Appendix I:

GEOTECHNICAL OVERVIEW

P-004-2014

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M E M O R A N D U M

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DATE: July 2, 2014

SUBJECT: **Franklin County**
US 60 Traffic Study in Frankfort, KY
Mars # 7743401P
Item # 5-275.00
1100 C35 D625 05 FD04 0410 C037 E143
Geotechnical Overview

The Division of Planning is conducting a traffic study in Frankfort, Kentucky on US 60 from US 460 (Georgetown Road) to I-64. There are numerous locations of potential improvements located in the subject area as shown on the supplied project map. This abbreviated review will discuss some general geotechnical concerns with the study area.

The approximate coordinates for this study area is :
- 38.187886 degrees North and -84.830167 degrees West.

Previous Geotechnical reports completed in or near this study area are listed in a table in the attachments to this report. These reports can be accessed in the KYTC Geotechnical Branch data base. A review of these reports was made and findings were incorporated into this document.

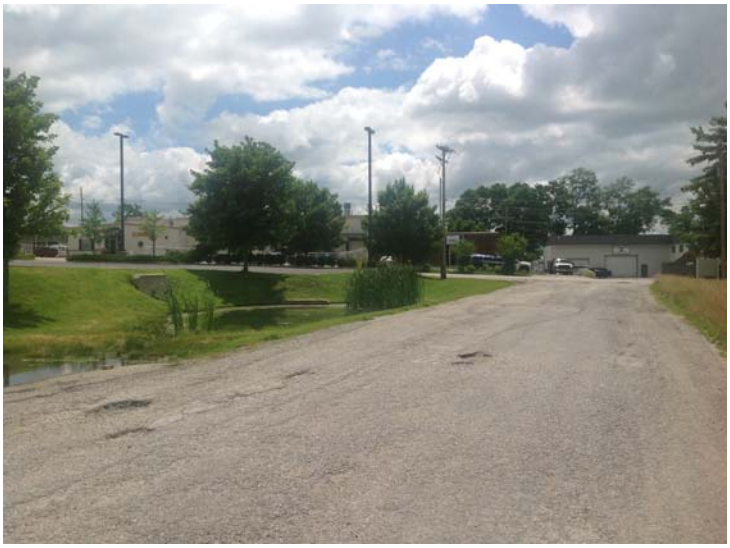
The site is located in the Frankfort East (GQ 707) Geologic Quadrangle. The area of interest is located in the Inner Bluegrass Physiographic Region. Most of the study area is generally characterized by fairly gentle ground slopes with a range in elevation generally less than 100 feet in broad areas.

The Lexington Limestone Formation with its numerous members (designated Ol on the map) is the predominant formation in the study area. The Clays Ferry Formation is also present in the vicinity at higher elevations. The Lexington Limestone formation is generally gray, hard, fine to coarse grained, fossiliferous limestone with some shale partings. Some members of the Lexington Limestone Formation are susceptible to developing karst related issues. The Clays Ferry Formation is primarily interbedded limestone and shale. The shale in this area can be very susceptible to weathering. The mapping indicates a few sinkholes near the study area. Rock cut slopes in the area require site specific design. Cut slopes can generally range from ½:1 to 2:1 depending on the rock and site conditions. No faulting is noted on the available mapping.

