SUMMARY REPORT 240-1(S)

# ANALYSIS OF FLY ASHES PRODUCED IN TEXAS

SUMMARY REPORT
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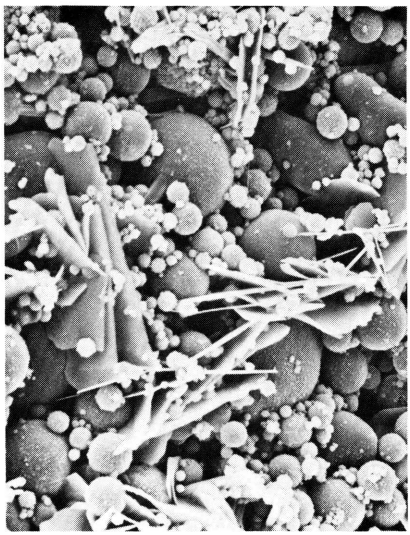

A 1500 X Photomicrograph of Fly Ash From Sub-bituminous Coal Exposed to Moisture for Seven Days

Cooperative Research Program of the
Texas Transportation Institute
and the
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In Cooperation with the
U. S. Department of Transportation, Federal Highway Administration

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TEXAS TRANSPORTATION INSTITUTE
The Texas A&M University System
College Station, Texas

# Analysis of Fly Ashes Produced in Texas

by

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The objective of this phase of the study was to analyze the variability of selected Texas fly ashes and develop laboratory procedures which will quickly ascertain those characteristics of fly ash important to their utilization in soil stabilization and concrete.

The scope of work involved the examination of five fly ashes produced in Texas through collection of a number of fly ash samples from each plant over a period of time (generally three months). The examination included physical and chemical characterization, development of laboratory procedures to quickly ascertain total CaO content and fineness of each fly ash, and determination of selected fresh properties of mortar made with fly ash-portland cement. The results of this examination were subjected to statistical correlation evaluation to ascertain the degree of correlation between physical and chemical characteristics measured. Major conclusions reached were:

1. The total CaO content of Texas fly ashes can be accurately and rapidly estimated *in the field* by the use of a simple test — termed the CaO Heat Evolution Test — which takes less than 10 minutes to perform.

2. The percentage retained on the No. 325 Sieve can be accurately and rapidly estimated by determining the percentage retained on the No. 200 Sieve.

3. There is a wide range of chemical compositions found in Texas fly ashes, both between different sources and — to a lesser extent — within a given source with time. This wide range makes it very important to be able to quickly estimate the total CaO content of a sample of fly ash.

4. There is a wide range in physical characteristics between different fly ashes and — to a lesser extent — within a given source with time.

5. All five fly ashes met the PAI and water requirement limits specified in ASTM C-618, indicating they all exhibit acceptable properties for use as a partial replacement for lime and for portland cement.

Based on the conclusions reached in this study the following

recommendations are made concerning implementation of results.

1. Consideration should be given to specifying a *field acceptance* uniformity requirement for CaO content in the fly ash, based on the CaO Heat Evolution Test.

2. Consideration should be given to checking fineness of random shipments of purchased fly ash using the No. 200 Sieve.

3. Consideration should be given to "source qualifying" fly ash produced for the Texas highway market. This source qualification should be repeated on a *random* schedule from shipments of fly ash purchased for use in Texas highways.

The published version of this report may be obtained by addressing your request as follows:

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