

Hydraulic Cement Acceptance Program

February 2013

North Carolina Department of Transportation
Materials and Tests Unit

Revisions

The latest revision can be found at:

<http://www.ncdot.gov/doh/operations/materials/chemical/others.html>

- 4/25/2012 Added link to section 3 for approved cement sources.
- 6/7/2012 Added the option for Optimum SO₃ in Hydraulic Cement to allow using 24hr, 3 day, or 7 day compressive strength
- 2/18/2013 Added cement for latex concrete and cement for bag mix sampling frequencies

1. Scope

1.1 The purpose of the NCDOT Hydraulic Cement Acceptance Program is to establish uniform procedures for the acceptance of hydraulic cement and its use in the various products and applications as specified by the North Carolina Department of Transportation (NCDOT). Hydraulic cement producers shall become prequalified as an approved source. Cement users shall maintain documentation as to the types, sources, and tracking of cements purchased. NCDOT shall be responsible to perform random sampling, testing, and maintain records to verify the quality and source of the hydraulic cement used on NCDOT projects.

1.1.1 The intent of this program is to verify the source and quality of the cement at the point of use.

1.1.2 Compliance with the requirements of this program does not relieve the cement or concrete producer of the responsibility of complying with all requirements of the *NCDOT Standard Specifications for Roads and Structures*.

1.2. Organization of this manual:

1.2.1 Section A of this manual describes the responsibilities, duties, and requirements of individual cement producers and the NCDOT as they pertain to the manufacture, testing, shipment of hydraulic cements, and documentation thereof.

1.2.2 Section B of this manual describes the responsibilities and duties of cement users and the NCDOT as they pertain to the purchase, storage, use, and documentation of cement used in the production of concrete and concrete products.

2 Terminology

2.1 End Users

Typical end users include but are not limited to the following:

2.1.1 **Precast Concrete Producers** – Facilities utilizing reusable molds or forms to cast concrete in a controlled environment. Materials included, but not limited to box culverts, box beams, manholes, wing walls, junction boxes, inlets, utility boxes, panels, and traffic barriers.

- 2.1.2 **Prestressed Concrete Producers** – Facilities utilizing tendons to overcome concrete's weakness in tension. Materials include, but are not limited to piles, girders, box beams and cored slabs.
- 2.1.3 **Ready Mixed Concrete Producers** – A central batching plant that manufactures concrete according to a pre-determined mix design.
- 2.1.4 **Mobile Batch Producers** – Temporary plants producing concrete on or near the jobsite. Typical applications are concrete pavement.
- 2.1.5 **Concrete Pipe Producers**
- 2.1.6 **Geotechnical** – Typical applications include soil stabilization and cement treated base course.
- 2.1.7 **Point of Use** – The point where cement is incorporated into the final product.

Section A – Cement Producer Responsibilities

3. APPROVED CEMENT PRODUCERS LIST

- 3.1** The Materials and Tests Unit shall maintain an Approved List of all cement producers that comply with the Hydraulic Cement Acceptance Program. The latest list can be found at:
<https://apps.dot.state.nc.us/vendor/approvedproducts/Producer.aspx>
-

4. PARTICIPATION

- 4.1** The cement producer shall submit a written request to NCDOT to apply for inclusion to the approved list in accordance with the Hydraulic Cement Acceptance Program. Additional information, in accordance with Section 4.2, shall accompany the written request. Send the application to:

North Carolina Department of Transportation
Materials and Tests Unit
1801 Blue Ridge Road
Raleigh, NC 27607

Attn: State Materials Engineer

- 4.2** Supporting Information:
- Submit a copy of the Quality Control Plan or Manual for the specific manufacturing facility under consideration.
 - Submit a spreadsheet containing physical and chemical test data for the last six months for each type of cement proposed for use from the specific facility. The data shall represent test results for at least 30 separate samples. For new sources without six months of prior data this requirement is waived, however all physical and chemical test data accumulated for samples shall be submitted to the Department on the first of each month for the first six months of production.
 - Submit a one-gallon prequalification sample of each type of cement proposed for use along with a representative cement mill test report for each. The test report shall list at least the minimum compositional analysis as shown in Section 6.1. The cement sample will be used to establish a future baseline for the material. The baseline will be used to help identify sources of cement.
- 4.3** NCDOT shall conduct a review of the application to determine compliance with the requirements set forth in Section 5.2. If omissions or discrepancies are

identified regarding the required information, the Department will provide written notification to the cement producer detailing said omissions and/or discrepancies. The cement producer shall resubmit a revised application addressing the omissions and/or deficiencies. Upon satisfactory compliance with the requirements of the application, the cement producer will receive a letter stating their inclusion to the Approved List of Cement Producers.

