

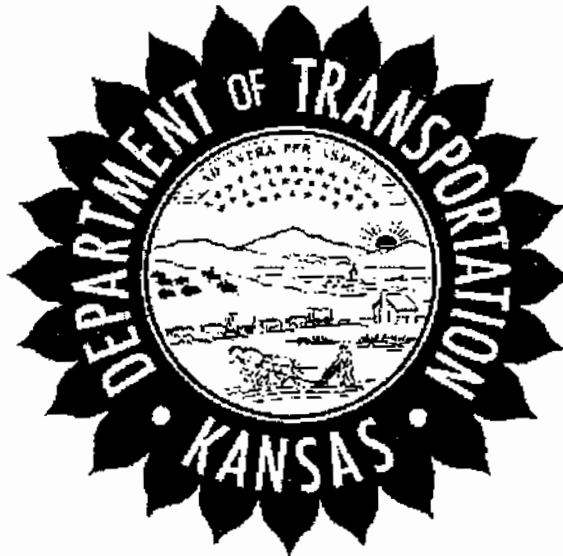
**GEOTECHNICAL UNIT
GEOLOGY SECTION**

GEOLOGY REPORT

16-75 K-5654-01

**Bridge approaches to Vermillion River Bridge (023),
1.26 kilometers (0.78 mile) east of K-259 Jct.**

Pottawatomie County



**GARY R. KOONTZ
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BY

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Delmar Thompson, Regional Geologist**

June 1997

Kansas Department of Transportation

BUREAU OF MATERIALS AND RESEARCH

GEOTECHNICAL UNIT
GEOLOGY SECTION
TOPEKA, KANSAS

July 7, 1998

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Project No. 16-75 K-5654-01
Bridge approaches to Vermillion River Bridge (023),
1.26 kilometers (0.78 mile) east of K-259 Jct.
Pottawatomie County

MEMORANDUM TO: MR. G. DAVID COMSTOCK, P.E.
CHIEF, BUREAU OF DESIGN

ATTENTION: MR. JAMES O. BREWER, P.E.
ENGINEERING MANAGER, STATE ROAD OFFICE

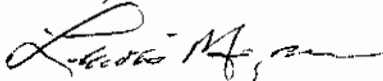
SUBJECT: GEOLOGY REPORT
FINAL DESIGN GEOLOGY REPORT

Three copies of the above report are attached to this memorandum. A generalized geologic section will be drawn on the Microstation Workstation. This file will be placed on the Design file server *Witch* under the filename 5654RC.DGN.

Manually plotted cross sections and centerline profile sheets accompany this report; and should be routed to Mr. Ron Seitz, Road Squad Leader.

If questions arise over the contents of this report, please do not hesitate to contact the Lawrence Regional Geology Office (785) 843-2827

