STATE HIGHWAY COMMISSION

July, 1954

MEMORANDUM TO: C. Frank Virr
Engineer of Design

FROM: John D. McNeal, Acting Chief Geologist
By J. A. Barnett and L. G. Hitzeman Geologists
V. L. Darland, Regional Geologist

SUBJECT: Geological Report
From Havensville north to county line.
Project No. 63-75-S145 (5)

From Havens ville, No. & East

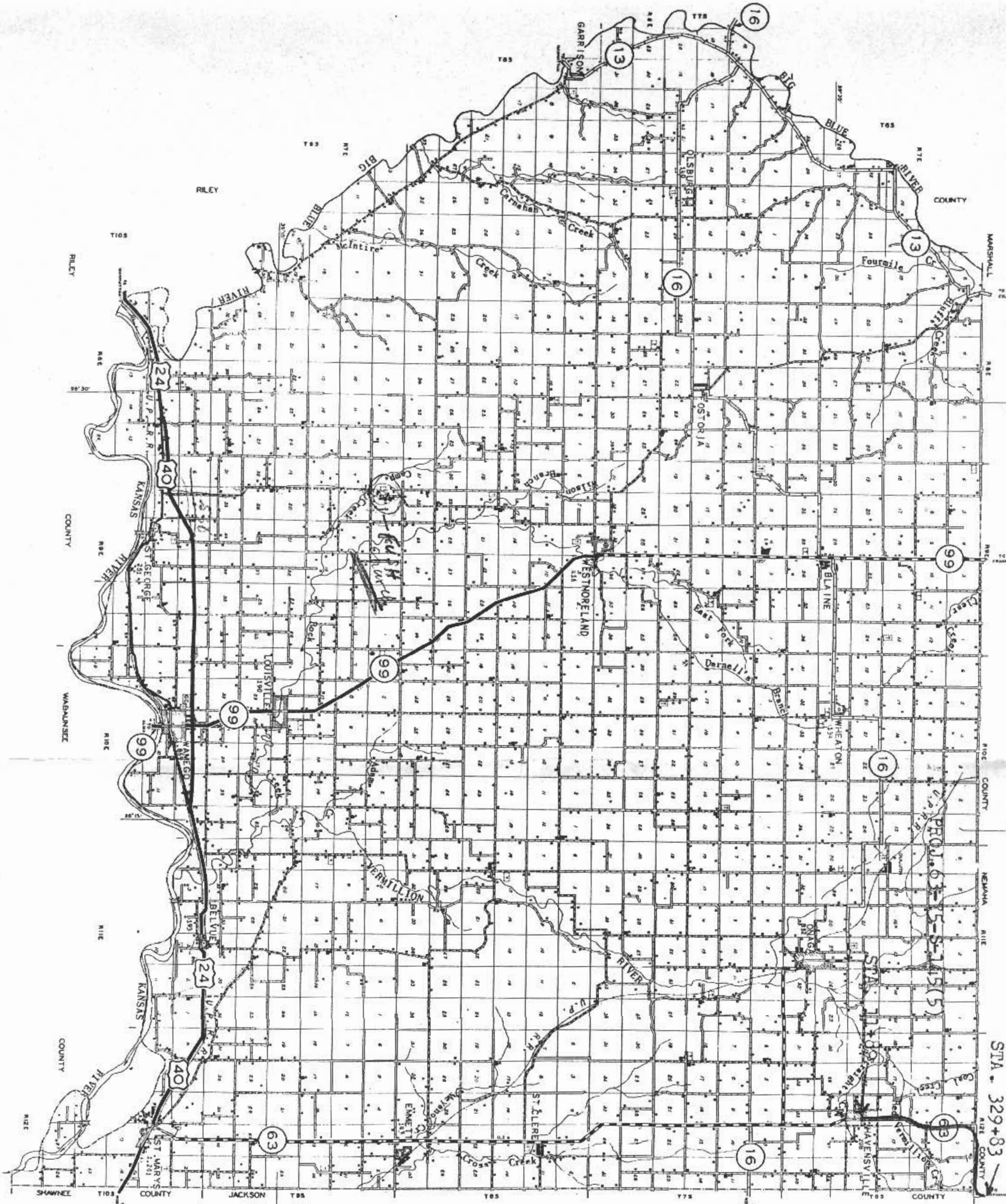
INTRODUCTION

This report presents geological information obtained by the Kansas State Highway Commission through field study and is submitted for use in the design and construction of the above project with reference to the formations that occur and the engineering problems affected by the geology of the project.