- 4.4** Cement suppliers approved under this plan that may provide hydraulic cement from sources other than their own manufacturing facilities (either domestic or imported) shall assume all responsibility for compliance of the subject hydraulic cement to meet applicable NCDOT specifications. The hydraulic cement supplier of record shall have in their Quality Control Plan/Manual procedures for addressing notification to the NCDOT of the composition and any changes thereof of the purchased cement in accordance with Sections 6.1.2 and 6.1.3.

5. CEMENT PRODUCER REQUIREMENTS

- 5.1** **Requirements** The cement producer must comply, in principal, with the requirements of section 5.

- 5.2** **Quality Control Plan** - The cement producer must have a written quality control plan approved by the NCDOT for the specific manufacturing facility. The plan must provide a general description of the manufacturing process used to produce (or purchase), store, and control the quality of hydraulic cements to assure that the applicable NCDOT specification requirements are met. The Quality Control Plan/Manual must meet, in principle, the following:

- Identify the ownership of the manufacturing facility, to include the legally traded name and the address of the company, corporation, or LLC.
- Contact information for the specific manufacturing source to include:
 - Mailing and physical address of the Specific Facility
 - Responsible Facility Management Personnel
 - Quality Control Supervisor/Manager
 - Plant Management
 - Contact information for the above to include phone numbers and email address
- Identify the physical address of the source, including a description of the property site and reference to the nearest identifiable points such as highways and towns.
- Describe procedures for random sampling and testing of the material in accordance with AASHTO R38.

- Indicate the sampling and testing frequency.
- Include the method of identification for each type of material including tracking from point of manufacture to the transfer of ownership to the purchaser.
- Describe the methods by which the products are to be loaded and shipped including safeguards against loading improper materials, contamination, and degradation of the cement.
- Insure all products are accurately identified Indicate how all QC processes will be monitored, documented and tracked.
- Describe how the producer plans to initiate an immediate investigation regarding samples deemed to be in non-compliance with the applicable specification requirements and what corrective action are to be taken to remedy the non-compliance .
- Include a copy of either the latest onsite CCRL inspection report, proof of current AASHTO Accreditation, or approved equivalent for the laboratory used to perform sample testing.

5.3 Approved Laboratory – The laboratory conducting tests on hydraulic cements shall be adequately equipped and staffed with personnel competent to perform said test. Satisfactory documentation of laboratory competence shall be met by submission of the most recent CCRL inspection report and responses to any deficiencies found. A laboratory that is AASHTO accredited may submit documentation thereof without submission of the CCRL data. The laboratory must retain records of the analysis of samples for at least five year.

5.4 Approved Quality Control Technician Supervisor/Manager – The facility shall have an approved quality control supervisor/manager who is responsible for assuring all technicians under their charge are adequately trained and competent in execution of the respective tests.

5.5 Annual Facility Update –The cement producer must submit a request to remain on the approved cement producer list by December 31 of each year. A summary of any changes to the quality control plan is acceptable in lieu of a complete submittal.

