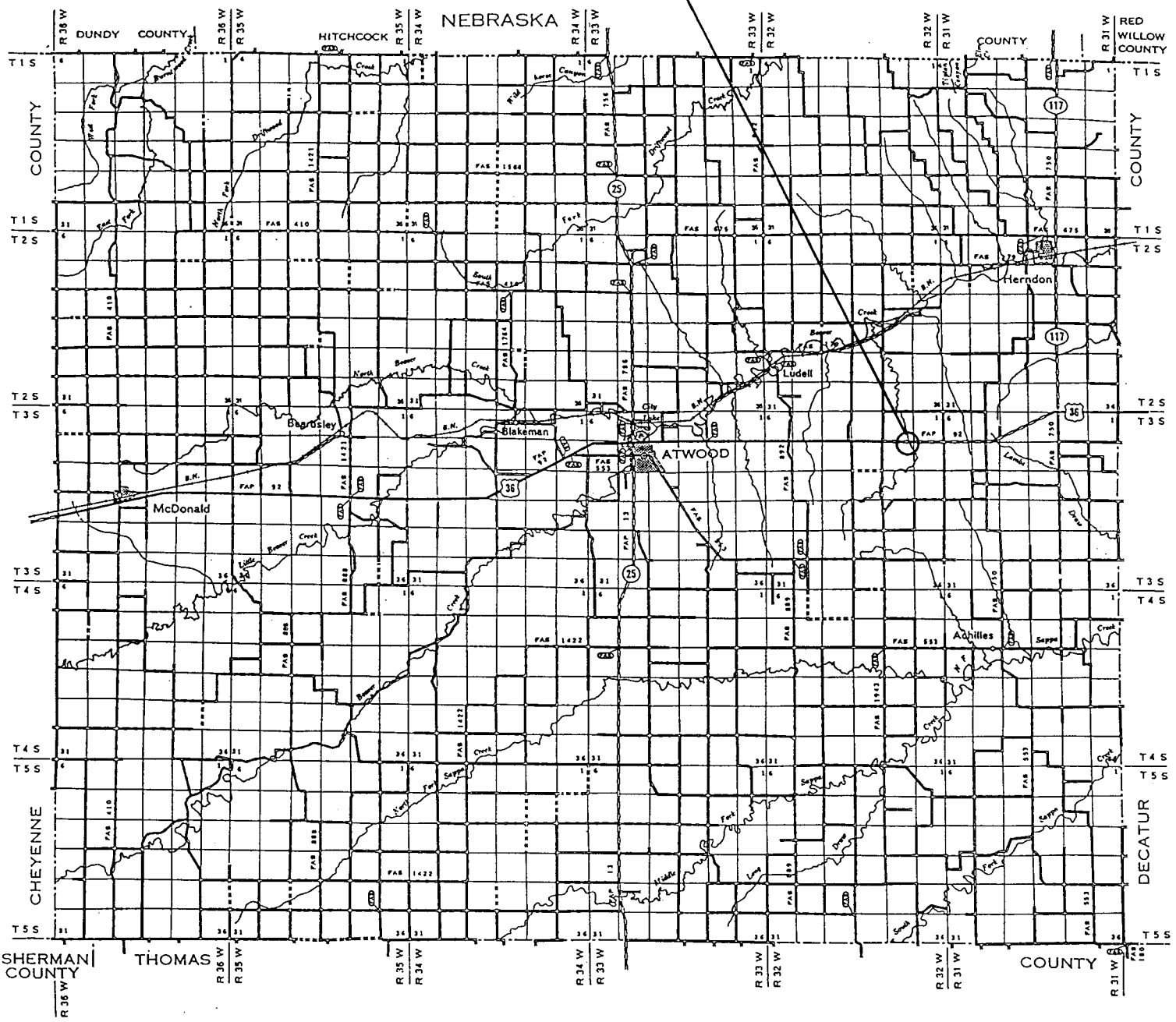
BRIDGE FOUNDATION GEOLOGY REPORT

36-77 K-5741-01
Bridge No. 36-77-29.09
US-36 over the Beaver Creek Drainage



Rawlins County

SE¼ Sec 2 T3S R32W

KANSAS DEPARTMENT OF TRANSPORTATION

RTE./CO. 36-77	SOUNDING NO. CD #2	SHEET 1 OF 2
BRIDGE STA. 11+540.20	PROJ. NO. K-5741-01	BRIDGE NO. 36-77-29.09
SITE NAME US-36 over Beaver Creek Drainage		HOLE STA. 11+588.2, 6m Rt ℄
GEOLOGIST Billinger	SCALE: 1:100 (10mm = 1 Meter)	DATE 11-18-98
DRILLER Bergman	RIG TYPE Mobile B-61	TOP HOLE ELEV. 868.742
GROUNDWATER ELEV 862.19	TOTAL DEPTH 16.74	M/B ELEV. 853.792

