STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

June 11, 2012

Addendum No. 1
RE: Contract ID C202823
WBS # 33791.3.1
F. A. # BRSTP-17(41)
Pasquotank County (B-4599)
Bridges #1 and #2 Over Knobb's Creek On US-17/158

June 19, 2012 Letting

To Whom It May Concern:

Reference is made to the plans furnished to you on this project.

The following revision has been made to the Roadway plans:

On Sheet Nos. 2, 3-A, 5, 7 and 8 a note has been added concerning "Aggregate Subgrade". Please void Sheet Nos. 2, 3-A, 5, 7 and 8 in your plans and staple the revised Sheet Nos. 2, 3-A, 5, 7 and 8 thereto.

The following revisions have been made to the Cross-Section plans:

Sheet Nos. X-12 and X-13 have been revised to add a note concerning "Aggregate Subgrade". Please void Sheet Nos. X-12 and X-13 in your plans and staple the revised Sheet Nos. X-12 and X-13 thereto.

The following revisions have been made to the proposal:

New Page Nos. 60A thru 60F have been added to include the project special provision entitled "Aggregate Subgrade". Please staple New Page Nos. 60A thru 60F after Page No. 60 in your proposal.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
CONTRACT STANDARDS AND DEVELOPMENT UNIT
1591 MAIL SERVICE CENTER
RALEIGH NC 27699-1591

TELEPHONE: 919-707-6900
FAX: 919-250-4119
WEBSITE: WWW.NCDOT.ORG

LOCATION:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

On the new item sheets the following pay items have been added:

Item	Description	Old Quantity	New Quantity
191-0234000000-E-SP	Shallow Undercut	**NEW ITEM**	**150 CY**
192-0241000000-E-SP	Geogrid	**NEW ITEM**	**450 SY**
193-0241000000-E-SP	Nonwoven Separation Geotextile	**NEW ITEM**	**450 SY**
194-0241000000-E-SP	High Strength Geotextile	**NEW ITEM**	**450 SY**
195-0255000000-E-SP	Class IV Subgrade Stabilization	**NEW ITEM**	**250 TON**

The Contractor's bid must include these new pay items. The contract will be prepared accordingly.

The Expedite File has been updated to reflect these revisions. Please download the Expedite Addendum File and follow the instructions for applying the addendum. Bid Express will not accept your bid unless the addendum has been applied.

Sincerely,

R. A. Garris, PE
Contract Officer

RAG/jag
Attachments

cc: Mr. Jon Nance, PE
Mr. Ron Hancock, PE
Mr. Jerry Jennings, PE
Ms. D. M. Barbour, PE
Mr. J. V. Barbour, PE
Mr. Njorge Wainaina, PE
Ms. Lori Strickland
Project File (2)
Mr. R.E. Davenport, PE
Ms. Natalie Roskam, PE
Ms. Penny Higgins
Ms. Jaci Kincaid
Mr. Ronnie Higgins
Mr. Larry Strickland
Ms. Marsha Sample

AGGREGATE SUBGRADE (SPECIAL)

Description

Construct aggregate subgrades with shallow undercut in accordance with this special provision. Install geogrid and nonwoven separation geotextile or alternatively install high strength geotextile and place Class IV subgrade stabilization at locations shown on the plans or as determined by the Engineer.

Materials

Refer to Division 10 of the *Standard Specifications*:

Item	Section
Anchor Pins	1056
Select Material, Class IV	1016
Wire Staples	1060-8(D)

Use Class IV, select material for Class IV subgrade stabilization.

Geogrid

The Geogrid shall be biaxial geogrid composed of polypropylene. The biaxial geogrid shall be a regular network of integrally connected elements with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil. The geogrid shall have high tensile modulus in relation to the soil being reinforced and shall also have a high continuity of tensile strength through all of its elements. The geogrid shall be dimensionally stable and able to retain its geometry under construction stresses. The material shall have high resistance to ultraviolet degradation and to all forms of chemical and biological degradation encountered in the soil being reinforced.

Geogrids used must meet the following properties:

MINIMUM GEOGRID PROPERTY VALUES

Geogrid Properties	Test Method	Machine Direction MD	Perpendicular to Machine Direction (Cross-Machine Direction)
Aperture Size –(in.)	Direct Measure	1.0 to 2.0	1.0 to 2.0
Wide Width Strip Tensile Strength at 5% Strain (lb/ft)	ASTM D 6637-01	700	700
Wide Width Strip Tensile Strength – Ultimate Strength (lb/ft)	ASTM D 6637-01	1200	1200
Ultimate Junction Strength (lbs/ft)	GRI-GG2-05	600	600
Aperture Stability (m-N/deg)	U.S. Army C.O.E.*	0.65	0.65

*The Aperture Stability is based on resistance to in-plane rotational movement measured by applying a 20 kg-cm (2 m-N) moment to the central junction of a 9 inch by 9 inch specimen at its perimeter in accordance with the U.S. Army Corps of Engineers Methodology for measurement of Torsional Rigidity.

mg = milligram
cm = centimeter
m = meter
N = Newton

Unless indicated otherwise, values shown are minimum average roll values (MARV) determined in accordance with ASTM D-4759-02. Multiple layers of geogrid used to meet the requirements set forth in the preceding table will not be accepted.

