

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

PORTLAND CEMENT AND BLENDED
HYDRAULIC CEMENT MILL CERTIFICATION

1. PURPOSE

- 1.1 To provide the Division's acceptance procedures for portland cement and blended hydraulic cements.
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2. SCOPE

- 2.1 This procedure shall apply to all portland cement and blended hydraulic cement production mills which furnish cement to projects, except that the Division may elect to use other control procedures when special conditions dictate the need for more stringent control.
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3. APPLICABLE SPECIFICATIONS

- 3.1 All items under this procedure shall meet the requirements of Section 701.1 and 701.3 of Specifications. This section specifically includes ASTM C150 for portland cement and ASTM C595 for blended hydraulic cements. In addition, samples will be obtained in accordance with ASTM C183.
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4. PROCEDURE

Cement mills which produce cement for use in projects shall be identified as Certified or Non-Certified, as outlined below.

4.1 CERTIFIED

To be considered for certification, the manufacturer shall do the following:

- 4.1.1 Submit a certified statement to Materials Control, Soils and Testing (MCS&T) Division that all cement shipped to projects will conform to the specification requirements. The certified statement shall be signed by a representative of the manufacturer having legal authority to bind the company.
- 4.1.2 Maintain records of production control tests, for each type of cement which may be supplied to projects, for a period of at least five years and make them available to the Division upon request.
- 4.1.3 Have mill laboratory facilities inspected by the Cement and Concrete Reference Laboratory (CCRL). A copy of the CCRL report on the mill laboratory inspection shall be provided to the Division, accompanied by documentation of resolution of any discrepancies noted in the CCRL report.

- 4.1.3.1 Each mill shall continue to participate in the CCRL inspection program at the normal inspection frequency scheduled by CCRL, typically 24-36 months. Each mill shall submit a copy of that inspection report to this Division accompanied by documentation of resolution of any discrepancies noted in the CCRL report.
- 4.1.4 Submit to the MCS&T Division test data developed on the type(s) of cement to be certified. This data must consist of test results developed from each day's production over the most recent fifty production days. The required tests are for all the standard chemical and physical requirements listed in ASTM C150 and/or ASTM C595. Each complete battery of tests shall represent not more than twenty-four hours of continuous production per finish mill.
 - 4.1.4.1 In the case of Type III cement, blended hydraulic cement, or other cement, which is not produced on a regular basis, if there are not fifty production days for that type of cement in the previous two-year period, then the data for that type of cement shall consist of test results from at least the last twenty-six production days, unless otherwise approved by the Division.
- 4.1.5 The quality history of a cement plant seeking certification will be determined using the data submitted by the manufacturer as specified in 4.1.4 or 4.1.4.1. Statistical limits, as defined in ASTM C183, will be developed from this data. When an acceptable quality history has been determined, the Division will compare test data developed on production grab samples taken by Division representatives, to the statistical limits established by the mill's production data.
- 4.1.6 When a cement mill has met the above criteria and has been designated by the Division as Certified, the manufacturer will be required to submit test data on a monthly basis in the same manner as described in 4.1.4.
 - 4.1.6.1 As required in Section 4.1.4, all Certified cement mills shall submit test results, for all tests, developed from each day's production, to MCS&T Division, except for the results for the Insoluble Residue test. Once a cement mill has been Certified, and if, during the previous three-month period, none of the Insoluble Residue test results from that Certified cement mill exceed 0.75%, then that Certified cement mill may reduce the frequency of Insoluble Residue test result submittal to one test per week of production, instead of one test per day of production. If any Insoluble Residue test result from that Certified cement mill (including results from samples obtained by the Division), is greater than 0.75%, then the frequency of Insoluble Residue test result submittal from that Certified cement mill shall immediately be increased back to one test per day of production, until another three-month period has elapsed, with no Insoluble Residue test results greater than 0.75% from that Certified cement mill.
 - 4.1.6.2 When ASTM C1038 testing is performed due to higher SO_s content, as outlined in Table 1 of ASTM C150 and/or Table 1 of ASTM C595, the Certified cement mill performing that testing shall perform a minimum of one test per month on the sample with the highest SO_s content for that month.
 - 4.1.6.3 In the case of Type III cement, blended hydraulic cement, or other cement, which is not produced on a regular basis, if no cement of this type was produced in a particular

month(s), then the Cement Manufacturer shall submit a written statement noting this to MCS&T Division.

