



Date: July 2016

Memorandum to: Greg Purvis, PE
Project Manager
Wetherill Engineering

From: Matt Alexander, PE
Geotechnical Project Engineer
Terracon Consultants

TIP Number: R-5769
County: Johnston
Description: Novo Nordisk Access Road from SR 1905 (Gordon Road) to
Proposed Novo Nordisk Site

Subject: Geotechnical Report - Design and Construction Recommendations

Terracon Consultants has completed a subsurface investigation for this project and presents the following recommendations:

I. Slope / Embankment Stability and Settlement

A. Slope Design

All permanent slopes should be constructed at a ratio of 3:1 (H:V) or flatter. Slopes steeper than 3:1 are proposed for sections of the -L- and -L1- alignments. The following sections of embankment side slope were identified as having a predicted slope stability factor of safety less than 1.5 based on our analyses:

<u>Alignment</u>	<u>Stations</u>	<u>Offset</u>
-L-	24+50 to 30+00	Left and Right
-L-	35+50 to 39+38	Right
-L2-	10+00 to 11+15	Right

The end slopes at the approach embankments to the bridge over the Norfolk Southern Railroad at -L- 33+26.23 were also predicted to have a global slope stability factor of safety less than 1.5 parallel to the -L- alignment behind the abutment MSE retaining walls. A PET geotextile reinforced aggregate platform has been designed to increase the global factor of safety at the abutment MSE retaining walls. Slope stability factors of safety predicted for the side slopes and MSE retaining walls at the bridge approach were in excess of 1.5.

Reinforcing the base of the embankments in these problem areas is preferred to undercut due to shallow groundwater or shallow standing water on the surface and because the borrow for the project will need to be imported from off site.



PROJECT REFERENCE NO.	REPORT PAGE
R-5769	2 OF 7

B. Geotextile for Embankment Stabilization

Polyester (PET) geotextile for embankment stabilization was used in the limit-equilibrium slope stability analyses to achieve a factor of safety greater than or equal to 1.5 for the roadway embankments. Please refer to the attached Geotextile for Embankment Stabilization Special Provision (GT-2) for details regarding the required properties of the geotextile. The following table outlines the locations for use of geotextile for embankment stabilization:

<u>Alignment</u>	<u>Stations</u>	<u>Offset</u>	<u>Number of Layers</u>
-L-	24+50 to 27+50	Left and Right	1
-L-	27+50 to 30+00	Left and Right	2
-L-	35+50 to 39+38	Right	1
-L1-	10+00 to 11+15	Left and Right	1

We recommend a quantity of 12,700 square yards of Geotextile for Embankment Stabilization be included in the project contract. An additional contingency quantity of 500 square yards of Geotextile for Embankment Stabilization is recommended for use at the discretion of the Engineer.

C. Rock Embankments

Rock embankment should be used at the following locations for embankment that will be constructed in wetlands:

<u>Alignment</u>	<u>Stations</u>
-L-	20+80 to 29+40
-L-	35+80 to 43+57
-L1-	10+00 to 15+15
-L2-	10+00 to 11+40

Due to the relatively short rock embankment heights needed to reach an elevation of 1 foot above the 100 year storm water level in the wetlands, we recommend construction follow the Rock Embankments Special Provision (GT-3) attached to this report.

We recommend a quantity of 12,200 tons of Rock Embankment and 3,900 tons of #57 Stone be included in the project contract for construction of the rock embankments in the wetlands. We recommend a quantity of 15,500 square yards of Geotextile for Rock Embankments, Type 2 be included in the project contract for use in conjunction with construction of the rock embankments in the wetlands.

PROJECT REFERENCE NO.	REPORT PAGE
R-5769	3 OF 7

D. Reinforced Aggregate Platforms

Reinforced aggregate platforms have been designed to increase global stability at the bridge abutment MSE retaining walls. The reinforced aggregate platforms should be constructed at the following locations:

<u>Alignment</u>	<u>Stations</u>
-L-	31+42 to 32+69
-L-	33+68 to 35+17

We recommend the reinforced aggregate platforms be constructed in accordance with the Reinforced Aggregate Platforms Special Provision (GT-4). We recommend a quantity of 500 tons of Rip Rap, Class A and 800 tons of #57 Stone for Aggregate Platforms be included in the project contract for construction of the reinforced aggregate platforms. We recommend a quantity of 5,500 square yards of Reinforcement Geotextile for Aggregate Platforms be included in the project contract for construction of the reinforced aggregate platforms. We recommend a quantity of 2,200 square yard of Separation Geotextile, Type 2 be included in the project contract for use in conjunction with construction of the reinforced aggregate platforms.

