

BUILDING SITE DEVELOPMENT
Osage County, Kansas

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The following tables show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

BUILDING SITE DEVELOPMENT--Continued
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Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
045KC: Kennebec-----	88	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.82 0.50	Very limited Flooding Shrink-swell	1.00 0.50
045MO: Martin-----	40	Very limited Shrink-swell Depth to saturated zone	1.00 0.44	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone Slope	1.00 0.44 0.12
Oska-----	30	Very limited Shrink-swell Depth to hard bedrock	1.00 0.01	Very limited Shrink-swell Depth to hard bedrock	1.00 1.00	Very limited Shrink-swell Slope Depth to hard bedrock	1.00 0.12 0.01
045OE: Oska-----	88	Very limited Shrink-swell Depth to hard bedrock	1.00 0.01	Very limited Shrink-swell Depth to hard bedrock	1.00 1.00	Very limited Shrink-swell Slope Depth to hard bedrock	1.00 0.12 0.01
045SW: Sogn-----	55	Very limited Depth to hard bedrock Shrink-swell Slope	1.00 0.50 0.16	Very limited Depth to hard bedrock Shrink-swell Slope	1.00 0.50 0.16	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 1.00 0.50
Vinland-----	30	Somewhat limited Depth to soft bedrock Slope Shrink-swell	1.00 0.84 0.50	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 0.84 0.50	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 0.50
045SX: Rock Outcrop-----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 1.00 0.50
045VM: Vinland-----	40	Somewhat limited Depth to soft bedrock Shrink-swell Slope	1.00 0.50 0.37	Very limited Depth to soft bedrock Shrink-swell Slope	1.00 0.50 0.37	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 0.50
Martin-----	25	Very limited Shrink-swell Depth to saturated zone Slope	1.00 0.44 0.04	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.04	Very limited Shrink-swell Slope Depth to saturated zone	1.00 1.00 0.44
045WS: Woodson-----	90	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00

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Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059CM: Clareson-----	55	Very limited Shrink-swell Content of large stones Depth to hard bedrock Slope	1.00 0.81 0.79 0.04	Very limited Shrink-swell Depth to hard bedrock Content of large stones Slope	1.00 1.00 0.81 0.04	Very limited Shrink-swell Slope Content of large stones Depth to hard bedrock	1.00 1.00 0.81 0.79
Eram-----	30	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.00	Very limited Depth to saturated zone Shrink-swell Depth to soft bedrock Slope	1.00 1.00 0.01 0.00	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 1.00
059EA: Eram-----	55	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.16	Very limited Depth to saturated zone Shrink-swell Slope Depth to soft bedrock	1.00 1.00 0.16 0.01	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 1.00
Lebo-----	35	Somewhat limited Shrink-swell Slope	0.50 0.16	Somewhat limited Depth to soft bedrock Shrink-swell Slope	0.64 0.50 0.16	Very limited Slope Shrink-swell	1.00 0.50
059EC: Eram-----	60	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Depth to soft bedrock	1.00 1.00 0.01	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.12
Lula-----	25	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to hard bedrock	1.00 0.88	Very limited Shrink-swell Slope	1.00 0.00
111CA: Chase-----	100	Very limited Flooding Shrink-swell	1.00 1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.95	Very limited Flooding Shrink-swell	1.00 1.00
111EA: Elmont-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
111EF: Eram-----	60	Very limited Shrink-swell Depth to saturated zone Slope	1.00 1.00 0.37	Very limited Depth to saturated zone Shrink-swell Depth to soft bedrock Slope	1.00 1.00 0.71 0.37	Very limited Shrink-swell Depth to saturated zone Slope	1.00 1.00 1.00
Bates-----	40	Not limited		Somewhat limited Depth to soft bedrock	0.10	Somewhat limited Slope	0.86
177AN: Kennebec-----	90	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.82 0.50	Very limited Flooding Shrink-swell	1.00 0.50

