

State of Louisiana
Department of Transportation and Development (DOTD)
Materials and Testing Section Approved Materials Procedure
for

PORTLAND CEMENT AND BLENDED HYDRAULIC CEMENT

MATERIAL SPECIFICATION REFERENCE:

DOTD Standard Specifications, Subsections 1001.01, 1001.02, AASHTO M 85, AASHTO M 240, Supplemental Specifications and Special Provisions.

APPROVED MATERIAL EVALUATION SUBMITTAL:

The manufacturer shall submit a completed Approved Materials Evaluation Submittal to the DOTD Materials and Testing Section Coordinator listed below.

PRELIMINARY REQUIREMENTS:

The complete submittal must include:

- Complete Approved Materials Evaluation Form
 - Complete name and address of the supplier
 - Complete name and address of the cement source and owner
 - Type of cement produced
- An outline of the supplier's quality assurance sampling and testing program
- Description of cement storage facilities including capacities
- An outline of production procedures including pulverization techniques, description of additives mixed during production, and collection methods
- Letter requesting evaluation of the material
 - Intended use of cement
- Product Data Sheets
- Manufacturer's specifications
- Safety Data Sheet (SDS)
- Samples
- Independent Laboratory Test Results
 - Name and address of the accredited Concrete and Cement Reference Laboratory (CCRL) performing the quality control tests and a copy of their latest inspection report.

Foreign Sources shall meet all the above requirements for source approval as well as supply a letter of authorization from their representative in the United States who will assume full responsibility for the handling and quality control of their cement. A copy of this letter shall be submitted to the Materials and Testing Section. Documentation submitted for source approval, such as letters, quality control plans, products data sheets, test reports, etc., shall be in English.

NOTE: Evaluation will not begin until all required items listed above are received by the Materials Laboratory

PRELIMINARY REQUIREMENTS CONTINUED:

Certifications and/or Test Reports

Submit a Certificate of Analysis (CA) for five (5) daily production samples to the Materials and Testing Section. The CA shall show test results applicable to the intended use of the cement and the test results shall meet all specifications for AASHTO M 85 for Portland Cement or AASHTO M 240 for Blended Hydraulic Cement. All test results included on the CA shall be performed by a laboratory which is CCRL accredited.

Samples (to be furnished at no cost to the Department)

Submit five (5) daily composite production samples to the DOTD Materials and Testing Coordinator for evaluation. Each sample shall be randomly taken each day for five (5) days of production from one (1) identifiable storage unit. Each composite sample shall be continually split until a 20 lb. sample is obtained. Half of each of the five (5) daily 20 lb. composite samples shall be sent to the Materials and Testing Section in a 1-gallon water tight container with a re-sealable lid. The other half of each of the five (5) daily composite samples shall be retained and tested by the supplier. The supplier shall forward the applicable physical and chemical test results obtained on the retained samples to the DOTD Materials and Testing Coordinator upon completion of testing.

Submit a 10 lb. representative sample of the fly ash or bottom ash used in the production of the Type IP cement in a 1-gallon water tight container with re-sealable lid if applicable.

Submit a 10 lb. representative sample of the ground granulated blast-furnace slag (GGBFS) used in the production of the Type IS cement in a 1-gallon water tight container with re-sealable lid if applicable.

Submit a 10 lb. representative sample of the crushed limestone used in the production of the Type IL cement in a 1-gallon water tight container with re-sealable lid if applicable.

After completion of all testing, the Department may grant approval for the cement source.

TEST REQUIREMENTS:

Laboratory Testing

Each approval sample shall be tested by a laboratory currently accredited by CCRL for compliance with the applicable Departmental Specification for its intended use.

Note: Individual samples for initial approval shall not be combined into a composite sample.

TEST REQUIREMENTS CONTINUED:

A complete physical and chemical analysis shall be conducted on each approval sample in accordance with the following:

Portland Cement shall be tested in accordance with AASHTO M 85 and shall conform to the requirements of the intended type of cement.

Portland-Pozzolan Cement shall be tested in accordance with AASHTO M 240 and shall conform to the requirements for Type IP Cement, with the exception of the fly ash or bottom ash content as shown in Subsection 1001.02 of the LA DOTD Standard Specifications.

Fly Ash or Bottom Ash shall be tested in accordance with AASHTO M 295 and shall conform to the requirements for Class C or Class F Pozzolan.

