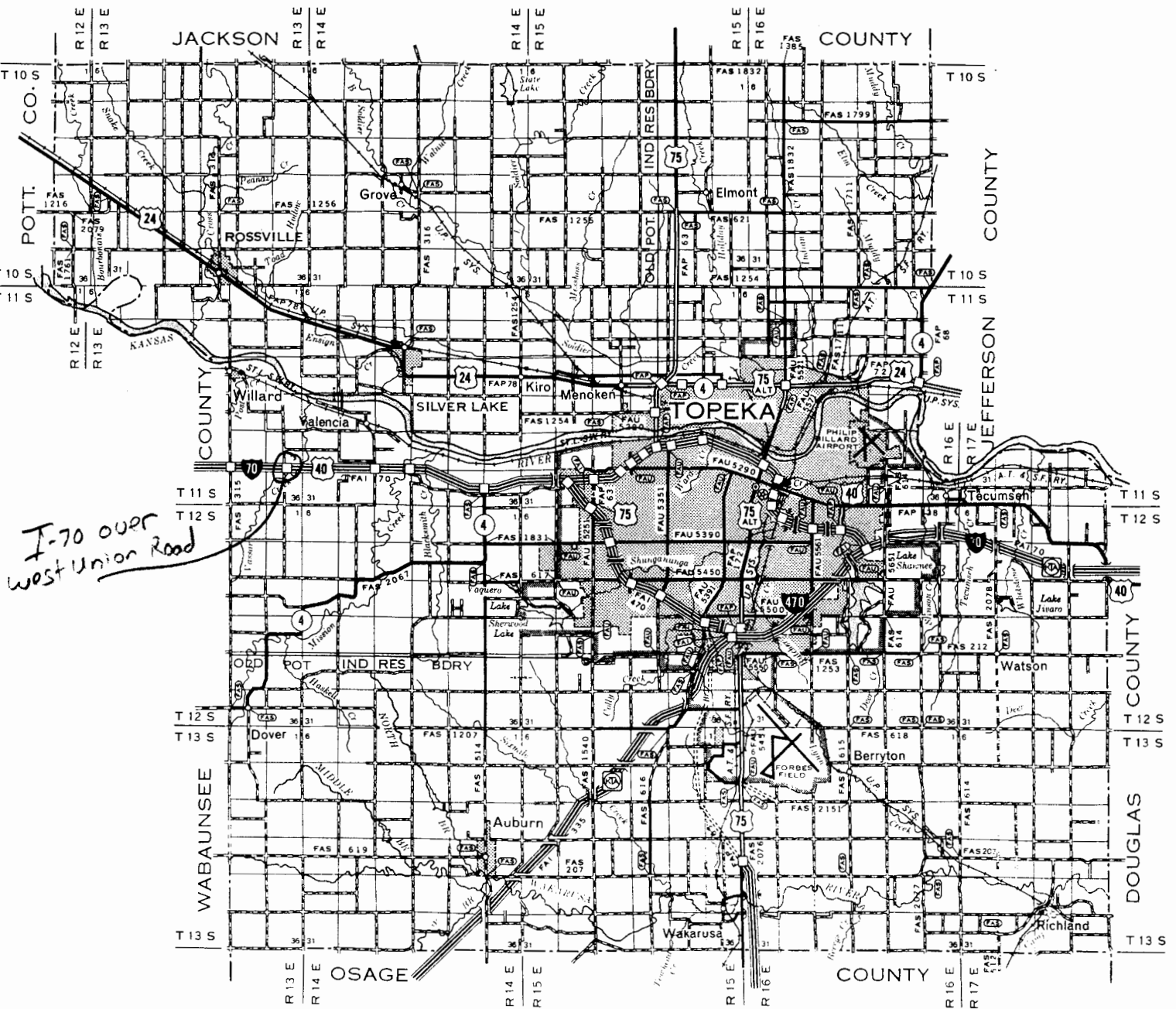


Project # 70-89 K-6358-01

2ABI ✓

I-70 over West Union Rd



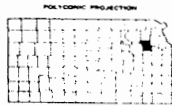
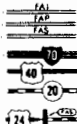
LEGEND

