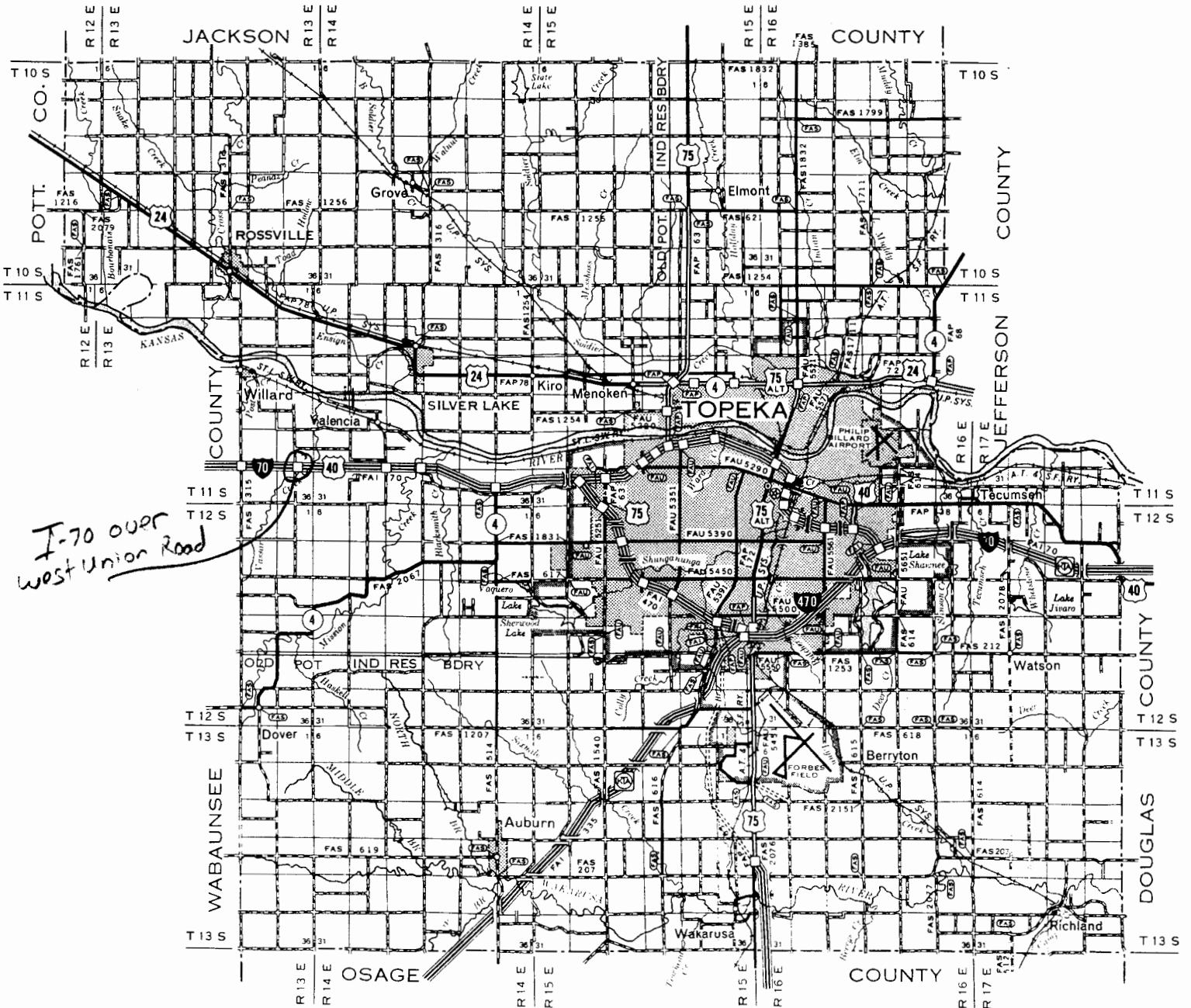


Project # 70-89 K-6358-01

2ABI ✓

I-70 over West Union Rd

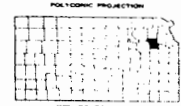
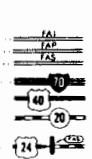


I-70 over West Union Road

LEGEND

- ROADS AND ROADWAY FEATURES**
- PRIMITIVE ROAD
 - UNIMPROVED ROAD
 - GRADED AND DRAINED ROAD
 - SOIL SURFACED ROAD
 - GRAVEL OR STONE ROAD - NOT GRADED OR DRAINED
 - GRAVEL OR STONE ROAD - GRADED AND DRAINED
 - GRAVEL OR STONE ROAD WITH STABILIZED SURFACE
 - BITUMINOUS ROAD-LOW TYPE
 - PAVED ROAD
 - DIVIDED HIGHWAY
 - HIGHWAY WITH FULL CONTROL OF ACCESS AND INTERCHANGE

