

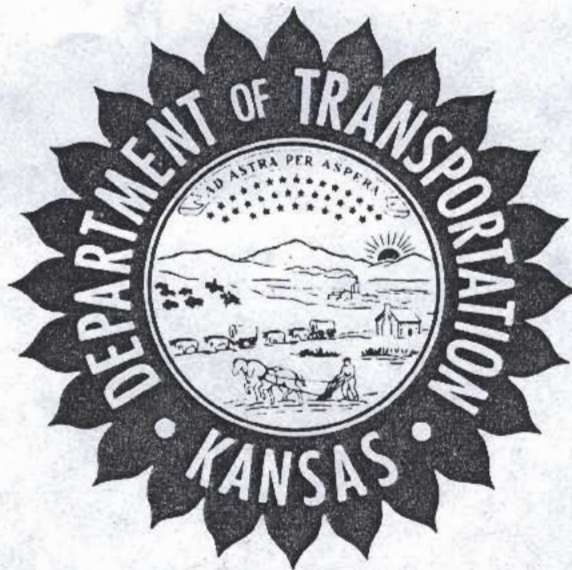
BUREAU of MATERIALS and RESEARCH

GEOTECHNICAL UNIT

GEOLOGY SECTION

BRIDGE FOUNDATION GEOLOGY REPORT

24-75 K 2592-01
US-24 OVER U.P.R.R.
BR. NO. 19.76 STATION 100+00
POTTAWATOMIE COUNTY



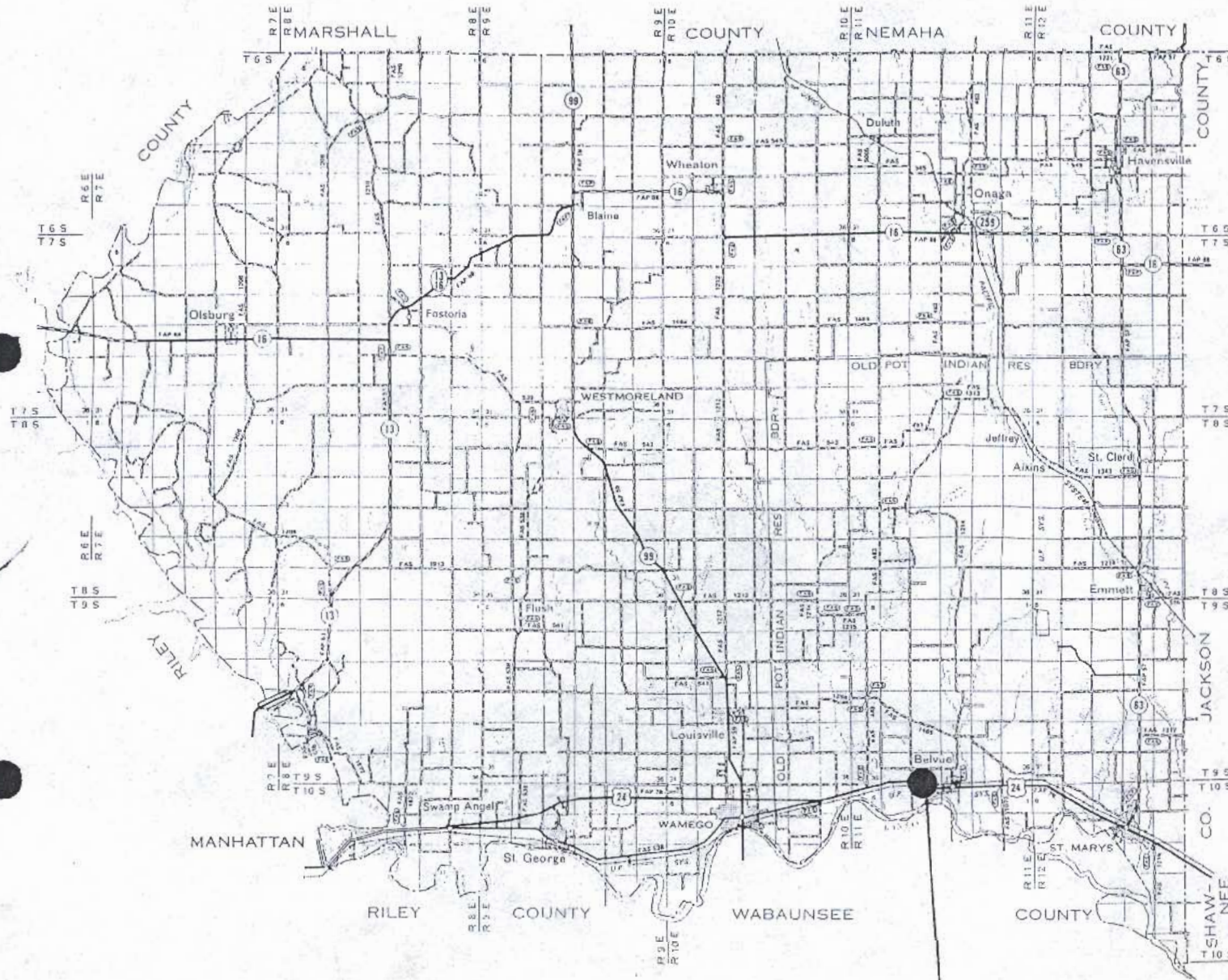
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OCTOBER 1987