The report is divided into four sections for the purpose of grouping the information and discussions of the different phases. This report is intended to be complete within itself, but is best used in connection with the Geo-Engineering survey.

Resume of Sections

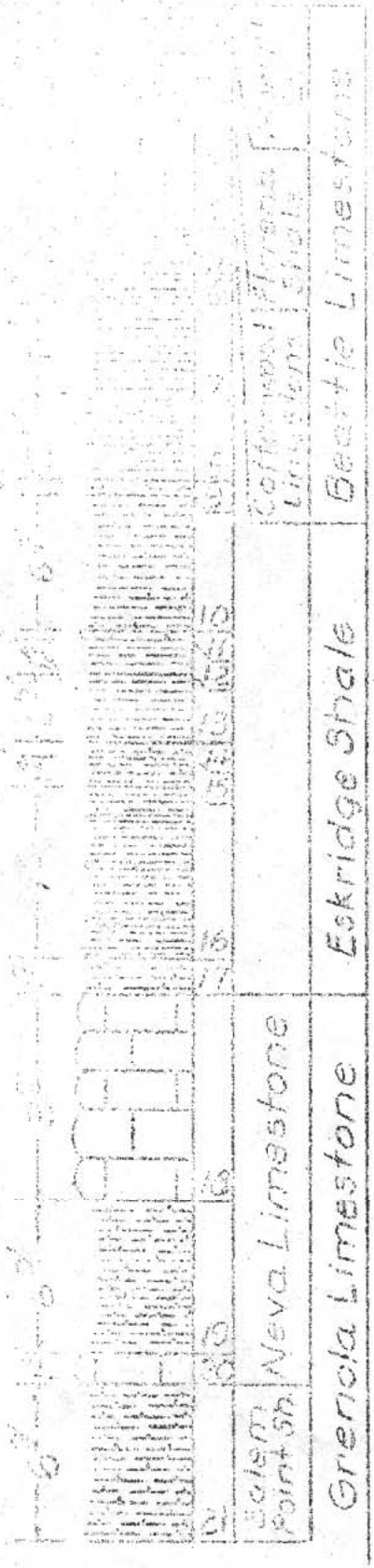
Section I.	Geological Description and Formational Sequence.
Section II.	Geology of the Project.
Section III.	Geo-Engineering Aspects.
Section IV.	Hydrology.



GARRISON
OLSBURG
BIG BLUE RIVER
Carnahan Creek
McIntire Creek
Fourmile Cr.
MARSHALL COUNTY
RILEY
RILEY COUNTY
FOSTORIA
WESTMORELAND
BLAINE
East Fork
Darnell's Branch
WHEATON
LOUISVILLE
Rock Creek
ST. GEORGE
WAMEGO
KANSAS RIVER
U.P. R.R.
WABAUNSEE COUNTY
BELVUE
VERMILLION RIVER
NEMAHA COUNTY
EMMETT
ST. CLERE
HAVENSVILLE
Cross Creek
Vermillion Cr.
ST. MARYS
SHAWNEE COUNTY
JACKSON COUNTY
TO FRANKFORT
PROJ. 63-75-S-145(5)
STA. 329+83
24
40
99
16
13
63