BIT TYPE	GEOLOGIC NAME	STRATIGRAPHIC COLUMN	DEPTH	ELEVATION	CLASSIFICATION OF MATERIALS DESCRIPTION AND REMARKS	UNCONFINED COMPRESSION	STANDARD PENETRATION OR CASING DRIVE BLOWS	STANDARD PENETRATION OR CASING DRIVE ELEV
			0.0	868.742				
	Mantle			868	Loess, tan to yellow-brown.			
				867				
				866				
				865	Tighter			
			4.27	864.47				
			4.63	864.11	Mortar bed. Hard.			
	Ogallala Formation			863	Sand & small gravel. Some is loosely cemented. Silty			
				862				
			7.85	860.89				
				860	Clay, Sandy Clay, & Silty clay. greenish			
				859				
			10.1	858.64				
				858	Sandy Clay grading to clay. yellow-brown/olive/gray. Firm			
				857	Shelby #1 11.54-12.14			856.6
				856				
				855				
				854				
			14.95	853.792				853.37
	Pierre Fm.	core		853	Shale, weathered, very firm Yellow-brown to olive			

	SOUNDING NO. CD #2	PROJECT NO. K-5741-01	SHEET 2 OF 2
DATE 11-18-98	RTE./CO. 36-77	TOTAL DEPTH 16.74	THE 868.742

BIT TYPE	GEOLOGIC NAME	STRATIGRAPHIC COLUMN	DEPTH	ELEVATION	CLASSIFICATION OF MATERIALS DESCRIPTION AND REMARKS	UNCONFINED COMPRESSION	STANDARD PENETRATION OR CASING DRIVE BLOWS	STANDARD PENETRATION OR CASING DRIVE ELEV
				853				
	Pierre Fm		16.12	852.62	Shale, Olive, very firm			
	Pierre Fm		16.74	852	Shale, dark gray, very firm			

Shelby #1 11.54 - 12.14 very firm clay, yellow-brown
Pushed 0.60 Recov. 0.60

Core #1
14.95 - 16.02 shale, weathered, firm, yellow-brown & olive.
Cut 1.07
Recov. 1.07
RQD = 96%
Sample 1
15.21 - 15.37

Core #2 16.02 - 16.74
Cut 0.72 Recov. 0.60 RQD = 100%
16.02 - 16.12 shale, olive, firm.
16.12 - 16.74 shale, dark gray, very firm.

.35 - 5.35

0.20 - 0.92

Pierre Fm

Core #1 14.95 - 16.02 Cut 1.07 Recov. 1.07 RQD = 96%	853.792	14.95 - 15.72	very firm clay or very weathered shale, very firm yellow-brown & olive.
		15.72 - 15.84	Shale, more Olive gray, very firm
	852.9	15.84 - 16.02	Shale, more olive gray with yellow-brown zones
	853.53	15.21 - 15.37	Sample #1 very weathered shale, olive & yellow-brown
		16.02 - 16.12	olive gray Shale, very firm
Core 2 16.02 - 16.74 Cut - 0.72 Recov. 0.6 RQD = 100%	852.62	16.12 - 16.74	Shale, dark gray, very firm weathered out lenses which are rust brown.

11-18-98
CD #2
About 2 Rt.
Sta 11+588.2
6 m Rt

Bergman
Law
Derr
Billinger
W.L. = 6.55 m
Plugged

Augers
IIII IIII

11-19-98 —

Rods
IIII IIII
II

metric

868.742	0.00 - 0.60	mantle, brown
	0.60 - 3.60	Loess, tan - yellow-tan
	3.60 - 4.27	seems to be tighter, Loess. tan
864.47	4.27 - 4.63	mortar bed, very firm to hard
869.11	4.63 - 5.76	drills real firm, Oggal. Sand, some loosely cemented, some gravel, light tan.
	5.76 - 6.36	softer, Sand with some small gravel some cementation, Oggal.
	6.36 - 7.38	softer yet Sand, light cementation Oggal. (pieces bust open with your fingers)
	7.38 - 7.85	firmer, Sand, wet, more cementation. bumpy.
860.89	7.85 - 8.70	smooth, clay, greenish?
	8.70 - 9.00	Some vibration. maybe some sandy lenses
	9.00 - 9.50	smooth, Silty sand
	9.50 - 10.1	Seems tighter, clay bound sand. tan-brown.
858.64	10.1 - 11.54	getting firmer
857.2	11.54 - 12.14	Shelby #4 pushed 0.60 Recov. 0.60 very firm, molded clay, yellow-brown, orange, and some gray lenses.
856.6	12.14 - 14.95	clay, very firm, some sand mixed in yellow-brown with olive coloring
	14.95	start coring

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Ogallala Fm