



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

September 4, 2013

MEMO TO: Jay Bennett, Jonathan Bivens, Stuart Bourne, John Bridges, Ken Cates, Joe Coleman, Judith Corley-Lay, Ron Hancock, Berry Jenkins, Ben Lanier, Don Lee, Skip Partington, Ian Scott, Mason Sexton, Lamar Sylvester, Michael Taylor, Kevin Thomas, Brian Webb, Dennis Wofford, and Jim Wyngaarden

FROM: R. A. Garris, PE
Contract Officer

SUBJECT: AGC/Roadway Subcommittee Meeting Minutes

The subject committee met on August 15 at 9:30 a.m. in the Riverwood Conference Room at the Century Center with the following in attendance:

Jay Bennett	Berry Jenkins	Natalie Roskam
John Bridge	Phillip Johnson	Lamar Sylvester
Ken Cates	BJ Lanier	Michael Taylor
Scott Clement	Chris Peoples	Roger Thomas
Dean Fowler	John Pilipchuk	Dennis Wofford
David Harris	Wayne Ramsey	Roger Worthington
Scott Hidden		

1. AGGREGATE STABILIZATION – SCOTT HIDDEN

Mr. Hidden addressed concerns from the last meeting where, in the east, aggregate was being used as a 3” bridge layer across dead sands for a work platform and not mixed into the project. This work is different than the work described as “Stabilizer Aggregate” in Section 510. “Stabilizer Aggregate” will remain as a pay item where ABC is mixed in, compacted, and used in the project. A new pay item was created for “Aggregate Stabilization” to address the bridge layer. Mr. Hidden provided a draft provision modifying Section 510. “Aggregate Stabilization” is different than “Aggregate Subgrade” in Section 505. “Aggregate Subgrade” is typically used in small areas to avoid utilities, and is usually coupled with a pay item for “Shallow Undercut”. Any undercut for “Aggregate Stabilization” will be dealt with as normal earthwork within the project. The committee discussed adding moisture for compaction which may degrade soils below the aggregate stabilization but thought this issue could be addressed with training.

2. SOIL-CEMENT BASE (FDR) – SCOTT HIDDEN

Mr. Hidden presented a draft provision modifying Section 542 Soil-Cement Base for the work of Full Depth Reclamation (FDR). This provision does not use emulsions. Instead, the asphalt is broken and mixed into cement.

3. GEOTECHNICAL SUMMARY TABLE – SCOTT HIDDEN

Mr. Hidden asked for feedback regarding the Geotechnical summary table in the plans which addressed a request from a previous meeting to specify where to place geotextiles, subgrade stabilization, rock plating and other geotechnical items. Feedback was positive.

4. GEOTEXTILE SPECIFICATION – SCOTT HIDDEN

Mr. Hidden noted that the Department has been studying geotextile quality control and quality assurance measures. The current geotextile specification in Section 1056 references AASHTO M 288 and NTPEP. NTPEP is an AASHTO organization that tests to the AASHTO standard through independent laboratories and provides onsite manufacturer audits for geotextiles.

Mr. Hidden provided a draft provision revising Section 1056 and requiring geotextiles to be listed on the Department's Approved Products List (APL). The Department added geotextiles to the APL at <https://apps.dot.state.nc.us/vendor/approvedproducts/> and will begin verifying that geotextiles are on the APL for projects let January 2014 or later.

5. WHITE LINING FOR STATIONARY WORK ZONE SIGNS – LAMAR SYLVESTER/DEAN FOWLER

Mr. Sylvester noted that a revised resurfacing provision, in use since July, addresses payment for work zone stationary signs. He requested feedback from the committee regarding this provision's use.

Mr. Fowler noted that the first job using the new provision had an issue because there were five Y-lines and only two signs are allowed. He is concerned about the communication and responsibility for assigning locations for these signs, and the compensation for sign relocation if the signs are placed but the Department requests that they be moved. He would like to see the Department or the prime contractor stake sign locations. If not, he would like to be compensated for locating the signs.

Mr. Sylvester indicated that, at this time, the Department is not planning to add a new pay item for locating signs as that work is included in existing pay items. By the same logic, the Department is not responsible for staking sign locations because that work is included in the pay item.