E. Rock Plating

We recommend rock plating for all embankment slopes steeper than 3:1. Rock plating should be used at the following locations:

<u>Alignment</u>	<u>Stations</u>	<u>Offset</u>
-L-	24+50 to 32+68	Left and Right
-L-	33+69 to 39+38	Right
-L2-	10+00 to 11+15	Right

We recommend a quantity of 9,700 square yards of Rock Plating be included in the project contract for use on the slopes described above.

F. Embankment Monitoring

We recommend settlement monitoring at the approach embankments for the bridge over the Norfolk Southern Railroad at -L- Station 33+26.23. The bridge foundations were designed to account for down drag from settlement of the approach embankments. We recommend a quantity of 13 Embankment Settlement Gauges be included in the project contract to monitor settlement at the approaches before releasing them for final grading and paving.

II. Subgrade Stability

A. Aggregate Subgrade

High plasticity coastal plain and roadway embankment soils were encountered on the - Y1REV- alignment. The following locations should be undercut to a depth of 1 foot below proposed subgrade elevation:

PROJECT REFERENCE NO.	REPORT PAGE
R-5769	4 OF 7

Alignment
-Y1REV-

Stations
10+50 to 22+75

Offset
Left

We recommend a quantity of 300 cubic yards of Undercut Excavation be included in the project contract for use at the widening of SR 1905. We recommend a contingency quantity of 200 cubic yards of Undercut Excavation be included in the project contract for use at the discretion of the Engineer.

B. Geotextile for Soil Stabilization

We recommend a quantity of 1,200 square yards of Geotextile for Soil Stabilization be included in the project contract for use in the bottom of the undercut areas described in Section II.A. We recommend a contingency quantity of 200 square yards of Geotextile for Embankment Stabilization be included in the project contract for use at the discretion of the Engineer.

III. Borrow Specifications

A. Disposal of Waste Materials

Unsuitable material derived from undercut or excavations should be wasted off site.

B. Borrow Criteria

Use the Statewide Criteria for Acceptance of Borrow Material as described in Section 1018 of the Standard Specifications.

C. Shrinkage Factor

A shrinkage factor of 25 percent is recommended for calculation of earthwork quantities on this project.

D. Class IV Subgrade Stabilization

We recommend a quantity of 200 tons of Class IV Subgrade Stabilization be included in the project contract for backfilling the shallow undercut described in Section II.A. We recommend a contingency quantity of 200 tons of Class IV Subgrade Stabilization be included in the project contract for use at the discretion of the Engineer to backfill additional undercut excavation.

IV. Miscellaneous

A. Reduction of Unclassified Excavation - Unsuitable

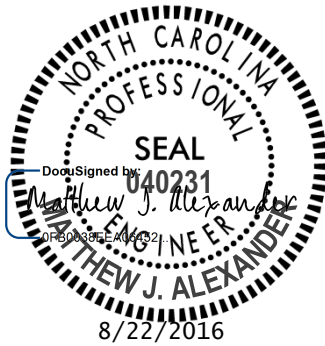
The coastal plain soils derived primarily from ditch cuts along -Y1REV- and the coastal plain soils that will need to be excavated to construct the reinforced aggregate platforms described previously are unsuitable for use as embankment fill. We estimate a quantity of 3,800 cubic yards of material derived from these excavations will need to be wasted off site.

PROJECT REFERENCE NO.	REPORT PAGE
R-5769	5 OF 7

B. Construction Procedures

See the attached project special provisions for applicable construction procedures and guidance.

Sincerely,
Terracon Consultants, Inc.