Acceptance Requirements - The actual minimum average roll values furnished by the manufacturer must be based on representative test results from the manufacturing plant which produced the geogrid, and must meet or exceed each of the specified minimum values. Label all geogrids clearly as being part of the same production run certified as meeting all applicable requirements.

Furnish a Type 1 Certified Mill Test Report for the geogrid in accordance with Article 1056-3 of the *Standard Specifications*; however, the material shall be subject to inspection, test, or rejection by the Engineer at any time. If requested by the Engineer, provide a sample of the geogrid for testing.

Nonwoven Separation Geotextile

The nonwoven separation geotextile must meet the following properties:

MINIMUM NONWOVEN SEPARATION GEOTEXTILE PROPERTY VALUES

Nonwoven Separation Geotextile Properties	**Test Method**	**Minimum Requirements are for both Machine and Cross-Machine Directions**
Grab Strength (lb)	ASTM D 4632-08	160
Puncture Strength (lb)	ASTM D 6241-04	310
Trapezoidal Tear (lb)	ASTM D 4533-04	60
Max. Apparent Opening Size (US Sieve #)	ASTM D 4751-04	60
Permittivity (sec-1)	ASTM D 4491-99a	0.05
Ultraviolet Degradation (% Retained Strength at 500 hr)	ASTM D 4355-04	50
Polymer Type		Polyester (PET) or Polypropylene (PP)

Furnish a Type 1 Certified Mill Test Report for the nonwoven separation geotextile in accordance with Section 106-3 of *Standard Specifications*; however, the material shall be subject to inspection, test, or rejection by the Engineer at any time. If requested by the Engineer, provide a sample of the geotextile for testing.

High Strength Geotextile

The geotextile shall be made of high-tenacity polyester in the machine direction with a plain or straight-warp weave pattern and polyester or polypropylene in the cross machine direction or approved equal. The geotextile shall be composed of strong rot-proof synthetic fibers formed into a geotextile of the woven type. The geotextile shall be free of any treatment or coating which might significantly alter its physical properties after installation.

The geotextile shall contain stabilizers and/or inhibitors to make the filaments resistant to deterioration resulting from ultraviolet or heat exposure. The geotextile shall be a pervious sheet of synthetic fibers oriented into a stable network so that the fibers retain their relative positions with respect to each other. The edges of the geotextile shall be finished to prevent the outer yarn from pulling away from the geotextile. The geotextile shall be free of defects or flaws which significantly affect its physical and/or filtering properties. Sew sheets of geotextile together with a seam that furnishes the required minimum strengths, when sewing is required. The seam thread shall be made of synthetic fibers which are resistant to deterioration, as are the geotextile fibers. Lamination of geotextile sheets to produce the physical requirements of a geotextile layer will not be accepted.

The geotextile shall meet the following physical requirements:

All values represent minimum average roll values (MARV) as defined by ASTM D4439 for geotextile properties (any roll in a lot (a single day's production) should meet or exceed the minimum values in this table). Machine direction (MD) and cross-machine direction (CD) are as defined by ASTM D4439.

Provide Type 1 Certified Mill Test Report in accordance with Article 106-3 of the *Standard Specifications* with minimum average roll values (MARV) as defined by ASTM D4439 for geotextile properties. For testing geotextiles, a lot is defined as a single day's production. The Engineer reserves the right to inspect or test the geotextiles at any time. If requested by the Engineer, provide a sample of the geotextile for testing.

Use woven polyester or polypropylene geotextiles with properties meeting the following requirements:

Property	ASTM Test Method	Requirement (MARV)
Wide Width Tensile Strength @ 5% Strain (MD & CD)	D4595	2400 lbs/ft
Wide Width Tensile Strength @ Ultimate (MD & CD)	D4595	4800 lbs/ft
Permittivity	D4491	0.40 sec^{-1}
Apparent Opening Size[1]	D4751	No. 30 sieve (0.6 mm)
Ultraviolet Stability (% strength retained)[2]	D4355	80%
Ultimate Seam Strength (MD & CD)	D4884	3000 lbs/ft

[1]Per ASTM D4751
[2]After 500 hours of exposure

Construction

Use geogrid and nonwoven separation geotextile or alternatively use high strength geotextile as the reinforcement to be located at the bottom of the aggregate subgrade. A geogrid/nonwoven geotextile composite product meeting the individual geogrid and nonwoven geotextile requirements is acceptable in place of separate products.

During all periods of shipment and storage, the geotextile and geogrid shall be wrapped in a heavy duty protective covering to protect the geotextile and geogrid from direct sunlight ultraviolet rays, mud, dust, dirt, and debris. The geotextile and geogrid shall not be exposed to temperatures greater than 60°C (140°F). After the protective wrapping has been removed, the geotextile and geogrid shall not be left uncovered under any circumstances for longer than one (1) week.