The committee discussed the impact of the new whitelining law which will go into effect next year and require either an exact sign location or placing a physical mark for sign location in order to call in locates within a quarter mile of the mark. Mr. Sylvester agreed to discuss this issue further with the Work Zone Traffic Control Unit.

6. EXTENDED TIME CONTRACTS WITH LUMP SUM ITEMS – LAMAR SYLVESTER/DEAN FOWLER

Mr. Sylvester reviewed the request for additional compensation for lump sum pay items going past the completion date; however, no specification change is expected at this time. Changes to the specifications would impact multiple pay items. Mr. Fowler noted that about 40% of the projects overrun the completion date, and lump sum items are not getting extra pay for the extended time. Mr. Sylvester noted that the Department is willing to look at individual situations.

7. PERMANENT VEGETATION ESTABLISHMENT – LAMAR SYLVESTER

Mr. Sylvester presented a draft revision of the permanent vegetation establishment which will go in effect on October let projects. The changes allow the Department to take over the NPTDS until final inspection of the project and clarified the vegetation establishment criteria. The committee discussed how basins and other pay items are treated with this provision.

8. SKIMMER BASINS – MICHAEL TAYLOR

Mr. Taylor expressed concerns with the current skimmer basin design. He noted that the current design has experienced blow out around the PVC pipes at low points in the project. He noted issues with blow out and sediment loss from basins inlet failures. Mr. Harris noted that a redesigned basin is being tested with impervious fabric to prevent seepage under the fabric. Sturdier seep collars were also discussed.

The committee discussed the maximum number of skimmer basins per project and the cost of moving and replacing skimmer basins is included as the price paid per skimmer basin.

Mr. Harris mentioned that IAS Skimmers has a new basin design with a different outlet orifice. He requested feedback on the use of this basin.

Mr. Jenkins asked for feedback regarding the new organization in DENR, specifically the Water Resources Division. The committee noted DENR's understanding of the recent heavy rain events. The issue regarding sediment removal due to the unusual rains was discussed. Contractors should discuss potential for force account payment with the Resident Engineer if the records support such action.

9. UTILITY PIPE MATERIALS – MICHAEL TAYLOR

Mr. Taylor noted that some proposals do not specify the type of pipe material for water lines or other utilities. He asked if the Department could provide the specifics for the pipes required by the utility owners. Mr. Worthington noted that the Department does specify when there are specific requirements. Using the specifications, the contractor may choose the lowest cost material if the utility or local government did not specify a restrictive material. If the pipe material was not specified, but it is restrictive, the change in specification should be handled through a supplemental agreement. Mr. Worthington noted that his unit is discussing utility requirements earlier in the process and ultimately would like to take utilities out of the contract.

Mr. Taylor noted that when there is a change in the utility plans, the mega lugs and other fittings are incidental to the straight run of pipe, but the price of pipe is often less expensive than the fittings. The bids for pipe have increased to compensate for the fittings. He requested that the Department consider a per unit pay item for the fittings to address the increased price of adding additional fittings.

10. UTILITY ISSUES – ROGER WORTHINGTON

Mr. Worthington noted that several low impact bridges are being handled by the Divisions and consultants and are not being reviewed by the Utilities Unit. There was an issue with utility owners not being notified about the work.

Mr. Worthington noted that the Clean Water Act's copper and lead rules go into effective on January 1, 2014. All copper fittings used on projects will need to be lead free.

11. EXPRESSWAY GUTTER FRAME – MICHAEL TAYLOR

Mr. Taylor noted that the expressway frame gutter has a metal tab to lock it into the last lift of asphalt. The tab causes problems during compaction with rollers. Mr. Taylor requested that the Department consider a redesign that would allow the rollers to pass over the gutter frame. Mr. Thomas will work with Joel Howerton to review the design.

The next meeting will be held on Thursday, October 17, 2013, at 9:30 am in the Riverwood Conference Room at the Century Center, Building B.

CC: Victor Barbour, PE
Andy Gay, PE

AGGREGATE STABILIZATION:

(?-?-13)

510

SP5 R?