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

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	
GEOLOGIST Randy Billinger	SCALE: 1:100 (10mm = 1 Meter)	DATE 3/5/01
DRILLER Rob Veruynek	RIG TYPE Mobil B-61	TOP HOLE ELEV. 296.32
GROUNDWATER ELEV 292 ⁷⁶	TOTAL DEPTH 13 ²¹ 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	Silty clay with some small gravel.			
				295				
				294				
			3 ⁰⁴	293 ²⁸				
	Elmont Limestone Willard shale Formation			293	Shale, weathered, Olive & tan.			
			4 ¹¹	292 ²¹				
	Member			292	Limestone, weathered, platy to blocky, shaly, brown.	46,693	Sample 1	291 ⁸⁷
			5 ²¹	291 ¹¹				
	Harveyville Shale Member			291	Shale, gray, firm. Several thin limy stringers.			
				290		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>13²¹ m</u>		THE <u>296.32</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 Reading Limestone Member Auburn Shale Formation		Core 3	8 ⁶²	288	Shale, gray, firm.	985.8	Sample 4	288 ²⁵
		Core 4		287 ²⁰	Limestone, hard, light gray, massive.	2,243.2	Sample 5	287 ⁰⁹
		Core 5	10 ⁰⁸	286 ²⁴	Mudstone with shaly breaks, hard, gray-green.	13,847.7	Sample 6	286 ²⁴
		Core 6	11 ⁷⁰	285		4,257.5	Sample 7	285 ⁷⁵
		Core 7	12 ⁶¹	284 ⁶²	Shale, green, firm, limy.	10,662.7	Sample 8	285 ²⁸
				284		23,461.1	Sample 9	284 ⁰⁹
				283 ⁷¹	Mudstone, hard, green.	2,892.5	Sample 10	284 ³⁵
				283		15,038.3	Sample 11	283 ⁴²
				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 Formation
Recovered 1.18 m	285.93	10.39	Shale, limy, gray, hard.	
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 Formation
10.97 to 12.46 m	284.62	11.70	Shale, green, firm, clayey.	
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 Shale Formation
12.46 to 13.71	283.71	12.61	Mudstone, hard, green and tan-green.	
Cut 1.24 m	282.94	13.38	Mudstone, green, harder.	
Recovered 1.24 m	282.61	13.71	End core 7. Total depth.	
RQD = 100%			End core hole 1.	
			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		Depth m	Description	Qu. kPa	Dry Unit	Moisture (% of Dry Wt.)
		Dist. m				Weight kg/m ³	
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	9.75
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. Grand for

Title James J. Brennan, Soils Engineer

3-5-01

CD #1

Sta 42+97.9

34 m R+Project 2

d

meters

feet

~~295.41~~ 0.0

969.19 0.0-12.5

296.32

Set casing. Casing started to show down ground 5 to 10 ft
Silty clay with some ls gravel in the casing.

293.28 3.04

10.0-12.5

Shale, weathered, olive, tan.

292.51 3.81

12.5

Start coring

1 Rndy, Pab. B. 11

H₂O 11.7 ft

3.56 m

292.76

casing $4' + 7' = 11' + 1' = 12' + 1' = 14'$

$14' - 1' = 12.5$ ft in ground.
3.81 meters

Core 1

12.5 - 17.5 ft

3.81 - 5.33 m

Cut 5 ft / 1.52 m

Recov. 47 / 1.43 m

RQD = $27/50$
= 58%

292.51 3.81

12.5-13.5

Shale, weathered, olive

292.21 4.11

13.5-15.6

LS, blocky, weathered, rusty brown

291.57 4.75

15.6-16.1

LS, very platy, weathered, brown

286.67 4.90

16.1-16.6

LS, Blocky, weathered, brown

291.27 5.05

16.6-16.9

Shale, weathered, tan

291.17 5.15

16.9-17.1

LS, platy, gray

291.11 5.21

17.1-17.5

Shale, gray, firm

290.99 5.33

17.5

End core 1

Sample 1

14' - 14.6 ft LS, weathered, brown
(4.29 - 4.45 meters)

291.87

3.6 ft
1.1 m
Elmont
Fayetteville sh.

I-70 over West Union Rd

Core 2
17⁵-22⁵ ft

5.33 - 6.85 m

Cut 5⁰ ft / 1.52 mRecov. 5⁰ ft / 1.52 m

RQD = 100%

Meters

290.99 5.33

289.47 6.85

Feet

17⁵-22⁵22⁵Shale, Firm, gray, clayey
End core 2Sample 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

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

22⁵-24⁰24⁰-24²24²-24⁵24²-24⁷24⁷-26⁶26⁶-27⁰27⁰-27⁵27⁵

Shale, gray

LS stringer, gray

Shale, gray

LS stringer, gray

Shale, limy, gray

Shale, Firm, gray, clayey

" " " "

End Core 3

Harveysville
ShaleSample 3 23⁵-24⁰ ft Shale, gray, clayey
(7.16-7.31 m)
289.01Sample 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 45 ft / 1.37		9.44	31 ⁰ -
Recov. 45 ft / 1.37	286.57	9.75	32 ⁰
RQD = 4 3/4 =			
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 49 ft / 1.21 m	285.93	10.39	34 ¹ -34 ⁹
Recov. 39 ft / 1.18 m	285.69	10.63	34 ⁹ -36 ⁰
RQD = 100%	285.35	10.97	36 ⁰

I-70 over West Union Rd

36

"282

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.
End core 7

Auburn
Shale

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