



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

May 15, 2013

MEMORANDUM TO: William T. Goodwin, P.E.
Bridge Project Development Section Head
PDEA – Bridge Project Development Section

ATTENTION: John Williams, P.E.
Project Development Engineer Supervisor

A handwritten signature in dark ink, appearing to read "John Pilipchuk".

FROM: John Pilipchuk, L.G., P.E.
State Geotechnical Engineer

TIP: B-4777
WBS : 38548.1.2
COUNTY: Madison
DESCRIPTION: Replace Bridges 8 and 9 over the Ivy River on NC 251

SUBJECT: Geotechnical Report for Planning

The Geotechnical Engineering Unit has completed the Geotechnical Impact Report, and presents the following information.

Methods

Madison County Bridge Numbers 8 and 9 on NC-251 over Ivy River were investigated in February of 2013 by the Asheville office of the Geotechnical Engineering Unit. As built structure plans dated 5-16-1938 from the NC DOT Bridge Document Management System provided rock line elevation data at each existing bent foundation for Bridge Number 8 used in this report. Abundant bedrock exposures and rock line data eliminated the need for drilling.

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www.ncdot.gov/doh/preconstruct/highway/geotech

LOCATION:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

Findings

Both bridges are of similar dimensions and founded on concrete. Both bridges are about 25 feet higher than Ivy River which has water approximately 1 to 2 feet deep. Foundations for a former 120 foot long steel truss bridge may be located approximately 60 feet upstream of Bridge Number 8 but were not observed at the time of the site visit. A dam on the Ivy River approximately two and a quarter miles upstream limits the sediment supply to the lower reaches of the Ivy River, yet the river is full of sand.

The tandem bridges are over Ivy River but are also on the French Broad River floodplain. Both rivers are deeply incised with steep and rocky valley sides having 200 to 400 feet of relief and could be called canyons. Floodplains have an intermittent and thin alluvium that is in contact with bedrock, of basement age, identified on the Western Half of the Asheville 100K Quadrangle geologic map as Yeg or Earlies Gap Granulitic Gneiss. Earlies Gap Gneisses are intensely metamorphosed with abundant shearing and mylonization and often have inclusions of other rock types.

Descriptions of the bridges follow the 1938 as built plans concerning bent names with EB1 located at the north end of the bridge. The rock line elevations are rounded to the nearest foot as follows:

<u>Bents on Br. No. 8</u>	<u>Elevation of Rock Line</u>
EB1	1661 ft.
B1	1659 ft.
B2	1659 ft.
B3	1659 ft.
B4	1659 ft.
EB2	1664 ft.

The rock line for Bridge Number 9 is anticipated to be very similar to the rock line of Bridge Number 8.

Groundwater

Groundwater is anticipated to be at or slightly above river levels at elevations of 1662 to 1665 feet.

Anticipated Impacts

Thin alluvium over crystalline rock is suitable for shallow or drilled foundations. Potential for acid producing rock is low.

If there are any questions regarding the geotechnical issues, please contact P.Q. Lockamy, L.G. at 828 298-3874.