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Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
177BK: Martin-----	54	Very limited Shrink-swell Depth to saturated zone	1.00 0.50	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Slope Depth to saturated zone	1.00 0.86 0.50
Kennebec-----	43	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.82 0.50	Very limited Flooding Shrink-swell	1.00 0.50
177BR: Fluvents-----	97	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.95 0.50	Very limited Flooding Shrink-swell	1.00 0.50
177DM: Dwight-----	60	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Martin-----	30	Very limited Shrink-swell Depth to saturated zone	1.00 0.50	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.50
177DW: Dwight-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
177EN: Elmont-----	90	Somewhat limited Shrink-swell Slope	0.50 0.16	Somewhat limited Shrink-swell Slope	0.50 0.16	Very limited Slope Shrink-swell	1.00 0.50
177LB: Labette-----	85	Very limited Shrink-swell Depth to hard bedrock	1.00 0.01	Very limited Shrink-swell Depth to hard bedrock	1.00 1.00	Very limited Shrink-swell Slope Depth to hard bedrock	1.00 0.12 0.01
177LC: Labette, eroded----	95	Very limited Shrink-swell Depth to hard bedrock	1.00 0.06	Very limited Shrink-swell Depth to hard bedrock	1.00 1.00	Very limited Shrink-swell Slope Depth to hard bedrock	1.00 0.12 0.06
177LD: Ladysmith-----	90	Very limited Shrink-swell Depth to saturated zone	1.00 0.50	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.50
177LM: Ladysmith-----	85	Very limited Shrink-swell Depth to saturated zone	1.00 0.44	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.44
177LS: Ladysmith, eroded---	100	Very limited Shrink-swell Depth to saturated zone	1.00 0.50	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.50
177MF: Martin-----	90	Very limited Shrink-swell Depth to saturated zone Slope	1.00 0.50 0.04	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.04	Very limited Shrink-swell Slope Depth to saturated zone	1.00 1.00 0.50
177RE: Reading-----	85	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50

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		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
177SU: Sibleyville-----	90	Somewhat limited Slope	0.04	Somewhat limited Slope Depth to soft bedrock	0.04 0.01	Very limited Slope	1.00
177SV: Sogn-----	55	Very limited Depth to hard bedrock Shrink-swell Slope	1.00 0.50 0.00	Very limited Depth to hard bedrock Shrink-swell Slope	1.00 0.50 0.00	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 1.00 0.50
Vinland-----	25	Somewhat limited Depth to soft bedrock Slope Shrink-swell	1.00 0.96 0.50	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 0.96 0.50	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 0.50
177SW: Stony Steep Land----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 0.50	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 1.00 0.50
197CE: Chase-----	85	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.44	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.44
197CS: Cline-----	60	Very limited Shrink-swell Slope	1.00 0.84	Very limited Shrink-swell Slope Depth to soft bedrock	1.00 0.84 0.03	Very limited Shrink-swell Slope	1.00 1.00
Sogn-----	20	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 0.84 0.50	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 0.84 0.50	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 1.00 0.50
197IB: Irwin-----	80	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
197WE: Wamego-----	75	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to soft bedrock	1.00 0.46	Very limited Shrink-swell Slope	1.00 0.12
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	
Bd: Bates-----	90	Not limited		Somewhat limited Depth to soft bedrock	0.46	Somewhat limited Slope	0.12
Cm: Clareson-----	55	Very limited Shrink-swell Depth to hard bedrock Content of large stones Slope	1.00 0.90 0.53 0.04	Very limited Shrink-swell Depth to hard bedrock Content of large stones Slope	1.00 1.00 0.53 0.04	Very limited Shrink-swell Slope Depth to hard bedrock Content of large stones	1.00 1.00 0.90 0.53
Eram-----	30	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.00	Very limited Depth to saturated zone Shrink-swell Depth to soft bedrock Slope	1.00 1.00 0.64 0.00	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 1.00

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		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Cs: Clime-----	65	Somewhat limited Shrink-swell Slope	0.50 0.04	Somewhat limited Shrink-swell Depth to soft bedrock Slope	0.50 0.29 0.04	Very limited Slope Shrink-swell	1.00 0.50
Sogn-----	20	Very limited Depth to hard bedrock Shrink-swell Slope	1.00 0.50 0.04	Very limited Depth to hard bedrock Shrink-swell Slope	1.00 0.50 0.04	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 1.00 0.50
Dn: Dennis-----	90	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.00
Ds: Dwight-----	90	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Ed: Elmont-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
EL: Elmont-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
En: Eram-----	85	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Depth to soft bedrock	1.00 1.00 0.64	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.12
Er: Eram, eroded-----	85	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Depth to soft bedrock	1.00 1.00 0.64	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.12
INT: Aguolls-----	100	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00
KB: Kennebec-----	95	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.82 0.50	Very limited Flooding Shrink-swell	1.00 0.50
Ke: Kenoma-----	85	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
LA: Labette-----	100	Very limited Shrink-swell Depth to hard bedrock	1.00 0.01	Very limited Shrink-swell Depth to hard bedrock	1.00 1.00	Very limited Shrink-swell Depth to hard bedrock	1.00 0.01
Ln: Lebo-----	75	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 0.64 0.50	Very limited Slope Shrink-swell	1.00 0.50
Rock Outcrop-----	15	Not rated		Not rated		Not rated	

