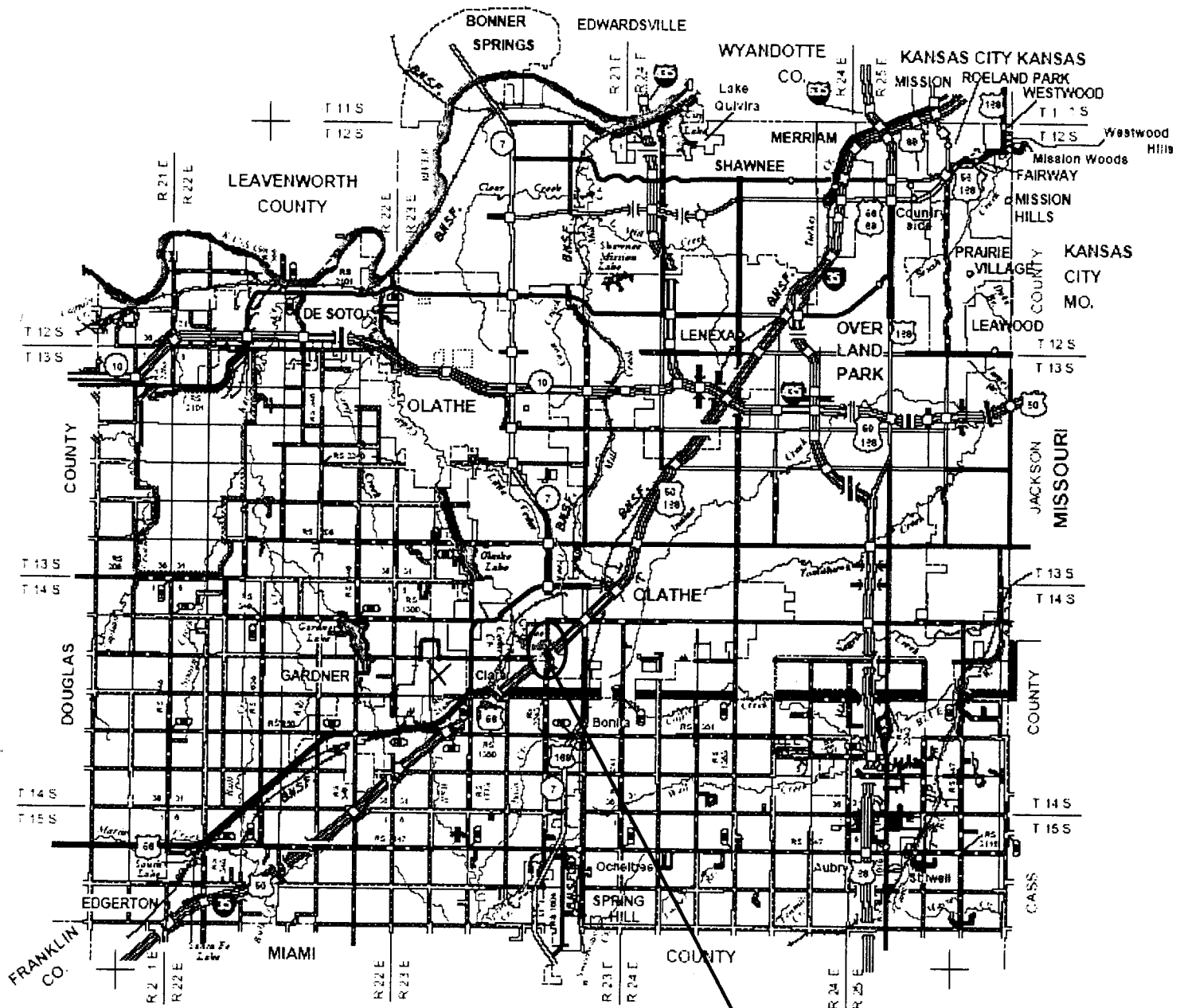


Johnson County

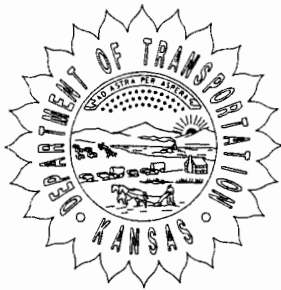


35-46 K-9014-01
159th Street over I-35

Core Hole 2
(See also core hole 1)