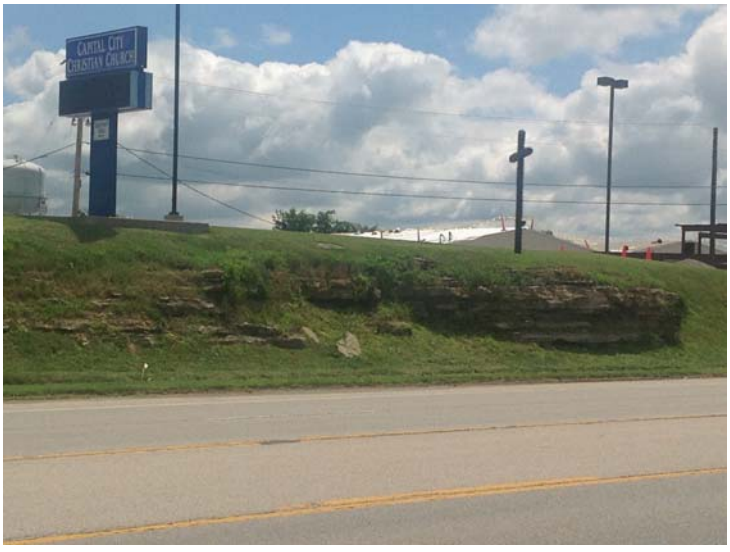
Although mapping does not indicate it, numerous areas of artificial fill should be anticipated due to the amount of development in the area. The limestone members weather to moderately and highly plastic clay soils. Generally, overburden in this part of the study region is relatively thin. There are numerous places on the project where bedrock is outcropped. Most borings available in the study area indicate soil depths of less than 20 feet.

Soils in the area are generally suitable for embankment construction. Generally, embankments built from the native soils can be constructed to a height of 30 feet or more with 2H:1V slopes if the foundation is suitable and proper compaction methods are used. Soil cuts over approximately 10 feet often require analyses to design proper slopes. In no case should soil cuts be steeper than 2H:1V. Suitable rock for embankment construction and rock roadbed is readily available in this area of the state. Shales can be problematic for construction and may require special methods for placement.

California Bearing Ratio (CBR) values used in pavement design generally range from 2-5 for soils subgrades in the area. The use of rock roadbed is a common practice in the area. Wet areas could require undercutting and/or rock stabilization for embankment construction. It is likely that subgrade under existing pavements could be very wet and might require some type of stabilization if pavements are removed.



Wet area and possible subgrade problems on connector road near Early Learning Village.



Rock Outcrop on US 60 @ Capital City Christian Church

Site specific Geotechnical investigations are critical in this region for design.

Please feel free to contact this office for additional information.

Attachments:
GQ Area Map
List of previous Geotechnical Studies in or near area

Franklin County
US-60
Planning Study
I-64 to US-460 Interchange

N

Ending

Beginning

Frankfort East

421
460
60
676
676
2821
1681
64
64

Legend

- Interstates
- US Highways
- State Roads
- Local Roads
- Sinkholes

Lexington Limestone Members

- Ocf Clays Ferry Formation
- Olt Tanglewood Limestone
- Olm Millersburg Member
- Old Devils Hollow Member
- Olb Brannon Member

0 1,000 2,000 4,000 Feet

Report No.	Route	Structure Over	Project Type	Description
S-075-1977	KY-676		Wall	Retaining Walls at Urban Interchange of East-West Connector (KY 676), US 60, & US 421
S-078-2005	US-421		Wall	Franklin Co. - Retaining Wall @ Ramp B Sta. 202+86.7 to 204+91.2 - Structure Report
S-061-1976	KY-676	US-421	State Bridge	Bridge on US 60 over KY 676 at MP 12.020 (US 60/US 421/KY 676 Interchange)
S-077-2005	US-421		Wall	Retaining wall left of center line mainline station 116+25.8 to 118+80.0
R-050-2001	US-421		Roadway	US-421 Widening from Duckers to US-60
R-002-1977	KY-676		Roadway	East-West Connector: From Sta 159+90.73 to Sta 292+00 (Equation 177+07.23 Back = 159+90.73 Ahead)
S-003-1973	US-460		State Bridge	US 460 over US 421
S-048-1975	US-421		State Bridge	Pedestrial Overpass over US 421 at MP 3.310
R-001-1973	US-460		Roadway	Green Mill Interchange - Georgetown Rd Stas 10+00 to 30+00 & Thornhill Bypass Stas 45+00 to 92+00