Matthew J. Alexander, PE
Geotechnical Project Engineer

Andrew A. Nash, PE
Geotechnical Department Manager

- Attachments: Summary of Quantities
Geotextile for Embankment Stabilization Special Provision (GT-2)
Rock Embankments Special Provision (GT-3)
Reinforced Aggregate Platform Special Provision (GT-4)



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

Summary of Quantities

WBS Number: N/ACounty: JohnstonProject Engineer: Alexander, M. J.TIP Number: R-5769Field Office: Terracon

Project Geologist: _____

Description: Novo Nordisk Access Road from SR 1905 (Gordon Road) to Proposed Novo Nordisk Site

Pay Item No.	Pay Item/ Quantity Adjustment	Spec Book Section No. or Special Provision (SP) Reference	Report Section	Alignment	Begin Station	End Station	Quantity	Units / %
0127000000-N	Embankment Settlement Gauges	SP - Embankment Settlement Gauges	I. F	-L-	31+00.00	36+00.00	13	EA
Total Quantity of Embankment Settlement Gauges =							13	EA
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	II. B	-Y1REV-	10+50.00	22+75.00	1,200	SY
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	II. B	Contingency	N/A	N/A	200	SY
Total Quantity of Geotextile for Soil Stabilization =							1,400	SY
0220000000-E	Rock Embankments	SP - Rock Embankments	I. C	Varies	N/A	N/A	12,200	TON
Total Quantity of Rock Embankments =							12,200	TON
0222000000-E	Geotextile for Rock Embankments	SP - Rock Embankments	I. D	Varies	N/A	N/A	15,500	SY
Total Quantity of Geotextile for Rock Embankments =							15,500	SY
0223000000-E	Rock Plating	275 - Rock Plating	I. E	Varies	N/A	N/A	9,700	SY
Total Quantity of Rock Plating =							9,700	SY
0241000000-E	Geotextile for Embankment Stabilization	SP - Geotextile for Embankment Stabilization - Non-Standard Pay Item	I. B	Varies	N/A	N/A	12,700	SY
0241000000-E	Geotextile for Embankment Stabilization	SP - Geotextile for Embankment Stabilization - Non-Standard Pay Item	I. B	Contingency	N/A	N/A	500	SY
Total Quantity of Geotextile for Embankment Stabilization =							13,200	SY
0241000000-E	Reinforcement Geotextile for Aggregate Platforms	SP - Reinforced Aggregate Platforms - Non-Standard Pay Item	I. D	-L-	31+42.00	35+17	5,500	SY
Total Quantity of Reinforcement Geotextile for Aggregate Platforms =							5,500	SY
0241000000-E	Separation Geotextile, Type 2	SP - Reinforced Aggregate Platforms - Non-Standard Pay Item	I. D	-L-	31+42.00	35+17.00	2,200	SY
Total Quantity of Separation Geotextile, Type 2 =							2,200	SY
0255000000-E	#57 Stone for Aggregate Platforms	SP - Reinforced Aggregate Platforms - Non-Standard Pay Item	I. D	-L-	31+42.00	35+17.00	800	TONS



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GEOTECHNICAL ENGINEERING UNIT

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WBS Number: N/ACounty: JohnstonProject Engineer: Alexander, M. J.TIP Number: R-5769Field Office: Terracon

Project Geologist: _____

Description: Novo Nordisk Access Road from SR 1905 (Gordon Road) to Proposed Novo Nordisk Site

Pay Item No.	Pay Item/ Quantity Adjustment	Spec Book Section No. or Special Provision (SP) Reference	Report Section	Alignment	Begin Station	End Station	Quantity	Units / %
Total Quantity of #57 Stone for Aggregate Platforms =							800	TONS
025500000-E	Rip Rap, Class A for Aggregate Platforms	SP - Reinforced Aggregate Platforms - Non-Standard Pay Item	I. D	-L-	31+42.00	35+17.00	500	TONS
Total Quantity of Rip Rap, Class A for Aggregate Platforms =							500	TONS
107700000-E	#57 Stone	SP - Rock Embankments	I. C	Varies	N/A	N/A	3,900	TON
Total Quantity of #57 Stone =							3,900	TON
1099500000-E	Shallow Undercut	505 - Aggregate Subgrade	II. A	-Y1REV-	10+50.00	22+75.00	300	CY
1099500000-E	Shallow Undercut	505 - Aggregate Subgrade	II. A	Contingency	N/A	N/A	200	CY
Total Quantity of Shallow Undercut =							500	CY
1099700000-E	Class IV Subgrade Stabilization	505 - Aggregate Subgrade	III. D	-Y1REV-	10+50.00	22+75.00	200	TON
1099700000-E	Class IV Subgrade Stabilization	505 - Aggregate Subgrade	III. D	Contingency	N/A	N/A	200	TON
Total Quantity of Class IV Subgrade Stabilization =							400	TON