10-14-23E
SW SW

KANSAS DEPARTMENT OF TRANSPORTATION



RTE./CO.	35-46	SOUNDING NO.	CD-2	SHEET 1 OF 2	
BRIDGE STA.	29+807.080	PROJ.NO.	K-9014-01	BRIDGE NO. 35-46-12JII(354)	
SITE NAME				159 th Street over I-35	
HOLE STA				29+899.3:20 m Lt.	
GEOLOGIST	D.Martin	SCALE	1:100 (10mm=1m)	DATE	12-30-04
DRILLER	B.Bergman	RIG TYPE	CME-75	TOP HOLE ELEV.	311.57
GW ELEV.	N/A	TOTAL DEPTH	13.11	M/B ELEV.	310.35

BIT TYPE	GEOLOGIC NAME	STRATIGRAPHIC COLUMN	DEPTH	ELEVATION	CLASSIFICATION OF MATERIALS DESCRIPTION AND REMARKS	SHAFT 5.0 SEGMENTS	UNCONFINED COMPRESSION	ELASTIC MODULUS	ELEVATION
					T.H.E. - 311.57				
Casing	Soil Mantle		1.22	311	Clay, silty, strong brown to medium brown.				311
				310.35					
			1.95	310	Sandstone, weathered, light gray to brown, soft, clayey.				310
				309.62					
			2.73	309	Sandstone, firm, light yellow to light gray, fine grained, & iron stains present. Lower 0.05 is coarse shaley, argillaceous, brown to dark brown conglomerate.				309
				308					308
				308.84			26300	4780000	307.55
				307	Limestone, light to dark gray, fossiliferous.				307
				306.53			46300	8540000	306.63
				306	Limestone, light to medium gray, fossiliferous, shaley zones at 306.53 and 305.99, 0.07 and 0.47 respectively.				306
				305					305
				305.25			4490	342000	304.65
				304	Shale, dark gray to black to dark gray, black shale is firm and fissile, dark gray shale is soft and clayey. Top of the unit is crumbly.				304
				303			5543	711000	303.36
				302.31			6362	244000	302.38
				302	Limestone, light to medium gray, fossiliferous, more shaley with depth. Dark gray shale breaks at 302.21, 302.18, and 302.09, all 0.02 thick.		18400	4280000	301.40
				301					301
				300.34			35400	5920000	300.31
				300	Shale, clayey to silty, medium gray, high swell potential.		268	10500	299.76
				299			162	6100	299.60
				298.46					
				298	TD - 13.11				298



KANSAS DEPARTMENT OF TRANSPORTATION

RTE./CO.	35-46	SOUNDING NO.	CD-2	SHEET 2 OF 2
BRIDGE STA.	29+807.080	PROJ.NO.	K-9014-01	BRIDGE NO. 35-46-121K(354)
SITE NAME	159 th Street over I-35			HOLE STA 29+899.3; 20 m Lt.

