

System Group	Section	Average thickness (feet)	Symbol on pl. 3	Formation	Member	Description	Construction materials
QUATERNARY		20	Qal	Alluvium		Dark gray to dark-brown clayey silt containing lenses of sand and gravel	Aggregate and fill material
		50	Qt	Terrace deposits		Dark gray to brownish-gray clayey silt containing lenses of sand and gravel	Mineral filler and fill material
		20	Qs	Sanborn		Reddish-brown to light-gray silt and clay containing lenses of buff to orange, fine to medium well-sorted quartz sand and thin lenses of poorly sorted gravel	Mineral filler, aggregate, road metal, and fill material
CRETACEOUS		30	Kd	Dakota sandstone		Red, brown, tan, soft to hard, and fine- to medium-grained sandstone, composed predominantly of quartz and interbedded with clayey and silty shale ranging from light gray through dark gray and tan, and from massive to thin-bedded	Aggregate, road metal, and fill material
		100	Kk	Kiowa shale		Shale with clayey, silty, and sandy zones; massive in the upper part, thin-bedded and fissile in the lower part, containing plant fossils, thin layers of bentonite and gypsum, and abundant concretions of limonite and hematite	
PERMIAN		30			Afton shale	Red, green, gray, thin-bedded to blocky clayey calcareous shale containing thin beds of gray-tan limestone and lime concretions	
		10			Slate Creek shale	Dark gray thin-bedded clayey shale	
		40			Highland shale	Gray-green, maroon, and red thin-bedded clayey shale	
		70			Carleton limestone	Gray to buff soft partly clayey limestone that splits into thin plates; interbedded with gray to tan-gray soft thin-bedded calcareous shale; contains fossil plants and insects	Road metal and fill material
		40	Pwe	*Wellington	Chisholm Creek shale	Light-green, maroon, and red soft clayey thin-bedded shale	
		20			Annelly gypsum	Gray and pink massive contorted and coarsely crystalline gypsum; shale partings	
		200			Geuda Springs shale	Two beds of white chalky limestone separated by shale; Prairie Creek bed limestone	
						Greenish-gray clayey shale interbedded with light-buff soft thin-bedded limestone and a hard gray anhydrite	

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SUMMER		8			Hollenberg limestone	Tan-gray cellular coarsely crystalline limestone with dolomitic zones	Road metal and fill material
		40	Pwe	*Wellington	Pearl shale	Light tan-gray to faintly varicolored thin-bedded calcareous clayey shale with limy concretions and some thin tan-gray crystalline dolomitic limestone	
PERMIAN		18	Pn	Nolans limestone	Herington limestone	Tan to gray fairly hard massive thick-bedded fossiliferous dolomitic limestone with geodes locally abundant	Structural stone, road metal, aggregate, and riprap
		10			Paddock shale	Tan to gray thin-bedded to blocky calcareous shale with fossils locally abundant	
		2			Krider limestone	Tan to gray soft clayey limestone	
		30	Po	Odell shale		Gray, tan, and green blocky silty and clayey shale with thin limy zones; a red zone near the top	Fill material
		28	Pw	Winfield limestone	Cresswell limestone	Gray to buff locally soft and dolomitic fossiliferous limestone with abundant geodes; platy and thin bedded in upper part, massive and thick bedded in lower part	Structural stone, road metal, aggregate, riprap, and fill material
		10			Grant shale	Gray to tan silty calcareous fossiliferous shale	
		2			Stovall limestone	Hard gray massive cherty fossiliferous limestone	
		45	Pd	Doyle shale	Gage shale	Thin-bedded to massive fossiliferous shale; greenish gray to tan and calcareous in upper part, and green, maroon, and clayey in lower part	Fill material
		10			Towanda limestone	Hard tan to gray platy to blocky limestone	Structural stone, road metal, aggregate, riprap, and fill material
		25			Holmesville shale	Greenish-gray silty clayey and partly calcareous shale with a thin reddish bed and local lenses of limestone	Fill material
		39			Fort Riley limestone	Gray to tan fairly hard fossiliferous limestone with thin shale partings; thin bedded at top, massive beds in middle and near base; lower massive bed is called "rimrock"	Structural stone, road metal, aggregate, riprap, and fill material
		2	Pb	Boneston limestone	Oketo shale	Gray calcareous fossiliferous silty shale	Fill material
		39			Florence limestone	Gray to tan thick-bedded fossiliferous limestone with many beds and nodules of chert and a thin shale parting	Structural stone, road metal, aggregate, riprap, and fill material
	35			Blue Springs shale	Banded maroon, gray, and green, massive to blocky clayey silty poorly exposed shale		
	5	Pm	Matfield shale	Kinney limestone	Tan to gray hard massive fossiliferous limestone with few good outcrops	Fill material	
	30			Wymore shale	Tan, green, and maroon, thin-bedded to blocky silty and calcareous shale		
	10	Pwr	Wreford limestone	Schroyer limestone	Gray massive limestone containing nodules and lenses of chert		

*Subdivisions of Wellington formation modified from Ver Wiebe (1937, p 4 and 5)

STRATIGRAPHIC UNITS THAT CROP OUT IN MARION COUNTY, KANSAS,
AND THE CONSTRUCTION MATERIALS OF EACH