5.6 Random inspection by NCDOT may occur at any time to verify compliance with the program requirements.

6. CEMENT PRODUCER REPORTING REQUIREMENTS

- 6.1** For each type of cement on the Hydraulic Cement Acceptance Program, submit to the NCDOT Materials and Tests Laboratory:
- 6.1.1** A monthly mill certificate to document that the respective hydraulic cement meets the requirements of AASHTO M85 and all applicable NCDOT specification. An example mill test is attached (see Exhibit C).
- 6.1.2** An annual declaration of the anticipated maximum alkali content of the hydraulic cement produced from the respective manufacturing facility.
- 6.1.3** A written notification to NCDOT, within 30 days, should the alkali content exceed the maximum stated in the annual declaration of alkali content.
- 6.1.4** Where applicable, an annual test report of the following:
- A written notification of changes in raw material or other major production changes
 - Annual test reports, if applicable, for:
 - ASTM C563, Test Method for Optimum SO₃ in Hydraulic Cement Using 24-hr, 3 day, or 7 day Compressive Strength.
 - ASTM C1038, Test Method for Expansion of Portland Cement in Mortar Bars Stored in Water
 - If applicable, ASTM C465, Standard Specification for Processing Additions for Use in the Manufacture of Hydraulic Cements
- 6.2** The hydraulic cement supplier must submit a mill certification with each shipment of cement. The mill certification shall contain the chemical and physical analysis of the hydraulic cement and shall contain additional information that will comply with that shown in Exhibit C. The certification may be added to the bottom of the Bill of Lading or supplied as a separate certificate. Mill certification must be signed by a representative of the manufacturer and signed by the responsible Quality Control Supervisor/Manager identified in the Quality Control Plan/Manual.

7. SHIPPING REQUIREMENTS

7.1.1 Requirements - There are three requirements for shipping

- A “Bill of Lading” (BOL) and “Mill Certification” will be required with every cement tanker and/or railcar when delivered to an approved NCDOT concrete producer and/or facility. This requirement also applies for cement delivered directly to a project site.
- The documentation shall identify the seller and manufacturing location in a clear and easily recognized manner on the BOL. Note this location will utilize the term “Manufactured In” (city, state (and country if applicable)).

8. SAMPLING AND TESTING

- 8.1** NCDOT reserves the right to conduct random verification sampling of materials for testing and to perform random audits of test reports. Department representatives may sample material from the plant, terminal, or transportation container to inspect for compliance with the specifications.

9. REMOVAL FROM APPROVED LIST

- 9.1** NCDOT may suspend a cement producer or supplier from the Hydraulic Cement Acceptance Program for the following reason:

- Hydraulic cement not meeting the specification requirements as prescribed by the NCDOT Specifications. Failure to comply with the Hydraulic Cement Acceptance Program.

Note: Before removal occurs, NCDOT will provide written notification of deficiencies. The producer will respond in writing with an explanation and corrective actions. NCDOT will hold a meeting discussing findings and actions when deemed necessary.

- 9.2** No suspension shall occur until such time that the NCDOT has provided written notification to the responsible Quality Control Manager/Supervisor of the hydraulic cement manufacturer identified in the QC Plan for the respective cement supplier of pending suspension and the reasons thereof. The hydraulic cement producer will have 30 calendar days to respond in writing to NCDOT with an explanation and corrective actions proposed. When deemed necessary by either NCDOT or the cement producer a meeting must held to review the

discrepancies and determine the corrective actions necessary. Upon satisfactory resolution to the discrepancies in question the cement producer/supplier will not be removed from the approved list.

10. REINSTATEMENT

10.1 The requirements for reinstatement only apply when a resolution in accordance with section 9.2 have not been met.

10.1.2 For requalification, submit a written request to the address in the Participation section (Section 4) of this program. Detail the corrections or changes made that support reinstatement. If disqualification has been longer than one year, submit the following in addition to the written request:

- A one-gallon sample of each type of cement with a representative test report including the properties shown in the Producer Reporting Requirement section of this program
- A summary of changes to the quality control plan is acceptable in lieu of a complete submittal

Section B – End User Responsibilities

11. END USER REQUIREMENTS

11.1 **Requirements** - There are three requirements for the end user.

- All end users are required to obtain a “Bill of Lading” (BOL) and “Mill Certification” for every tanker and/or railcar of cement delivered to an approved NCDOT Concrete producer, project site, and/or facility. It is the responsibility of the end user to verify that the documentation, location, and type of cement correspond with the approved NCDOT mix design.
- During plant visits, routine inspections, or sampling operations, the certified batcher or facility manager will be required to furnish this documentation if requested. Copies of all documentation shall remain onsite or easily accessible for at least three years after the project has been completed.

11.2.1 Any end user found not complying with this program may be removed from the NCDOT Approved Producer List.

Note: Before removal occurs, NCDOT will provide written notification of deficiencies. The producer will respond in writing with an explanation and corrective actions. NCDOT will hold a meeting discussing findings and actions when deemed necessary.

12. NC DOT PLANT INSPECTION RANDOM SAMPLING

12.1 **Precast Concrete Plant:**

For Concrete supplied by the precaster, the NCDOT plant inspector or representative will obtain at least one random 1-gallon sample per year.