Revise the *2012 Standard Specifications* as follows:

Replace Section 510 with the following:

**SECTION 510
AGGREGATE STABILIZATION**

510-1 DESCRIPTION

Stabilize subgrades with aggregate base course (ABC) in accordance with the contract or as directed. Define “aggregate” as ABC for stabilizer aggregate or Class IV aggregate stabilization. Define “stabilizer aggregate” as mixing aggregate with subgrade soils. Define “Class IV aggregate stabilization” as replacing subgrade soils with aggregate. Remove material as needed in cut areas. Install geotextile for soil stabilization as needed and place aggregate at locations shown on the plans.

510-2 MATERIALS

Refer to Division 10.

Item	Section
Aggregate for Stabilization	1008
Geotextile for Soil Stabilization, Type 4	1056
Select Material, Class IV	1016

Use aggregate for stabilization for stabilizer aggregate and Class IV select material for Class IV aggregate stabilization.

510-3 CONSTRUCTION METHODS

When undercut is required for aggregate stabilization, undercut as needed to place aggregate as shown on the plans or as directed. Perform undercut excavation in accordance with Section 225.

(A) Stabilizer Aggregate

Spread aggregate uniformly and evenly with a mechanical spreader to the required thickness. Do not spread more aggregate than what can be mixed and compacted within a week. Mix aggregate with the top 3" of subgrade soils until aggregate and soils are uniformly mixed. Compact stabilizer aggregate to 100% of AASHTO T 99 as modified by the Department.

(B) Class IV Aggregate Stabilization

When geotextile for soil stabilization is required, install geotextiles in accordance with Article 270-3. Place aggregate by end dumping aggregate on geotextiles or subgrade soils. Do not operate heavy equipment on geotextiles or subgrade soils until geotextiles or soils are covered with the required thickness of aggregate. Compact Class IV aggregate stabilization less than 6" thick with a smooth wheeled roller without vibration to the satisfaction of the Engineer. Compact Class IV aggregate stabilization with a thickness of 6" or more to 92% of AASHTO T 180 as modified by the Department or to the highest density that can be reasonably obtained.

(C) Maintenance

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

510-4 MEASUREMENT AND PAYMENT

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

Geotextile for Soil Stabilization will be measured and paid in accordance with Article 270-4. Materials excavated to place aggregate below the subgrade or ground line, whichever is lower, will be measured and paid in accordance with Article 225-7.

Payment will be made under:

Pay Item	Pay Unit
Stabilizer Aggregate	Ton
Class IV Aggregate Stabilization	Ton

SOIL-CEMENT BASE (FULL DEPTH RECLAMATION):

(?-?-13)

542

SP5 R?

Revise the *2012 Standard Specifications* as follows:

Page 5-20, Article 542-1 DESCRIPTION, line 15, add “ existing asphalt pavement,” after “treating the”.

Page 5-20, Article 542-1 DESCRIPTION, add the following:

Define “full depth reclamation” (FDR) as a type of soil-cement base that includes treating the existing flexible pavement section consisting of asphalt pavement and base course.

Page 5-21, Subarticle 542-4(E) Compaction Equipment, add the following:

Use vibratory sheepfoot, vibratory smooth drum and pneumatic tire rollers for FDR.

Page 5-21, Article 542-4 EQUIPMENT, add the following:

(G) FDR Equipment

An asphalt reclaimer and motor grader equipped with a cross slope indicator are required for FDR. Use a self-propelled reclaimer with at least 400 horsepower (hp), a cutter depth of at least 12", a cutter width of at least 8 ft and a metered water additive system with a full width spray bar. Use a water truck with flow rate control to add water directly to the asphalt reclaimer. Submit details of the FDR equipment to the Engineer for acceptance at least 5 days before mobilizing equipment to the site.

Page 5-21, Article 542-6 SCARIFYING, add the following:

For FDR, pulverize existing asphalt pavement with an asphalt reclaimer to the required depth and maintain moisture content at or below optimum as determined by the Engineer.

Page 5-22, Article 542-7 APPLICATION OF CEMENT, lines 13-15, delete the first two sentences of the fourth paragraph and replace with the following:

Apply cement to sections sized so soil-cement base is completed within the traffic control requirements. Complete finishing soil-cement base within 4 hours of adding water to the soil-cement mix except complete FDR within 3 hours of pulverizing existing asphalt pavement. If a road remains open for FDR, pulverize pavement in sections sized so FDR is completed within the same working day.