- ROAD SYSTEM DESIGNATION**
- FEDERAL-AID INTERSTATE HIGHWAY SYSTEM
 - FEDERAL-AID PRIMARY HIGHWAY SYSTEM
 - FEDERAL-AID SECONDARY HIGHWAY SYSTEM
 - INTERSTATE NUMBERED HIGHWAY
 - U.S. NUMBERED HIGHWAY
 - STATE HIGHWAY SYSTEM OR STATE NUMBERED HIGHWAY
 - END OF DESIGNATED SYSTEM OR MARKED ROUTE



FA SYSTEM REVISED TO MAR 15 1968

GENERAL HIGHWAY MAP
SHAWNEE COUNTY
KANSAS

KANSAS DEPARTMENT OF TRANSPORTATION
BUREAU OF TRANSPORTATION PLANNING

SCALE
1966



KANSAS DEPARTMENT OF TRANSPORTATION

RTE./CO. 70-89	SOUNDING NO. CD 1	SHEET OF 2
BRIDGE STA. 43+00.686 ^{EB} / _{WB}	PROJ. NO. K-6358-01	BRIDGE NO. ^{70-89-1.490(004) EB} / _{70-89-1.500(003) WB}
SITE NAME I-70 over West Union Road		HOLE STA. 42+979.34m Rt Project ²
GEOLOGIST Randy Billinger	SCALE: 1:100 (10mm = 1 Meter)	DATE 3/5/01
DRILLER Rob Veruyneck	RIG TYPE Mobil B-61	TOP HOLE ELEV. 296.32
GROUNDWATER ELEV. 292 ⁷⁶	TOTAL DEPTH 13 ⁷⁶ m	M/B ELEV. 293.28

BIT TYPE	GEOLOGIC NAME	STRATIGRAPHIC COLUMN	DEPTH	ELEVATION	CLASSIFICATION OF MATERIALS DESCRIPTION AND REMARKS	UNCONFINED COMPRESSION	STANDARD PENETRATION OR CASING DRIVE	
							BLOWS	ELEV
			0 ⁰	296.32				
	Mantle			296 295 294	Silty clay with some small gravel.			
			3 ⁰⁴	293 ²⁸				
	Elmont Limestone Member	Willard Shale Formation	4 ¹¹	292 ²¹	Shale, weathered, Olive & tan.			
			5 ²¹	291 ¹¹	Limestone, weathered, platy to blocky, shaly, brown.	46,693	Sample 1	291 ⁸⁷
	Harveysville Shale Member			290	Shale, gray, firm. Several thin limy stringers.	1,528.6	Sample 2	290 ³²
				289		1,176.9	Sample 3	289 ⁰¹

SOUNDING NO. <u>CD 1</u>		PROJECT NO. <u>K-6358-01</u>		SHEET <u>2</u> OF <u>2</u>					
DATE <u>3/5/01</u>		RTE./CO. <u>70-89</u>		TOTAL DEPTH <u>13² m</u>					
BIT TYPE	GEOLOGIC NAME	STRATIGRAPHIC COLUMN	DEPTH	ELEVATION	CLASSIFICATION OF MATERIALS DESCRIPTION AND REMARKS	UNCONFINED COMPRESSION	STANDARD PENETRATION OR CASING DRIVE		
							BLOWS	ELEV	
	Harvestville Shale	Core 3	8 ⁶²	288	Shale, gray, firm.	985.8	Sample 4	288 ²⁵	
					287 ²⁰				
	Reading Limestone Member	Core 4		287	Limestone, hard, light gray, massive.	2,243.2	Sample 5	287 ⁰⁹	
	Auburn Shale Formation	Core 5	10 ⁰⁸	286	Mudstone with shaly breaks, hard, gray-green.	13,847.7	Sample 6	286 ²⁴	
					286		4,257.5	Sample 7	285 ⁷⁵
						285		10,662.7	Sample 8
	Auburn Shale Formation	Core 6	11 ⁷⁰	284	Shale, green, firm, limy.	23,461.1	Sample 9	284 ⁰⁹	
						284		2,892.5	Sample 10
	Auburn Shale Formation	Core 7	12 ⁶¹	283	Mudstone, hard, green.	15,038.3	Sample 11	283 ⁴²	
						283			
			13 ⁷¹	282	282.61 Total Depth	18,593.1	Sample 12	282 ⁷⁰	
				282					
				281					