12.1.1 During routine inspections, NCDOT will conduct a review of all cement delivery tickets to confirm that cement usage corresponds to the requirements of the NCDOT approved mix designs.

12.1.2 The plant NC DOT inspector will conduct additional sampling for verification of brand identification bi-annually, during plant inspections, and during low strength investigations.

12.2 **Prestressed Concrete Plant:**

For Concrete supplied by the prestresser, the NCDOT representative will obtain one random 1-gallon sample per month.

12.2.1 During routine inspections, NCDOT will conduct a review of all cement delivery tickets to confirm that cement usage corresponds to the requirements of the NCDOT approved mix designs.

12.3 **Ready Mixed Concrete Plant:**
For Concrete supplied by the Ready Mixed concrete producer, the NCDOT representative will obtain one random 1-gallon sample per year.

12.3.1 During routine inspections, NCDOT will conduct a review of all cement delivery tickets to confirm that cement usage corresponds to the requirements of the NCDOT approved mix designs.

12.3.2 The plant inspector will conduct additional sampling for verification of brand identification bi-annually, during plant inspections, and during low strength investigations.

13. POINT OF USE SAMPLING

13.1 Portland Cement Used in Concrete:

Acceptance:

Concrete Pavement: From each actively producing facility per project, Resident Engineer's personnel shall take one – 1-gallon sample from the concrete facility for every 1,250 tons of cement used in concrete pavement.

Latex Modified Concrete: From each active project, Resident Engineer's personnel shall take one – 1 gallon sample from the tanker/truck for every 100 cy of concrete used in latex modified concrete.

Miscellaneous Project Onsite/Bag Mixes: From each active project Resident Engineer's personnel shall take one – 1 gallon sample from each source for every 25 tons of cement used.

Verification:

Concrete Pavement: Materials and Tests personnel obtain one – 1-gallon sample from the facility for every 5,000 tons of cement used in concrete pavement.

Structural Concrete: Materials and Tests personnel obtains at least one – 1 cup sample for source identification from each actively producing concrete plant randomly during the life of the project or if questionable material is an issue.

13.2

Portland Cement Used in Geotechnical Applications:

Acceptance:

Project inspector take one – 1-gallon sample per 1,250 tons of cement used in soil stabilization or cement treated base course.

Exhibit A

Producer or Supplier Shipment Certification

I. Introduction

Cement Producers or Suppliers must submit the following additional certification with each shipment of cement. This will act as an affidavit that the cement meets or exceeds NCDOT specifications. If this certificate is not physically contained on the BOL it must also contain lot/batch number, date manufactured and project or facility destination.

II. Example Certification

This is to certify that the shipment of (_____ Tons) of Portland cement manufactured by _____(Company Name) and meets the requirements of AASHTO M-85 for Type ____ cement. Tests were conducted in accordance with AASHTO procedures and reports are on file.

BY PROVIDING THIS DATA UNDER MY SIGNATURE, I ATTEST TO THE ACCURACY AND VALIDITY OF THE DATA CONTAINED ON THIS FORM AND CERTIFY THAT NO DELIBERATE MISREPRESENTATION OF THE TEST RESULTS, IN ANY MANNER, HAS OCCURRED

Signed: _____

Authorized Officer
Of Supplier

Dated: _____

Exhibit B

SAMPLING HYDRAULIC CEMENT, GROUND GRANULATED BLAST-FURNACE SLAG, FLY ASH AND/OR OTHER POZZOLANIC MATERIALS

1. SCOPE

- 1.1 This method covers the procedure for sampling hydraulic cement, ground granulated blast-furnace slag, fly ash and/or other pozzolanic materials in the field for use in Portland Cement Concrete and other applications.
 - 1.2 This procedure does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user of this procedure to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.
-

2. REFERENCED DOCUMENTS

- 2.1 North Carolina Department of Transportation *Standard Specifications for Roads and Structures*
 - 2.2 North Carolina Department of Transportation Hydraulic Cement Acceptance Program
 - 2.3 North Carolina Department of Transportation Field Test of Portland Cement for Contamination
 - 2.4 AASHTO Standards:
 - T127, Standard Method of Test for Sampling and Amount of Testing of Hydraulic Cement
-