Page 5-22, Article 542-8 MIXING, line 20, add “Except for FDR, ” before “Mixing will” and the following:

Mixing will be sufficient for FDR when 100% of the mixture passes a 2" sieve and at least 50% passes a No. 4 sieve, exclusive of any aggregate.

Page 5-22, Article 542-8 MIXING, line 23, add “Except for FDR and ” before “Immediately after” and the following:

During final mixing and compaction for FDR, maintain moisture content between optimum and optimum plus 1.5% as determined by the Engineer.

Page 5-23, Article 542-12 CURING, line 18, add “Except for FDR and ” before “After the”.

COMPUTED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____

(?-?-13)

PROJECT NO. _____

SHEET NO. 3-??

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY					
				TOTAL LF:	0

*UD = Underdrain
*BD = Blind Drain
*SD = Subsurface Drain

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS

SUMMARY OF SETTLEMENT GAUGES

Gauge No.	LINE	Approx. Station	Approx. Offset
TOTAL GAUGES (EACH):			

SUMMARY OF ROCK PLATING

LINE	Beginning Slope	Approx. Station	Ending Slope	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	SY
TOTAL SY:								0

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

SUMMARY OF EMBANKMENT WAITING PERIODS

LINE	Station	Station	MONTHS

SUMMARY OF SURCHARGES AND SURCHARGE WAITING PERIODS

LINE	Station	Station	Surcharge Height FT	MONTHS

SUMMARY OF REINFORCED SOIL SLOPES (RSS)

LINE	Beginning Slope	Approx. Station	Ending Slope	Approx. Station	Location LT/RT	SY
TOTAL SY:						0

SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION

LINE	Station	Station	SY
CONTINGENCY			
TOTAL SY:			0

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY									
TOTAL CY/TONS/SY:					0	0	0	0	0

*ASU = Aggregate Subgrade
*AST = Aggregate Stabilization

MATERIALS:

(2-21-12) (Rev. ~~5-21-13~~ 1-21-14)

1000, 1005, 1050, 1056, 1074, 1078, 1080, 1081, 1087, 1092

SP10 R01

Revise the *2012 Standard Specifications* as follows:

Page 10-1, Article 1000-1, DESCRIPTION, line 14, add the following:

Use materials which do not produce a mottled appearance through rusting or other staining of the finished concrete surface.

Page 10-5, Table 1000-1, REQUIREMENTS FOR CONCRETE, replace with the following:

TABLE 1000-1 REQUIREMENTS FOR CONCRETE											
Class of Concrete	Min. Comp. Strength at 28 days	Maximum Water-Cement Ratio				Consistency Max. Slump		Cement Content			
		Air-Entrained Concrete		Non Air-Entrained Concrete		Vibrated	Non-Vibrated	Vibrated		Non-Vibrated	
		Rounded Aggregate	Angular Aggregate	Rounded Aggregate	Angular Aggregate			Min.	Max.	Min.	Max.
<i>Units</i>	<i>psi</i>					<i>inch</i>	<i>inch</i>	<i>lb/cy</i>	<i>lb/cy</i>	<i>lb/cy</i>	<i>lb/cy</i>
AA	4,500	0.381	0.426	-	-	3.5	-	639	715	-	-
AA Slip Form	4,500	0.381	0.426	-	-	1.5	-	639	715	-	-
Drilled Pier	4,500	-	-	0.450	0.450	-	5-7 dry 7-9 wet	-	-	640	800
A	3,000	0.488	0.532	0.550	0.594	3.5	4	564	-	602	-
B	2,500	0.488	0.567	0.559	0.630	2.5	4	508	-	545	-
B Slip Formed	2,500	0.488	0.567	-	-	1.5	-	508	-	-	-
Sand Lightweight	4,500	-	0.420	-	-	4	-	715	-	-	-
Latex Modified	3,000 7 day	0.400	0.400	-	-	6	-	658	-	-	-
Flowable Fill excavatable	150 max. at 56 days	as needed	as needed	as needed	as needed	-	Flowable	-	-	40	100
Flowable Fill non-excavatable	125	as needed	as needed	as needed	as needed	-	Flowable	-	-	100	as needed
Pavement	4,500 design, field 650 flexural, design only	0.559	0.559	-	-	1.5 slip form 3.0 hand place	-	526	-	-	-
Precast	See Table 1077-1	as needed	as needed	-	-	6	as needed	as needed	as needed	as needed	as needed
Prestress	per contract	See Table 1078-1	See Table 1078-1	-	-	8	-	564	as needed	-	-

Page 10-65, Article 1050-1, GENERAL, line 41, replace the first sentence with:

All fencing material and accessories shall meet Section 106.