These Items Only Impact Earthwork Totals								
N/A	Shrinkage Factor	235 - Embankments	III. C	N/A	N/A	N/A	25	%
N/A	Unclassified Excavation - Unsuitable Waste	225 - Roadway Excavation	IV. A	N/A	N/A	N/A	3,800	CY

R-5769

GT-2.1

Johnston County

GEOTEXTILE FOR EMBANKMENT STABILIZATION:**(Special)****Description**

This work consists of furnishing and installing synthetic geotextile for stabilizing embankment in accordance with this provision and as directed by the Engineer. The work shall include maintaining the geotextile in the required configuration until completion and acceptance of overlying work items. The geotextile shall be placed at the locations shown in the plans or as directed by the Engineer.

Materials

The geotextile for embankment stabilization 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 light 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 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. Sheets of geotextile shall be sewn together with a seam that furnishes the required minimum strengths, when sewing is required. No seams are permitted perpendicular to the machine direction, geotextile sheets shall be continuous in the machine direction. Lamination of geotextile sheets to produce the physical requirements of a geotextile layer will not be accepted.

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

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, or 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 geotextiles with properties meeting the following requirements:

R-5769

GT-2.2

Johnston County

Geotextile for Embankment Stabilization

Property	ASTM Test Method	Requirement (MARV)
Wide Width Tensile Strength @ 5% Strain (MD)	D4595	8,000 lb/ft
Wide Width Tensile Strength @ Ultimate (MD)	D4595	20,000 lb/ft
Apparent Opening Size ¹	D4751	No. 20 to No. 70
Ultraviolet Stability (retained strength) ²	D4355	50%
Ultimate Seam Strength (MD)	D4884	1,000 lb/ft
1 Per AASHTO M92 2 After 250 hours of exposure		

Construction Methods

The geotextile for embankment stabilization shall be placed at the locations shown in the plans or as directed by the Engineer. The location should be cleared and free of obstructions, debris, and pockets. Stumps shall be cut smooth at the ground elevation with the root system left intact. Where geotextile for embankment stabilization is being used in conjunction with rock embankments, the geotextile should be placed on the ground as described above or incorporated into the base of the rock embankment. Where the geotextile for embankment stabilization is being placed within the rock embankment, fill voids and provide a smooth surface for placing the geotextile to prevent damage when installed and covered. At the time of installation the geotextile shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation, or storage.

The geotextile for embankment stabilization shall be placed with the machine direction as shown on the plans or as directed by the Engineer. Geotextile shall be laid smooth and free from tension, stress fold, wrinkles or creases without any joint, seam, or overlapping in the machine (roll) direction. All joints in the cross machine direction may be sewn by an approved method or overlapped a minimum of 18 inches. All sewn seams must be placed upward to allow for inspection. All geotextile 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. Compaction equipment must be operated such that it will not damage the geotextile.

Where piles will penetrate geotextile for embankment stabilization, establish horizontal control for bridge foundation construction and slit the geotextile using a hot knife in the machine direction as detailed in the plans.

Any geotextile which is left uncovered for longer than one week after placement shall be replaced at no additional cost to the Department.

Measurement and Payment

The quantity of geotextile to be paid for will be the number of square yard of *Geotextile for Embankment Stabilization* measured along the surface of the ground, which has been placed and accepted by the engineer. No measurement will be made for overlapping geotextiles or sewing

R-5769

GT-2.3

Johnston County

seams.

The quantity of geotextile, measured as described above, will be paid for at the contract unit price per square yard for *Geotextile for Embankment Stabilization*. Such price and payment will be full compensation for furnishing, transporting, placing, sewing, testing, and all incidentals necessary to complete the work as described in this provision and the plans.

Payment will be made under:

Pay Item

Geotextile for Embankment Stabilization

Pay Unit

SY



R-5769

GT-3.1

Johnston County

ROCK EMBANKMENTS:**(Special)****Description**

Construct rock embankments in accordance with the contract. Rock embankments are required to construct embankments in water and wetlands at locations shown in the plans and as directed.

Materials

Refer to Division 10 of the *Standard Specifications*.