Slag Cement shall be tested in accordance with AASHTO M 240 and shall conform to the requirements for Type IS Cement, with the exception of the slag content as shown in Subsection 1001.02 of the LA DOTD Standard Specifications.

Slag shall be tested in accordance with AASHTO M 302 and shall conform to the requirements for Grade 100 Slag and Grade 120 Slag.

Portland-Limestone Cement shall be tested in accordance with AASHTO M 240 and shall conform to the requirements for Type IL Cement, with the exception that it shall not be treated as a blended cement for purposes of cement material substitution with fly ash and slag as show in Subsection 1001.02 of the LA DOTD Standard Specifications.

All cement types shall be tested for alkali content. Alkali content of Portland Cement and Blended Hydraulic Cement calculated as sodium oxide equivalent shall not exceed 0.60 percent by weight. Alkali content of Fly Ash calculated in accordance with DOTD TR 531 shall not exceed 2.5 percent by weight.

Field Evaluation

The Department may require an inspection of the plant to review methods of sampling, testing and handling of cement.

Evaluation Time (6 Months)

GENERAL:

If approved, the Portland Cement or Blended Hydraulic Cement manufacturer and/or supplier shall abide to the following requirements:

Effective Quality Control Program

The source shall have an effective quality control program to ensure that the finished cement possesses uniform characteristics within the Department's specifications. An accurate record of test results representing a specific production period (not to exceed a 24-hour production period) shall be maintained by the plant.

Minimum requirements of the quality control program shall be as follows:

- Individual samples shall be representative of the cement stream into bulk storage and shall be obtained at a minimum rate of one (1) sample per 376 tons of finished cement. The samples shall be secured by the “grab” or “continuous” method in accordance with AASHTO T 127.
- Daily composite samples shall be prepared in accordance with the procedure outlined in AASHTO T 127 and shall not represent more than a 24-hour production period.
- All physical and chemical tests (including alkali content) required by AASHTO M 85 or AASHTO M 240 shall be conducted on each composite sample. Deletion of specific tests or a reduction in the testing rate for a specific test may be approved only by the Department’s Materials Engineer Administrator. For Type IP cement, all physical and chemical tests shall be conducted on fly ash or bottom ash in accordance with AASHTO M 295 on a semi-annual basis when fly ash or bottom ash is obtained from the same source. Tests shall also be conducted on all new sources of pozzolan or on the same source if there is a radical change in composition or production.

Maintain List of Authorized Representatives

All approved mills and terminals shall submit and maintain a list of telephone numbers and e-mail addresses of representatives authorized to sign documents pertaining to the certification, testing, handling and shipment of cement in accordance with this procedure. Additionally, the mill shall provide a list of names, telephone numbers and e-mail addresses of the person(s) responsible for submitting quarterly mill samples and monthly mill test reports to the Materials and Testing Section. The manufacturer is required to submit these lists to the DOTD Materials and Testing Coordinator.

Allow Periodic Inspections by Department Personnel

The Department reserves the right to send a representative to make on-site inspections of a plant’s facilities with emphasis on the method of sampling and testing. If and when a facility inspection occurs, the inspector shall have entry at all times to such parts of the plant concerning the manufacturing, sampling and testing of the cement, and shall also have the cooperation and assistance of plant personnel during the inspections. When a plant is inspected by CCRL, a copy of the latest CCRL report shall be submitted to the DOTD Materials Section accompanied with documentation of resolutions for any discrepancies. CCRL reports shall be treated with strict confidentiality.

GENERAL CONTINUED:

Provide Quarterly Mill Samples and Monthly Mill Reports

A mill sample shall be representative of the production of Portland Cement or Blended Hydraulic Cement for each quarter. A 20 lb. mill sample shall be split with half submitted to the DOTD Materials and Testing Section and the other half retained and tested at the plant or by an independent CCRL accredited laboratory. All results obtained from quarterly mill samples shall be submitted to the DOTD Materials and Testing Coordinator with proper identification stating the quarter represented and mill sample number. Mill test data shall be kept on file for three (3) years in accordance with AASHTO R 18 and available upon request.

Upon completion of the evaluation, the submitter will be notified in writing concerning the results of the evaluation and whether the material will or will not be added to the Approved Materials List (AML). The DOTD Materials and Testing Section Coordinator shall be notified in writing of any change from the original material submittal. The Department reserves the right to re-evaluate any material at any time.

A 1-gallon mill sample conforming to the requirements above shall be accompanied with a CA of the material and submitted quarterly to the DOTD Materials and Testing Section to remain on the AML.