SECTION I

DEVONIAN SYSTEM



Beattie Limestone Formation
Morrill Limestone Member

1. Limestone, grey, weathers buff, shaly, irregular.

Florena Shale Member

2. Shale, grey-green, platy, limy.

Cottonwood Limestone Member

3. Limestone, grey, weathers buff, dense, blocky, contains a few chert nodules.

4. Limestone, grey, weathers buff, dense, blocky, contains a few chert nodules.

Eskridge Shale Formation

5. Shale, lt.-green, weathers tan-grey, blocky.

6. Shale, lt.-green, weathers dark-green, blocky.

7. Shale, mottled maroon and green, platy.

8. Shale, lt.-green, weathers lt.-grey, very platy.

9. Shale, grey, limy, hard.

10. Shale, green, blocky, limy.

11. Limestone, lithographic, porcellaneous glaze.

12. Shale, green, blocky.

13. Shale, maroon, blocky.

14. Shale, green, blocky, limy.

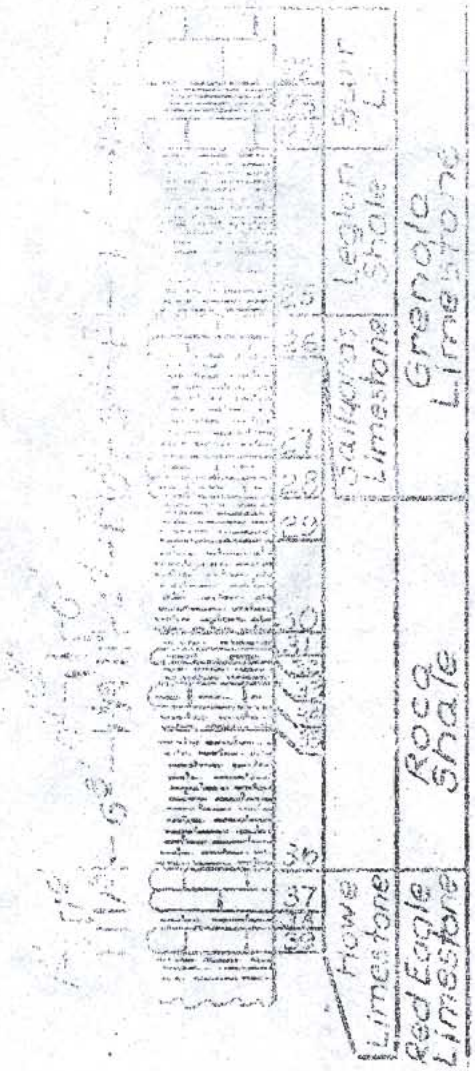
15. Shale, dark maroon, blocky.