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Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LS: Lebo-----	55	Somewhat limited Shrink-swell Slope	0.50 0.16	Somewhat limited Shrink-swell Depth to soft bedrock Slope	0.50 0.46 0.16	Very limited Slope Shrink-swell	1.00 0.50
Summit-----	35	Very limited Shrink-swell Depth to saturated zone	1.00 0.44	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone Slope	1.00 0.44 0.12
LU: Lula-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to hard bedrock Shrink-swell	0.88 0.50	Somewhat limited Shrink-swell	0.50
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
MA: Martin-----	85	Very limited Shrink-swell Depth to saturated zone	1.00 0.44	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone Slope	1.00 0.44 0.12
Mb: Mason-----	85	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
Oe: Olpe-----	55	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Kenoma-----	30	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
Op: Arents-----	100	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
Os: Osage-----	85	Very limited Ponding Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00
Ov: Osage-----	90	Very limited Ponding Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00
Ow: Osage-----	85	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Pt: Pits, Quarries-----	100	Not rated		Not rated		Not rated	
SI: Sibleyville-----	90	Not limited		Somewhat limited Depth to soft bedrock	0.01	Somewhat limited Slope	0.12
Sn: Summit-----	100	Very limited Shrink-swell Depth to saturated zone	1.00 0.44	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.44

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		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
So: Summit-----	90	Very limited Shrink-swell Depth to saturated zone	1.00 0.44	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone Slope	1.00 0.44 0.12
Vb: Verdigris-----	90	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
Vc: Verdigris-----	88	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
W: Water-----	100	Not rated		Not rated		Not rated	
Wo: Woodson-----	100	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00

BUILDING SITE DEVELOPMENT--Continued
Osage County, Kansas

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Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
045KC: Kennebec-----	88	Very limited Frost action	1.00	Somewhat limited Depth to saturated zone	0.82	Very limited Flooding	1.00
		Flooding	1.00	Flooding	0.80		
		Shrink-swell	0.50	Cutbanks cave	0.10		
045MO: Martin-----	40	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Shrink-swell	1.00	Too clayey	0.32		
		Depth to saturated zone	0.19	Cutbanks cave	0.10		
Oska-----	30	Very limited Shrink-swell	1.00	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to bedrock	0.01
		Frost action	0.50	Too clayey	0.41		
		Depth to hard bedrock	0.01	Cutbanks cave	0.10		
045OE: Oska-----	88	Very limited Shrink-swell	1.00	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to bedrock	0.01
		Frost action	0.50	Too clayey	0.41		
		Depth to hard bedrock	0.01	Cutbanks cave	0.10		
045SW: Sogn-----	55	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to bedrock	1.00
		Shrink-swell	0.50	Slope	0.16	Droughty	0.80
		Frost action	0.50	Cutbanks cave	0.10	Slope	0.16
		Slope	0.16			Content of large stones	0.00
Vinland-----	30	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to bedrock	1.00
		Slope	0.84	Slope	0.84	Slope	0.84
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	0.09
		Frost action	0.50				
045SX: Rock Outcrop-----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Slope	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	0.11
		Frost action	0.50				
045VM: Vinland-----	40	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to bedrock	1.00
		Shrink-swell	0.50	Slope	0.37	Slope	0.37
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.11
		Slope	0.37				
Martin-----	25	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Shrink-swell	1.00	Too clayey	0.32	Slope	0.04
		Depth to saturated zone	0.19	Cutbanks cave	0.10		
		Slope	0.04	Slope	0.04		
045WS: Woodson-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Frost action	1.00	Too clayey	0.50		
		Shrink-swell	1.00	Cutbanks cave	0.10		