3. SAMPLING EQUIPMENT

- 3.1 Clean Scoop, Shovel, or Tube
 - 3.2 Clean Plastic Gallon Size Sampling Bags
-

4. SAMPLING PROCEDURE

4.1 General Requirements:

- 4.1.1 Samples shall be taken by a NCDOT employee or by a concrete producer representative and witnessed by a NCDOT employee.
- 4.1.2 The concrete producer is responsible for insuring that the samples are obtained without contamination.
- 4.1.3 The sample shall be representative of the material being used on the project.
- 4.1.4 All samples shall be approximately 1 gallon. The sample bag shall be as full as possible to minimize air space in the sealed bag.
- 4.1.5 Do not obtain sample from the ground.
- 4.1.6 Insure samples do not become contaminated with sand, air-entraining admixtures, or other materials not representative of the sample.
- 4.1.7 Deliver the sample as soon as possible to the testing facility to minimize aeration, contamination, and moisture absorption.

4.2 Sampling from a Transport Truck:

- 4.2.1 From Top of Truck: Take a sample from the top of the truck. Prior to unloading, brush back the top foot of material and obtain sample using a tube sampler meeting the requirements of AASHTO T127.

4.2.2 From Discharge Line of Truck (Ideal Method): If the discharge line is equipped with a sampling valve, take the sample at the halfway point of unloading or after the flow of material is well established and the line is purged of old material.

4.3 Sampling from Concrete Plant Storage:

4.3.1 Sampling from Storage Silo (Ideal Method): Take sample from storage silo through draw off port using a tube sampler meeting the requirements of AASHTO T127.

4.3.2 Sampling from Weigh Hopper: Take sample from weigh hopper through draw off port using a tube sampler meeting the requirements of AASHTO T127.

NOTE: *Use the North Carolina Department of Transportation Field Test of Portland Cement for Contamination (MT C-1.2) to verify sample has not been contaminated prior to leaving the facility. If the sample is contaminated obtain another sample.*

4.4 Sampling from Packaged Material:

4.4.1 Insert a sampler tube meeting the requirements of AASHTO T127 diagonally into the valve opening of the bag. Take small samples from several bags of the lot and combine until the required amount of material has been obtained.

Exhibit C

ABC Portland Cement Company
Qualitytown, NJ

Plant Example

Cement Type II(MH)

Date March 9, 2002

Production Period March 2, 2002–March 8, 2002

STANDARD REQUIREMENTS

M 85, Tables 1 and 3

CHEMICAL			PHYSICAL		
Item	Spec. Limit	Test Result	Item	Spec. Limit	Test Result
SiO ₂ (%)	^a	20.6	Air content of Mortar (volume %)	12 max	8
Al ₂ O ₃ (%)	6.0 max	4.4	Fineness (m ² /kg)	260 min	377
			(Air permeability)	430 max	
Fe ₂ O ₃ (%)	6.0 max	3.3	Autoclave expansion (%)	0.80 max	0.04
CaO (%)	^a	62.9	Compressive strength (MPa)	Min:	
MgO (%)	6.0 max	2.2	1 day	^a	
SO ₃ (%)	3.0 max	3.2	3 days	7.0	23.4
Loss on ignition (%)	3.0 max	2.7	7 days	12.0	29.8
Na ₂ O (%)	^a	0.19	28 days	^a	
K ₂ O (%)	^a	0.50	Time of setting (minutes)		
Insoluble residue (%)	0.75 max	0.27	(Vicat)		
CO ₂ (%)	^a	1.5	Initial	Not less than 45	124
Limestone (%)	5.0 max	3.5		Not more than 375	
CaCO ₃ in limestone (%)	70 min	98	Heat of hydration (kJ/kg)	^b	300
Inorganic processing addition (ground, granulated blast-furnace slag)	5.0 max	3.0	7 days		
Potential phase compositions (%) ^d			ASTM C1038 mortar bar expansion (%)	^c	0.010 ^e
C ₃ S	^a	59			
C ₂ S	^a	11			
C ₃ A	8 max	6			
C ₄ AF	^a	10			
C ₄ AF + 2(C ₃ A)	^a	20			
C ₃ S+4.75 C ₃ A, (%)	100 max	83			

^a Not applicable.

^b Test result represents most recent value and is provided for information only.