I-70 over West Union Road Core Hole #1

Project No. 70-89 K-6358-01

	<u>Elevation</u>	<u>Depth</u>		
Core Hole #1	296.32	0.00	Set casing. Casing started to refuse around 2.8 m.	
Sta. 42+979			Silty clay with some limestone gravel in the casing.	
34 m Rt. Project C.L.	293.28	3.04	Shale, weathered, olive and tan.	Willard
Water Level 3.56 m	292.51	3.81	Start coring.	Shale
Water Elevation 292.76				
Date Drilled 3/05/01				
Core # 1	292.51	3.81	Shale, weathered, olive.	
3.81 to 5.33 m	292.21	4.11	Limestone, blocky, weathered, rusty brown.	Elmont
Cut 1.52 m	291.57	4.75	Limestone, very platy, weathered, brown.	Ls.
Recovered 1.43 m	291.42	4.90	Limestone, blocky, weathered, rusty brown.	
RQD = 58%	291.27	5.05	Shale, weathered, tan.	
	291.17	5.15	Limestone, platy, gray.	Member
	291.11	5.21	Shale, firm, gray.	Harveyville Shale
	290.99	5.33	End Core 1.	Member
			Sample 1 4.29 to 4.45 Limestone, weathered, brown.	
Core # 2	290.99	5.33	Shale, firm, gray, clayey.	Harveyville Shale
5.33 to 6.85 m	289.47	6.85	End core 2.	Member
Cut 1.52 m				
Recovered 1.52 m			Sample 2 5.79 to 6.00 Shale, gray.	
RQD = 100%				
Core # 3	289.47	6.85	Shale, gray.	Harveyville
6.85 to 8.38 m	289.01	7.31	Limestone stringer, gray.	Shale
Cut 1.52 m	288.95	7.37	Shale, gray.	Member
Recovered 1.43 m	288.86	7.46	Limestone stringer, gray.	
RQD = 95%	288.80	7.52	Shale, limy, gray.	
	288.22	8.10	Shale, firm, gray, clayey.	
	287.94	8.38	End core 3.	
			Sample 3 7.16 to 7.31 Shale, gray, clayey.	
			Sample 4 7.90 to 8.07 Shale, gray, limy.	
Core # 4	287.94	8.38	Shale, gray, clayey, firm.	Harveyville Sh. Mbr.
8.38 to 9.75 m	287.70	8.62	Limestone, light-gray to gray-white, massive.	
Cut 1.37 m			Lower 0.4 m brecciated.	Reading Limestone
Recovered 1.37 m	286.57	9.75	End core 4.	Member
RQD = 96%			Sample 5 9.02 to 9.23 Limestone, gray-white.	

I-70 over West Union Road Core Hole #1

Project No. 70-89 K-6358-01

	<u>Elevation</u>	<u>Depth</u>		
Core # 5	286.57	9.75	Limestone, hard, light gray, massive, brecciated.	
9.75 to 10.97 m	286.24	10.08	Shale break, gray-green.	
Cut 1.21 m	286.02	10.30	Limestone, shaly, gray.	Auburn Shale
Recovered 1.18 m	285.93	10.39	Shale, limy, gray, hard.	Formation
RQD = 100%	285.69	10.63	Limestone/mudstone, light gray-green.	
	285.35	10.97	End core 5.	
			Sample 6 9.87 to 10.08 Limestone, hard, massive.	
			Sample 7 10.39 to 10.57 Shale, gray-green, limy.	
			Sample 8 10.82 to 10.94 Mudstone, light gray-green.	
Core # 6	285.35	10.97	Limestone, light gray, massive.	Auburn Shale
10.97 to 12.46 m	284.62	11.70	Shale, green, firm, clayey.	Formation
Cut 1.49 m	284.22	12.10	Shale, green, limy, blocky, firm.	
Recovered 1.49 m	283.86	12.46	End core 6.	
RQD = 96%				
			Sample 9 11.24 to 11.43 Limestone, light gray.	
			Sample 10 11.79 to 11.97 Shale, green.	
Core # 7	283.86	12.46	Shale, green, limy, firm.	Auburn
12.46 to 13.71	283.71	12.61	Mudstone, hard, green and tan-green.	Shale
Cut 1.24 m	282.94	13.38	Mudstone, green, harder.	Formation
Recovered 1.24 m	282.61	13.71	End core 7. Total depth. End core hole 1.	
RQD = 100%				
			Sample 11 12.74 to 12.90 Mudstone, green.	
			Sample 12 13.47 to 13.62 Mudstone, green, earthy.	