LON S. INGRAM, P.E.
CHIEF, MATERIALS AND RESEARCH

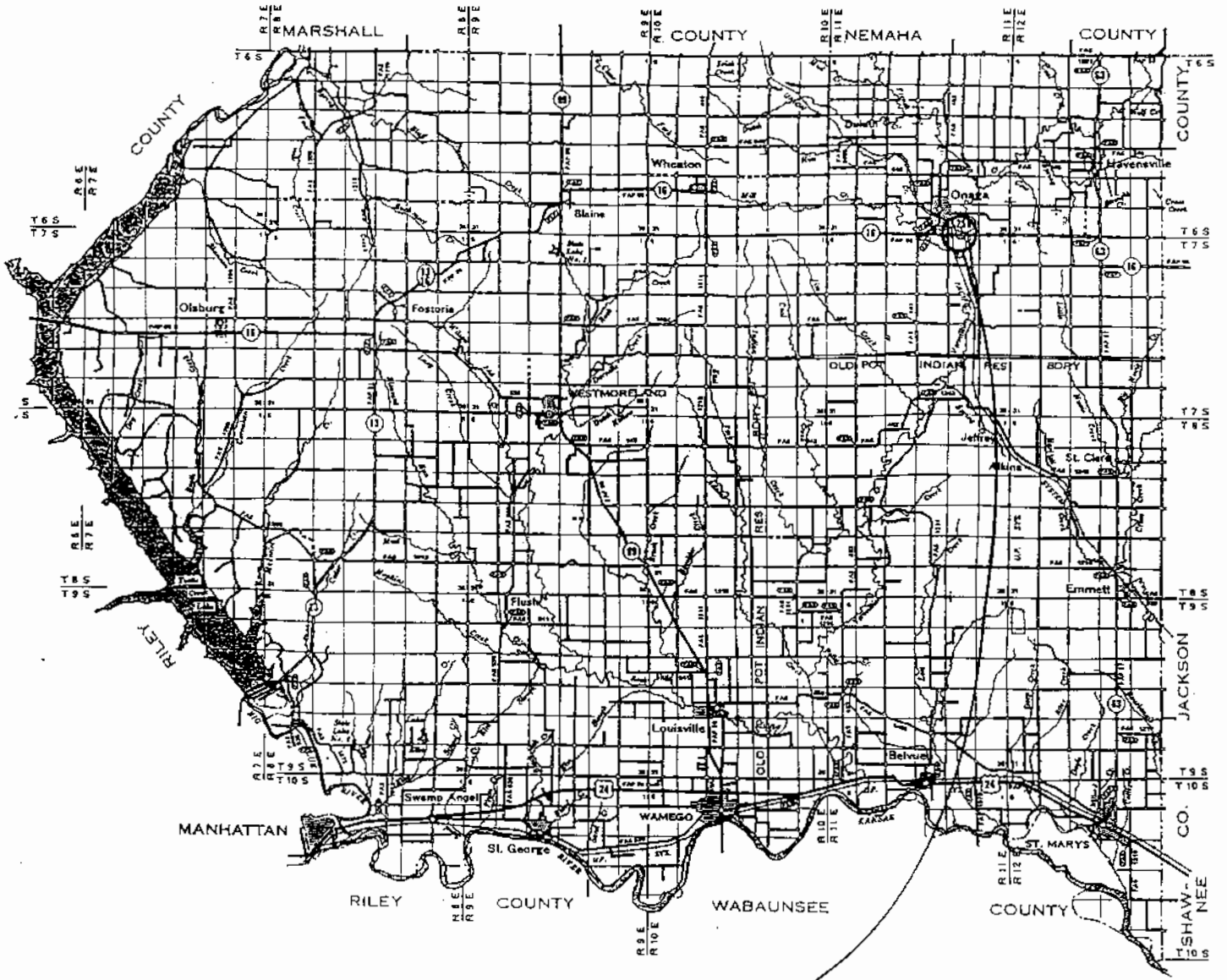


G.N. CLARK, P.E.
GEOTECHNICAL ENGINEER

LSI:GNC:GRK:ds

Attachments

c: Bureau of Construction and Maintenance
District 1
Regional Geology Offices
Project File

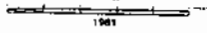


16-75 K-5654-01

Bridge approaches to Vermillion River Bridge (023),
1.26 kilometers (0.78 mile) east of K-259 Jct.

GENERAL HIGHWAY MAP
POTTAWATOMIE COUNTY
KANSAS

Prepared by
KANSAS DEPARTMENT OF TRANSPORTATION
PLANNING AND DEVELOPMENT DEPARTMENT
in cooperation with the
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION



1961

INTRODUCTION

This report presents geological information obtained by the Kansas Department of Transportation through field and laboratory studies and is submitted for use in the design and construction of the project. This report is best utilized in conjunction with the plan-profile and cross-section sheets for the project.

This project covers the bridge approaches to the Vermillion River Bridge (023), 1.26 kilometers (0.78 mile) east of K-259 Jct.

The report is divided into three sections. Section I is a generalized stratigraphic illustration of the thickness of the geologic units occurring in the project area accompanied with a brief description of each unit. Section II includes a discussion of the structure and physical characteristics of the strata that will be encountered in the project area. Section III includes specific information and recommendations pertaining to the design and construction of the project.

