



November 8, 2013

Mr. Kamran Khalilian, PE
AECOM Technical Services, Inc.
4840 Cox Road
Glen Allen, Virginia 23060

Subject: Project 12613082, Addendum No. 1, Geotechnical Engineering Report, Route 14 Drainage Improvements, Buckley Hall Road, and Main and Church Streets, Mathews County, Virginia

Dear Mr. Khalilian:

SCHNABEL ENGINEERING CONSULTANTS, INC. (Schnabel) is pleased to submit Addendum No. 1 to our geotechnical engineering report for this project. This addendum was performed in accordance with our proposal dated August 6, 2012 as authorized by AECOM on August 8, 2012.

SCOPE

VDOT has requested additional geotechnical recommendations for support of the proposed drainage structures on this project. We understand the purpose of this request is to help reduce long-term maintenance of the roadways above the proposed drainage structures.

GEOTECHNICAL RECOMMENDATIONS

Drainage Structure Bedding

As indicated in our original report, most of the test borings revealed very loose to loose density natural sands, and very soft to medium consistency clays to a depth of about 45 ft below the ground surface. We consider the near-surface soils suitable for support of the proposed box culverts, horizontal elliptical concrete pipes (HECPs) and junction boxes in part because these facilities are expected to all weigh less than the soils to be excavated for construction. Accordingly, settlements should be limited to recompression of the soils that will be unloaded during excavation.

Culverts, HECPs and junction boxes should be installed in accordance with the VDOT Road and Bridge Specifications (2007) and subsequent addenda. In order to reduce potential recompression settlement, we recommend supporting these structures on a mat of crushed stone reinforced with geogrid. The crushed stone mat should be at least 2 ft thick, and should consist of 12 inches of VDOT No. 25 or 26 aggregate over at least 12 inches of VDOT No. 57 crushed stone.

AECOM Technical Services, Inc.
Route 14 Drainage Improvements, Mathews County, VA

The VDOT No. 57 crushed stone should be underlain by a layer of drainage geotextile placed directly on the subgrade, and a layer of geogrid placed directly on the drainage geotextile. The crushed stone mat should extend at least 5 ft beyond the limits of the drainage structures as illustrated on attached Figure 3, Bedding Detail. The crushed stone mat should be uniformly compacted in place.

The geotechnical drainage fabric should meet the requirements of Section 245.03(c) of the VDOT Road and Bridge Specifications. Mirafi 180N meets the requirements of this section and is recommended for this project because of its drainage characteristics and strength. Tensar BX1100 geogrid is also recommended for use on this project.

We evaluated the use of lightweight fill materials as a substitute for VDOT No. 57 aggregate below the drainage structures. However, the difference between the unit weights of lightweight fill at about 60 pounds per cubic foot (pcf) and VDOT No. 57 crushed stone at about 105 pcf for a 1-ft thick layer does not significantly reduce stresses below the structures and potential settlement, and will probably not warrant the additional cost.

Excavations for the crushed stone mats will likely encounter ground water on much of this site. The contractor should be prepared to dewater the excavations as needed. The contractor should also consider placing the crushed stone mat as excavation proceeds from one end of the structure to the other in order to protect the subgrades during construction.

GENERAL

The other recommendations included in our Geotechnical Engineering Report dated October 1, 2012 remain unchanged. Refer to that report for details.

We have endeavored to complete the services identified herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions as this project. No other representation, express or implied, is included or intended, and no warranty or guarantee is included or intended in this report, or any other instrument of service.

AECOM Technical Services, Inc.
Route 14 Drainage Improvements, Mathews County, VA

We appreciate the opportunity to be of service for this project. Please call us if you have any questions regarding this report.

Sincerely,
SCHNABEL ENGINEERING CONSULTANTS, INC.



Benedictus K. Azumah, EIT
Staff Engineer



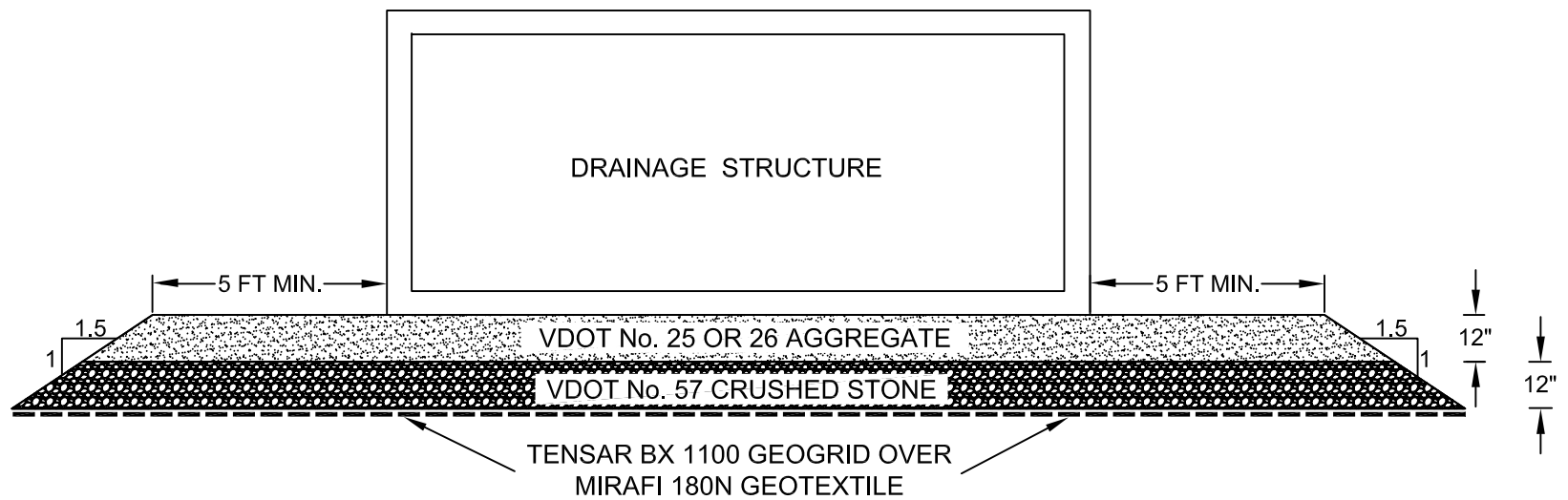
Edward G. Drahos, PE
Senior Reviewer



EGD:BKA:ms

Figure 3: Bedding Detail

- c: Ms. Annette F. Adams, PE
- Mr. Kevin Northridge, PE
- Mr. James Brent, PE
- Mr. Alex E. Teklu, PE
- Mr. Frederick Proper, PE.
- Mr. Sean P. Trapani, PE
- Mr. J. Scott Hodge, PE
- Ms. Sara Lajoie, P.E.



ROUTE 14 DRAINAGE IMPROVEMENTS
BUCKLEY HALL ROAD, AND MAIN AND
CHURCH STREETS,
MATHEWS COUNTY, VIRGINIA

Figure Name:
BEDDING DETAIL

Project Number:
12613082

Done:
B. AZUMAH

Reviewed:
E. DRAHOS

Figure Number:
3

Date:
NOV 2013