Kansas Department of Transportation

Report of sample of Shelby/Geology Cores

Laboratory No. 01-522

Date Reported. March 19, 2001

Date Received. March 8, 2001

Specification No. -- Quantity ---

Source of material Project

Sample from Project

Submitted by Delmar Thompson, Lawrence Regional Geology Office

Identification marks Tags with samples

Project or POV 70-89 K-6358-01, Shawnee County

Type of construction Bridge I-70 over West Union Road CD #1

TEST RESULTS

Sample No.	Station	Dist. m	Depth m	Description	Qu. kPa	Dry Unit Weight kg/m ³	Moisture (% of Dry Wt.)
S# 1	42+979	34 RT	4.29-4.45	Limestone, Weathered	49,693.0	2,499	3.0%
S# 2	"	"	5.79-6.00	Shale, Gray	1,528.6	2,161	9.5%
S# 3	"	"	7.16-7.31	Shale, Gray	1,176.9	2,016	13.1%
S# 4	"	"	7.9-8.07	Shale, Gray	985.8	1,955	12.8%
S# 5	"	"	9.02-9.23	Limestone, Light Gray, Earthy	2,243.2	2,209	9.3%
S# 6	"	"	9.87-10.08	Limestone, Hard, Massive	13,847.7	2,181	9.9%
S# 7	"	"	10.39-10.57	Shale, Gray-Green	4,257.5	2,171	8.9%
S# 8	"	"	10.82-10.94	Limestone, Light Gray-Green	10,662.7	2,393	5.9%
S# 9	"	"	11.24-11.43	Limestone, Light Gray	23,461.1	2,309	7.0%
S# 10	"	"	11.79-11.97	Shale, Green	2,892.5	2,132	9.7%
S# 11	"	"	12.74-12.90	Mudstone, Green	15,038.3	2,353	6.0%
S# 12	"	"	13.47-13.62	Limestone, Earthy/Mudstone	18,593.1	2,338	6.0%

cc: L.S. Ingram
G.R. Koontz
D. Thompson
J.J. Brennan
Soil Section
File

Reported by: Lee A. Bradford

Title James J. Brennan, Soils Engineer

3-5-01
CD #1
Sta 424979
34 m R+Project 2

	meters	feet
d	295.41 0°	969.19 0°-12 ⁵
	296.32	
	293.28 3.04	10°-12 ⁵
Randy, Pub. B. 11	292.51 3.81	12 ⁵

H₂O 11.7 ft
3.56 m
292.76

Core 1	292.51	3.81
12 ⁵ - 17 ⁵ ft	292.21	4.11
3.81 - 5.33 m	291.57	4.75
Cut 5 ⁰ ft / 1.52 m	286.67	4.90
Recov. 4 ⁷ / 1.43 m	291.27	5.05
RQD = 2 ⁷ / ₅ °	291.17	5.15
= 58%	291.11	5.21
	290.99	5.33

Set casing. Casing started to show
down ground 5 to 10 ft
Silty clay with some ls gravel in
the casing.
Shale, weathered, olive, tan.
Start coring

casing 4° + 7' = 11' + 1⁸ = 12⁹ + 1⁵ = 14⁴
14⁴ - 1⁰ = 12⁵ ft in ground.
3.81 meters

12 ⁵ - 13 ⁵	Shale, weathered, olive	
13 ⁵ - 15 ⁶	LS, blocky, weathered, rusty brown	3.6 ft
15 ⁶ - 16 ¹	LS, very platy, weathered, brown	1.1 m
16 ¹ - 16 ⁶	LS, Blocky, weathered, brown	Elmont
16 ⁶ - 16 ⁹	Shale, weathered, tan	
16 ⁹ - 17 ¹	LS, platy, gray	
17 ¹ - 17 ⁵	Shale, gray, firm	Laweville sh.
17 ⁵	End core 1	

Sample 1
14' - 14⁶ ft LS, weathered, brown
(4.29 - 4.45 meters)
291.87

I-70 over West Union Rd

35

Core 2
 17⁵-22⁵ ft
 5.33 - 6.85 m
 cut 5⁰ ft / 1.52 m
 Recov. 5⁰ ft / 1.52 m
 RQD = 100%

Meters
 290.99 5.33
 289.47 6.85

Feet
 17⁵-22⁵
 22⁵

Shale, firm, gray, clayey
 End core 2

Sample 2 19⁰-19⁷ ft Shale, gray
 (5.79-6.00 m)
 290.32

Core 3
 22⁵-27⁵ ft
 6.85 - 8.38 m
 Cut 5⁰ ft / 1.52 m
 Recov. 4.7 / 1.43 m
 RQD = 95%
 lost 0³