ROADS AND ROADWAY FEATURES

- PRIMITIVE ROAD
- UNIMPROVED ROAD
- GRAVEL AND SHARPED ROAD
- SOIL SURFACE ROAD
- GRAVEL OR STONE ROAD - NOT GRADED OR BARRIED
- GRAVEL OR STONE ROAD - GRADED AND BARRIED
- GRAVEL OR STONE ROAD WITH STABILIZED SURFACE
- BIRMINGHAM ROADWAY TYPE
- PAVED ROAD
- DRIVEN HIGHWAY
- HIGHWAY WITH FULL CONTROL OF ACCESS AND INTERCHANGES

LEGEND

- FEDERAL AIR INTERSTATE HIGHWAY SYSTEM
- FEDERAL AND PRIVATE HIGHWAY SYSTEM
- RESERVED AND DESIGNATED HIGHWAY SYSTEM
- INTERSTATE NUMBERED HIGHWAY
- U.S. NUMBERED HIGHWAY
- STATE HIGHWAY SYSTEM
- STATE NUMBERED HIGHWAY
- U.S. OF DESIGNATED SYSTEM OR NUMBERED HIGHWAY



24-75 K 2592-01
 US-24 Over U.P.R.R.
 Br. No. 19.76 Station 100+0
 Pottawatomie County

FA SYSTEM REVISED TO DEC. 15, 1955

GEOLOGY AND FOUNDATION MATERIAL

The alluvium deposit consists predominantly of fine sand with lenses of coarse sand and gravel.

The Hamlin Shale Member is the bedrock that will provide the foundation material. It overlies the Five Point Limestone Member. This Shale Member is composed of different layers of limy, silty, clayey, and multicolored shales.

FIELD TEST PROCEDURES

The footing material was subjected to dynamic field tests and laboratory tests for the determination of bearing capacities. Two Air Hammer Drives, a Casing Drive, Standard Penetration Tests, and Unconfined Compression Tests were made.

The casing drive refused at an elevation of 887.1. It penetrated 0.2 foot into the shale.

The unconfined compression test taken between an elevation of 885.0 to 881.9 shows the compressive strength of the silty shale to be 3.3 T.S.F. The average compressive strength of the siltstone between elevation 881.9 to 866.1 was 9.4 T.S.F.

FOOTING RECOMMENDATIONS

We recommend H-pile be used at the abutment and pier footings. Design pile tip elevations and mantle-bedrock contacts at each location are listed below in tabulated form.

<u>Location</u>	<u>Station</u>	<u>Bedrock Elevation</u>	<u>Design Pile Tip Elevation</u>
Abutment No. 1	98+16.38	887.3	881.5
Pier No. 1	99+16.38	887.9	881.5
Pier No. 2	100+83.63	887.8	881.5
Abutment No. 2	101+83.63	887.7	881.5

If sufficient bearing and penetration into bedrock are achieved before the design pile tip elevation is reached, the pile should be cut off to avoid damage by overdriving.

HYDROLOGY

The groundwater was found to have a hydrostatic level at an elevation of 950.9.

INVESTIGATION PROCEDURES

One core drill sounding and two penetro-hammer drives were made to determine geologic setting at this bridge site.

KANSAS DEPARTMENT OF TRANSPORTATION

COUNTY *Pottawatomie* PROJECT NO. *24-75-K-2592-01* BRIDGE NO. *19.76*

DESCRIPTION _____ STA. _____

GEOLOGIST _____ VERTICAL SCALE _____ DATE _____

BIT TYPE & NO.	GEOLOGIC NAME	GEOLOGIC COLUMN	GROUNDWATER ELEVATION	DEPTH	ELEVATION	GEOLOGIC DESCRIPTION AND REMARKS	UNCONFINED COMPRESSION	STANDARD PENETRATION OR CASING DRIVE	
								BLOWS	ELEV.
					881.8	<i>Core #1, 76'-81' (886.6-881.8)</i>			
						<i>R.O.D. 58%</i>			
						<i>Core Rec. 98%</i>			
					876.8	<i>Core #2, 81'-86' (881.8-876.8)</i>			
						<i>R.O.D. 33%</i>			
						<i>Core Rec. 100%</i>			
					871.8	<i>Core #3, 86'-91' (876.8-871.8)</i>			
						<i>R.O.D. 10%</i>			
						<i>Core Rec. 90%</i>			
					867.3	<i>Core #4, 91'-95' (871.8-867.3)</i>			
						<i>R.O.D. 96%</i>			
						<i>Core Rec. 100%</i>			
					862.3	<i>Core #5, 95'-100' (867.3-862.3)</i>			
						<i>R.O.D. 66%</i>			
						<i>Core Rec. 90%</i>			
					857.3	<i>Core #6, 100'-105' (862.3-857.3)</i>			
						<i>R.O.D. 85%</i>			
						<i>Core Rec. 100%</i>			