Page 10-23, Table 1005-1, AGGREGATE GRADATION-COARSE AGGREGATE, replace with the following:

TABLE 1005-1 AGGREGATE GRADATION - COARSE AGGREGATE													
Percentage of Total by Weight Passing													
Std. Size #	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4	#8	#10	#16	#40	#200	Remarks
4	100	90-100	20-55	0-15	-	0-5	-	-	-	-	-	A	Asphalt Plant Mix
467M	100	95-100	-	35-70	-	0-30	0-5	-	-	-	-	A	Asphalt Plant Mix
5	-	100	90-100	20-55	0-10	0-5	-	-	-	-	-	A	AST, Sediment Control Stone
57	-	100	95-100	-	25-60	-	0-10	0-5	-	-	-	A	AST, Str. Concrete, Shoulder Drain, Sediment Control Stone
57M	-	100	95-100	-	25-45	-	0-10	0-5	-	-	-	A	AST, Concrete Pavement
6M	-	-	100	90-100	20-55	0-20	0-8	-	-	-	-	A	AST
67	-	-	100	90-100	-	20-55	0-10	0-5	-	-	-	A	AST, Str. Concrete, Asphalt Plant Mix
78M	-	-	-	100	98-100	75-100	20-45	0-15	-	-	-	A	Asphalt Plant Mix, AST, Str. Conc. Weep Hole Drains
14M	-	-	-	-	-	100	35-70	5-20	-	0-8	-	A	Asphalt Plant Mix, AST, Weep Hole Drains, Str. Concrete
9	-	-	-	-	-	100	85-100	10-40	-	0-10	-	A	AST
ABC	-	100	75-97	-	55-80	-	35-55	-	25-45	-	14-30	4-12B	Aggregate Base Course, Aggregate Stabilization
ABC (M)	-	100	75-100	-	45-79	-	20-40	-	0-25	-	-	0-12B	Maintenance Stabilization
Light-C weight	-	-	-	-	100	80-100	5-40	0-20	-	0-10	-	0-2.5	AST

- A. See Subarticle 1005-4(A).
- B. See Subarticle 1005-4(B).
- C. For Lightweight Aggregate used in Structural Concrete, see Subarticle 1014-2(E)(6).

Page 10-73, Article 1056-1 DESCRIPTION, lines 7-8, delete the first sentence of the second paragraph and replace with the following:

Use geotextile fabrics that are on the NCDOT Approved Products List.

Page 10-73, Article 1056-2 HANDLING AND STORING, line 17, replace “mechanically stabilized earth (MSE) wall faces” with “temporary wall faces”.

Page 10-74, TABLE 1056-1 GEOTEXTILE REQUIREMENTS, replace table with the following:

TABLE 1056-1 GEOTEXTILE REQUIREMENTS						
<u>Property</u>	<u>Requirement (MARV^A)</u>					<u>Test Method</u>
	<u>Type 1</u>	<u>Type 2</u>	<u>Type 3^B</u>	<u>Type 4</u>	<u>Type 5^C</u>	
<u>Typical Application</u>	<u>Shoulder Drains</u>	<u>Under Rip Rap</u>	<u>Temporary Silt Fence</u>	<u>Soil Stabilization</u>	<u>Temporary Walls</u>	
<u>Elongation (MD & CD)</u>	<u>≥ 50%</u>	<u>≥ 50%</u>	<u>≤ 25%</u>	<u>< 50%</u>	<u>< 50%</u>	<u>ASTM D4632</u>
<u>Grab Strength (MD & CD)</u>			<u>100 lb</u>		<u>=</u>	<u>ASTM D4632</u>
<u>Tear Strength (MD & CD)</u>	<u>Table 1^D, Class 3</u>	<u>Table 1^D, Class 1</u>	<u>=</u>	<u>Table 1^D, Class 3</u>	<u>=</u>	<u>ASTM D4533</u>
<u>Puncture Strength</u>			<u>=</u>		<u>=</u>	<u>ASTM D6241</u>
<u>Ultimate Tensile Strength (MD & CD)</u>	<u>=</u>	<u>=</u>	<u>=</u>	<u>=</u>	<u>2,400 lb/ft (unless required otherwise in the contract)</u>	<u>ASTM D4595</u>
<u>Permittivity</u>	<u>Table 2^D, 15% to 50% in Situ Soil Passing No. 200^E</u>		<u>Table 7^D</u>	<u>Table 5^D</u>	<u>0.20 sec⁻¹</u>	<u>ASTM D4491</u>
<u>Apparent Opening Size</u>					<u>No. 30^E</u>	<u>ASTM D4751</u>
<u>UV Stability (Retained Strength)</u>					<u>70%</u>	<u>ASTM D4355</u>

- A. MARV does not apply to elongation**
- B. Minimum roll width of 36" required**
- C. Minimum roll width of 13 ft required**
- D. AASHTO M 288**
- E. US Sieve No. per AASHTO M 92**

Page 10-115, Subarticle 1074-7(B), Gray Iron Castings, lines 10-11, replace with the first two sentences with the following:

Supply gray iron castings meeting all facets of AASHTO M 306 excluding proof load. Proof load testing will only be required for new casting designs during the design process, and conformance to M306 loading (40,000 lbs.) will be required only when noted on the design documents.

Page 10-126, Table 1078-1, REQUIREMENTS FOR CONCRETE, replace with the following:

TABLE 1078-1 REQUIREMENTS FOR CONCRETE		
Property	28 Day Design Compressive Strength 6,000 psi or less	28 Day Design Compressive Strength greater than 6,000 psi
Maximum Water/Cementitious Material Ratio	0.45	0.40
Maximum Slump without HRWR	3.5"	3.5"
Maximum Slump with HRWR	8"	8"
Air Content (upon discharge into forms)	5 + 2%	5 + 2%

Page 10-151, Article 1080-4 Inspection and Sampling, lines 18-22, replace (B), (C) and (D) with the following:

- (B) At least 3 panels prepared as specified in 5.5.10 of AASHTO M 300, Bullet Hole Immersion Test.
- (C) At least 3 panels of 4"x6"x1/4" for the Elcometer Adhesion Pull Off Test, ASTM D4541.
- (D) A certified test report from an approved independent testing laboratory for the Salt Fog Resistance Test, Cyclic Weathering Resistance Test, and Bullet Hole Immersion Test as specified in AASHTO M 300.
- (E) A certified test report from an approved independent testing laboratory that the product has been tested for slip coefficient and meets AASHTO M253, Class B.

Page 10-162, Subarticle 1081-1(A) Classifications, lines 4-7, delete the second and third sentences of the description for Type 3A.

Page 10-162, Subarticle 1081-1(B) Requirements, lines 26-30, replace the second paragraph with the following:

For epoxy resin systems used for embedding dowel bars, threaded rods, rebar, anchor bolts and other fixtures in hardened concrete, the manufacturer shall submit test results showing that the bonding system will obtain 125% of the specified required yield strength of the fixture. Furnish certification that, for the particular bolt grade, diameter and embedment depth required, the anchor system will not fail by adhesive failure and that there is no movement of the anchor bolt. For certification and anchorage, use 3,000 psi as the minimum Portland cement concrete compressive strength used in this test. Use adhesives that meet Section 1081.

List the properties of the adhesive on the container and include density, minimum and maximum temperature application, setting time, shelf life, pot life, shear strength and compressive strength.

Page 10-169, Subarticle 1081-3(G) Anchor Bolt Adhesives, delete this subarticle.

Page 10-179, Subarticle 1087-4(A) Composition, lines 39-41, replace the third paragraph with the following:

All intermixed and drop-on glass beads shall not contain more than 75 ppm arsenic or 200 ppm lead.