BIT TYPE	GEOLOGIC NAME	STRATIGRAPHIC COLUMN	DEPTH	ELEVATION	CLASSIFICATION OF MATERIALS DESCRIPTION AND REMARKS	UNCONFINED COMPRESSION	ELASTIC MODULUS	ELEVATION																																																																					
					<table><tr><td>Core</td><td>Depth</td><td>Elev.</td><td>Cut</td><td>Rec.</td><td>%</td><td>ROD</td></tr><tr><td>1</td><td>1.22</td><td>310.35</td><td>1.43</td><td>0.88</td><td>62</td><td>15%</td></tr><tr><td>2</td><td>2.65</td><td>308.92</td><td>1.46</td><td>1.46</td><td>100</td><td>62%</td></tr><tr><td>3</td><td>4.11</td><td>307.46</td><td>1.52</td><td>1.52</td><td>100</td><td>92%</td></tr><tr><td>4</td><td>5.64</td><td>305.93</td><td>1.52</td><td>1.52</td><td>100</td><td>98%</td></tr><tr><td>5</td><td>7.16</td><td>304.41</td><td>1.52</td><td>1.42</td><td>93</td><td>68%</td></tr><tr><td>6</td><td>8.69</td><td>302.88</td><td>1.48</td><td>1.52</td><td>103</td><td>82%</td></tr><tr><td>7</td><td>10.16</td><td>301.41</td><td>1.52</td><td>1.55</td><td>102</td><td>78%</td></tr><tr><td>8</td><td>11.69</td><td>299.88</td><td>1.42</td><td>1.62</td><td>114</td><td>60%</td></tr><tr><td>Total</td><td>13.11</td><td>298.46</td><td>11.87</td><td>11.49</td><td>97</td><td>XXXXX</td></tr></table>	Core	Depth	Elev.	Cut	Rec.	%	ROD	1	1.22	310.35	1.43	0.88	62	15%	2	2.65	308.92	1.46	1.46	100	62%	3	4.11	307.46	1.52	1.52	100	92%	4	5.64	305.93	1.52	1.52	100	98%	5	7.16	304.41	1.52	1.42	93	68%	6	8.69	302.88	1.48	1.52	103	82%	7	10.16	301.41	1.52	1.55	102	78%	8	11.69	299.88	1.42	1.62	114	60%	Total	13.11	298.46	11.87	11.49	97	XXXXX		
Core	Depth	Elev.	Cut	Rec.	%	ROD																																																																							
1	1.22	310.35	1.43	0.88	62	15%																																																																							
2	2.65	308.92	1.46	1.46	100	62%																																																																							
3	4.11	307.46	1.52	1.52	100	92%																																																																							
4	5.64	305.93	1.52	1.52	100	98%																																																																							
5	7.16	304.41	1.52	1.42	93	68%																																																																							
6	8.69	302.88	1.48	1.52	103	82%																																																																							
7	10.16	301.41	1.52	1.55	102	78%																																																																							
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Total	13.11	298.46	11.87	11.49	97	XXXXX																																																																							

35-46 K-9014-01
35-46-12.11(354)
159th Street over I-35
Johnson County

Page 1 of 2

CD #2

29+899.3; 20.0 m Lt.

Date: December 30, 2004

T.H.E. = 311.57

	<i>Elevation</i>	<i>Meters</i>	<i>Feet</i>	<i>Description</i>
	311.57	0.00	0.00	Clay, silty, strong brown to brown.
	310.35	1.22	4.00	BEGIN CORE
Core #1				
1.22 - 2.65	310.35	1.22	4.00	Sandstone, weathered, light gray to brown, soft, clayey.
Cut: 1.43	309.62	1.95	6.40	Sandstone, light yellow to light gray with iron staining, washed easily.
Rec: 0.88	308.92	2.65	8.70	END CORE #1
				RQD = 15%
Core #2				
2.65 - 4.11	308.92	2.65	8.70	Sandstone, light gray, fine grained, iron stains.
Cut: 1.46	308.89	2.68	8.80	Conglomerate, coarse, shaley, brown to dark brown.
Rec: 1.46	308.84	2.73	8.95	Limestone, light to medium gray, fossiliferous.
	308.49	3.08	10.10	Shale, dark gray, limy.
	308.46	3.11	10.20	Limestone, medium to light gray, fossiliferous.
	307.46	4.11	13.50	END CORE #2
				RQD = 62%
Core #3				
4.11 - 5.64	307.46	4.11	13.50	Limestone, light to medium gray, fossiliferous.
Cut: 1.52	306.53	5.04	16.55	Limestone, shaley, light to medium gray, fossiliferous.
Rec: 1.52	306.46	5.11	16.75	Limestone, light to medium gray, fossiliferous.
	305.99	5.58	18.30	Limestone, shaley, light to medium gray, fossiliferous.
	305.93	5.64	18.50	END CORE #3
				RQD = 92%
Core #4				
5.64 - 7.16	305.93	5.64	18.50	Limestone, light to medium gray, fossiliferous.
Cut: 1.52	305.25	6.32	20.75	Shale, dark gray, fissile, crumbly.
Rec: 1.52	305.03	6.54	21.45	Shale, black, fissile.
	304.41	7.16	23.50	END CORE #4
				RQD = 98%
Core #5				
7.16 - 8.69	304.41	7.16	23.50	Shale, dark gray to black, fissile.
Cut: 1.52	303.83	7.74	25.40	Shale, black, very fissile, parts easily.
Rec: 1.42	303.55	8.02	26.30	Shale, black, firmer, fissile.
	303.04	8.53	28.00	Shale, medium gray, clayey, less firm.
	302.88	8.69	28.50	END CORE #5
				RQD = 68%
Core #6				
8.69 - 10.16	302.88	8.69	28.50	Shale, dark gray, clayey, very soft at bottom.
Cut: 1.52	302.31	9.26	30.40	Limestone, light gray, shale breaks at 302.21, 302.18, and 302.09; all 0.02 m thick.
Rec: 1.52	301.41	10.16	33.35	END CORE #6
				RQD = 82%