It is also the manufacturer's responsibility to supply the contact information of the representative responsible for the material to the Materials Section Coordinator to remain on the AML. This is done by completing the Approved Materials Evaluation Form every two (2) years or when there is a change in the manufacturing representative responsible for the material.

DISTRIBUTION OF CEMENT:

The manufacturer's seals shall be placed on all outlets of railroad cars and barges as well as on the discharge ends of trucks delivering cement to Department projects. This seal shall be placed immediately after loading and in the presence of the manufacturer's or terminal's authorized representative. The seals shall be intact and in place upon arrival at the destination.

The Department's authorized representative shall observe the removal of seals and verify that the seal numbers are the same as listed on the certifications which accompany the shipment. In the event that cement is unloaded during non-working hours or delivered to a commercial concrete plant, it will be the responsibility of the designated plant representative to verify that all conveyances were properly sealed.

DISTRIBUTION OF FOREIGN CEMENT:

The representative/distributor of foreign cement shall adhere to all applicable requirements of the Approved Material Procedure. The representative/distributor shall submit a Quality Control Program to show methods of cement distribution, traceability, location of plants and terminals, a list of authorized signatures to sign all documents, and a flow chart that shows distribution of cement from the plant to the job site.

DISTRIBUTION OF FOREIGN CEMENT CONTINUED:

Foreign source cement shipments shall be accompanied by a completed cement Certificate of Compliance (CC), and conveyances shall be sealed with a manufacturer's seal. All requirements listed in the Distribution of Cement section shall also be adhered to. No mixing of cement from different sources shall be allowed in shipping or storage of cement.

Foreign source cement shipments shall be sampled and tested at the time of vessel loading and again upon arrival at United States ports. The vessel shall be sampled from at least three (3) locations in the vessel and composited into a 5-gallon sample. The 5-gallon composite sample shall be split into two (2) samples. The distributor shall test one split sample and retain the other. Within the first three (3) month period, the test reports for each shipment to United States ports shall be mailed to the Materials Engineer Administrator. Test reports for shipments received after the three (3) month period shall be maintained on file by the representative/distributor for a period of three (3) years in accordance with AASHTO R 18. The cement Certificate of Compliance records shall be maintained for a period of three (3) years. These documents shall be made available to the Department upon request.

The Department may conduct periodic inspections of distribution facilities and shipping records. Department personnel shall have the cooperation and assistance of the company's facility personnel during all inspections.

The foreign cement manufacturer and their distributor shall be responsible for the quality of the cement supplied to the Department for use on state projects. Failure to comply with all the Department's requirements will result in the removal of the foreign cement source from the Approved Materials List (AML), and the distributor's approval to distribute cement to state projects shall be revoked.

PROJECT ACCEPTANCE REQUIREMENTS:

A completed "Cement Certificate of Compliance" form, supplied by the Department, shall accompany each shipment of cement intended for use on state projects. A copy of each form shall also be sent to the Materials Engineer Administrator for review. This form shall be signed by an authorized representative. The terminal manager shall keep the certificate on file and issue a new certificate with each shipment to state projects with a copy of the new certificate mailed to the Materials Engineer Administrator. The terminal's records and operations shall be such that the cement handled is traceable to a production period. The cement Certificate of Compliance records shall be maintained for a period of three (3) years.

The inclusion of any material on the AML is not blanket approval for its use. All materials, regardless of prior approval, shall be sampled in accordance to the Materials Sampling Manual.

DISQUALIFICATION AND REMOVAL:

Any material may be removed from the AML at any time. Causes for removal from the AML may include, but are not limited to the following:

- Non-conformance with specifications
- Performance requirements
- Failure to notify the Department of any change in material formulation
- Failure of the plant to provide quarterly mill samples in accordance with this procedure
- Failure of the supplier to provide proper certifications as required by this procedure
- Failing test results obtained by the Materials Section of consecutive quarterly mill samples or project verification samples
- Continued violation of variability limits
- Failure to supply current contact information for the material representative in accordance with this procedure

REQUALIFICATION:

Any material which has been disqualified and/or removed from the AML will be considered for re-evaluation only after submission of a formal request along with acceptable evidence that the problems causing the disqualification and/or removal have been resolved.

DOTD MATERIALS AND TESTING SECTION COORDINATOR:

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A handwritten signature in black ink, appearing to be 'B. Owens', with a stylized flourish at the end.

BRIAN OWENS, P.E.
DOTD MATERIALS ENGINEER ADMINISTRATOR