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November 19, 2004

Mr. Njoroge Wainaina, P.E.
State Geotechnical Engineer
North Carolina Department of Transportation
PO Box 25201
Raleigh, North Carolina 27611-5201

Re: Bridge Foundation Investigation
State Project: 33321.1.1
TIP No.: B-3877
F.A. Number: BRZ-110(7)
County: Nash
Description: Bridge No. 52 over Turkey Creek on SR 1101 (Claude Lewis Road)

Dear Mr. Wainaina:

The Raleigh, North Carolina office of Froehling & Robertson, Inc. (F&R) is pleased to submit the accompanying Bridge Foundation Investigation Report. Please contact us at your earliest convenience to discuss any comments regarding this report or our services in general.

Sincerely,

Christopher R. Baldwin
Staff Geologist

Elizabeth C. Howey, L.G., P.E.
Project Geotechnical Engineer

NORTH CAROLINA LICENSED SEAL 671 12/9/04 GEOLOGIST ELIZABETH C. HOWEY

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SITE DESCRIPTION

The proposed construction will involve a new three-span bridge to replace an existing three-span bridge on SR 1101 (Claude Lewis Road) over Turkey Creek. The Preliminary General Drawing dated 9/04, indicates the structure will contain span lengths of 65 feet, 65 feet, and 50 feet for an overall length of 180 feet, 59 feet longer than the existing bridge. The proposed skew angle varies from 86°41'40" to 93°18'20".

METHOD OF EXPLORATION

A subsurface investigation was conducted in October, 2004. Eight borings were advanced to depths ranging from 22.3 to 48.8 feet utilizing a CME-550 drill rig with a 140-pound automatic hammer, 2.25 and 3.25 inch inside diameter hollow stem augers, and NQ3 rock coring equipment. Standard penetration tests were performed, in general accordance with ASTM D-1586, at all boring locations to aid in foundation analysis. Representative soil samples were obtained for visual classification in the field and returned to our office for potential laboratory analysis. Ten samples were selected and subjected to grain size, Atterberg Limits, and natural moisture content testing in accordance with AASHTO T-87, T-88, T-89, and T-90 as modified by NCDOT. Four samples of the recovered rock core were trimmed and subjected to unconfined compression strength testing in general accordance with ASTM D 2938.

Elevations were surveyed using a temporary benchmark (TBM #3) consisting of a railroad spike located in a 17" poplar located at Station 27+10 with an elevation of 157.14 feet.

GEOLOGY

Based on review of the *Geologic Map of North Carolina* (1985), the project site is situated in an area mapped as metamorphic rock of the Eastern Slate Belt consisting of metamudstone and meta-argillite (ЄZmd). The recovered core exhibits the characteristics of the meta-argillite. Additional information about the recovered core is discussed below in the Rock Properties section.