Undercut in accordance with Section 225 of the *Standard Specifications* as needed to install separation geotextile and geogrid or high strength geotextile and a minimum compacted thickness of 12 inches of Class IV subgrade stabilization. Install nonwoven separation geotextile and geogrid or alternatively install high strength geotextile in accordance with Article 270-3 of the *Standard Specifications* directly below the Class IV subgrade stabilization. Place the geogrid directly above the nonwoven separation geotextile. Roll direction (machine direction) for both nonwoven separation geotextile and geogrid or the high strength geotextile shall be parallel with the project alignment. Overlap sides of rolls of the geotextile or geogrid with adjacent panels a minimum of one (1) foot. Overlap ends of rolls with next roll a minimum of four (4) feet. In lieu of overlap, the Contractor may sew the adjacent layers of the geotextiles by an approved method to develop the required seam strength. All sewn seams shall be placed facing upward to allow for inspection. Remove all slack from separation geotextile and geogrid or high strength geotextile before placing Class IV subgrade stabilization. All geotextile and geogrid which is damaged as a result of installation shall be replaced or repaired at the discretion of the Engineer with no additional cost to the Department.

Place Class IV subgrade stabilization in one lift by end dumping or spreading aggregate on the geogrid and nonwoven separation geotextile or high strength geotextile. Do not operate any equipment on the geogrid or high strength geotextile until it is covered with 12 inches of Class IV subgrade stabilization. Compact Class IV subgrade stabilization to a minimum of 92% of AASHTO T180 as modified by the Department. A copy of this modified test procedure is available upon request from the Materials and Tests Unit.

Do not leave the earth material at the bottom of the aggregate subgrade exposed for more than three (3) days before placement of Aggregate Subgrade.

Maintain Class IV subgrade stabilization in an acceptable condition and minimize the use of heavy equipment on Class IV subgrade stabilization in order to avoid damaging aggregate subgrades. Provide and maintain drainage ditches and drains as required to prevent entrapment of water in aggregate subgrades.

DCP Testing

The Engineer may conduct DCP testing at the bottom of the aggregate subgrade on 200 ft spacing when the Contractor has notified the Department that the aggregate subgrade location has been prepared for geogrid or geotextile placement. The Department reserves the right to increase the frequency of DCP testing in poor subgrade locations. If the DCP tests indicate extremely poor subgrade such that the above aggregate subgrade thickness may be insufficient, the Engineer may provide direction to increase the aggregate compacted thickness.

If a compacted thickness of greater than 12 inches is so directed, place the nonwoven separation geotextile at the bottom of the aggregate layer and place sufficient Class IV subgrade stabilization, before geogrid placement, to position the geogrid at a depth of 12 inches below the surface of the compacted aggregate subgrade. The high strength geotextile shall be placed at the bottom of the undercut regardless of the thickness of the aggregate subgrade. Compaction requirements apply only to the top 12 inches of Class IV subgrade stabilization for aggregate for thicknesses greater than 12 inches.

Measurement and Payment

Shallow Undercut will be measured and paid in cubic yards. Shallow undercut will be measured in accordance with Article 225-7 of the *Standard Specifications*. The contract unit price for *Shallow Undercut* will be full compensation for excavating, hauling and disposing of materials to construct aggregate subgrades. No separate payment will be made for any drainage measures to prevent entrapping water in the shallow undercut area.

Class IV Subgrade Stabilization will be measured and paid in tons. *Class IV Subgrade Stabilization* will be measured by weighing material in trucks in accordance with Article 106-7. The contract unit price for *Class IV Subgrade Stabilization* will be full compensation for furnishing, hauling and handling, placing, compacting, maintaining ABC.

Geogrid will be measured and paid in square yards. *Geogrid* will be measured along the ground surface as the square yards of exposed geogrids before placing backfill material. No measurement will be made for overlapping geogrids. The contract unit price for *Geogrid* will be full compensation for providing, transporting, placing geogrid, wire staples, and anchor pins.

Nonwoven Separation Geotextile will be measured and paid in square yards. *Nonwoven Separation Geotextile* will be measured along the ground surface as the square yards of exposed geotextiles before placing backfill material. No measurement will be made for overlapping geotextiles or sewing seams. The contract unit price for *Nonwoven Separation Geotextile* will be full compensation for providing, transporting, placing geotextiles, wire staples, and anchor pins and sewing geotextiles.

High Strength Geotextile will be measured and paid in square yards. *High Strength Geotextile* will be measured along the ground surface as the square yards of exposed geotextiles before placing backfill material. No measurement will be made for overlapping geotextiles or sewing seams. The contract unit price for *High Strength Geotextile* will be full compensation for providing, transporting, placing geotextiles, wire staples, and anchor pins and sewing geotextiles.

Pay Item	**Pay Unit**
Shallow Undercut	Cubic Yards
Class IV Subgrade Stabilization	Tons
Geogrid	Square Yards
Nonwoven Separation Geotextile	Square Yards
High Strength Geotextile	Square Yards