KANSAS DEPARTMENT OF TRANSPORTATION

GEOLOGY SECTION

DATE 9-24-87
 WEATHER Warm
 COUNTY Pottawatomie
 BR. NO. 19.76

PARTY
Kotomantz
Bersman
Chapman
Strickland

DIV. 1 ROUTE 24 SEC 75 CL R PROJ. 2592 SEC. AGR CL.

Pier No. 2

T.H. EL. 962.98 STA. 100+83.63 Lt. 100' SDG. NO. 1

DEPTH	0-1	1-2	2-3	3-4	4-5
0-5					
5-10					
10-15					
15-20					
20-25	20	12 32	10 42	14 56	12 68
25-30	17	16 33	13 46	15 61	14 75
30-35	15	17 32	16 48	18 66	20 86
35-40	22	22 44	21 65	20 85	42 127
40-45	25	31 56	29 85	35 120	17 137
45-50	22	22 46	24 70	26 96	21 117
50-55	23	21 44	20 64	19 83	17 100
55-60	23	19 42	14 56	16 72	21 93
60-65	17	23 40	23 63	27 90	24 114
65-70	22	16 38	14 52	15 67	15 82
70-75	15	16 31	29 60	21 81	11 92
75-80	38	324 362			
80-85					
85-90					
90-95					
95-100					
100-105					
105-110					
110-115					
115-120					
120-125					

Ref.
76⁵
886.5

NO. 2 McK. & T. AIR HAMMER TIMED AT SECONDS PER FT.

REMARKS: 19² some firmness, 54² less firm, 75² very firm, 76² hard
76⁴-76⁵, 4 min & no penetration. (887.8)

COMPRESSOR TIME - BEGINNING _____ COMPLETION _____

KANSAS DEPARTMENT OF TRANSPORTATION

GEOLOGY SECTION

DATE 9-
 WEATHER _____
 COUNTY _____
 BR. NO. 19-76

PARTY
cloudy, cool

DIV. 1 ROUTE 20 SEC. CL 15 PROJ. K-2592 SEC. AGR CL. CL.

T.H. EL. 961.23 STA. 99+16.38 ^{Pier #1} SDG. NO. 2

DEPTH	0-1	1-2	2-3	3-4	4-5
0-5					
5-10					
10-15					
15-20					
20-25					
25-30					
30-35	15	7 22	12 34	11 45	9 54
35-40	8	8 16	13 29	26 55	65 120
40-45	17	12 29	14 43	17 60	24 84
45-50	32	24 56	22 78	20 98	19 117
50-55	13	14 27	13 40	16 54	22 78
55-60	14	17 31	19 50	15 65	21 86
60-65	15	13 28	11 39	12 51	25 76
65-70	32	33 65	23 88	22 106	16 122
70-75	15	17 32	18 50	19 124	90 330
75-80					
80-85					
85-90					
90-95					
95-100					
100-105					
105-110					
110-115					
115-120					
120-125					

Ref.
74°
887.23

NO. 2 McK. & T. AIR HAMMER TIMED AT SECONDS PER FT.

REMARKS: 39⁶ firmness, 42⁵ less firm, 50³ limy, 64³ limy,
70 less firm, 73³ hard, 74²-74⁰¹ No penetration.
(887.9)

COMPRESSOR TIME - BEGINNING _____ COMPLETION _____

Survey Notes

Project 24-75-K-2592-01

Br. No. 19.76

US-36 over UPRR G

Pottawatomie County

Sta.	B.S.	H.I.	F.S.	Elev.	Plans - $\frac{1}{4}$ " Rivet & K.D.O.T. Disk Set in E Top S. Hdwl. Sta. 98+85 El. 964.043
BM-12				964.04	
T	2.81	966.85			
CD#1			3.96	962.89	
BM-12			2.81	964.04	
BM-12				964.04	Plans
T	3.71	967.75			
AH#1			4.77	962.98	
BM-12			3.71	964.04	
BM-12				964.04	Plans
T	3.01	967.05			
AH#2			5.82	961.23	
BM-12			3.01	964.04	