BUILDING SITE DEVELOPMENT--Continued
Osage County, Kansas

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Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059CM: Clareson-----	55	Very limited Shrink-swell	1.00	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to bedrock	0.80
		Content of large stones	0.81	Content of large stones	0.81	Droughty	0.31
		Depth to hard bedrock	0.79	Cutbanks cave	0.10	Content of large stones	0.20
		Slope	0.04	Slope	0.04	Slope	0.04
Eram-----	30	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too clayey	0.12	Depth to bedrock	0.01
		Slope	0.00	Cutbanks cave	0.10	Slope	0.00
				Depth to soft bedrock	0.01		
				Slope	0.00		
059EA: Eram-----	55	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.16	Slope	0.16
		Slope	0.16	Too clayey	0.12	Depth to bedrock	0.01
				Cutbanks cave	0.10		
				Depth to soft bedrock	0.01		
Lebo-----	35	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to soft bedrock	0.64	Somewhat limited Depth to bedrock	0.65
		Slope	0.16	Slope	0.16	Slope	0.16
				Cutbanks cave	0.10		
059EC: Eram-----	60	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too clayey	0.12	Depth to bedrock	0.01
				Cutbanks cave	0.10		
				Depth to soft bedrock	0.01		
Lula-----	25	Very limited Shrink-swell	1.00	Somewhat limited Depth to hard bedrock	0.88	Not limited	
				Cutbanks cave	0.10		
111CA: Chase-----	100	Very limited Frost action	1.00	Somewhat limited Depth to saturated zone	0.95	Somewhat limited Flooding	0.60
		Flooding	1.00	Flooding	0.60		
		Shrink-swell	1.00	Too clayey	0.12		
				Cutbanks cave	0.10		
111EA: Elmont-----	100	Very limited Frost action	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
		Shrink-swell	0.50				
111EF: Eram-----	60	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.71	Depth to bedrock	0.71
		Slope	0.37	Slope	0.37	Slope	0.37
				Too clayey	0.12		
				Cutbanks cave	0.10		
Bates-----	40	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Depth to bedrock	0.10
				Depth to soft bedrock	0.10		
177AN: Kennebec-----	90	Very limited Frost action	1.00	Somewhat limited Depth to saturated zone	0.82	Very limited Flooding	1.00
		Flooding	1.00	Flooding	0.80		
		Shrink-swell	0.50	Cutbanks cave	0.10		

BUILDING SITE DEVELOPMENT--Continued
Osage County, Kansas

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Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
177BK: Martin-----	54	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.22
		Shrink-swell	1.00	Too clayey	0.32		
		Depth to saturated zone	0.22	Cutbanks cave	0.10		
Kennebec-----	43	Very limited Frost action	1.00	Somewhat limited Depth to saturated zone	0.82	Very limited Flooding	1.00
		Flooding	1.00	Flooding	0.80		
		Shrink-swell	0.50	Cutbanks cave	0.10		
177BR: Fluvents-----	97	Very limited Flooding	1.00	Somewhat limited Depth to saturated zone	0.95	Very limited Flooding	1.00
		Shrink-swell	0.50	Flooding	0.80		
				Cutbanks cave	0.10		
177DM: Dwight-----	60	Very limited Shrink-swell	1.00	Somewhat limited Too clayey	0.68	Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Martin-----	30	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.22
		Shrink-swell	1.00	Too clayey	0.32		
		Depth to saturated zone	0.22	Cutbanks cave	0.10		
177DW: Dwight-----	85	Very limited Shrink-swell	1.00	Somewhat limited Too clayey	0.76	Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
177EN: Elmont-----	90	Very limited Frost action	1.00	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Slope	0.16				
177LB: Labette-----	85	Very limited Shrink-swell	1.00	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to bedrock	0.01
		Frost action	0.50	Too clayey	0.12		
		Depth to hard bedrock	0.01	Cutbanks cave	0.10		
177LC: Labette, eroded----	95	Very limited Shrink-swell	1.00	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to bedrock	0.06
		Frost action	0.50	Too clayey	0.12		
		Depth to hard bedrock	0.06	Cutbanks cave	0.10		
177LD: Ladysmith-----	90	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.22
		Frost action	0.50	Too clayey	0.50		
		Depth to saturated zone	0.22	Cutbanks cave	0.10		
177LM: Ladysmith-----	85	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Frost action	0.50	Too clayey	0.50		
		Depth to saturated zone	0.19	Cutbanks cave	0.10		
177LS: Ladysmith, eroded---	100	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.22
		Frost action	0.50	Too clayey	0.50		
		Depth to saturated zone	0.22	Cutbanks cave	0.10		