Page 10-180, Subarticle 1087-4(B) Physical Characteristics, line 8, replace the second paragraph with the following:

All intermixed and drop-on glass beads shall comply with NCGS § 136-30.2 and 23 USC § 109(r).

Page 10-181, Subarticle 1087-7(A) Intermixed and Drop-on Glass Beads, line 24, add the following after the first paragraph:

Use X-ray Fluorescence for the normal sampling procedure for intermixed and drop-on beads, without crushing, to check for any levels of arsenic and lead. If any arsenic or lead is detected, the sample shall be crushed and repeat the test using X-ray Fluorescence. If the X-ray Fluorescence test shows more than a LOD of 5 ppm, test the beads using United States Environmental Protection Agency Method 6010B, 6010C or 3052 for no more than 75 ppm arsenic or 200 ppm lead.

Page 10-204, Subarticle 1092-2(A) Performance and Test Requirements, replace **Table 1092-3 Minimum Coefficient of Retroreflection for NC Grade A** with the following:

Observation Angle, degrees	Entrance Angle, degrees	White	Yellow	Green	Red	Blue	Fluorescent Yellow Green	Fluorescent Yellow
0.2	-4.0	525	395	52	95	30	420	315
0.2	30.0	215	162	22	43	10	170	130
0.5	-4.0	310	230	31	56	18	245	185
0.5	30.0	135	100	14	27	6	110	81
1.0	-4.0	120	60	8	16	3.6	64	48
1.0	30.0	45	34	4.5	9	2	36	27



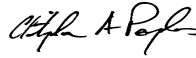
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

July 9, 2013

Memorandum To: Division Engineers

From: Christopher A. Peoples, PE 
State Materials Engineer

Subject: Acceptance of Geosynthetics on Projects

In 2006, the Department started requiring Geosynthetic Products to be evaluated by the AASHTO Nation Transportation Product Evaluation Program (NTPEP). In lieu of accepting test results provided by the manufacturers in catalogs, NTPEP published independent tests on Geosynthetics which States can use to qualify the products for specific uses.

The information provided by NTPEP was used by the Department to establish the approved product list for geotextile materials which is published online at the following site:

<https://apps.dot.state.nc.us/vendor/approvedproducts/>

On that site users can select "Geotextile" in the "Product Group" and click "Search" for a complete list of approved products along with the categories they are approved for.

This year, the NTPEP process was expanded to include manufacturer audits as well as independent testing. The new program provides States with added assurance that materials supplied will meet quality standards by conducting regular on-site audits. During the implementation of the new program, NCDOT will continue to accept geosynthetics that have only been evaluated by NTPEP (i.e., the manufacturer/supplier has not yet been audited). On January 1, 2014, the NCDOT will begin requiring geosynthetic providers to have a current evaluation and a current successful audit in order to remain on the approved list.

If you have any questions about this change, please contact Mr. C. K. Su at 919-329-4150.

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
PRODUCT EVALUATION PROGRAM
GEOTEXTILE CHECKLIST



I. INSTRUCTIONS

1. All Type 1-5 and Pavement Stabilization Geotextiles used on NCDOT projects let after January 1, 2014 must be on the Department's [Approved Products List](#) (APL). See Geosynthetics provision (No. SP10 R???) available from: connect.ncdot.gov/resources/Specifications/Pages/Specifications-and-Special-Provisions.aspx
2. Any person or company submitting a geotextile product to the NCDOT for possible inclusion on the NCDOT [APL](#) shall follow the instructions and requirements outlined below as well as send a completed Product Evaluation Program [Application](#) to productevaluation@ncdot.gov.
3. Questions regarding the evaluation process should be directed to productevaluation@ncdot.gov.
4. One Product Evaluation Program Application may be submitted for each Geotextile product line or series. However, in the product description portion of the application, please list all Geotextile products (models) in the product line along with the specific types each model is being submitted for (i.e. Type 1, Type 2, Type 3, Type 4, Type 5, or Pavement Stabilization).
5. Once the PEP Application has been processed, a Letter of Acknowledgment will be sent. Details regarding a sample submission will be included in the letter as well as the product's NCDOT tracking number. This sample will be for visual inspection only, so there is no specific size requirement.

