----	---	---	---	---	0	0	Moderate	Moderate	High
73278: Rueter-----	---	---	---	---	0	0	Moderate	Moderate	High
73279: Sonsac-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High
Moko-----	Bedrock (lithic)	4-20	---	Indurated	0	0	Moderate	Low	Low
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	0	0	None	---	---
73280: Alred-----	Strongly contrasting textural stratification	15-39	41-65	Noncemented	0	0	Moderate	Moderate	High

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	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
73281: Hobson-----	Fragipan	18-27	10-30	Noncemented	0	0	Moderate	Moderate	High
	Bedrock (lithic)	61-80	---	Indurated					
73282: Alred-----	Strongly contrasting textural stratification	15-39	41-65	Noncemented	0	0	Moderate	Moderate	High
Sonsac-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High
73283: Courtois, eroded-----	---	---	---	---	0	0	Moderate	Moderate	High
73284: Courtois-----	---	---	---	---	0	0	Moderate	Moderate	High
Goss-----	---	---	---	---	0	0	Moderate	Moderate	High
73285: Useful-----	Bedrock (lithic)	40-59	---	Indurated	0	0	Moderate	Moderate	Moderate
Courtois-----	---	---	---	---	0	0	Moderate	Moderate	High
73286: Useful-----	Bedrock (lithic)	40-59	---	Indurated	0	0	Moderate	Moderate	Moderate
Courtois-----	---	---	---	---	0	0	Moderate	Moderate	High
73287: Useful-----	Bedrock (lithic)	40-59	---	Indurated	0	0	Moderate	Moderate	Moderate
Sonsac-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	High

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	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
73288: Caneyville-----	Bedrock (lithic)	20-40	---	Indurated	0	0	Moderate	Moderate	Moderate
Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	0	0	None	---	---
73289: Fourche-----	---	---	---	---	0	0	Moderate	High	High
74634: Hartville-----	---	---	---	---	0	0	Moderate	Moderate	High
74650: Higdon-----	---	---	---	---	0	0	Moderate	High	Moderate
74652: Lecoma-----	---	---	---	---	0	0	Moderate	Moderate	High
74653: Racoon-----	---	---	---	---	0	0	Moderate	High	High
Freeburg-----	---	---	---	---	0	0	Moderate	High	High
74656: Deible-----	Abrupt textural change	11-22	---	Noncemented	0	0	Moderate	High	High
74661: Waben-----	---	---	---	---	0	0	Low	Low	Moderate
74662: Higdon-----	---	---	---	---	0	0	Moderate	High	Moderate
75376: Cedargap-----	---	---	---	---	0	0	Moderate	Low	Moderate