BUILDING SITE DEVELOPMENT--Continued
Osage County, Kansas

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		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
177MF: Martin-----	90	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.22
		Shrink-swell	1.00	Too clayey	0.32	Slope	0.04
		Depth to saturated zone	0.22	Cutbanks cave	0.10		
		Slope	0.04	Slope	0.04		
177RE: Reading-----	85	Very limited Frost action	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
		Shrink-swell	0.50				
		Flooding	0.40				
177SU: Sibleyville-----	90	Somewhat limited Frost action	0.50	Somewhat limited Cutbanks cave	0.10	Somewhat limited Slope	0.04
		Slope	0.04	Slope	0.04	Depth to bedrock	0.01
				Depth to soft bedrock	0.01		
177SV: Sogn-----	55	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to bedrock	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	1.00
		Frost action	0.50	Slope	0.00	Slope	0.00
		Slope	0.00			Content of large stones	0.00
Vinland-----	25	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to bedrock	1.00
		Slope	0.96	Slope	0.96	Slope	0.96
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	0.40
		Frost action	0.50				
177SW: Stony Steep Land----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	0.05
		Frost action	0.50				
197CE: Chase-----	85	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Shrink-swell	1.00	Too clayey	0.12		
		Flooding	0.40	Cutbanks cave	0.10		
		Depth to saturated zone	0.19				
197CS: Cline-----	60	Very limited Shrink-swell	1.00	Somewhat limited Slope	0.84	Somewhat limited Slope	0.84
		Slope	0.84	Too clayey	0.32	Depth to bedrock	0.03
		Frost action	0.50	Cutbanks cave	0.10		
				Depth to soft bedrock	0.03		
Sogn-----	20	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to bedrock	1.00
		Slope	0.84	Slope	0.84	Slope	0.84
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	0.17
		Frost action	0.50			Content of large stones	0.00
197IB: Irwin-----	80	Very limited Shrink-swell	1.00	Somewhat limited Too clayey	0.50	Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
197WE: Wamego-----	75	Very limited Shrink-swell	1.00	Somewhat limited Depth to soft bedrock	0.46	Somewhat limited Depth to bedrock	0.46
		Frost action	0.50	Cutbanks cave	0.10		
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	

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		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Bd: Bates-----	90	Not limited		Very limited Cutbanks cave Depth to soft bedrock	1.00 0.46	Somewhat limited Depth to bedrock	0.46
Cm: Clareson-----	55	Very limited Shrink-swell	1.00	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to bedrock	0.90
		Depth to hard bedrock	0.90	Content of large stones	0.53	Droughty	0.29
		Content of large stones	0.53	Cutbanks cave	0.10	Content of large stones	0.20
		Slope	0.04	Slope	0.04	Slope	0.04
Eram-----	30	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.64	Depth to bedrock	0.65
		Slope	0.00	Too clayey Cutbanks cave Slope	0.12 0.10 0.00	Slope	0.00
Cs: Clime-----	65	Somewhat limited Shrink-swell	0.50	Somewhat limited Too clayey	0.32	Very limited Too clayey	1.00
		Frost action	0.50	Depth to soft bedrock	0.29	Depth to bedrock	0.29
		Slope	0.04	Cutbanks cave Slope	0.10 0.04	Slope	0.04
Sogn-----	20	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to bedrock	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	1.00
		Frost action	0.50	Slope	0.04	Slope	0.04
		Slope	0.04			Content of large stones	0.00
Dn: Dennis-----	90	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too clayey	0.12		
				Cutbanks cave	0.10		
Ds: Dwight-----	90	Very limited Shrink-swell	1.00	Somewhat limited Too clayey	0.76	Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Ed: Elmont-----	85	Very limited Frost action	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
		Shrink-swell	0.50				
EL: Elmont-----	90	Very limited Frost action	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
		Shrink-swell	0.50				
En: Eram-----	85	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.64	Depth to bedrock	0.65
				Too clayey Cutbanks cave	0.12 0.10		
Er: Eram, eroded-----	85	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.64	Too clayey	1.00
				Too clayey	0.12	Depth to bedrock	0.65
				Cutbanks cave	0.10	Droughty	0.00
INT: Aguolls-----	100	Very limited Ponding	1.00	Very limited Ponding	1.00	Very limited Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Frost action	0.50	Cutbanks cave	0.10		