16. Shale, maroon and green banded, contains several thin limy zones.

17. Shale, green, blocky, limy.

Granola Limestone Formation

White Limestone Member



18. Limestone, buff, massive.

19. Shale, green, blocky, limy.

20. Limestone, buff, blocky algal.

Salem Point Shale Member

21. Shale, green, blocky, limy.

Burr Limestone Member

22. Limestone, buff, platy, iron stained, upper 0.1 is an ostracod zone.

23. Shale, black, fissile.

24. Limestone, buff, blocky.

Legion Shale Member

25. Shale, green, blocky, contains an impure limestone.

Sallyards Limestone Member

26. Limestone, buff, blocky.

Roca Shale Formation

27. Shale, green, blocky, limy.

28. Limestone, shaly, tan-grey, blocky.

29. Shale, grey to green, platy to blocky.

30. Shale, light bluish-green, limy.

31. Shale, green with maroon mottling, platy.

32. Shaly, Limestone, buff, lensing.

33. Shale, maroon and green, blocky.

34. Limestone, buff, blocky.

35. Limy shale, buff to light green.

36. Shale, green, platy and blocky, limy.

Pennsylvanian System

Brownville Limestone Formation

1. Limestone, lt.-brown, blocky.
2. Shale, blue-grey, weathers tan.
3. Limestone, grey, weathers lt.-brown, platy.

Pony Creek Shale Formation

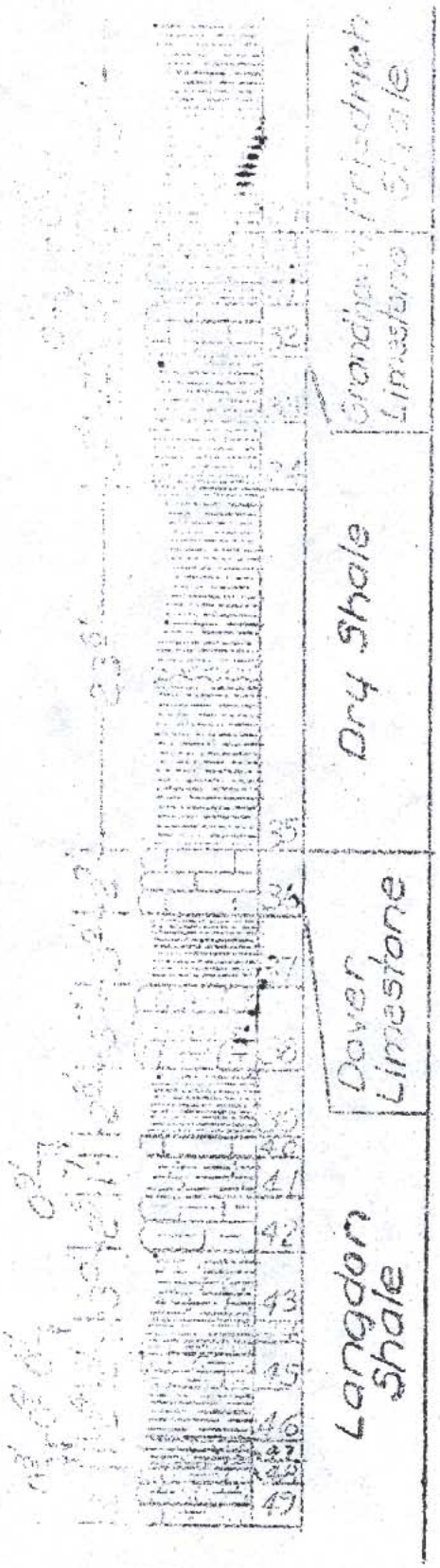
4. Shale, grey-green, blocky.
5. Shaly Limestone, brown, nodular.
6. Shale, maroon mottled with green, sandy.
7. Sandstone, lenses.
8. Shale, blue-green, platy.
9. Limestone, brown, upper portion impure. (Grayhorse Limestone (?))
10. Shale, maroon and green, blocky.
11. Limestone, lt.-grey, slightly sandy.
12. Shale, green, platy, sandy.

Caneyville Limestone Formation
Nebraska City Member

13. Limestone, lt.-brown, platy.

French Creek Shale Formation.

14. Shale, green, platy, contains thin sandstone stringers.
15. Lignite, black, irregular.
16. Shale, grey-green, contains very thin sandstone stringers, platy.
17. Lignite, black.
18. Shale, grey-green, platy, contains thin sandstone stringers.
19. Sandstone, grey, variable.



20. Shale, grey, very sandy.

Elm Creek Limestone Formation.

21. Limestone, grey, blocky, lower 0.4 somewhat impure.

Friedrich Shale Formation

22. Shale, green, blocky, slightly sandy.

23. Sandstone, lt.-brown, lenticular.

24. Sandstone, lt.-grey, shaly.

25. Sandstone, lt.-brown, micaceous.

26. Sandstone, lt. grey-green, very shaly, contains lensing pure sandstones.

27. Shale, green and maroon, sandy.

Grandhaven Limestone Formation

28. Limestone, lt.-grey, blocky.

29. Shale, lt.-grey, platy.

30. Limestone, lt.-grey, blocky.

31. Shale, lt-green, platy.

32. Limestone, lt.-grey, nodular.

Dry Shale Formation

33. Shale, green, blocky.

34. Shale, maroon, blocky.

35. Shale, green, blocky.

Dover Limestone Formation

36. Limestone, grey, weathers buff, blocky.

Langdon Shale Formation

37. Shale, blocky, fissile, lignitic.

38. Sandstone, Argillaceous.

39. Shale, platy, blocky & lignitic.

40. Limestone, argillaceous in lower part.

41. Shale, green, blocky, calcareous.

42. Limestone, partings in center, slightly argillaceous.

43. Shale, blue-grey, blocky.

44. Shale, light-grey brown, slightly arenaceous, micaceous.

45. Sandstone, light-greyish-brown, argillaceous, micaceous.

46. Alternating bands of grey shale & sandstone with a few very thin zones of lignitic.

47. Sandstone, brown impure.

48. Alternating bands of grey shale & sandstone, with a few very thin zones of lignitic.

49. Sandstone, light greyish brown, with laminations of grey shale, very micaceous.

50. Shale, blue-grey, blocky, very sandy & micaceous, ferruginous, lower two feet is a blue-black platy shale, argillaceous.

Maple Hill Limestone Formation.

51. Limestone, grey, weathers brownish-grey.

52. Shale, blue-grey, platy.

53. Limestone, blue-grey, weathers brown, nodular.

54. Shale, blue weathering to brown, platy, clayey.

55. Limestone, blue-grey, blocky.

56. Shale, bluish-grey, to green, platy.

57. Limestone, grey, weathers buff, blocky, argillaceous, contains three horizontal partings.

58. Shale, blue-grey weathers buff, platy.

59. Limestone, blue-grey, weathers buff.

60. Shale, blue-grey, weathers buff, platy.

61. Limestone, dense, blocky, four horizontal partings, grey weathers tan.