Item	Section
Geotextile for Rock Embankments, Type 2	1056
Rip Rap Materials	1042
Select Materials	1016

Provide Type 2 geotextile for separation geotextiles. Use Rip Rap Class B, Rip Rap Class A, and Class VI Select Material (standard size No. 57) for rock embankments as shown in the plans. Use Rip Rap Class B for core material and Rip Rap Class A and No. 57 stone to choke off voids near the top of rock embankments. Obtain aggregates from sources participating in the Department's Aggregate QC/QA Program in accordance with Section 1006 of the *Standard Specifications*.

Construction Methods

Construct rock embankments in accordance with the slopes, dimensions and elevations shown in the plans and Section 235 of the *Standard Specifications*. Provide a uniform surface free of obstructions, debris and groups of large rocks that could cause voids in embankments.

Before placing embankment fill material or filtration geotextiles over rock embankments, fill voids in the top of rock embankments with Rip Rap Class A and No. 57 stone. Place and compact Rip Rap Class A first. Then, fill any remaining voids with No. 57 stone so geotextiles are not torn, ripped or otherwise damaged when installed and covered. Compact rip rap and No. 57 stone with tracked equipment or other approved methods. Install Geotextiles for Rock Embankments, Type 2 on top of rip rap and No. 57 stone in accordance with Article 270-3 of the *Standard Specifications* before placing embankment fill material.

Measurement and Payment

Rock Embankments and *No. 57 Stone* will be measured and paid in tons. Select material and rip rap will be measured by weighing material and rip rap in trucks in accordance with Article 106-7 of the *Standard Specifications*. The contract unit prices for *Rock Embankments* and *No. 57 Stone* will be full compensation for providing, hauling, handling, placing, compacting and maintaining select material and rip rap.

Geotextile for Rock Embankments, Type 2 will be measured and paid in square yards. Geotextiles will be measured along the top of rock embankments as the square yards of exposed geotextiles before placing embankment fill material. No measurement will be made for overlapping geotextiles. The contract unit price for *Geotextile for Rock Embankments, Type 2* will be full compensation for providing, transporting and installing geotextiles.

R-5769

GT-3.2

Johnston County

Payment will be made under:

Pay Item

Rock Embankments

#57 Stone

Geotextile for Rock Embankments, Type 2

Pay Unit

Ton

Ton

Square Yard



R-5769

GT-4.1

Johnston County

REINFORCED AGGREGATE PLATFORMS:**(Special)****Description**

Construct reinforced aggregate platforms in accordance with the contract. Use Rip Rap Class A and Class VI Select Material in conjunction with the reinforcement geotextile for aggregate platforms as shown in the plans and described herein. Use only Class VI Select Material where piles will be driven through the reinforced aggregate platforms as shown in the plans. Reinforced aggregate platforms are required below the MSE walls at the bridge abutments for the bridge on - L- over the Norfolk Southern Railroad.

Materials

Refer to Division 10 of the *Standard Specifications*.

Item	Section
Separation Geotextile, Type 2	1056
Rip Rap Materials	1042
Select Materials	1016
Reinforcement Geotextile for Aggregate Platforms	SP

Provide Separation Geotextile, Type 2, for separation geotextiles. Install Separation Geotextile, Type 2 on top of completed platform in accordance with Article 270-3 of the *Standard Specifications* before placing embankment fill material.

Use Rip Rap Class A and Class VI Select Material (standard size No. 57) for reinforced aggregate platforms as shown in the plans. Use Rip Rap Class A to construct platforms and No. 57 stone to fill voids and provide a clean, level surface for placing separation and reinforcing geotextile. Obtain aggregates from sources participating in the Department's Aggregate QC/QA Program in accordance with Section 1006 of the *Standard Specifications*.

Provide Reinforcement Geotextile for Aggregate Platforms 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 Reinforcement Geotextile for Aggregate Platforms shall be composed of strong rot-proof synthetic fibers formed into a geotextile of the woven type. The Reinforcement Geotextile for Aggregate Platforms shall be free of any treatment or coating which might significantly alter its physical properties after installation.