CONTENTS

SECTION I	General Geologic Section and Description
SECTION II	Geology of the Project
SECTION III	Engineering Geology Recommendations

SECTION II

GEOLOGY OF THE PROJECT

Soil Mantle

Mantle material consists of unconsolidated brown to dark brown silty to clayey material. The thickness of soil mantle in the area of the project ranges from 0-1.5 m (0-4.9 feet).

Wabaunsee Group

Nemaha Subgroup

Willard Shale Formation

The Willard Shale Formation consists of gray and brown shale and sandstone. The thickness of the Willard observed on this project is 13.7 m (44.95 feet).

Emporia Limestone Formation

Elmont Limestone Member

The Elmont Limestone Member is bluish-gray, blocky limestone. A thin conglomeratic limestone marks the base of the member. The total thickness of the Elmont observed on this project is 1 m (3.28 feet).

Harveyville Shale Member

The Harveyville Shale Member is a gray-green clayey shale. The total thickness of the Harveyville Member observed on this project is 3.1 m (10.17 feet).

Reading Limestone Member

The Reading Limestone Member is a brown, blocky limestone that weathers rust-brown. It contains two horizontal partings and vertical joints. The total thickness of the Reading observed on this project is 0.9 m (2.95 feet).

Auburn Shale Formation

The Auburn Shale Formation is a gray, limy shale that weathers tan-gray. The total thickness of the Auburn was not observed on this project.

SECTION III ENGINEERING GEOLOGY RECOMMENDATIONS

Plotting and Use of Geology

Geologic formations and members have been plotted on the plan-profile and cross-section sheets. Common and rock excavation boundaries within the geologic units are shown on the cross-section sheets.

ICES ROADS GEOLOGY ABBREVIATIONS

Rock	(R)
Common	(C)
Limestone	LS
Shale	SH
Soil Mantle	MANTLE
Willard Formation	WLRD
Elmont Member	ELMM
Harveyville Member	HVVL
Reading Member	RDNG
Auburn Formation	ABRN

Special Notes:

In order to provide more stable slopes, the following slope design modifications should be utilized:

- 1.) Backslope recommendations given in this report are partly based on the performance of the existing backslopes along the project alignment.
- 2.) All bedrock, both shale and limestone, that is 1.5 m or less in thickness and covered only by mantle, should be placed at the same slope as the mantle.

Beginning of Project

Station 10+000 to 10+250

This is a fill section. Backslopes should be placed at 1:3 or flatter.

Station 10+250 to 10+925

This is a cut and fill section with minor cuts for the ditches in the soil mantle. Common excavation should be expected. Backslopes should be placed at 1:3 or flatter.

Station 10+925 to 11+100

This is a cut and fill section with major cuts for the ditches in the soil mantle, the Willard Formation, the Elmont Member, the Harveyville Member, the Reading Member and the Auburn Formation. Both common and rock excavation should be expected.

<u>Unit</u>	<u>Excavation</u>	<u>VMF</u>	<u>Backslope Rec.</u>
MANTLE	C		1:3
WLRD1SHC	C	1.05	1:3
ELMM1LSR	R	1.25	2:1
HVVL1SHC	C	1.05	1:3
RDNG1LSR	R	1.25	2:1
ABRN1SHC	C	1.05	1:3

Due to the nature of existing backslopes and lack of noticeable spalling, benching will not be required for the Elmont and Reading Members. A typical backslope design for Station 11+000 is included with this report.

Station 11+100 to End of Project (11+275)

No changes will be made to the existing roadway for, ditch sections and backslopes through this final portion of the project.

Pre-splitting Note

Pre-splitting of the geologic units on this project will not be required.

Subgrading Note

Subgrading will not be required for this project.

Hydrology

No existing underdrains were found within the area of this project. Hydrology problems are not anticipated for the construction and grading of the roadway improvements

Final Design Geology Report

A Final Design Geology Report will not be required for this project. If any questions arise over the contents of this report please contact the Lawrence Regional Geology Office at (785) 843-2827.

Acknowledgments

The following people should be recognized for their help in obtaining field data and CADD work for this report: **Randy Billinger**, Geologist II, **Bob Bergman**, ET Senior, **Don Kerl**, and **Mike Law**, both ETs and **Dustin Boyd**, utility worker.