- 4.1.7 The Division will take paired samples from a certified plant's production at a frequency dependent upon the variability of test data. The frequency will generally be such that the sampling is accomplished every four months.
- 4.1.7.1 In the case of Type III cement, blended hydraulic cement, or other cement, which is not produced on a regular basis, if no cement of this type was produced in a four-month period, then the Cement Manufacturer shall submit a written statement noting this to MCS&T Division, and the Division will not be required to take paired samples for that four-month period.
- 4.1.7.2 The paired samples will be obtained, tested, and evaluated in accordance with applicable ASTM procedures.
- 4.1.7.3 Two consecutive pairs of test values failing to meet the statistical control criteria may be considered cause to remove the mill from the certified group.
- 4.1.7.4 If any individual sample fails to meet the requirements of the applicable ASTM Specification, the mill may be removed from the certified group.
- 4.1.7.5 If a certification is removed, it may be reinstated at the discretion of the Division when sufficient sampling and testing has been conducted to ensure statistical control.
- 4.1.8 When all requirements for certification have been met, the manufacturer may ship cement of the type certified to projects. Records of quantities of cement shipped to projects must be maintained by the manufacturer for a minimum of three years and made available to the Division upon request.
- 4.1.9 The manufacturer and the District Materials offices will be notified of all changes in the status of a mill's certification.
- 4.1.10 Once each month, or anytime the list is updated, the MCS&T Division will provide the District with a list of all currently certified cement mills.

4.2 NON-CERTIFIED

A cement mill defined as non-certified may supply cement to the projects from approved LOTs.

- 4.2.1 The Division will sample, test, approve, and seal LOTs of cement for use in projects. Samples will be obtained in accordance with ASTM C183 except that one grab sample shall be secured for each 400 tons (360 Mg) in the sampling of bulk storage at points of discharge, while the cement is flowing through the openings. All of the applicable chemical and physical tests noted in ASTM C150 and/or ASTM C595 will be conducted by the Division laboratories.
- 4.2.1.1 Any individual sample failing to meet all of the applicable ASTM requirements will result in rejection of the entire LOT of cement.

- 4.2.2 When a LOT of cement has been sampled, tested, and found to meet all specification requirements, the Division will notify the manufacturer of approval and a Division approval number will be assigned to the LOT.
- 4.2.3 A manufacturer may make shipments from approved LOTs upon notification of Division approval. When such shipments are made, the manufacturer shall provide documentation as follows:
1. Project to which material is shipped (if available)
 2. Silo number from which material drawn
 3. Location of shipping origin
 4. Contractor (i.e. consignee)
 5. Division approval number assigned to silo
 6. Identification of carrier
 7. Quantity of material in shipment
 8. Type of material
- 4.2.3.1 This documentation may be provided in the form of bills of lading and shall have the following distribution:
1. 1 copy sent to MCS&T Division
 2. 1 copy sent to accompany shipment and to be left at the destination to become the property of the Division
- 4.2.3.2 Records of quantities of cement shipped to projects must be maintained by the manufacturer for a minimum of three years and made available to the Division upon request.

4.2.3.3 A balance sheet shall be maintained by the manufacturer for each LOT of cement approved for shipment to projects. This balance sheet shall provide the following information:

1. The silo number
2. The Division approval number assigned to the silo
3. The test quantity
4. Separate entries for each shipment made from the silo showing bill of lading number and quantity.
5. The balance left in the test quantity after each shipment

The manufacturer may not ship material in excess of the test quantity plus five percent (5%).

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MP 701.01.10 Steward – Cement and Concrete Section
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