Core #7

10.16 - 11.69	301.41	10.16	33.35	Limestone, light to medium gray, fossiliferous, becomes shaley towards base.
Cut: 1.52	300.34	11.23	36.85	Shale, medium gray, clayey.
Rec: 1.55	299.88	11.69	38.35	END CORE #7

RQD = 78%

Core #8

11.69 - 13.11	299.88	11.69	38.35	Shale, gray, silty, high swell potential.
Cut: 1.42	298.46	13.11	43.00	END CORE #8
Rec: 1.62				

RQD = 60%

TD = 13.11 43.00

Kansas Department of Transportation

Report of sample of Geology cores

Laboratory No. 05-0040

Date Reported: 1/12/2005

Date Received: 1/4/2005

Quantity: 9

County: Johnson

Specification No. AASHTO T-208

Source of Material 35-46 K-9014-01

Sampled from 35-46 K-9014-01

Submitted by: Topeka geology office

Identification marks: Tags on samples

Project or POV 35-46 K-9014-01

Description of site:

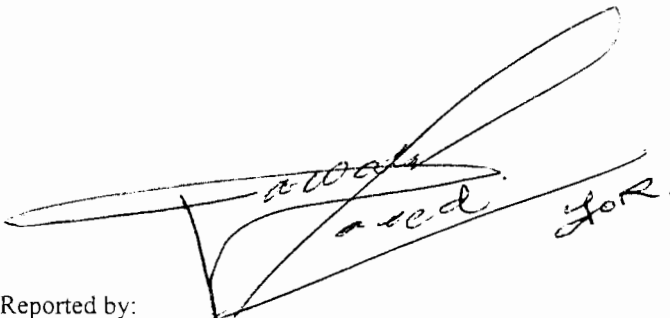
Type of Construction New construction

TEST RESULTS

Sample No.	Station	Offset (m)	Depth (m)	Description	Unconfined Compression Qu (kPa)	Elastic Modulus E (kPa)	Dry Density γ_d (kg/m ³)	Moisture Percent w %
S-1	29+89.3	20.0M LT	3.69-4.02	Lt-med gray LS	26300	4780000	2405	4.7
S-2	"	"	4.69-4.94	Lt gray LS	46300	8540000	2481	3.3
S-3	"	"	6.64-6.92	Black fissile SH	4490	342000	2082	11.1
S-4	"	"	8.03-8.21	Black fissile SH	5543	711000	2061	10.1
S-5	"	"	8.99-9.19	Dk gray, fissile, soft SH	6362	244000	2162	9.9
S-6	"	"	9.91-10.17	Lt gray LS	18400	4280000	2405	5.0
S-7	"	"	11.03-11.26	Lt-med gray, shaley LS	35400	5920000	2605	2.0
S-8	"	"	11.69-11.81	Med gray, silty SH	268	10500	2034	11.8
S-9	"	"	12.45-12.57	Med gray, silty SH	162	6100	1656	12.1

T.H.E.= 311.57M

cc: L.S. Ingram
R. Fuller
R. Henthorne
Soil Section
File 18-3

Reported by: 

Title: Robert A. Fuller; Soils Engineer