^c Required only if percent SO₃ exceeds the limit in Table 1, in which case expansion shall not exceed 0.020% at 14 days.

^d Adjusted per Annex A1.6.

^e Test result for this production period not available. Most recent test result provided.

OPTIONAL REQUIREMENTS

M 85, Tables 2 and 4

CHEMICAL			PHYSICAL		
Item	Spec. Limit	Test Result	Item	Spec. Limit	Test Result
Equivalent alkalis (%)	^f	0.52	False set (%)	50 min	82
			Compressive strength (MPa)		
			28 days	28.0 min	39.7 ^e

^f Limit not specified by purchaser. Test result provided for information only.

We certify that the above-described cement, at the time of shipment, meets the chemical and physical requirements of M 85-xx or (other) _____ specification.

Signature: _____

Title: _____

ABC Portland Cement Company
Qualitytown, NJ

Plant Example

Cement Type II(MH)

Date March 9, 2002

Production Period March 2, 2002–March 8, 2002

STANDARD REQUIREMENTS

M 85, Tables 1 and 3

CHEMICAL			PHYSICAL		
Item	Spec. Limit	Test Result	Item	Spec. Limit	Test Result
SiO ₂ (%)	^a	20.6	Air content of Mortar (volume %)	12 max	8
Al ₂ O ₃ (%)	6.0 max	4.4	Fineness (m ² /kg)	260 min	377
			(Air permeability)	430 max	
Fe ₂ O ₃ (%)	6.0 max	3.3	Autoclave expansion (%)	0.80 max	0.04
CaO (%)	^a	62.9	Compressive strength (MPa)	Min:	
MgO (%)	6.0 max	2.2	1 day	^a	
SO ₃ (%)	3.0 max	3.2	3 days	7.0	23.4
Loss on ignition (%)	3.0 max	2.7	7 days	12.0	29.8
Na ₂ O (%)	^a	0.19	28 days	^a	
K ₂ O (%)	^a	0.50	Time of setting (minutes)		
Insoluble residue (%)	0.75 max	0.27	(Vicat)		
CO ₂ (%)	^a	1.5	Initial	Not less than 45	124
Limestone (%)	5.0 max	3.5		Not more than 375	
CaCO ₃ in limestone (%)	70 min	98			
Inorganic processing addition (ground, granulated blast-furnace slag)	5.0 max	3.0			
Potential phase compositions (%) ^d			Heat of hydration (kJ/kg)	^b	300
C ₃ S	^a	59	7 days		
C ₂ S	^a	11	ASTM C1038 mortar bar expansion (%)	^c	0.010 ^e
C ₃ A	8 max	6			
C ₄ AF	^a	10			
C ₄ AF + 2(C ₃ A)	^a	20			
C ₃ S+4.75 C ₃ A, (%)	100 max	83			

^a Not applicable.

^b Test result represents most recent value and is provided for information only.

^c Required only if percent SO₃ exceeds the limit in Table 1, in which case expansion shall not exceed 0.020% at 14 days

^d Adjusted per Annex A1.6.

^e Test result for this production period not available. Most recent test result provided.

OPTIONAL REQUIREMENTS

M 85, Tables 2 and 4

CHEMICAL			PHYSICAL		
Item	Spec. Limit	Test Result	Item	Spec. Limit	Test Result
Equivalent alkalis (%)	^f	0.52	False set (%)	50 min	82
			Compressive strength (MPa)		
			28 days	28.0 min	39.7 ^e

^f Limit not specified by purchaser. Test result provided for information only.

We certify that the above-described cement, at the time of shipment, meets the chemical and physical requirements of M 85-xx or (other) _____ specification.

Signature: _____

Title: _____

Exhibit D



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

Materials and Tests Unit
July 15, 2010

Dear Cement Manufacturers and Producers:

The Materials and Tests Unit has performed a review regarding our current sampling frequency and test results for Portland cement utilized by the Department over the last several years. Evaluations of the samples were obtained from Ready Mix facilities, Prestress facilities, Precast facilities, soil stabilization, and concrete pavement operations.

Numerous incidents relating to failing samples revealed an incorrect manufacturer, or no supporting documentation for the cement's origin. The Department has concerns regarding the potential for Alkali Silica Reactivity (ASR), and verification of raw materials being used in the production of concrete products. The need to maintain accurate and current records is essential for the integrity of our program.