The Reinforcement Geotextile for Aggregate Platforms shall contain stabilizers and/or inhibitors to make the filaments resistant to deterioration resulting from ultraviolet light or heat exposure. The Reinforcement Geotextile for Aggregate Platforms 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 geotextile shall be finished to prevent the outer yarn from pulling away from the geotextile. The Reinforcement Geotextile for Aggregate Platforms shall be free of defects or flaws which significantly affect its physical and/or filtering properties. Sheets of Reinforcement Geotextile for Aggregate Platforms shall be sewn together with a seam that furnishes the required minimum strengths, when sewing is required. No seams are permitted perpendicular to the machine direction, reinforcement geotextile sheets shall be continuous in the machine direction. Lamination of geotextile sheets to produce the physical requirements of a geotextile layer will not be accepted.

During all periods of shipment and storage, the geotextile shall be wrapped in a heavy duty

R-5769

GT-4.2

Johnston County

protective covering to protect the geotextile from direct sunlight ultraviolet rays, mud, dust, dirt, and debris. The geotextile shall not be exposed to temperatures greater than 140° F. After the protective wrapping has been removed, the geotextile shall not be left uncovered under any circumstances for longer than one (1) week.

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, or 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 geotextiles with properties meeting the following requirements:

Reinforcement Geotextile for Aggregate Platforms

Property	ASTM Test Method	Requirement (MARV)
Wide Width Tensile Strength @ 5% Strain (MD)	D4595	14,000 lb/ft
Wide Width Tensile Strength @ Ultimate (MD)	D4595	32,000 lb/ft
Apparent Opening Size ¹	D4751	No. 20 to No. 70
Ultraviolet Stability (retained strength) ²	D4355	50%
Ultimate Seam Strength (MD)	D4884	1,600 lb/ft
1 Per AASHTO M92 2 After 250 hours of exposure		

Construction Methods

Construct the reinforced aggregate platforms in accordance with the slopes, dimensions and elevations shown in the plans and Section 235 of the *Standard Specifications*. Provide a uniform surface free of obstructions, debris and groups of large rocks that could cause voids in embankments. Where piles will be installed through the reinforced aggregate platforms, place Rip Rap Class A so there will be at least 5 feet between rock and piles. Slit the Reinforcement Geotextile for Aggregate Platforms using a hot knife in the machine direction at the pile locations as shown in the plans. Provide and maintain a minimum of 1 foot of cover over Reinforcement Geotextile for Aggregate Platforms when operating equipment over the reinforced aggregate platform.

Before placing embankment fill material or filtration geotextiles over reinforced aggregate platforms, drive bridge piles then fill voids in the top of reinforced aggregate platforms with No. 57 stone. Fill any voids with No. 57 stone so separation geotextiles are not torn, ripped or

R-5769

GT-4.3

Johnston County

otherwise damaged when installed and covered. Compact rip rap and No. 57 stone with tracked equipment or other approved methods. Install separation geotextiles on top of rip rap and No. 57 stone in accordance with Article 270-3 of the *Standard Specifications* before placing embankment fill material.

Measurement and Payment

Rip Rap, Class A for Aggregate Platforms and *#57 Stone for Aggregate Platforms* will be measured and paid in tons. Select material and rip rap will be measured by weighing material and rip rap in trucks in accordance with Article 106-7 of the *Standard Specifications*. The contract unit prices for *Rip Rap, Class A for Aggregate Platforms* and *#57 Stone for Aggregate Platforms* will be full compensation for providing, hauling, handling, placing, compacting and maintaining select material and rip rap.

Reinforcement Geotextile for Aggregate Platforms will be measured and paid in square yards. *Reinforcement Geotextile for Aggregate Platforms* will be measured along the surface of the ground after placement and acceptance by the Engineer. No measurement will be made for overlapping geotextiles or sewing seams. The contract unit price for *Reinforcement Geotextile for Aggregate Platforms* will be full compensation for furnishing, transporting, placing, sewing, testing, and all incidentals necessary to complete the work as described in this provision and the plans.

Separation Geotextile, Type 2 will be measured and paid in square yards. *Separation Geotextile, Type 2* will be measured as the square yards of exposed geotextiles before placing embankment fill material. No measurement will be made for overlapping geotextiles. The contract unit price for *Separation Geotextile, Type 2* will be full compensation for providing, transporting, and installing geotextiles.

Payment will be made under:

Pay Item

Rip Rap, Class A for Aggregate Platforms
#57 Stone for Aggregate Platforms
Separation Geotextile, Type 2
Reinforcement Geotextile for Aggregate Platforms

Pay Unit

Ton
Ton
Square Yard
Square Yard