BUILDING SITE DEVELOPMENT--Continued
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		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KB: Kennebec-----	95	Very limited Frost action	1.00	Somewhat limited Depth to saturated zone	0.82	Somewhat limited Flooding	0.60
		Flooding	1.00	Flooding	0.60		
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
Ke: Kenoma-----	85	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too clayey	0.50		
				Cutbanks cave	0.10		
LA: Labette-----	100	Very limited Shrink-swell	1.00	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to bedrock	0.01
		Frost action	0.50	Too clayey	0.12		
		Depth to hard bedrock	0.01	Cutbanks cave	0.10		
Ln: Lebo-----	75	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Shrink-swell	0.50	Depth to soft bedrock	0.64	Content of large stones	1.00
				Cutbanks cave	0.10	Depth to bedrock	0.65
Rock Outcrop-----	15	Not rated		Not rated		Droughty	0.18
						Not rated	
LS: Lebo-----	55	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to soft bedrock	0.46	Somewhat limited Depth to bedrock	0.46
		Slope	0.16	Slope	0.16	Slope	0.16
				Cutbanks cave	0.10		
Summit-----	35	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Depth to saturated zone	0.19	Too clayey	0.50		
				Cutbanks cave	0.10		
LU: Lula-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to hard bedrock	0.88	Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
MA: Martin-----	85	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Shrink-swell	1.00	Too clayey	0.32		
		Depth to saturated zone	0.19	Cutbanks cave	0.10		
Mb: Mason-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
		Flooding	0.40				
Oe: Olpe-----	55	Somewhat limited Shrink-swell	0.50	Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.96
				Too clayey	0.12		
Kenoma-----	30	Very limited Low strength	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50		
		Depth to saturated zone	1.00	Cutbanks cave	0.10		

BUILDING SITE DEVELOPMENT--Continued
Osage County, Kansas

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		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Op: Arents-----	100	Very limited Slope Shrink-swell Frost action	1.00 0.50 0.50	Very limited Slope Cutbanks cave Too clayey	1.00 0.10 0.02	Very limited Too clayey Slope Gravel content Droughty	1.00 1.00 0.41 0.05
Os: Osage-----	85	Very limited Shrink-swell Ponding Depth to saturated zone Flooding	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Flooding Too clayey Cutbanks cave	1.00 1.00 0.60 0.32 0.10	Very limited Ponding Depth to saturated zone Flooding	1.00 1.00 0.60
Ov: Osage-----	90	Very limited Shrink-swell Ponding Depth to saturated zone Flooding	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Flooding Too clayey Cutbanks cave	1.00 1.00 0.60 0.32 0.10	Very limited Ponding Depth to saturated zone Too clayey Flooding	1.00 1.00 1.00 0.60
Ow: Osage-----	85	Very limited Shrink-swell Depth to saturated zone Flooding	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Too clayey Cutbanks cave	1.00 0.80 0.32 0.10	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 1.00
Pt: Pits, Quarries-----	100	Not rated		Not rated		Not rated	
SI: Sibleyville-----	90	Somewhat limited Frost action	0.50	Somewhat limited Cutbanks cave Depth to soft bedrock	0.10 0.01	Somewhat limited Depth to bedrock	0.01
Sn: Summit-----	100	Very limited Shrink-swell Depth to saturated zone	1.00 0.19	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.50 0.10	Somewhat limited Depth to saturated zone	0.19
So: Summit-----	90	Very limited Shrink-swell Depth to saturated zone	1.00 0.19	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.50 0.10	Somewhat limited Depth to saturated zone	0.19
Vb: Verdigris-----	90	Very limited Flooding Shrink-swell	1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
Vc: Verdigris-----	88	Very limited Flooding Shrink-swell	1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.80 0.10	Very limited Flooding	1.00
W: Water-----	100	Not rated		Not rated		Not rated	
Wo: Woodson-----	100	Very limited Depth to saturated zone Frost action Shrink-swell	1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.50 0.10	Very limited Depth to saturated zone	1.00