To help correct these concerns from occurring in the future, and to ensure the quality of cement used in products delivered to the Department, the following tasks will be the responsibility of all approved cement producers:

1. A "Bill of Lading" (BOL), and "Mill Certification" will be required with every cement tanker and/or railcar when delivered to an approved NCDOT Concrete producer and/or facility. This requirement also applies if the cement is delivered directly to a project site (i.e. to be used in soil stabilization or concrete pavement).
2. The manufacturing location will be clear, easily observed, and recorded on the BOL. This location will be noted utilizing the term "Manufactured In (city, state or city, country)".
3. All BOL's and Mill Certifications shall have traceability to the associated load of cement.

Implementation of this policy will begin immediately. Any facility found not complying with this policy or not recording this information may be removed from the Department's Approved Producer List. Thank you for your cooperation in this matter.

Sincerely,

Christopher A. Peoples, P.E.
State Materials Engineer

Exhibit E



**STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION**

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

Materials and Tests Unit
July 15, 2010

Dear Ready Mix, Prestress, and Precast Concrete Producers:

The Materials and Tests Unit has performed a review regarding our current sampling frequency and test results for Portland Cement utilized by the Department over the last several years. Evaluations of the samples were obtained from Ready Mix facilities, Prestress facilities, Precast facilities, soil stabilization, and concrete pavement operations.

Numerous incidents relating to failing samples revealed an incorrect manufacturer, or no supporting documentation for the cement's origin. The Department has concerns regarding the potential for Alkali Silica Reactivity (ASR), and verification of raw materials being used in the production of concrete products. The need to maintain accurate and current records is essential for the integrity of our program.

To help correct this from occurring in the future, and to ensure the quality of cement usage for the Department, the following tasks will be completed by all concrete producers listed on the NCDOT Approved Producer List:

4. All "approved" cement manufacturers/producers are required to produce a "Bill of Lading" (BOL), and "Mill Certification" for every cement tanker and/or railcar when delivered to an approved NCDOT Concrete producer and/or facility. This requirement also applies if the cement is delivered to a project site (i.e. to be used in soil stabilization or concrete pavement).
5. Located on every BOL, the cement manufacturing location will be recorded clearly and easily observed. This location will be noted utilizing the term "Manufactured In (city, state or city, country)". It is the responsibility of the concrete producer's certified batcher to verify the documentation, location, and type of cement corresponds with the approved mix design utilized for NCDOT usage.
6. During plant visits, routine inspections, or sampling operations, the certified batcher or facility manager will be required to furnish this documentation if requested. Copies of all documentation shall remain onsite or easily accessible for at least three years after the project has been completed.
7. All BOL's and Mill Certifications shall have accurate and recent traceability to the associated load of cement. It is the responsibility of the concrete producer's facility manager or his representative to verify the documentation.

Implementation of this policy will begin immediately. Any facility found not complying with this policy or not recording this information may be removed from the Department's Approved Producer List. Thank you for your cooperation in this matter.

Sincerely,

Christopher A. Peoples, P.E.
State Materials Engineer

Exhibit F



U.S. Department of Transportation
Federal Highway Administration

NOTICE

The highway construction underway at this location is a Federal or Federal-aid project and is subject to applicable State and Federal laws, including Title 18, United States Code, Section 1020, which reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or the cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the costs thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction of any highway or related project submitted for approval to the Secretary of Transportation; or

"Whoever knowingly makes any false statement, false representation, false report, or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

"Whoever knowingly makes any false statement or false representation as to a material fact in any statement, certificate, or report submitted pursuant to the provisions of the Federal-Aid Road Act approved July 11, 1916 (39 Stat. 355), as amended and supplemented,

"Shall be fined under this title or imprisoned not more than five years, or both."

Any person having reason to believe this statute is being violated should report the same to the agency representative(s) named below. (Federal-aid project only) (Both Federal and Federal-aid projects)

(Federal-aid project only)
State Highway Department
Terry R. Gibson, PE
919-733-7384

(Both Federal and Federal-aid projects)
Federal Highway Administration
John Sullivan, PE
919-747-7000

(Both Federal and Federal-aid projects)
Department of Transportation
Office of Inspector General
Toll Free Hotline: 1-800-424-9071

Form FHWA-1022 (Rev Sept 1994)