Meters
 289.47 6.85
 289.01 7.31
 288.95 7.37
 288.86 7.46
 288.80 7.52
 288.22 8.10
 8.22
 287.94 8.38

Feet
 22⁵-24⁰
 24⁰-24²
 24²-24⁵
 24⁷-24⁷
 24⁷-26⁶
 26⁶-27⁰
 27⁰-27⁵
 27⁵

Shale, gray
 LS stringer, gray
 Shale, gray
 LS stringer, gray
 Shale, limy, gray
 Shale, firm, gray, clayey
 " " " "
 End Core 3

Harveysville
 Shale

Sample 3 23⁵-24⁰ ft Shale, gray, clayey
 (7.16-7.31 m)
 289.01

Sample 4 26⁰-26⁵ Shale, gray, limy
 (7.9-8.07 m)
 288.25

	Meters		Feet
Core 4	287.94	8.38	27 ⁵ -28 ³
27 ⁵ -32 ⁰ ft	287.70	8.62	28 ³ -28 ⁹
8.38-9.75 m		8.80	28 ⁹ -31 ⁰
Cut 4 ⁵ ft / 1.37		9.44	31 ⁰ - ⁰
Recov. 4 ⁵ ft / 1.37	286.57	9.75	32 ⁰
RQD = 4 ³ / ₄ ⁵ =			
96%			
Core 5	286.57	9.75	32 ⁰ -33 ¹
32 ⁰ -36 ⁰ ft	286.24	10.08	33 ¹ -33 ⁵
9.75-10.97 m	286.02	10.30	33 ⁵ -34 ¹
Cut 4 ⁹ ft / 1.21 m	285.93	10.39	34 ¹ -34 ⁹
Recov. 3 ⁹ ft / 1.18 m	285.69	10.63	34 ⁹ -36 ⁰
RQD = 100%	285.35	10.97	36 ⁰

6
4

I-70 over West Union Rd

36

11-28-82

Harveyville

shale, gray, clayey, firm
LS, earthy, shaly, light gray to grayish white
LS, earthy, light grayish-white, massive bedded. brecciated

End Core 4

sample 5

29⁶-30³ ft LS, light gray-white
(9.02-9.23 m) earthy LS
287.09

LS, hard, light gray, massive bedded, brecciated.

shale, break, gray-green.

Mudstone hard

Shale, limy, gray, hard

Mudstone, earthy light gray-green. (maybe very hard shale?)

End core 5

sample 6 32⁴ to 33¹ ft LS, hard, massive
(9.87-10.08 m)
286.24

sample 7 34¹ to 34⁷ shale, gray-green
(10.39-10.57 m) limy
285.75

sample 8 35⁵-35⁹ LS, light gray-green.
(10.82-10.94 m)
285.38

Reading

Auburn shale

Core 6	285.35	10.97	36 ⁰ -38 ⁴
36 ⁰ -40 ⁹ ft	284.62	11.70	38 ⁴ -39 ⁷
10.97-12.46 m	284.22	12.10	39 ⁷ -40 ⁹
cut 4 ⁹ ft / 1.49 m	283.86	12.46	40 ⁹
Recov. 4 ⁹ ft / 1.49 m			
RQD = 4 ⁹ / 4 ⁹			
= 96%			

Core 7	283.86	12.46	40 ⁹ -41 ⁴
40 ⁹ -45 ⁰	283.71	12.61	41 ⁴ -43 ⁹
12.46-13.71	282.94	13.38	43 ⁹ -45 ⁰
cut 4 ¹¹ ft / 1.24 m	282.61	13.71	45 ⁰
Recov. 4 ¹¹ ft / 1.24 m			
RQD = 100%			

Mudstone
light gray, massive,
shale, green, firm, clayey
shale, green, limy, blocky, firm
End core 6

Auburn shale

Sample 9 36⁹-37⁵ ft LS, light gray
(11.24-11.43 m)
284.89

Sample 10 38⁷-39³ shale, green.
(11.79-11.97 m)
284.35

Shale, green, limy, firm
Mudstone, hard, green & tan-green
mudstone to LS, green, hard.

Auburn shale

End core 7
Total Depth

Sample 11 41⁸-42⁴ ft mudstone, green
12⁷⁴-12⁹
283.42

Sample 12 44²-44⁷ LS, earthy or mudstone
13⁴⁷-13⁶² green
282.7