

**KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 2015 EDITION**

Delete SECTION 2004 and replace with the following:

SECTION 2004

FLY ASH and NATURAL POZZOLANS FOR USE IN CONCRETE

2004.1 DESCRIPTION

This specification covers fly ash and natural pozzolans that may be used as a partial replacement for portland cement and blended hydraulic cement in concrete, when allowed by other parts of the Contract Documents.

2004.2 REQUIREMENTS

- a. Fly ash and natural pozzolan sources must be prequalified.
- b. Provide material that complies with the chemical and physical requirements of ASTM C 618, Type F, C or N. The supplementary optional physical requirements apply, except that with the "Effectiveness in Controlling Alkali-Silica Reaction," based on ASTM C618-15, Table 3, the expansion of the test mixture as a percentage of the low-alkali cement control at 14 days may not exceed 120%. Conduct this testing with 15% fly ash and a Type I/II cement with an alkali content between 0.40% and 0.60%.
- c. The quality-monitoring program must comply with the minimum sampling and testing frequencies established in ASTM C 311. This frequency may be altered slightly with the approval of the Bureau Chief of Construction and Materials, provided the monitoring intent of ASTM C 311 is met or exceeded.
- d. There are other requirements that must be met for the fly ash or natural pozzolan and cement mixture in addition to those cited above for qualification of the fly ash or natural pozzolan alone. Additional testing will be required for specific applications. Consult the Contract Documents before proposing the use of fly ash or natural pozzolan in concrete.

2004.3 TEST METHODS

Sample and test materials according to ASTM C 311. Field sample according to Part V, KT-29.

2004.4 PREQUALIFICATION

a. Becoming Prequalified.

- (1) Manufacturers desiring to provide material under this specification are to submit the following to the Engineer of Tests:
 - (a) A copy of the quality control plan for the source. The plan should include information on where and how sampling is performed, frequency, and what standards (ASTM, AASHTO, etc.) are used.
 - (b) A 2-gallon sample representative of material intended for use on KDOT projects.
 - (c) Complete instructions on the use of the material and a Safety Data Sheet (SDS).
 - (d) Certified test results of fly ash or natural pozzolans produced during the 6 months immediately before the prequalification request. Show the high, low and average values or statistical analysis for each month.
 - (e) Written information regarding the sources of coal utilized in the production of fly ash for the preceding 6 months, and that anticipated for the future. For natural pozzolans, provide a statement noting the location of the parent material(s) and the source (ie: pumice, volcanic ash deposits, calcined clay, etc.).

(f) Provide evidence that the quality control laboratory is accredited by a national accrediting body, such as AASHTO Resource, and regularly inspected receiving satisfactory ratings by the Cement and Concrete Reference Laboratory (CCRL).

(g) For natural pozzolans, provide evidence that no detrimental effects of the product will occur when used in typical KDOT mix designs. This documentation shall be a comparison of testing results of either laboratory produced mix or actual production mix with one mix utilizing the natural pozzolan and another mix as a control without the natural pozzolan. All materials utilized should be durable so the comparison of using the natural pozzolan will highlight any detrimental effects that might occur. The coarse aggregates utilized shall be from KDOT PQL 3.4.

Results of the comparison should meet the following requirements:

- ASTM C39, Compressive strength at 7 and 28 days: 90% or better of control
- ASTM C78, Flexural Strength at 7 and 28 days: 95% or better of control
- ASTM C157, Length Change up to 56 days: 95% to 105% of control or less than -0.04% to 0.04% at 56 days.
- ASTM C666, Freeze-Thaw Resistance up to 300 cycles: a durability factor greater than 95.
- ASTM C1202, Rapid Chloride Permeability: 50% or lower of control

(2) The Engineer of Tests will test the submitted sample and review the information submitted by the source, for compliance with the Contract Documents. The Engineer of Tests will notify the source of the results in writing. Suppliers complying with all requirements will be placed on a list of prequalified fly ash and natural pozzolan sources maintained by the Bureau of Construction and Materials.

(3) Prequalification of the source of fly ash will be based on material produced when the power plant is using specific materials, equipment and processes. Prequalification of the source for natural pozzolans will be based on the original location of the parent material, equipment and processes.

(4) Any change in materials for both fly ash and natural pozzolans, materials sources, equipment or processes voids the source prequalification, and a new prequalification will be required.

b. Maintaining Prequalified Status. After a source has gained prequalified status, the source will be permitted to furnish materials for use on KDOT projects provided the following conditions are met:

(1) Submit quality monitoring test reports monthly for all monitoring samples.

(2) Use an approved laboratory to conduct quality control tests. The laboratory will be considered approved if it is properly equipped, has the capabilities to perform the tests required by the Contract Documents and is a quality control laboratory accredited by a national accrediting body, such as AASHTO Resource, and regularly inspected receiving satisfactory ratings by the Cement and Concrete Reference Laboratory (CCRL). Continued approval of the control laboratory and the source will depend on satisfactory comparison of its test results with the results obtained by the KDOT Materials and Research Center.

(3) The source has not changed materials, material sources, equipment, or processes since prequalification.

2004.5 BASIS OF ACCEPTANCE

a. Prequalification as specified in **subsection 2004.4.**

b. A proper certification must accompany each shipment of fly ash or natural pozzolan. Provide to the Field Engineer 2 copies of the bill of lading which includes the following certification statement and the signature of a responsible company representative.

Certification Statement

The material herein has been sampled and tested as prescribed by KDOT and complies with the applicable specification requirements for Class ____ fly ash or natural pozzolan.

Date _____ Signed _____

Identify the bills of lading with a project number, and denote the source, the type and the quantity in the shipment. Retain these copies at the project or ready mix plant for the Field Engineer's records.

In the case of more than one project being supplied by a ready mix plant, the plant must provide the Field Engineer with a copy of the bill of lading, or a signed listing of the bills of lading representing the material incorporated in each project.

Note: Verification samples will be obtained by KDOT personnel at the project site at the rate of one per year, for each source supplying material to that District's projects. Test results which do not comply with the Contract Documents may be considered sufficient cause to rescind approval to furnish materials on a certification basis.

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