SECTION 103

FLY ASH

103.1 DESCRIPTION

A. General: Fly ash shall be from a base loaded electric generating plant using a single coal source. Plants using a limestone injection process for controlling air pollutants are not acceptable. Fly ash from the start up and shut down of the plant shall not be used.

B. Related Work:

Section 40	Portland Cement Concrete Pavement
Section 50	Precast Concrete
Section 55	Cast in Place Concrete Structures
Section 56	Class M6 Concrete for Curb & Gutter and Flatwork
Section 58	Concrete Box Culvert
Section 60	Concrete Curb and Gutter
Section 61	Concrete Sidewalk, Curb Ramps and Detectable Warning Surfaces
Section 62	Drop Inlets
Section 63	Storm Sewer Junction Boxes and Manholes
Section 101	Air-Entraining Admixtures
Section 200	Controlled Low Strength Material
Section 203	Submittals

103.2 MATERIALS

A. Class C Fly Ash: Conforming to AASHTO M 295 will only be allowed in grout for pavement jacking, undersealing, controlled density fill, or when specified.

B. Class F, Modified Fly Ash: Fly ash used in all other concrete shall conform to AASHTO M 295 Class F including the optional requirements in the referenced AASHTO specification except as modified by the following:

Loss on Ignition	2.0% Maximum
Moisture Content	2.0% Maximum
Available Alkalis as Na_2O	1.5% Maximum*

Note: These modifications shall not apply to fly ash used in slurry for pavement jacking or undersealing operations.
* Available alkalis up to 2.0% may be used, provided mortar expansion test results at 14 days is less than or equal to that of the control sample. The expansion test shall be run in accordance with modified ASTM C441. The control sample shall be made using cement that will be used on the project. The test sample shall be made using cement and fly ash that will be used on the project.

The total of silicon dioxide (SiO_2) plus aluminum oxide (Al_2O_3) plus iron oxide (Fe_2O_3) shall be at least 66.0% by dry weight of the total fly ash composition. The silicon dioxide (SiO_2) shall be at least 40.0% by dry weight of the total fly ash composition.

C. Number of Tests: Each sample representing 400 tons or less shall be tested for the following:

1. Fineness - #325 sieve analysis;

2. Moisture content;

3. Specific gravity;

4. Loss on ignition;

5. Soundness.

6. All other physical tests and chemical determinations shall be made on composite samples representing each 3200 tons. This composite sample shall be prepared by combining equal parts of 8 consecutive samples, each representing 400 tons.

The test data shall be furnished to the Engineer in the form of a chemical and physical analysis report.

Fly ash delivered without an acceptable Certificate of Compliance will be subject to rejection.

103.3 CONSTRUCTION REQUIREMENTS

A. Limitations: Fly ash will not be permitted when Type III cement is used.

B. Storage: Fly ash shall be stored at the concrete plant site in clearly marked separate containers. Use of divided bins in the same silo will be permitted if the silo is commercially manufactured with divided bins or if the contractor/concrete supplier has a certification by a registered professional engineer that the divided bins will structurally handle the load associated with the use of the silo.

C. Design Mix: Fly ash may be substituted for cement in concrete. The addition or deletion of fly ash from the mix will be at no cost to the City. If fly ash is used, the minimum amount of cement to be replaced is 15% and the maximum amount is 25% at a 1:1 ratio by weight.

Changes in fly ash source or mill plant coal supply will require a new mix design approval.

D. Batching: Fly ash may be weighed on a separate scale or on the same scale as the cement. If the cement scale is used, the cement must be weighed first.

103.4 METHOD OF MEASUREMENT

There will be no separate measurement for fly ash admixtures.

103.5 BASIS OF PAYMENT

There will be no separate payment for fly ash admixtures.

END OF SECTION