II. SUPPLEMENTAL REQUIREMENTS

1. All Geotextile prime manufacturers and private labeler suppliers submitting Geotextiles for possible inclusion on the APL must maintain a current NTPEP audit status of "Compliant" as shown in [NTPEP's list of participating Geotextile manufacturers](#). In order to be "Compliant", all the requirements in the [NTPEP's Project Work Plan for Geotextiles](#) must be adhered to.
2. Geotextile products must meet Article 4.1 of AASHTO M 288 and shall meet or exceed the NCDOT Geotextile material requirements. The requirements for Type 1-5 Geotextiles are located in Section 1056 (Table 1056-1) of the NCDOT [2012 Standard Specifications](#).
3. Pavement Stabilization Geotextiles shall meet or exceed the requirements outlined in the NCDOT Geotechnical Engineering Unit's "[2012 Roadway – Geotextile for Pavement Stabilization](#)" Standard Provision No. 13.
4. Acceptable Type 1-5 and Pavement Stabilization Geotextiles with a current NTPEP evaluation defined as having data in the [NTPEP DataMine](#) will be assigned a status of "Approved". (Previous data from earlier NTPEP reports will not be considered current.) Acceptable Type 5 and Pavement Stabilization Geotextiles without a current NTPEP evaluation will be assigned a status of "Approved for Provisional Use" provided another Geotextile product from the same product line or series is approved. Type 1-4 Geotextiles without a current NTPEP evaluation will not be approved. On the PEP Application, please provide the corresponding NTPEP identification number for each Geotextile product or series.
5. Only NTPEP data will be used for review of geotextiles with a current NTPEP evaluation except when NTPEP does not test for a property (e.g., wide width tensile strength). For laboratory data not available from NTPEP, the Geotextile product must be tested by a laboratory accredited by the Geosynthetic Accreditation Institute (GAI) to perform the specific test method. A list of GAI accredited laboratories with their accredited test methods is available from <http://www.geosynthetic-institute.org/gai/lab.htm>. Laboratory data should not be more than 3 years old but older data may be accepted provided the Geotextile product has not changed since tested.
6. If a specific Geotextile product has not been tested for UV Stability, representative UV test data from the [NTPEP DataMine](#) for that Geotextile product line or series may be used for review provided the mass per unit area of the specific geotextile is greater than that of the geotextile used for the representative UV testing.

PERMANENT VEGETATION ESTABLISHMENT:

(2-16-128-5-13)

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SP1 G16

Establish a permanent stand of the vegetation mixture shown in the contract. During the period between initial vegetation planting and final project acceptance, perform all work necessary to establish ~~80% coverage of~~ permanent vegetation on all erodible areas within the project limits, as well as, in borrow and waste pits. This work shall include erosion control device maintenance and installation, repair seeding and mulching, supplemental seeding and mulching, mowing, and fertilizer topdressing, as directed. All work shall be performed in accordance with the applicable section of the *2012 Standard Specifications*. All work required for initial vegetation planting shall be performed as a part of the work necessary for the completion and acceptance of the Intermediate Contract Time (ICT). Between the time of ICT and Final Project acceptance, or otherwise referred to as the vegetation establishment period, the Department will be responsible for preparing the required National Pollutant Discharge Elimination System (NPDES) inspection records.

Once the Engineer has determined that ~~80% coverage of the~~ permanent vegetation establishment requirement has been achieved at an 80% vegetation density (the amount of established, the vegetation per given area to stabilize the soil) and no erodible areas exist within the project limits. The Contractor will be notified to remove the remaining erosion control devices that are no longer needed. The Contractor will be responsible for, and shall correct any areas disturbed by operations performed in permanent vegetation establishment and the removal of temporary erosion control measures, whether occurring prior to or after placing traffic on the project.

Payment for *Response for Erosion Control, Seeding and Mulching, Repair Seeding, Supplemental Seeding, Mowing, Fertilizer Topdressing, Silt Excavation, and Stone for Erosion Control* will be made at contract unit prices for the affected items. Work required that is not represented by contract line items will be paid in accordance with Articles 104-7 or 104-3 of the *2012 Standard Specifications*. No additional compensation will be made for maintenance and removal of temporary erosion control items.